Appendix I

Preliminary Hydrology Report

PRELIMINARY HYDROLOGY REPORT

For

MOJAVE INDUSTRIAL PARK
MOJAVE DRIVE AT ONYX ROAD
APN(s): 3128-631-02, 03 & 04
PPTXXXXX

PROJECT LOCATION

North of Mojave Drive, south of Cactus Road,
between Onyx Road and Topaz Road
City of Victorville, County of San Bernardino, CA

DEVELOPER

MOJAVE 80 GRAY, LLC
C/O COVINGTON DEVELOPMENT PARTNERS, LLC
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949-514-0274

PREPARED BY

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Johnny Murad, P.E.
C67512, Exp 06/30/2025

PREPARATION DATE

May 16th, 2023

HZ PROJECT NUMBER

R315712.01

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Introduction

This preliminary hydrology report has been prepared for Mojave 80 Gray, LLC, C/O Covington Development Partners, LLC for the proposed industrial warehouse development located north of Mojave Drive, south of Cactus Road between Onyx Road and Topaz Road in the City of Victorville, County of San Bernardino, California. This project consists of three industrial warehouse buildings ranging from approximately 91,000 square feet to 1,159,000 square feet on a total of approximately 73 acres of vacant land.

Phase 1 – Building 1, 2 and 3:

- Building 1 will be located at the northwest corner of Mojave Drive and Topaz Road and is planned to be approximately 100,000 square feet on approximately 6.21 acres.
- Building 2 will be located at the northeast corner of Mohave Drive and Onyx Road and is planned to be approximately 91,000 square feet on approximately 5.70 acres.
- Building 3 will be located at the southeast corner of Cactus Road and Onyx Road and is planned to be approximately 1,159,000 square feet on approximately 61.05 acres.

Additionally, the project will require the widening of the north side of Mojave Drive to the ultimate street section from Onyx Road to Topaz Road as well as the extension of Onyx Road and Topaz Road from Mojave Drive to Cactus Road and extension of Cactus Road from the existing terminus approximately 370 feet east of Highway 395 to Topaz Road.

Purpose

The purpose of this report is to study the existing drainage patterns tributary to the proposed development and determine the necessary off-site (public) and on-site (private) drainage facility improvements.

In addition, this study will:

- Study the existing condition drainage patterns tributary to the project limits based on the master plan of drainage and existing infrastructure and determine the required off-site drainage improvements required to capture and convey the tributary storm water through or around the project site.
- Estimate the pre-development peak flow rate for the 10-year and the 100-year storm events for the area that is tributary to the existing storm drain line T in Cactus Road.
- Estimate the post-development peak flow rate for the 10-year and the 100-year storm event for each building site.

- Estimate the minimum mitigation volume for sizing of the on-site underground infiltration chamber for each building to mitigate the total 10-year and 100-year flow from Buildings 1, 2, and 3 down to the existing 10-year and 100-year flow that is tributary to existing Line T.

Existing Condition and Watersheds

The existing site is undeveloped land located north of Mojave Drive, south of Cactus Road, between Onyx Road to the west and Topaz Road to the east. The Elevation ranges from approximately 3010 at the southwest corner near Mojave Drive at Onyx Road and 2980 at the northeast corner near Cactus Road at Topaz Road.

Based on the original master plan of drainage prepared by Williamson & Schmid, the terrain generally drains in the northeasterly direction with a majority of the site tributary to the master planned E-01 storm drain. The tributary area south of Mojave Drive was master planned to drain to the E-07 storm drain along the south side of Mojave Drive and confluence with the E-01 storm drain east of Topaz Road.

Based on the Master Storm Drain Plan Alternate for Line E-01, prepared by Ludwig Engineering in November of 2018, the flow patterns south of Mojave have been altered from the original master plan of drainage and approximately 463 cfs have been directed to flow to the existing double 48-inch culvert that crosses Mojave Drive between Mesa Linda Avenue and Onyx Road as an interim condition and a reduced amount of flow (1508 cfs) has been directed to the culvert system east of Topaz Road for Line E-01.

An existing 60-inch storm drain lateral (Line T) has been extended in Cactus/Tawney Ridge Lane at Diamond Road which has the capacity to accept the tributary runoff from the area north of Mojave Drive between Mesa Linda and Diamond Road, approximately 209 cfs. An existing open channel (E-01) has been constructed south of Cactus/Tawney Ridge Lane to intercept the tributary runoff from south of Mojave Drive, approximately 2373 cfs. Based on the existing downstream infrastructure for Line E-01, it is anticipated that the redirected flow of 463 cfs will need to be conveyed to the east along Mojave Drive to confluence with the Line E-01 system east of Topaz Road.

There is approximately 44 acres to the east of Onyx Road (not a part) and 47 acres between Onyx Road and Topaz Road (this project) that is tributary to Line T and another 60 acres to the east of Onyx Road (not a part) that is not tributary to Line T that continues northeast across Cactus Road. The flows that are not a part will need to be collected and conveyed to the appropriate tributary system.

See Appendix A for the existing condition hydrology map.

Proposed Off-Site/Public Improvements

Based on the Master Storm Drain Plan Alternate for Line E-01, prepared by Ludwig Engineering in November of 2018, approximately 463 cfs have been directed to flow to the existing double 48-inch culvert that crosses Mojave Drive between Mesa Linda

Avenue and Onyx Road. As part of the development this runoff will need to be re-directed to the east to confluence with the Line E-01 system. Based on a preliminary capacity analysis, the existing double 48-inch culvert does not have the capacity to capture and convey the entire 463 cfs that has been directed toward it and therefore will need to be upgraded. A Reinforced Concrete Box (RCB) storm drain (Line E-07) will be constructed on the north side of Mojave Drive from the existing double 48-inch culvert system between Mesa Linda Avenue and Onyx Road and extend easterly to the existing culvert just east of Topaz Road and outlet into the existing earthen channel on the north side of Mojave Drive at the existing culvert outlet. This will re-direct the watershed south of Mojave Drive to drain to the E-01 system as originally master planned. The sizing of the proposed RCB facility will be provided during the final design phase.

For this development (Building 1, 2 and 3) a local storm drain (Line T) will be extended in Tawney Ridge Lane/Cactus Road from the intersection of Diamond Lane to Onyx Road to accept the street flows from Cactus Road and the onsite overflow from Building 3. Line T will continue south on Onyx Road to accept runoff from the west side of Onyx Road, street flows from Onyx Road, and the onsite overflow from Building 2. Lateral T-6 will be extended south from the intersection of Cactus Road and Topaz Road to accept the street flows from Topaz Road and the onsite overflow from Building 1.

Additionally, a street crossing culvert system will be designed to convey runoff that is not tributary to Line T from the east side of Onyx Road across Cactus and outlet between Onyx Road and Topaz Road to mimic the existing drainage pattern.

See Appendix A for the proposed condition hydrology map.

Proposed On-Site/Private Improvements

The development will be required to reduce the site runoff from Buildings 1, 2, and 3 down to the pre-developed 10-year and 100-year condition tributary to Line T by implementing storm water detention in conjunction with the storm water quality management mitigation. For building 1, 2 and 3 the site soils exhibit sufficient infiltration capacity and therefore underground infiltration chamber systems will be utilized to help meet the WQMP Design Capture Volume (DCV) requirements as well as detention for 10-year and 100-year flow mitigation. Each site will be designed to capture and convey site runoff in an on-site storm drain system which will discharge site flows into an underground infiltration/detention chamber system. Once the infiltration chambers have captured the required WQMP DCV, each system will begin to overflow into an outlet pipe that will be extended to the property, per the offsite proposed storm drain.

Hydrologic Analysis

A hydrologic analysis was prepared using the methodology outlined in the San Bernardino County Flood Control District (SBCFCD) Hydrology Manual and City of Victorville hydrology report guidance document. A rational method & unit hydrograph analysis were completed for the existing & proposed 10-year and 100-year storm events using Civild software.

The rainfall rates were taken from the NOAA 14 ATLAS per the County of San Bernardino Hydrology Manual. The hydrologic soils type for the site is "C" and was taken from the soil map in the Hydrology Manual (see Appendix G for reference maps). A "commercial" land use designation was used with an AMC of III for the 100-year storm and an AMC of II for the 10-year. Unit hydrograph analysis (Appendix C) were also completed for the 10-year and 100-year existing storm events for the area tributary to line T and proposed storm events for the project site using Civild software.

Results

Our preliminary drainage study results are as follows:

Off-Site Facilities:

- Based on our preliminary study there will be a need to extend a new RCB facility from the existing culvert crossing Mojave Drive between Mesa Linda and Onyx to the existing culvert system crossing Mojave Drive just east of Topaz Road to convey the tributary 463 cfs that was re-directed toward the existing culvert system. Sizing of the new culvert inlet, outlet and RCB facility will be determined in the final design phase.
- Line T will need to be extended in Cactus Road, from Diamond Road to Onyx Road and south in Onyx Road to capture and convey the tributary flows.
- A lateral T-6 will need to be extended in Topaz Road from Cactus Road to just south of Mojave Drive to capture and convey the tributary flows.
- Line T will convey approximately 116.2 cfs from the proposed development and off-site tributary areas to the existing 60-inch storm drain in Tawney Ridge Lane/Cactus Road at Diamond Road.
- A separate culvert will need to be constructed to capture and convey tributary runoff of approximately 80.1 cfs at the southwest corner of Onyx Road at Cactus Road and discharge to the north side of Cactus just east of Onyx Road.

On-Site Facilities:

- The Building 1 site will drain to an on-site infiltration chamber system and overflow to Line T-6 in Topaz Road.
- The Building 2 site will drain to an on-site infiltration chamber system and overflow to Line T in Onyx Road.
- The Building 3 site will drain to an on-site infiltration chamber system and overflow to Line T in Cactus Road.
- Each building infiltration chamber system has been sized to capture and retain the WQMP design capture volume as well as provide storm water mitigation for the 10-year and 100-year storm events. See storm water basin and runoff summary tables below:

COVINGTON - MIP STORM WATER BASIN SUMMARY			
	WQMP DCV (CF)	PROPOSED Q PRIOR TO MITIGATION (CFS)	PROPOSED Q PRIOR TO MITIGATION (CFS)
BUILDING 1 (6.2 AC)	13,252	14,043	39,840
BUILDING 2 (5.7 AC)	12,182	12,396	36,803
BUILDING 3 (61.1 AC)	130,209	163,541	397,409
TOTAL	155,643	189,980	474,052

COVINGTON - MIP UNIT HYDROGRAPH AND STORM WATER MITIGATION SUMMARY									
	EXISTING Q TRIBUTARY TO STREAM (CFS) (47 AC)		PROPOSED Q PRIOR TO MITIGATION (CFS)		PROPOSED Q AFTER MITIGATION (CFS)		Q_{out} DUE TO INFILTRATION (CFS)	PROPOSED Q AFTER MITIGATION TO PUBLIC SD (CFS)	
	10 YR	100 YR	10 YR	100 YR	10 YR	100 YR		10 YR	100 YR
BUILDING 1 (6.2 AC)			10.19	17.79	1.20	3.19	0.30	0.90	2.89
BUILDING 2 (5.7 AC)			9.84	17.18	1.03	3.39	0.34	0.69	3.05
BUILDING 3 (61.1 AC)			93.04	169.07	8.27	26.38	2.27	6.00	24.11
TOTAL	14.29	33.24	113.07	204.04	10.5	32.96		7.59	30.05
IS Q AFTER ROUTING LESS THAN OR EQUAL TO EXISTING Q TRIBUTARY TO STREAM?								YES	YES

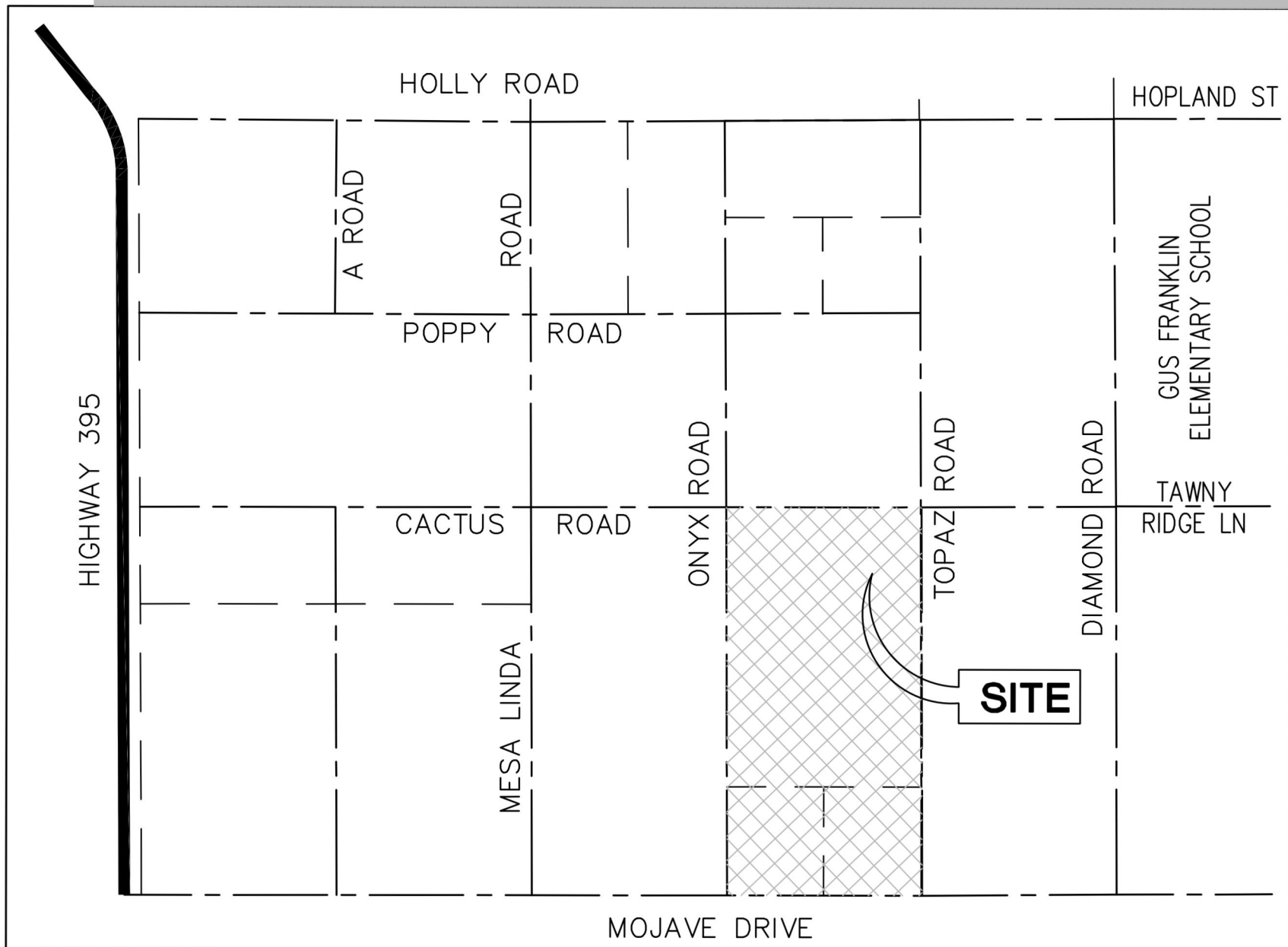
See Appendix B, C and D for the preliminary hydrologic calculations and basin routing analysis.

All proposed project site drainage and storm drain facilities will be sized adequately for 100-year storm event. Storm drain hydraulic calculations and catch basin sizing calculations will be provided during the final design phase.

Appendix A

Existing Condition Hydrology Map

Preliminary Proposed Condition Hydrology Map


HOLLY ROAD
HOPLAND ST
A ROAD
ROAD
POPPY ROAD
HIGHWAY 395
GUS FRANKLIN ELEMENTARY SCHOOL
ONYX ROAD
TOPAZ ROAD
DIAMOND ROAD
TAWNY RIDGE LN
CACTUS ROAD
MESA LINDA
SITE
MOJAVE DRIVE
LEGEND
PROJECT LIMITS
VICINITY MAP
NOT TO SCALE
N

CITY CASE NO. (to be assigned at plan submittal)

BASIS OF BEARINGS:
BEARINGS SHOWN HEREON ARE BASED ON THE BEARING BETWEEN SOPAC STATION P581 AND SOPAC STATION AVRY BEING N85°20'40"W

BENCH MARK
V-215
NAVD29, ELEVATION=2998.27'
MOJAVE DR. @ TOPAZ RD., TC OF CENTER ISLAND NOSE 48' E/O INT.

BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS	CITY	

DESIGNED BY: M.M.
DRAWN BY: H-Z STAFF
CHECKED BY: J.M.
SCALE: AS SHOWN

CITY OF VICTORVILLE ENGINEERING DEPARTMENT
14343 Civic Drive, Victorville, CA 92392 (760) 955-5000
Approved By:
Brian W. Gengler, RCE C44730
City Engineer
DATE

REGISTERED PROFESSIONAL ENGINEER JOHNNY MURAD NO. 67512 EXPIRATION 6-30-2025 CIVIL STATE OF CALIFORNIA

PREPARED BY:
REGISTERED CIVIL ENGINEER NO. 67512
EXPIRATION: 6-30-2025
DATE

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CITY OF VICTORVILLE
MOJAVE INDUSTRIAL PARK
HYDROLOGY MAP- EXISTING CONDITION TRIBUTARY TO LINE T
FOR
COVINGTON GROUP
SHEET 1 OF 1 SHEETS
M.O.
CITY FILE NO.
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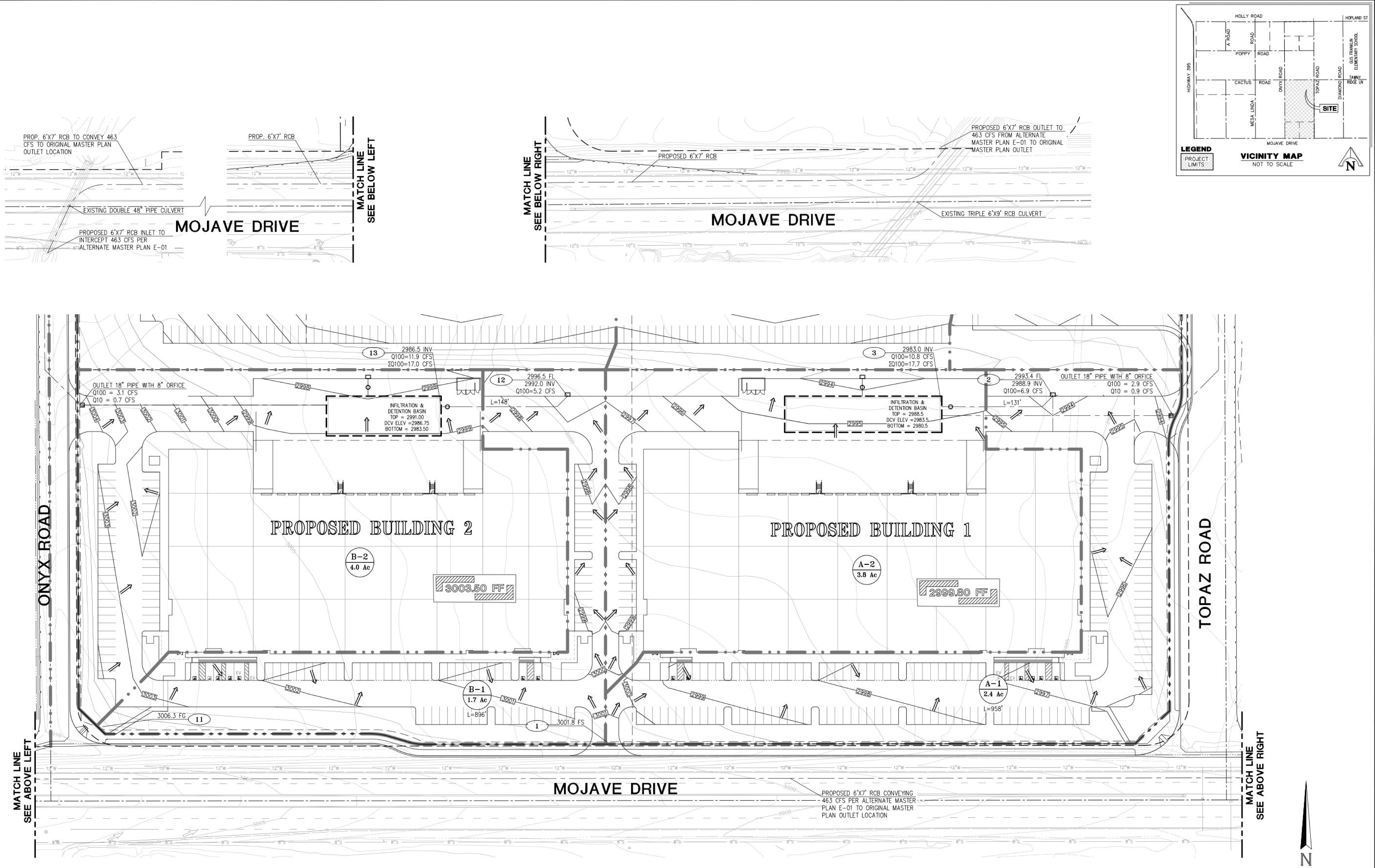

LEGEND

NO.	HYDROLOGY MODEL NODE NUMBER
A-11 7.40 Ac	TRIBUTARY AREA IN ACRES
L=300'	LENGTH OF FLOW
	PROPOSED STORM DRAIN
	DRAINAGE BOUNDARY
	FLOWLINE
	FLOW DIRECTION

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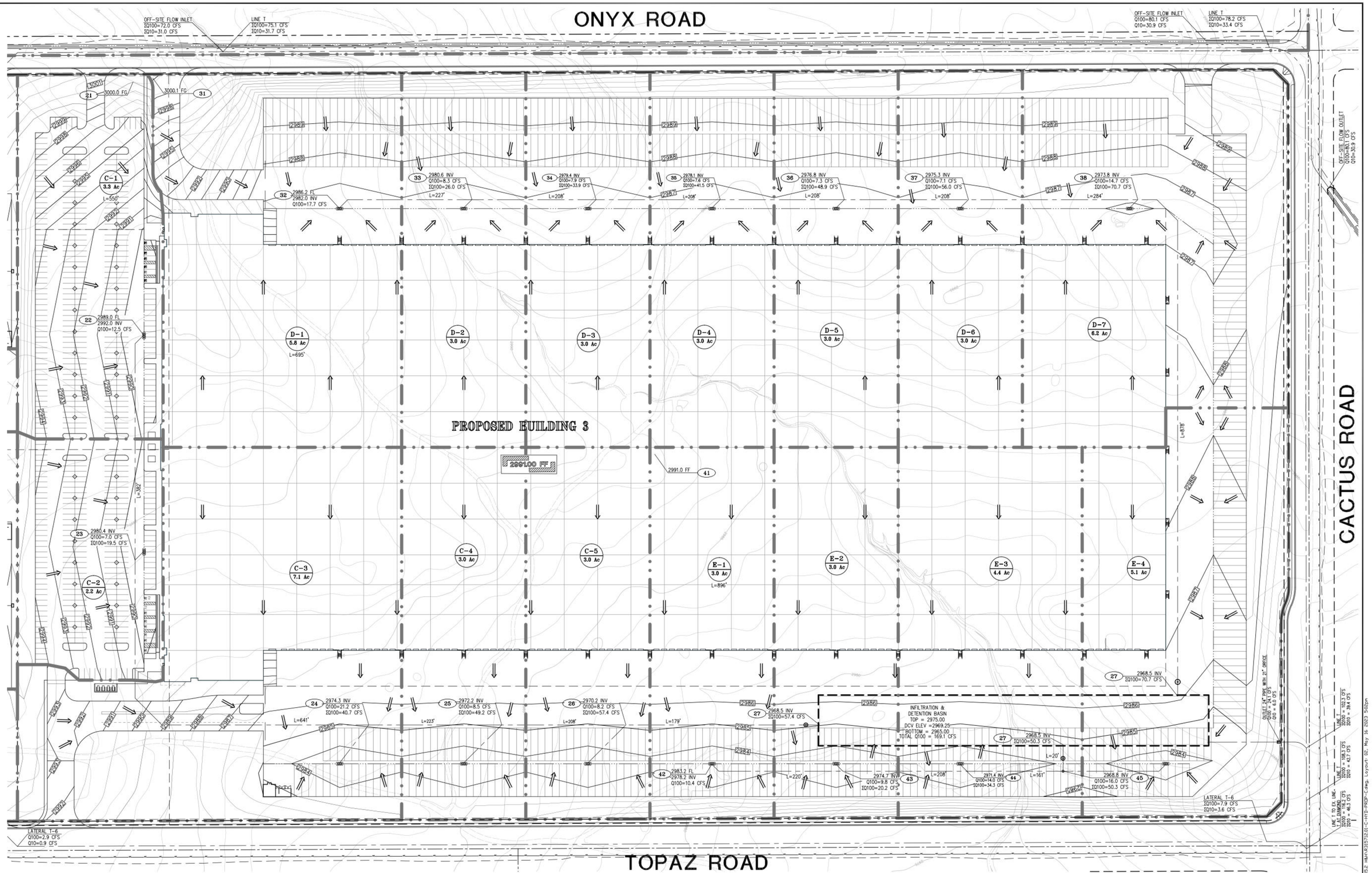
CITY OF VICTORVILLE
MOJAVE INDUSTRIAL PARK
HYDROLOGY MAP-BUILDINGS 1 & 2 PROPOSED CONDITION

SHEET 1 OF 2 SHEETS

FOR COVINGTON GROUP
M.O.
CITY FILE NO.



LEGEND

- NO. — HYDROLOGY MODEL NODE NUMBER
- A-11 / 7.40 Ac — TRIBUTARY AREA IN ACRES
- L=300' — LENGTH OF FLOW
- PROPOSED STORM DRAIN
- DRAINAGE BOUNDARY
- FLOWLINE
- FLOW DIRECTION

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REGISTERED PROFESSIONAL ENGINEER — JOHNNY MURAD — NO. 67512 — EXPIRATION 6-30-2025 — CIVIL — STATE OF CALIFORNIA

PREPARED BY:
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CITY OF VICTORVILLE
MOJAVE INDUSTRIAL PARK
HYDROLOGY MAP-BUILDING 3
PROPOSED CONDITION

SHEET 2 OF 2 SHEETS

FOR COVINGTON GROUP | M.O. | CITY FILE NO. .

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Appendix B

10-yr and 100-yr Rational Method Hydrologic Analysis

-Existing Condition

-Proposed Condition

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 04/27/23

COVINGTON - MIP
10 YEAR STORM EVENT WEST OF ONYX THROUGH SITE TO TOPAZ
5712Q10EA
DS

Program License Serial Number 6145

********* Hydrology Study Control Information **********

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.621 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++

Process from Point/Station 11.000 to Point/Station 12.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 86.00
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.265(In/Hr)
Initial subarea data:
Initial area flow distance = 1000.000(Ft.)
Top (of initial area) elevation = 3026.000(Ft.)
Bottom (of initial area) elevation = 3008.400(Ft.)
Difference in elevation = 17.600(Ft.)
Slope = 0.01760 s(%)= 1.76
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 18.666 min.
Rainfall intensity = 1.406(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.730
Subarea runoff = 10.270(CFS)
Total initial stream area = 10.000(Ac.)
Pervious area fraction = 1.000
Initial area Fm value = 0.265(In/Hr)

++

Process from Point/Station 12.000 to Point/Station 13.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 0.000(CFS)
Depth of flow = 0.597(Ft.), Average velocity = 2.012(Ft/s)
******* Irregular Channel Data ***********

```
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              2.00
       2            100.00              0.00
       3              2.00            200.00
Manning's 'N' friction factor =   0.035
-----------------------------------------------------------------
Sub-Channel flow  =     17.918(CFS)
  '     '     flow top width =     29.845(Ft.)
  '     '    velocity=    2.012(Ft/s)
  '     '     area =      8.907(Sq.Ft)
  '     '     Froude number =     0.649

Upstream point elevation =  3008.400(Ft.)
Downstream point elevation =  3002.100(Ft.)
Flow length =   545.000(Ft.)
Travel time  =    4.52 min.
Time of concentration =   23.18 min.
Depth of flow =   0.597(Ft.)
Average velocity =   2.012(Ft/s)
Total irregular channel flow =    17.918(CFS)
Irregular channel normal depth above invert elev. =   0.597(Ft.)
Average velocity of channel(s) =   2.012(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.265(In/Hr)
Rainfall intensity =      1.208(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.703
Subarea runoff =     15.198(CFS) for   20.000(Ac.)
Total runoff =     25.468(CFS)
Effective area this stream =       30.00(Ac.)
Total Study Area (Main Stream No. 1) =       30.00(Ac.)
Area averaged Fm value =    0.265(In/Hr)
Depth of flow =   0.681(Ft.), Average velocity =   2.196(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       13.000 to Point/Station       14.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
_________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.559(Ft.), Average velocity =   1.811(Ft/s)
       ******* Irregular Channel Data ***********
-----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              2.00
       2            100.00              0.00
       3            200.00              2.00
Manning's 'N' friction factor =   0.035
-----------------------------------------------------------------
Sub-Channel flow  =     28.270(CFS)
  '     '     flow top width =     55.874(Ft.)
  '     '    velocity=    1.811(Ft/s)
  '     '     area =     15.610(Sq.Ft)
  '     '     Froude number =     0.604
```

```
Upstream point elevation =  3002.100(Ft.)
Downstream point elevation =  2996.300(Ft.)
Flow length =   582.000(Ft.)
Travel time  =    5.36 min.
Time of concentration =   28.54 min.
Depth of flow =   0.559(Ft.)
Average velocity =   1.811(Ft/s)
Total irregular channel flow =    28.270(CFS)
Irregular channel normal depth above invert elev. =   0.559(Ft.)
Average velocity of channel(s) =   1.811(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.265(In/Hr)
Rainfall intensity =      1.045(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.672
Subarea runoff =      5.546(CFS) for   14.200(Ac.)
Total runoff =     31.014(CFS)
Effective area this stream =       44.20(Ac.)
Total Study Area (Main Stream No. 1) =       44.20(Ac.)
Area averaged Fm value =    0.265(In/Hr)
Depth of flow =   0.578(Ft.), Average velocity =   1.853(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       14.000 to Point/Station       15.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.598(Ft.), Average velocity =   1.975(Ft/s)
       ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              2.00
       2            100.00              0.00
       3            200.00              2.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     35.358(CFS)
  '     '     flow top width =     59.833(Ft.)
  '     '    velocity=    1.975(Ft/s)
  '     '     area =     17.900(Sq.Ft)
  '     '     Froude number =     0.636

Upstream point elevation =  2996.300(Ft.)
Downstream point elevation =  2973.900(Ft.)
Flow length =  2070.000(Ft.)
Travel time  =   17.47 min.
Time of concentration =   46.00 min.
Depth of flow =   0.598(Ft.)
Average velocity =   1.975(Ft/s)
Total irregular channel flow =    35.358(CFS)
Irregular channel normal depth above invert elev. =   0.598(Ft.)
Average velocity of channel(s) =   1.975(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
```

```
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.265(In/Hr)
Rainfall intensity =      0.748(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.581
Subarea runoff =      8.615(CFS) for   47.000(Ac.)
Total runoff =     39.629(CFS)
Effective area this stream =       91.20(Ac.)
Total Study Area (Main Stream No. 1) =       91.20(Ac.)
Area averaged Fm value =    0.265(In/Hr)
Depth of flow =   0.624(Ft.), Average velocity =   2.032(Ft/s)
End of computations, Total Study Area =           91.20 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged SCS curve number =  86.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 04/27/23

COVINGTON - MIP
100 YEAR STORM EVENT WEST OF ONYX THROUGH SITE TO TOPAZ
5712Q100EA
DS

Program License Serial Number 6145

********* Hydrology Study Control Information **********

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.060 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++

Process from Point/Station 11.000 to Point/Station 12.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 86.00
Adjusted SCS curve number for AMC 3 = 97.20
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.055(In/Hr)
Initial subarea data:
Initial area flow distance = 1000.000(Ft.)
Top (of initial area) elevation = 3026.000(Ft.)
Bottom (of initial area) elevation = 3008.400(Ft.)
Difference in elevation = 17.600(Ft.)
Slope = 0.01760 s(%)= 1.76
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 18.666 min.
Rainfall intensity = 2.400(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.879
Subarea runoff = 21.104(CFS)
Total initial stream area = 10.000(Ac.)
Pervious area fraction = 1.000
Initial area Fm value = 0.055(In/Hr)

++

Process from Point/Station 12.000 to Point/Station 13.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 0.000(CFS)
Depth of flow = 0.794(Ft.), Average velocity = 2.433(Ft/s)
******* Irregular Channel Data **********

```
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              2.00
       2            100.00              0.00
       3              2.00            200.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     38.361(CFS)
  '     '     flow top width =     39.705(Ft.)
  '     '    velocity=    2.433(Ft/s)
  '     '     area =     15.765(Sq.Ft)
  '     '     Froude number =     0.681

Upstream point elevation =  3008.400(Ft.)
Downstream point elevation =  3002.100(Ft.)
Flow length =   545.000(Ft.)
Travel time  =    3.73 min.
Time of concentration =   22.40 min.
Depth of flow =   0.794(Ft.)
Average velocity =   2.433(Ft/s)
Total irregular channel flow =    38.361(CFS)
Irregular channel normal depth above invert elev. =   0.794(Ft.)
Average velocity of channel(s) =   2.433(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Adjusted SCS curve number for AMC 3 = 97.20
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.055(In/Hr)
Rainfall intensity =      2.113(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.876
Subarea runoff =     34.444(CFS) for   20.000(Ac.)
Total runoff =     55.549(CFS)
Effective area this stream =       30.00(Ac.)
Total Study Area (Main Stream No. 1) =       30.00(Ac.)
Area averaged Fm value =    0.055(In/Hr)
Depth of flow =   0.912(Ft.), Average velocity =   2.669(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       13.000 to Point/Station       14.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
______________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.758(Ft.), Average velocity =   2.220(Ft/s)
       ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              2.00
       2            100.00              0.00
       3            200.00              2.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     63.809(CFS)
  '     '     flow top width =     75.822(Ft.)
  '     '    velocity=    2.220(Ft/s)
  '     '     area =     28.745(Sq.Ft)
```

```
  '     '     Froude number =     0.635

Upstream point elevation =  3002.100(Ft.)
Downstream point elevation =  2996.300(Ft.)
Flow length =   582.000(Ft.)
Travel time  =    4.37 min.
Time of concentration =   26.77 min.
Depth of flow =   0.758(Ft.)
Average velocity =   2.220(Ft/s)
Total irregular channel flow =    63.809(CFS)
Irregular channel normal depth above invert elev. =   0.758(Ft.)
Average velocity of channel(s) =   2.220(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Adjusted SCS curve number for AMC 3 = 97.20
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.055(In/Hr)
Rainfall intensity =      1.865(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.873
Subarea runoff =     16.436(CFS) for   14.200(Ac.)
Total runoff =     71.985(CFS)
Effective area this stream =       44.20(Ac.)
Total Study Area (Main Stream No. 1) =       44.20(Ac.)
Area averaged Fm value =    0.055(In/Hr)
Depth of flow =   0.793(Ft.), Average velocity =   2.288(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       14.000 to Point/Station       15.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.853(Ft.), Average velocity =   2.502(Ft/s)
       ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              2.00
       2            100.00              0.00
       3            200.00              2.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     90.966(CFS)
  '     '     flow top width =     85.278(Ft.)
  '     '    velocity=    2.502(Ft/s)
  '     '     area =     36.362(Sq.Ft)
  '     '     Froude number =     0.675

Upstream point elevation =  2996.300(Ft.)
Downstream point elevation =  2973.900(Ft.)
Flow length =  2070.000(Ft.)
Travel time  =   13.79 min.
Time of concentration =   40.56 min.
Depth of flow =   0.853(Ft.)
Average velocity =   2.502(Ft/s)
Total irregular channel flow =    90.966(CFS)
Irregular channel normal depth above invert elev. =   0.853(Ft.)
Average velocity of channel(s) =   2.502(Ft/s)
```

```
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Adjusted SCS curve number for AMC 3 = 97.20
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.055(In/Hr)
Rainfall intensity =      1.394(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.864
Subarea runoff =     37.910(CFS) for   47.000(Ac.)
Total runoff =     109.895(CFS)
Effective area this stream =       91.20(Ac.)
Total Study Area (Main Stream No. 1) =       91.20(Ac.)
Area averaged Fm value =    0.055(In/Hr)
Depth of flow =   0.915(Ft.), Average velocity =   2.623(Ft/s)
End of computations, Total Study Area =           91.20 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged SCS curve number =  86.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 04/27/23

COVINGTON - MIP
10 YEAR STORM EVENT WEST OF ONYX TO NORTH OF CACTUS
5712Q10EB
DS

Program License Serial Number 6145

********* Hydrology Study Control Information **********

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.621 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++
Process from Point/Station 21.000 to Point/Station 22.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 86.00
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.265(In/Hr)
Initial subarea data:
Initial area flow distance = 1000.000(Ft.)
Top (of initial area) elevation = 3026.000(Ft.)
Bottom (of initial area) elevation = 3008.000(Ft.)
Difference in elevation = 18.000(Ft.)
Slope = 0.01800 s(%)= 1.80
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 18.583 min.
Rainfall intensity = 1.411(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.731
Subarea runoff = 10.310(CFS)
Total initial stream area = 10.000(Ac.)
Pervious area fraction = 1.000
Initial area Fm value = 0.265(In/Hr)

++
Process from Point/Station 22.000 to Point/Station 23.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 0.000(CFS)
Depth of flow = 0.595(Ft.), Average velocity = 1.928(Ft/s)
******* Irregular Channel Data ***********

```
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              2.00
       2            100.00              0.00
       3              2.00            200.00
Manning's 'N' friction factor =   0.035
-----------------------------------------------------------------
Sub-Channel flow  =     17.056(CFS)
  '     '     flow top width =     29.743(Ft.)
  '     '    velocity=    1.928(Ft/s)
  '     '     area =      8.847(Sq.Ft)
  '     '     Froude number =     0.623

Upstream point elevation =  3008.000(Ft.)
Downstream point elevation =  3000.000(Ft.)
Flow length =   750.000(Ft.)
Travel time  =    6.48 min.
Time of concentration =   25.07 min.
Depth of flow =   0.595(Ft.)
Average velocity =   1.928(Ft/s)
Total irregular channel flow =    17.056(CFS)
Irregular channel normal depth above invert elev. =   0.595(Ft.)
Average velocity of channel(s) =   1.928(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.265(In/Hr)
Rainfall intensity =      1.144(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.691
Subarea runoff =     13.421(CFS) for   20.000(Ac.)
Total runoff =     23.731(CFS)
Effective area this stream =       30.00(Ac.)
Total Study Area (Main Stream No. 1) =       30.00(Ac.)
Area averaged Fm value =    0.265(In/Hr)
Depth of flow =   0.673(Ft.), Average velocity =   2.094(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       23.000 to Point/Station       24.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.584(Ft.), Average velocity =   1.607(Ft/s)
       ******* Irregular Channel Data ***********
-----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              2.00
       2            100.00              0.00
       3            200.00              2.00
Manning's 'N' friction factor =   0.035
-----------------------------------------------------------------
Sub-Channel flow  =     27.369(CFS)
  '     '     flow top width =     58.357(Ft.)
  '     '    velocity=    1.607(Ft/s)
  '     '     area =     17.028(Sq.Ft)
  '     '     Froude number =     0.524
```

```
Upstream point elevation =  3000.000(Ft.)
Downstream point elevation =  2990.000(Ft.)
Flow length =  1350.000(Ft.)
Travel time  =   14.00 min.
Time of concentration =   39.06 min.
Depth of flow =   0.584(Ft.)
Average velocity =   1.607(Ft/s)
Total irregular channel flow =    27.369(CFS)
Irregular channel normal depth above invert elev. =   0.584(Ft.)
Average velocity of channel(s) =   1.607(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.265(In/Hr)
Rainfall intensity =      0.839(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.615
Subarea runoff =      7.186(CFS) for   29.900(Ac.)
Total runoff =     30.917(CFS)
Effective area this stream =       59.90(Ac.)
Total Study Area (Main Stream No. 1) =       59.90(Ac.)
Area averaged Fm value =    0.265(In/Hr)
Depth of flow =   0.611(Ft.), Average velocity =   1.657(Ft/s)
End of computations, Total Study Area =           59.90 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged SCS curve number =  86.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 04/27/23

COVINGTON - MIP
100 YEAR STORM EVENT WEST OF ONYX TO NORTH OF CACTUS
5712Q100EB
DS

Program License Serial Number 6145

********* Hydrology Study Control Information **********

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.060 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++
Process from Point/Station 21.000 to Point/Station 22.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 86.00
Adjusted SCS curve number for AMC 3 = 97.20
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.055(In/Hr)
Initial subarea data:
Initial area flow distance = 1000.000(Ft.)
Top (of initial area) elevation = 3026.000(Ft.)
Bottom (of initial area) elevation = 3008.000(Ft.)
Difference in elevation = 18.000(Ft.)
Slope = 0.01800 s(%)= 1.80
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 18.583 min.
Rainfall intensity = 2.408(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.879
Subarea runoff = 21.173(CFS)
Total initial stream area = 10.000(Ac.)
Pervious area fraction = 1.000
Initial area Fm value = 0.055(In/Hr)

++
Process from Point/Station 22.000 to Point/Station 23.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 0.000(CFS)
Depth of flow = 0.796(Ft.), Average velocity = 2.342(Ft/s)
******* Irregular Channel Data ***********

```
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              2.00
       2            100.00              0.00
       3              2.00            200.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     37.127(CFS)
  '     '     flow top width =     39.817(Ft.)
  '     '    velocity=    2.342(Ft/s)
  '     '     area =     15.854(Sq.Ft)
  '     '     Froude number =     0.654

Upstream point elevation =  3008.000(Ft.)
Downstream point elevation =  3000.000(Ft.)
Flow length =   750.000(Ft.)
Travel time  =    5.34 min.
Time of concentration =   23.92 min.
Depth of flow =   0.796(Ft.)
Average velocity =   2.342(Ft/s)
Total irregular channel flow =    37.127(CFS)
Irregular channel normal depth above invert elev. =   0.796(Ft.)
Average velocity of channel(s) =   2.342(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Adjusted SCS curve number for AMC 3 = 97.20
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.055(In/Hr)
Rainfall intensity =      2.018(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.875
Subarea runoff =     31.812(CFS) for   20.000(Ac.)
Total runoff =     52.985(CFS)
Effective area this stream =       30.00(Ac.)
Total Study Area (Main Stream No. 1) =       30.00(Ac.)
Area averaged Fm value =    0.055(In/Hr)
Depth of flow =   0.910(Ft.), Average velocity =   2.560(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       23.000 to Point/Station       24.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
______________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.815(Ft.), Average velocity =   2.007(Ft/s)
       ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              2.00
       2            100.00              0.00
       3            200.00              2.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     66.593(CFS)
  '     '     flow top width =     81.453(Ft.)
  '     '    velocity=    2.007(Ft/s)
  '     '     area =     33.173(Sq.Ft)
```

```
  '     '     Froude number =     0.554

Upstream point elevation =  3000.000(Ft.)
Downstream point elevation =  2990.000(Ft.)
Flow length =  1350.000(Ft.)
Travel time  =   11.21 min.
Time of concentration =   35.13 min.
Depth of flow =   0.815(Ft.)
Average velocity =   2.007(Ft/s)
Total irregular channel flow =    66.593(CFS)
Irregular channel normal depth above invert elev. =   0.815(Ft.)
Average velocity of channel(s) =   2.007(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Adjusted SCS curve number for AMC 3 = 97.20
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.055(In/Hr)
Rainfall intensity =      1.542(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.868
Subarea runoff =     27.152(CFS) for   29.900(Ac.)
Total runoff =     80.136(CFS)
Effective area this stream =       59.90(Ac.)
Total Study Area (Main Stream No. 1) =       59.90(Ac.)
Area averaged Fm value =    0.055(In/Hr)
Depth of flow =   0.873(Ft.), Average velocity =   2.103(Ft/s)
End of computations, Total Study Area =           59.90 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged SCS curve number =  86.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 04/28/23

COVINGTON - MIP BUILDING 1
10 YEAR STORM EVENT PROPOSED BUILDING 1
5712Q10P1
DS

Program License Serial Number 6145

********* Hydrology Study Control Information **********

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.621 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++
Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 69.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.055(In/Hr)
Initial subarea data:
Initial area flow distance = 958.000(Ft.)
Top (of initial area) elevation = 3001.800(Ft.)
Bottom (of initial area) elevation = 2993.400(Ft.)
Difference in elevation = 8.400(Ft.)
Slope = 0.00877 s(%)= 0.88
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 12.213 min.
Rainfall intensity = 1.892(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.874
Subarea runoff = 3.969(CFS)
Total initial stream area = 2.400(Ac.)
Pervious area fraction = 0.100
Initial area Fm value = 0.055(In/Hr)

++
Process from Point/Station 2.000 to Point/Station 3.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 2988.900(Ft.)
Downstream point/station elevation = 2983.000(Ft.)
Pipe length = 131.00(Ft.) Manning's N = 0.012
No. of pipes = 1 Required pipe flow = 3.969(CFS)

```
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.969(CFS)
Normal flow depth in pipe =    5.89(In.)
Flow top width inside pipe =   12.00(In.)
Critical Depth =   10.13(In.)
Pipe flow velocity =     10.35(Ft/s)
Travel time through pipe =    0.21 min.
Time of concentration (TC) =    12.42 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        3.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    12.42 min.
Rainfall intensity =      1.870(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.874
Subarea runoff =      6.159(CFS) for    3.800(Ac.)
Total runoff =     10.128(CFS)
Effective area this stream =        6.20(Ac.)
Total Study Area (Main Stream No. 1) =        6.20(Ac.)
Area averaged Fm value =    0.055(In/Hr)
End of computations, Total Study Area =            6.20 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number =  69.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 04/28/23

COVINGTON - MIP BUILDING 2
10 YEAR PROPOSED EVENT PROPOSED BUILD 2
5712Q10P2
DS

Program License Serial Number 6145

********* Hydrology Study Control Information **********

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.621 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++
Process from Point/Station 11.000 to Point/Station 12.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 69.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.055(In/Hr)
Initial subarea data:
Initial area flow distance = 896.000(Ft.)
Top (of initial area) elevation = 3006.300(Ft.)
Bottom (of initial area) elevation = 2996.500(Ft.)
Difference in elevation = 9.800(Ft.)
Slope = 0.01094 s(%)= 1.09
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 11.377 min.
Rainfall intensity = 1.989(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.875
Subarea runoff = 2.959(CFS)
Total initial stream area = 1.700(Ac.)
Pervious area fraction = 0.100
Initial area Fm value = 0.055(In/Hr)

++
Process from Point/Station 12.000 to Point/Station 13.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 2992.000(Ft.)
Downstream point/station elevation = 2986.500(Ft.)
Pipe length = 148.00(Ft.) Manning's N = 0.012
No. of pipes = 1 Required pipe flow = 2.959(CFS)

```
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     2.959(CFS)
Normal flow depth in pipe =    6.41(In.)
Flow top width inside pipe =    8.15(In.)
Critical depth could not be calculated.
Pipe flow velocity =      8.79(Ft/s)
Travel time through pipe =    0.28 min.
Time of concentration (TC) =    11.66 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       13.000 to Point/Station       13.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    11.66 min.
Rainfall intensity =      1.955(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.875
Subarea runoff =      6.790(CFS) for    4.000(Ac.)
Total runoff =      9.749(CFS)
Effective area this stream =        5.70(Ac.)
Total Study Area (Main Stream No. 1) =        5.70(Ac.)
Area averaged Fm value =    0.055(In/Hr)
End of computations, Total Study Area =            5.70 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number =  69.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 05/16/23

COVINGT - MIP BUILDING 3
10 YEAR STORM EVENT PROPOSED BUILDING 3
5712Q10P3
DS

Program License Serial Number 6145

********* Hydrology Study Control Information **********

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.621 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++
Process from Point/Station 21.000 to Point/Station 22.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.026(In/Hr)
Initial subarea data:
Initial area flow distance = 550.000(Ft.)
Top (of initial area) elevation = 3000.000(Ft.)
Bottom (of initial area) elevation = 2989.000(Ft.)
Difference in elevation = 11.000(Ft.)
Slope = 0.02000 s(%)= 2.00
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 8.295 min.
Rainfall intensity = 2.481(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.891
Subarea runoff = 7.291(CFS)
Total initial stream area = 3.300(Ac.)
Pervious area fraction = 0.100
Initial area Fm value = 0.026(In/Hr)

++
Process from Point/Station 22.000 to Point/Station 23.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 2984.000(Ft.)
Downstream point/station elevation = 2980.400(Ft.)
Pipe length = 382.00(Ft.) Manning's N = 0.012

```
No. of pipes = 1  Required pipe flow  =     7.291(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     7.291(CFS)
Normal flow depth in pipe =   10.68(In.)
Flow top width inside pipe =   17.69(In.)
Critical Depth =   12.56(In.)
Pipe flow velocity =      6.68(Ft/s)
Travel time through pipe =    0.95 min.
Time of concentration (TC) =     9.25 min.


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Process from Point/Station       23.000 to Point/Station       23.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =     9.25 min.
Rainfall intensity =      2.299(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.890
Subarea runoff =      3.960(CFS) for    2.200(Ac.)
Total runoff =     11.251(CFS)
Effective area this stream =        5.50(Ac.)
Total Study Area (Main Stream No. 1) =        5.50(Ac.)
Area averaged Fm value =    0.026(In/Hr)


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Process from Point/Station       23.000 to Point/Station       24.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  2980.400(Ft.)
Downstream point/station elevation =  2974.300(Ft.)
Pipe length  =   641.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    11.251(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    11.251(CFS)
Normal flow depth in pipe =   12.60(In.)
Flow top width inside pipe =   20.58(In.)
Critical Depth =   15.01(In.)
Pipe flow velocity =      7.47(Ft/s)
Travel time through pipe =    1.43 min.
Time of concentration (TC) =    10.68 min.


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Process from Point/Station       24.000 to Point/Station       24.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
```

```
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    10.68 min.
Rainfall intensity =      2.079(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.889
Subarea runoff =     12.026(CFS) for    7.100(Ac.)
Total runoff =     23.277(CFS)
Effective area this stream =       12.60(Ac.)
Total Study Area (Main Stream No. 1) =       12.60(Ac.)
Area averaged Fm value =    0.026(In/Hr)


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Process from Point/Station       24.000 to Point/Station       25.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  2974.300(Ft.)
Downstream point/station elevation =  2972.200(Ft.)
Pipe length  =   223.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    23.277(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    23.277(CFS)
Normal flow depth in pipe =   19.22(In.)
Flow top width inside pipe =   19.17(In.)
Critical Depth =   20.57(In.)
Pipe flow velocity =      8.63(Ft/s)
Travel time through pipe =    0.43 min.
Time of concentration (TC) =    11.11 min.


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Process from Point/Station       25.000 to Point/Station       25.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    11.11 min.
Rainfall intensity =      2.022(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.888
Subarea runoff =      4.745(CFS) for    3.000(Ac.)
Total runoff =     28.023(CFS)
Effective area this stream =       15.60(Ac.)
Total Study Area (Main Stream No. 1) =       15.60(Ac.)
Area averaged Fm value =    0.026(In/Hr)


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Process from Point/Station       25.000 to Point/Station       26.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  2972.200(Ft.)
Downstream point/station elevation =  2970.200(Ft.)
Pipe length  =   208.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    28.023(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    28.023(CFS)
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```
Normal flow depth in pipe =   19.15(In.)
Flow top width inside pipe =   24.52(In.)
Critical Depth =   22.11(In.)
Pipe flow velocity =      9.29(Ft/s)
Travel time through pipe =    0.37 min.
Time of concentration (TC) =    11.48 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       26.000 to Point/Station       26.000
**** SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    11.48 min.
Rainfall intensity =      1.976(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.888
Subarea runoff =      4.615(CFS) for    3.000(Ac.)
Total runoff =     32.638(CFS)
Effective area this stream =       18.60(Ac.)
Total Study Area (Main Stream No. 1) =       18.60(Ac.)
Area averaged Fm value =    0.026(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       26.000 to Point/Station       27.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------------
Upstream point/station elevation =  2970.200(Ft.)
Downstream point/station elevation =  2968.500(Ft.)
Pipe length  =   179.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    32.638(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    32.638(CFS)
Normal flow depth in pipe =   22.08(In.)
Flow top width inside pipe =   20.85(In.)
Critical Depth =   23.54(In.)
Pipe flow velocity =      9.37(Ft/s)
Travel time through pipe =    0.32 min.
Time of concentration (TC) =    11.80 min.


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Process from Point/Station       27.000 to Point/Station       27.000
**** CONFLUENCE OF MAIN STREAMS ****
----------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     18.600(Ac.)
Runoff from this stream =     32.638(CFS)
Time of concentration =   11.80 min.
Rainfall intensity =     1.938(In/Hr)
Area averaged loss rate (Fm) =    0.0262(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2
```

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Process from Point/Station       31.000 to Point/Station       32.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Initial subarea data:
Initial area flow distance =   695.000(Ft.)
Top (of initial area) elevation =  2991.000(Ft.)
Bottom (of initial area) elevation =  2986.200(Ft.)
Difference in elevation =     4.800(Ft.)
Slope =    0.00691  s(%)=       0.69
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.267 min.
Rainfall intensity =      2.002(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.888
Subarea runoff =     10.315(CFS)
Total initial stream area =        5.800(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.026(In/Hr)


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Process from Point/Station       32.000 to Point/Station       33.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  2982.000(Ft.)
Downstream point/station elevation =  2980.600(Ft.)
Pipe length  =   227.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    10.315(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    10.315(CFS)
Normal flow depth in pipe =   13.76(In.)
Flow top width inside pipe =   19.96(In.)
Critical Depth =   14.36(In.)
Pipe flow velocity =      6.17(Ft/s)
Travel time through pipe =    0.61 min.
Time of concentration (TC) =    11.88 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       33.000 to Point/Station       33.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    11.88 min.
Rainfall intensity =      1.929(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.888
```

```
Subarea runoff =      4.758(CFS) for    3.000(Ac.)
Total runoff =     15.074(CFS)
Effective area this stream =        8.80(Ac.)
Total Study Area (Main Stream No. 2) =       27.40(Ac.)
Area averaged Fm value =    0.026(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       33.000 to Point/Station       34.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  2980.600(Ft.)
Downstream point/station elevation =  2979.400(Ft.)
Pipe length  =   208.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    15.074(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    15.074(CFS)
Normal flow depth in pipe =   16.38(In.)
Flow top width inside pipe =   22.34(In.)
Critical Depth =   16.78(In.)
Pipe flow velocity =      6.60(Ft/s)
Travel time through pipe =    0.53 min.
Time of concentration (TC) =    12.41 min.


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Process from Point/Station       34.000 to Point/Station       34.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    12.41 min.
Rainfall intensity =      1.872(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.887
Subarea runoff =      4.527(CFS) for    3.000(Ac.)
Total runoff =     19.601(CFS)
Effective area this stream =       11.80(Ac.)
Total Study Area (Main Stream No. 2) =       30.40(Ac.)
Area averaged Fm value =    0.026(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       34.000 to Point/Station       35.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  2979.400(Ft.)
Downstream point/station elevation =  2978.100(Ft.)
Pipe length  =   208.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    19.601(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    19.601(CFS)
Normal flow depth in pipe =   17.27(In.)
Flow top width inside pipe =   25.92(In.)
Critical Depth =   18.58(In.)
Pipe flow velocity =      7.30(Ft/s)
Travel time through pipe =    0.47 min.
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```
Time of concentration (TC) =    12.88 min.


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Process from Point/Station       35.000 to Point/Station       35.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    12.88 min.
Rainfall intensity =      1.823(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.887
Subarea runoff =      4.336(CFS) for    3.000(Ac.)
Total runoff =     23.938(CFS)
Effective area this stream =       14.80(Ac.)
Total Study Area (Main Stream No. 2) =       33.40(Ac.)
Area averaged Fm value =    0.026(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       35.000 to Point/Station       36.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  2978.100(Ft.)
Downstream point/station elevation =  2976.800(Ft.)
Pipe length  =   208.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    23.938(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    23.938(CFS)
Normal flow depth in pipe =   20.06(In.)
Flow top width inside pipe =   23.60(In.)
Critical Depth =   20.52(In.)
Pipe flow velocity =      7.55(Ft/s)
Travel time through pipe =    0.46 min.
Time of concentration (TC) =    13.34 min.


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Process from Point/Station       36.000 to Point/Station       36.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    13.34 min.
Rainfall intensity =      1.779(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.887
Subarea runoff =      4.145(CFS) for    3.000(Ac.)
Total runoff =     28.082(CFS)
Effective area this stream =       17.80(Ac.)
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Total Study Area (Main Stream No. 2) =       36.40(Ac.)
Area averaged Fm value =    0.026(In/Hr)


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Process from Point/Station       36.000 to Point/Station       37.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  2976.800(Ft.)
Downstream point/station elevation =  2975.300(Ft.)
Pipe length  =   208.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    28.082(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    28.082(CFS)
Normal flow depth in pipe =   21.80(In.)
Flow top width inside pipe =   21.30(In.)
Critical Depth =   22.13(In.)
Pipe flow velocity =      8.17(Ft/s)
Travel time through pipe =    0.42 min.
Time of concentration (TC) =    13.76 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       37.000 to Point/Station       37.000
**** SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    13.76 min.
Rainfall intensity =      1.741(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.886
Subarea runoff =      4.011(CFS) for    3.000(Ac.)
Total runoff =     32.093(CFS)
Effective area this stream =       20.80(Ac.)
Total Study Area (Main Stream No. 2) =       39.40(Ac.)
Area averaged Fm value =    0.026(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       37.000 to Point/Station       38.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  2975.300(Ft.)
Downstream point/station elevation =  2973.800(Ft.)
Pipe length  =   284.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    32.093(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    32.093(CFS)
Normal flow depth in pipe =   24.42(In.)
Flow top width inside pipe =   23.34(In.)
Critical Depth =   23.13(In.)
Pipe flow velocity =      7.50(Ft/s)
Travel time through pipe =    0.63 min.
Time of concentration (TC) =    14.39 min.
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       38.000 to Point/Station       38.000
**** SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    14.39 min.
Rainfall intensity =      1.687(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.886
Subarea runoff =      8.260(CFS) for    6.200(Ac.)
Total runoff =     40.353(CFS)
Effective area this stream =       27.00(Ac.)
Total Study Area (Main Stream No. 2) =       45.60(Ac.)
Area averaged Fm value =    0.026(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       38.000 to Point/Station       27.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------------
Upstream point/station elevation =  2973.800(Ft.)
Downstream point/station elevation =  2968.500(Ft.)
Pipe length  =   878.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    40.353(CFS)
Nearest computed pipe diameter  =     33.00(In.)
Calculated individual pipe flow  =    40.353(CFS)
Normal flow depth in pipe =   24.61(In.)
Flow top width inside pipe =   28.74(In.)
Critical Depth =   25.34(In.)
Pipe flow velocity =      8.49(Ft/s)
Travel time through pipe =    1.72 min.
Time of concentration (TC) =    16.12 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       27.000 to Point/Station       27.000
**** CONFLUENCE OF MAIN STREAMS ****
----------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     27.000(Ac.)
Runoff from this stream =     40.353(CFS)
Time of concentration =   16.12 min.
Rainfall intensity =     1.558(In/Hr)
Area averaged loss rate (Fm) =    0.0262(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       41.000 to Point/Station       42.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
```

```
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Initial subarea data:
Initial area flow distance =   600.000(Ft.)
Top (of initial area) elevation =  2991.000(Ft.)
Bottom (of initial area) elevation =  2983.200(Ft.)
Difference in elevation =     7.800(Ft.)
Slope =    0.01300  s(%)=       1.30
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.361 min.
Rainfall intensity =      2.280(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.890
Subarea runoff =      6.084(CFS)
Total initial stream area =        3.000(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.026(In/Hr)


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Process from Point/Station       42.000 to Point/Station       43.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  2978.200(Ft.)
Downstream point/station elevation =  2974.700(Ft.)
Pipe length  =   220.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =     6.084(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     6.084(CFS)
Normal flow depth in pipe =    9.15(In.)
Flow top width inside pipe =   14.63(In.)
Critical Depth =   11.96(In.)
Pipe flow velocity =      7.76(Ft/s)
Travel time through pipe =    0.47 min.
Time of concentration (TC) =     9.83 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       43.000 to Point/Station       43.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =     9.83 min.
Rainfall intensity =      2.202(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.889
Subarea runoff =      5.667(CFS) for    3.000(Ac.)
Total runoff =     11.751(CFS)
Effective area this stream =        6.00(Ac.)
Total Study Area (Main Stream No. 3) =       51.60(Ac.)
Area averaged Fm value =    0.026(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
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Process from Point/Station       43.000 to Point/Station       44.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  2974.700(Ft.)
Downstream point/station elevation =  2971.400(Ft.)
Pipe length  =   208.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    11.751(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    11.751(CFS)
Normal flow depth in pipe =   12.40(In.)
Flow top width inside pipe =   16.67(In.)
Critical Depth =   15.65(In.)
Pipe flow velocity =      9.05(Ft/s)
Travel time through pipe =    0.38 min.
Time of concentration (TC) =    10.22 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       44.000 to Point/Station       44.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    10.22 min.
Rainfall intensity =      2.144(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.889
Subarea runoff =      8.074(CFS) for    4.400(Ac.)
Total runoff =     19.825(CFS)
Effective area this stream =       10.40(Ac.)
Total Study Area (Main Stream No. 3) =       56.00(Ac.)
Area averaged Fm value =    0.026(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       44.000 to Point/Station       45.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  2971.400(Ft.)
Downstream point/station elevation =  2968.800(Ft.)
Pipe length  =   161.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    19.825(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    19.825(CFS)
Normal flow depth in pipe =   15.70(In.)
Flow top width inside pipe =   18.24(In.)
Critical Depth =   19.13(In.)
Pipe flow velocity =     10.28(Ft/s)
Travel time through pipe =    0.26 min.
Time of concentration (TC) =    10.48 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       45.000 to Point/Station       45.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
COMMERCIAL subarea type
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    10.48 min.
Rainfall intensity =      2.107(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.889
Subarea runoff =      9.198(CFS) for    5.100(Ac.)
Total runoff =     29.023(CFS)
Effective area this stream =       15.50(Ac.)
Total Study Area (Main Stream No. 3) =       61.10(Ac.)
Area averaged Fm value =    0.026(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       45.000 to Point/Station       27.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  2968.800(Ft.)
Downstream point/station elevation =  2968.500(Ft.)
Pipe length  =    20.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    29.023(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    29.023(CFS)
Normal flow depth in pipe =   18.98(In.)
Flow top width inside pipe =   19.52(In.)
Critical Depth =   22.14(In.)
Pipe flow velocity =     10.88(Ft/s)
Travel time through pipe =    0.03 min.
Time of concentration (TC) =    10.51 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       27.000 to Point/Station       27.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =     15.500(Ac.)
Runoff from this stream =     29.023(CFS)
Time of concentration =   10.51 min.
Rainfall intensity =     2.102(In/Hr)
Area averaged loss rate (Fm) =    0.0262(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)    (Ac.)       (min) (In/Hr)     (In/Hr)


1     32.64    18.600     11.80    0.026      1.938
2     40.35    27.000     16.12    0.026      1.558
3     29.02    15.500     10.51    0.026      2.102
Qmax(1) =
          1.000 *    1.000 *    32.638) +
          1.248 *    0.732 *    40.353) +
          0.921 *    1.000 *    29.023) + =      96.242
Qmax(2) =
          0.801 *    1.000 *    32.638) +
```

```
          1.000 *    1.000 *    40.353) +
          0.738 *    1.000 *    29.023) + =      87.922
Qmax(3) =
          1.086 *    0.890 *    32.638) +
          1.355 *    0.652 *    40.353) +
          1.000 *    1.000 *    29.023) + =      96.228

Total of 3 main streams to confluence:
Flow rates before confluence point:
      33.638      41.353      30.023
Maximum flow rates at confluence using above data:
       96.242       87.922       96.228
Area of streams before confluence:
       18.600       27.000       15.500
Effective area values after confluence:
       53.868       61.100       49.666


Results of confluence:
Total flow rate =      96.242(CFS)
Time of concentration =    11.801 min.
Effective stream area after confluence  =     53.868(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.026(In/Hr)
Study area total =      61.10(Ac.)
End of computations, Total Study Area =           61.10 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number =  69.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 04/28/23

COVINGTON - MIP BUILDING 1
100 YEAR STORM EVENT BUILDING 1
5712Q100P1
DS

Program License Serial Number 6145

********* Hydrology Study Control Information **********

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.060 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++
Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.026(In/Hr)
Initial subarea data:
Initial area flow distance = 958.000(Ft.)
Top (of initial area) elevation = 3001.800(Ft.)
Bottom (of initial area) elevation = 2993.400(Ft.)
Difference in elevation = 8.400(Ft.)
Slope = 0.00877 s(%)= 0.88
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 12.213 min.
Rainfall intensity = 3.230(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.893
Subarea runoff = 6.921(CFS)
Total initial stream area = 2.400(Ac.)
Pervious area fraction = 0.100
Initial area Fm value = 0.026(In/Hr)

++
Process from Point/Station 2.000 to Point/Station 3.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 2988.900(Ft.)
Downstream point/station elevation = 2983.000(Ft.)
Pipe length = 131.00(Ft.) Manning's N = 0.012

```
No. of pipes = 1  Required pipe flow  =     6.921(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     6.921(CFS)
Normal flow depth in pipe =    8.46(In.)
Flow top width inside pipe =   10.94(In.)
Critical depth could not be calculated.
Pipe flow velocity =     11.70(Ft/s)
Travel time through pipe =    0.19 min.
Time of concentration (TC) =    12.40 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        3.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    12.40 min.
Rainfall intensity =      3.196(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.893
Subarea runoff =     10.767(CFS) for    3.800(Ac.)
Total runoff =     17.688(CFS)
Effective area this stream =        6.20(Ac.)
Total Study Area (Main Stream No. 1) =        6.20(Ac.)
Area averaged Fm value =    0.026(In/Hr)
End of computations, Total Study Area =            6.20 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number =  69.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 04/28/23

COVINGTON - MIP BUILDING 2
100 YEAR PROPOSED EVENT PROPOSED BUILD 2
5712Q100P2
DS

Program License Serial Number 6145

********* Hydrology Study Control Information **********

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.060 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++
Process from Point/Station 11.000 to Point/Station 12.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.026(In/Hr)
Initial subarea data:
Initial area flow distance = 896.000(Ft.)
Top (of initial area) elevation = 3006.300(Ft.)
Bottom (of initial area) elevation = 2996.500(Ft.)
Difference in elevation = 9.800(Ft.)
Slope = 0.01094 s(%)= 1.09
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 11.377 min.
Rainfall intensity = 3.395(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.893
Subarea runoff = 5.154(CFS)
Total initial stream area = 1.700(Ac.)
Pervious area fraction = 0.100
Initial area Fm value = 0.026(In/Hr)

++
Process from Point/Station 12.000 to Point/Station 13.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 2992.000(Ft.)
Downstream point/station elevation = 2986.500(Ft.)
Pipe length = 148.00(Ft.) Manning's N = 0.012

```
No. of pipes = 1  Required pipe flow  =     5.154(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     5.154(CFS)
Normal flow depth in pipe =    7.35(In.)
Flow top width inside pipe =   11.69(In.)
Critical Depth =   11.09(In.)
Pipe flow velocity =     10.23(Ft/s)
Travel time through pipe =    0.24 min.
Time of concentration (TC) =    11.62 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       13.000 to Point/Station       13.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    11.62 min.
Rainfall intensity =      3.345(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.893
Subarea runoff =     11.873(CFS) for    4.000(Ac.)
Total runoff =     17.027(CFS)
Effective area this stream =        5.70(Ac.)
Total Study Area (Main Stream No. 1) =        5.70(Ac.)
Area averaged Fm value =    0.026(In/Hr)
End of computations, Total Study Area =            5.70 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number =  69.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 05/16/23

COVINGT - MIP BUILDING 3
100 YEAR STORM EVENT PROPOSED BUILDING 3
5712Q100P3
DS

Program License Serial Number 6145

********* Hydrology Study Control Information **********

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.060 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++
Process from Point/Station 21.000 to Point/Station 22.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.026(In/Hr)
Initial subarea data:
Initial area flow distance = 550.000(Ft.)
Top (of initial area) elevation = 3000.000(Ft.)
Bottom (of initial area) elevation = 2989.000(Ft.)
Difference in elevation = 11.000(Ft.)
Slope = 0.02000 s(%)= 2.00
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 8.295 min.
Rainfall intensity = 4.235(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.894
Subarea runoff = 12.500(CFS)
Total initial stream area = 3.300(Ac.)
Pervious area fraction = 0.100
Initial area Fm value = 0.026(In/Hr)

++
Process from Point/Station 22.000 to Point/Station 23.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 2984.000(Ft.)
Downstream point/station elevation = 2980.400(Ft.)
Pipe length = 382.00(Ft.) Manning's N = 0.012

```
No. of pipes = 1  Required pipe flow  =    12.500(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    12.500(CFS)
Normal flow depth in pipe =   13.57(In.)
Flow top width inside pipe =   20.08(In.)
Critical Depth =   15.80(In.)
Pipe flow velocity =      7.60(Ft/s)
Travel time through pipe =    0.84 min.
Time of concentration (TC) =     9.13 min.


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Process from Point/Station       23.000 to Point/Station       23.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =     9.13 min.
Rainfall intensity =      3.959(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.894
Subarea runoff =      6.969(CFS) for    2.200(Ac.)
Total runoff =     19.469(CFS)
Effective area this stream =        5.50(Ac.)
Total Study Area (Main Stream No. 1) =        5.50(Ac.)
Area averaged Fm value =    0.026(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       23.000 to Point/Station       24.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  2980.400(Ft.)
Downstream point/station elevation =  2974.300(Ft.)
Pipe length  =   641.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    19.469(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    19.469(CFS)
Normal flow depth in pipe =   16.45(In.)
Flow top width inside pipe =   22.29(In.)
Critical Depth =   19.03(In.)
Pipe flow velocity =      8.48(Ft/s)
Travel time through pipe =    1.26 min.
Time of concentration (TC) =    10.39 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       24.000 to Point/Station       24.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
```

```
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    10.39 min.
Rainfall intensity =      3.617(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.893
Subarea runoff =     21.250(CFS) for    7.100(Ac.)
Total runoff =     40.718(CFS)
Effective area this stream =       12.60(Ac.)
Total Study Area (Main Stream No. 1) =       12.60(Ac.)
Area averaged Fm value =    0.026(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       24.000 to Point/Station       25.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  2974.300(Ft.)
Downstream point/station elevation =  2972.200(Ft.)
Pipe length  =   223.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    40.718(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    40.718(CFS)
Normal flow depth in pipe =   23.20(In.)
Flow top width inside pipe =   25.12(In.)
Critical Depth =   25.71(In.)
Pipe flow velocity =      9.99(Ft/s)
Travel time through pipe =    0.37 min.
Time of concentration (TC) =    10.76 min.


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Process from Point/Station       25.000 to Point/Station       25.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    10.76 min.
Rainfall intensity =      3.529(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.893
Subarea runoff =      8.460(CFS) for    3.000(Ac.)
Total runoff =     49.178(CFS)
Effective area this stream =       15.60(Ac.)
Total Study Area (Main Stream No. 1) =       15.60(Ac.)
Area averaged Fm value =    0.026(In/Hr)


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Process from Point/Station       25.000 to Point/Station       26.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  2972.200(Ft.)
Downstream point/station elevation =  2970.200(Ft.)
Pipe length  =   208.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    49.178(CFS)
Nearest computed pipe diameter  =     33.00(In.)
Calculated individual pipe flow  =    49.178(CFS)
```

```
Normal flow depth in pipe =   23.91(In.)
Flow top width inside pipe =   29.49(In.)
Critical Depth =   27.71(In.)
Pipe flow velocity =     10.66(Ft/s)
Travel time through pipe =    0.33 min.
Time of concentration (TC) =    11.09 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       26.000 to Point/Station       26.000
**** SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    11.09 min.
Rainfall intensity =      3.456(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.893
Subarea runoff =      8.240(CFS) for    3.000(Ac.)
Total runoff =     57.418(CFS)
Effective area this stream =       18.60(Ac.)
Total Study Area (Main Stream No. 1) =       18.60(Ac.)
Area averaged Fm value =    0.026(In/Hr)


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Process from Point/Station       26.000 to Point/Station       27.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------------
Upstream point/station elevation =  2970.200(Ft.)
Downstream point/station elevation =  2968.500(Ft.)
Pipe length  =   179.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    57.418(CFS)
Nearest computed pipe diameter  =     36.00(In.)
Calculated individual pipe flow  =    57.418(CFS)
Normal flow depth in pipe =   24.70(In.)
Flow top width inside pipe =   33.41(In.)
Critical Depth =   29.45(In.)
Pipe flow velocity =     11.11(Ft/s)
Travel time through pipe =    0.27 min.
Time of concentration (TC) =    11.36 min.


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Process from Point/Station       27.000 to Point/Station       27.000
**** CONFLUENCE OF MAIN STREAMS ****
----------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     18.600(Ac.)
Runoff from this stream =     57.418(CFS)
Time of concentration =   11.36 min.
Rainfall intensity =     3.399(In/Hr)
Area averaged loss rate (Fm) =    0.0262(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2
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Process from Point/Station       31.000 to Point/Station       32.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Initial subarea data:
Initial area flow distance =   695.000(Ft.)
Top (of initial area) elevation =  2991.000(Ft.)
Bottom (of initial area) elevation =  2986.200(Ft.)
Difference in elevation =     4.800(Ft.)
Slope =    0.00691  s(%)=       0.69
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.267 min.
Rainfall intensity =      3.418(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.893
Subarea runoff =     17.704(CFS)
Total initial stream area =        5.800(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.026(In/Hr)


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Process from Point/Station       32.000 to Point/Station       33.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  2982.000(Ft.)
Downstream point/station elevation =  2980.600(Ft.)
Pipe length  =   227.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    17.704(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    17.704(CFS)
Normal flow depth in pipe =   18.14(In.)
Flow top width inside pipe =   20.62(In.)
Critical Depth =   18.19(In.)
Pipe flow velocity =      6.95(Ft/s)
Travel time through pipe =    0.54 min.
Time of concentration (TC) =    11.81 min.


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Process from Point/Station       33.000 to Point/Station       33.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    11.81 min.
Rainfall intensity =      3.307(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.893
```

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Subarea runoff =      8.278(CFS) for    3.000(Ac.)
Total runoff =     25.982(CFS)
Effective area this stream =        8.80(Ac.)
Total Study Area (Main Stream No. 2) =       27.40(Ac.)
Area averaged Fm value =    0.026(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       33.000 to Point/Station       34.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  2980.600(Ft.)
Downstream point/station elevation =  2979.400(Ft.)
Pipe length  =   208.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    25.982(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    25.982(CFS)
Normal flow depth in pipe =   19.73(In.)
Flow top width inside pipe =   28.47(In.)
Critical Depth =   20.84(In.)
Pipe flow velocity =      7.58(Ft/s)
Travel time through pipe =    0.46 min.
Time of concentration (TC) =    12.27 min.


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Process from Point/Station       34.000 to Point/Station       34.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    12.27 min.
Rainfall intensity =      3.220(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.893
Subarea runoff =      7.936(CFS) for    3.000(Ac.)
Total runoff =     33.919(CFS)
Effective area this stream =       11.80(Ac.)
Total Study Area (Main Stream No. 2) =       30.40(Ac.)
Area averaged Fm value =    0.026(In/Hr)


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Process from Point/Station       34.000 to Point/Station       35.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  2979.400(Ft.)
Downstream point/station elevation =  2978.100(Ft.)
Pipe length  =   208.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    33.919(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    33.919(CFS)
Normal flow depth in pipe =   23.72(In.)
Flow top width inside pipe =   24.41(In.)
Critical Depth =   23.77(In.)
Pipe flow velocity =      8.15(Ft/s)
Travel time through pipe =    0.43 min.
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Time of concentration (TC) =    12.69 min.


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Process from Point/Station       35.000 to Point/Station       35.000
**** SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    12.69 min.
Rainfall intensity =      3.144(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.893
Subarea runoff =      7.612(CFS) for    3.000(Ac.)
Total runoff =     41.531(CFS)
Effective area this stream =       14.80(Ac.)
Total Study Area (Main Stream No. 2) =       33.40(Ac.)
Area averaged Fm value =    0.026(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       35.000 to Point/Station       36.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------------
Upstream point/station elevation =  2978.100(Ft.)
Downstream point/station elevation =  2976.800(Ft.)
Pipe length  =   208.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    41.531(CFS)
Nearest computed pipe diameter  =     33.00(In.)
Calculated individual pipe flow  =    41.531(CFS)
Normal flow depth in pipe =   24.87(In.)
Flow top width inside pipe =   28.44(In.)
Critical Depth =   25.70(In.)
Pipe flow velocity =      8.65(Ft/s)
Travel time through pipe =    0.40 min.
Time of concentration (TC) =    13.09 min.


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Process from Point/Station       36.000 to Point/Station       36.000
**** SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    13.09 min.
Rainfall intensity =      3.076(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.892
Subarea runoff =      7.334(CFS) for    3.000(Ac.)
Total runoff =     48.865(CFS)
Effective area this stream =       17.80(Ac.)
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Total Study Area (Main Stream No. 2) =       36.40(Ac.)
Area averaged Fm value =    0.026(In/Hr)


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Process from Point/Station       36.000 to Point/Station       37.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  2976.800(Ft.)
Downstream point/station elevation =  2975.300(Ft.)
Pipe length  =   208.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    48.865(CFS)
Nearest computed pipe diameter  =     36.00(In.)
Calculated individual pipe flow  =    48.865(CFS)
Normal flow depth in pipe =   24.28(In.)
Flow top width inside pipe =   33.74(In.)
Critical Depth =   27.31(In.)
Pipe flow velocity =      9.64(Ft/s)
Travel time through pipe =    0.36 min.
Time of concentration (TC) =    13.45 min.


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Process from Point/Station       37.000 to Point/Station       37.000
**** SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    13.45 min.
Rainfall intensity =      3.019(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.892
Subarea runoff =      7.153(CFS) for    3.000(Ac.)
Total runoff =     56.019(CFS)
Effective area this stream =       20.80(Ac.)
Total Study Area (Main Stream No. 2) =       39.40(Ac.)
Area averaged Fm value =    0.026(In/Hr)


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Process from Point/Station       37.000 to Point/Station       38.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  2975.300(Ft.)
Downstream point/station elevation =  2973.800(Ft.)
Pipe length  =   284.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    56.019(CFS)
Nearest computed pipe diameter  =     39.00(In.)
Calculated individual pipe flow  =    56.019(CFS)
Normal flow depth in pipe =   27.94(In.)
Flow top width inside pipe =   35.16(In.)
Critical Depth =   28.67(In.)
Pipe flow velocity =      8.82(Ft/s)
Travel time through pipe =    0.54 min.
Time of concentration (TC) =    13.99 min.
```

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Process from Point/Station       38.000 to Point/Station       38.000
**** SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    13.99 min.
Rainfall intensity =      2.937(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.892
Subarea runoff =     14.716(CFS) for    6.200(Ac.)
Total runoff =     70.735(CFS)
Effective area this stream =       27.00(Ac.)
Total Study Area (Main Stream No. 2) =       45.60(Ac.)
Area averaged Fm value =    0.026(In/Hr)


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Process from Point/Station       38.000 to Point/Station       27.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------------
Upstream point/station elevation =  2973.800(Ft.)
Downstream point/station elevation =  2968.500(Ft.)
Pipe length  =   878.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    70.735(CFS)
Nearest computed pipe diameter  =     42.00(In.)
Calculated individual pipe flow  =    70.735(CFS)
Normal flow depth in pipe =   29.34(In.)
Flow top width inside pipe =   38.54(In.)
Critical Depth =   31.60(In.)
Pipe flow velocity =      9.85(Ft/s)
Travel time through pipe =    1.49 min.
Time of concentration (TC) =    15.48 min.


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Process from Point/Station       27.000 to Point/Station       27.000
**** CONFLUENCE OF MAIN STREAMS ****
----------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     27.000(Ac.)
Runoff from this stream =     70.735(CFS)
Time of concentration =   15.48 min.
Rainfall intensity =     2.737(In/Hr)
Area averaged loss rate (Fm) =    0.0262(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 3


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Process from Point/Station       41.000 to Point/Station       42.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
```

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Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Initial subarea data:
Initial area flow distance =   600.000(Ft.)
Top (of initial area) elevation =  2991.000(Ft.)
Bottom (of initial area) elevation =  2983.200(Ft.)
Difference in elevation =     7.800(Ft.)
Slope =    0.01300  s(%)=       1.30
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.361 min.
Rainfall intensity =      3.891(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.894
Subarea runoff =     10.435(CFS)
Total initial stream area =        3.000(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.026(In/Hr)


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Process from Point/Station       42.000 to Point/Station       43.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  2978.200(Ft.)
Downstream point/station elevation =  2974.700(Ft.)
Pipe length  =   220.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    10.435(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    10.435(CFS)
Normal flow depth in pipe =   11.39(In.)
Flow top width inside pipe =   17.35(In.)
Critical Depth =   14.91(In.)
Pipe flow velocity =      8.86(Ft/s)
Travel time through pipe =    0.41 min.
Time of concentration (TC) =     9.78 min.


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Process from Point/Station       43.000 to Point/Station       43.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =     9.78 min.
Rainfall intensity =      3.775(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.894
Subarea runoff =      9.809(CFS) for    3.000(Ac.)
Total runoff =     20.244(CFS)
Effective area this stream =        6.00(Ac.)
Total Study Area (Main Stream No. 3) =       51.60(Ac.)
Area averaged Fm value =    0.026(In/Hr)


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Process from Point/Station       43.000 to Point/Station       44.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  2974.700(Ft.)
Downstream point/station elevation =  2971.400(Ft.)
Pipe length  =   208.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    20.244(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    20.244(CFS)
Normal flow depth in pipe =   16.13(In.)
Flow top width inside pipe =   17.73(In.)
Critical Depth =   19.24(In.)
Pipe flow velocity =     10.22(Ft/s)
Travel time through pipe =    0.34 min.
Time of concentration (TC) =    10.11 min.


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Process from Point/Station       44.000 to Point/Station       44.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    10.11 min.
Rainfall intensity =      3.686(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.894
Subarea runoff =     14.012(CFS) for    4.400(Ac.)
Total runoff =     34.255(CFS)
Effective area this stream =       10.40(Ac.)
Total Study Area (Main Stream No. 3) =       56.00(Ac.)
Area averaged Fm value =    0.026(In/Hr)


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Process from Point/Station       44.000 to Point/Station       45.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  2971.400(Ft.)
Downstream point/station elevation =  2968.800(Ft.)
Pipe length  =   161.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    34.255(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    34.255(CFS)
Normal flow depth in pipe =   18.33(In.)
Flow top width inside pipe =   25.21(In.)
Critical Depth =   23.94(In.)
Pipe flow velocity =     11.92(Ft/s)
Travel time through pipe =    0.23 min.
Time of concentration (TC) =    10.34 min.


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Process from Point/Station       45.000 to Point/Station       45.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
COMMERCIAL subarea type
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Adjusted SCS curve number for AMC 3 = 86.20
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.026(In/Hr)
Time of concentration =    10.34 min.
Rainfall intensity =      3.630(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.894
Subarea runoff =     16.012(CFS) for    5.100(Ac.)
Total runoff =     50.268(CFS)
Effective area this stream =       15.50(Ac.)
Total Study Area (Main Stream No. 3) =       61.10(Ac.)
Area averaged Fm value =    0.026(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       45.000 to Point/Station       27.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  2968.800(Ft.)
Downstream point/station elevation =  2968.500(Ft.)
Pipe length  =    20.00(Ft.)   Manning's N = 0.012
No. of pipes = 1  Required pipe flow  =    50.268(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    50.268(CFS)
Normal flow depth in pipe =   22.73(In.)
Flow top width inside pipe =   25.70(In.)
Critical Depth =   27.63(In.)
Pipe flow velocity =     12.58(Ft/s)
Travel time through pipe =    0.03 min.
Time of concentration (TC) =    10.37 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       27.000 to Point/Station       27.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =     15.500(Ac.)
Runoff from this stream =     50.268(CFS)
Time of concentration =   10.37 min.
Rainfall intensity =     3.623(In/Hr)
Area averaged loss rate (Fm) =    0.0262(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)    (Ac.)       (min) (In/Hr)     (In/Hr)


1     57.42    18.600     11.36    0.026      3.399
2     70.73    27.000     15.48    0.026      2.737
3     50.27    15.500     10.37    0.026      3.623
Qmax(1) =
          1.000 *    1.000 *    57.418) +
          1.244 *    0.734 *    70.735) +
          0.938 *    1.000 *    50.268) + =     169.134
Qmax(2) =
          0.804 *    1.000 *    57.418) +
```

```
          1.000 *    1.000 *    70.735) +
          0.754 *    1.000 *    50.268) + =     154.765
Qmax(3) =
          1.067 *    0.913 *    57.418) +
          1.327 *    0.670 *    70.735) +
          1.000 *    1.000 *    50.268) + =     169.030

Total of 3 main streams to confluence:
Flow rates before confluence point:
      58.418      71.735      51.268
Maximum flow rates at confluence using above data:
      169.134      154.765      169.030
Area of streams before confluence:
       18.600       27.000       15.500
Effective area values after confluence:
       53.914       61.100       50.561


Results of confluence:
Total flow rate =    169.134(CFS)
Time of concentration =    11.358 min.
Effective stream area after confluence  =     53.914(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.026(In/Hr)
Study area total =      61.10(Ac.)
End of computations, Total Study Area =           61.10 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number =  69.0
```

Appendix C

10-yr and 100-yr Unit Hydrograph Calculations

-Existing Condition:

-Proposed Condition:

U n i t H y d r o g r a p h A n a l y s i s

Study date 04/28/23

++

San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6145

COVINGTON - MIP
10 YEAR STORM EVENT EXISTING TRIBUTARY TO OUTLET
5712Q10E
DS

Storm Event Year = 10

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
47.00	1	0.62
Rainfall data for year 10		
47.00	6	1.27
Rainfall data for year 10		
47.00	24	2.32

++

******** Area-averaged max loss rate, Fm ********

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
86.0	86.0	47.00	1.000	0.265	1.000	0.265

Area-averaged adjusted loss rate Fm (In/Hr) = 0.265

********* Area-Averaged low loss rate fraction, Yb **********

Area	Area	SCS CN	SCS CN	S	Pervious

(Ac.)	Fract	(AMC2)	(AMC2)		Yield Fr
47.00	1.000	86.0	86.0	1.63	0.473

Area-averaged catchment yield fraction, Y = 0.473
Area-averaged low loss fraction, Yb = 0.527
++
Watercourse length = 2070.00(Ft.)
Length from concentration point to centroid = 1190.00(Ft.)
Elevation difference along watercourse = 22.40(Ft.)
Mannings friction factor along watercourse = 0.350
Watershed area = 47.00(Ac.)
Catchment Lag time = 1.549 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 5.3799
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.265(In/Hr)
Average low loss rate fraction (Yb) = 0.527 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.295(In)
Computed peak 30-minute rainfall = 0.504(In)
Specified peak 1-hour rainfall = 0.621(In)
Computed peak 3-hour rainfall = 0.963(In)
Specified peak 6-hour rainfall = 1.270(In)
Specified peak 24-hour rainfall = 2.320(In)

Rainfall depth area reduction factors:
Using a total area of 47.00(Ac.) (Ref: fig. E-4)

5-minute factor = 0.998 Adjusted rainfall = 0.294(In)
30-minute factor = 0.998 Adjusted rainfall = 0.503(In)
1-hour factor = 0.998 Adjusted rainfall = 0.620(In)
3-hour factor = 1.000 Adjusted rainfall = 0.963(In)
6-hour factor = 1.000 Adjusted rainfall = 1.270(In)
24-hour factor = 1.000 Adjusted rainfall = 2.320(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 568.41 (CFS))		
1	0.237	1.346
2	0.710	2.691
3	1.282	3.251
4	2.163	5.009
5	3.094	5.290
6	4.338	7.072
7	5.673	7.585
8	7.257	9.008
9	9.065	10.275
10	11.281	12.593
11	14.653	19.170
12	18.248	20.431
13	23.363	29.077
14	28.871	31.305
15	33.876	28.449
16	38.481	26.176
17	42.772	24.388
18	46.255	19.802
19	49.644	19.259

20	52.553	16.535
21	55.347	15.885
22	57.717	13.468
23	59.783	11.743
24	61.735	11.097
25	63.424	9.601
26	65.078	9.397
27	66.538	8.302
28	67.957	8.068
29	69.299	7.624
30	70.590	7.339
31	71.813	6.952
32	72.894	6.142
33	73.955	6.034
34	74.920	5.484
35	75.867	5.379
36	76.786	5.226
37	77.690	5.137
38	78.528	4.763
39	79.241	4.053
40	79.951	4.037
41	80.661	4.037
42	81.369	4.025
43	81.994	3.551
44	82.575	3.303
45	83.156	3.303
46	83.737	3.303
47	84.309	3.251
48	84.833	2.976
49	85.349	2.936
50	85.866	2.936
51	86.382	2.936
52	86.865	2.744
53	87.296	2.450
54	87.726	2.446
55	88.157	2.446
56	88.584	2.429
57	88.938	2.013
58	89.261	1.835
59	89.584	1.835
60	89.906	1.835
61	90.225	1.813
62	90.529	1.723
63	90.830	1.712
64	91.131	1.712
65	91.432	1.712
66	91.714	1.604
67	91.973	1.468
68	92.231	1.468
69	92.489	1.468
70	92.747	1.462
71	92.989	1.376
72	93.225	1.346
73	93.462	1.346
74	93.699	1.346
75	93.924	1.281
76	94.110	1.058
77	94.293	1.040
78	94.476	1.040
79	94.659	1.040
80	94.842	1.040
81	95.025	1.040
82	95.208	1.040

83	95.391	1.040
84	95.571	1.024
85	95.720	0.846
86	95.860	0.795
87	95.999	0.795
88	96.139	0.795
89	96.279	0.795
90	96.419	0.795
91	96.559	0.795
92	96.699	0.795
93	96.839	0.795
94	96.954	0.658
95	97.051	0.550
96	97.148	0.550
97	97.245	0.550
98	97.342	0.550
99	97.439	0.550
100	97.535	0.550
101	97.632	0.550
102	97.729	0.550
103	97.813	0.478
104	97.868	0.312
105	97.922	0.306
106	97.976	0.306
107	98.030	0.306
108	98.083	0.306
109	98.137	0.306
110	98.191	0.306
111	98.245	0.306
112	98.300	0.313
113	98.363	0.359
114	98.427	0.367
115	98.492	0.367
116	98.557	0.367
117	98.621	0.367
118	98.686	0.367
119	98.750	0.367
120	98.815	0.367
121	98.879	0.367
122	98.944	0.367
123	99.009	0.367
124	99.073	0.367
125	99.138	0.367
126	99.202	0.367
127	99.267	0.367
128	99.331	0.367
129	99.396	0.367
130	99.460	0.367
131	99.513	0.298
132	99.547	0.192
133	99.580	0.191
134	99.614	0.191
135	99.648	0.191
136	99.681	0.191
137	99.715	0.191
138	99.748	0.191
139	99.782	0.191
140	99.816	0.191
141	99.849	0.191
142	99.883	0.191
143	99.917	0.191
144	99.950	0.191
145	100.000	0.096

Total soil rain loss = 1.07(In)
Total effective rainfall = 1.25(In)
Peak flow rate in flood hydrograph = 14.29(CFS)

++

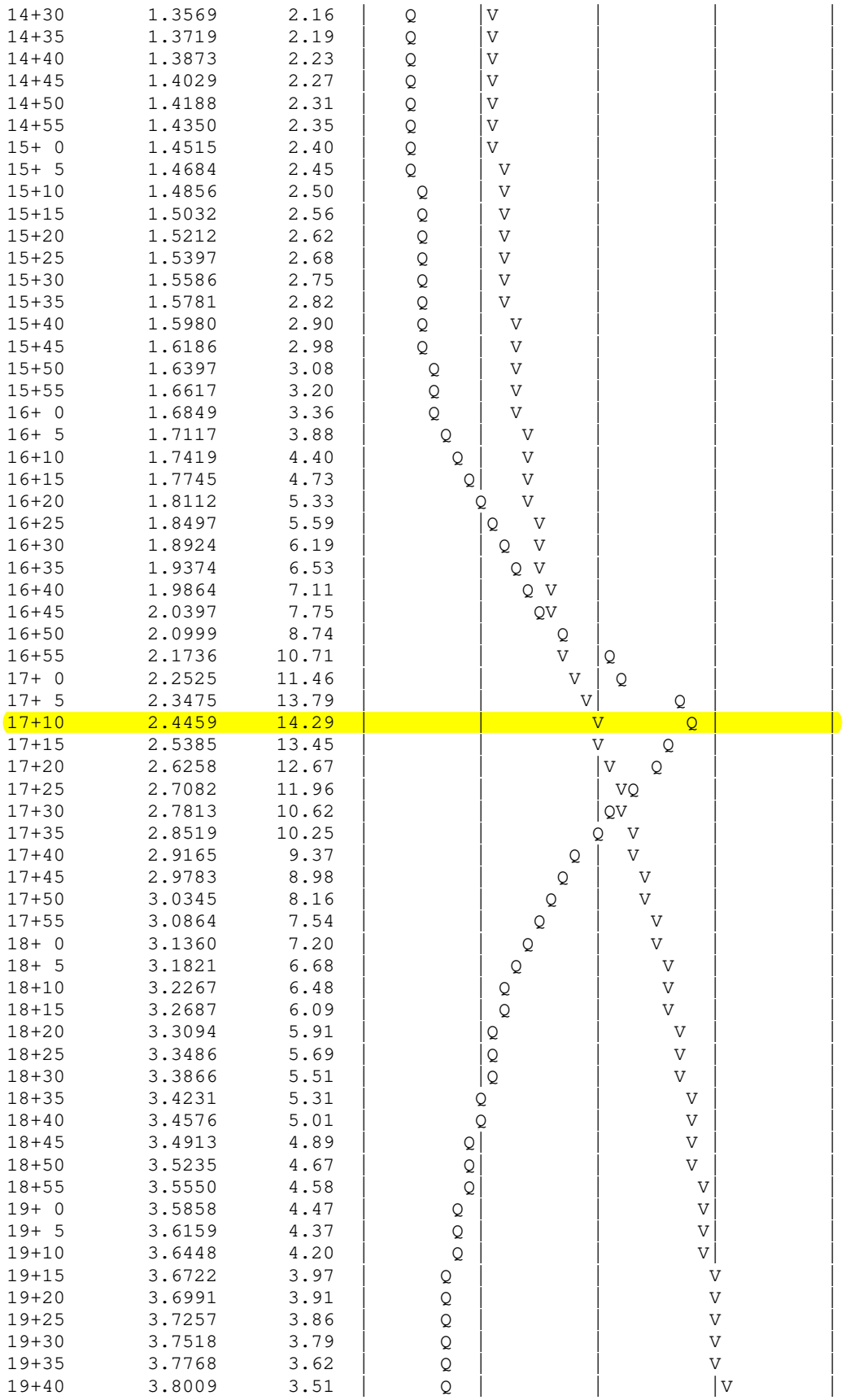
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0000	0.00	Q				
0+10	0.0001	0.01	Q				
0+15	0.0001	0.01	Q				
0+20	0.0003	0.02	Q				
0+25	0.0005	0.03	Q				
0+30	0.0008	0.04	Q				
0+35	0.0011	0.05	Q				
0+40	0.0016	0.07	Q				
0+45	0.0022	0.09	Q				
0+50	0.0029	0.11	Q				
0+55	0.0039	0.14	Q				
1+ 0	0.0051	0.17	Q				
1+ 5	0.0066	0.22	Q				
1+10	0.0085	0.28	Q				
1+15	0.0108	0.32	Q				
1+20	0.0133	0.37	Q				
1+25	0.0161	0.41	Q				
1+30	0.0192	0.44	Q				
1+35	0.0224	0.48	Q				
1+40	0.0259	0.51	VQ				
1+45	0.0296	0.53	VQ				
1+50	0.0334	0.56	VQ				
1+55	0.0374	0.58	VQ				
2+ 0	0.0415	0.60	VQ				
2+ 5	0.0458	0.62	VQ				
2+10	0.0501	0.63	VQ				
2+15	0.0546	0.65	VQ				
2+20	0.0592	0.66	VQ				
2+25	0.0639	0.68	VQ				
2+30	0.0686	0.69	VQ				
2+35	0.0735	0.71	VQ				
2+40	0.0785	0.72	VQ				
2+45	0.0835	0.73	VQ				
2+50	0.0886	0.74	VQ				
2+55	0.0939	0.76	VQ				
3+ 0	0.0991	0.77	VQ				
3+ 5	0.1045	0.78	VQ				
3+10	0.1099	0.79	VQ				
3+15	0.1154	0.80	VQ				
3+20	0.1210	0.81	VQ				
3+25	0.1266	0.82	|Q				
3+30	0.1323	0.83	|Q				
3+35	0.1380	0.83	|Q				
3+40	0.1438	0.84	|Q				
3+45	0.1497	0.85	|Q				
3+50	0.1556	0.86	|Q				
3+55	0.1616	0.87	|Q				

4+ 0	0.1676	0.88	Q			
4+ 5	0.1737	0.88	Q			
4+10	0.1798	0.89	Q			
4+15	0.1860	0.90	Q			
4+20	0.1923	0.91	Q			
4+25	0.1985	0.91	Q			
4+30	0.2049	0.92	Q			
4+35	0.2113	0.93	Q			
4+40	0.2177	0.94	Q			
4+45	0.2242	0.94	Q			
4+50	0.2308	0.95	Q			
4+55	0.2374	0.96	Q			
5+ 0	0.2440	0.96	Q			
5+ 5	0.2507	0.97	QV			
5+10	0.2574	0.98	QV			
5+15	0.2642	0.98	QV			
5+20	0.2710	0.99	QV			
5+25	0.2778	1.00	QV			
5+30	0.2847	1.00	Q			
5+35	0.2917	1.01	Q			
5+40	0.2987	1.01	Q			
5+45	0.3057	1.02	Q			
5+50	0.3128	1.03	Q			
5+55	0.3199	1.03	Q			
6+ 0	0.3271	1.04	Q			
6+ 5	0.3343	1.05	Q			
6+10	0.3415	1.05	Q			
6+15	0.3488	1.06	Q			
6+20	0.3562	1.07	Q			
6+25	0.3636	1.07	Q			
6+30	0.3710	1.08	QV			
6+35	0.3784	1.08	QV			
6+40	0.3860	1.09	QV			
6+45	0.3935	1.10	QV			
6+50	0.4011	1.10	QV			
6+55	0.4088	1.11	QV			
7+ 0	0.4164	1.12	QV			
7+ 5	0.4242	1.12	QV			
7+10	0.4320	1.13	QV			
7+15	0.4398	1.14	QV			
7+20	0.4476	1.14	QV			
7+25	0.4556	1.15	QV			
7+30	0.4635	1.15	QV			
7+35	0.4715	1.16	QV			
7+40	0.4795	1.17	QV			
7+45	0.4876	1.17	QV			
7+50	0.4958	1.18	Q V			
7+55	0.5040	1.19	Q V			
8+ 0	0.5122	1.19	Q V			
8+ 5	0.5205	1.20	Q V			
8+10	0.5288	1.21	Q V			
8+15	0.5371	1.21	Q V			
8+20	0.5456	1.22	Q V			
8+25	0.5540	1.23	Q V			
8+30	0.5625	1.24	Q V			
8+35	0.5711	1.24	Q V			
8+40	0.5797	1.25	Q V			
8+45	0.5884	1.26	Q V			
8+50	0.5971	1.26	Q V			
8+55	0.6058	1.27	Q V			
9+ 0	0.6146	1.28	Q V			
9+ 5	0.6235	1.29	Q V			
9+10	0.6324	1.29	Q V			

9+15	0.6413	1.30	Q V			
9+20	0.6503	1.31	Q V			
9+25	0.6594	1.32	Q V			
9+30	0.6685	1.32	Q V			
9+35	0.6777	1.33	Q V			
9+40	0.6869	1.34	Q V			
9+45	0.6962	1.35	Q V			
9+50	0.7056	1.36	Q V			
9+55	0.7150	1.37	Q V			
10+ 0	0.7245	1.37	Q V			
10+ 5	0.7340	1.38	Q V			
10+10	0.7436	1.39	Q V			
10+15	0.7532	1.40	Q V			
10+20	0.7630	1.41	Q V			
10+25	0.7727	1.42	Q V			
10+30	0.7826	1.43	Q V			
10+35	0.7925	1.44	Q V			
10+40	0.8025	1.45	Q V			
10+45	0.8126	1.46	Q V			
10+50	0.8227	1.47	Q V			
10+55	0.8329	1.48	Q V			
11+ 0	0.8432	1.49	Q V			
11+ 5	0.8536	1.50	Q V			
11+10	0.8640	1.51	Q V			
11+15	0.8745	1.53	Q V			
11+20	0.8851	1.54	Q V			
11+25	0.8957	1.55	Q V			
11+30	0.9065	1.56	Q V			
11+35	0.9173	1.57	Q V			
11+40	0.9282	1.58	Q V			
11+45	0.9392	1.60	Q V			
11+50	0.9503	1.61	Q V			
11+55	0.9615	1.62	Q V			
12+ 0	0.9728	1.64	Q V			
12+ 5	0.9842	1.65	Q V			
12+10	0.9956	1.66	Q V			
12+15	1.0072	1.68	Q V			
12+20	1.0188	1.69	Q V			
12+25	1.0305	1.70	Q V			
12+30	1.0423	1.72	Q V			
12+35	1.0543	1.73	Q V			
12+40	1.0663	1.74	Q V			
12+45	1.0784	1.76	Q V			
12+50	1.0906	1.77	Q V			
12+55	1.1028	1.78	Q V			
13+ 0	1.1152	1.79	Q V			
13+ 5	1.1276	1.80	Q V			
13+10	1.1401	1.81	Q V			
13+15	1.1527	1.83	Q V			
13+20	1.1653	1.84	Q V			
13+25	1.1781	1.85	Q V			
13+30	1.1909	1.87	Q V			
13+35	1.2039	1.88	Q V			
13+40	1.2170	1.90	Q V			
13+45	1.2302	1.92	Q V			
13+50	1.2436	1.94	Q V			
13+55	1.2571	1.96	Q V			
14+ 0	1.2708	1.99	Q V			
14+ 5	1.2847	2.01	Q V			
14+10	1.2987	2.04	Q V			
14+15	1.3129	2.07	Q V			
14+20	1.3274	2.09	Q V			
14+25	1.3420	2.13	Q V			



19+45	3.8248	3.47	Q		V	
19+50	3.8484	3.43	Q		V	
19+55	3.8716	3.37	Q		V	
20+ 0	3.8940	3.26	Q		V	
20+ 5	3.9161	3.21	Q		V	
20+10	3.9379	3.17	Q		V	
20+15	3.9595	3.13	Q		V	
20+20	3.9804	3.03	Q		V	
20+25	4.0005	2.92	Q		V	
20+30	4.0203	2.88	Q		V	
20+35	4.0399	2.85	Q		V	
20+40	4.0592	2.80	Q		V	
20+45	4.0774	2.65	Q		V	
20+50	4.0952	2.57	Q		V	
20+55	4.1127	2.54	Q		V	
21+ 0	4.1300	2.52	Q		V	
21+ 5	4.1471	2.48	Q		V	
21+10	4.1638	2.43	Q		V	
21+15	4.1804	2.40	Q		V	
21+20	4.1968	2.38	Q		V	
21+25	4.2130	2.35	Q		V	
21+30	4.2288	2.29	Q		V	
21+35	4.2442	2.24	Q		V	
21+40	4.2594	2.21	Q		V	
21+45	4.2745	2.19	Q		V	
21+50	4.2894	2.17	Q		V	
21+55	4.3040	2.12	Q		V	
22+ 0	4.3184	2.09	Q		V	
22+ 5	4.3327	2.07	Q		V	
22+10	4.3468	2.05	Q		V	
22+15	4.3606	2.00	Q		V	
22+20	4.3738	1.93	Q		V	
22+25	4.3869	1.90	Q		V	
22+30	4.3999	1.88	Q		V	
22+35	4.4128	1.87	Q		V	
22+40	4.4255	1.85	Q		V	
22+45	4.4381	1.83	Q		V	
22+50	4.4507	1.82	Q		V	
22+55	4.4630	1.80	Q		V	
23+ 0	4.4752	1.77	Q		V	
23+ 5	4.4870	1.71	Q		V	
23+10	4.4985	1.68	Q		V	
23+15	4.5100	1.66	Q		V	
23+20	4.5213	1.65	Q		V	
23+25	4.5326	1.63	Q		V	
23+30	4.5438	1.62	Q		V	
23+35	4.5548	1.61	Q		V	
23+40	4.5658	1.59	Q		V	
23+45	4.5766	1.57	Q		V	
23+50	4.5870	1.52	Q		V	
23+55	4.5972	1.48	Q		V	
24+ 0	4.6072	1.46	Q		V	
24+ 5	4.6172	1.45	Q		V	
24+10	4.6271	1.43	Q		V	
24+15	4.6368	1.41	Q		V	
24+20	4.6464	1.39	Q		V	
24+25	4.6559	1.37	Q		V	
24+30	4.6651	1.34	Q		V	
24+35	4.6740	1.30	Q		V	
24+40	4.6825	1.23	Q		V	
24+45	4.6908	1.20	Q		V	
24+50	4.6988	1.17	Q		V	
24+55	4.7066	1.13	Q		V	

25+ 0	4.7140	1.08	Q			V
25+ 5	4.7211	1.03	Q			V
25+10	4.7278	0.97	Q			V
25+15	4.7341	0.92	Q			V
25+20	4.7401	0.87	Q			V
25+25	4.7459	0.84	Q			V
25+30	4.7514	0.80	Q			V
25+35	4.7566	0.76	Q			V
25+40	4.7617	0.73	Q			V
25+45	4.7665	0.70	Q			V
25+50	4.7711	0.67	Q			V
25+55	4.7756	0.65	Q			V
26+ 0	4.7799	0.63	Q			V
26+ 5	4.7841	0.61	Q			V
26+10	4.7881	0.59	Q			V
26+15	4.7920	0.57	Q			V
26+20	4.7958	0.55	Q			V
26+25	4.7995	0.53	Q			V
26+30	4.8030	0.52	Q			V
26+35	4.8065	0.50	Q			V
26+40	4.8098	0.49	Q			V
26+45	4.8131	0.47	Q			V
26+50	4.8162	0.45	Q			V
26+55	4.8191	0.42	Q			V
27+ 0	4.8217	0.38	Q			V
27+ 5	4.8242	0.36	Q			V
27+10	4.8266	0.35	Q			V
27+15	4.8289	0.34	Q			V
27+20	4.8312	0.33	Q			V
27+25	4.8334	0.32	Q			V
27+30	4.8356	0.31	Q			V
27+35	4.8376	0.30	Q			V
27+40	4.8396	0.29	Q			V
27+45	4.8416	0.28	Q			V
27+50	4.8435	0.27	Q			V
27+55	4.8453	0.26	Q			V
28+ 0	4.8470	0.25	Q			V
28+ 5	4.8485	0.21	Q			V
28+10	4.8498	0.18	Q			V
28+15	4.8510	0.17	Q			V
28+20	4.8521	0.17	Q			V
28+25	4.8532	0.16	Q			V
28+30	4.8543	0.15	Q			V
28+35	4.8553	0.15	Q			V
28+40	4.8562	0.14	Q			V
28+45	4.8572	0.14	Q			V
28+50	4.8581	0.13	Q			V
28+55	4.8590	0.13	Q			V
29+ 0	4.8598	0.12	Q			V
29+ 5	4.8606	0.12	Q			V
29+10	4.8614	0.11	Q			V
29+15	4.8621	0.11	Q			V
29+20	4.8629	0.11	Q			V
29+25	4.8636	0.10	Q			V
29+30	4.8642	0.10	Q			V
29+35	4.8649	0.09	Q			V
29+40	4.8655	0.09	Q			V
29+45	4.8661	0.09	Q			V
29+50	4.8667	0.08	Q			V
29+55	4.8673	0.08	Q			V
30+ 0	4.8678	0.08	Q			V
30+ 5	4.8684	0.08	Q			V
30+10	4.8689	0.07	Q			V

30+15	4.8693	0.07	Q	|	|	|	V|
30+20	4.8698	0.07	Q	|	|	|	V|
30+25	4.8703	0.07	Q	|	|	|	V|
30+30	4.8707	0.06	Q	|	|	|	V|
30+35	4.8711	0.06	Q	|	|	|	V|
30+40	4.8715	0.06	Q	|	|	|	V|
30+45	4.8719	0.06	Q	|	|	|	V|
30+50	4.8723	0.05	Q	|	|	|	V|
30+55	4.8726	0.05	Q	|	|	|	V|
31+ 0	4.8730	0.05	Q	|	|	|	V|
31+ 5	4.8733	0.05	Q	|	|	|	V|
31+10	4.8736	0.05	Q	|	|	|	V|
31+15	4.8739	0.04	Q	|	|	|	V|
31+20	4.8742	0.04	Q	|	|	|	V|
31+25	4.8745	0.04	Q	|	|	|	V|
31+30	4.8748	0.04	Q	|	|	|	V|
31+35	4.8750	0.04	Q	|	|	|	V|
31+40	4.8753	0.04	Q	|	|	|	V|
31+45	4.8755	0.03	Q	|	|	|	V|
31+50	4.8758	0.03	Q	|	|	|	V|
31+55	4.8760	0.03	Q	|	|	|	V|
32+ 0	4.8762	0.03	Q	|	|	|	V|
32+ 5	4.8764	0.03	Q	|	|	|	V|
32+10	4.8766	0.03	Q	|	|	|	V|
32+15	4.8768	0.03	Q	|	|	|	V|
32+20	4.8770	0.03	Q	|	|	|	V|
32+25	4.8771	0.03	Q	|	|	|	V|
32+30	4.8773	0.02	Q	|	|	|	V|
32+35	4.8775	0.02	Q	|	|	|	V|
32+40	4.8776	0.02	Q	|	|	|	V|
32+45	4.8778	0.02	Q	|	|	|	V|
32+50	4.8779	0.02	Q	|	|	|	V|
32+55	4.8781	0.02	Q	|	|	|	V|
33+ 0	4.8782	0.02	Q	|	|	|	V|
33+ 5	4.8783	0.02	Q	|	|	|	V|
33+10	4.8785	0.02	Q	|	|	|	V|
33+15	4.8786	0.02	Q	|	|	|	V|
33+20	4.8787	0.02	Q	|	|	|	V|
33+25	4.8788	0.02	Q	|	|	|	V|
33+30	4.8789	0.02	Q	|	|	|	V|
33+35	4.8790	0.02	Q	|	|	|	V|
33+40	4.8791	0.01	Q	|	|	|	V|
33+45	4.8792	0.01	Q	|	|	|	V|
33+50	4.8793	0.01	Q	|	|	|	V|
33+55	4.8794	0.01	Q	|	|	|	V|
34+ 0	4.8795	0.01	Q	|	|	|	V|
34+ 5	4.8796	0.01	Q	|	|	|	V|
34+10	4.8796	0.01	Q	|	|	|	V|
34+15	4.8797	0.01	Q	|	|	|	V|
34+20	4.8798	0.01	Q	|	|	|	V|
34+25	4.8798	0.01	Q	|	|	|	V|
34+30	4.8799	0.01	Q	|	|	|	V|
34+35	4.8799	0.01	Q	|	|	|	V|
34+40	4.8800	0.01	Q	|	|	|	V|
34+45	4.8800	0.01	Q	|	|	|	V|
34+50	4.8800	0.00	Q	|	|	|	V|
34+55	4.8801	0.00	Q	|	|	|	V|
35+ 0	4.8801	0.00	Q	|	|	|	V|
35+ 5	4.8801	0.00	Q	|	|	|	V|
35+10	4.8801	0.00	Q	|	|	|	V|
35+15	4.8802	0.00	Q	|	|	|	V|
35+20	4.8802	0.00	Q	|	|	|	V|
35+25	4.8802	0.00	Q	|	|	|	V|

35+30	4.8802	0.00	Q	|	|	|	V|
35+35	4.8802	0.00	Q	|	|	|	V|
35+40	4.8802	0.00	Q	|	|	|	V|
35+45	4.8802	0.00	Q	|	|	|	V|
35+50	4.8802	0.00	Q	|	|	|	V|
35+55	4.8803	0.00	Q	|	|	|	V|
36+ 0	4.8803	0.00	Q	|	|	|	V

U n i t H y d r o g r a p h A n a l y s i s

Study date 05/16/23

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6145

COVINGTON - MIP BUILDING 1
10 YEAR STORM EVENT PROPOSED UNIT HYDROGRAPH BUILDING 1
5712Q10PUH1
DS

Storm Event Year = 10

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
6.20	1	0.62
Rainfall data for year 10		
6.20	6	1.27
Rainfall data for year 10		
6.20	24	2.32

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******** Area-averaged max loss rate, Fm ********

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
69.0	69.0	6.20	1.000	0.548	0.100	0.055

Area-averaged adjusted loss rate Fm (In/Hr) = 0.055

********* Area-Averaged low loss rate fraction, Yb **********

Area	Area	SCS CN	SCS CN	S	Pervious

(Ac.)	Fract	(AMC2)	(AMC2)		Yield Fr
0.62	0.100	69.0	69.0	4.49	0.147
5.58	0.900	98.0	98.0	0.20	0.902

Area-averaged catchment yield fraction, Y = 0.826
Area-averaged low loss fraction, Yb = 0.174
User entry of time of concentration = 0.168 (hours)
++
Watershed area = 6.20(Ac.)
Catchment Lag time = 0.134 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 62.0040
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.055(In/Hr)
Average low loss rate fraction (Yb) = 0.174 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.295(In)
Computed peak 30-minute rainfall = 0.504(In)
Specified peak 1-hour rainfall = 0.621(In)
Computed peak 3-hour rainfall = 0.963(In)
Specified peak 6-hour rainfall = 1.270(In)
Specified peak 24-hour rainfall = 2.320(In)

Rainfall depth area reduction factors:
Using a total area of 6.20(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.295(In)
30-minute factor = 1.000 Adjusted rainfall = 0.504(In)
1-hour factor = 1.000 Adjusted rainfall = 0.621(In)
3-hour factor = 1.000 Adjusted rainfall = 0.963(In)
6-hour factor = 1.000 Adjusted rainfall = 1.270(In)
24-hour factor = 1.000 Adjusted rainfall = 2.320(In)

U n i t H y d r o g r a p h
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Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 74.98 (CFS))		
1	5.972	4.478
2	43.460	28.109
3	69.299	19.374
4	80.386	8.314
5	86.911	4.892
6	91.059	3.110
7	93.939	2.160
8	95.974	1.526
9	97.381	1.055
10	98.197	0.611
11	98.912	0.537
12	99.567	0.490
13	100.000	0.325

Total soil rain loss = 0.34(In)
Total effective rainfall = 1.98(In)
Peak flow rate in flood hydrograph = 10.19(CFS)

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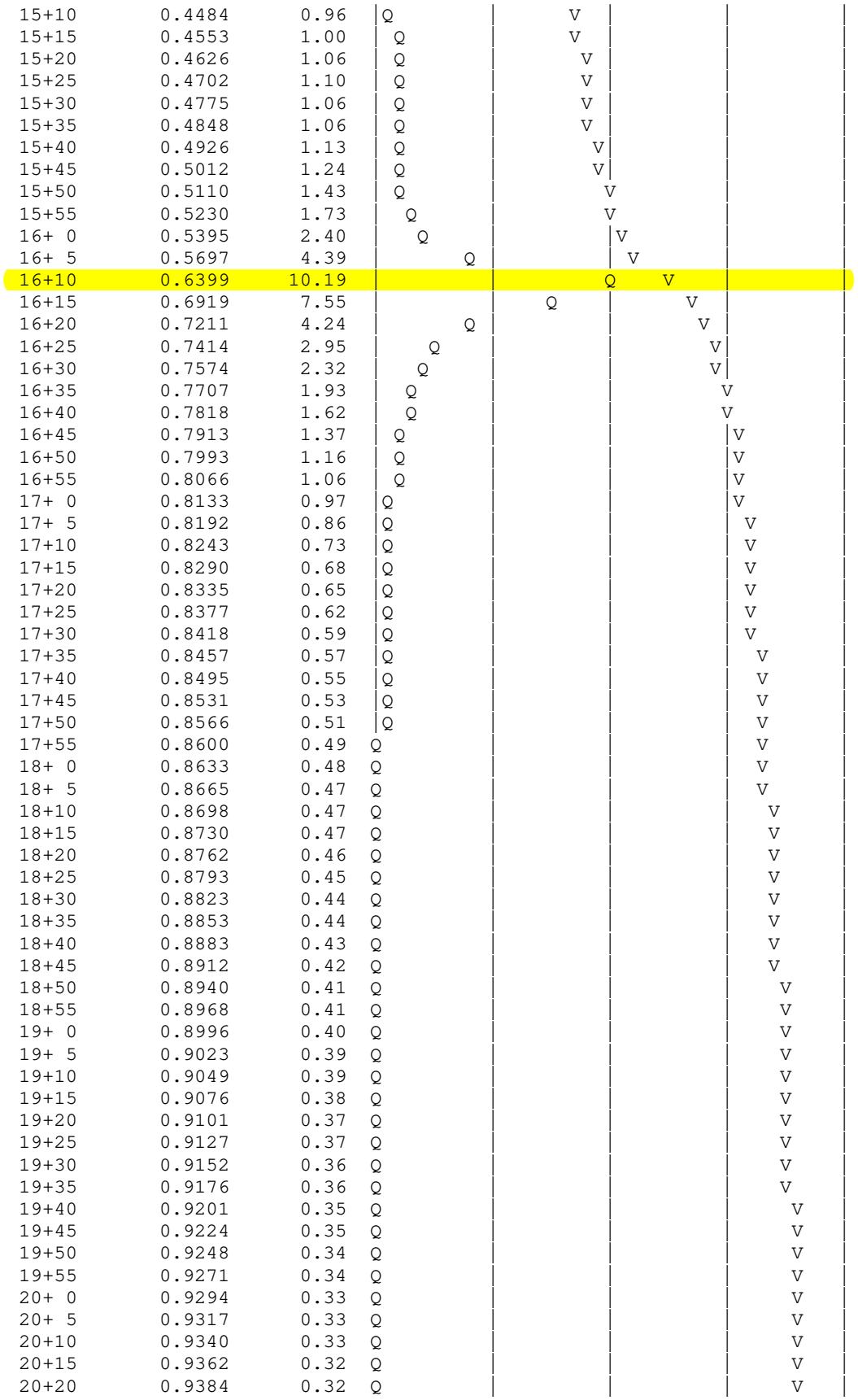
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0001	0.01	Q				
0+10	0.0007	0.09	Q				
0+15	0.0018	0.15	Q				
0+20	0.0030	0.18	Q				
0+25	0.0043	0.19	Q				
0+30	0.0057	0.20	Q				
0+35	0.0071	0.21	Q				
0+40	0.0085	0.21	Q				
0+45	0.0100	0.22	Q				
0+50	0.0115	0.22	Q				
0+55	0.0130	0.22	Q				
1+ 0	0.0146	0.22	Q				
1+ 5	0.0161	0.22	Q				
1+10	0.0176	0.22	Q				
1+15	0.0192	0.22	Q				
1+20	0.0207	0.23	Q				
1+25	0.0223	0.23	Q				
1+30	0.0239	0.23	Q				
1+35	0.0254	0.23	Q				
1+40	0.0270	0.23	QV				
1+45	0.0286	0.23	QV				
1+50	0.0302	0.23	QV				
1+55	0.0318	0.23	QV				
2+ 0	0.0334	0.23	QV				
2+ 5	0.0350	0.23	QV				
2+10	0.0366	0.23	QV				
2+15	0.0382	0.23	QV				
2+20	0.0398	0.23	QV				
2+25	0.0414	0.24	QV				
2+30	0.0430	0.24	QV				
2+35	0.0447	0.24	QV				
2+40	0.0463	0.24	QV				
2+45	0.0479	0.24	QV				
2+50	0.0496	0.24	QV				
2+55	0.0512	0.24	Q V				
3+ 0	0.0529	0.24	Q V				
3+ 5	0.0546	0.24	Q V				
3+10	0.0562	0.24	Q V				
3+15	0.0579	0.24	Q V				
3+20	0.0596	0.24	Q V				
3+25	0.0613	0.25	Q V				
3+30	0.0630	0.25	Q V				
3+35	0.0647	0.25	Q V				
3+40	0.0664	0.25	Q V				
3+45	0.0681	0.25	Q V				
3+50	0.0699	0.25	Q V				
3+55	0.0716	0.25	Q V				
4+ 0	0.0733	0.25	Q V				
4+ 5	0.0751	0.25	Q V				
4+10	0.0768	0.25	Q V				
4+15	0.0786	0.26	Q V				
4+20	0.0803	0.26	Q V				
4+25	0.0821	0.26	Q V				
4+30	0.0839	0.26	Q V				
4+35	0.0857	0.26	Q V				

4+40	0.0875	0.26	Q	V				
4+45	0.0893	0.26	Q	V				
4+50	0.0911	0.26	Q	V				
4+55	0.0929	0.26	Q	V				
5+ 0	0.0947	0.26	Q	V				
5+ 5	0.0965	0.27	Q	V				
5+10	0.0984	0.27	Q	V				
5+15	0.1002	0.27	Q	V				
5+20	0.1021	0.27	Q	V				
5+25	0.1039	0.27	Q	V				
5+30	0.1058	0.27	Q	V				
5+35	0.1077	0.27	Q	V				
5+40	0.1096	0.27	Q	V				
5+45	0.1114	0.27	Q	V				
5+50	0.1133	0.28	Q	V				
5+55	0.1153	0.28	Q	V				
6+ 0	0.1172	0.28	Q	V				
6+ 5	0.1191	0.28	Q	V				
6+10	0.1210	0.28	Q	V				
6+15	0.1230	0.28	Q	V				
6+20	0.1249	0.28	Q	V				
6+25	0.1269	0.29	Q	V				
6+30	0.1289	0.29	Q	V				
6+35	0.1309	0.29	Q	V				
6+40	0.1329	0.29	Q	V				
6+45	0.1349	0.29	Q	V				
6+50	0.1369	0.29	Q	V				
6+55	0.1389	0.29	Q	V				
7+ 0	0.1409	0.30	Q	V				
7+ 5	0.1430	0.30	Q	V				
7+10	0.1450	0.30	Q	V				
7+15	0.1471	0.30	Q	V				
7+20	0.1492	0.30	Q	V				
7+25	0.1513	0.30	Q	V				
7+30	0.1534	0.30	Q	V				
7+35	0.1555	0.31	Q	V				
7+40	0.1576	0.31	Q	V				
7+45	0.1597	0.31	Q	V				
7+50	0.1619	0.31	Q	V				
7+55	0.1640	0.31	Q	V				
8+ 0	0.1662	0.32	Q	V				
8+ 5	0.1684	0.32	Q	V				
8+10	0.1706	0.32	Q	V				
8+15	0.1728	0.32	Q	V				
8+20	0.1750	0.32	Q	V				
8+25	0.1773	0.32	Q	V				
8+30	0.1795	0.33	Q	V				
8+35	0.1818	0.33	Q	V				
8+40	0.1840	0.33	Q	V				
8+45	0.1863	0.33	Q	V				
8+50	0.1886	0.33	Q	V				
8+55	0.1910	0.34	Q	V				
9+ 0	0.1933	0.34	Q	V				
9+ 5	0.1956	0.34	Q	V				
9+10	0.1980	0.34	Q	V				
9+15	0.2004	0.35	Q	V				
9+20	0.2028	0.35	Q	V				
9+25	0.2052	0.35	Q	V				
9+30	0.2076	0.35	Q	V				
9+35	0.2101	0.36	Q	V				
9+40	0.2125	0.36	Q	V				
9+45	0.2150	0.36	Q	V				
9+50	0.2175	0.36	Q	V				

9+55	0.2200	0.37	Q	V	|	|	|	|
10+ 0	0.2226	0.37	Q	V	|	|	|	|
10+ 5	0.2251	0.37	Q	V	|	|	|	|
10+10	0.2277	0.37	Q	V	|	|	|	|
10+15	0.2303	0.38	Q	V	|	|	|	|
10+20	0.2329	0.38	Q	V	|	|	|	|
10+25	0.2356	0.38	Q	V	|	|	|	|
10+30	0.2382	0.39	Q	V	|	|	|	|
10+35	0.2409	0.39	Q	V	|	|	|	|
10+40	0.2436	0.39	Q	V	|	|	|	|
10+45	0.2463	0.40	Q	V	|	|	|	|
10+50	0.2491	0.40	Q	V	|	|	|	|
10+55	0.2519	0.40	Q	V	|	|	|	|
11+ 0	0.2547	0.41	Q	V	|	|	|	|
11+ 5	0.2575	0.41	Q	V		|	|	|
11+10	0.2604	0.41	Q	V		|	|	|
11+15	0.2632	0.42	Q	V		|	|	|
11+20	0.2661	0.42	Q	V		|	|	|
11+25	0.2691	0.43	Q	V		|	|	|
11+30	0.2720	0.43	Q	V		|	|	|
11+35	0.2750	0.43	Q	V		|	|	|
11+40	0.2781	0.44	Q	V		|	|	|
11+45	0.2811	0.44	Q		V	|	|	|
11+50	0.2842	0.45	Q		V	|	|	|
11+55	0.2873	0.45	Q		V	|	|	|
12+ 0	0.2905	0.46	Q		V	|	|	|
12+ 5	0.2936	0.46	Q		V	|	|	|
12+10	0.2968	0.45	Q		V	|	|	|
12+15	0.2998	0.45	Q		V	|	|	|
12+20	0.3029	0.45	Q		V	|	|	|
12+25	0.3060	0.45	Q		V	|	|	|
12+30	0.3092	0.46	Q		| V	|	|	|
12+35	0.3124	0.46	Q		| V	|	|	|
12+40	0.3156	0.47	Q		| V	|	|	|
12+45	0.3188	0.47	Q		| V	|	|	|
12+50	0.3221	0.48	Q		| V	|	|	|
12+55	0.3255	0.49	Q		| V	|	|	|
13+ 0	0.3289	0.49	Q		| V	|	|	|
13+ 5	0.3323	0.50	|Q		| V	|	|	|
13+10	0.3358	0.51	|Q		| V	|	|	|
13+15	0.3394	0.52	|Q		| V	|	|	|
13+20	0.3430	0.53	|Q		| V	|	|	|
13+25	0.3467	0.54	|Q		| V	|	|	|
13+30	0.3505	0.55	|Q		| V	|	|	|
13+35	0.3543	0.56	|Q		| V	|	|	|
13+40	0.3582	0.57	|Q		| V	|	|	|
13+45	0.3622	0.58	|Q		| V	|	|	|
13+50	0.3662	0.59	|Q		| V	|	|	|
13+55	0.3704	0.60	|Q		| V	|	|	|
14+ 0	0.3746	0.62	|Q		| V	|	|	|
14+ 5	0.3789	0.63	|Q		| V	|	|	|
14+10	0.3834	0.64	|Q		| V	|	|	|
14+15	0.3879	0.66	|Q		| V	|	|	|
14+20	0.3926	0.68	|Q		| V	|	|	|
14+25	0.3974	0.70	|Q		| V	|	|	|
14+30	0.4023	0.72	|Q		| V	|	|	|
14+35	0.4074	0.74	|Q		| V	|	|	|
14+40	0.4126	0.76	|Q		| V	|	|	|
14+45	0.4180	0.78	|Q		| V	|	|	|
14+50	0.4236	0.81	|Q		| V	|	|	|
14+55	0.4294	0.84	|Q		| V	|	|	|
15+ 0	0.4355	0.88	|Q		| V	|	|	|
15+ 5	0.4418	0.91	|Q		| V	|	|	|



20+25	0.9405	0.31	Q				V
20+30	0.9427	0.31	Q				V
20+35	0.9448	0.31	Q				V
20+40	0.9469	0.30	Q				V
20+45	0.9490	0.30	Q				V
20+50	0.9510	0.30	Q				V
20+55	0.9531	0.30	Q				V
21+ 0	0.9551	0.29	Q				V
21+ 5	0.9571	0.29	Q				V
21+10	0.9590	0.29	Q				V
21+15	0.9610	0.28	Q				V
21+20	0.9629	0.28	Q				V
21+25	0.9648	0.28	Q				V
21+30	0.9667	0.28	Q				V
21+35	0.9686	0.27	Q				V
21+40	0.9705	0.27	Q				V
21+45	0.9723	0.27	Q				V
21+50	0.9742	0.27	Q				V
21+55	0.9760	0.26	Q				V
22+ 0	0.9778	0.26	Q				V
22+ 5	0.9796	0.26	Q				V
22+10	0.9814	0.26	Q				V
22+15	0.9831	0.26	Q				V
22+20	0.9849	0.25	Q				V
22+25	0.9866	0.25	Q				V
22+30	0.9883	0.25	Q				V
22+35	0.9900	0.25	Q				V
22+40	0.9917	0.25	Q				V
22+45	0.9934	0.24	Q				V
22+50	0.9951	0.24	Q				V
22+55	0.9967	0.24	Q				V
23+ 0	0.9984	0.24	Q				V
23+ 5	1.0000	0.24	Q				V
23+10	1.0017	0.24	Q				V
23+15	1.0033	0.23	Q				V
23+20	1.0049	0.23	Q				V
23+25	1.0065	0.23	Q				V
23+30	1.0080	0.23	Q				V
23+35	1.0096	0.23	Q				V
23+40	1.0112	0.23	Q				V
23+45	1.0127	0.23	Q				V
23+50	1.0143	0.22	Q				V
23+55	1.0158	0.22	Q				V
24+ 0	1.0173	0.22	Q				V
24+ 5	1.0188	0.21	Q				V
24+10	1.0196	0.12	Q				V
24+15	1.0201	0.07	Q				V
24+20	1.0204	0.04	Q				V
24+25	1.0206	0.03	Q				V
24+30	1.0207	0.02	Q				V
24+35	1.0208	0.01	Q				V
24+40	1.0209	0.01	Q				V
24+45	1.0209	0.01	Q				V
24+50	1.0209	0.00	Q				V
24+55	1.0210	0.00	Q				V
25+ 0	1.0210	0.00	Q				V

U n i t H y d r o g r a p h A n a l y s i s

Study date 05/16/23

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6145

COVINGTON - MIP BUILDING 2
10 YEAR STORM EVENT PROPOSED UNIT HYDROGRAPH BUILDING 2
5712Q10PUH2
DS

Storm Event Year = 10

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
5.70	1	0.62
Rainfall data for year 10		
5.70	6	1.27
Rainfall data for year 10		
5.70	24	2.32

++

******** Area-averaged max loss rate, Fm ********

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
69.0	69.0	5.70	1.000	0.548	0.100	0.055

Area-averaged adjusted loss rate Fm (In/Hr) = 0.055

********* Area-Averaged low loss rate fraction, Yb **********

Area	Area	SCS CN	SCS CN	S	Pervious

(Ac.)	Fract	(AMC2)	(AMC2)		Yield Fr
0.57	0.100	69.0	69.0	4.49	0.147
5.13	0.900	98.0	98.0	0.20	0.902

Area-averaged catchment yield fraction, Y = 0.826
Area-averaged low loss fraction, Yb = 0.174
User entry of time of concentration = 0.158 (hours)
++
Watershed area = 5.70(Ac.)
Catchment Lag time = 0.126 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 65.9283
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.055(In/Hr)
Average low loss rate fraction (Yb) = 0.174 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.295(In)
Computed peak 30-minute rainfall = 0.504(In)
Specified peak 1-hour rainfall = 0.621(In)
Computed peak 3-hour rainfall = 0.963(In)
Specified peak 6-hour rainfall = 1.270(In)
Specified peak 24-hour rainfall = 2.320(In)

Rainfall depth area reduction factors:
Using a total area of 5.70(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.295(In)
30-minute factor = 1.000 Adjusted rainfall = 0.504(In)
1-hour factor = 1.000 Adjusted rainfall = 0.621(In)
3-hour factor = 1.000 Adjusted rainfall = 0.963(In)
6-hour factor = 1.000 Adjusted rainfall = 1.270(In)
24-hour factor = 1.000 Adjusted rainfall = 2.320(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 68.93 (CFS))		
1	6.808	4.693
2	47.088	27.767
3	71.507	16.833
4	82.068	7.280
5	88.285	4.286
6	92.167	2.676
7	94.861	1.857
8	96.710	1.275
9	97.873	0.801
10	98.616	0.513
11	99.379	0.526
12	100.000	0.428

Total soil rain loss = 0.34(In)
Total effective rainfall = 1.98(In)
Peak flow rate in flood hydrograph = 9.84(CFS)

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24 - H O U R S T O R M

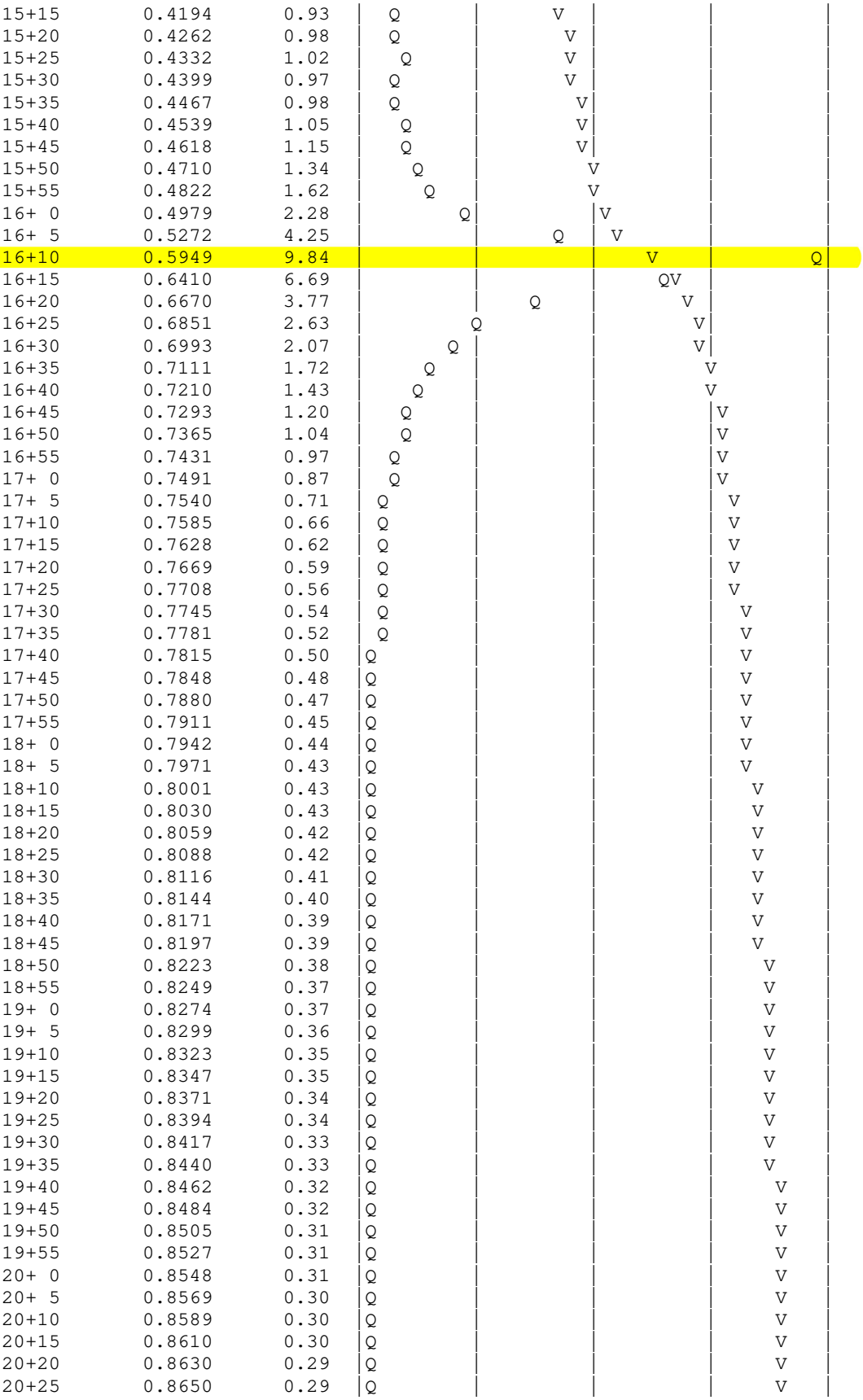
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0001	0.01	Q				
0+10	0.0007	0.09	Q				
0+15	0.0017	0.14	Q				
0+20	0.0029	0.16	Q				
0+25	0.0041	0.18	Q				
0+30	0.0054	0.19	Q				
0+35	0.0067	0.19	Q				
0+40	0.0080	0.20	Q				
0+45	0.0094	0.20	Q				
0+50	0.0108	0.20	Q				
0+55	0.0122	0.20	Q				
1+ 0	0.0136	0.20	Q				
1+ 5	0.0150	0.21	Q				
1+10	0.0164	0.21	Q				
1+15	0.0178	0.21	Q				
1+20	0.0193	0.21	Q				
1+25	0.0207	0.21	Q				
1+30	0.0221	0.21	Q				
1+35	0.0236	0.21	QV				
1+40	0.0250	0.21	QV				
1+45	0.0265	0.21	QV				
1+50	0.0279	0.21	QV				
1+55	0.0294	0.21	QV				
2+ 0	0.0309	0.21	QV				
2+ 5	0.0323	0.21	QV				
2+10	0.0338	0.21	QV				
2+15	0.0353	0.21	QV				
2+20	0.0368	0.22	QV				
2+25	0.0383	0.22	QV				
2+30	0.0398	0.22	QV				
2+35	0.0413	0.22	QV				
2+40	0.0428	0.22	QV				
2+45	0.0443	0.22	QV				
2+50	0.0458	0.22	QV				
2+55	0.0473	0.22	Q V				
3+ 0	0.0489	0.22	Q V				
3+ 5	0.0504	0.22	Q V				
3+10	0.0519	0.22	Q V				
3+15	0.0535	0.22	Q V				
3+20	0.0550	0.23	Q V				
3+25	0.0566	0.23	Q V				
3+30	0.0581	0.23	Q V				
3+35	0.0597	0.23	Q V				
3+40	0.0613	0.23	Q V				
3+45	0.0629	0.23	Q V				
3+50	0.0644	0.23	Q V				
3+55	0.0660	0.23	Q V				
4+ 0	0.0676	0.23	Q V				
4+ 5	0.0692	0.23	Q V				
4+10	0.0708	0.23	Q V				
4+15	0.0725	0.23	Q V				
4+20	0.0741	0.24	Q V				
4+25	0.0757	0.24	Q V				
4+30	0.0773	0.24	Q V				
4+35	0.0790	0.24	Q V				
4+40	0.0806	0.24	Q V				

4+45	0.0823	0.24	Q V	|	|	|
4+50	0.0840	0.24	Q V	|	|	|
4+55	0.0856	0.24	Q V	|	|	|
5+ 0	0.0873	0.24	Q V	|	|	|
5+ 5	0.0890	0.24	Q V	|	|	|
5+10	0.0907	0.25	Q V	|	|	|
5+15	0.0924	0.25	Q V	|	|	|
5+20	0.0941	0.25	Q V	|	|	|
5+25	0.0958	0.25	Q V	|	|	|
5+30	0.0975	0.25	Q V	|	|	|
5+35	0.0992	0.25	|Q V	|	|	|
5+40	0.1010	0.25	|Q V	|	|	|
5+45	0.1027	0.25	|Q V	|	|	|
5+50	0.1045	0.25	|Q V	|	|	|
5+55	0.1062	0.26	|Q V	|	|	|
6+ 0	0.1080	0.26	|Q V	|	|	|
6+ 5	0.1098	0.26	|Q V	|	|	|
6+10	0.1115	0.26	|Q V	|	|	|
6+15	0.1133	0.26	|Q V	|	|	|
6+20	0.1151	0.26	|Q V	|	|	|
6+25	0.1169	0.26	|Q V	|	|	|
6+30	0.1188	0.26	|Q V	|	|	|
6+35	0.1206	0.27	|Q V	|	|	|
6+40	0.1224	0.27	|Q V	|	|	|
6+45	0.1243	0.27	|Q V	|	|	|
6+50	0.1261	0.27	|Q V	|	|	|
6+55	0.1280	0.27	|Q V	|	|	|
7+ 0	0.1298	0.27	|Q V	|	|	|
7+ 5	0.1317	0.27	|Q V	|	|	|
7+10	0.1336	0.27	|Q V	|	|	|
7+15	0.1355	0.28	|Q V	|	|	|
7+20	0.1374	0.28	|Q V	|	|	|
7+25	0.1393	0.28	|Q V	|	|	|
7+30	0.1413	0.28	|Q V	|	|	|
7+35	0.1432	0.28	|Q V	|	|	|
7+40	0.1452	0.28	|Q V	|	|	|
7+45	0.1471	0.29	|Q V	|	|	|
7+50	0.1491	0.29	|Q V	|	|	|
7+55	0.1511	0.29	|Q V	|	|	|
8+ 0	0.1531	0.29	|Q V	|	|	|
8+ 5	0.1551	0.29	|Q V	|	|	|
8+10	0.1571	0.29	|Q V	|	|	|
8+15	0.1592	0.29	|Q V	|	|	|
8+20	0.1612	0.30	|Q V	|	|	|
8+25	0.1633	0.30	|Q V	|	|	|
8+30	0.1653	0.30	|Q V	|	|	|
8+35	0.1674	0.30	|Q V	|	|	|
8+40	0.1695	0.30	|Q V	|	|	|
8+45	0.1716	0.31	|Q V	|	|	|
8+50	0.1737	0.31	|Q V	|	|	|
8+55	0.1759	0.31	|Q V	|	|	|
9+ 0	0.1780	0.31	|Q V	|	|	|
9+ 5	0.1802	0.31	|Q V	|	|	|
9+10	0.1823	0.32	|Q V	|	|	|
9+15	0.1845	0.32	|Q V	|	|	|
9+20	0.1867	0.32	|Q V	|	|	|
9+25	0.1890	0.32	|Q V	|	|	|
9+30	0.1912	0.32	|Q V	|	|	|
9+35	0.1935	0.33	|Q V	|	|	|
9+40	0.1957	0.33	|Q V	|	|	|
9+45	0.1980	0.33	|Q V	|	|	|
9+50	0.2003	0.33	|Q V	|	|	|
9+55	0.2026	0.34	|Q V	|	|	|

10+ 0	0.2050	0.34	Q V				
10+ 5	0.2073	0.34	Q V				
10+10	0.2097	0.34	Q V				
10+15	0.2121	0.35	Q V				
10+20	0.2145	0.35	Q V				
10+25	0.2169	0.35	Q V				
10+30	0.2194	0.36	Q V				
10+35	0.2218	0.36	Q V				
10+40	0.2243	0.36	Q V				
10+45	0.2268	0.36	Q V				
10+50	0.2294	0.37	Q V				
10+55	0.2319	0.37	Q V				
11+ 0	0.2345	0.37	Q V				
11+ 5	0.2371	0.38	Q V				
11+10	0.2397	0.38	Q V				
11+15	0.2424	0.38	Q V				
11+20	0.2451	0.39	Q V				
11+25	0.2478	0.39	Q V				
11+30	0.2505	0.40	Q V				
11+35	0.2532	0.40	Q V				
11+40	0.2560	0.40	Q V				
11+45	0.2588	0.41	Q V				
11+50	0.2617	0.41	Q V				
11+55	0.2646	0.42	Q V				
12+ 0	0.2675	0.42	Q V				
12+ 5	0.2704	0.42	Q V				
12+10	0.2732	0.41	Q V				
12+15	0.2761	0.41	Q V				
12+20	0.2789	0.41	Q V				
12+25	0.2818	0.42	Q V				
12+30	0.2847	0.42	Q V				
12+35	0.2876	0.42	Q V				
12+40	0.2905	0.43	Q V				
12+45	0.2935	0.44	Q V				
12+50	0.2966	0.44	Q V				
12+55	0.2997	0.45	Q V				
13+ 0	0.3028	0.45	Q V				
13+ 5	0.3060	0.46	Q V				
13+10	0.3092	0.47	Q V				
13+15	0.3125	0.48	Q V				
13+20	0.3158	0.49	Q V				
13+25	0.3192	0.49	Q V				
13+30	0.3227	0.50	Q V				
13+35	0.3262	0.51	Q V				
13+40	0.3298	0.52	Q V				
13+45	0.3335	0.53	Q V				
13+50	0.3372	0.54	Q V				
13+55	0.3410	0.55	Q V				
14+ 0	0.3449	0.57	Q V				
14+ 5	0.3489	0.58	Q V				
14+10	0.3530	0.59	Q V				
14+15	0.3572	0.61	Q V				
14+20	0.3615	0.63	Q V				
14+25	0.3660	0.64	Q V				
14+30	0.3705	0.66	Q V				
14+35	0.3752	0.68	Q V				
14+40	0.3800	0.70	Q V				
14+45	0.3850	0.72	Q V				
14+50	0.3902	0.75	Q V				
14+55	0.3955	0.78	Q V				
15+ 0	0.4011	0.81	Q V				
15+ 5	0.4069	0.84	Q V				
15+10	0.4131	0.89	Q V				

15+15	0.4194	0.93	
15+20	0.4262	0.98	
15+25	0.4332	1.02	
15+30	0.4399	0.97	
15+35	0.4467	0.98	
15+40	0.4539	1.05	
15+45	0.4618	1.15	
15+50	0.4710	1.34	
15+55	0.4822	1.62	
16+ 0	0.4979	2.28	
16+ 5	0.5272	4.25	
16+10	0.5949	9.84	
16+15	0.6410	6.69	
16+20	0.6670	3.77	
16+25	0.6851	2.63	
16+30	0.6993	2.07	
16+35	0.7111	1.72	
16+40	0.7210	1.43	
16+45	0.7293	1.20	
16+50	0.7365	1.04	
16+55	0.7431	0.97	
17+ 0	0.7491	0.87	
17+ 5	0.7540	0.71	
17+10	0.7585	0.66	
17+15	0.7628	0.62	
17+20	0.7669	0.59	
17+25	0.7708	0.56	
17+30	0.7745	0.54	
17+35	0.7781	0.52	
17+40	0.7815	0.50	
17+45	0.7848	0.48	
17+50	0.7880	0.47	
17+55	0.7911	0.45	
18+ 0	0.7942	0.44	
18+ 5	0.7971	0.43	
18+10	0.8001	0.43	
18+15	0.8030	0.43	
18+20	0.8059	0.42	
18+25	0.8088	0.42	
18+30	0.8116	0.41	
18+35	0.8144	0.40	
18+40	0.8171	0.39	
18+45	0.8197	0.39	
18+50	0.8223	0.38	
18+55	0.8249	0.37	
19+ 0	0.8274	0.37	
19+ 5	0.8299	0.36	
19+10	0.8323	0.35	
19+15	0.8347	0.35	
19+20	0.8371	0.34	
19+25	0.8394	0.34	
19+30	0.8417	0.33	
19+35	0.8440	0.33	
19+40	0.8462	0.32	
19+45	0.8484	0.32	
19+50	0.8505	0.31	
19+55	0.8527	0.31	
20+ 0	0.8548	0.31	
20+ 5	0.8569	0.30	
20+10	0.8589	0.30	
20+15	0.8610	0.30	
20+20	0.8630	0.29	
20+25	0.8650	0.29	

20+30	0.8669	0.29	Q				V
20+35	0.8689	0.28	Q				V
20+40	0.8708	0.28	Q				V
20+45	0.8727	0.28	Q				V
20+50	0.8746	0.27	Q				V
20+55	0.8765	0.27	Q				V
21+ 0	0.8783	0.27	Q				V
21+ 5	0.8801	0.27	Q				V
21+10	0.8820	0.26	Q				V
21+15	0.8837	0.26	Q				V
21+20	0.8855	0.26	Q				V
21+25	0.8873	0.26	Q				V
21+30	0.8890	0.25	Q				V
21+35	0.8908	0.25	Q				V
21+40	0.8925	0.25	Q				V
21+45	0.8942	0.25	Q				V
21+50	0.8959	0.24	Q				V
21+55	0.8975	0.24	Q				V
22+ 0	0.8992	0.24	Q				V
22+ 5	0.9008	0.24	Q				V
22+10	0.9025	0.24	Q				V
22+15	0.9041	0.23	Q				V
22+20	0.9057	0.23	Q				V
22+25	0.9073	0.23	Q				V
22+30	0.9089	0.23	Q				V
22+35	0.9104	0.23	Q				V
22+40	0.9120	0.23	Q				V
22+45	0.9135	0.22	Q				V
22+50	0.9151	0.22	Q				V
22+55	0.9166	0.22	Q				V
23+ 0	0.9181	0.22	Q				V
23+ 5	0.9196	0.22	Q				V
23+10	0.9211	0.22	Q				V
23+15	0.9226	0.22	Q				V
23+20	0.9241	0.21	Q				V
23+25	0.9255	0.21	Q				V
23+30	0.9270	0.21	Q				V
23+35	0.9284	0.21	Q				V
23+40	0.9298	0.21	Q				V
23+45	0.9313	0.21	Q				V
23+50	0.9327	0.21	Q				V
23+55	0.9341	0.20	Q				V
24+ 0	0.9355	0.20	Q				V
24+ 5	0.9368	0.19	Q				V
24+10	0.9375	0.11	Q				V
24+15	0.9379	0.06	Q				V
24+20	0.9382	0.04	Q				V
24+25	0.9383	0.02	Q				V
24+30	0.9384	0.02	Q				V
24+35	0.9385	0.01	Q				V
24+40	0.9386	0.01	Q				V
24+45	0.9386	0.00	Q				V
24+50	0.9386	0.00	Q				V
24+55	0.9386	0.00	Q				V

U n i t H y d r o g r a p h A n a l y s i s

Study date 05/01/23

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6145

COVINGTON - MIP BUILDING 3
10 YEAR STORM EVENT PROPOSED UNIT HYDROGRAPH BUILDING 3
5712Q10PUH3
DS

Storm Event Year = 10

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
61.10	1	0.62
Rainfall data for year 10		
61.10	6	1.27
Rainfall data for year 10		
61.10	24	2.32

++

******** Area-averaged max loss rate, Fm ********

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
69.0	69.0	61.10	1.000	0.548	0.100	0.055

Area-averaged adjusted loss rate Fm (In/Hr) = 0.055

********* Area-Averaged low loss rate fraction, Yb **********

Area	Area	SCS CN	SCS CN	S	Pervious

```
 (Ac.)      Fract          (AMC2)     (AMC2)           Yield Fr
    6.11    0.100          69.0       69.0       4.49     0.147
   54.99    0.900          98.0       98.0       0.20     0.902

Area-averaged catchment yield fraction, Y =  0.826
Area-averaged low loss fraction, Yb =  0.174
User entry of time of concentration  =   0.182 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =      61.10(Ac.)
Catchment Lag time =   0.145 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 57.3605
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.055(In/Hr)
Average low loss rate fraction (Yb) = 0.174 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall =  0.295(In)
Computed peak 30-minute rainfall =  0.504(In)
Specified peak 1-hour rainfall =  0.621(In)
Computed peak 3-hour rainfall =  0.963(In)
Specified peak 6-hour rainfall =  1.270(In)
Specified peak 24-hour rainfall =  2.320(In)


Rainfall depth area reduction factors:
Using a total area of      61.10(Ac.) (Ref: fig. E-4)

5-minute factor = 0.997     Adjusted rainfall =  0.294(In)
30-minute factor = 0.997    Adjusted rainfall =  0.503(In)
1-hour factor = 0.997       Adjusted rainfall =  0.619(In)
3-hour factor = 1.000       Adjusted rainfall =  0.963(In)
6-hour factor = 1.000       Adjusted rainfall =  1.270(In)
24-hour factor = 1.000      Adjusted rainfall =  2.320(In)
--------------------------------------------------------------------------

                    U n i t  H y d r o g r a p h
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values             ((CFS))
--------------------------------------------------------------------------
              (K =       738.93 (CFS))

  1                5.104                  37.712
  2               38.756                 248.667
  3               66.340                 203.830
  4               78.133                  87.142
  5               85.016                  50.858
  6               89.586                  33.767
  7               92.669                  22.785
  8               94.921                  16.641
  9               96.558                  12.095
 10               97.670                   8.213
 11               98.340                   4.949
 12               99.016                   4.996
 13               99.599                   4.313
 14              100.000                   2.960
--------------------------------------------------------------------------
--------------------------------------------------------------------------
--------------------------------------------------------------------------
Total soil rain loss =      0.34(In)
Total effective rainfall =      1.98(In)
Peak flow rate in flood hydrograph =     93.04(CFS)
--------------------------------------------------------------------------
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24 - H O U R S T O R M

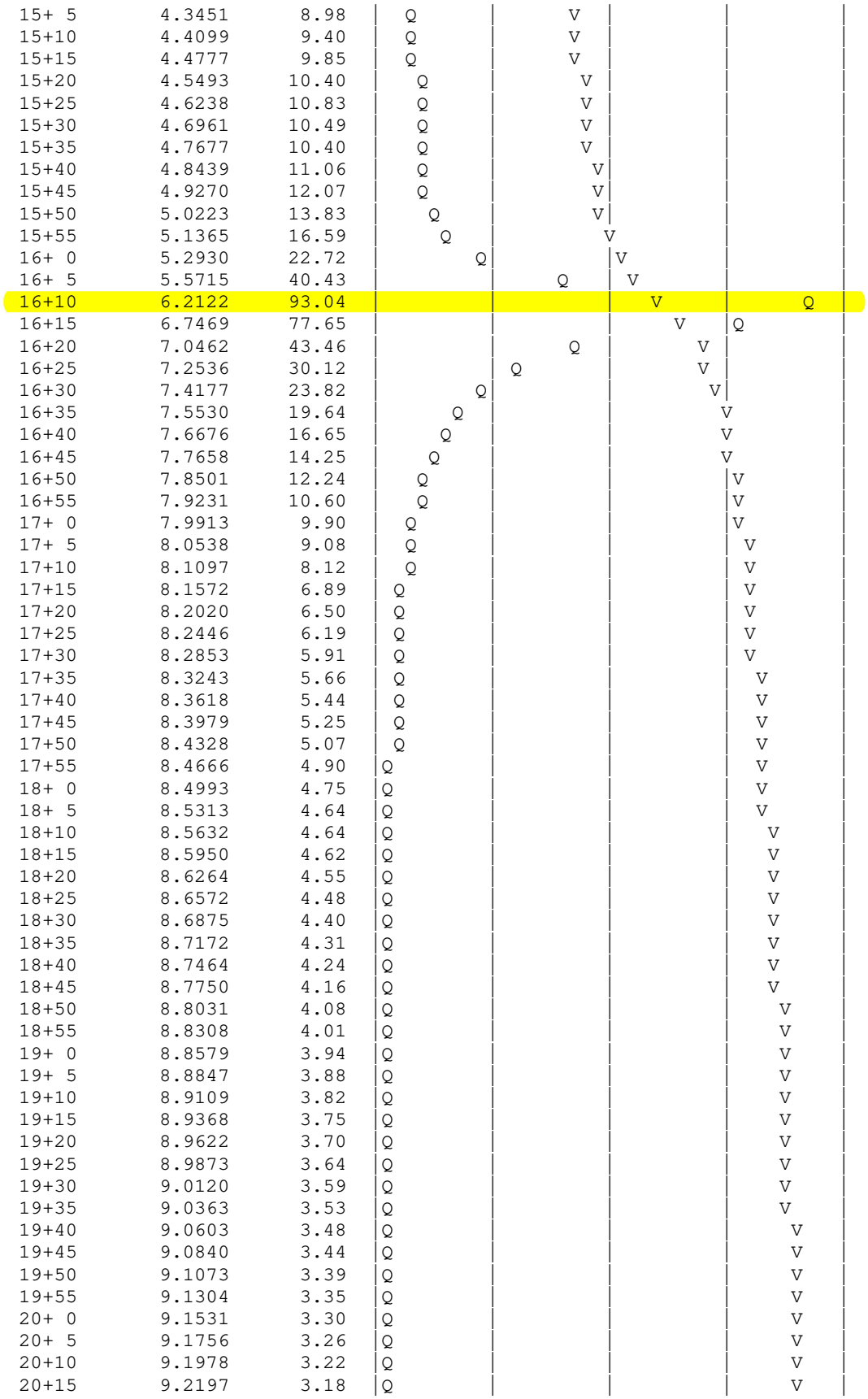
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	25.0	50.0	75.0	100.0
0+ 5	0.0008	0.11	Q				
0+10	0.0065	0.83	Q				
0+15	0.0163	1.42	Q				
0+20	0.0278	1.68	Q				
0+25	0.0404	1.83	Q				
0+30	0.0537	1.93	Q				
0+35	0.0676	2.01	Q				
0+40	0.0817	2.06	Q				
0+45	0.0962	2.10	Q				
0+50	0.1109	2.13	Q				
0+55	0.1257	2.15	Q				
1+ 0	0.1407	2.17	Q				
1+ 5	0.1558	2.19	Q				
1+10	0.1710	2.21	Q				
1+15	0.1862	2.21	Q				
1+20	0.2015	2.22	Q				
1+25	0.2169	2.23	Q				
1+30	0.2323	2.24	Q				
1+35	0.2477	2.24	Q				
1+40	0.2632	2.25	QV				
1+45	0.2788	2.26	QV				
1+50	0.2944	2.26	QV				
1+55	0.3100	2.27	QV				
2+ 0	0.3257	2.28	QV				
2+ 5	0.3415	2.29	QV				
2+10	0.3573	2.29	QV				
2+15	0.3731	2.30	QV				
2+20	0.3890	2.31	QV				
2+25	0.4050	2.32	QV				
2+30	0.4210	2.33	QV				
2+35	0.4371	2.33	QV				
2+40	0.4532	2.34	QV				
2+45	0.4694	2.35	QV				
2+50	0.4856	2.36	QV				
2+55	0.5019	2.37	QV				
3+ 0	0.5183	2.38	Q V				
3+ 5	0.5347	2.38	Q V				
3+10	0.5512	2.39	Q V				
3+15	0.5677	2.40	Q V				
3+20	0.5843	2.41	Q V				
3+25	0.6010	2.42	Q V				
3+30	0.6177	2.43	Q V				
3+35	0.6345	2.44	Q V				
3+40	0.6513	2.45	Q V				
3+45	0.6682	2.45	Q V				
3+50	0.6852	2.46	Q V				
3+55	0.7022	2.47	Q V				
4+ 0	0.7193	2.48	Q V				
4+ 5	0.7365	2.49	Q V				
4+10	0.7537	2.50	QV				
4+15	0.7710	2.51	Q V				
4+20	0.7884	2.52	Q V				
4+25	0.8058	2.53	Q V				
4+30	0.8233	2.54	Q V				

4+35	0.8409	2.55	Q V			
4+40	0.8585	2.56	Q V			
4+45	0.8762	2.57	Q V			
4+50	0.8940	2.58	Q V			
4+55	0.9119	2.59	Q V			
5+ 0	0.9298	2.60	Q V			
5+ 5	0.9478	2.62	Q V			
5+10	0.9659	2.63	Q V			
5+15	0.9841	2.64	Q V			
5+20	1.0024	2.65	Q V			
5+25	1.0207	2.66	Q V			
5+30	1.0391	2.67	Q V			
5+35	1.0576	2.68	Q V			
5+40	1.0761	2.70	Q V			
5+45	1.0948	2.71	Q V			
5+50	1.1135	2.72	Q V			
5+55	1.1323	2.73	Q V			
6+ 0	1.1512	2.75	Q V			
6+ 5	1.1702	2.76	Q V			
6+10	1.1893	2.77	Q V			
6+15	1.2085	2.78	Q V			
6+20	1.2277	2.80	Q V			
6+25	1.2471	2.81	Q V			
6+30	1.2665	2.82	Q V			
6+35	1.2861	2.84	Q V			
6+40	1.3057	2.85	Q V			
6+45	1.3254	2.86	Q V			
6+50	1.3453	2.88	Q V			
6+55	1.3652	2.89	Q V			
7+ 0	1.3852	2.91	Q V			
7+ 5	1.4054	2.92	Q V			
7+10	1.4256	2.94	Q V			
7+15	1.4460	2.95	Q V			
7+20	1.4664	2.97	Q V			
7+25	1.4870	2.98	Q V			
7+30	1.5076	3.00	Q V			
7+35	1.5284	3.02	Q V			
7+40	1.5493	3.03	Q V			
7+45	1.5703	3.05	Q V			
7+50	1.5914	3.07	Q V			
7+55	1.6127	3.08	Q V			
8+ 0	1.6340	3.10	Q V			
8+ 5	1.6555	3.12	Q V			
8+10	1.6771	3.14	Q V			
8+15	1.6989	3.16	Q V			
8+20	1.7207	3.18	Q V			
8+25	1.7427	3.19	Q V			
8+30	1.7649	3.21	Q V			
8+35	1.7871	3.23	Q V			
8+40	1.8095	3.25	Q V			
8+45	1.8321	3.27	Q V			
8+50	1.8548	3.29	Q V			
8+55	1.8776	3.31	Q V			
9+ 0	1.9006	3.34	Q V			
9+ 5	1.9237	3.36	Q V			
9+10	1.9470	3.38	Q V			
9+15	1.9704	3.40	Q V			
9+20	1.9940	3.43	Q V			
9+25	2.0178	3.45	Q V			
9+30	2.0417	3.47	Q V			
9+35	2.0658	3.50	Q V			
9+40	2.0900	3.52	Q V			
9+45	2.1145	3.55	Q V			

9+50	2.1391	3.57	Q V				
9+55	2.1639	3.60	Q V				
10+ 0	2.1889	3.63	Q V				
10+ 5	2.2140	3.65	Q V				
10+10	2.2394	3.68	Q V				
10+15	2.2650	3.71	Q V				
10+20	2.2907	3.74	Q V				
10+25	2.3167	3.77	Q V				
10+30	2.3429	3.80	Q V				
10+35	2.3693	3.83	Q V				
10+40	2.3959	3.87	Q V				
10+45	2.4227	3.90	Q V				
10+50	2.4498	3.93	Q V				
10+55	2.4771	3.97	Q V				
11+ 0	2.5047	4.00	Q V				
11+ 5	2.5325	4.04	Q V				
11+10	2.5605	4.07	Q V				
11+15	2.5889	4.11	Q V				
11+20	2.6175	4.15	Q V				
11+25	2.6463	4.19	Q V				
11+30	2.6755	4.23	Q V				
11+35	2.7049	4.27	Q V				
11+40	2.7347	4.32	Q V				
11+45	2.7647	4.36	Q V				
11+50	2.7951	4.41	Q V				
11+55	2.8258	4.46	Q V				
12+ 0	2.8568	4.51	Q V				
12+ 5	2.8881	4.54	Q V				
12+10	2.9188	4.46	Q V				
12+15	2.9492	4.41	Q V				
12+20	2.9796	4.42	Q V				
12+25	3.0102	4.45	Q V				
12+30	3.0412	4.49	Q V				
12+35	3.0724	4.54	Q V				
12+40	3.1041	4.59	Q V				
12+45	3.1361	4.65	Q V				
12+50	3.1686	4.72	Q V				
12+55	3.2015	4.78	Q V				
13+ 0	3.2350	4.85	Q V				
13+ 5	3.2689	4.93	Q V				
13+10	3.3034	5.01	Q V				
13+15	3.3384	5.09	Q V				
13+20	3.3740	5.17	Q V				
13+25	3.4103	5.26	Q V				
13+30	3.4472	5.36	Q V				
13+35	3.4847	5.46	Q V				
13+40	3.5231	5.56	Q V				
13+45	3.5621	5.67	Q V				
13+50	3.6020	5.79	Q V				
13+55	3.6427	5.91	Q V				
14+ 0	3.6843	6.04	Q V				
14+ 5	3.7268	6.18	Q V				
14+10	3.7705	6.34	Q V				
14+15	3.8152	6.50	Q V				
14+20	3.8612	6.68	Q V				
14+25	3.9084	6.85	Q V				
14+30	3.9570	7.05	Q V				
14+35	4.0069	7.25	Q V				
14+40	4.0585	7.49	Q V				
14+45	4.1117	7.72	Q V				
14+50	4.1668	8.00	Q V				
14+55	4.2239	8.29	Q V				
15+ 0	4.2833	8.63	Q V				



20+20	9.2413	3.15	Q				V
20+25	9.2627	3.11	Q				V
20+30	9.2839	3.07	Q				V
20+35	9.3049	3.04	Q				V
20+40	9.3256	3.01	Q				V
20+45	9.3461	2.98	Q				V
20+50	9.3663	2.94	Q				V
20+55	9.3864	2.91	Q				V
21+ 0	9.4063	2.88	Q				V
21+ 5	9.4259	2.86	Q				V
21+10	9.4454	2.83	Q				V
21+15	9.4647	2.80	Q				V
21+20	9.4838	2.78	Q				V
21+25	9.5028	2.75	Q				V
21+30	9.5215	2.72	Q				V
21+35	9.5401	2.70	Q				V
21+40	9.5586	2.68	Q				V
21+45	9.5768	2.65	Q				V
21+50	9.5949	2.63	Q				V
21+55	9.6129	2.61	Q				V
22+ 0	9.6307	2.59	Q				V
22+ 5	9.6484	2.57	Q				V
22+10	9.6659	2.55	Q				V
22+15	9.6833	2.52	Q				V
22+20	9.7006	2.51	Q				V
22+25	9.7177	2.49	Q				V
22+30	9.7347	2.47	Q				V
22+35	9.7515	2.45	Q				V
22+40	9.7683	2.43	Q				V
22+45	9.7849	2.41	Q				V
22+50	9.8014	2.39	Q				V
22+55	9.8178	2.38	Q				V
23+ 0	9.8340	2.36	Q				V
23+ 5	9.8502	2.34	Q				V
23+10	9.8662	2.33	Q				V
23+15	9.8821	2.31	Q				V
23+20	9.8980	2.30	Q				V
23+25	9.9137	2.28	Q				V
23+30	9.9293	2.27	Q				V
23+35	9.9448	2.25	Q				V
23+40	9.9602	2.24	Q				V
23+45	9.9755	2.22	Q				V
23+50	9.9907	2.21	Q				V
23+55	10.0059	2.20	Q				V
24+ 0	10.0209	2.18	Q				V
24+ 5	10.0351	2.06	Q				V
24+10	10.0442	1.33	Q				V
24+15	10.0493	0.73	Q				V
24+20	10.0526	0.48	Q				V
24+25	10.0548	0.33	Q				V
24+30	10.0564	0.23	Q				V
24+35	10.0575	0.16	Q				V
24+40	10.0582	0.11	Q				V
24+45	10.0587	0.07	Q				V
24+50	10.0591	0.05	Q				V
24+55	10.0593	0.04	Q				V
25+ 0	10.0595	0.02	Q				V
25+ 5	10.0595	0.01	Q				V

U n i t H y d r o g r a p h A n a l y s i s

Study date 05/16/23

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6145

COVINGTON - MIP BUILDING 1
100 YEAR STORM EVENT PROPOSED UNIT HYDROGRAPH BUILDING 1
5712Q100PUH1
DS

Storm Event Year = 100

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
6.20	1	1.06
Rainfall data for year 100		
6.20	6	2.13
Rainfall data for year 100		
6.20	24	3.96

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******** Area-averaged max loss rate, Fm ********

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
69.0	86.2	6.20	1.000	0.262	0.100	0.026

Area-averaged adjusted loss rate Fm (In/Hr) = 0.026

********* Area-Averaged low loss rate fraction, Yb **********

Area	Area	SCS CN	SCS CN	S	Pervious

(Ac.)	Fract	(AMC2)	(AMC3)		Yield Fr
0.62	0.100	69.0	86.2	1.60	0.638
5.58	0.900	98.0	98.0	0.20	0.941

Area-averaged catchment yield fraction, Y = 0.910
Area-averaged low loss fraction, Yb = 0.090
User entry of time of concentration = 0.168 (hours)
++
Watershed area = 6.20(Ac.)
Catchment Lag time = 0.134 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 62.0040
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.026(In/Hr)
Average low loss rate fraction (Yb) = 0.090 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.503(In)
Computed peak 30-minute rainfall = 0.861(In)
Specified peak 1-hour rainfall = 1.060(In)
Computed peak 3-hour rainfall = 1.626(In)
Specified peak 6-hour rainfall = 2.130(In)
Specified peak 24-hour rainfall = 3.960(In)

Rainfall depth area reduction factors:
Using a total area of 6.20(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.503(In)
30-minute factor = 1.000 Adjusted rainfall = 0.861(In)
1-hour factor = 1.000 Adjusted rainfall = 1.060(In)
3-hour factor = 1.000 Adjusted rainfall = 1.626(In)
6-hour factor = 1.000 Adjusted rainfall = 2.130(In)
24-hour factor = 1.000 Adjusted rainfall = 3.960(In)

U n i t H y d r o g r a p h
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Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 74.98 (CFS))		
1	5.972	4.478
2	43.460	28.109
3	69.299	19.374
4	80.386	8.314
5	86.911	4.892
6	91.059	3.110
7	93.939	2.160
8	95.974	1.526
9	97.381	1.055
10	98.197	0.611
11	98.912	0.537
12	99.567	0.490
13	100.000	0.325

Total soil rain loss = 0.28(In)
Total effective rainfall = 3.68(In)
Peak flow rate in flood hydrograph = 17.79(CFS)

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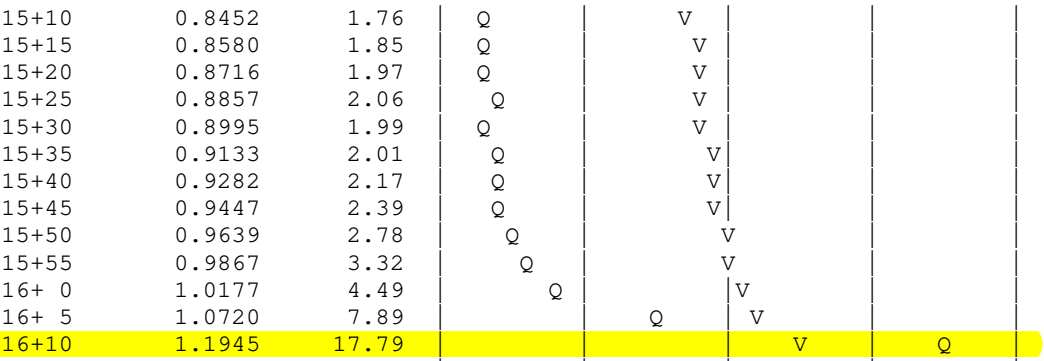
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0002	0.03	Q				
0+10	0.0014	0.18	Q				
0+15	0.0034	0.29	Q				
0+20	0.0058	0.34	Q				
0+25	0.0083	0.37	Q				
0+30	0.0110	0.39	Q				
0+35	0.0137	0.40	Q				
0+40	0.0165	0.41	Q				
0+45	0.0194	0.42	Q				
0+50	0.0223	0.42	Q				
0+55	0.0252	0.43	Q				
1+ 0	0.0282	0.43	Q				
1+ 5	0.0312	0.43	Q				
1+10	0.0341	0.43	Q				
1+15	0.0371	0.43	Q				
1+20	0.0401	0.44	Q				
1+25	0.0432	0.44	Q				
1+30	0.0462	0.44	Q				
1+35	0.0492	0.44	QV				
1+40	0.0523	0.44	QV				
1+45	0.0553	0.44	QV				
1+50	0.0584	0.44	QV				
1+55	0.0614	0.45	QV				
2+ 0	0.0645	0.45	QV				
2+ 5	0.0676	0.45	QV				
2+10	0.0707	0.45	QV				
2+15	0.0738	0.45	QV				
2+20	0.0769	0.45	QV				
2+25	0.0801	0.45	QV				
2+30	0.0832	0.46	QV				
2+35	0.0864	0.46	QV				
2+40	0.0895	0.46	QV				
2+45	0.0927	0.46	QV				
2+50	0.0959	0.46	Q V				
2+55	0.0991	0.46	Q V				
3+ 0	0.1023	0.47	Q V				
3+ 5	0.1055	0.47	Q V				
3+10	0.1087	0.47	Q V				
3+15	0.1120	0.47	Q V				
3+20	0.1152	0.47	Q V				
3+25	0.1185	0.47	Q V				
3+30	0.1218	0.48	Q V				
3+35	0.1251	0.48	Q V				
3+40	0.1284	0.48	Q V				
3+45	0.1317	0.48	Q V				
3+50	0.1350	0.48	Q V				
3+55	0.1383	0.48	Q V				
4+ 0	0.1417	0.49	Q V				
4+ 5	0.1451	0.49	Q V				
4+10	0.1484	0.49	Q V				
4+15	0.1518	0.49	Q V				
4+20	0.1552	0.49	Q V				
4+25	0.1586	0.50	Q V				
4+30	0.1621	0.50	Q V				
4+35	0.1655	0.50	Q V				

4+40	0.1690	0.50	Q V			
4+45	0.1724	0.50	Q V			
4+50	0.1759	0.51	Q V			
4+55	0.1794	0.51	Q V			
5+ 0	0.1829	0.51	Q V			
5+ 5	0.1864	0.51	Q V			
5+10	0.1900	0.51	Q V			
5+15	0.1935	0.52	Q V			
5+20	0.1971	0.52	Q V			
5+25	0.2007	0.52	Q V			
5+30	0.2043	0.52	Q V			
5+35	0.2079	0.52	Q V			
5+40	0.2115	0.53	Q V			
5+45	0.2152	0.53	Q V			
5+50	0.2188	0.53	Q V			
5+55	0.2225	0.53	Q V			
6+ 0	0.2262	0.54	Q V			
6+ 5	0.2299	0.54	Q V			
6+10	0.2337	0.54	Q V			
6+15	0.2374	0.54	Q V			
6+20	0.2412	0.55	Q V			
6+25	0.2449	0.55	Q V			
6+30	0.2487	0.55	Q V			
6+35	0.2526	0.55	Q V			
6+40	0.2564	0.56	Q V			
6+45	0.2603	0.56	Q V			
6+50	0.2641	0.56	Q V			
6+55	0.2680	0.57	Q V			
7+ 0	0.2719	0.57	Q V			
7+ 5	0.2759	0.57	Q V			
7+10	0.2798	0.57	Q V			
7+15	0.2838	0.58	Q V			
7+20	0.2878	0.58	Q V			
7+25	0.2918	0.58	Q V			
7+30	0.2958	0.59	Q V			
7+35	0.2999	0.59	Q V			
7+40	0.3039	0.59	Q V			
7+45	0.3080	0.59	Q V			
7+50	0.3122	0.60	Q V			
7+55	0.3163	0.60	Q V			
8+ 0	0.3205	0.60	Q V			
8+ 5	0.3247	0.61	Q V			
8+10	0.3289	0.61	Q V			
8+15	0.3331	0.62	Q V			
8+20	0.3374	0.62	Q V			
8+25	0.3417	0.62	Q V			
8+30	0.3460	0.63	Q V			
8+35	0.3503	0.63	Q V			
8+40	0.3547	0.63	Q V			
8+45	0.3591	0.64	Q V			
8+50	0.3635	0.64	Q V			
8+55	0.3679	0.65	Q V			
9+ 0	0.3724	0.65	Q V			
9+ 5	0.3769	0.65	Q V			
9+10	0.3814	0.66	Q V			
9+15	0.3860	0.66	Q V			
9+20	0.3906	0.67	Q V			
9+25	0.3952	0.67	Q V			
9+30	0.3999	0.68	Q V			
9+35	0.4046	0.68	Q V			
9+40	0.4093	0.69	Q V			
9+45	0.4140	0.69	Q V			
9+50	0.4188	0.69	Q V			

9+55	0.4236	0.70	Q	V			
10+ 0	0.4285	0.71	Q	V			
10+ 5	0.4334	0.71	Q	V			
10+10	0.4383	0.72	Q	V			
10+15	0.4433	0.72	Q	V			
10+20	0.4483	0.73	Q	V			
10+25	0.4533	0.73	Q	V			
10+30	0.4584	0.74	Q	V			
10+35	0.4635	0.74	Q	V			
10+40	0.4687	0.75	Q	V			
10+45	0.4739	0.76	Q	V			
10+50	0.4792	0.76	Q	V			
10+55	0.4845	0.77	Q	V			
11+ 0	0.4898	0.78	Q	V			
11+ 5	0.4952	0.78	Q	V			
11+10	0.5006	0.79	Q	V			
11+15	0.5061	0.80	Q	V			
11+20	0.5117	0.80	Q	V			
11+25	0.5173	0.81	Q	V			
11+30	0.5229	0.82	Q	V			
11+35	0.5286	0.83	Q	V			
11+40	0.5344	0.84	Q	V			
11+45	0.5402	0.84	Q	V			
11+50	0.5461	0.85	Q	V			
11+55	0.5520	0.86	Q	V			
12+ 0	0.5580	0.87	Q	V			
12+ 5	0.5641	0.87	Q	V			
12+10	0.5698	0.84	Q	V			
12+15	0.5755	0.82	Q	V			
12+20	0.5811	0.82	Q	V			
12+25	0.5868	0.82	Q	V			
12+30	0.5925	0.83	Q	V			
12+35	0.5982	0.83	Q	V			
12+40	0.6040	0.84	Q	V			
12+45	0.6099	0.85	Q	V			
12+50	0.6159	0.87	Q	V			
12+55	0.6219	0.88	Q	V			
13+ 0	0.6281	0.89	Q	V			
13+ 5	0.6343	0.90	Q	V			
13+10	0.6407	0.92	Q	V			
13+15	0.6471	0.94	Q	V			
13+20	0.6537	0.95	Q	V			
13+25	0.6603	0.97	Q	V			
13+30	0.6671	0.99	Q	V			
13+35	0.6740	1.00	Q	V			
13+40	0.6811	1.03	Q	V			
13+45	0.6883	1.05	Q	V			
13+50	0.6957	1.07	Q	V			
13+55	0.7032	1.09	Q	V			
14+ 0	0.7109	1.12	Q	V			
14+ 5	0.7187	1.14	Q	V			
14+10	0.7268	1.17	Q	V			
14+15	0.7350	1.20	Q	V			
14+20	0.7435	1.23	Q	V			
14+25	0.7522	1.26	Q	V			
14+30	0.7612	1.30	Q	V			
14+35	0.7704	1.34	Q	V			
14+40	0.7799	1.38	Q	V			
14+45	0.7898	1.43	Q	V			
14+50	0.8000	1.48	Q	V			
14+55	0.8105	1.54	Q	V			
15+ 0	0.8216	1.60	Q	V			
15+ 5	0.8331	1.67	Q	V			

15+10	0.8452	1.76	
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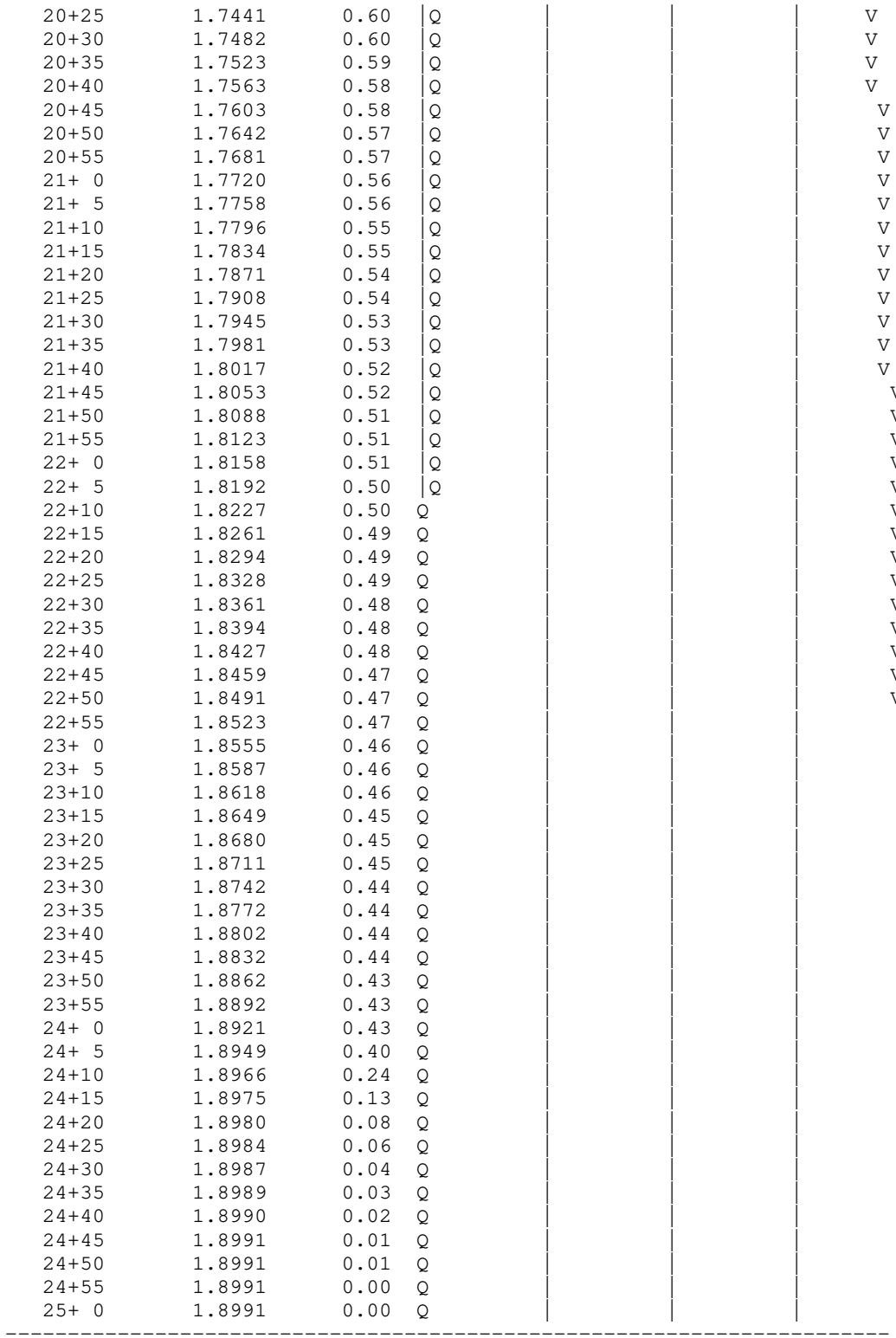
15+25	0.8857	2.06	
15+30	0.8995	1.99	
15+35	0.9133	2.01	
15+40	0.9282	2.17	
15+45	0.9447	2.39	
15+50	0.9639	2.78	
15+55	0.9867	3.32	
16+ 0	1.0177	4.49	
16+ 5	1.0720	7.89	
16+10	1.1945	17.79	
16+15	1.2861	13.30	
16+20	1.3386	7.62	
16+25	1.3756	5.36	
16+30	1.4047	4.23	
16+35	1.4290	3.52	
16+40	1.4493	2.95	
16+45	1.4666	2.50	
16+50	1.4812	2.12	
16+55	1.4944	1.93	
17+ 0	1.5066	1.77	
17+ 5	1.5174	1.57	
17+10	1.5266	1.33	
17+15	1.5351	1.25	
17+20	1.5433	1.18	
17+25	1.5510	1.12	
17+30	1.5584	1.07	
17+35	1.5655	1.03	
17+40	1.5723	0.99	
17+45	1.5789	0.95	
17+50	1.5852	0.92	
17+55	1.5914	0.89	
18+ 0	1.5973	0.86	
18+ 5	1.6032	0.85	
18+10	1.6091	0.87	
18+15	1.6152	0.88	
18+20	1.6211	0.87	
18+25	1.6270	0.86	
18+30	1.6328	0.84	
18+35	1.6385	0.83	
18+40	1.6441	0.81	
18+45	1.6497	0.80	
18+50	1.6551	0.79	
18+55	1.6604	0.77	
19+ 0	1.6657	0.76	
19+ 5	1.6708	0.75	
19+10	1.6759	0.74	
19+15	1.6809	0.73	
19+20	1.6858	0.71	
19+25	1.6907	0.70	
19+30	1.6954	0.69	
19+35	1.7002	0.68	
19+40	1.7048	0.67	
19+45	1.7094	0.67	
19+50	1.7139	0.66	
19+55	1.7184	0.65	
20+ 0	1.7228	0.64	
20+ 5	1.7272	0.63	
20+10	1.7315	0.63	
20+15	1.7357	0.62	
20+20	1.7399	0.61	


20+25 1.7441 0.60
20+30 1.7482 0.60
20+35 1.7523 0.59
20+40 1.7563 0.58
20+45 1.7603 0.58
20+50 1.7642 0.57
20+55 1.7681 0.57
21+ 0 1.7720 0.56
21+ 5 1.7758 0.56
21+10 1.7796 0.55
21+15 1.7834 0.55
21+20 1.7871 0.54
21+25 1.7908 0.54
21+30 1.7945 0.53
21+35 1.7981 0.53
21+40 1.8017 0.52
21+45 1.8053 0.52
21+50 1.8088 0.51
21+55 1.8123 0.51
22+ 0 1.8158 0.51
22+ 5 1.8192 0.50
22+10 1.8227 0.50
22+15 1.8261 0.49
22+20 1.8294 0.49
22+25 1.8328 0.49
22+30 1.8361 0.48
22+35 1.8394 0.48
22+40 1.8427 0.48
22+45 1.8459 0.47
22+50 1.8491 0.47
22+55 1.8523 0.47
23+ 0 1.8555 0.46
23+ 5 1.8587 0.46
23+10 1.8618 0.46
23+15 1.8649 0.45
23+20 1.8680 0.45
23+25 1.8711 0.45
23+30 1.8742 0.44
23+35 1.8772 0.44
23+40 1.8802 0.44
23+45 1.8832 0.44
23+50 1.8862 0.43
23+55 1.8892 0.43
24+ 0 1.8921 0.43
24+ 5 1.8949 0.40
24+10 1.8966 0.24
24+15 1.8975 0.13
24+20 1.8980 0.08
24+25 1.8984 0.06
24+30 1.8987 0.04
24+35 1.8989 0.03
24+40 1.8990 0.02
24+45 1.8991 0.01
24+50 1.8991 0.01
24+55 1.8991 0.00
25+ 0 1.8991 0.00

U n i t H y d r o g r a p h A n a l y s i s

Study date 05/16/23

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6145

COVINGTON - MIP BUILDING 2
100 YEAR STORM EVENT PROPOSED UNIT HYDROGRAPH BUILDING 2
5712Q100PUH2
DS

Storm Event Year = 100

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
5.70	1	1.06
Rainfall data for year 100		
5.70	6	2.13
Rainfall data for year 100		
5.70	24	3.96

++

******** Area-averaged max loss rate, Fm ********

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
69.0	86.2	5.70	1.000	0.262	0.100	0.026

Area-averaged adjusted loss rate Fm (In/Hr) = 0.026

********* Area-Averaged low loss rate fraction, Yb **********

Area	Area	SCS CN	SCS CN	S	Pervious

(Ac.)	Fract	(AMC2)	(AMC3)		Yield Fr
0.57	0.100	69.0	86.2	1.60	0.638
5.13	0.900	98.0	98.0	0.20	0.941

Area-averaged catchment yield fraction, Y = 0.910
Area-averaged low loss fraction, Yb = 0.090
User entry of time of concentration = 0.158 (hours)
++
Watershed area = 5.70(Ac.)
Catchment Lag time = 0.126 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 65.9283
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.026(In/Hr)
Average low loss rate fraction (Yb) = 0.090 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.503(In)
Computed peak 30-minute rainfall = 0.861(In)
Specified peak 1-hour rainfall = 1.060(In)
Computed peak 3-hour rainfall = 1.626(In)
Specified peak 6-hour rainfall = 2.130(In)
Specified peak 24-hour rainfall = 3.960(In)

Rainfall depth area reduction factors:
Using a total area of 5.70(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.503(In)
30-minute factor = 1.000 Adjusted rainfall = 0.861(In)
1-hour factor = 1.000 Adjusted rainfall = 1.060(In)
3-hour factor = 1.000 Adjusted rainfall = 1.626(In)
6-hour factor = 1.000 Adjusted rainfall = 2.130(In)
24-hour factor = 1.000 Adjusted rainfall = 3.960(In)

U n i t H y d r o g r a p h
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Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 68.93 (CFS))		
1	6.808	4.693
2	47.088	27.767
3	71.507	16.833
4	82.068	7.280
5	88.285	4.286
6	92.167	2.676
7	94.861	1.857
8	96.710	1.275
9	97.873	0.801
10	98.616	0.513
11	99.379	0.526
12	100.000	0.428

Total soil rain loss = 0.28(In)
Total effective rainfall = 3.68(In)
Peak flow rate in flood hydrograph = 17.18(CFS)

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24 - H O U R S T O R M

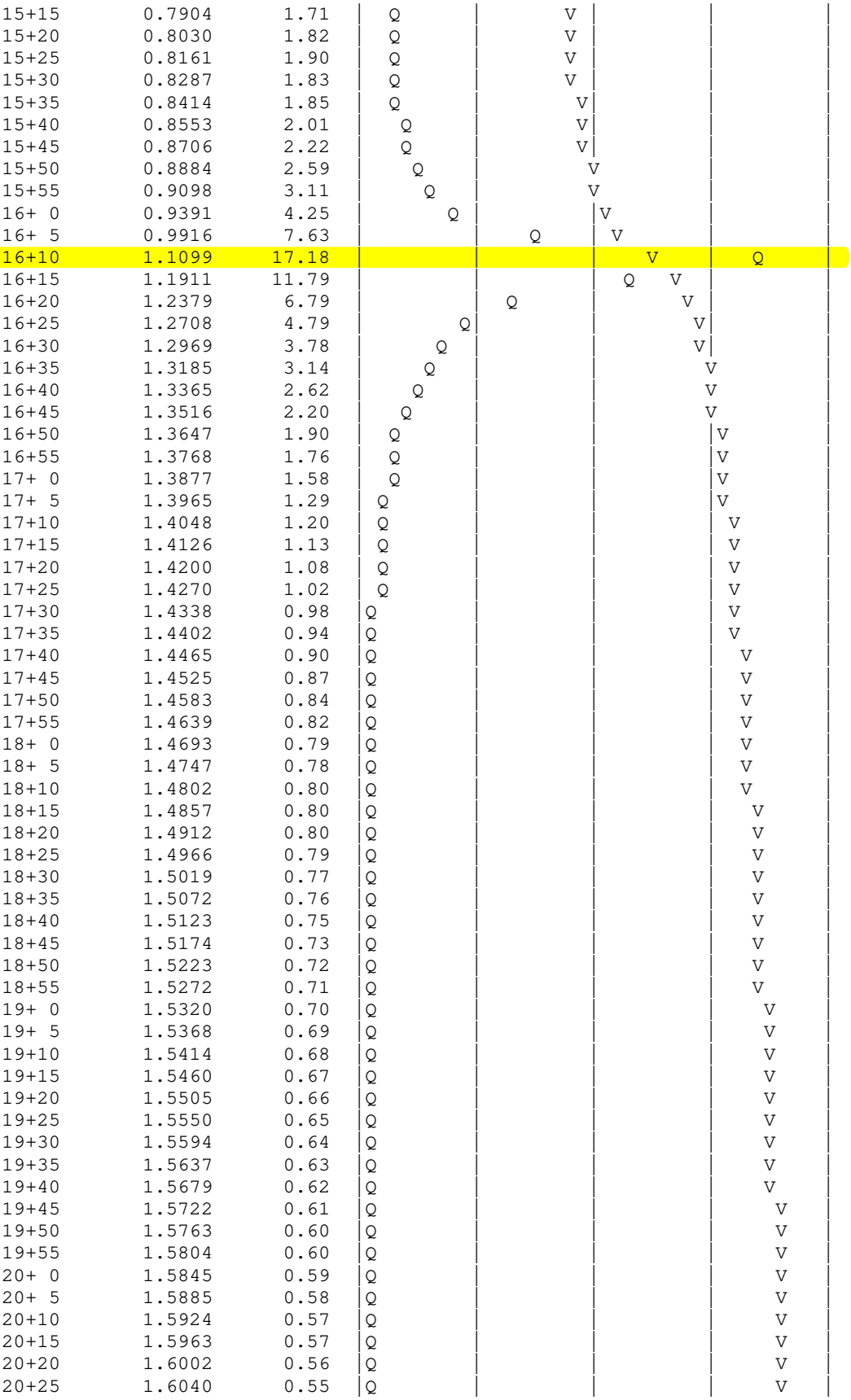
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0002	0.03	Q				
0+10	0.0014	0.18	Q				
0+15	0.0033	0.28	Q				
0+20	0.0055	0.32	Q				
0+25	0.0079	0.34	Q				
0+30	0.0104	0.36	Q				
0+35	0.0129	0.37	Q				
0+40	0.0155	0.38	Q				
0+45	0.0182	0.38	Q				
0+50	0.0209	0.39	Q				
0+55	0.0236	0.39	Q				
1+ 0	0.0263	0.40	Q				
1+ 5	0.0290	0.40	Q				
1+10	0.0318	0.40	Q				
1+15	0.0345	0.40	Q				
1+20	0.0373	0.40	Q				
1+25	0.0401	0.40	Q				
1+30	0.0429	0.40	Q				
1+35	0.0456	0.40	QV				
1+40	0.0484	0.41	QV				
1+45	0.0512	0.41	QV				
1+50	0.0541	0.41	QV				
1+55	0.0569	0.41	QV				
2+ 0	0.0597	0.41	QV				
2+ 5	0.0626	0.41	QV				
2+10	0.0654	0.41	QV				
2+15	0.0683	0.42	QV				
2+20	0.0711	0.42	QV				
2+25	0.0740	0.42	QV				
2+30	0.0769	0.42	QV				
2+35	0.0798	0.42	QV				
2+40	0.0827	0.42	QV				
2+45	0.0856	0.42	QV				
2+50	0.0886	0.43	Q V				
2+55	0.0915	0.43	Q V				
3+ 0	0.0945	0.43	Q V				
3+ 5	0.0974	0.43	Q V				
3+10	0.1004	0.43	Q V				
3+15	0.1034	0.43	Q V				
3+20	0.1064	0.43	Q V				
3+25	0.1094	0.44	Q V				
3+30	0.1124	0.44	Q V				
3+35	0.1154	0.44	Q V				
3+40	0.1184	0.44	Q V				
3+45	0.1215	0.44	Q V				
3+50	0.1246	0.44	Q V				
3+55	0.1276	0.45	Q V				
4+ 0	0.1307	0.45	Q V				
4+ 5	0.1338	0.45	Q V				
4+10	0.1369	0.45	Q V				
4+15	0.1400	0.45	Q V				
4+20	0.1431	0.45	Q V				
4+25	0.1463	0.46	Q V				
4+30	0.1494	0.46	Q V				
4+35	0.1526	0.46	Q V				
4+40	0.1558	0.46	Q V				

4+45	0.1590	0.46	Q V			
4+50	0.1622	0.47	Q V			
4+55	0.1654	0.47	Q V			
5+ 0	0.1686	0.47	Q V			
5+ 5	0.1719	0.47	Q V			
5+10	0.1751	0.47	Q V			
5+15	0.1784	0.47	Q V			
5+20	0.1817	0.48	Q V			
5+25	0.1850	0.48	Q V			
5+30	0.1883	0.48	Q V			
5+35	0.1916	0.48	Q V			
5+40	0.1949	0.49	Q V			
5+45	0.1983	0.49	Q V			
5+50	0.2017	0.49	Q V			
5+55	0.2051	0.49	Q V			
6+ 0	0.2085	0.49	Q V			
6+ 5	0.2119	0.50	Q V			
6+10	0.2153	0.50	Q V			
6+15	0.2187	0.50	Q V			
6+20	0.2222	0.50	Q V			
6+25	0.2257	0.51	Q V			
6+30	0.2292	0.51	Q V			
6+35	0.2327	0.51	Q V			
6+40	0.2362	0.51	Q V			
6+45	0.2398	0.51	Q V			
6+50	0.2433	0.52	Q V			
6+55	0.2469	0.52	Q V			
7+ 0	0.2505	0.52	Q V			
7+ 5	0.2541	0.52	Q V			
7+10	0.2578	0.53	Q V			
7+15	0.2614	0.53	Q V			
7+20	0.2651	0.53	Q V			
7+25	0.2688	0.54	Q V			
7+30	0.2725	0.54	Q V			
7+35	0.2762	0.54	Q V			
7+40	0.2800	0.54	Q V			
7+45	0.2837	0.55	Q V			
7+50	0.2875	0.55	Q V			
7+55	0.2913	0.55	Q V			
8+ 0	0.2952	0.56	Q V			
8+ 5	0.2990	0.56	Q V			
8+10	0.3029	0.56	Q V			
8+15	0.3068	0.57	Q V			
8+20	0.3107	0.57	Q V			
8+25	0.3147	0.57	Q V			
8+30	0.3186	0.58	Q V			
8+35	0.3226	0.58	Q V			
8+40	0.3266	0.58	Q V			
8+45	0.3307	0.59	Q V			
8+50	0.3347	0.59	Q V			
8+55	0.3388	0.59	Q V			
9+ 0	0.3430	0.60	Q V			
9+ 5	0.3471	0.60	Q V			
9+10	0.3513	0.61	Q V			
9+15	0.3555	0.61	Q V			
9+20	0.3597	0.61	Q V			
9+25	0.3639	0.62	Q V			
9+30	0.3682	0.62	Q V			
9+35	0.3725	0.63	Q V			
9+40	0.3769	0.63	Q V			
9+45	0.3813	0.63	Q V			
9+50	0.3857	0.64	Q V			
9+55	0.3901	0.64	Q V			

10+ 0	0.3946	0.65	Q	V			
10+ 5	0.3991	0.65	Q	V			
10+10	0.4036	0.66	Q	V			
10+15	0.4082	0.66	Q	V			
10+20	0.4128	0.67	Q	V			
10+25	0.4174	0.67	Q	V			
10+30	0.4221	0.68	Q	V			
10+35	0.4268	0.68	Q	V			
10+40	0.4316	0.69	Q	V			
10+45	0.4364	0.70	Q	V			
10+50	0.4412	0.70	Q	V			
10+55	0.4461	0.71	Q	V			
11+ 0	0.4510	0.71	Q	V			
11+ 5	0.4560	0.72	Q	V			
11+10	0.4610	0.73	Q	V			
11+15	0.4660	0.73	Q	V			
11+20	0.4711	0.74	Q	V			
11+25	0.4763	0.75	Q	V			
11+30	0.4815	0.76	Q	V			
11+35	0.4867	0.76	Q	V			
11+40	0.4920	0.77	Q	V			
11+45	0.4974	0.78	Q	V			
11+50	0.5028	0.79	Q	V			
11+55	0.5083	0.79	Q	V			
12+ 0	0.5138	0.80	Q	V			
12+ 5	0.5193	0.80	Q	V			
12+10	0.5247	0.77	Q	V			
12+15	0.5298	0.75	Q	V			
12+20	0.5350	0.75	Q	V			
12+25	0.5402	0.75	Q	V			
12+30	0.5455	0.76	Q	V			
12+35	0.5507	0.77	Q	V			
12+40	0.5561	0.78	Q	V			
12+45	0.5615	0.79	Q	V			
12+50	0.5670	0.80	Q	V			
12+55	0.5726	0.81	Q	V			
13+ 0	0.5782	0.82	Q	V			
13+ 5	0.5840	0.83	Q	V			
13+10	0.5898	0.85	Q	V			
13+15	0.5957	0.86	Q	V			
13+20	0.6018	0.88	Q	V			
13+25	0.6079	0.89	Q	V			
13+30	0.6142	0.91	Q	V			
13+35	0.6206	0.93	Q	V			
13+40	0.6271	0.95	Q	V			
13+45	0.6337	0.96	Q	V			
13+50	0.6405	0.98	Q	V			
13+55	0.6474	1.00	Q	V			
14+ 0	0.6545	1.03	Q	V			
14+ 5	0.6618	1.05	Q	V			
14+10	0.6692	1.08	Q	V			
14+15	0.6768	1.10	Q	V			
14+20	0.6846	1.14	Q	V			
14+25	0.6926	1.17	Q	V			
14+30	0.7009	1.20	Q	V			
14+35	0.7094	1.24	Q	V			
14+40	0.7182	1.28	Q	V			
14+45	0.7273	1.32	Q	V			
14+50	0.7367	1.37	Q	V			
14+55	0.7465	1.42	Q	V			
15+ 0	0.7567	1.48	Q	V			
15+ 5	0.7674	1.55	Q	V			
15+10	0.7786	1.63	Q	V			

15+15	0.7904	1.71	
15+20	0.8030	1.82	
15+25	0.8161	1.90	
15+30	0.8287	1.83	
15+35	0.8414	1.85	
15+40	0.8553	2.01	
15+45	0.8706	2.22	
15+50	0.8884	2.59	
15+55	0.9098	3.11	
16+ 0	0.9391	4.25	
16+ 5	0.9916	7.63	
16+10	1.1099	17.18	
16+15	1.1911	11.79	
16+20	1.2379	6.79	
16+25	1.2708	4.79	
16+30	1.2969	3.78	
16+35	1.3185	3.14	
16+40	1.3365	2.62	
16+45	1.3516	2.20	
16+50	1.3647	1.90	
16+55	1.3768	1.76	
17+ 0	1.3877	1.58	
17+ 5	1.3965	1.29	
17+10	1.4048	1.20	
17+15	1.4126	1.13	
17+20	1.4200	1.08	
17+25	1.4270	1.02	
17+30	1.4338	0.98	
17+35	1.4402	0.94	
17+40	1.4465	0.90	
17+45	1.4525	0.87	
17+50	1.4583	0.84	
17+55	1.4639	0.82	
18+ 0	1.4693	0.79	
18+ 5	1.4747	0.78	
18+10	1.4802	0.80	
18+15	1.4857	0.80	
18+20	1.4912	0.80	
18+25	1.4966	0.79	
18+30	1.5019	0.77	
18+35	1.5072	0.76	
18+40	1.5123	0.75	
18+45	1.5174	0.73	
18+50	1.5223	0.72	
18+55	1.5272	0.71	
19+ 0	1.5320	0.70	
19+ 5	1.5368	0.69	
19+10	1.5414	0.68	
19+15	1.5460	0.67	
19+20	1.5505	0.66	
19+25	1.5550	0.65	
19+30	1.5594	0.64	
19+35	1.5637	0.63	
19+40	1.5679	0.62	
19+45	1.5722	0.61	
19+50	1.5763	0.60	
19+55	1.5804	0.60	
20+ 0	1.5845	0.59	
20+ 5	1.5885	0.58	
20+10	1.5924	0.57	
20+15	1.5963	0.57	
20+20	1.6002	0.56	
20+25	1.6040	0.55	

20+30	1.6078	0.55	Q				V
20+35	1.6115	0.54	Q				V
20+40	1.6152	0.54	Q				V
20+45	1.6189	0.53	Q				V
20+50	1.6225	0.53	Q				V
20+55	1.6261	0.52	Q				V
21+ 0	1.6296	0.52	Q				V
21+ 5	1.6331	0.51	Q				V
21+10	1.6366	0.51	Q				V
21+15	1.6401	0.50	Q				V
21+20	1.6435	0.50	Q				V
21+25	1.6469	0.49	Q				V
21+30	1.6502	0.49	Q				V
21+35	1.6536	0.48	Q				V
21+40	1.6569	0.48	Q				V
21+45	1.6601	0.48	Q				V
21+50	1.6634	0.47	Q				V
21+55	1.6666	0.47	Q				V
22+ 0	1.6698	0.46	Q				V
22+ 5	1.6730	0.46	Q				V
22+10	1.6761	0.46	Q				V
22+15	1.6792	0.45	Q				V
22+20	1.6823	0.45	Q				V
22+25	1.6854	0.45	Q				V
22+30	1.6885	0.44	Q				V
22+35	1.6915	0.44	Q				V
22+40	1.6945	0.44	Q				V
22+45	1.6975	0.43	Q				V
22+50	1.7004	0.43	Q				V
22+55	1.7034	0.43	Q				V
23+ 0	1.7063	0.42	Q				V
23+ 5	1.7092	0.42	Q				V
23+10	1.7121	0.42	Q				V
23+15	1.7150	0.42	Q				V
23+20	1.7178	0.41	Q				V
23+25	1.7206	0.41	Q				V
23+30	1.7234	0.41	Q				V
23+35	1.7262	0.41	Q				V
23+40	1.7290	0.40	Q				V
23+45	1.7318	0.40	Q				V
23+50	1.7345	0.40	Q				V
23+55	1.7372	0.40	Q				V
24+ 0	1.7399	0.39	Q				V
24+ 5	1.7424	0.36	Q				V
24+10	1.7439	0.21	Q				V
24+15	1.7446	0.11	Q				V
24+20	1.7451	0.07	Q				V
24+25	1.7454	0.05	Q				V
24+30	1.7457	0.03	Q				V
24+35	1.7458	0.02	Q				V
24+40	1.7459	0.01	Q				V
24+45	1.7459	0.01	Q				V
24+50	1.7460	0.01	Q				V
24+55	1.7460	0.00	Q				V

U n i t H y d r o g r a p h A n a l y s i s

Study date 05/01/23

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6145

COVINGTON - MIP BUILDING 3
100 YEAR STORM EVENT PROPOSED UNIT HYDROGRAPH BUILDING 3
5712Q100PUH3
DS

Storm Event Year = 100

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
61.10	1	1.06
Rainfall data for year 100		
61.10	6	2.13
Rainfall data for year 100		
61.10	24	3.96

++

******** Area-averaged max loss rate, Fm ********

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
69.0	86.2	61.10	1.000	0.262	0.100	0.026

Area-averaged adjusted loss rate Fm (In/Hr) = 0.026

********* Area-Averaged low loss rate fraction, Yb **********

Area	Area	SCS CN	SCS CN	S	Pervious

(Ac.)	Fract	(AMC2)	(AMC3)		Yield Fr
6.11	0.100	69.0	86.2	1.60	0.638
54.99	0.900	98.0	98.0	0.20	0.941

Area-averaged catchment yield fraction, Y = 0.910
Area-averaged low loss fraction, Yb = 0.090
User entry of time of concentration = 0.174 (hours)
++
Watershed area = 61.10(Ac.)
Catchment Lag time = 0.140 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 59.6944
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.026(In/Hr)
Average low loss rate fraction (Yb) = 0.090 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.503(In)
Computed peak 30-minute rainfall = 0.861(In)
Specified peak 1-hour rainfall = 1.060(In)
Computed peak 3-hour rainfall = 1.626(In)
Specified peak 6-hour rainfall = 2.130(In)
Specified peak 24-hour rainfall = 3.960(In)

Rainfall depth area reduction factors:
Using a total area of 61.10(Ac.) (Ref: fig. E-4)

5-minute factor = 0.997 Adjusted rainfall = 0.502(In)
30-minute factor = 0.997 Adjusted rainfall = 0.859(In)
1-hour factor = 0.997 Adjusted rainfall = 1.057(In)
3-hour factor = 1.000 Adjusted rainfall = 1.625(In)
6-hour factor = 1.000 Adjusted rainfall = 2.130(In)
24-hour factor = 1.000 Adjusted rainfall = 3.960(In)

U n i t H y d r o g r a p h
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Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 738.93 (CFS))		
1	5.528	40.848
2	41.172	263.380
3	67.882	197.370
4	79.304	84.401
5	86.001	49.490
6	90.357	32.187
7	93.336	22.012
8	95.471	15.775
9	96.999	11.293
10	97.960	7.098
11	98.622	4.889
12	99.325	5.197
13	99.789	3.426
14	100.000	1.562

Total soil rain loss = 0.28(In)
Total effective rainfall = 3.68(In)
Peak flow rate in flood hydrograph = 169.07(CFS)

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24 - H O U R S T O R M

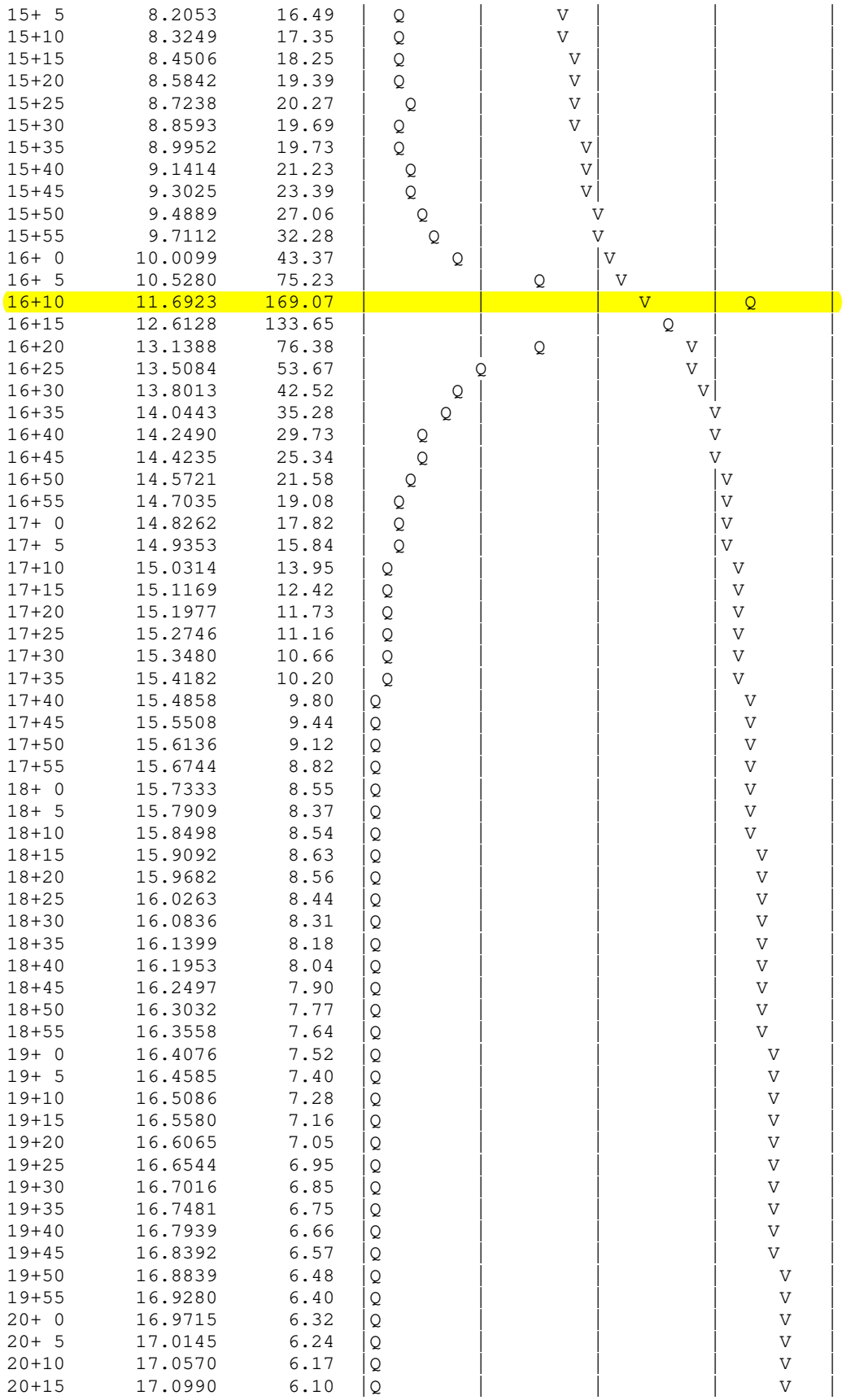
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+ 5	0.0016	0.23	Q				
0+10	0.0133	1.71	Q				
0+15	0.0327	2.82	Q				
0+20	0.0554	3.30	Q				
0+25	0.0801	3.58	Q				
0+30	0.1061	3.78	Q				
0+35	0.1330	3.91	Q				
0+40	0.1607	4.01	Q				
0+45	0.1888	4.08	Q				
0+50	0.2173	4.14	Q				
0+55	0.2460	4.18	Q				
1+ 0	0.2751	4.22	Q				
1+ 5	0.3044	4.25	Q				
1+10	0.3338	4.27	Q				
1+15	0.3633	4.28	Q				
1+20	0.3929	4.30	Q				
1+25	0.4226	4.31	Q				
1+30	0.4524	4.33	Q				
1+35	0.4822	4.34	QV				
1+40	0.5122	4.35	QV				
1+45	0.5423	4.37	QV				
1+50	0.5724	4.38	QV				
1+55	0.6027	4.39	QV				
2+ 0	0.6331	4.41	QV				
2+ 5	0.6635	4.42	QV				
2+10	0.6941	4.44	QV				
2+15	0.7247	4.45	QV				
2+20	0.7555	4.47	QV				
2+25	0.7863	4.48	QV				
2+30	0.8173	4.50	QV				
2+35	0.8484	4.51	QV				
2+40	0.8795	4.53	QV				
2+45	0.9108	4.54	QV				
2+50	0.9422	4.56	Q V				
2+55	0.9737	4.57	Q V				
3+ 0	1.0053	4.59	Q V				
3+ 5	1.0370	4.60	Q V				
3+10	1.0688	4.62	Q V				
3+15	1.1008	4.64	Q V				
3+20	1.1328	4.65	Q V				
3+25	1.1650	4.67	Q V				
3+30	1.1972	4.69	Q V				
3+35	1.2296	4.70	Q V				
3+40	1.2622	4.72	Q V				
3+45	1.2948	4.74	Q V				
3+50	1.3275	4.76	Q V				
3+55	1.3604	4.77	Q V				
4+ 0	1.3934	4.79	Q V				
4+ 5	1.4265	4.81	Q V				
4+10	1.4598	4.83	Q V				
4+15	1.4932	4.85	Q V				
4+20	1.5267	4.87	Q V				
4+25	1.5603	4.88	Q V				
4+30	1.5941	4.90	Q V				

4+35	1.6280	4.92	Q V	|	|	|	|
4+40	1.6620	4.94	Q V	|	|	|	|
4+45	1.6962	4.96	Q V	|	|	|	|
4+50	1.7305	4.98	Q V	|	|	|	|
4+55	1.7649	5.00	|Q V	|	|	|	|
5+ 0	1.7995	5.02	|Q V	|	|	|	|
5+ 5	1.8342	5.04	|Q V	|	|	|	|
5+10	1.8691	5.06	|Q V	|	|	|	|
5+15	1.9041	5.08	|Q V	|	|	|	|
5+20	1.9393	5.11	|Q V	|	|	|	|
5+25	1.9746	5.13	|Q V	|	|	|	|
5+30	2.0101	5.15	|Q V	|	|	|	|
5+35	2.0457	5.17	|Q V	|	|	|	|
5+40	2.0814	5.19	|Q V	|	|	|	|
5+45	2.1174	5.22	|Q V	|	|	|	|
5+50	2.1535	5.24	|Q V	|	|	|	|
5+55	2.1897	5.26	|Q V	|	|	|	|
6+ 0	2.2261	5.29	|Q V	|	|	|	|
6+ 5	2.2627	5.31	|Q V	|	|	|	|
6+10	2.2994	5.33	|Q V	|	|	|	|
6+15	2.3363	5.36	|Q V	|	|	|	|
6+20	2.3734	5.38	|Q V	|	|	|	|
6+25	2.4106	5.41	|Q V	|	|	|	|
6+30	2.4481	5.43	|Q V	|	|	|	|
6+35	2.4857	5.46	|Q V	|	|	|	|
6+40	2.5235	5.49	|Q V	|	|	|	|
6+45	2.5614	5.51	|Q V	|	|	|	|
6+50	2.5996	5.54	|Q V	|	|	|	|
6+55	2.6379	5.57	|Q V	|	|	|	|
7+ 0	2.6764	5.59	|Q V	|	|	|	|
7+ 5	2.7152	5.62	|Q V	|	|	|	|
7+10	2.7541	5.65	|Q V	|	|	|	|
7+15	2.7932	5.68	|Q V	|	|	|	|
7+20	2.8325	5.71	|Q V	|	|	|	|
7+25	2.8720	5.74	|Q V	|	|	|	|
7+30	2.9118	5.77	|Q V	|	|	|	|
7+35	2.9517	5.80	|Q V	|	|	|	|
7+40	2.9918	5.83	|Q V	|	|	|	|
7+45	3.0322	5.86	|Q V	|	|	|	|
7+50	3.0728	5.89	|Q V	|	|	|	|
7+55	3.1136	5.92	|Q V	|	|	|	|
8+ 0	3.1546	5.96	|Q V	|	|	|	|
8+ 5	3.1959	5.99	|Q V	|	|	|	|
8+10	3.2374	6.03	|Q V	|	|	|	|
8+15	3.2791	6.06	|Q V	|	|	|	|
8+20	3.3211	6.10	|Q V	|	|	|	|
8+25	3.3633	6.13	|Q V	|	|	|	|
8+30	3.4058	6.17	|Q V	|	|	|	|
8+35	3.4485	6.20	|Q V	|	|	|	|
8+40	3.4915	6.24	|Q V	|	|	|	|
8+45	3.5348	6.28	|Q V	|	|	|	|
8+50	3.5783	6.32	|Q V	|	|	|	|
8+55	3.6221	6.36	|Q V	|	|	|	|
9+ 0	3.6662	6.40	|Q V	|	|	|	|
9+ 5	3.7105	6.44	|Q V	|	|	|	|
9+10	3.7551	6.48	|Q V	|	|	|	|
9+15	3.8001	6.52	|Q V	|	|	|	|
9+20	3.8453	6.57	|Q V	|	|	|	|
9+25	3.8908	6.61	|Q V	|	|	|	|
9+30	3.9366	6.66	|Q V	|	|	|	|
9+35	3.9828	6.70	|Q V	|	|	|	|
9+40	4.0293	6.75	|Q V	|	|	|	|
9+45	4.0761	6.79	|Q V	|	|	|	|

9+50	4.1232	6.84	Q V				
9+55	4.1707	6.89	Q V				
10+ 0	4.2185	6.94	Q V				
10+ 5	4.2667	6.99	Q V				
10+10	4.3152	7.05	Q V				
10+15	4.3641	7.10	Q V				
10+20	4.4134	7.16	Q V				
10+25	4.4631	7.21	Q V				
10+30	4.5131	7.27	Q V				
10+35	4.5636	7.33	Q V				
10+40	4.6145	7.39	Q V				
10+45	4.6658	7.45	Q V				
10+50	4.7175	7.51	Q V				
10+55	4.7697	7.58	Q V				
11+ 0	4.8224	7.64	Q V				
11+ 5	4.8755	7.71	Q V				
11+10	4.9291	7.78	Q V				
11+15	4.9831	7.85	Q V				
11+20	5.0377	7.93	Q V				
11+25	5.0928	8.00	Q V				
11+30	5.1484	8.08	Q V				
11+35	5.2046	8.15	Q V				
11+40	5.2613	8.24	Q V				
11+45	5.3186	8.32	Q V				
11+50	5.3765	8.41	Q V				
11+55	5.4350	8.49	Q V				
12+ 0	5.4942	8.59	Q V				
12+ 5	5.5535	8.62	Q V				
12+10	5.6107	8.31	Q V				
12+15	5.6665	8.09	Q V				
12+20	5.7220	8.07	Q V				
12+25	5.7778	8.09	Q V				
12+30	5.8339	8.15	Q V				
12+35	5.8906	8.23	Q V				
12+40	5.9479	8.32	Q V				
12+45	6.0059	8.42	Q V				
12+50	6.0646	8.54	Q V				
12+55	6.1242	8.65	Q V				
13+ 0	6.1847	8.78	Q V				
13+ 5	6.2461	8.91	Q V				
13+10	6.3085	9.06	Q V				
13+15	6.3719	9.21	Q V				
13+20	6.4364	9.37	Q V				
13+25	6.5021	9.53	Q V				
13+30	6.5690	9.71	Q V				
13+35	6.6371	9.89	Q V				
13+40	6.7066	10.09	Q V				
13+45	6.7774	10.29	Q V				
13+50	6.8498	10.51	Q V				
13+55	6.9237	10.73	Q V				
14+ 0	6.9993	10.98	Q V				
14+ 5	7.0766	11.22	Q V				
14+10	7.1560	11.53	Q V				
14+15	7.2374	11.82	Q V				
14+20	7.3211	12.15	Q V				
14+25	7.4070	12.48	Q V				
14+30	7.4955	12.85	Q V				
14+35	7.5866	13.22	Q V				
14+40	7.6807	13.66	Q V				
14+45	7.7778	14.10	Q V				
14+50	7.8785	14.62	Q V				
14+55	7.9829	15.15	Q V				
15+ 0	8.0918	15.81	Q V				



20+20	17.1405	6.03	Q				V
20+25	17.1816	5.96	Q				V
20+30	17.2222	5.90	Q				V
20+35	17.2623	5.83	Q				V
20+40	17.3021	5.77	Q				V
20+45	17.3414	5.71	Q				V
20+50	17.3803	5.65	Q				V
20+55	17.4189	5.60	Q				V
21+ 0	17.4570	5.54	Q				V
21+ 5	17.4948	5.49	Q				V
21+10	17.5323	5.44	Q				V
21+15	17.5693	5.38	Q				V
21+20	17.6061	5.34	Q				V
21+25	17.6425	5.29	Q				V
21+30	17.6786	5.24	Q				V
21+35	17.7144	5.19	Q				V
21+40	17.7498	5.15	Q				V
21+45	17.7850	5.11	Q				V
21+50	17.8199	5.06	Q				V
21+55	17.8545	5.02	Q				V
22+ 0	17.8888	4.98	Q				V
22+ 5	17.9228	4.94	Q				V
22+10	17.9566	4.90	Q				V
22+15	17.9901	4.87	Q				V
22+20	18.0234	4.83	Q				V
22+25	18.0564	4.79	Q				V
22+30	18.0891	4.76	Q				V
22+35	18.1216	4.72	Q				V
22+40	18.1539	4.69	Q				V
22+45	18.1860	4.65	Q				V
22+50	18.2178	4.62	Q				V
22+55	18.2494	4.59	Q				V
23+ 0	18.2808	4.56	Q				V
23+ 5	18.3120	4.53	Q				V
23+10	18.3429	4.50	Q				V
23+15	18.3737	4.47	Q				V
23+20	18.4042	4.44	Q				V
23+25	18.4346	4.41	Q				V
23+30	18.4648	4.38	Q				V
23+35	18.4947	4.35	Q				V
23+40	18.5245	4.32	Q				V
23+45	18.5541	4.30	Q				V
23+50	18.5835	4.27	Q				V
23+55	18.6128	4.25	Q				V
24+ 0	18.6419	4.22	Q				V
24+ 5	18.6692	3.97	Q				V
24+10	18.6862	2.47	Q				V
24+15	18.6955	1.35	Q				V
24+20	18.7015	0.87	Q				V
24+25	18.7056	0.59	Q				V
24+30	18.7084	0.41	Q				V
24+35	18.7103	0.28	Q				V
24+40	18.7116	0.19	Q				V
24+45	18.7125	0.13	Q				V
24+50	18.7130	0.09	Q				V
24+55	18.7134	0.06	Q				V
25+ 0	18.7136	0.03	Q				V
25+ 5	18.7137	0.01	Q				V

Appendix D
Detention Basin Routing Calculations

COVINGTON - MIP UNIT HYDROGRAPH AND STORM WATER MITIGATION SUMMARY									
	EXISTING Q TRIBUTARY TO STREAM (CFS) (47 AC)		PROPOSED Q PRIOR TO MITIGATION (CFS)		PROPOSED Q AFTER MITIGATION (CFS)		Q_{out} DUE TO INFILTRATION (CFS)	PROPOSED Q AFTER MITIGATION TO PUBLIC SD (CFS)	
	10 YR	100 YR	10 YR	100 YR	10 YR	100 YR		10 YR	100 YR
BUILDING 1 (6.2 AC)			10.19	17.79	1.20	3.19	0.30	0.90	2.89
BUILDING 2 (5.7 AC)			9.84	17.18	1.03	3.39	0.34	0.69	3.05
BUILDING 3 (61.1 AC)			93.04	169.07	8.27	26.38	2.27	6.00	24.11
TOTAL	14.29	33.24	113.07	204.04	10.5	32.96		7.59	30.05
IS Q AFTER ROUTING LESS THAN OR EQUAL TO EXISTING Q TRIBUTARY TO STREAM?								YES	YES

COVINGTON - MIP STORM WATER BASIN SUMMARY			
	WQMP DCV (CF)	PROPOSED Q PRIOR TO MITIGATION (CFS)	PROPOSED Q PRIOR TO MITIGATION (CFS)
BUILDING 1 (6.2 AC)	13,252	14,043	39,840
BUILDING 2 (5.7 AC)	12,182	12,396	36,803
BUILDING 3 (61.1 AC)	130,209	163,541	397,409
TOTAL	155,643	189,980	474,052

Project: COVINGTON - MIP BUILDING 1

Detention/ Infiltration System Routing Study Summary

Stage Storage Number	Storage Depth (ft)	Elevation (ft)	Area (ft^2)	Incremental volume (ft^3)	Total Volume (ft^3)	Total Volume (acre-ft)	Outflow Q (cfs)	Notes
1	0.0	2,980.50	7,298	0	0	0	0	**Bottom of Infiltration System Rock**
2	0.5	2,981.00	7,298	1,460	1,460	0.034	0.30	**84" CMP Invert**
3	1.5	2,982.00	7,298	4,364	5,824	0.134	0.30	
4	2.5	2,983.00	7,298	5,361	11,185	0.257	0.30	
5	3.0	2,983.50	7,298	2,859	14,043	0.322	0.30	System Releases Water @ 2983.5
6	4.0	2,984.50	7,298	5,877	19,920	0.457	1.67	
7	5.5	2,986.00	7,298	8,735	28,655	0.658	2.77	
8	6.50	2,987.00	7,298	5,361	34,017	0.781	3.29	
9	7.50	2,988.00	7,298	2,382	36,398	0.836	3.73	
10	8.00	2,988.50	7,298	3,442	39,840	0.915	3.93	**Top of Infiltration/ Detention System**
11	9.00	2,989.50	7,298	0	39,840	0.915	4.30	
12	10.00	2,990.50	7,298	0	39,840	0.915	4.64	
13	11.00	2,991.50	7,298	0	39,840	0.915	4.95	
14	12.0	2,992.50	7,298	0	39,840	0.915	5.25	

84" CMP system with 6" rock top & bottom

Infiltration System Bottom Area Discharge ($Q_{out,bottom}$)		
Infiltration Rate per Geo Tech Report (in/hr)	=	5.3
Factor of Safety		3
Unit Conversion (ft/sec) $\frac{6.8\frac{in}{hr}}{3.25} \times \frac{1\ ft}{12\ in} \times \frac{1\ hr}{60\ min} \times \frac{1\ min}{60\ sec} =$		0.0000409
Infiltration System Footprint (ft^2)	178 ft x 41 ft =	7,298
$Q_{out,bottom}$ (cfs)	=	**0.30**

*WQMP Design Capture Volume (DCV) is 13,252 CF

Basin Routing Summary Table

	100 YR 24 HR	10 YR 24 HR
Proposed Q100(cfs) 6.2 ac	17.79	10.19
Q (cfs) after Routing	3.19	1.20
WSE (ft)	2986.81	2984.15

note: 0.3 cfs to infiltration

Storm Drain System Net Drainage (Q_{net})		
One 8-inch Outlet Pipe + Infiltration $Q_{out,bottom}$		
Orifice Eqn	$= C * A * \sqrt{2gh} + Q_{out,bottom}$	
	$= 0.6 \times A\sqrt{2 \times 32.2 \times h} + Q_{out,bottom}$	
A: Outlet pipe cross sectional area		
h: WSE - outlet pipe centerline elevation		
Example: WSE @ 1113.23 ft		
Q_{net}	$= C \times A\sqrt{2 \times 32.2 \times h} + Q_{out,bottom}$	
C		0.6
A (ft^2) = π r^2		0.35
WSE (ft)		2,991.50
Outlet Centerline (ft)		2983.833333
h (ft)		7.666666667
$Q_{out,bottom\ (cfs)}$		0.30
Q_{net}	=	**4.95**

HUITT-ZOLLARS

FLOOD HYDROGRAPH ROUTING PROGRAM
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Study date: 05/16/23

COVINGTON - MIP BUILDING 1
10 YEAR STORM EVENT BASIN ROUTING BUILDING 1
5712Q10ROUTING1
DS

Program License Serial Number 6145

********** HYDROGRAPH INFORMATION **********

From study/file name: 5712Q10PUH1.rte
**********HYDROGRAPH DATA**********
Number of intervals = 300
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 10.185 (CFS)
Total volume = 1.021 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

++
Process from Point/Station 0.000 to Point/Station 0.000
**** RETARDING BASIN ROUTING ****
_____

User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 300
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-O*dt/2) (Ac.Ft)	(S+O*dt/2) (Ac.Ft)
0.000	0.000	0.000	0.000	0.000
0.500	0.034	0.300	0.033	0.035
1.500	0.134	0.300	0.133	0.135
2.500	0.257	0.300	0.256	0.258
3.000	0.322	0.300	0.321	0.323
4.000	0.457	1.670	0.451	0.463
5.500	0.658	2.770	0.648	0.668

6.500	0.781	3.290	0.770	0.792
7.500	0.836	3.730	0.823	0.849
8.000	0.915	3.930	0.901	0.929
9.000	0.916	4.300	0.901	0.931
10.000	0.917	4.640	0.901	0.933
11.000	0.918	4.950	0.901	0.935
12.000	0.919	5.250	0.901	0.937

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0 2.5 5.09 7.64 10.19	Depth (Ft.)
0.083	0.01	0.00	0.000	O	0.00
0.167	0.09	0.00	0.000	O	0.01
0.250	0.15	0.01	0.001	O	0.02
0.333	0.18	0.02	0.002	O	0.03
0.417	0.19	0.03	0.003	O	0.05
0.500	0.20	0.04	0.004	O	0.06
0.583	0.21	0.05	0.006	O	0.08
0.667	0.21	0.06	0.007	O	0.10
0.750	0.22	0.07	0.008	O	0.11
0.833	0.22	0.08	0.009	O	0.13
0.917	0.22	0.08	0.010	O	0.14
1.000	0.22	0.09	0.010	O	0.15
1.083	0.22	0.10	0.011	O	0.17
1.167	0.22	0.11	0.012	O	0.18
1.250	0.22	0.11	0.013	O	0.19
1.333	0.23	0.12	0.014	O	0.20
1.417	0.23	0.13	0.014	O	0.21
1.500	0.23	0.13	0.015	O	0.22
1.583	0.23	0.14	0.016	O	0.23
1.667	0.23	0.14	0.016	O	0.24
1.750	0.23	0.15	0.017	O	0.25
1.833	0.23	0.15	0.017	O	0.26
1.917	0.23	0.16	0.018	O	0.26
2.000	0.23	0.16	0.018	O	0.27
2.083	0.23	0.17	0.019	O	0.28
2.167	0.23	0.17	0.019	O	0.28
2.250	0.23	0.17	0.020	O	0.29
2.333	0.23	0.18	0.020	O	0.30
2.417	0.24	0.18	0.021	O	0.30
2.500	0.24	0.18	0.021	O	0.31
2.583	0.24	0.19	0.021	O	0.31
2.667	0.24	0.19	0.022	O	0.32
2.750	0.24	0.19	0.022	O	0.32
2.833	0.24	0.20	0.022	O	0.33
2.917	0.24	0.20	0.022	O	0.33
3.000	0.24	0.20	0.023	O	0.33
3.083	0.24	0.20	0.023	O	0.34
3.167	0.24	0.21	0.023	O	0.34
3.250	0.24	0.21	0.024	O	0.35
3.333	0.24	0.21	0.024	O	0.35
3.417	0.25	0.21	0.024	O	0.35
3.500	0.25	0.21	0.024	O	0.36
3.583	0.25	0.22	0.024	O	0.36
3.667	0.25	0.22	0.025	O	0.36
3.750	0.25	0.22	0.025	O	0.37
3.833	0.25	0.22	0.025	O	0.37
3.917	0.25	0.22	0.025	O	0.37
4.000	0.25	0.22	0.025	O	0.37

4.083	0.25	0.23	0.026	O				0.38
4.167	0.25	0.23	0.026	O				0.38
4.250	0.26	0.23	0.026	O				0.38
4.333	0.26	0.23	0.026	O				0.39
4.417	0.26	0.23	0.026	O				0.39
4.500	0.26	0.23	0.027	O				0.39
4.583	0.26	0.24	0.027	O				0.39
4.667	0.26	0.24	0.027	O				0.39
4.750	0.26	0.24	0.027	O				0.40
4.833	0.26	0.24	0.027	O				0.40
4.917	0.26	0.24	0.027	O				0.40
5.000	0.26	0.24	0.027	O				0.40
5.083	0.27	0.24	0.028	O				0.41
5.167	0.27	0.25	0.028	O				0.41
5.250	0.27	0.25	0.028	O				0.41
5.333	0.27	0.25	0.028	O				0.41
5.417	0.27	0.25	0.028	O				0.42
5.500	0.27	0.25	0.028	O				0.42
5.583	0.27	0.25	0.029	O				0.42
5.667	0.27	0.25	0.029	O				0.42
5.750	0.27	0.25	0.029	O				0.42
5.833	0.28	0.26	0.029	O				0.43
5.917	0.28	0.26	0.029	O				0.43
6.000	0.28	0.26	0.029	O				0.43
6.083	0.28	0.26	0.029	O				0.43
6.167	0.28	0.26	0.030	O				0.43
6.250	0.28	0.26	0.030	O				0.44
6.333	0.28	0.26	0.030	O				0.44
6.417	0.29	0.26	0.030	O				0.44
6.500	0.29	0.27	0.030	O				0.44
6.583	0.29	0.27	0.030	O				0.44
6.667	0.29	0.27	0.030	O				0.45
6.750	0.29	0.27	0.031	O				0.45
6.833	0.29	0.27	0.031	O				0.45
6.917	0.29	0.27	0.031	O				0.45
7.000	0.30	0.27	0.031	O				0.46
7.083	0.30	0.27	0.031	O				0.46
7.167	0.30	0.28	0.031	O				0.46
7.250	0.30	0.28	0.031	O				0.46
7.333	0.30	0.28	0.032	O				0.46
7.417	0.30	0.28	0.032	O				0.47
7.500	0.30	0.28	0.032	O				0.47
7.583	0.31	0.28	0.032	O				0.47
7.667	0.31	0.28	0.032	O				0.47
7.750	0.31	0.29	0.032	O				0.48
7.833	0.31	0.29	0.033	O				0.48
7.917	0.31	0.29	0.033	O				0.48
8.000	0.32	0.29	0.033	O				0.48
8.083	0.32	0.29	0.033	O				0.49
8.167	0.32	0.29	0.033	OI				0.49
8.250	0.32	0.29	0.033	OI				0.49
8.333	0.32	0.30	0.034	OI				0.49
8.417	0.32	0.30	0.034	OI				0.50
8.500	0.33	0.30	0.034	OI				0.50
8.583	0.33	0.30	0.034	OI				0.50
8.667	0.33	0.30	0.034	OI				0.50
8.750	0.33	0.30	0.035	OI				0.51
8.833	0.33	0.30	0.035	OI				0.51
8.917	0.34	0.30	0.035	OI				0.51
9.000	0.34	0.30	0.035	OI				0.51
9.083	0.34	0.30	0.036	OI				0.52
9.167	0.34	0.30	0.036	OI				0.52
9.250	0.35	0.30	0.036	OI				0.52

9.333	0.35	0.30	0.037	OI				0.53
9.417	0.35	0.30	0.037	OI				0.53
9.500	0.35	0.30	0.037	OI				0.53
9.583	0.36	0.30	0.038	OI				0.54
9.667	0.36	0.30	0.038	OI				0.54
9.750	0.36	0.30	0.038	OI				0.54
9.833	0.36	0.30	0.039	OI				0.55
9.917	0.37	0.30	0.039	OI				0.55
10.000	0.37	0.30	0.040	OI				0.56
10.083	0.37	0.30	0.040	OI				0.56
10.167	0.37	0.30	0.041	OI				0.57
10.250	0.38	0.30	0.041	OI				0.57
10.333	0.38	0.30	0.042	OI				0.58
10.417	0.38	0.30	0.042	OI				0.58
10.500	0.39	0.30	0.043	OI				0.59
10.583	0.39	0.30	0.044	OI				0.60
10.667	0.39	0.30	0.044	OI				0.60
10.750	0.40	0.30	0.045	OI				0.61
10.833	0.40	0.30	0.045	OI				0.61
10.917	0.40	0.30	0.046	OI				0.62
11.000	0.41	0.30	0.047	OI				0.63
11.083	0.41	0.30	0.048	OI				0.64
11.167	0.41	0.30	0.048	OI				0.64
11.250	0.42	0.30	0.049	OI				0.65
11.333	0.42	0.30	0.050	OI				0.66
11.417	0.43	0.30	0.051	OI				0.67
11.500	0.43	0.30	0.052	OI				0.68
11.583	0.43	0.30	0.053	OI				0.69
11.667	0.44	0.30	0.054	OI				0.70
11.750	0.44	0.30	0.055	OI				0.71
11.833	0.45	0.30	0.056	OI				0.72
11.917	0.45	0.30	0.057	OI				0.73
12.000	0.46	0.30	0.058	OI				0.74
12.083	0.46	0.30	0.059	OI				0.75
12.167	0.45	0.30	0.060	OI				0.76
12.250	0.45	0.30	0.061	OI				0.77
12.333	0.45	0.30	0.062	OI				0.78
12.417	0.45	0.30	0.063	OI				0.79
12.500	0.46	0.30	0.064	OI				0.80
12.583	0.46	0.30	0.065	OI				0.81
12.667	0.47	0.30	0.066	OI				0.82
12.750	0.47	0.30	0.067	OI				0.83
12.833	0.48	0.30	0.069	OI				0.85
12.917	0.49	0.30	0.070	OI				0.86
13.000	0.49	0.30	0.071	OI				0.87
13.083	0.50	0.30	0.073	OI				0.89
13.167	0.51	0.30	0.074	OI				0.90
13.250	0.52	0.30	0.075	OI				0.91
13.333	0.53	0.30	0.077	OI				0.93
13.417	0.54	0.30	0.079	OI				0.95
13.500	0.55	0.30	0.080	OI				0.96
13.583	0.56	0.30	0.082	OI				0.98
13.667	0.57	0.30	0.084	OI				1.00
13.750	0.58	0.30	0.086	OI				1.02
13.833	0.59	0.30	0.088	OI				1.04
13.917	0.60	0.30	0.090	OI				1.06
14.000	0.62	0.30	0.092	OI				1.08
14.083	0.63	0.30	0.094	OI				1.10
14.167	0.64	0.30	0.096	O I				1.12
14.250	0.66	0.30	0.099	O I				1.15
14.333	0.68	0.30	0.101	O I				1.17
14.417	0.70	0.30	0.104	O I				1.20
14.500	0.72	0.30	0.107	O I				1.23

14.583	0.74	0.30	0.110	O I	|	|	|	1.26
14.667	0.76	0.30	0.113	O I	|	|	|	1.29
14.750	0.78	0.30	0.116	O I	|	|	|	1.32
14.833	0.81	0.30	0.119	O I	|	|	|	1.35
14.917	0.84	0.30	0.123	O I	|	|	|	1.39
15.000	0.88	0.30	0.127	O I	|	|	|	1.43
15.083	0.91	0.30	0.131	O I	|	|	|	1.47
15.167	0.96	0.30	0.135	O I	|	|	|	1.51
15.250	1.00	0.30	0.140	O I	|	|	|	1.55
15.333	1.06	0.30	0.145	O I	|	|	|	1.59
15.417	1.10	0.30	0.151	O I	|	|	|	1.63
15.500	1.06	0.30	0.156	O I	|	|	|	1.68
15.583	1.06	0.30	0.161	O I	|	|	|	1.72
15.667	1.13	0.30	0.167	O I	|	|	|	1.77
15.750	1.24	0.30	0.173	O I	|	|	|	1.81
15.833	1.43	0.30	0.180	O I	|	|	|	1.87
15.917	1.73	0.30	0.189	O I	|	|	|	1.94
16.000	2.40	0.30	0.201	O I	|	|	|	2.04
16.083	4.39	0.30	0.222	O I	|	|	|	2.22
16.167	10.19	0.30	0.270	O	|	|	I	2.60
16.250	7.55	0.37	0.329	O	|	I	|	3.05
16.333	4.24	0.75	0.366	O	I |	|	|	3.32
16.417	2.95	0.94	0.385	O	I |	|	|	3.47
16.500	2.32	1.05	0.396	O I	|	|	|	3.55
16.583	1.93	1.12	0.403	O I	|	|	|	3.60
16.667	1.62	1.17	0.408	O I	|	|	|	3.63
16.750	1.37	1.19	0.410	OI	|	|	|	3.65
16.833	1.16	1.20	0.410	O	|	|	|	3.65
16.917	1.06	1.19	0.410	O	|	|	|	3.65
17.000	0.97	1.18	0.409	O	|	|	|	3.64
17.083	0.86	1.16	0.407	IO	|	|	|	3.63
17.167	0.73	1.14	0.404	IO	|	|	|	3.61
17.250	0.68	1.11	0.402	IO	|	|	|	3.59
17.333	0.65	1.08	0.399	IO	|	|	|	3.57
17.417	0.62	1.05	0.396	I O	|	|	|	3.55
17.500	0.59	1.02	0.393	I O	|	|	|	3.52
17.583	0.57	0.99	0.390	I O	|	|	|	3.50
17.667	0.55	0.96	0.387	I O	|	|	|	3.48
17.750	0.53	0.93	0.384	IO	|	|	|	3.46
17.833	0.51	0.90	0.381	IO	|	|	|	3.44
17.917	0.49	0.88	0.379	IO	|	|	|	3.42
18.000	0.48	0.85	0.376	IO	|	|	|	3.40
18.083	0.47	0.82	0.374	IO	|	|	|	3.38
18.167	0.47	0.80	0.371	IO	|	|	|	3.36
18.250	0.47	0.78	0.369	IO	|	|	|	3.35
18.333	0.46	0.76	0.367	IO	|	|	|	3.33
18.417	0.45	0.74	0.365	IO	|	|	|	3.32
18.500	0.44	0.72	0.363	IO	|	|	|	3.30
18.583	0.44	0.70	0.361	IO	|	|	|	3.29
18.667	0.43	0.68	0.359	IO	|	|	|	3.28
18.750	0.42	0.66	0.358	IO	|	|	|	3.26
18.833	0.41	0.65	0.356	IO	|	|	|	3.25
18.917	0.41	0.63	0.355	O	|	|	|	3.24
19.000	0.40	0.61	0.353	O	|	|	|	3.23
19.083	0.39	0.60	0.352	O	|	|	|	3.22
19.167	0.39	0.59	0.350	O	|	|	|	3.21
19.250	0.38	0.57	0.349	O	|	|	|	3.20
19.333	0.37	0.56	0.348	O	|	|	|	3.19
19.417	0.37	0.55	0.346	O	|	|	|	3.18
19.500	0.36	0.53	0.345	O	|	|	|	3.17
19.583	0.36	0.52	0.344	O	|	|	|	3.16
19.667	0.35	0.51	0.343	O	|	|	|	3.15
19.750	0.35	0.50	0.342	O	|	|	|	3.15

19.833	0.34	0.49	0.341	|O	|	|	|	3.14
19.917	0.34	0.48	0.340	|O	|	|	|	3.13
20.000	0.33	0.47	0.339	|O	|	|	|	3.12
20.083	0.33	0.46	0.338	|O	|	|	|	3.12
20.167	0.33	0.45	0.337	|O	|	|	|	3.11
20.250	0.32	0.44	0.336	|O	|	|	|	3.10
20.333	0.32	0.43	0.335	|O	|	|	|	3.10
20.417	0.31	0.43	0.334	IO	|	|	|	3.09
20.500	0.31	0.42	0.334	IO	|	|	|	3.09
20.583	0.31	0.41	0.333	IO	|	|	|	3.08
20.667	0.30	0.40	0.332	IO	|	|	|	3.08
20.750	0.30	0.40	0.332	IO	|	|	|	3.07
20.833	0.30	0.39	0.331	IO	|	|	|	3.07
20.917	0.30	0.38	0.330	IO	|	|	|	3.06
21.000	0.29	0.38	0.330	IO	|	|	|	3.06
21.083	0.29	0.37	0.329	IO	|	|	|	3.05
21.167	0.29	0.37	0.329	IO	|	|	|	3.05
21.250	0.28	0.36	0.328	IO	|	|	|	3.04
21.333	0.28	0.36	0.328	IO	|	|	|	3.04
21.417	0.28	0.35	0.327	IO	|	|	|	3.04
21.500	0.28	0.35	0.327	IO	|	|	|	3.03
21.583	0.27	0.34	0.326	IO	|	|	|	3.03
21.667	0.27	0.34	0.326	IO	|	|	|	3.03
21.750	0.27	0.33	0.325	IO	|	|	|	3.02
21.833	0.27	0.33	0.325	IO	|	|	|	3.02
21.917	0.26	0.32	0.324	IO	|	|	|	3.02
22.000	0.26	0.32	0.324	IO	|	|	|	3.01
22.083	0.26	0.32	0.324	O	|	|	|	3.01
22.167	0.26	0.31	0.323	O	|	|	|	3.01
22.250	0.26	0.31	0.323	O	|	|	|	3.01
22.333	0.25	0.30	0.322	O	|	|	|	3.00
22.417	0.25	0.30	0.322	O	|	|	|	3.00
22.500	0.25	0.30	0.322	O	|	|	|	3.00
22.583	0.25	0.30	0.321	O	|	|	|	3.00
22.667	0.25	0.30	0.321	O	|	|	|	2.99
22.750	0.24	0.30	0.321	O	|	|	|	2.99
22.833	0.24	0.30	0.320	O	|	|	|	2.99
22.917	0.24	0.30	0.320	O	|	|	|	2.98
23.000	0.24	0.30	0.319	O	|	|	|	2.98
23.083	0.24	0.30	0.319	O	|	|	|	2.98
23.167	0.24	0.30	0.319	O	|	|	|	2.97
23.250	0.23	0.30	0.318	O	|	|	|	2.97
23.333	0.23	0.30	0.318	O	|	|	|	2.97
23.417	0.23	0.30	0.317	O	|	|	|	2.96
23.500	0.23	0.30	0.317	O	|	|	|	2.96
23.583	0.23	0.30	0.316	O	|	|	|	2.96
23.667	0.23	0.30	0.316	O	|	|	|	2.95
23.750	0.23	0.30	0.315	O	|	|	|	2.95
23.833	0.22	0.30	0.315	O	|	|	|	2.94
23.917	0.22	0.30	0.314	O	|	|	|	2.94
24.000	0.22	0.30	0.314	O	|	|	|	2.94
24.083	0.21	0.30	0.313	O	|	|	|	2.93
24.167	0.12	0.30	0.312	O	|	|	|	2.92
24.250	0.07	0.30	0.311	O	|	|	|	2.91
24.333	0.04	0.30	0.309	O	|	|	|	2.90
24.417	0.03	0.30	0.307	O	|	|	|	2.89
24.500	0.02	0.30	0.305	O	|	|	|	2.87
24.583	0.01	0.30	0.303	O	|	|	|	2.86
24.667	0.01	0.30	0.301	O	|	|	|	2.84
24.750	0.01	0.30	0.299	O	|	|	|	2.83
24.833	0.00	0.30	0.297	O	|	|	|	2.81
24.917	0.00	0.30	0.295	O	|	|	|	2.79
25.000	0.00	0.30	0.293	O	|	|	|	2.78

25.083	0.00	0.30	0.291	O					2.76
25.167	0.00	0.30	0.289	O					2.75
25.250	0.00	0.30	0.287	O					2.73
25.333	0.00	0.30	0.285	O					2.72
25.417	0.00	0.30	0.283	O					2.70
25.500	0.00	0.30	0.281	O					2.68
25.583	0.00	0.30	0.279	O					2.67
25.667	0.00	0.30	0.277	O					2.65
25.750	0.00	0.30	0.275	O					2.64
25.833	0.00	0.30	0.273	O					2.62
25.917	0.00	0.30	0.271	O					2.60
26.000	0.00	0.30	0.268	O					2.59
26.083	0.00	0.30	0.266	O					2.57
26.167	0.00	0.30	0.264	O					2.56
26.250	0.00	0.30	0.262	O					2.54
26.333	0.00	0.30	0.260	O					2.52
26.417	0.00	0.30	0.258	O					2.51
26.500	0.00	0.30	0.256	O					2.49
26.583	0.00	0.30	0.254	O					2.48
26.667	0.00	0.30	0.252	O					2.46
26.750	0.00	0.30	0.250	O					2.44
26.833	0.00	0.30	0.248	O					2.43
26.917	0.00	0.30	0.246	O					2.41
27.000	0.00	0.30	0.244	O					2.39
27.083	0.00	0.30	0.242	O					2.37
27.167	0.00	0.30	0.240	O					2.36
27.250	0.00	0.30	0.237	O					2.34
27.333	0.00	0.30	0.235	O					2.32
27.417	0.00	0.30	0.233	O					2.31
27.500	0.00	0.30	0.231	O					2.29
27.583	0.00	0.30	0.229	O					2.27
27.667	0.00	0.30	0.227	O					2.26
27.750	0.00	0.30	0.225	O					2.24
27.833	0.00	0.30	0.223	O					2.22
27.917	0.00	0.30	0.221	O					2.21
28.000	0.00	0.30	0.219	O					2.19
28.083	0.00	0.30	0.217	O					2.17
28.167	0.00	0.30	0.215	O					2.16
28.250	0.00	0.30	0.213	O					2.14
28.333	0.00	0.30	0.211	O					2.12
28.417	0.00	0.30	0.209	O					2.11
28.500	0.00	0.30	0.206	O					2.09
28.583	0.00	0.30	0.204	O					2.07
28.667	0.00	0.30	0.202	O					2.06
28.750	0.00	0.30	0.200	O					2.04
28.833	0.00	0.30	0.198	O					2.02
28.917	0.00	0.30	0.196	O					2.01
29.000	0.00	0.30	0.194	O					1.99
29.083	0.00	0.30	0.192	O					1.97
29.167	0.00	0.30	0.190	O					1.95
29.250	0.00	0.30	0.188	O					1.94
29.333	0.00	0.30	0.186	O					1.92
29.417	0.00	0.30	0.184	O					1.90
29.500	0.00	0.30	0.182	O					1.89
29.583	0.00	0.30	0.180	O					1.87
29.667	0.00	0.30	0.178	O					1.85
29.750	0.00	0.30	0.175	O					1.84
29.833	0.00	0.30	0.173	O					1.82
29.917	0.00	0.30	0.171	O					1.80
30.000	0.00	0.30	0.169	O					1.79
30.083	0.00	0.30	0.167	O					1.77
30.167	0.00	0.30	0.165	O					1.75
30.250	0.00	0.30	0.163	O					1.74

30.333	0.00	0.30	0.161	O	|	|	|	|	1.72
30.417	0.00	0.30	0.159	O	|	|	|	|	1.70
30.500	0.00	0.30	0.157	O	|	|	|	|	1.69
30.583	0.00	0.30	0.155	O	|	|	|	|	1.67
30.667	0.00	0.30	0.153	O	|	|	|	|	1.65
30.750	0.00	0.30	0.151	O	|	|	|	|	1.64
30.833	0.00	0.30	0.149	O	|	|	|	|	1.62
30.917	0.00	0.30	0.147	O	|	|	|	|	1.60
31.000	0.00	0.30	0.144	O	|	|	|	|	1.59
31.083	0.00	0.30	0.142	O	|	|	|	|	1.57
31.167	0.00	0.30	0.140	O	|	|	|	|	1.55
31.250	0.00	0.30	0.138	O	|	|	|	|	1.53
31.333	0.00	0.30	0.136	O	|	|	|	|	1.52
31.417	0.00	0.30	0.134	O	|	|	|	|	1.50
31.500	0.00	0.30	0.132	O	|	|	|	|	1.48
31.583	0.00	0.30	0.130	O	|	|	|	|	1.46
31.667	0.00	0.30	0.128	O	|	|	|	|	1.44
31.750	0.00	0.30	0.126	O	|	|	|	|	1.42
31.833	0.00	0.30	0.124	O	|	|	|	|	1.40
31.917	0.00	0.30	0.122	O	|	|	|	|	1.38
32.000	0.00	0.30	0.120	O	|	|	|	|	1.36
32.083	0.00	0.30	0.118	O	|	|	|	|	1.34
32.167	0.00	0.30	0.116	O	|	|	|	|	1.32
32.250	0.00	0.30	0.113	O	|	|	|	|	1.29
32.333	0.00	0.30	0.111	O	|	|	|	|	1.27
32.417	0.00	0.30	0.109	O	|	|	|	|	1.25
32.500	0.00	0.30	0.107	O	|	|	|	|	1.23
32.583	0.00	0.30	0.105	O	|	|	|	|	1.21
32.667	0.00	0.30	0.103	O	|	|	|	|	1.19
32.750	0.00	0.30	0.101	O	|	|	|	|	1.17
32.833	0.00	0.30	0.099	O	|	|	|	|	1.15
32.917	0.00	0.30	0.097	O	|	|	|	|	1.13
33.000	0.00	0.30	0.095	O	|	|	|	|	1.11
33.083	0.00	0.30	0.093	O	|	|	|	|	1.09
33.167	0.00	0.30	0.091	O	|	|	|	|	1.07
33.250	0.00	0.30	0.089	O	|	|	|	|	1.05
33.333	0.00	0.30	0.087	O	|	|	|	|	1.03
33.417	0.00	0.30	0.085	O	|	|	|	|	1.01
33.500	0.00	0.30	0.082	O	|	|	|	|	0.98
33.583	0.00	0.30	0.080	O	|	|	|	|	0.96
33.667	0.00	0.30	0.078	O	|	|	|	|	0.94
33.750	0.00	0.30	0.076	O	|	|	|	|	0.92
33.833	0.00	0.30	0.074	O	|	|	|	|	0.90
33.917	0.00	0.30	0.072	O	|	|	|	|	0.88
34.000	0.00	0.30	0.070	O	|	|	|	|	0.86
34.083	0.00	0.30	0.068	O	|	|	|	|	0.84
34.167	0.00	0.30	0.066	O	|	|	|	|	0.82
34.250	0.00	0.30	0.064	O	|	|	|	|	0.80
34.333	0.00	0.30	0.062	O	|	|	|	|	0.78
34.417	0.00	0.30	0.060	O	|	|	|	|	0.76
34.500	0.00	0.30	0.058	O	|	|	|	|	0.74
34.583	0.00	0.30	0.056	O	|	|	|	|	0.72
34.667	0.00	0.30	0.054	O	|	|	|	|	0.70
34.750	0.00	0.30	0.052	O	|	|	|	|	0.68
34.833	0.00	0.30	0.049	O	|	|	|	|	0.65
34.917	0.00	0.30	0.047	O	|	|	|	|	0.63
35.000	0.00	0.30	0.045	O	|	|	|	|	0.61
35.083	0.00	0.30	0.043	O	|	|	|	|	0.59
35.167	0.00	0.30	0.041	O	|	|	|	|	0.57
35.250	0.00	0.30	0.039	O	|	|	|	|	0.55
35.333	0.00	0.30	0.037	O	|	|	|	|	0.53
35.417	0.00	0.30	0.035	O	|	|	|	|	0.51
35.500	0.00	0.29	0.033	O	|	|	|	|	0.48

35.583	0.00	0.27	0.031	O	|	|	|	0.46
35.667	0.00	0.26	0.029	O	|	|	|	0.43
35.750	0.00	0.24	0.027	O	|	|	|	0.40
35.833	0.00	0.23	0.026	O	|	|	|	0.38
35.917	0.00	0.21	0.024	O	|	|	|	0.36
36.000	0.00	0.20	0.023	O	|	|	|	0.34
36.083	0.00	0.19	0.022	O	|	|	|	0.32
36.167	0.00	0.18	0.020	O	|	|	|	0.30
36.250	0.00	0.17	0.019	O	|	|	|	0.28
36.333	0.00	0.16	0.018	O	|	|	|	0.26
36.417	0.00	0.15	0.017	O	|	|	|	0.25
36.500	0.00	0.14	0.016	O	|	|	|	0.23
36.583	0.00	0.13	0.015	O	|	|	|	0.22
36.667	0.00	0.12	0.014	O	|	|	|	0.21
36.750	0.00	0.12	0.013	O	|	|	|	0.19
36.833	0.00	0.11	0.012	O	|	|	|	0.18
36.917	0.00	0.10	0.012	O	|	|	|	0.17
37.000	0.00	0.10	0.011	O	|	|	|	0.16
37.083	0.00	0.09	0.010	O	|	|	|	0.15
37.167	0.00	0.09	0.010	O	|	|	|	0.14
37.250	0.00	0.08	0.009	O	|	|	|	0.14
37.333	0.00	0.08	0.009	O	|	|	|	0.13
37.417	0.00	0.07	0.008	O	|	|	|	0.12
37.500	0.00	0.07	0.008	O	|	|	|	0.11
37.583	0.00	0.06	0.007	O	|	|	|	0.11
37.667	0.00	0.06	0.007	O	|	|	|	0.10
37.750	0.00	0.06	0.006	O	|	|	|	0.09
37.833	0.00	0.05	0.006	O	|	|	|	0.09
37.917	0.00	0.05	0.006	O	|	|	|	0.08
38.000	0.00	0.05	0.005	O	|	|	|	0.08
38.083	0.00	0.04	0.005	O	|	|	|	0.07
38.167	0.00	0.04	0.005	O	|	|	|	0.07
38.250	0.00	0.04	0.004	O	|	|	|	0.07
38.333	0.00	0.04	0.004	O	|	|	|	0.06
38.417	0.00	0.03	0.004	O	|	|	|	0.06
38.500	0.00	0.03	0.004	O	|	|	|	0.05
38.583	0.00	0.03	0.003	O	|	|	|	0.05
38.667	0.00	0.03	0.003	O	|	|	|	0.05
38.750	0.00	0.03	0.003	O	|	|	|	0.05
38.833	0.00	0.03	0.003	O	|	|	|	0.04
38.917	0.00	0.02	0.003	O	|	|	|	0.04
39.000	0.00	0.02	0.003	O	|	|	|	0.04
39.083	0.00	0.02	0.002	O	|	|	|	0.04
39.167	0.00	0.02	0.002	O	|	|	|	0.03
39.250	0.00	0.02	0.002	O	|	|	|	0.03
39.333	0.00	0.02	0.002	O	|	|	|	0.03
39.417	0.00	0.02	0.002	O	|	|	|	0.03
39.500	0.00	0.02	0.002	O	|	|	|	0.03
39.583	0.00	0.01	0.002	O	|	|	|	0.02
39.667	0.00	0.01	0.002	O	|	|	|	0.02
39.750	0.00	0.01	0.001	O	|	|	|	0.02
39.833	0.00	0.01	0.001	O	|	|	|	0.02
39.917	0.00	0.01	0.001	O	|	|	|	0.02
40.000	0.00	0.01	0.001	O	|	|	|	0.02
40.083	0.00	0.01	0.001	O	|	|	|	0.02
40.167	0.00	0.01	0.001	O	|	|	|	0.02
40.250	0.00	0.01	0.001	O	|	|	|	0.02
40.333	0.00	0.01	0.001	O	|	|	|	0.01
40.417	0.00	0.01	0.001	O	|	|	|	0.01
40.500	0.00	0.01	0.001	O	|	|	|	0.01
40.583	0.00	0.01	0.001	O	|	|	|	0.01
40.667	0.00	0.01	0.001	O	|	|	|	0.01
40.750	0.00	0.01	0.001	O	|	|	|	0.01

40.833	0.00	0.01	0.001	O	|	|	|	|	0.01
40.917	0.00	0.01	0.001	O	|	|	|	|	0.01
41.000	0.00	0.01	0.001	O	|	|	|	|	0.01
41.083	0.00	0.00	0.001	O	|	|	|	|	0.01
41.167	0.00	0.00	0.001	O	|	|	|	|	0.01
41.250	0.00	0.00	0.000	O	|	|	|	|	0.01
41.333	0.00	0.00	0.000	O	|	|	|	|	0.01
41.417	0.00	0.00	0.000	O	|	|	|	|	0.01
41.500	0.00	0.00	0.000	O	|	|	|	|	0.01
41.583	0.00	0.00	0.000	O	|	|	|	|	0.01
41.667	0.00	0.00	0.000	O	|	|	|	|	0.01
41.750	0.00	0.00	0.000	O	|	|	|	|	0.01
41.833	0.00	0.00	0.000	O	|	|	|	|	0.00
41.917	0.00	0.00	0.000	O	|	|	|	|	0.00
42.000	0.00	0.00	0.000	O	|	|	|	|	0.00
42.083	0.00	0.00	0.000	O	|	|	|	|	0.00
42.167	0.00	0.00	0.000	O	|	|	|	|	0.00
42.250	0.00	0.00	0.000	O	|	|	|	|	0.00
42.333	0.00	0.00	0.000	O	|	|	|	|	0.00
42.417	0.00	0.00	0.000	O	|	|	|	|	0.00
42.500	0.00	0.00	0.000	O	|	|	|	|	0.00
42.583	0.00	0.00	0.000	O	|	|	|	|	0.00
42.667	0.00	0.00	0.000	O	|	|	|	|	0.00
42.750	0.00	0.00	0.000	O	|	|	|	|	0.00
42.833	0.00	0.00	0.000	O	|	|	|	|	0.00
42.917	0.00	0.00	0.000	O	|	|	|	|	0.00
43.000	0.00	0.00	0.000	O	|	|	|	|	0.00
43.083	0.00	0.00	0.000	O	|	|	|	|	0.00
43.167	0.00	0.00	0.000	O	|	|	|	|	0.00
43.250	0.00	0.00	0.000	O	|	|	|	|	0.00
43.333	0.00	0.00	0.000	O	|	|	|	|	0.00

**********HYDROGRAPH DATA**********

Number of intervals = 520
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 1.196 (CFS)
Total volume = 1.021 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
Study date: 05/16/23

COVINGTON - MIP BUILDING 1
100 YEAR STORM EVENT BASIN ROUTING BUILDING 1
5712Q100ROUTING1
DS

Program License Serial Number 6145

********** HYDROGRAPH INFORMATION **********

From study/file name: 5712Q100PUH1.rte
**********HYDROGRAPH DATA**********
Number of intervals = 300
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 17.791 (CFS)
Total volume = 1.899 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

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Process from Point/Station 0.000 to Point/Station 0.000
**** RETARDING BASIN ROUTING ****
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User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 300
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-O*dt/2) (Ac.Ft)	(S+O*dt/2) (Ac.Ft)
0.000	0.000	0.000	0.000	0.000
0.500	0.034	0.300	0.033	0.035
1.500	0.134	0.300	0.133	0.135
2.500	0.257	0.300	0.256	0.258
3.000	0.322	0.300	0.321	0.323
4.000	0.457	1.670	0.451	0.463
5.500	0.658	2.770	0.648	0.668

6.500	0.781	3.290	0.770	0.792
7.500	0.836	3.730	0.823	0.849
8.000	0.915	3.930	0.901	0.929
9.000	0.916	4.300	0.901	0.931
10.000	0.917	4.640	0.901	0.933
11.000	0.918	4.950	0.901	0.935
12.000	0.919	5.250	0.901	0.937

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0 4.4 8.90 13.34 17.79	Depth (Ft.)
0.083	0.03	0.00	0.000	O	0.00
0.167	0.18	0.01	0.001	O	0.01
0.250	0.29	0.02	0.002	O	0.03
0.333	0.34	0.04	0.004	O	0.06
0.417	0.37	0.06	0.006	O	0.09
0.500	0.39	0.08	0.009	O	0.13
0.583	0.40	0.09	0.011	O	0.16
0.667	0.41	0.11	0.013	O	0.19
0.750	0.42	0.13	0.015	O	0.22
0.833	0.42	0.15	0.017	O	0.25
0.917	0.43	0.16	0.019	O	0.27
1.000	0.43	0.18	0.020	O	0.30
1.083	0.43	0.19	0.022	O	0.32
1.167	0.43	0.21	0.024	O	0.35
1.250	0.43	0.22	0.025	O	0.37
1.333	0.44	0.23	0.026	O	0.39
1.417	0.44	0.25	0.028	O	0.41
1.500	0.44	0.26	0.029	O	0.43
1.583	0.44	0.27	0.030	O	0.45
1.667	0.44	0.28	0.032	O	0.46
1.750	0.44	0.29	0.033	O	0.48
1.833	0.44	0.30	0.034	O	0.50
1.917	0.45	0.30	0.035	O	0.51
2.000	0.45	0.30	0.036	O	0.52
2.083	0.45	0.30	0.037	O	0.53
2.167	0.45	0.30	0.038	O	0.54
2.250	0.45	0.30	0.039	O	0.55
2.333	0.45	0.30	0.040	O	0.56
2.417	0.45	0.30	0.041	O	0.57
2.500	0.46	0.30	0.042	O	0.58
2.583	0.46	0.30	0.043	O	0.59
2.667	0.46	0.30	0.044	O	0.60
2.750	0.46	0.30	0.045	O	0.61
2.833	0.46	0.30	0.046	O	0.62
2.917	0.46	0.30	0.047	O	0.63
3.000	0.47	0.30	0.049	O	0.65
3.083	0.47	0.30	0.050	O	0.66
3.167	0.47	0.30	0.051	O	0.67
3.250	0.47	0.30	0.052	O	0.68
3.333	0.47	0.30	0.053	O	0.69
3.417	0.47	0.30	0.054	O	0.70
3.500	0.48	0.30	0.056	O	0.72
3.583	0.48	0.30	0.057	O	0.73
3.667	0.48	0.30	0.058	O	0.74
3.750	0.48	0.30	0.059	O	0.75
3.833	0.48	0.30	0.061	O	0.77
3.917	0.48	0.30	0.062	O	0.78
4.000	0.49	0.30	0.063	O	0.79

4.083	0.49	0.30	0.064	O				0.80
4.167	0.49	0.30	0.066	O				0.82
4.250	0.49	0.30	0.067	O				0.83
4.333	0.49	0.30	0.068	O				0.84
4.417	0.50	0.30	0.070	O				0.86
4.500	0.50	0.30	0.071	O				0.87
4.583	0.50	0.30	0.072	O				0.88
4.667	0.50	0.30	0.074	O				0.90
4.750	0.50	0.30	0.075	O				0.91
4.833	0.51	0.30	0.077	O				0.93
4.917	0.51	0.30	0.078	O				0.94
5.000	0.51	0.30	0.079	O				0.95
5.083	0.51	0.30	0.081	O				0.97
5.167	0.51	0.30	0.082	O				0.98
5.250	0.52	0.30	0.084	O				1.00
5.333	0.52	0.30	0.085	O				1.01
5.417	0.52	0.30	0.087	O				1.03
5.500	0.52	0.30	0.088	O				1.04
5.583	0.52	0.30	0.090	O				1.06
5.667	0.53	0.30	0.092	O				1.08
5.750	0.53	0.30	0.093	O				1.09
5.833	0.53	0.30	0.095	O				1.11
5.917	0.53	0.30	0.096	O				1.12
6.000	0.54	0.30	0.098	O				1.14
6.083	0.54	0.30	0.100	O				1.16
6.167	0.54	0.30	0.101	O				1.17
6.250	0.54	0.30	0.103	O				1.19
6.333	0.55	0.30	0.105	O				1.21
6.417	0.55	0.30	0.106	O				1.22
6.500	0.55	0.30	0.108	O				1.24
6.583	0.55	0.30	0.110	O				1.26
6.667	0.56	0.30	0.111	OI				1.27
6.750	0.56	0.30	0.113	OI				1.29
6.833	0.56	0.30	0.115	OI				1.31
6.917	0.57	0.30	0.117	OI				1.33
7.000	0.57	0.30	0.119	OI				1.35
7.083	0.57	0.30	0.121	OI				1.37
7.167	0.57	0.30	0.122	OI				1.38
7.250	0.58	0.30	0.124	OI				1.40
7.333	0.58	0.30	0.126	OI				1.42
7.417	0.58	0.30	0.128	OI				1.44
7.500	0.59	0.30	0.130	OI				1.46
7.583	0.59	0.30	0.132	OI				1.48
7.667	0.59	0.30	0.134	OI				1.50
7.750	0.59	0.30	0.136	OI				1.52
7.833	0.60	0.30	0.138	OI				1.53
7.917	0.60	0.30	0.140	OI				1.55
8.000	0.60	0.30	0.142	OI				1.57
8.083	0.61	0.30	0.144	OI				1.58
8.167	0.61	0.30	0.147	OI				1.60
8.250	0.62	0.30	0.149	OI				1.62
8.333	0.62	0.30	0.151	OI				1.64
8.417	0.62	0.30	0.153	OI				1.66
8.500	0.63	0.30	0.155	OI				1.67
8.583	0.63	0.30	0.158	OI				1.69
8.667	0.63	0.30	0.160	OI				1.71
8.750	0.64	0.30	0.162	OI				1.73
8.833	0.64	0.30	0.165	OI				1.75
8.917	0.65	0.30	0.167	OI				1.77
9.000	0.65	0.30	0.169	OI				1.79
9.083	0.65	0.30	0.172	OI				1.81
9.167	0.66	0.30	0.174	OI				1.83
9.250	0.66	0.30	0.177	OI				1.85

9.333	0.67	0.30	0.179	OI				1.87
9.417	0.67	0.30	0.182	OI				1.89
9.500	0.68	0.30	0.184	OI				1.91
9.583	0.68	0.30	0.187	OI				1.93
9.667	0.69	0.30	0.190	OI				1.95
9.750	0.69	0.30	0.192	OI				1.97
9.833	0.69	0.30	0.195	OI				2.00
9.917	0.70	0.30	0.198	OI				2.02
10.000	0.71	0.30	0.200	OI				2.04
10.083	0.71	0.30	0.203	OI				2.06
10.167	0.72	0.30	0.206	OI				2.09
10.250	0.72	0.30	0.209	OI				2.11
10.333	0.73	0.30	0.212	OI				2.13
10.417	0.73	0.30	0.215	OI				2.16
10.500	0.74	0.30	0.218	OI				2.18
10.583	0.74	0.30	0.221	OI				2.21
10.667	0.75	0.30	0.224	OI				2.23
10.750	0.76	0.30	0.227	OI				2.26
10.833	0.76	0.30	0.230	OI				2.28
10.917	0.77	0.30	0.233	OI				2.31
11.000	0.78	0.30	0.237	OI				2.33
11.083	0.78	0.30	0.240	OI				2.36
11.167	0.79	0.30	0.243	OI				2.39
11.250	0.80	0.30	0.247	OI				2.42
11.333	0.80	0.30	0.250	OI				2.44
11.417	0.81	0.30	0.254	OI				2.47
11.500	0.82	0.30	0.257	OI				2.50
11.583	0.83	0.30	0.261	OI				2.53
11.667	0.84	0.30	0.265	OI				2.56
11.750	0.84	0.30	0.268	OI				2.59
11.833	0.85	0.30	0.272	OI				2.62
11.917	0.86	0.30	0.276	OI				2.65
12.000	0.87	0.30	0.280	OI				2.68
12.083	0.87	0.30	0.284	OI				2.71
12.167	0.84	0.30	0.288	OI				2.74
12.250	0.82	0.30	0.291	OI				2.76
12.333	0.82	0.30	0.295	OI				2.79
12.417	0.82	0.30	0.298	OI				2.82
12.500	0.83	0.30	0.302	OI				2.85
12.583	0.83	0.30	0.306	OI				2.87
12.667	0.84	0.30	0.309	OI				2.90
12.750	0.85	0.30	0.313	OI				2.93
12.833	0.87	0.30	0.317	OI				2.96
12.917	0.88	0.30	0.321	OI				2.99
13.000	0.89	0.33	0.325	OI				3.02
13.083	0.90	0.37	0.329	OI				3.05
13.167	0.92	0.40	0.332	OI				3.08
13.250	0.94	0.44	0.336	OI				3.10
13.333	0.95	0.47	0.339	OI				3.13
13.417	0.97	0.51	0.342	OI				3.15
13.500	0.99	0.54	0.346	OI				3.17
13.583	1.00	0.57	0.349	|O				3.20
13.667	1.03	0.60	0.352	|O				3.22
13.750	1.05	0.63	0.354	|O				3.24
13.833	1.07	0.66	0.357	|O				3.26
13.917	1.09	0.69	0.360	|O				3.28
14.000	1.12	0.71	0.363	|OI				3.30
14.083	1.14	0.74	0.366	|OI				3.32
14.167	1.17	0.77	0.368	|OI				3.34
14.250	1.20	0.80	0.371	|OI				3.36
14.333	1.23	0.83	0.374	|OI				3.38
14.417	1.26	0.85	0.377	|OI				3.40
14.500	1.30	0.88	0.380	|OI				3.43

14.583	1.34	0.91	0.382	OI				3.45
14.667	1.38	0.94	0.385	OI				3.47
14.750	1.43	0.97	0.388	OI				3.49
14.833	1.48	1.01	0.392	OI				3.52
14.917	1.54	1.04	0.395	OI				3.54
15.000	1.60	1.08	0.399	OI				3.57
15.083	1.67	1.11	0.402	OI				3.59
15.167	1.76	1.16	0.406	OI				3.62
15.250	1.85	1.20	0.411	OI				3.66
15.333	1.97	1.25	0.415	OI				3.69
15.417	2.06	1.30	0.420	OI				3.73
15.500	1.99	1.35	0.425	OI				3.77
15.583	2.01	1.39	0.430	OI				3.80
15.667	2.17	1.44	0.434	OI				3.83
15.750	2.39	1.50	0.440	O I				3.87
15.833	2.78	1.57	0.447	O I				3.93
15.917	3.32	1.67	0.457	O I				4.00
16.000	4.49	1.75	0.472	O	I			4.11
16.083	7.89	1.92	0.502	O		I		4.34
16.167	17.79	2.32	0.576	O			I	4.89
16.250	13.30	2.80	0.665	O		I		5.56
16.333	7.62	3.02	0.717	O	I			5.98
16.417	5.36	3.12	0.741	O	I			6.17
16.500	4.23	3.17	0.752	O I				6.27
16.583	3.52	3.19	0.757	OI				6.31
16.667	2.95	3.19	0.757	O				6.31
16.750	2.50	3.18	0.754	IO				6.28
16.833	2.12	3.15	0.748	I O				6.24
16.917	1.93	3.12	0.741	I O				6.17
17.000	1.77	3.08	0.732	I O				6.10
17.083	1.57	3.04	0.723	I O				6.02
17.167	1.33	3.00	0.712	I O				5.94
17.250	1.25	2.95	0.700	I O				5.84
17.333	1.18	2.90	0.688	I O				5.75
17.417	1.12	2.85	0.676	I O				5.65
17.500	1.07	2.80	0.665	I O				5.55
17.583	1.03	2.74	0.653	I O				5.46
17.667	0.99	2.68	0.641	I O				5.37
17.750	0.95	2.61	0.630	I O				5.29
17.833	0.92	2.55	0.618	I O				5.20
17.917	0.89	2.49	0.607	I O				5.12
18.000	0.86	2.43	0.596	I O				5.04
18.083	0.85	2.37	0.586	I O				4.96
18.167	0.87	2.32	0.575	I O				4.88
18.250	0.88	2.26	0.565	I O				4.81
18.333	0.87	2.21	0.556	I O				4.74
18.417	0.86	2.16	0.547	I O				4.67
18.500	0.84	2.11	0.538	I O				4.61
18.583	0.83	2.07	0.529	I O				4.54
18.667	0.81	2.02	0.521	I O				4.48
18.750	0.80	1.98	0.513	I O				4.42
18.833	0.79	1.93	0.505	I O				4.36
18.917	0.77	1.89	0.497	I O				4.30
19.000	0.76	1.85	0.489	I O				4.24
19.083	0.75	1.81	0.482	I O				4.19
19.167	0.74	1.77	0.475	I O				4.13
19.250	0.73	1.73	0.468	I O				4.08
19.333	0.71	1.69	0.461	I O				4.03
19.417	0.70	1.64	0.454	IO				3.98
19.500	0.69	1.58	0.448	IO				3.93
19.583	0.68	1.52	0.442	IO				3.89
19.667	0.67	1.46	0.437	IO				3.85
19.750	0.67	1.41	0.431	IO				3.81

19.833	0.66	1.36	0.426	IO				3.77
19.917	0.65	1.31	0.422	IO				3.74
20.000	0.64	1.27	0.417	IO				3.71
20.083	0.63	1.22	0.413	IO				3.67
20.167	0.63	1.18	0.409	IO				3.65
20.250	0.62	1.15	0.405	IO				3.62
20.333	0.61	1.11	0.402	O				3.59
20.417	0.60	1.08	0.398	O				3.57
20.500	0.60	1.04	0.395	O				3.54
20.583	0.59	1.01	0.392	O				3.52
20.667	0.58	0.98	0.389	O				3.50
20.750	0.58	0.96	0.387	O				3.48
20.833	0.57	0.93	0.384	O				3.46
20.917	0.57	0.91	0.382	O				3.44
21.000	0.56	0.88	0.380	O				3.43
21.083	0.56	0.86	0.377	O				3.41
21.167	0.55	0.84	0.375	IO				3.40
21.250	0.55	0.82	0.373	IO				3.38
21.333	0.54	0.80	0.372	IO				3.37
21.417	0.54	0.79	0.370	IO				3.35
21.500	0.53	0.77	0.368	IO				3.34
21.583	0.53	0.75	0.367	IO				3.33
21.667	0.52	0.74	0.365	IO				3.32
21.750	0.52	0.72	0.364	IO				3.31
21.833	0.51	0.71	0.362	IO				3.30
21.917	0.51	0.69	0.361	IO				3.29
22.000	0.51	0.68	0.360	IO				3.28
22.083	0.50	0.67	0.358	IO				3.27
22.167	0.50	0.66	0.357	IO				3.26
22.250	0.49	0.65	0.356	IO				3.25
22.333	0.49	0.64	0.355	IO				3.25
22.417	0.49	0.63	0.354	IO				3.24
22.500	0.48	0.62	0.353	IO				3.23
22.583	0.48	0.61	0.352	IO				3.22
22.667	0.48	0.60	0.351	IO				3.22
22.750	0.47	0.59	0.351	IO				3.21
22.833	0.47	0.58	0.350	IO				3.21
22.917	0.47	0.57	0.349	IO				3.20
23.000	0.46	0.57	0.348	IO				3.20
23.083	0.46	0.56	0.348	IO				3.19
23.167	0.46	0.55	0.347	O				3.18
23.250	0.45	0.55	0.346	O				3.18
23.333	0.45	0.54	0.346	O				3.18
23.417	0.45	0.53	0.345	O				3.17
23.500	0.44	0.53	0.344	O				3.17
23.583	0.44	0.52	0.344	O				3.16
23.667	0.44	0.52	0.343	O				3.16
23.750	0.44	0.51	0.343	O				3.15
23.833	0.43	0.51	0.342	O				3.15
23.917	0.43	0.50	0.342	O				3.15
24.000	0.43	0.50	0.341	O				3.14
24.083	0.40	0.49	0.341	O				3.14
24.167	0.24	0.48	0.340	O				3.13
24.250	0.13	0.46	0.338	O				3.12
24.333	0.08	0.44	0.335	O				3.10
24.417	0.06	0.41	0.333	O				3.08
24.500	0.04	0.39	0.331	O				3.06
24.583	0.03	0.36	0.328	O				3.05
24.667	0.02	0.34	0.326	O				3.03
24.750	0.01	0.32	0.324	O				3.01
24.833	0.01	0.30	0.322	O				3.00
24.917	0.00	0.30	0.320	O				2.98
25.000	0.00	0.30	0.318	O				2.97

25.083	0.00	0.30	0.316	O				2.95
25.167	0.00	0.30	0.313	O				2.93
25.250	0.00	0.30	0.311	O				2.92
25.333	0.00	0.30	0.309	O				2.90
25.417	0.00	0.30	0.307	O				2.89
25.500	0.00	0.30	0.305	O				2.87
25.583	0.00	0.30	0.303	O				2.85
25.667	0.00	0.30	0.301	O				2.84
25.750	0.00	0.30	0.299	O				2.82
25.833	0.00	0.30	0.297	O				2.81
25.917	0.00	0.30	0.295	O				2.79
26.000	0.00	0.30	0.293	O				2.78
26.083	0.00	0.30	0.291	O				2.76
26.167	0.00	0.30	0.289	O				2.74
26.250	0.00	0.30	0.287	O				2.73
26.333	0.00	0.30	0.285	O				2.71
26.417	0.00	0.30	0.282	O				2.70
26.500	0.00	0.30	0.280	O				2.68
26.583	0.00	0.30	0.278	O				2.66
26.667	0.00	0.30	0.276	O				2.65
26.750	0.00	0.30	0.274	O				2.63
26.833	0.00	0.30	0.272	O				2.62
26.917	0.00	0.30	0.270	O				2.60
27.000	0.00	0.30	0.268	O				2.58
27.083	0.00	0.30	0.266	O				2.57
27.167	0.00	0.30	0.264	O				2.55
27.250	0.00	0.30	0.262	O				2.54
27.333	0.00	0.30	0.260	O				2.52
27.417	0.00	0.30	0.258	O				2.51
27.500	0.00	0.30	0.256	O				2.49
27.583	0.00	0.30	0.254	O				2.47
27.667	0.00	0.30	0.251	O				2.46
27.750	0.00	0.30	0.249	O				2.44
27.833	0.00	0.30	0.247	O				2.42
27.917	0.00	0.30	0.245	O				2.40
28.000	0.00	0.30	0.243	O				2.39
28.083	0.00	0.30	0.241	O				2.37
28.167	0.00	0.30	0.239	O				2.35
28.250	0.00	0.30	0.237	O				2.34
28.333	0.00	0.30	0.235	O				2.32
28.417	0.00	0.30	0.233	O				2.30
28.500	0.00	0.30	0.231	O				2.29
28.583	0.00	0.30	0.229	O				2.27
28.667	0.00	0.30	0.227	O				2.25
28.750	0.00	0.30	0.225	O				2.24
28.833	0.00	0.30	0.223	O				2.22
28.917	0.00	0.30	0.220	O				2.20
29.000	0.00	0.30	0.218	O				2.19
29.083	0.00	0.30	0.216	O				2.17
29.167	0.00	0.30	0.214	O				2.15
29.250	0.00	0.30	0.212	O				2.14
29.333	0.00	0.30	0.210	O				2.12
29.417	0.00	0.30	0.208	O				2.10
29.500	0.00	0.30	0.206	O				2.09
29.583	0.00	0.30	0.204	O				2.07
29.667	0.00	0.30	0.202	O				2.05
29.750	0.00	0.30	0.200	O				2.04
29.833	0.00	0.30	0.198	O				2.02
29.917	0.00	0.30	0.196	O				2.00
30.000	0.00	0.30	0.194	O				1.98
30.083	0.00	0.30	0.192	O				1.97
30.167	0.00	0.30	0.189	O				1.95
30.250	0.00	0.30	0.187	O				1.93

30.333	0.00	0.30	0.185	O				1.92
30.417	0.00	0.30	0.183	O				1.90
30.500	0.00	0.30	0.181	O				1.88
30.583	0.00	0.30	0.179	O				1.87
30.667	0.00	0.30	0.177	O				1.85
30.750	0.00	0.30	0.175	O				1.83
30.833	0.00	0.30	0.173	O				1.82
30.917	0.00	0.30	0.171	O				1.80
31.000	0.00	0.30	0.169	O				1.78
31.083	0.00	0.30	0.167	O				1.77
31.167	0.00	0.30	0.165	O				1.75
31.250	0.00	0.30	0.163	O				1.73
31.333	0.00	0.30	0.161	O				1.72
31.417	0.00	0.30	0.158	O				1.70
31.500	0.00	0.30	0.156	O				1.68
31.583	0.00	0.30	0.154	O				1.67
31.667	0.00	0.30	0.152	O				1.65
31.750	0.00	0.30	0.150	O				1.63
31.833	0.00	0.30	0.148	O				1.62
31.917	0.00	0.30	0.146	O				1.60
32.000	0.00	0.30	0.144	O				1.58
32.083	0.00	0.30	0.142	O				1.56
32.167	0.00	0.30	0.140	O				1.55
32.250	0.00	0.30	0.138	O				1.53
32.333	0.00	0.30	0.136	O				1.51
32.417	0.00	0.30	0.134	O				1.50
32.500	0.00	0.30	0.132	O				1.48
32.583	0.00	0.30	0.130	O				1.46
32.667	0.00	0.30	0.128	O				1.44
32.750	0.00	0.30	0.125	O				1.41
32.833	0.00	0.30	0.123	O				1.39
32.917	0.00	0.30	0.121	O				1.37
33.000	0.00	0.30	0.119	O				1.35
33.083	0.00	0.30	0.117	O				1.33
33.167	0.00	0.30	0.115	O				1.31
33.250	0.00	0.30	0.113	O				1.29
33.333	0.00	0.30	0.111	O				1.27
33.417	0.00	0.30	0.109	O				1.25
33.500	0.00	0.30	0.107	O				1.23
33.583	0.00	0.30	0.105	O				1.21
33.667	0.00	0.30	0.103	O				1.19
33.750	0.00	0.30	0.101	O				1.17
33.833	0.00	0.30	0.099	O				1.15
33.917	0.00	0.30	0.097	O				1.13
34.000	0.00	0.30	0.094	O				1.10
34.083	0.00	0.30	0.092	O				1.08
34.167	0.00	0.30	0.090	O				1.06
34.250	0.00	0.30	0.088	O				1.04
34.333	0.00	0.30	0.086	O				1.02
34.417	0.00	0.30	0.084	O				1.00
34.500	0.00	0.30	0.082	O				0.98
34.583	0.00	0.30	0.080	O				0.96
34.667	0.00	0.30	0.078	O				0.94
34.750	0.00	0.30	0.076	O				0.92
34.833	0.00	0.30	0.074	O				0.90
34.917	0.00	0.30	0.072	O				0.88
35.000	0.00	0.30	0.070	O				0.86
35.083	0.00	0.30	0.068	O				0.84
35.167	0.00	0.30	0.066	O				0.82
35.250	0.00	0.30	0.063	O				0.79
35.333	0.00	0.30	0.061	O				0.77
35.417	0.00	0.30	0.059	O				0.75
35.500	0.00	0.30	0.057	O				0.73

35.583	0.00	0.30	0.055	O	|	|	|	0.71
35.667	0.00	0.30	0.053	O	|	|	|	0.69
35.750	0.00	0.30	0.051	O	|	|	|	0.67
35.833	0.00	0.30	0.049	O	|	|	|	0.65
35.917	0.00	0.30	0.047	O	|	|	|	0.63
36.000	0.00	0.30	0.045	O	|	|	|	0.61
36.083	0.00	0.30	0.043	O	|	|	|	0.59
36.167	0.00	0.30	0.041	O	|	|	|	0.57
36.250	0.00	0.30	0.039	O	|	|	|	0.55
36.333	0.00	0.30	0.037	O	|	|	|	0.53
36.417	0.00	0.30	0.035	O	|	|	|	0.51
36.500	0.00	0.29	0.033	O	|	|	|	0.48
36.583	0.00	0.27	0.031	O	|	|	|	0.45
36.667	0.00	0.25	0.029	O	|	|	|	0.42
36.750	0.00	0.24	0.027	O	|	|	|	0.40
36.833	0.00	0.22	0.025	O	|	|	|	0.37
36.917	0.00	0.21	0.024	O	|	|	|	0.35
37.000	0.00	0.20	0.023	O	|	|	|	0.33
37.083	0.00	0.19	0.021	O	|	|	|	0.31
37.167	0.00	0.18	0.020	O	|	|	|	0.29
37.250	0.00	0.17	0.019	O	|	|	|	0.28
37.333	0.00	0.16	0.018	O	|	|	|	0.26
37.417	0.00	0.15	0.017	O	|	|	|	0.24
37.500	0.00	0.14	0.016	O	|	|	|	0.23
37.583	0.00	0.13	0.015	O	|	|	|	0.22
37.667	0.00	0.12	0.014	O	|	|	|	0.20
37.750	0.00	0.12	0.013	O	|	|	|	0.19
37.833	0.00	0.11	0.012	O	|	|	|	0.18
37.917	0.00	0.10	0.012	O	|	|	|	0.17
38.000	0.00	0.10	0.011	O	|	|	|	0.16
38.083	0.00	0.09	0.010	O	|	|	|	0.15
38.167	0.00	0.09	0.010	O	|	|	|	0.14
38.250	0.00	0.08	0.009	O	|	|	|	0.13
38.333	0.00	0.08	0.009	O	|	|	|	0.13
38.417	0.00	0.07	0.008	O	|	|	|	0.12
38.500	0.00	0.07	0.008	O	|	|	|	0.11
38.583	0.00	0.06	0.007	O	|	|	|	0.10
38.667	0.00	0.06	0.007	O	|	|	|	0.10
38.750	0.00	0.06	0.006	O	|	|	|	0.09
38.833	0.00	0.05	0.006	O	|	|	|	0.09
38.917	0.00	0.05	0.006	O	|	|	|	0.08
39.000	0.00	0.05	0.005	O	|	|	|	0.08
39.083	0.00	0.04	0.005	O	|	|	|	0.07
39.167	0.00	0.04	0.005	O	|	|	|	0.07
39.250	0.00	0.04	0.004	O	|	|	|	0.06
39.333	0.00	0.04	0.004	O	|	|	|	0.06
39.417	0.00	0.03	0.004	O	|	|	|	0.06
39.500	0.00	0.03	0.004	O	|	|	|	0.05
39.583	0.00	0.03	0.003	O	|	|	|	0.05
39.667	0.00	0.03	0.003	O	|	|	|	0.05
39.750	0.00	0.03	0.003	O	|	|	|	0.04
39.833	0.00	0.03	0.003	O	|	|	|	0.04
39.917	0.00	0.02	0.003	O	|	|	|	0.04
40.000	0.00	0.02	0.003	O	|	|	|	0.04
40.083	0.00	0.02	0.002	O	|	|	|	0.04
40.167	0.00	0.02	0.002	O	|	|	|	0.03
40.250	0.00	0.02	0.002	O	|	|	|	0.03
40.333	0.00	0.02	0.002	O	|	|	|	0.03
40.417	0.00	0.02	0.002	O	|	|	|	0.03
40.500	0.00	0.02	0.002	O	|	|	|	0.03
40.583	0.00	0.01	0.002	O	|	|	|	0.02
40.667	0.00	0.01	0.002	O	|	|	|	0.02
40.750	0.00	0.01	0.001	O	|	|	|	0.02

40.833	0.00	0.01	0.001	O	|	|	|	|	0.02
40.917	0.00	0.01	0.001	O	|	|	|	|	0.02
41.000	0.00	0.01	0.001	O	|	|	|	|	0.02
41.083	0.00	0.01	0.001	O	|	|	|	|	0.02
41.167	0.00	0.01	0.001	O	|	|	|	|	0.02
41.250	0.00	0.01	0.001	O	|	|	|	|	0.01
41.333	0.00	0.01	0.001	O	|	|	|	|	0.01
41.417	0.00	0.01	0.001	O	|	|	|	|	0.01
41.500	0.00	0.01	0.001	O	|	|	|	|	0.01
41.583	0.00	0.01	0.001	O	|	|	|	|	0.01
41.667	0.00	0.01	0.001	O	|	|	|	|	0.01
41.750	0.00	0.01	0.001	O	|	|	|	|	0.01
41.833	0.00	0.01	0.001	O	|	|	|	|	0.01
41.917	0.00	0.01	0.001	O	|	|	|	|	0.01
42.000	0.00	0.01	0.001	O	|	|	|	|	0.01
42.083	0.00	0.00	0.001	O	|	|	|	|	0.01
42.167	0.00	0.00	0.001	O	|	|	|	|	0.01
42.250	0.00	0.00	0.000	O	|	|	|	|	0.01
42.333	0.00	0.00	0.000	O	|	|	|	|	0.01
42.417	0.00	0.00	0.000	O	|	|	|	|	0.01
42.500	0.00	0.00	0.000	O	|	|	|	|	0.01
42.583	0.00	0.00	0.000	O	|	|	|	|	0.01
42.667	0.00	0.00	0.000	O	|	|	|	|	0.01
42.750	0.00	0.00	0.000	O	|	|	|	|	0.01
42.833	0.00	0.00	0.000	O	|	|	|	|	0.00
42.917	0.00	0.00	0.000	O	|	|	|	|	0.00
43.000	0.00	0.00	0.000	O	|	|	|	|	0.00
43.083	0.00	0.00	0.000	O	|	|	|	|	0.00
43.167	0.00	0.00	0.000	O	|	|	|	|	0.00
43.250	0.00	0.00	0.000	O	|	|	|	|	0.00
43.333	0.00	0.00	0.000	O	|	|	|	|	0.00
43.417	0.00	0.00	0.000	O	|	|	|	|	0.00
43.500	0.00	0.00	0.000	O	|	|	|	|	0.00
43.583	0.00	0.00	0.000	O	|	|	|	|	0.00
43.667	0.00	0.00	0.000	O	|	|	|	|	0.00
43.750	0.00	0.00	0.000	O	|	|	|	|	0.00
43.833	0.00	0.00	0.000	O	|	|	|	|	0.00
43.917	0.00	0.00	0.000	O	|	|	|	|	0.00
44.000	0.00	0.00	0.000	O	|	|	|	|	0.00
44.083	0.00	0.00	0.000	O	|	|	|	|	0.00
44.167	0.00	0.00	0.000	O	|	|	|	|	0.00
44.250	0.00	0.00	0.000	O	|	|	|	|	0.00
44.333	0.00	0.00	0.000	O	|	|	|	|	0.00

**********HYDROGRAPH DATA**********

Number of intervals = 532
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 3.190 (CFS)
Total volume = 1.899 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

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Project: COVINGTON - MIP BUILDING 2

Detention/ Infiltration System Routing Study Summary

Stage Storage Number	Storage Depth (ft)	Elevation (ft)	Area (ft^2)	Incremental volume (ft^3)	Total Volume (ft^3)	Total Volume (acre-ft)	Outflow Q (cfs)	Notes
1	0.0	2,983.00	5,850	0	0	0	0	**Bottom of Infiltration System Rock**
2	0.5	2,983.50	5,850	1,170	1,170	0.027	0.34	**96" CMP Invert**
3	1.5	2,984.50	5,850	3,476	4,646	0.107	0.34	
4	2.5	2,985.50	5,850	4,282	8,928	0.205	0.34	
5	3.0	2,986.00	5,850	2,295	11,223	0.258	0.34	
6	3.25	2,986.25	5,850	1,173	12,396	0.285	0.34	System Releases Water @ 2986.25
7	4.25	2,987.25	5,850	4,794	17,191	0.395	1.72	
8	5.25	2,988.25	5,850	4,834	22,025	0.506	2.51	
9	7.50	2,990.50	5,850	8,055	30,080	0.691	3.67	
10	8.00	2,991.00	5,850	3,974	34,053	0.782	3.88	
11	9.00	2,992.00	5,850	2,750	36,803	0.845	4.25	**Top of Infiltration/ Detention System**
12	10.00	2,993.00	5,850	0	36,803	0.845	4.60	
13	11.00	2,994.00	5,850	0	36,803	0.845	4.92	
14	12.0	2,995.00	5,850	0	36,803	0.845	5.22	
96" CMP system with 6" rock top & bottom								

Infiltration System Bottom Area Discharge ($Q_{out,bottom}$)			
Infiltration Rate per Geo Tech Report (in/hr)		=	7.6
Factor of Safety			3
Unit Conversion (ft/sec)	$\frac{6.8\frac{in}{hr}}{3.25} \times \frac{1\ ft}{12\ in} \times \frac{1\ hr}{60\ min} \times \frac{1\ min}{60\ sec} =$		0.0000586
Infiltration System Footprint (ft^2)	130 ft x 45 ft	=	5,850
$Q_{out,bottom}$ (cfs)		=	**0.34**

*WQMP Design Capture Volume (DCV) is 12,182 CF

Basin Routing Summary Table

	100 YR 24 HR	10 YR 24HR
Proposed Q100(cfs) 5.71 ac	17.18	9.84
Q (cfs) after Routing	3.39	1.03
WSE (ft)	2989.95	2986.75

note: 0.34 cfs to infiltration

Storm Drain System Net Drainage (Q_{net})		
One 8-inch Outlet Pipe + Infiltration $Q_{out,bottom}$		
Orifice Eqn	$= C * A * \sqrt{2gh} + Q_{out,bottom}$	
	$= 0.6 \times A\sqrt{2 \times 32.2 \times h} + Q_{out,bottom}$	
A: Outlet pipe cross sectional area		
h: WSE - outlet pipe centerline elevation		
Example: WSE @ 1113.23 ft		
Q_{net}	$= C \times A\sqrt{2 \times 32.2 \times h} + Q_{out,bottom}$	
C		0.6
A (ft^2) = πr^2		0.35
WSE (ft)		2,994.00
Outlet Centerline (ft)		2986.583333
h (ft)		7.416666667
$Q_{out,bottom}$ (cfs)		0.34
Q_{net}	=	**4.92**

HUITT-ZOLLARS

FLOOD HYDROGRAPH ROUTING PROGRAM

Study date: 05/16/23

COVINGTON - MIP BUILDING 2
10 YEAR STORM EVENT BASIN ROUTING BUILDING 2
5712Q10ROUTING2
DS

Program License Serial Number 6145

********** HYDROGRAPH INFORMATION **********

From study/file name: 5712Q10PUH2.rte
**********HYDROGRAPH DATA**********
Number of intervals = 299
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 9.842 (CFS)
Total volume = 0.939 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

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Process from Point/Station 0.000 to Point/Station 0.000
**** RETARDING BASIN ROUTING ****

User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 299
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-O*dt/2) (Ac.Ft)	(S+O*dt/2) (Ac.Ft)
0.000	0.000	0.000	0.000	0.000
0.500	0.027	0.340	0.026	0.028
1.500	0.107	0.340	0.106	0.108
2.500	0.205	0.340	0.204	0.206
3.000	0.258	0.340	0.257	0.259
3.250	0.285	0.340	0.284	0.286
4.250	0.395	1.720	0.389	0.401

5.250	0.506	2.510	0.497	0.515
7.500	0.691	3.670	0.678	0.704
8.000	0.782	3.880	0.769	0.795
9.000	0.845	4.250	0.830	0.860
10.000	0.846	4.600	0.830	0.862
11.000	0.847	4.920	0.830	0.864
12.000	0.848	5.220	0.830	0.866

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0 2.5 4.92 7.38 9.84	Depth (Ft.)
0.083	0.01	0.00	0.000	O	0.00
0.167	0.09	0.00	0.000	O	0.01
0.250	0.14	0.01	0.001	O	0.02
0.333	0.16	0.03	0.002	O	0.04
0.417	0.18	0.04	0.003	O	0.06
0.500	0.19	0.05	0.004	O	0.07
0.583	0.19	0.06	0.005	O	0.09
0.667	0.20	0.07	0.006	O	0.11
0.750	0.20	0.08	0.007	O	0.12
0.833	0.20	0.09	0.007	O	0.14
0.917	0.20	0.10	0.008	O	0.15
1.000	0.20	0.11	0.009	O	0.16
1.083	0.21	0.12	0.009	O	0.17
1.167	0.21	0.13	0.010	O	0.18
1.250	0.21	0.13	0.010	O	0.19
1.333	0.21	0.14	0.011	O	0.20
1.417	0.21	0.14	0.011	O	0.21
1.500	0.21	0.15	0.012	O	0.22
1.583	0.21	0.15	0.012	O	0.23
1.667	0.21	0.16	0.013	O	0.23
1.750	0.21	0.16	0.013	O	0.24
1.833	0.21	0.17	0.013	O	0.25
1.917	0.21	0.17	0.014	O	0.25
2.000	0.21	0.17	0.014	O	0.26
2.083	0.21	0.18	0.014	O	0.26
2.167	0.21	0.18	0.014	O	0.27
2.250	0.21	0.18	0.015	O	0.27
2.333	0.22	0.19	0.015	O	0.27
2.417	0.22	0.19	0.015	O	0.28
2.500	0.22	0.19	0.015	O	0.28
2.583	0.22	0.19	0.015	O	0.28
2.667	0.22	0.20	0.016	O	0.29
2.750	0.22	0.20	0.016	O	0.29
2.833	0.22	0.20	0.016	O	0.29
2.917	0.22	0.20	0.016	O	0.30
3.000	0.22	0.20	0.016	O	0.30
3.083	0.22	0.20	0.016	O	0.30
3.167	0.22	0.21	0.016	O	0.30
3.250	0.22	0.21	0.016	O	0.30
3.333	0.23	0.21	0.017	O	0.31
3.417	0.23	0.21	0.017	O	0.31
3.500	0.23	0.21	0.017	O	0.31
3.583	0.23	0.21	0.017	O	0.31
3.667	0.23	0.21	0.017	O	0.31
3.750	0.23	0.22	0.017	O	0.32
3.833	0.23	0.22	0.017	O	0.32
3.917	0.23	0.22	0.017	O	0.32
4.000	0.23	0.22	0.017	O	0.32

4.083	0.23	0.22	0.017	O				0.32
4.167	0.23	0.22	0.018	O				0.33
4.250	0.23	0.22	0.018	O				0.33
4.333	0.24	0.22	0.018	O				0.33
4.417	0.24	0.22	0.018	O				0.33
4.500	0.24	0.23	0.018	O				0.33
4.583	0.24	0.23	0.018	O				0.33
4.667	0.24	0.23	0.018	O				0.33
4.750	0.24	0.23	0.018	O				0.34
4.833	0.24	0.23	0.018	O				0.34
4.917	0.24	0.23	0.018	O				0.34
5.000	0.24	0.23	0.018	O				0.34
5.083	0.24	0.23	0.018	O				0.34
5.167	0.25	0.23	0.019	O				0.34
5.250	0.25	0.23	0.019	O				0.34
5.333	0.25	0.24	0.019	O				0.35
5.417	0.25	0.24	0.019	O				0.35
5.500	0.25	0.24	0.019	O				0.35
5.583	0.25	0.24	0.019	O				0.35
5.667	0.25	0.24	0.019	O				0.35
5.750	0.25	0.24	0.019	O				0.35
5.833	0.25	0.24	0.019	O				0.36
5.917	0.26	0.24	0.019	O				0.36
6.000	0.26	0.24	0.019	O				0.36
6.083	0.26	0.25	0.019	O				0.36
6.167	0.26	0.25	0.020	O				0.36
6.250	0.26	0.25	0.020	O				0.36
6.333	0.26	0.25	0.020	O				0.37
6.417	0.26	0.25	0.020	O				0.37
6.500	0.26	0.25	0.020	O				0.37
6.583	0.27	0.25	0.020	O				0.37
6.667	0.27	0.25	0.020	O				0.37
6.750	0.27	0.25	0.020	O				0.37
6.833	0.27	0.26	0.020	O				0.38
6.917	0.27	0.26	0.020	O				0.38
7.000	0.27	0.26	0.020	O				0.38
7.083	0.27	0.26	0.021	O				0.38
7.167	0.27	0.26	0.021	O				0.38
7.250	0.28	0.26	0.021	O				0.38
7.333	0.28	0.26	0.021	O				0.39
7.417	0.28	0.26	0.021	O				0.39
7.500	0.28	0.27	0.021	O				0.39
7.583	0.28	0.27	0.021	O				0.39
7.667	0.28	0.27	0.021	O				0.39
7.750	0.29	0.27	0.021	O				0.40
7.833	0.29	0.27	0.021	O				0.40
7.917	0.29	0.27	0.022	O				0.40
8.000	0.29	0.27	0.022	O				0.40
8.083	0.29	0.27	0.022	O				0.40
8.167	0.29	0.28	0.022	O				0.41
8.250	0.29	0.28	0.022	O				0.41
8.333	0.30	0.28	0.022	O				0.41
8.417	0.30	0.28	0.022	O				0.41
8.500	0.30	0.28	0.022	O				0.42
8.583	0.30	0.28	0.023	O				0.42
8.667	0.30	0.29	0.023	O				0.42
8.750	0.31	0.29	0.023	O				0.42
8.833	0.31	0.29	0.023	OI				0.42
8.917	0.31	0.29	0.023	OI				0.43
9.000	0.31	0.29	0.023	OI				0.43
9.083	0.31	0.29	0.023	OI				0.43
9.167	0.32	0.30	0.023	OI				0.43
9.250	0.32	0.30	0.024	OI				0.44

9.333	0.32	0.30	0.024	OI					0.44
9.417	0.32	0.30	0.024	OI					0.44
9.500	0.32	0.30	0.024	OI					0.45
9.583	0.33	0.30	0.024	OI					0.45
9.667	0.33	0.31	0.024	OI					0.45
9.750	0.33	0.31	0.025	O					0.45
9.833	0.33	0.31	0.025	O					0.46
9.917	0.34	0.31	0.025	O					0.46
10.000	0.34	0.31	0.025	O					0.46
10.083	0.34	0.32	0.025	O					0.47
10.167	0.34	0.32	0.025	O					0.47
10.250	0.35	0.32	0.026	O					0.47
10.333	0.35	0.32	0.026	O					0.48
10.417	0.35	0.33	0.026	O					0.48
10.500	0.36	0.33	0.026	O					0.48
10.583	0.36	0.33	0.026	O					0.49
10.667	0.36	0.33	0.026	O					0.49
10.750	0.36	0.34	0.027	O					0.49
10.833	0.37	0.34	0.027	O					0.50
10.917	0.37	0.34	0.027	O					0.50
11.000	0.37	0.34	0.027	O					0.50
11.083	0.38	0.34	0.028	O					0.51
11.167	0.38	0.34	0.028	O					0.51
11.250	0.38	0.34	0.028	O					0.51
11.333	0.39	0.34	0.028	O					0.52
11.417	0.39	0.34	0.029	O					0.52
11.500	0.40	0.34	0.029	O					0.53
11.583	0.40	0.34	0.030	O					0.53
11.667	0.40	0.34	0.030	O					0.54
11.750	0.41	0.34	0.030	O					0.54
11.833	0.41	0.34	0.031	O					0.55
11.917	0.42	0.34	0.031	O					0.56
12.000	0.42	0.34	0.032	O					0.56
12.083	0.42	0.34	0.033	O					0.57
12.167	0.41	0.34	0.033	O					0.58
12.250	0.41	0.34	0.034	O					0.58
12.333	0.41	0.34	0.034	O					0.59
12.417	0.42	0.34	0.035	O					0.60
12.500	0.42	0.34	0.035	O					0.60
12.583	0.42	0.34	0.036	O					0.61
12.667	0.43	0.34	0.036	O					0.62
12.750	0.44	0.34	0.037	O					0.62
12.833	0.44	0.34	0.038	O					0.63
12.917	0.45	0.34	0.038	O					0.64
13.000	0.45	0.34	0.039	O					0.65
13.083	0.46	0.34	0.040	O					0.66
13.167	0.47	0.34	0.041	O					0.67
13.250	0.48	0.34	0.042	O					0.68
13.333	0.49	0.34	0.043	O					0.70
13.417	0.49	0.34	0.044	O					0.71
13.500	0.50	0.34	0.045	O					0.72
13.583	0.51	0.34	0.046	O					0.74
13.667	0.52	0.34	0.047	O					0.75
13.750	0.53	0.34	0.048	O					0.77
13.833	0.54	0.34	0.050	O					0.79
13.917	0.55	0.34	0.051	O					0.80
14.000	0.57	0.34	0.053	O					0.82
14.083	0.58	0.34	0.054	O					0.84
14.167	0.59	0.34	0.056	O					0.86
14.250	0.61	0.34	0.058	O					0.89
14.333	0.63	0.34	0.060	OI					0.91
14.417	0.64	0.34	0.062	OI					0.94
14.500	0.66	0.34	0.064	OI					0.96

14.583	0.68	0.34	0.066	OI				0.99
14.667	0.70	0.34	0.069	OI				1.02
14.750	0.72	0.34	0.071	OI				1.05
14.833	0.75	0.34	0.074	OI				1.09
14.917	0.78	0.34	0.077	OI				1.12
15.000	0.81	0.34	0.080	OI				1.16
15.083	0.84	0.34	0.083	OI				1.20
15.167	0.89	0.34	0.087	OI				1.25
15.250	0.93	0.34	0.091	O I				1.30
15.333	0.98	0.34	0.095	O I				1.35
15.417	1.02	0.34	0.100	O I				1.41
15.500	0.97	0.34	0.104	O I				1.47
15.583	0.98	0.34	0.109	O I				1.52
15.667	1.05	0.34	0.113	O I				1.56
15.750	1.15	0.34	0.118	O I				1.62
15.833	1.34	0.34	0.125	O I				1.68
15.917	1.62	0.34	0.133	O I				1.76
16.000	2.28	0.34	0.144	O I				1.87
16.083	4.25	0.34	0.164	O	I			2.08
16.167	9.84	0.34	0.210	O			I	2.55
16.250	6.69	0.34	0.265	O		I		3.06
16.333	3.77	0.50	0.298	O	I			3.36
16.417	2.63	0.72	0.316	O	I			3.53
16.500	2.07	0.86	0.326	O I				3.62
16.583	1.72	0.94	0.333	O I				3.69
16.667	1.43	1.00	0.337	OI				3.72
16.750	1.20	1.02	0.339	O				3.74
16.833	1.04	1.03	0.340	O				3.75
16.917	0.97	1.03	0.340	O				3.75
17.000	0.87	1.02	0.339	IO				3.74
17.083	0.71	1.00	0.338	IO				3.73
17.167	0.66	0.97	0.335	IO				3.71
17.250	0.62	0.95	0.333	IO				3.69
17.333	0.59	0.92	0.331	IO				3.67
17.417	0.56	0.89	0.329	IO				3.65
17.500	0.54	0.86	0.327	IO				3.63
17.583	0.52	0.83	0.324	IO				3.61
17.667	0.50	0.81	0.322	IO				3.59
17.750	0.48	0.78	0.320	IO				3.57
17.833	0.47	0.76	0.318	IO				3.55
17.917	0.45	0.73	0.316	IO				3.53
18.000	0.44	0.71	0.314	IO				3.52
18.083	0.43	0.68	0.312	IO				3.50
18.167	0.43	0.66	0.311	IO				3.48
18.250	0.43	0.64	0.309	IO				3.47
18.333	0.42	0.63	0.308	IO				3.46
18.417	0.42	0.61	0.306	O				3.44
18.500	0.41	0.59	0.305	O				3.43
18.583	0.40	0.58	0.304	O				3.42
18.667	0.39	0.56	0.303	O				3.41
18.750	0.39	0.55	0.302	O				3.40
18.833	0.38	0.53	0.300	O				3.39
18.917	0.37	0.52	0.299	O				3.38
19.000	0.37	0.51	0.298	O				3.37
19.083	0.36	0.50	0.297	O				3.36
19.167	0.35	0.48	0.297	O				3.35
19.250	0.35	0.47	0.296	O				3.35
19.333	0.34	0.46	0.295	O				3.34
19.417	0.34	0.45	0.294	O				3.33
19.500	0.33	0.44	0.293	O				3.32
19.583	0.33	0.43	0.292	O				3.32
19.667	0.32	0.42	0.292	O				3.31
19.750	0.32	0.42	0.291	O				3.31

19.833	0.31	0.41	0.290	|O	|	|	|	3.30
19.917	0.31	0.40	0.290	|O	|	|	|	3.29
20.000	0.31	0.39	0.289	IO	|	|	|	3.29
20.083	0.30	0.39	0.289	IO	|	|	|	3.28
20.167	0.30	0.38	0.288	IO	|	|	|	3.28
20.250	0.30	0.37	0.288	IO	|	|	|	3.27
20.333	0.29	0.37	0.287	IO	|	|	|	3.27
20.417	0.29	0.36	0.287	IO	|	|	|	3.26
20.500	0.29	0.35	0.286	IO	|	|	|	3.26
20.583	0.28	0.35	0.286	IO	|	|	|	3.26
20.667	0.28	0.34	0.285	IO	|	|	|	3.25
20.750	0.28	0.34	0.285	IO	|	|	|	3.25
20.833	0.27	0.34	0.284	IO	|	|	|	3.24
20.917	0.27	0.34	0.284	IO	|	|	|	3.24
21.000	0.27	0.34	0.283	IO	|	|	|	3.23
21.083	0.27	0.34	0.283	IO	|	|	|	3.23
21.167	0.26	0.34	0.282	IO	|	|	|	3.22
21.250	0.26	0.34	0.282	IO	|	|	|	3.22
21.333	0.26	0.34	0.281	IO	|	|	|	3.21
21.417	0.26	0.34	0.281	IO	|	|	|	3.21
21.500	0.25	0.34	0.280	IO	|	|	|	3.20
21.583	0.25	0.34	0.279	IO	|	|	|	3.20
21.667	0.25	0.34	0.279	IO	|	|	|	3.19
21.750	0.25	0.34	0.278	IO	|	|	|	3.19
21.833	0.24	0.34	0.278	IO	|	|	|	3.18
21.917	0.24	0.34	0.277	IO	|	|	|	3.17
22.000	0.24	0.34	0.276	IO	|	|	|	3.17
22.083	0.24	0.34	0.275	IO	|	|	|	3.16
22.167	0.24	0.34	0.275	IO	|	|	|	3.16
22.250	0.23	0.34	0.274	IO	|	|	|	3.15
22.333	0.23	0.34	0.273	IO	|	|	|	3.14
22.417	0.23	0.34	0.273	IO	|	|	|	3.14
22.500	0.23	0.34	0.272	IO	|	|	|	3.13
22.583	0.23	0.34	0.271	IO	|	|	|	3.12
22.667	0.23	0.34	0.270	IO	|	|	|	3.11
22.750	0.22	0.34	0.269	IO	|	|	|	3.11
22.833	0.22	0.34	0.269	IO	|	|	|	3.10
22.917	0.22	0.34	0.268	IO	|	|	|	3.09
23.000	0.22	0.34	0.267	IO	|	|	|	3.08
23.083	0.22	0.34	0.266	IO	|	|	|	3.08
23.167	0.22	0.34	0.265	IO	|	|	|	3.07
23.250	0.22	0.34	0.265	IO	|	|	|	3.06
23.333	0.21	0.34	0.264	IO	|	|	|	3.05
23.417	0.21	0.34	0.263	IO	|	|	|	3.04
23.500	0.21	0.34	0.262	IO	|	|	|	3.04
23.583	0.21	0.34	0.261	IO	|	|	|	3.03
23.667	0.21	0.34	0.260	IO	|	|	|	3.02
23.750	0.21	0.34	0.259	IO	|	|	|	3.01
23.833	0.21	0.34	0.258	IO	|	|	|	3.00
23.917	0.20	0.34	0.257	IO	|	|	|	2.99
24.000	0.20	0.34	0.256	IO	|	|	|	2.99
24.083	0.19	0.34	0.255	IO	|	|	|	2.98
24.167	0.11	0.34	0.254	IO	|	|	|	2.96
24.250	0.06	0.34	0.252	IO	|	|	|	2.95
24.333	0.04	0.34	0.250	IO	|	|	|	2.93
24.417	0.02	0.34	0.248	IO	|	|	|	2.91
24.500	0.02	0.34	0.246	IO	|	|	|	2.89
24.583	0.01	0.34	0.244	IO	|	|	|	2.87
24.667	0.01	0.34	0.241	IO	|	|	|	2.84
24.750	0.00	0.34	0.239	IO	|	|	|	2.82
24.833	0.00	0.34	0.237	IO	|	|	|	2.80
24.917	0.00	0.34	0.234	IO	|	|	|	2.78
25.000	0.00	0.34	0.232	IO	|	|	|	2.76

25.083	0.00	0.34	0.230	IO				2.73
25.167	0.00	0.34	0.227	IO				2.71
25.250	0.00	0.34	0.225	IO				2.69
25.333	0.00	0.34	0.223	IO				2.67
25.417	0.00	0.34	0.220	IO				2.65
25.500	0.00	0.34	0.218	IO				2.62
25.583	0.00	0.34	0.216	IO				2.60
25.667	0.00	0.34	0.213	IO				2.58
25.750	0.00	0.34	0.211	IO				2.56
25.833	0.00	0.34	0.209	IO				2.54
25.917	0.00	0.34	0.206	IO				2.51
26.000	0.00	0.34	0.204	IO				2.49
26.083	0.00	0.34	0.202	IO				2.47
26.167	0.00	0.34	0.199	IO				2.44
26.250	0.00	0.34	0.197	IO				2.42
26.333	0.00	0.34	0.195	IO				2.39
26.417	0.00	0.34	0.192	IO				2.37
26.500	0.00	0.34	0.190	IO				2.35
26.583	0.00	0.34	0.188	IO				2.32
26.667	0.00	0.34	0.185	IO				2.30
26.750	0.00	0.34	0.183	IO				2.28
26.833	0.00	0.34	0.181	IO				2.25
26.917	0.00	0.34	0.178	IO				2.23
27.000	0.00	0.34	0.176	IO				2.20
27.083	0.00	0.34	0.174	IO				2.18
27.167	0.00	0.34	0.171	IO				2.16
27.250	0.00	0.34	0.169	IO				2.13
27.333	0.00	0.34	0.167	IO				2.11
27.417	0.00	0.34	0.164	IO				2.08
27.500	0.00	0.34	0.162	IO				2.06
27.583	0.00	0.34	0.160	IO				2.04
27.667	0.00	0.34	0.157	IO				2.01
27.750	0.00	0.34	0.155	IO				1.99
27.833	0.00	0.34	0.153	IO				1.96
27.917	0.00	0.34	0.150	IO				1.94
28.000	0.00	0.34	0.148	IO				1.92
28.083	0.00	0.34	0.146	IO				1.89
28.167	0.00	0.34	0.143	IO				1.87
28.250	0.00	0.34	0.141	IO				1.85
28.333	0.00	0.34	0.138	IO				1.82
28.417	0.00	0.34	0.136	IO				1.80
28.500	0.00	0.34	0.134	IO				1.77
28.583	0.00	0.34	0.131	IO				1.75
28.667	0.00	0.34	0.129	IO				1.73
28.750	0.00	0.34	0.127	IO				1.70
28.833	0.00	0.34	0.124	IO				1.68
28.917	0.00	0.34	0.122	IO				1.65
29.000	0.00	0.34	0.120	IO				1.63
29.083	0.00	0.34	0.117	IO				1.61
29.167	0.00	0.34	0.115	IO				1.58
29.250	0.00	0.34	0.113	IO				1.56
29.333	0.00	0.34	0.110	IO				1.53
29.417	0.00	0.34	0.108	IO				1.51
29.500	0.00	0.34	0.106	IO				1.48
29.583	0.00	0.34	0.103	IO				1.45
29.667	0.00	0.34	0.101	IO				1.43
29.750	0.00	0.34	0.099	IO				1.40
29.833	0.00	0.34	0.096	IO				1.37
29.917	0.00	0.34	0.094	IO				1.34
30.000	0.00	0.34	0.092	IO				1.31
30.083	0.00	0.34	0.089	IO				1.28
30.167	0.00	0.34	0.087	IO				1.25
30.250	0.00	0.34	0.085	IO				1.22

30.333	0.00	0.34	0.082	IO				1.19
30.417	0.00	0.34	0.080	IO				1.16
30.500	0.00	0.34	0.078	IO				1.13
30.583	0.00	0.34	0.075	IO				1.10
30.667	0.00	0.34	0.073	IO				1.07
30.750	0.00	0.34	0.071	IO				1.04
30.833	0.00	0.34	0.068	IO				1.02
30.917	0.00	0.34	0.066	IO				0.99
31.000	0.00	0.34	0.064	IO				0.96
31.083	0.00	0.34	0.061	IO				0.93
31.167	0.00	0.34	0.059	IO				0.90
31.250	0.00	0.34	0.057	IO				0.87
31.333	0.00	0.34	0.054	IO				0.84
31.417	0.00	0.34	0.052	IO				0.81
31.500	0.00	0.34	0.049	IO				0.78
31.583	0.00	0.34	0.047	IO				0.75
31.667	0.00	0.34	0.045	IO				0.72
31.750	0.00	0.34	0.042	IO				0.69
31.833	0.00	0.34	0.040	IO				0.66
31.917	0.00	0.34	0.038	IO				0.63
32.000	0.00	0.34	0.035	IO				0.61
32.083	0.00	0.34	0.033	IO				0.58
32.167	0.00	0.34	0.031	IO				0.55
32.250	0.00	0.34	0.028	IO				0.52
32.333	0.00	0.33	0.026	IO				0.48
32.417	0.00	0.30	0.024	O				0.44
32.500	0.00	0.28	0.022	O				0.41
32.583	0.00	0.25	0.020	O				0.37
32.667	0.00	0.23	0.018	O				0.34
32.750	0.00	0.21	0.017	O				0.31
32.833	0.00	0.20	0.016	O				0.29
32.917	0.00	0.18	0.014	O				0.26
33.000	0.00	0.16	0.013	O				0.24
33.083	0.00	0.15	0.012	O				0.22
33.167	0.00	0.14	0.011	O				0.20
33.250	0.00	0.13	0.010	O				0.19
33.333	0.00	0.12	0.009	O				0.17
33.417	0.00	0.11	0.008	O				0.16
33.500	0.00	0.10	0.008	O				0.14
33.583	0.00	0.09	0.007	O				0.13
33.667	0.00	0.08	0.007	O				0.12
33.750	0.00	0.08	0.006	O				0.11
33.833	0.00	0.07	0.005	O				0.10
33.917	0.00	0.06	0.005	O				0.09
34.000	0.00	0.06	0.005	O				0.09
34.083	0.00	0.05	0.004	O				0.08
34.167	0.00	0.05	0.004	O				0.07
34.250	0.00	0.04	0.004	O				0.07
34.333	0.00	0.04	0.003	O				0.06
34.417	0.00	0.04	0.003	O				0.06
34.500	0.00	0.03	0.003	O				0.05
34.583	0.00	0.03	0.003	O				0.05
34.667	0.00	0.03	0.002	O				0.04
34.750	0.00	0.03	0.002	O				0.04
34.833	0.00	0.02	0.002	O				0.04
34.917	0.00	0.02	0.002	O				0.03
35.000	0.00	0.02	0.002	O				0.03
35.083	0.00	0.02	0.001	O				0.03
35.167	0.00	0.02	0.001	O				0.03
35.250	0.00	0.02	0.001	O				0.02
35.333	0.00	0.01	0.001	O				0.02
35.417	0.00	0.01	0.001	O				0.02
35.500	0.00	0.01	0.001	O				0.02

35.583	0.00	0.01	0.001	O	|	|	|	|	0.02
35.667	0.00	0.01	0.001	O	|	|	|	|	0.02
35.750	0.00	0.01	0.001	O	|	|	|	|	0.01
35.833	0.00	0.01	0.001	O	|	|	|	|	0.01
35.917	0.00	0.01	0.001	O	|	|	|	|	0.01
36.000	0.00	0.01	0.001	O	|	|	|	|	0.01
36.083	0.00	0.01	0.001	O	|	|	|	|	0.01
36.167	0.00	0.01	0.000	O	|	|	|	|	0.01
36.250	0.00	0.01	0.000	O	|	|	|	|	0.01
36.333	0.00	0.01	0.000	O	|	|	|	|	0.01
36.417	0.00	0.00	0.000	O	|	|	|	|	0.01
36.500	0.00	0.00	0.000	O	|	|	|	|	0.01
36.583	0.00	0.00	0.000	O	|	|	|	|	0.01
36.667	0.00	0.00	0.000	O	|	|	|	|	0.01
36.750	0.00	0.00	0.000	O	|	|	|	|	0.00
36.833	0.00	0.00	0.000	O	|	|	|	|	0.00
36.917	0.00	0.00	0.000	O	|	|	|	|	0.00
37.000	0.00	0.00	0.000	O	|	|	|	|	0.00
37.083	0.00	0.00	0.000	O	|	|	|	|	0.00
37.167	0.00	0.00	0.000	O	|	|	|	|	0.00
37.250	0.00	0.00	0.000	O	|	|	|	|	0.00
37.333	0.00	0.00	0.000	O	|	|	|	|	0.00
37.417	0.00	0.00	0.000	O	|	|	|	|	0.00
37.500	0.00	0.00	0.000	O	|	|	|	|	0.00
37.583	0.00	0.00	0.000	O	|	|	|	|	0.00
37.667	0.00	0.00	0.000	O	|	|	|	|	0.00
37.750	0.00	0.00	0.000	O	|	|	|	|	0.00
37.833	0.00	0.00	0.000	O	|	|	|	|	0.00
37.917	0.00	0.00	0.000	O	|	|	|	|	0.00

**********HYDROGRAPH DATA**********

Number of intervals = 455
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 1.030 (CFS)
Total volume = 0.939 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
Study date: 05/16/23

COVINGTON - MIP BUILDING 2
100 YEAR STORM EVENT BASIN ROUTING BUILDING 2
5712Q100ROUTING2
DS

Program License Serial Number 6145

********** HYDROGRAPH INFORMATION **********

From study/file name: 5712Q100PUH2.rte
**********HYDROGRAPH DATA**********
Number of intervals = 299
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 17.175 (CFS)
Total volume = 1.746 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

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Process from Point/Station 0.000 to Point/Station 0.000
**** RETARDING BASIN ROUTING ****
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User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 299
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-O*dt/2) (Ac.Ft)	(S+O*dt/2) (Ac.Ft)
0.000	0.000	0.000	0.000	0.000
0.500	0.027	0.340	0.026	0.028
1.500	0.107	0.340	0.106	0.108
2.500	0.205	0.340	0.204	0.206
3.000	0.258	0.340	0.257	0.259
3.250	0.285	0.340	0.284	0.286
4.250	0.395	1.720	0.389	0.401

5.250	0.506	2.510	0.497	0.515
7.500	0.691	3.670	0.678	0.704
8.000	0.782	3.880	0.769	0.795
9.000	0.845	4.250	0.830	0.860
10.000	0.846	4.600	0.830	0.862
11.000	0.847	4.920	0.830	0.864
12.000	0.848	5.220	0.830	0.866

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0 4.3 8.59 12.88 17.18	Depth (Ft.)
0.083	0.03	0.00	0.000	O | | | |	0.00
0.167	0.18	0.01	0.001	O | | | |	0.01
0.250	0.28	0.03	0.002	O | | | |	0.04
0.333	0.32	0.05	0.004	O | | | |	0.07
0.417	0.34	0.07	0.006	O | | | |	0.11
0.500	0.36	0.10	0.008	O | | | |	0.14
0.583	0.37	0.12	0.009	O | | | |	0.18
0.667	0.38	0.14	0.011	O | | | |	0.21
0.750	0.38	0.16	0.013	O | | | |	0.24
0.833	0.39	0.18	0.014	O | | | |	0.26
0.917	0.39	0.20	0.016	O | | | |	0.29
1.000	0.40	0.21	0.017	O | | | |	0.31
1.083	0.40	0.23	0.018	O | | | |	0.34
1.167	0.40	0.24	0.019	O | | | |	0.36
1.250	0.40	0.26	0.020	O | | | |	0.38
1.333	0.40	0.27	0.021	O | | | |	0.39
1.417	0.40	0.28	0.022	O | | | |	0.41
1.500	0.40	0.29	0.023	O | | | |	0.43
1.583	0.40	0.30	0.024	O | | | |	0.44
1.667	0.41	0.31	0.024	O | | | |	0.45
1.750	0.41	0.32	0.025	O | | | |	0.46
1.833	0.41	0.32	0.026	O | | | |	0.48
1.917	0.41	0.33	0.026	O | | | |	0.49
2.000	0.41	0.34	0.027	O | | | |	0.50
2.083	0.41	0.34	0.027	O | | | |	0.50
2.167	0.41	0.34	0.028	O | | | |	0.51
2.250	0.42	0.34	0.028	O | | | |	0.52
2.333	0.42	0.34	0.029	O | | | |	0.52
2.417	0.42	0.34	0.029	O | | | |	0.53
2.500	0.42	0.34	0.030	O | | | |	0.54
2.583	0.42	0.34	0.030	O | | | |	0.54
2.667	0.42	0.34	0.031	O | | | |	0.55
2.750	0.42	0.34	0.032	O | | | |	0.56
2.833	0.43	0.34	0.032	O | | | |	0.56
2.917	0.43	0.34	0.033	O | | | |	0.57
3.000	0.43	0.34	0.033	O | | | |	0.58
3.083	0.43	0.34	0.034	O | | | |	0.59
3.167	0.43	0.34	0.035	O | | | |	0.60
3.250	0.43	0.34	0.035	O | | | |	0.60
3.333	0.43	0.34	0.036	O | | | |	0.61
3.417	0.44	0.34	0.037	O | | | |	0.62
3.500	0.44	0.34	0.037	O | | | |	0.63
3.583	0.44	0.34	0.038	O | | | |	0.64
3.667	0.44	0.34	0.039	O | | | |	0.64
3.750	0.44	0.34	0.039	O | | | |	0.65
3.833	0.44	0.34	0.040	O | | | |	0.66
3.917	0.45	0.34	0.041	O | | | |	0.67
4.000	0.45	0.34	0.041	O | | | |	0.68

4.083	0.45	0.34	0.042	O				0.69
4.167	0.45	0.34	0.043	O				0.70
4.250	0.45	0.34	0.044	O				0.71
4.333	0.45	0.34	0.045	O				0.72
4.417	0.46	0.34	0.045	O				0.73
4.500	0.46	0.34	0.046	O				0.74
4.583	0.46	0.34	0.047	O				0.75
4.667	0.46	0.34	0.048	O				0.76
4.750	0.46	0.34	0.049	O				0.77
4.833	0.47	0.34	0.049	O				0.78
4.917	0.47	0.34	0.050	O				0.79
5.000	0.47	0.34	0.051	O				0.80
5.083	0.47	0.34	0.052	O				0.81
5.167	0.47	0.34	0.053	O				0.83
5.250	0.47	0.34	0.054	O				0.84
5.333	0.48	0.34	0.055	O				0.85
5.417	0.48	0.34	0.056	O				0.86
5.500	0.48	0.34	0.057	O				0.87
5.583	0.48	0.34	0.058	O				0.88
5.667	0.49	0.34	0.059	O				0.90
5.750	0.49	0.34	0.060	O				0.91
5.833	0.49	0.34	0.061	O				0.92
5.917	0.49	0.34	0.062	O				0.94
6.000	0.49	0.34	0.063	O				0.95
6.083	0.50	0.34	0.064	O				0.96
6.167	0.50	0.34	0.065	O				0.98
6.250	0.50	0.34	0.066	O				0.99
6.333	0.50	0.34	0.067	O				1.00
6.417	0.51	0.34	0.068	O				1.02
6.500	0.51	0.34	0.069	O				1.03
6.583	0.51	0.34	0.071	O				1.05
6.667	0.51	0.34	0.072	O				1.06
6.750	0.51	0.34	0.073	O				1.08
6.833	0.52	0.34	0.074	O				1.09
6.917	0.52	0.34	0.075	O				1.11
7.000	0.52	0.34	0.077	O				1.12
7.083	0.52	0.34	0.078	O				1.14
7.167	0.53	0.34	0.079	O				1.15
7.250	0.53	0.34	0.081	O				1.17
7.333	0.53	0.34	0.082	O				1.19
7.417	0.54	0.34	0.083	O				1.20
7.500	0.54	0.34	0.085	OI				1.22
7.583	0.54	0.34	0.086	OI				1.24
7.667	0.54	0.34	0.087	OI				1.25
7.750	0.55	0.34	0.089	OI				1.27
7.833	0.55	0.34	0.090	OI				1.29
7.917	0.55	0.34	0.092	OI				1.31
8.000	0.56	0.34	0.093	OI				1.33
8.083	0.56	0.34	0.095	OI				1.35
8.167	0.56	0.34	0.096	OI				1.36
8.250	0.57	0.34	0.098	OI				1.38
8.333	0.57	0.34	0.099	OI				1.40
8.417	0.57	0.34	0.101	OI				1.42
8.500	0.58	0.34	0.103	OI				1.44
8.583	0.58	0.34	0.104	OI				1.46
8.667	0.58	0.34	0.106	OI				1.49
8.750	0.59	0.34	0.107	OI				1.50
8.833	0.59	0.34	0.109	OI				1.52
8.917	0.59	0.34	0.111	OI				1.54
9.000	0.60	0.34	0.113	OI				1.56
9.083	0.60	0.34	0.114	OI				1.58
9.167	0.61	0.34	0.116	OI				1.59
9.250	0.61	0.34	0.118	OI				1.61

9.333	0.61	0.34	0.120	OI				1.63
9.417	0.62	0.34	0.122	OI				1.65
9.500	0.62	0.34	0.124	OI				1.67
9.583	0.63	0.34	0.126	OI				1.69
9.667	0.63	0.34	0.128	OI				1.71
9.750	0.63	0.34	0.130	OI				1.73
9.833	0.64	0.34	0.132	OI				1.75
9.917	0.64	0.34	0.134	OI				1.77
10.000	0.65	0.34	0.136	OI				1.80
10.083	0.65	0.34	0.138	OI				1.82
10.167	0.66	0.34	0.140	OI				1.84
10.250	0.66	0.34	0.143	OI				1.86
10.333	0.67	0.34	0.145	OI				1.89
10.417	0.67	0.34	0.147	OI				1.91
10.500	0.68	0.34	0.149	OI				1.93
10.583	0.68	0.34	0.152	OI				1.96
10.667	0.69	0.34	0.154	OI				1.98
10.750	0.70	0.34	0.157	OI				2.01
10.833	0.70	0.34	0.159	OI				2.03
10.917	0.71	0.34	0.162	OI				2.06
11.000	0.71	0.34	0.164	OI				2.08
11.083	0.72	0.34	0.167	OI				2.11
11.167	0.73	0.34	0.169	OI				2.14
11.250	0.73	0.34	0.172	OI				2.16
11.333	0.74	0.34	0.175	OI				2.19
11.417	0.75	0.34	0.178	OI				2.22
11.500	0.76	0.34	0.180	OI				2.25
11.583	0.76	0.34	0.183	OI				2.28
11.667	0.77	0.34	0.186	OI				2.31
11.750	0.78	0.34	0.189	OI				2.34
11.833	0.79	0.34	0.192	OI				2.37
11.917	0.79	0.34	0.195	OI				2.40
12.000	0.80	0.34	0.199	OI				2.43
12.083	0.80	0.34	0.202	OI				2.47
12.167	0.77	0.34	0.205	OI				2.50
12.250	0.75	0.34	0.208	OI				2.53
12.333	0.75	0.34	0.211	OI				2.55
12.417	0.75	0.34	0.213	OI				2.58
12.500	0.76	0.34	0.216	OI				2.61
12.583	0.77	0.34	0.219	OI				2.63
12.667	0.78	0.34	0.222	OI				2.66
12.750	0.79	0.34	0.225	OI				2.69
12.833	0.80	0.34	0.228	OI				2.72
12.917	0.81	0.34	0.232	OI				2.75
13.000	0.82	0.34	0.235	OI				2.78
13.083	0.83	0.34	0.238	OI				2.81
13.167	0.85	0.34	0.242	OI				2.85
13.250	0.86	0.34	0.245	OI				2.88
13.333	0.88	0.34	0.249	OI				2.91
13.417	0.89	0.34	0.253	OI				2.95
13.500	0.91	0.34	0.256	OI				2.99
13.583	0.93	0.34	0.260	OI				3.02
13.667	0.95	0.34	0.265	OI				3.06
13.750	0.96	0.34	0.269	OI				3.10
13.833	0.98	0.34	0.273	OI				3.14
13.917	1.00	0.34	0.278	OI				3.18
14.000	1.03	0.34	0.282	OI				3.22
14.083	1.05	0.37	0.287	OI				3.27
14.167	1.08	0.42	0.292	O I				3.31
14.250	1.10	0.48	0.296	O I				3.35
14.333	1.14	0.53	0.300	O I				3.39
14.417	1.17	0.58	0.304	|OI				3.43
14.500	1.20	0.63	0.308	|OI				3.46

14.583	1.24	0.68	0.312	OI				3.50
14.667	1.28	0.73	0.316	OI				3.53
14.750	1.32	0.78	0.320	OI				3.57
14.833	1.37	0.82	0.324	OI				3.60
14.917	1.42	0.87	0.327	OI				3.63
15.000	1.48	0.92	0.331	OI				3.67
15.083	1.55	0.97	0.335	OI				3.70
15.167	1.63	1.02	0.339	O I				3.74
15.250	1.71	1.07	0.343	O I				3.78
15.333	1.82	1.13	0.348	OI				3.82
15.417	1.90	1.19	0.353	OI				3.87
15.500	1.83	1.25	0.357	OI				3.91
15.583	1.85	1.30	0.361	OI				3.94
15.667	2.01	1.35	0.365	OI				3.98
15.750	2.22	1.41	0.371	O I				4.03
15.833	2.59	1.50	0.377	O I				4.09
15.917	3.11	1.61	0.386	O I				4.17
16.000	4.25	1.75	0.400	O I				4.29
16.083	7.63	1.95	0.428	O	I			4.55
16.167	17.18	2.45	0.498	O			I	5.18
16.250	11.79	2.97	0.579	O		I		6.14
16.333	6.79	3.24	0.622	O	I			6.66
16.417	4.79	3.34	0.639	O I				6.87
16.500	3.78	3.38	0.645	OI				6.94
16.583	3.14	3.39	0.646	IO				6.95
16.667	2.62	3.37	0.642	I O				6.91
16.750	2.20	3.32	0.636	I O				6.83
16.833	1.90	3.27	0.627	I O				6.73
16.917	1.76	3.21	0.618	I O				6.61
17.000	1.58	3.14	0.607	I O				6.48
17.083	1.29	3.07	0.596	I O				6.34
17.167	1.20	2.99	0.583	I O				6.19
17.250	1.13	2.92	0.571	I O				6.04
17.333	1.08	2.84	0.559	I O				5.89
17.417	1.02	2.77	0.547	I O				5.74
17.500	0.98	2.69	0.535	I O				5.60
17.583	0.94	2.62	0.523	I O				5.46
17.667	0.90	2.55	0.512	I O				5.32
17.750	0.87	2.47	0.501	I O				5.20
17.833	0.84	2.39	0.490	I O				5.10
17.917	0.82	2.32	0.479	I O				5.01
18.000	0.79	2.25	0.469	I O				4.92
18.083	0.78	2.18	0.459	I O				4.83
18.167	0.80	2.11	0.450	I O				4.74
18.250	0.80	2.05	0.441	I O				4.66
18.333	0.80	1.99	0.433	I O				4.59
18.417	0.79	1.93	0.425	I O				4.52
18.500	0.77	1.88	0.417	I O				4.45
18.583	0.76	1.82	0.409	I O				4.38
18.667	0.75	1.77	0.402	I O				4.31
18.750	0.73	1.72	0.395	I O				4.25
18.833	0.72	1.64	0.389	I O				4.19
18.917	0.71	1.56	0.383	IO				4.14
19.000	0.70	1.49	0.377	IO				4.09
19.083	0.69	1.43	0.372	IO				4.04
19.167	0.68	1.37	0.367	IO				3.99
19.250	0.67	1.31	0.362	IO				3.95
19.333	0.66	1.25	0.358	IO				3.91
19.417	0.65	1.20	0.354	IO				3.88
19.500	0.64	1.16	0.350	IO				3.84
19.583	0.63	1.11	0.347	IO				3.81
19.667	0.62	1.07	0.343	O				3.78
19.750	0.61	1.04	0.340	O				3.75

19.833	0.60	1.00	0.338	|O	|	|	|	3.73
19.917	0.60	0.97	0.335	|O	|	|	|	3.70
20.000	0.59	0.94	0.332	|O	|	|	|	3.68
20.083	0.58	0.91	0.330	|O	|	|	|	3.66
20.167	0.57	0.88	0.328	|O	|	|	|	3.64
20.250	0.57	0.85	0.326	|O	|	|	|	3.62
20.333	0.56	0.83	0.324	|O	|	|	|	3.60
20.417	0.55	0.81	0.322	|O	|	|	|	3.59
20.500	0.55	0.79	0.321	|O	|	|	|	3.57
20.583	0.54	0.77	0.319	|O	|	|	|	3.56
20.667	0.54	0.75	0.317	|O	|	|	|	3.55
20.750	0.53	0.73	0.316	IO	|	|	|	3.53
20.833	0.53	0.71	0.315	IO	|	|	|	3.52
20.917	0.52	0.70	0.313	IO	|	|	|	3.51
21.000	0.52	0.68	0.312	IO	|	|	|	3.50
21.083	0.51	0.67	0.311	IO	|	|	|	3.49
21.167	0.51	0.66	0.310	IO	|	|	|	3.48
21.250	0.50	0.64	0.309	IO	|	|	|	3.47
21.333	0.50	0.63	0.308	IO	|	|	|	3.46
21.417	0.49	0.62	0.307	IO	|	|	|	3.45
21.500	0.49	0.61	0.306	IO	|	|	|	3.44
21.583	0.48	0.60	0.306	IO	|	|	|	3.44
21.667	0.48	0.59	0.305	IO	|	|	|	3.43
21.750	0.48	0.58	0.304	IO	|	|	|	3.42
21.833	0.47	0.57	0.303	IO	|	|	|	3.42
21.917	0.47	0.56	0.303	IO	|	|	|	3.41
22.000	0.46	0.55	0.302	IO	|	|	|	3.41
22.083	0.46	0.55	0.301	IO	|	|	|	3.40
22.167	0.46	0.54	0.301	IO	|	|	|	3.39
22.250	0.45	0.53	0.300	O	|	|	|	3.39
22.333	0.45	0.53	0.300	O	|	|	|	3.38
22.417	0.45	0.52	0.299	O	|	|	|	3.38
22.500	0.44	0.51	0.299	O	|	|	|	3.38
22.583	0.44	0.51	0.298	O	|	|	|	3.37
22.667	0.44	0.50	0.298	O	|	|	|	3.37
22.750	0.43	0.50	0.297	O	|	|	|	3.36
22.833	0.43	0.49	0.297	O	|	|	|	3.36
22.917	0.43	0.49	0.297	O	|	|	|	3.36
23.000	0.42	0.48	0.296	O	|	|	|	3.35
23.083	0.42	0.48	0.296	O	|	|	|	3.35
23.167	0.42	0.47	0.295	O	|	|	|	3.35
23.250	0.42	0.47	0.295	O	|	|	|	3.34
23.333	0.41	0.46	0.295	O	|	|	|	3.34
23.417	0.41	0.46	0.294	O	|	|	|	3.34
23.500	0.41	0.45	0.294	O	|	|	|	3.33
23.583	0.41	0.45	0.294	O	|	|	|	3.33
23.667	0.40	0.45	0.293	O	|	|	|	3.33
23.750	0.40	0.44	0.293	O	|	|	|	3.32
23.833	0.40	0.44	0.293	O	|	|	|	3.32
23.917	0.40	0.44	0.293	O	|	|	|	3.32
24.000	0.39	0.43	0.292	O	|	|	|	3.32
24.083	0.36	0.43	0.292	O	|	|	|	3.31
24.167	0.21	0.42	0.291	O	|	|	|	3.31
24.250	0.11	0.39	0.289	O	|	|	|	3.29
24.333	0.07	0.37	0.287	O	|	|	|	3.27
24.417	0.05	0.34	0.285	O	|	|	|	3.25
24.500	0.03	0.34	0.283	O	|	|	|	3.23
24.583	0.02	0.34	0.281	O	|	|	|	3.21
24.667	0.01	0.34	0.279	O	|	|	|	3.19
24.750	0.01	0.34	0.277	O	|	|	|	3.17
24.833	0.01	0.34	0.274	O	|	|	|	3.15
24.917	0.00	0.34	0.272	O	|	|	|	3.13
25.000	0.00	0.34	0.270	O	|	|	|	3.11

25.083	0.00	0.34	0.267	O				3.09
25.167	0.00	0.34	0.265	O				3.06
25.250	0.00	0.34	0.263	O				3.04
25.333	0.00	0.34	0.260	O				3.02
25.417	0.00	0.34	0.258	O				3.00
25.500	0.00	0.34	0.256	O				2.98
25.583	0.00	0.34	0.253	O				2.95
25.667	0.00	0.34	0.251	O				2.93
25.750	0.00	0.34	0.249	O				2.91
25.833	0.00	0.34	0.246	O				2.89
25.917	0.00	0.34	0.244	O				2.87
26.000	0.00	0.34	0.242	O				2.84
26.083	0.00	0.34	0.239	O				2.82
26.167	0.00	0.34	0.237	O				2.80
26.250	0.00	0.34	0.234	O				2.78
26.333	0.00	0.34	0.232	O				2.76
26.417	0.00	0.34	0.230	O				2.73
26.500	0.00	0.34	0.227	O				2.71
26.583	0.00	0.34	0.225	O				2.69
26.667	0.00	0.34	0.223	O				2.67
26.750	0.00	0.34	0.220	O				2.65
26.833	0.00	0.34	0.218	O				2.62
26.917	0.00	0.34	0.216	O				2.60
27.000	0.00	0.34	0.213	O				2.58
27.083	0.00	0.34	0.211	O				2.56
27.167	0.00	0.34	0.209	O				2.54
27.250	0.00	0.34	0.206	O				2.51
27.333	0.00	0.34	0.204	O				2.49
27.417	0.00	0.34	0.202	O				2.47
27.500	0.00	0.34	0.199	O				2.44
27.583	0.00	0.34	0.197	O				2.42
27.667	0.00	0.34	0.195	O				2.39
27.750	0.00	0.34	0.192	O				2.37
27.833	0.00	0.34	0.190	O				2.35
27.917	0.00	0.34	0.188	O				2.32
28.000	0.00	0.34	0.185	O				2.30
28.083	0.00	0.34	0.183	O				2.28
28.167	0.00	0.34	0.181	O				2.25
28.250	0.00	0.34	0.178	O				2.23
28.333	0.00	0.34	0.176	O				2.20
28.417	0.00	0.34	0.174	O				2.18
28.500	0.00	0.34	0.171	O				2.16
28.583	0.00	0.34	0.169	O				2.13
28.667	0.00	0.34	0.167	O				2.11
28.750	0.00	0.34	0.164	O				2.08
28.833	0.00	0.34	0.162	O				2.06
28.917	0.00	0.34	0.160	O				2.04
29.000	0.00	0.34	0.157	O				2.01
29.083	0.00	0.34	0.155	O				1.99
29.167	0.00	0.34	0.153	O				1.96
29.250	0.00	0.34	0.150	O				1.94
29.333	0.00	0.34	0.148	O				1.92
29.417	0.00	0.34	0.145	O				1.89
29.500	0.00	0.34	0.143	O				1.87
29.583	0.00	0.34	0.141	O				1.85
29.667	0.00	0.34	0.138	O				1.82
29.750	0.00	0.34	0.136	O				1.80
29.833	0.00	0.34	0.134	O				1.77
29.917	0.00	0.34	0.131	O				1.75
30.000	0.00	0.34	0.129	O				1.73
30.083	0.00	0.34	0.127	O				1.70
30.167	0.00	0.34	0.124	O				1.68
30.250	0.00	0.34	0.122	O				1.65

30.333	0.00	0.34	0.120	O	|	|	|	1.63
30.417	0.00	0.34	0.117	O	|	|	|	1.61
30.500	0.00	0.34	0.115	O	|	|	|	1.58
30.583	0.00	0.34	0.113	O	|	|	|	1.56
30.667	0.00	0.34	0.110	O	|	|	|	1.53
30.750	0.00	0.34	0.108	O	|	|	|	1.51
30.833	0.00	0.34	0.106	O	|	|	|	1.48
30.917	0.00	0.34	0.103	O	|	|	|	1.45
31.000	0.00	0.34	0.101	O	|	|	|	1.43
31.083	0.00	0.34	0.099	O	|	|	|	1.40
31.167	0.00	0.34	0.096	O	|	|	|	1.37
31.250	0.00	0.34	0.094	O	|	|	|	1.34
31.333	0.00	0.34	0.092	O	|	|	|	1.31
31.417	0.00	0.34	0.089	O	|	|	|	1.28
31.500	0.00	0.34	0.087	O	|	|	|	1.25
31.583	0.00	0.34	0.085	O	|	|	|	1.22
31.667	0.00	0.34	0.082	O	|	|	|	1.19
31.750	0.00	0.34	0.080	O	|	|	|	1.16
31.833	0.00	0.34	0.078	O	|	|	|	1.13
31.917	0.00	0.34	0.075	O	|	|	|	1.10
32.000	0.00	0.34	0.073	O	|	|	|	1.07
32.083	0.00	0.34	0.071	O	|	|	|	1.04
32.167	0.00	0.34	0.068	O	|	|	|	1.02
32.250	0.00	0.34	0.066	O	|	|	|	0.99
32.333	0.00	0.34	0.064	O	|	|	|	0.96
32.417	0.00	0.34	0.061	O	|	|	|	0.93
32.500	0.00	0.34	0.059	O	|	|	|	0.90
32.583	0.00	0.34	0.057	O	|	|	|	0.87
32.667	0.00	0.34	0.054	O	|	|	|	0.84
32.750	0.00	0.34	0.052	O	|	|	|	0.81
32.833	0.00	0.34	0.049	O	|	|	|	0.78
32.917	0.00	0.34	0.047	O	|	|	|	0.75
33.000	0.00	0.34	0.045	O	|	|	|	0.72
33.083	0.00	0.34	0.042	O	|	|	|	0.69
33.167	0.00	0.34	0.040	O	|	|	|	0.66
33.250	0.00	0.34	0.038	O	|	|	|	0.63
33.333	0.00	0.34	0.035	O	|	|	|	0.61
33.417	0.00	0.34	0.033	O	|	|	|	0.58
33.500	0.00	0.34	0.031	O	|	|	|	0.55
33.583	0.00	0.34	0.028	O	|	|	|	0.52
33.667	0.00	0.33	0.026	O	|	|	|	0.48
33.750	0.00	0.30	0.024	O	|	|	|	0.44
33.833	0.00	0.28	0.022	O	|	|	|	0.41
33.917	0.00	0.25	0.020	O	|	|	|	0.37
34.000	0.00	0.23	0.018	O	|	|	|	0.34
34.083	0.00	0.21	0.017	O	|	|	|	0.31
34.167	0.00	0.20	0.016	O	|	|	|	0.29
34.250	0.00	0.18	0.014	O	|	|	|	0.26
34.333	0.00	0.16	0.013	O	|	|	|	0.24
34.417	0.00	0.15	0.012	O	|	|	|	0.22
34.500	0.00	0.14	0.011	O	|	|	|	0.20
34.583	0.00	0.13	0.010	O	|	|	|	0.19
34.667	0.00	0.12	0.009	O	|	|	|	0.17
34.750	0.00	0.11	0.008	O	|	|	|	0.16
34.833	0.00	0.10	0.008	O	|	|	|	0.14
34.917	0.00	0.09	0.007	O	|	|	|	0.13
35.000	0.00	0.08	0.007	O	|	|	|	0.12
35.083	0.00	0.08	0.006	O	|	|	|	0.11
35.167	0.00	0.07	0.005	O	|	|	|	0.10
35.250	0.00	0.06	0.005	O	|	|	|	0.09
35.333	0.00	0.06	0.005	O	|	|	|	0.09
35.417	0.00	0.05	0.004	O	|	|	|	0.08
35.500	0.00	0.05	0.004	O	|	|	|	0.07

35.583	0.00	0.04	0.004	O	|	|	|	|	0.07
35.667	0.00	0.04	0.003	O	|	|	|	|	0.06
35.750	0.00	0.04	0.003	O	|	|	|	|	0.06
35.833	0.00	0.03	0.003	O	|	|	|	|	0.05
35.917	0.00	0.03	0.003	O	|	|	|	|	0.05
36.000	0.00	0.03	0.002	O	|	|	|	|	0.04
36.083	0.00	0.03	0.002	O	|	|	|	|	0.04
36.167	0.00	0.02	0.002	O	|	|	|	|	0.04
36.250	0.00	0.02	0.002	O	|	|	|	|	0.03
36.333	0.00	0.02	0.002	O	|	|	|	|	0.03
36.417	0.00	0.02	0.001	O	|	|	|	|	0.03
36.500	0.00	0.02	0.001	O	|	|	|	|	0.03
36.583	0.00	0.02	0.001	O	|	|	|	|	0.02
36.667	0.00	0.01	0.001	O	|	|	|	|	0.02
36.750	0.00	0.01	0.001	O	|	|	|	|	0.02
36.833	0.00	0.01	0.001	O	|	|	|	|	0.02
36.917	0.00	0.01	0.001	O	|	|	|	|	0.02
37.000	0.00	0.01	0.001	O	|	|	|	|	0.02
37.083	0.00	0.01	0.001	O	|	|	|	|	0.01
37.167	0.00	0.01	0.001	O	|	|	|	|	0.01
37.250	0.00	0.01	0.001	O	|	|	|	|	0.01
37.333	0.00	0.01	0.001	O	|	|	|	|	0.01
37.417	0.00	0.01	0.001	O	|	|	|	|	0.01
37.500	0.00	0.01	0.000	O	|	|	|	|	0.01
37.583	0.00	0.01	0.000	O	|	|	|	|	0.01
37.667	0.00	0.01	0.000	O	|	|	|	|	0.01
37.750	0.00	0.00	0.000	O	|	|	|	|	0.01
37.833	0.00	0.00	0.000	O	|	|	|	|	0.01
37.917	0.00	0.00	0.000	O	|	|	|	|	0.01
38.000	0.00	0.00	0.000	O	|	|	|	|	0.01
38.083	0.00	0.00	0.000	O	|	|	|	|	0.00
38.167	0.00	0.00	0.000	O	|	|	|	|	0.00
38.250	0.00	0.00	0.000	O	|	|	|	|	0.00
38.333	0.00	0.00	0.000	O	|	|	|	|	0.00
38.417	0.00	0.00	0.000	O	|	|	|	|	0.00
38.500	0.00	0.00	0.000	O	|	|	|	|	0.00
38.583	0.00	0.00	0.000	O	|	|	|	|	0.00
38.667	0.00	0.00	0.000	O	|	|	|	|	0.00
38.750	0.00	0.00	0.000	O	|	|	|	|	0.00
38.833	0.00	0.00	0.000	O	|	|	|	|	0.00
38.917	0.00	0.00	0.000	O	|	|	|	|	0.00
39.000	0.00	0.00	0.000	O	|	|	|	|	0.00
39.083	0.00	0.00	0.000	O	|	|	|	|	0.00
39.167	0.00	0.00	0.000	O	|	|	|	|	0.00
39.250	0.00	0.00	0.000	O	|	|	|	|	0.00

**********HYDROGRAPH DATA**********

Number of intervals = 471
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 3.387 (CFS)
Total volume = 1.746 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

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Project: COVINGTON - MIP BUILDING 3

Detention/ Infiltration System Routing Study Summary

Stage Storage Number	Storage Depth (ft)	Elevation (ft)	Area (ft^2)	Incremental volume (ft^3)	Total Volume (ft^3)	Total Volume (acre-ft)	Outflow Q (cfs)	Notes
1	0.0	2,965.00	55,590	0	0	0	0	**Bottom of Infiltration System Rock**
2	0.5	2,965.50	55,590	11,118	11,118	0.255	2.27	**108" CMP Invert**
3	1.5	2,966.50	55,590	32,868	43,986	1.010	2.27	
4	2.5	2,967.50	55,590	40,569	84,555	1.941	2.27	
5	3.00	2,968.00	55,590	21,831	106,386	2.442	2.27	
6	4.25	2,969.25	55,590	57,154	163,541	3.754	2.27	System Releases Water @ 2969.25
7	6.00	2,971.00	55,590	81,959	245,500	5.636	13.11	
8	6.50	2,971.50	55,590	23,006	268,505	6.164	15.85	
9	7.50	2,972.50	55,590	44,349	312,854	7.182	20.12	
10	8.50	2,973.50	55,590	40,569	353,423	8.113	23.55	
11	9.50	2,974.50	55,590	32,868	386,291	8.868	26.50	
12	10.00	2,975.00	55,590	11,118	397,409	9.123	27.84	**Top of Infiltration/ Detention System**
13	11.00	2,976.00	55,590	0	397,409	9.123	30.34	
14	12.0	2,977.00	55,590	0	397,409	9.123	32.64	

108" CMP system with 6" rock top & bottom

Infiltration System Bottom Area Discharge ($Q_{out,bottom}$)			
Infiltration Rate per Geo Tech Report (in/hr)		=	5.3
Factor of Safety			3
Unit Conversion (ft/sec)	$\frac{6.8\frac{in}{hr}}{3.25} \times \frac{1\ ft}{12\ in} \times \frac{1\ hr}{60\ min} \times \frac{1\ min}{60\ sec} =$		0.0000409
Infiltration System Footprint (ft^2)	654 ft x 85 ft	=	55,590
$Q_{out,bottom}$ (cfs)		=	**2.27**

*WQMP Design Capture Volume (DCV) is 130,209 CF

Basin Routing Summary Table

	100 YR 24 HR	10 YR 24 HR
Proposed Q100(cfs) 75.9 ac	169.07	93.04
Q (cfs) after Routing	26.38	8.27
WSE (ft)	2974.46	2970.22

note: 2.27 cfs to infiltration

Storm Drain System Net Drainage (Q_{net})		
One 21-inch Outlet Pipe + Infiltration $Q_{out,bottom}$		
Orifice Eqn	$= C * A * \sqrt{2gh} + Q_{out,bottom}$	
	$= 0.6 \times A\sqrt{2 \times 32.2 \times h} + Q_{out,bottom}$	
A: Outlet pipe cross sectional area		
h: WSE - outlet pipe centerline elevation		
Example: WSE @ 1113.23 ft		
Q_{net}	$= C \times A\sqrt{2 \times 32.2 \times h} + Q_{out,bottom}$	
C		0.6
A (ft^2) = πr^2		2.41
WSE (ft)		2,976.00
Outlet Centerline (ft)		2970.125
h (ft)		5.875
$Q_{out,bottom\ (cfs)}$		2.27
Q_{net}	=	**30.34**

HUITT-ZOLLARS

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
Study date: 05/01/23

COVINGTON - MIP BUILDING 3
10 YEAR STORM EVENT BASIN ROUTING BUILDING 3
5712Q10ROUTING3
DS

Program License Serial Number 6145

********** HYDROGRAPH INFORMATION **********

From study/file name: 5712Q10PUH3.rte
**********HYDROGRAPH DATA**********
Number of intervals = 301
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 93.036 (CFS)
Total volume = 10.060 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

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Process from Point/Station 0.000 to Point/Station 0.000
**** RETARDING BASIN ROUTING ****
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User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 301
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-O*dt/2) (Ac.Ft)	(S+O*dt/2) (Ac.Ft)
0.000	0.000	0.000	0.000	0.000
0.500	0.255	2.270	0.247	0.263
1.500	1.010	2.270	1.002	1.018
2.500	1.941	2.270	1.933	1.949
3.000	2.442	2.270	2.434	2.450
4.250	3.754	2.270	3.746	3.762
6.000	5.636	13.110	5.591	5.681

6.500	6.164	15.850	6.109	6.219
7.500	7.182	20.120	7.113	7.251
8.500	8.113	23.550	8.032	8.194
9.500	8.868	26.500	8.777	8.959
10.000	9.123	27.840	9.027	9.219
11.000	9.124	30.340	9.020	9.228
12.000	9.125	32.640	9.013	9.237

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0	23.3	46.52	69.78	93.04	Depth (Ft.)
0.083	0.11	0.00	0.000	O	|	|	|	|	0.00
0.167	0.83	0.03	0.003	O	|	|	|	|	0.01
0.250	1.42	0.10	0.011	O	|	|	|	|	0.02
0.333	1.68	0.18	0.021	O	|	|	|	|	0.04
0.417	1.83	0.28	0.031	O	|	|	|	|	0.06
0.500	1.93	0.37	0.042	O	|	|	|	|	0.08
0.583	2.01	0.47	0.052	O	|	|	|	|	0.10
0.667	2.06	0.56	0.063	O	|	|	|	|	0.12
0.750	2.10	0.65	0.073	O	|	|	|	|	0.14
0.833	2.13	0.74	0.083	O	|	|	|	|	0.16
0.917	2.15	0.82	0.092	O	|	|	|	|	0.18
1.000	2.17	0.90	0.101	O	|	|	|	|	0.20
1.083	2.19	0.98	0.110	O	|	|	|	|	0.22
1.167	2.21	1.05	0.118	O	|	|	|	|	0.23
1.250	2.21	1.12	0.126	O	|	|	|	|	0.25
1.333	2.22	1.18	0.133	O	|	|	|	|	0.26
1.417	2.23	1.25	0.140	O	|	|	|	|	0.27
1.500	2.24	1.30	0.147	O	|	|	|	|	0.29
1.583	2.24	1.36	0.153	O	|	|	|	|	0.30
1.667	2.25	1.41	0.159	O	|	|	|	|	0.31
1.750	2.26	1.46	0.164	O	|	|	|	|	0.32
1.833	2.26	1.51	0.170	O	|	|	|	|	0.33
1.917	2.27	1.56	0.175	O	|	|	|	|	0.34
2.000	2.28	1.60	0.180	O	|	|	|	|	0.35
2.083	2.29	1.64	0.184	O	|	|	|	|	0.36
2.167	2.29	1.68	0.188	O	|	|	|	|	0.37
2.250	2.30	1.71	0.193	O	|	|	|	|	0.38
2.333	2.31	1.75	0.197	O	|	|	|	|	0.39
2.417	2.32	1.78	0.200	O	|	|	|	|	0.39
2.500	2.33	1.82	0.204	O	|	|	|	|	0.40
2.583	2.33	1.85	0.207	O	|	|	|	|	0.41
2.667	2.34	1.88	0.211	O	|	|	|	|	0.41
2.750	2.35	1.90	0.214	O	|	|	|	|	0.42
2.833	2.36	1.93	0.217	O	|	|	|	|	0.43
2.917	2.37	1.96	0.220	O	|	|	|	|	0.43
3.000	2.38	1.98	0.223	O	|	|	|	|	0.44
3.083	2.38	2.00	0.225	O	|	|	|	|	0.44
3.167	2.39	2.03	0.228	O	|	|	|	|	0.45
3.250	2.40	2.05	0.230	O	|	|	|	|	0.45
3.333	2.41	2.07	0.233	O	|	|	|	|	0.46
3.417	2.42	2.09	0.235	O	|	|	|	|	0.46
3.500	2.43	2.11	0.237	O	|	|	|	|	0.46
3.583	2.44	2.13	0.239	O	|	|	|	|	0.47
3.667	2.45	2.15	0.241	O	|	|	|	|	0.47
3.750	2.45	2.17	0.243	O	|	|	|	|	0.48
3.833	2.46	2.18	0.245	O	|	|	|	|	0.48
3.917	2.47	2.20	0.247	O	|	|	|	|	0.48
4.000	2.48	2.22	0.249	O	|	|	|	|	0.49

4.083	2.49	2.23	0.251	O				0.49
4.167	2.50	2.25	0.253	O				0.50
4.250	2.51	2.26	0.254	O				0.50
4.333	2.52	2.27	0.256	O				0.50
4.417	2.53	2.27	0.258	O				0.50
4.500	2.54	2.27	0.260	O				0.51
4.583	2.55	2.27	0.262	O				0.51
4.667	2.56	2.27	0.264	O				0.51
4.750	2.57	2.27	0.266	O				0.51
4.833	2.58	2.27	0.268	O				0.52
4.917	2.59	2.27	0.270	O				0.52
5.000	2.60	2.27	0.272	O				0.52
5.083	2.62	2.27	0.275	O				0.53
5.167	2.63	2.27	0.277	O				0.53
5.250	2.64	2.27	0.279	O				0.53
5.333	2.65	2.27	0.282	O				0.54
5.417	2.66	2.27	0.285	O				0.54
5.500	2.67	2.27	0.287	O				0.54
5.583	2.68	2.27	0.290	O				0.55
5.667	2.70	2.27	0.293	O				0.55
5.750	2.71	2.27	0.296	O				0.55
5.833	2.72	2.27	0.299	O				0.56
5.917	2.73	2.27	0.302	O				0.56
6.000	2.75	2.27	0.305	O				0.57
6.083	2.76	2.27	0.309	O				0.57
6.167	2.77	2.27	0.312	O				0.58
6.250	2.78	2.27	0.316	O				0.58
6.333	2.80	2.27	0.319	O				0.59
6.417	2.81	2.27	0.323	O				0.59
6.500	2.82	2.27	0.327	O				0.59
6.583	2.84	2.27	0.331	O				0.60
6.667	2.85	2.27	0.335	O				0.61
6.750	2.86	2.27	0.339	O				0.61
6.833	2.88	2.27	0.343	O				0.62
6.917	2.89	2.27	0.347	O				0.62
7.000	2.91	2.27	0.351	OI				0.63
7.083	2.92	2.27	0.356	OI				0.63
7.167	2.94	2.27	0.360	OI				0.64
7.250	2.95	2.27	0.365	OI				0.65
7.333	2.97	2.27	0.370	OI				0.65
7.417	2.98	2.27	0.375	OI				0.66
7.500	3.00	2.27	0.380	OI				0.67
7.583	3.02	2.27	0.385	OI				0.67
7.667	3.03	2.27	0.390	OI				0.68
7.750	3.05	2.27	0.395	OI				0.69
7.833	3.07	2.27	0.401	OI				0.69
7.917	3.08	2.27	0.406	OI				0.70
8.000	3.10	2.27	0.412	OI				0.71
8.083	3.12	2.27	0.418	OI				0.72
8.167	3.14	2.27	0.424	OI				0.72
8.250	3.16	2.27	0.430	OI				0.73
8.333	3.18	2.27	0.436	OI				0.74
8.417	3.19	2.27	0.442	OI				0.75
8.500	3.21	2.27	0.448	OI				0.76
8.583	3.23	2.27	0.455	OI				0.76
8.667	3.25	2.27	0.462	OI				0.77
8.750	3.27	2.27	0.469	OI				0.78
8.833	3.29	2.27	0.476	OI				0.79
8.917	3.31	2.27	0.483	OI				0.80
9.000	3.34	2.27	0.490	OI				0.81
9.083	3.36	2.27	0.497	OI				0.82
9.167	3.38	2.27	0.505	OI				0.83
9.250	3.40	2.27	0.513	OI				0.84

9.333	3.43	2.27	0.521	OI				0.85
9.417	3.45	2.27	0.529	OI				0.86
9.500	3.47	2.27	0.537	OI				0.87
9.583	3.50	2.27	0.545	OI				0.88
9.667	3.52	2.27	0.554	OI				0.90
9.750	3.55	2.27	0.562	OI				0.91
9.833	3.57	2.27	0.571	OI				0.92
9.917	3.60	2.27	0.580	OI				0.93
10.000	3.63	2.27	0.590	OI				0.94
10.083	3.65	2.27	0.599	OI				0.96
10.167	3.68	2.27	0.609	OI				0.97
10.250	3.71	2.27	0.619	OI				0.98
10.333	3.74	2.27	0.629	OI				0.99
10.417	3.77	2.27	0.639	OI				1.01
10.500	3.80	2.27	0.649	OI				1.02
10.583	3.83	2.27	0.660	OI				1.04
10.667	3.87	2.27	0.671	OI				1.05
10.750	3.90	2.27	0.682	OI				1.07
10.833	3.93	2.27	0.693	OI				1.08
10.917	3.97	2.27	0.705	OI				1.10
11.000	4.00	2.27	0.717	OI				1.11
11.083	4.04	2.27	0.729	OI				1.13
11.167	4.07	2.27	0.741	OI				1.14
11.250	4.11	2.27	0.753	OI				1.16
11.333	4.15	2.27	0.766	OI				1.18
11.417	4.19	2.27	0.779	OI				1.19
11.500	4.23	2.27	0.793	OI				1.21
11.583	4.27	2.27	0.806	OI				1.23
11.667	4.32	2.27	0.820	OI				1.25
11.750	4.36	2.27	0.835	OI				1.27
11.833	4.41	2.27	0.849	OI				1.29
11.917	4.46	2.27	0.864	OI				1.31
12.000	4.51	2.27	0.879	OI				1.33
12.083	4.54	2.27	0.895	OI				1.35
12.167	4.46	2.27	0.910	OI				1.37
12.250	4.41	2.27	0.925	OI				1.39
12.333	4.42	2.27	0.940	OI				1.41
12.417	4.45	2.27	0.955	OI				1.43
12.500	4.49	2.27	0.970	OI				1.45
12.583	4.54	2.27	0.985	OI				1.47
12.667	4.59	2.27	1.001	OI				1.49
12.750	4.65	2.27	1.017	OI				1.51
12.833	4.72	2.27	1.034	OI				1.53
12.917	4.78	2.27	1.051	OI				1.54
13.000	4.85	2.27	1.069	OI				1.56
13.083	4.93	2.27	1.087	OI				1.58
13.167	5.01	2.27	1.105	OI				1.60
13.250	5.09	2.27	1.124	OI				1.62
13.333	5.17	2.27	1.144	OI				1.64
13.417	5.26	2.27	1.164	OI				1.67
13.500	5.36	2.27	1.185	OI				1.69
13.583	5.46	2.27	1.207	OI				1.71
13.667	5.56	2.27	1.229	OI				1.74
13.750	5.67	2.27	1.252	OI				1.76
13.833	5.79	2.27	1.276	OI				1.79
13.917	5.91	2.27	1.301	O I				1.81
14.000	6.04	2.27	1.326	O I				1.84
14.083	6.18	2.27	1.353	O I				1.87
14.167	6.34	2.27	1.380	O I				1.90
14.250	6.50	2.27	1.409	O I				1.93
14.333	6.68	2.27	1.439	O I				1.96
14.417	6.85	2.27	1.470	O I				1.99
14.500	7.05	2.27	1.502	O I				2.03

14.583	7.25	2.27	1.535	O I	2.06
14.667	7.49	2.27	1.571	O I	2.10
14.750	7.72	2.27	1.607	O I	2.14
14.833	8.00	2.27	1.646	O I	2.18
14.917	8.29	2.27	1.686	O I	2.23
15.000	8.63	2.27	1.729	O I	2.27
15.083	8.98	2.27	1.774	O I	2.32
15.167	9.40	2.27	1.821	O I	2.37
15.250	9.85	2.27	1.872	O I	2.43
15.333	10.40	2.27	1.926	O I	2.48
15.417	10.83	2.27	1.984	O I	2.54
15.500	10.49	2.27	2.041	O I	2.60
15.583	10.40	2.27	2.098	O I	2.66
15.667	11.06	2.27	2.156	O I	2.71
15.750	12.07	2.27	2.220	O I	2.78
15.833	13.83	2.27	2.294	O I	2.85
15.917	16.59	2.27	2.383	O I	2.94
16.000	22.72	2.27	2.502	O I	3.06
16.083	40.43	2.27	2.704	O I	3.25
16.167	93.04	2.27	3.148	O I	3.67
16.250	77.65	2.27	3.720	O I	4.22
16.333	43.46	4.35	4.115	O I	4.59
16.417	30.12	5.61	4.334	O I	4.79
16.500	23.82	6.44	4.478	O I	4.92
16.583	19.64	7.03	4.581	O I	5.02
16.667	16.65	7.47	4.656	O I	5.09
16.750	14.25	7.78	4.710	O I	5.14
16.833	12.24	7.99	4.747	O I	5.17
16.917	10.60	8.12	4.770	OI	5.19
17.000	9.90	8.21	4.785	OI	5.21
17.083	9.08	8.26	4.793	OI	5.22
17.167	8.12	8.27	4.796	O	5.22
17.250	6.89	8.24	4.790	O	5.21
17.333	6.50	8.18	4.780	O	5.20
17.417	6.19	8.11	4.768	O	5.19
17.500	5.91	8.03	4.754	O	5.18
17.583	5.66	7.94	4.739	IO	5.17
17.667	5.44	7.85	4.722	IO	5.15
17.750	5.25	7.75	4.706	IO	5.13
17.833	5.07	7.65	4.688	IO	5.12
17.917	4.90	7.55	4.670	IO	5.10
18.000	4.75	7.44	4.652	IO	5.08
18.083	4.64	7.33	4.633	IO	5.07
18.167	4.64	7.23	4.615	IO	5.05
18.250	4.62	7.13	4.597	IO	5.03
18.333	4.55	7.03	4.580	IO	5.02
18.417	4.48	6.93	4.563	IO	5.00
18.500	4.40	6.83	4.546	IO	4.99
18.583	4.31	6.74	4.530	IO	4.97
18.667	4.24	6.64	4.513	IO	4.96
18.750	4.16	6.55	4.497	IO	4.94
18.833	4.08	6.45	4.480	IO	4.93
18.917	4.01	6.36	4.464	IO	4.91
19.000	3.94	6.27	4.448	IO	4.90
19.083	3.88	6.17	4.432	IO	4.88
19.167	3.82	6.08	4.416	IO	4.87
19.250	3.75	5.99	4.401	IO	4.85
19.333	3.70	5.91	4.385	IO	4.84
19.417	3.64	5.82	4.370	IO	4.82
19.500	3.59	5.73	4.355	O	4.81
19.583	3.53	5.65	4.341	O	4.80
19.667	3.48	5.57	4.326	O	4.78
19.750	3.44	5.48	4.312	O	4.77

19.833	3.39	5.40	4.298	|O	|	|	|	4.76
19.917	3.35	5.32	4.284	|O	|	|	|	4.74
20.000	3.30	5.25	4.271	|O	|	|	|	4.73
20.083	3.26	5.17	4.257	|O	|	|	|	4.72
20.167	3.22	5.09	4.244	|O	|	|	|	4.71
20.250	3.18	5.02	4.232	|O	|	|	|	4.69
20.333	3.15	4.95	4.219	|O	|	|	|	4.68
20.417	3.11	4.88	4.207	|O	|	|	|	4.67
20.500	3.07	4.81	4.195	|O	|	|	|	4.66
20.583	3.04	4.74	4.183	|O	|	|	|	4.65
20.667	3.01	4.67	4.171	|O	|	|	|	4.64
20.750	2.98	4.61	4.160	|O	|	|	|	4.63
20.833	2.94	4.54	4.149	|O	|	|	|	4.62
20.917	2.91	4.48	4.138	|O	|	|	|	4.61
21.000	2.88	4.42	4.127	IO	|	|	|	4.60
21.083	2.86	4.36	4.117	IO	|	|	|	4.59
21.167	2.83	4.30	4.107	IO	|	|	|	4.58
21.250	2.80	4.24	4.096	IO	|	|	|	4.57
21.333	2.78	4.19	4.087	IO	|	|	|	4.56
21.417	2.75	4.13	4.077	IO	|	|	|	4.55
21.500	2.72	4.08	4.068	IO	|	|	|	4.54
21.583	2.70	4.02	4.058	IO	|	|	|	4.53
21.667	2.68	3.97	4.049	IO	|	|	|	4.52
21.750	2.65	3.92	4.041	IO	|	|	|	4.52
21.833	2.63	3.87	4.032	IO	|	|	|	4.51
21.917	2.61	3.82	4.023	IO	|	|	|	4.50
22.000	2.59	3.77	4.015	IO	|	|	|	4.49
22.083	2.57	3.73	4.007	IO	|	|	|	4.49
22.167	2.55	3.68	3.999	IO	|	|	|	4.48
22.250	2.52	3.64	3.991	IO	|	|	|	4.47
22.333	2.51	3.59	3.984	IO	|	|	|	4.46
22.417	2.49	3.55	3.976	IO	|	|	|	4.46
22.500	2.47	3.51	3.969	IO	|	|	|	4.45
22.583	2.45	3.47	3.962	IO	|	|	|	4.44
22.667	2.43	3.43	3.955	IO	|	|	|	4.44
22.750	2.41	3.39	3.948	IO	|	|	|	4.43
22.833	2.39	3.35	3.942	IO	|	|	|	4.42
22.917	2.38	3.31	3.935	IO	|	|	|	4.42
23.000	2.36	3.28	3.929	IO	|	|	|	4.41
23.083	2.34	3.24	3.923	IO	|	|	|	4.41
23.167	2.33	3.21	3.916	IO	|	|	|	4.40
23.250	2.31	3.17	3.910	IO	|	|	|	4.40
23.333	2.30	3.14	3.905	IO	|	|	|	4.39
23.417	2.28	3.10	3.899	IO	|	|	|	4.38
23.500	2.27	3.07	3.893	IO	|	|	|	4.38
23.583	2.25	3.04	3.888	IO	|	|	|	4.37
23.667	2.24	3.01	3.882	IO	|	|	|	4.37
23.750	2.22	2.98	3.877	IO	|	|	|	4.36
23.833	2.21	2.95	3.872	IO	|	|	|	4.36
23.917	2.20	2.92	3.867	IO	|	|	|	4.36
24.000	2.18	2.89	3.862	O	|	|	|	4.35
24.083	2.06	2.86	3.857	O	|	|	|	4.35
24.167	1.33	2.82	3.849	O	|	|	|	4.34
24.250	0.73	2.75	3.837	O	|	|	|	4.33
24.333	0.48	2.66	3.822	O	|	|	|	4.31
24.417	0.33	2.58	3.807	O	|	|	|	4.30
24.500	0.23	2.49	3.792	O	|	|	|	4.28
24.583	0.16	2.40	3.776	O	|	|	|	4.27
24.667	0.11	2.31	3.761	O	|	|	|	4.26
24.750	0.07	2.27	3.746	O	|	|	|	4.24
24.833	0.05	2.27	3.731	O	|	|	|	4.23
24.917	0.04	2.27	3.715	O	|	|	|	4.21
25.000	0.02	2.27	3.700	O	|	|	|	4.20

25.083	0.01	2.27	3.684	O	|	|	|	|	4.18
25.167	0.00	2.27	3.669	O	|	|	|	|	4.17
25.250	0.00	2.27	3.653	O	|	|	|	|	4.15
25.333	0.00	2.27	3.637	O	|	|	|	|	4.14
25.417	0.00	2.27	3.622	O	|	|	|	|	4.12
25.500	0.00	2.27	3.606	O	|	|	|	|	4.11
25.583	0.00	2.27	3.590	O	|	|	|	|	4.09
25.667	0.00	2.27	3.575	O	|	|	|	|	4.08
25.750	0.00	2.27	3.559	O	|	|	|	|	4.06
25.833	0.00	2.27	3.544	O	|	|	|	|	4.05
25.917	0.00	2.27	3.528	O	|	|	|	|	4.03
26.000	0.00	2.27	3.512	O	|	|	|	|	4.02
26.083	0.00	2.27	3.497	O	|	|	|	|	4.00
26.167	0.00	2.27	3.481	O	|	|	|	|	3.99
26.250	0.00	2.27	3.465	O	|	|	|	|	3.97
26.333	0.00	2.27	3.450	O	|	|	|	|	3.96
26.417	0.00	2.27	3.434	O	|	|	|	|	3.95
26.500	0.00	2.27	3.418	O	|	|	|	|	3.93
26.583	0.00	2.27	3.403	O	|	|	|	|	3.92
26.667	0.00	2.27	3.387	O	|	|	|	|	3.90
26.750	0.00	2.27	3.372	O	|	|	|	|	3.89
26.833	0.00	2.27	3.356	O	|	|	|	|	3.87
26.917	0.00	2.27	3.340	O	|	|	|	|	3.86
27.000	0.00	2.27	3.325	O	|	|	|	|	3.84
27.083	0.00	2.27	3.309	O	|	|	|	|	3.83
27.167	0.00	2.27	3.293	O	|	|	|	|	3.81
27.250	0.00	2.27	3.278	O	|	|	|	|	3.80
27.333	0.00	2.27	3.262	O	|	|	|	|	3.78
27.417	0.00	2.27	3.246	O	|	|	|	|	3.77
27.500	0.00	2.27	3.231	O	|	|	|	|	3.75
27.583	0.00	2.27	3.215	O	|	|	|	|	3.74
27.667	0.00	2.27	3.200	O	|	|	|	|	3.72
27.750	0.00	2.27	3.184	O	|	|	|	|	3.71
27.833	0.00	2.27	3.168	O	|	|	|	|	3.69
27.917	0.00	2.27	3.153	O	|	|	|	|	3.68
28.000	0.00	2.27	3.137	O	|	|	|	|	3.66
28.083	0.00	2.27	3.121	O	|	|	|	|	3.65
28.167	0.00	2.27	3.106	O	|	|	|	|	3.63
28.250	0.00	2.27	3.090	O	|	|	|	|	3.62
28.333	0.00	2.27	3.075	O	|	|	|	|	3.60
28.417	0.00	2.27	3.059	O	|	|	|	|	3.59
28.500	0.00	2.27	3.043	O	|	|	|	|	3.57
28.583	0.00	2.27	3.028	O	|	|	|	|	3.56
28.667	0.00	2.27	3.012	O	|	|	|	|	3.54
28.750	0.00	2.27	2.996	O	|	|	|	|	3.53
28.833	0.00	2.27	2.981	O	|	|	|	|	3.51
28.917	0.00	2.27	2.965	O	|	|	|	|	3.50
29.000	0.00	2.27	2.949	O	|	|	|	|	3.48
29.083	0.00	2.27	2.934	O	|	|	|	|	3.47
29.167	0.00	2.27	2.918	O	|	|	|	|	3.45
29.250	0.00	2.27	2.903	O	|	|	|	|	3.44
29.333	0.00	2.27	2.887	O	|	|	|	|	3.42
29.417	0.00	2.27	2.871	O	|	|	|	|	3.41
29.500	0.00	2.27	2.856	O	|	|	|	|	3.39
29.583	0.00	2.27	2.840	O	|	|	|	|	3.38
29.667	0.00	2.27	2.824	O	|	|	|	|	3.36
29.750	0.00	2.27	2.809	O	|	|	|	|	3.35
29.833	0.00	2.27	2.793	O	|	|	|	|	3.33
29.917	0.00	2.27	2.777	O	|	|	|	|	3.32
30.000	0.00	2.27	2.762	O	|	|	|	|	3.30
30.083	0.00	2.27	2.746	O	|	|	|	|	3.29
30.167	0.00	2.27	2.731	O	|	|	|	|	3.27
30.250	0.00	2.27	2.715	O	|	|	|	|	3.26

30.333	0.00	2.27	2.699	O					3.25
30.417	0.00	2.27	2.684	O					3.23
30.500	0.00	2.27	2.668	O					3.22
30.583	0.00	2.27	2.652	O					3.20
30.667	0.00	2.27	2.637	O					3.19
30.750	0.00	2.27	2.621	O					3.17
30.833	0.00	2.27	2.606	O					3.16
30.917	0.00	2.27	2.590	O					3.14
31.000	0.00	2.27	2.574	O					3.13
31.083	0.00	2.27	2.559	O					3.11
31.167	0.00	2.27	2.543	O					3.10
31.250	0.00	2.27	2.527	O					3.08
31.333	0.00	2.27	2.512	O					3.07
31.417	0.00	2.27	2.496	O					3.05
31.500	0.00	2.27	2.480	O					3.04
31.583	0.00	2.27	2.465	O					3.02
31.667	0.00	2.27	2.449	O					3.01
31.750	0.00	2.27	2.434	O					2.99
31.833	0.00	2.27	2.418	O					2.98
31.917	0.00	2.27	2.402	O					2.96
32.000	0.00	2.27	2.387	O					2.94
32.083	0.00	2.27	2.371	O					2.93
32.167	0.00	2.27	2.355	O					2.91
32.250	0.00	2.27	2.340	O					2.90
32.333	0.00	2.27	2.324	O					2.88
32.417	0.00	2.27	2.308	O					2.87
32.500	0.00	2.27	2.293	O					2.85
32.583	0.00	2.27	2.277	O					2.84
32.667	0.00	2.27	2.262	O					2.82
32.750	0.00	2.27	2.246	O					2.80
32.833	0.00	2.27	2.230	O					2.79
32.917	0.00	2.27	2.215	O					2.77
33.000	0.00	2.27	2.199	O					2.76
33.083	0.00	2.27	2.183	O					2.74
33.167	0.00	2.27	2.168	O					2.73
33.250	0.00	2.27	2.152	O					2.71
33.333	0.00	2.27	2.137	O					2.70
33.417	0.00	2.27	2.121	O					2.68
33.500	0.00	2.27	2.105	O					2.66
33.583	0.00	2.27	2.090	O					2.65
33.667	0.00	2.27	2.074	O					2.63
33.750	0.00	2.27	2.058	O					2.62
33.833	0.00	2.27	2.043	O					2.60
33.917	0.00	2.27	2.027	O					2.59
34.000	0.00	2.27	2.011	O					2.57
34.083	0.00	2.27	1.996	O					2.55
34.167	0.00	2.27	1.980	O					2.54
34.250	0.00	2.27	1.965	O					2.52
34.333	0.00	2.27	1.949	O					2.51
34.417	0.00	2.27	1.933	O					2.49
34.500	0.00	2.27	1.918	O					2.47
34.583	0.00	2.27	1.902	O					2.46
34.667	0.00	2.27	1.886	O					2.44
34.750	0.00	2.27	1.871	O					2.42
34.833	0.00	2.27	1.855	O					2.41
34.917	0.00	2.27	1.839	O					2.39
35.000	0.00	2.27	1.824	O					2.37
35.083	0.00	2.27	1.808	O					2.36
35.167	0.00	2.27	1.793	O					2.34
35.250	0.00	2.27	1.777	O					2.32
35.333	0.00	2.27	1.761	O					2.31
35.417	0.00	2.27	1.746	O					2.29
35.500	0.00	2.27	1.730	O					2.27

35.583	0.00	2.27	1.714	O	|	|	|	|	2.26
35.667	0.00	2.27	1.699	O	|	|	|	|	2.24
35.750	0.00	2.27	1.683	O	|	|	|	|	2.22
35.833	0.00	2.27	1.667	O	|	|	|	|	2.21
35.917	0.00	2.27	1.652	O	|	|	|	|	2.19
36.000	0.00	2.27	1.636	O	|	|	|	|	2.17
36.083	0.00	2.27	1.621	O	|	|	|	|	2.16
36.167	0.00	2.27	1.605	O	|	|	|	|	2.14
36.250	0.00	2.27	1.589	O	|	|	|	|	2.12
36.333	0.00	2.27	1.574	O	|	|	|	|	2.11
36.417	0.00	2.27	1.558	O	|	|	|	|	2.09
36.500	0.00	2.27	1.542	O	|	|	|	|	2.07
36.583	0.00	2.27	1.527	O	|	|	|	|	2.06
36.667	0.00	2.27	1.511	O	|	|	|	|	2.04
36.750	0.00	2.27	1.496	O	|	|	|	|	2.02
36.833	0.00	2.27	1.480	O	|	|	|	|	2.00
36.917	0.00	2.27	1.464	O	|	|	|	|	1.99
37.000	0.00	2.27	1.449	O	|	|	|	|	1.97
37.083	0.00	2.27	1.433	O	|	|	|	|	1.95
37.167	0.00	2.27	1.417	O	|	|	|	|	1.94
37.250	0.00	2.27	1.402	O	|	|	|	|	1.92
37.333	0.00	2.27	1.386	O	|	|	|	|	1.90
37.417	0.00	2.27	1.370	O	|	|	|	|	1.89
37.500	0.00	2.27	1.355	O	|	|	|	|	1.87
37.583	0.00	2.27	1.339	O	|	|	|	|	1.85
37.667	0.00	2.27	1.324	O	|	|	|	|	1.84
37.750	0.00	2.27	1.308	O	|	|	|	|	1.82
37.833	0.00	2.27	1.292	O	|	|	|	|	1.80
37.917	0.00	2.27	1.277	O	|	|	|	|	1.79
38.000	0.00	2.27	1.261	O	|	|	|	|	1.77
38.083	0.00	2.27	1.245	O	|	|	|	|	1.75
38.167	0.00	2.27	1.230	O	|	|	|	|	1.74
38.250	0.00	2.27	1.214	O	|	|	|	|	1.72
38.333	0.00	2.27	1.198	O	|	|	|	|	1.70
38.417	0.00	2.27	1.183	O	|	|	|	|	1.69
38.500	0.00	2.27	1.167	O	|	|	|	|	1.67
38.583	0.00	2.27	1.152	O	|	|	|	|	1.65
38.667	0.00	2.27	1.136	O	|	|	|	|	1.64
38.750	0.00	2.27	1.120	O	|	|	|	|	1.62
38.833	0.00	2.27	1.105	O	|	|	|	|	1.60
38.917	0.00	2.27	1.089	O	|	|	|	|	1.58
39.000	0.00	2.27	1.073	O	|	|	|	|	1.57
39.083	0.00	2.27	1.058	O	|	|	|	|	1.55
39.167	0.00	2.27	1.042	O	|	|	|	|	1.53
39.250	0.00	2.27	1.027	O	|	|	|	|	1.52
39.333	0.00	2.27	1.011	O	|	|	|	|	1.50
39.417	0.00	2.27	0.995	O	|	|	|	|	1.48
39.500	0.00	2.27	0.980	O	|	|	|	|	1.46
39.583	0.00	2.27	0.964	O	|	|	|	|	1.44
39.667	0.00	2.27	0.948	O	|	|	|	|	1.42
39.750	0.00	2.27	0.933	O	|	|	|	|	1.40
39.833	0.00	2.27	0.917	O	|	|	|	|	1.38
39.917	0.00	2.27	0.901	O	|	|	|	|	1.36
40.000	0.00	2.27	0.886	O	|	|	|	|	1.34
40.083	0.00	2.27	0.870	O	|	|	|	|	1.31
40.167	0.00	2.27	0.855	O	|	|	|	|	1.29
40.250	0.00	2.27	0.839	O	|	|	|	|	1.27
40.333	0.00	2.27	0.823	O	|	|	|	|	1.25
40.417	0.00	2.27	0.808	O	|	|	|	|	1.23
40.500	0.00	2.27	0.792	O	|	|	|	|	1.21
40.583	0.00	2.27	0.776	O	|	|	|	|	1.19
40.667	0.00	2.27	0.761	O	|	|	|	|	1.17
40.750	0.00	2.27	0.745	O	|	|	|	|	1.15

40.833	0.00	2.27	0.729	O	|	|	|	1.13
40.917	0.00	2.27	0.714	O	|	|	|	1.11
41.000	0.00	2.27	0.698	O	|	|	|	1.09
41.083	0.00	2.27	0.683	O	|	|	|	1.07
41.167	0.00	2.27	0.667	O	|	|	|	1.05
41.250	0.00	2.27	0.651	O	|	|	|	1.02
41.333	0.00	2.27	0.636	O	|	|	|	1.00
41.417	0.00	2.27	0.620	O	|	|	|	0.98
41.500	0.00	2.27	0.604	O	|	|	|	0.96
41.583	0.00	2.27	0.589	O	|	|	|	0.94
41.667	0.00	2.27	0.573	O	|	|	|	0.92
41.750	0.00	2.27	0.558	O	|	|	|	0.90
41.833	0.00	2.27	0.542	O	|	|	|	0.88
41.917	0.00	2.27	0.526	O	|	|	|	0.86
42.000	0.00	2.27	0.511	O	|	|	|	0.84
42.083	0.00	2.27	0.495	O	|	|	|	0.82
42.167	0.00	2.27	0.479	O	|	|	|	0.80
42.250	0.00	2.27	0.464	O	|	|	|	0.78
42.333	0.00	2.27	0.448	O	|	|	|	0.76
42.417	0.00	2.27	0.432	O	|	|	|	0.74
42.500	0.00	2.27	0.417	O	|	|	|	0.71
42.583	0.00	2.27	0.401	O	|	|	|	0.69
42.667	0.00	2.27	0.386	O	|	|	|	0.67
42.750	0.00	2.27	0.370	O	|	|	|	0.65
42.833	0.00	2.27	0.354	O	|	|	|	0.63
42.917	0.00	2.27	0.339	O	|	|	|	0.61
43.000	0.00	2.27	0.323	O	|	|	|	0.59
43.083	0.00	2.27	0.307	O	|	|	|	0.57
43.167	0.00	2.27	0.292	O	|	|	|	0.55
43.250	0.00	2.27	0.276	O	|	|	|	0.53
43.333	0.00	2.27	0.260	O	|	|	|	0.51
43.417	0.00	2.18	0.245	O	|	|	|	0.48
43.500	0.00	2.05	0.231	O	|	|	|	0.45
43.583	0.00	1.93	0.217	O	|	|	|	0.43
43.667	0.00	1.82	0.204	O	|	|	|	0.40
43.750	0.00	1.71	0.192	O	|	|	|	0.38
43.833	0.00	1.61	0.180	O	|	|	|	0.35
43.917	0.00	1.51	0.170	O	|	|	|	0.33
44.000	0.00	1.42	0.160	O	|	|	|	0.31
44.083	0.00	1.34	0.150	O	|	|	|	0.29
44.167	0.00	1.26	0.141	O	|	|	|	0.28
44.250	0.00	1.18	0.133	O	|	|	|	0.26
44.333	0.00	1.11	0.125	O	|	|	|	0.24
44.417	0.00	1.05	0.117	O	|	|	|	0.23
44.500	0.00	0.98	0.110	O	|	|	|	0.22
44.583	0.00	0.92	0.104	O	|	|	|	0.20
44.667	0.00	0.87	0.098	O	|	|	|	0.19
44.750	0.00	0.82	0.092	O	|	|	|	0.18
44.833	0.00	0.77	0.086	O	|	|	|	0.17
44.917	0.00	0.72	0.081	O	|	|	|	0.16
45.000	0.00	0.68	0.076	O	|	|	|	0.15
45.083	0.00	0.64	0.072	O	|	|	|	0.14
45.167	0.00	0.60	0.068	O	|	|	|	0.13
45.250	0.00	0.57	0.064	O	|	|	|	0.12
45.333	0.00	0.53	0.060	O	|	|	|	0.12
45.417	0.00	0.50	0.056	O	|	|	|	0.11
45.500	0.00	0.47	0.053	O	|	|	|	0.10
45.583	0.00	0.44	0.050	O	|	|	|	0.10
45.667	0.00	0.42	0.047	O	|	|	|	0.09
45.750	0.00	0.39	0.044	O	|	|	|	0.09
45.833	0.00	0.37	0.041	O	|	|	|	0.08
45.917	0.00	0.35	0.039	O	|	|	|	0.08
46.000	0.00	0.33	0.037	O	|	|	|	0.07

46.083	0.00	0.31	0.034	O	|	|	|	|	0.07
46.167	0.00	0.29	0.032	O	|	|	|	|	0.06
46.250	0.00	0.27	0.030	O	|	|	|	|	0.06
46.333	0.00	0.26	0.029	O	|	|	|	|	0.06
46.417	0.00	0.24	0.027	O	|	|	|	|	0.05
46.500	0.00	0.23	0.025	O	|	|	|	|	0.05
46.583	0.00	0.21	0.024	O	|	|	|	|	0.05
46.667	0.00	0.20	0.022	O	|	|	|	|	0.04
46.750	0.00	0.19	0.021	O	|	|	|	|	0.04
46.833	0.00	0.18	0.020	O	|	|	|	|	0.04
46.917	0.00	0.17	0.019	O	|	|	|	|	0.04
47.000	0.00	0.16	0.018	O	|	|	|	|	0.03
47.083	0.00	0.15	0.017	O	|	|	|	|	0.03
47.167	0.00	0.14	0.016	O	|	|	|	|	0.03
47.250	0.00	0.13	0.015	O	|	|	|	|	0.03
47.333	0.00	0.12	0.014	O	|	|	|	|	0.03
47.417	0.00	0.11	0.013	O	|	|	|	|	0.03
47.500	0.00	0.11	0.012	O	|	|	|	|	0.02
47.583	0.00	0.10	0.011	O	|	|	|	|	0.02
47.667	0.00	0.10	0.011	O	|	|	|	|	0.02
47.750	0.00	0.09	0.010	O	|	|	|	|	0.02
47.833	0.00	0.08	0.010	O	|	|	|	|	0.02
47.917	0.00	0.08	0.009	O	|	|	|	|	0.02
48.000	0.00	0.07	0.008	O	|	|	|	|	0.02
48.083	0.00	0.07	0.008	O	|	|	|	|	0.02
48.167	0.00	0.07	0.007	O	|	|	|	|	0.01
48.250	0.00	0.06	0.007	O	|	|	|	|	0.01
48.333	0.00	0.06	0.007	O	|	|	|	|	0.01
48.417	0.00	0.06	0.006	O	|	|	|	|	0.01
48.500	0.00	0.05	0.006	O	|	|	|	|	0.01
48.583	0.00	0.05	0.005	O	|	|	|	|	0.01
48.667	0.00	0.05	0.005	O	|	|	|	|	0.01
48.750	0.00	0.04	0.005	O	|	|	|	|	0.01
48.833	0.00	0.04	0.005	O	|	|	|	|	0.01
48.917	0.00	0.04	0.004	O	|	|	|	|	0.01
49.000	0.00	0.04	0.004	O	|	|	|	|	0.01
49.083	0.00	0.03	0.004	O	|	|	|	|	0.01
49.167	0.00	0.03	0.004	O	|	|	|	|	0.01
49.250	0.00	0.03	0.003	O	|	|	|	|	0.01
49.333	0.00	0.03	0.003	O	|	|	|	|	0.01
49.417	0.00	0.03	0.003	O	|	|	|	|	0.01
49.500	0.00	0.02	0.003	O	|	|	|	|	0.01
49.583	0.00	0.02	0.003	O	|	|	|	|	0.01
49.667	0.00	0.02	0.002	O	|	|	|	|	0.00
49.750	0.00	0.02	0.002	O	|	|	|	|	0.00
49.833	0.00	0.02	0.002	O	|	|	|	|	0.00
49.917	0.00	0.02	0.002	O	|	|	|	|	0.00
50.000	0.00	0.02	0.002	O	|	|	|	|	0.00
50.083	0.00	0.02	0.002	O	|	|	|	|	0.00
50.167	0.00	0.02	0.002	O	|	|	|	|	0.00
50.250	0.00	0.01	0.002	O	|	|	|	|	0.00
50.333	0.00	0.01	0.002	O	|	|	|	|	0.00
50.417	0.00	0.01	0.001	O	|	|	|	|	0.00
50.500	0.00	0.01	0.001	O	|	|	|	|	0.00
50.583	0.00	0.01	0.001	O	|	|	|	|	0.00
50.667	0.00	0.01	0.001	O	|	|	|	|	0.00
50.750	0.00	0.01	0.001	O	|	|	|	|	0.00
50.833	0.00	0.01	0.001	O	|	|	|	|	0.00
50.917	0.00	0.01	0.001	O	|	|	|	|	0.00
51.000	0.00	0.01	0.001	O	|	|	|	|	0.00
51.083	0.00	0.01	0.001	O	|	|	|	|	0.00
51.167	0.00	0.01	0.001	O	|	|	|	|	0.00
51.250	0.00	0.01	0.001	O	|	|	|	|	0.00

51.333	0.00	0.01	0.001	O	|	|	|	|	0.00
51.417	0.00	0.01	0.001	O	|	|	|	|	0.00
51.500	0.00	0.01	0.001	O	|	|	|	|	0.00
51.583	0.00	0.01	0.001	O	|	|	|	|	0.00
51.667	0.00	0.01	0.001	O	|	|	|	|	0.00
51.750	0.00	0.00	0.001	O	|	|	|	|	0.00
51.833	0.00	0.00	0.001	O	|	|	|	|	0.00

**********HYDROGRAPH DATA**********

Number of intervals = 622
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 8.269 (CFS)
Total volume = 10.059 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

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FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
Study date: 05/01/23

COVINGTON - MIP BUILDING 3
100 YEAR STORM EVENT BASIN ROUTING BUILDING 3
5712Q100ROUTING3
DS

Program License Serial Number 6145

********** HYDROGRAPH INFORMATION **********

From study/file name: 5712Q100PUH3.rte
**********HYDROGRAPH DATA**********
Number of intervals = 301
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 169.069 (CFS)
Total volume = 18.714 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

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Process from Point/Station 0.000 to Point/Station 0.000
**** RETARDING BASIN ROUTING ****
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User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 301
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-O*dt/2) (Ac.Ft)	(S+O*dt/2) (Ac.Ft)
0.000	0.000	0.000	0.000	0.000
0.500	0.255	2.270	0.247	0.263
1.500	1.010	2.270	1.002	1.018
2.500	1.941	2.270	1.933	1.949
3.000	2.442	2.270	2.434	2.450
4.250	3.754	2.270	3.746	3.762
6.000	5.636	13.110	5.591	5.681

6.500	6.164	15.850	6.109	6.219
7.500	7.182	20.120	7.113	7.251
8.500	8.113	23.550	8.032	8.194
9.500	8.868	26.500	8.777	8.959
10.000	9.123	27.840	9.027	9.219
11.000	9.124	30.340	9.020	9.228
12.000	9.125	32.640	9.013	9.237

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0	42.3	84.53	126.80	169.07	Depth (Ft.)
0.083	0.23	0.01	0.001	O	|	|	|	|	0.00
0.167	1.71	0.06	0.007	O	|	|	|	|	0.01
0.250	2.82	0.19	0.022	O	|	|	|	|	0.04
0.333	3.30	0.36	0.041	O	|	|	|	|	0.08
0.417	3.58	0.55	0.062	O	|	|	|	|	0.12
0.500	3.78	0.73	0.082	O	|	|	|	|	0.16
0.583	3.91	0.92	0.103	O	|	|	|	|	0.20
0.667	4.01	1.10	0.124	O	|	|	|	|	0.24
0.750	4.08	1.28	0.143	O	|	|	|	|	0.28
0.833	4.14	1.44	0.162	O	|	|	|	|	0.32
0.917	4.18	1.61	0.180	O	|	|	|	|	0.35
1.000	4.22	1.76	0.198	O	|	|	|	|	0.39
1.083	4.25	1.91	0.214	O	|	|	|	|	0.42
1.167	4.27	2.05	0.230	O	|	|	|	|	0.45
1.250	4.28	2.18	0.245	O	|	|	|	|	0.48
1.333	4.30	2.27	0.259	O	|	|	|	|	0.51
1.417	4.31	2.27	0.273	O	|	|	|	|	0.52
1.500	4.33	2.27	0.287	O	|	|	|	|	0.54
1.583	4.34	2.27	0.301	O	|	|	|	|	0.56
1.667	4.35	2.27	0.316	O	|	|	|	|	0.58
1.750	4.37	2.27	0.330	O	|	|	|	|	0.60
1.833	4.38	2.27	0.345	O	|	|	|	|	0.62
1.917	4.39	2.27	0.359	O	|	|	|	|	0.64
2.000	4.41	2.27	0.374	O	|	|	|	|	0.66
2.083	4.42	2.27	0.389	O	|	|	|	|	0.68
2.167	4.44	2.27	0.403	O	|	|	|	|	0.70
2.250	4.45	2.27	0.418	O	|	|	|	|	0.72
2.333	4.47	2.27	0.433	O	|	|	|	|	0.74
2.417	4.48	2.27	0.449	O	|	|	|	|	0.76
2.500	4.50	2.27	0.464	O	|	|	|	|	0.78
2.583	4.51	2.27	0.479	O	|	|	|	|	0.80
2.667	4.53	2.27	0.495	O	|	|	|	|	0.82
2.750	4.54	2.27	0.510	O	|	|	|	|	0.84
2.833	4.56	2.27	0.526	O	|	|	|	|	0.86
2.917	4.57	2.27	0.542	O	|	|	|	|	0.88
3.000	4.59	2.27	0.558	O	|	|	|	|	0.90
3.083	4.60	2.27	0.574	O	|	|	|	|	0.92
3.167	4.62	2.27	0.590	O	|	|	|	|	0.94
3.250	4.64	2.27	0.606	O	|	|	|	|	0.97
3.333	4.65	2.27	0.623	O	|	|	|	|	0.99
3.417	4.67	2.27	0.639	O	|	|	|	|	1.01
3.500	4.69	2.27	0.656	O	|	|	|	|	1.03
3.583	4.70	2.27	0.672	O	|	|	|	|	1.05
3.667	4.72	2.27	0.689	O	|	|	|	|	1.08
3.750	4.74	2.27	0.706	O	|	|	|	|	1.10
3.833	4.76	2.27	0.723	O	|	|	|	|	1.12
3.917	4.77	2.27	0.740	O	|	|	|	|	1.14
4.000	4.79	2.27	0.758	O	|	|	|	|	1.17

4.083	4.81	2.27	0.775	O				1.19
4.167	4.83	2.27	0.793	O				1.21
4.250	4.85	2.27	0.810	O				1.24
4.333	4.87	2.27	0.828	O				1.26
4.417	4.88	2.27	0.846	O				1.28
4.500	4.90	2.27	0.864	O				1.31
4.583	4.92	2.27	0.882	O				1.33
4.667	4.94	2.27	0.901	O				1.36
4.750	4.96	2.27	0.919	O				1.38
4.833	4.98	2.27	0.938	O				1.40
4.917	5.00	2.27	0.956	O				1.43
5.000	5.02	2.27	0.975	O				1.45
5.083	5.04	2.27	0.994	O				1.48
5.167	5.06	2.27	1.013	O				1.50
5.250	5.08	2.27	1.033	O				1.52
5.333	5.11	2.27	1.052	O				1.55
5.417	5.13	2.27	1.072	O				1.57
5.500	5.15	2.27	1.092	O				1.59
5.583	5.17	2.27	1.112	O				1.61
5.667	5.19	2.27	1.132	O				1.63
5.750	5.22	2.27	1.152	O				1.65
5.833	5.24	2.27	1.172	O				1.67
5.917	5.26	2.27	1.193	O				1.70
6.000	5.29	2.27	1.213	OI				1.72
6.083	5.31	2.27	1.234	OI				1.74
6.167	5.33	2.27	1.255	OI				1.76
6.250	5.36	2.27	1.276	OI				1.79
6.333	5.38	2.27	1.298	OI				1.81
6.417	5.41	2.27	1.319	OI				1.83
6.500	5.43	2.27	1.341	OI				1.86
6.583	5.46	2.27	1.363	OI				1.88
6.667	5.49	2.27	1.385	OI				1.90
6.750	5.51	2.27	1.407	OI				1.93
6.833	5.54	2.27	1.430	OI				1.95
6.917	5.57	2.27	1.452	OI				1.98
7.000	5.59	2.27	1.475	OI				2.00
7.083	5.62	2.27	1.498	OI				2.02
7.167	5.65	2.27	1.521	OI				2.05
7.250	5.68	2.27	1.545	OI				2.07
7.333	5.71	2.27	1.568	OI				2.10
7.417	5.74	2.27	1.592	OI				2.13
7.500	5.77	2.27	1.616	OI				2.15
7.583	5.80	2.27	1.640	OI				2.18
7.667	5.83	2.27	1.665	OI				2.20
7.750	5.86	2.27	1.689	OI				2.23
7.833	5.89	2.27	1.714	OI				2.26
7.917	5.92	2.27	1.739	OI				2.28
8.000	5.96	2.27	1.764	OI				2.31
8.083	5.99	2.27	1.790	OI				2.34
8.167	6.03	2.27	1.816	OI				2.37
8.250	6.06	2.27	1.842	OI				2.39
8.333	6.10	2.27	1.868	OI				2.42
8.417	6.13	2.27	1.894	OI				2.45
8.500	6.17	2.27	1.921	OI				2.48
8.583	6.20	2.27	1.948	OI				2.51
8.667	6.24	2.27	1.975	OI				2.53
8.750	6.28	2.27	2.003	OI				2.56
8.833	6.32	2.27	2.030	OI				2.59
8.917	6.36	2.27	2.059	OI				2.62
9.000	6.40	2.27	2.087	OI				2.65
9.083	6.44	2.27	2.115	OI				2.67
9.167	6.48	2.27	2.144	OI				2.70
9.250	6.52	2.27	2.173	OI				2.73

9.333	6.57	2.27	2.203	OI				2.76
9.417	6.61	2.27	2.233	OI				2.79
9.500	6.66	2.27	2.263	OI				2.82
9.583	6.70	2.27	2.293	OI				2.85
9.667	6.75	2.27	2.324	OI				2.88
9.750	6.79	2.27	2.355	OI				2.91
9.833	6.84	2.27	2.386	OI				2.94
9.917	6.89	2.27	2.418	OI				2.98
10.000	6.94	2.27	2.450	OI				3.01
10.083	6.99	2.27	2.482	OI				3.04
10.167	7.05	2.27	2.515	OI				3.07
10.250	7.10	2.27	2.548	OI				3.10
10.333	7.16	2.27	2.581	OI				3.13
10.417	7.21	2.27	2.615	OI				3.16
10.500	7.27	2.27	2.649	OI				3.20
10.583	7.33	2.27	2.684	OI				3.23
10.667	7.39	2.27	2.719	OI				3.26
10.750	7.45	2.27	2.755	OI				3.30
10.833	7.51	2.27	2.790	OI				3.33
10.917	7.58	2.27	2.827	OI				3.37
11.000	7.64	2.27	2.864	OI				3.40
11.083	7.71	2.27	2.901	OI				3.44
11.167	7.78	2.27	2.938	OI				3.47
11.250	7.85	2.27	2.977	OI				3.51
11.333	7.93	2.27	3.015	OI				3.55
11.417	8.00	2.27	3.055	OI				3.58
11.500	8.08	2.27	3.094	OI				3.62
11.583	8.15	2.27	3.135	OI				3.66
11.667	8.24	2.27	3.175	OI				3.70
11.750	8.32	2.27	3.217	OI				3.74
11.833	8.41	2.27	3.259	OI				3.78
11.917	8.49	2.27	3.301	OI				3.82
12.000	8.59	2.27	3.344	OI				3.86
12.083	8.62	2.27	3.388	OI				3.90
12.167	8.31	2.27	3.431	OI				3.94
12.250	8.09	2.27	3.472	OI				3.98
12.333	8.07	2.27	3.512	OI				4.02
12.417	8.09	2.27	3.552	OI				4.06
12.500	8.15	2.27	3.592	OI				4.10
12.583	8.23	2.27	3.633	OI				4.13
12.667	8.32	2.27	3.674	OI				4.17
12.750	8.42	2.27	3.716	OI				4.21
12.833	8.54	2.30	3.759	OI				4.25
12.917	8.65	2.54	3.801	OI				4.29
13.000	8.78	2.78	3.843	OI				4.33
13.083	8.91	3.02	3.884	OI				4.37
13.167	9.06	3.25	3.924	OI				4.41
13.250	9.21	3.48	3.964	OI				4.45
13.333	9.37	3.70	4.003	OI				4.48
13.417	9.53	3.93	4.042	OI				4.52
13.500	9.71	4.15	4.080	OI				4.55
13.583	9.89	4.37	4.119	OI				4.59
13.667	10.09	4.59	4.157	OI				4.62
13.750	10.29	4.81	4.194	OI				4.66
13.833	10.51	5.02	4.232	OI				4.69
13.917	10.73	5.24	4.270	O I				4.73
14.000	10.98	5.46	4.308	|OI				4.76
14.083	11.22	5.68	4.346	|OI				4.80
14.167	11.53	5.90	4.384	|OI				4.84
14.250	11.82	6.13	4.423	|OI				4.87
14.333	12.15	6.35	4.463	|OI				4.91
14.417	12.48	6.59	4.503	|OI				4.95
14.500	12.85	6.82	4.544	|OI				4.98

14.583	13.22	7.06	4.586	OI				5.02
14.667	13.66	7.31	4.629	OI				5.06
14.750	14.10	7.57	4.674	OI				5.11
14.833	14.62	7.83	4.720	OI				5.15
14.917	15.15	8.11	4.767	OI				5.19
15.000	15.81	8.39	4.817	OI				5.24
15.083	16.49	8.69	4.869	O I				5.29
15.167	17.35	9.01	4.925	O I				5.34
15.250	18.25	9.36	4.984	O I				5.39
15.333	19.39	9.72	5.048	O I				5.45
15.417	20.27	10.12	5.117	O I				5.52
15.500	19.69	10.50	5.183	O I				5.58
15.583	19.73	10.86	5.245	OI				5.64
15.667	21.23	11.23	5.310	O I				5.70
15.750	23.39	11.66	5.385	O I				5.77
15.833	27.06	12.19	5.477	O I				5.85
15.917	32.28	12.87	5.595	O I				5.96
16.000	43.37	13.77	5.763	O I				6.12
16.083	75.23	15.37	6.071	O	I			6.41
16.167	169.07	18.50	6.796	O			I	7.12
16.250	133.65	22.02	7.699	O		I		8.06
16.333	76.38	24.14	8.263	O	I			8.70
16.417	53.67	25.22	8.541	O	I			9.07
16.500	42.52	25.83	8.696	O	I			9.27
16.583	35.28	26.18	8.785	O I				9.39
16.667	29.73	26.34	8.828	OI				9.45
16.750	25.34	26.38	8.836	O				9.46
16.833	21.58	26.30	8.817	O				9.43
16.917	19.08	26.14	8.776	IO				9.38
17.000	17.82	25.94	8.724	IO				9.31
17.083	15.84	25.69	8.662	I O				9.23
17.167	13.95	25.41	8.588	I O				9.13
17.250	12.42	25.08	8.505	I O				9.02
17.333	11.73	24.74	8.417	I O				8.90
17.417	11.16	24.38	8.327	I O				8.78
17.500	10.66	24.03	8.235	I O				8.66
17.583	10.20	23.67	8.143	I O				8.54
17.667	9.80	23.32	8.050	I O				8.43
17.750	9.44	22.97	7.957	I O				8.33
17.833	9.12	22.63	7.864	I O				8.23
17.917	8.82	22.29	7.771	I O				8.13
18.000	8.55	21.95	7.678	I O				8.03
18.083	8.37	21.61	7.586	I O				7.93
18.167	8.54	21.28	7.497	I O				7.84
18.250	8.63	20.96	7.411	I O				7.75
18.333	8.56	20.65	7.327	I O				7.66
18.417	8.44	20.35	7.244	I O				7.57
18.500	8.31	20.04	7.163	I O				7.48
18.583	8.18	19.70	7.082	I O				7.40
18.667	8.04	19.37	7.004	I O				7.32
18.750	7.90	19.05	6.926	I O				7.25
18.833	7.77	18.73	6.850	I O				7.17
18.917	7.64	18.41	6.775	I O				7.10
19.000	7.52	18.11	6.702	I O				7.03
19.083	7.40	17.80	6.630	I O				6.96
19.167	7.28	17.50	6.558	I O				6.89
19.250	7.16	17.21	6.489	I O				6.82
19.333	7.05	16.92	6.420	I O				6.75
19.417	6.95	16.64	6.353	I O				6.69
19.500	6.85	16.36	6.287	I O				6.62
19.583	6.75	16.09	6.222	I O				6.56
19.667	6.66	15.82	6.158	IO				6.49
19.750	6.57	15.50	6.096	IO				6.44

19.833	6.48	15.18	6.035	IO				6.38
19.917	6.40	14.87	5.976	IO				6.32
20.000	6.32	14.57	5.918	IO				6.27
20.083	6.24	14.28	5.862	IO				6.21
20.167	6.17	14.00	5.808	IO				6.16
20.250	6.10	13.72	5.754	IO				6.11
20.333	6.03	13.46	5.702	IO				6.06
20.417	5.96	13.19	5.652	IO				6.02
20.500	5.90	12.92	5.603	IO				5.97
20.583	5.83	12.65	5.555	IO				5.92
20.667	5.77	12.38	5.509	IO				5.88
20.750	5.71	12.12	5.464	IO				5.84
20.833	5.65	11.87	5.421	IO				5.80
20.917	5.60	11.63	5.379	IO				5.76
21.000	5.54	11.39	5.338	IO				5.72
21.083	5.49	11.16	5.298	IO				5.69
21.167	5.44	10.94	5.259	IO				5.65
21.250	5.38	10.73	5.222	IO				5.62
21.333	5.34	10.52	5.186	O				5.58
21.417	5.29	10.31	5.151	O				5.55
21.500	5.24	10.12	5.117	IO				5.52
21.583	5.19	9.93	5.084	IO				5.49
21.667	5.15	9.74	5.051	IO				5.46
21.750	5.11	9.56	5.020	IO				5.43
21.833	5.06	9.39	4.990	IO				5.40
21.917	5.02	9.22	4.961	IO				5.37
22.000	4.98	9.06	4.932	IO				5.35
22.083	4.94	8.90	4.905	IO				5.32
22.167	4.90	8.74	4.878	IO				5.29
22.250	4.87	8.59	4.852	IO				5.27
22.333	4.83	8.45	4.826	IO				5.25
22.417	4.79	8.31	4.802	IO				5.22
22.500	4.76	8.17	4.778	IO				5.20
22.583	4.72	8.03	4.755	IO				5.18
22.667	4.69	7.90	4.732	IO				5.16
22.750	4.65	7.78	4.710	IO				5.14
22.833	4.62	7.66	4.689	IO				5.12
22.917	4.59	7.54	4.669	IO				5.10
23.000	4.56	7.42	4.649	IO				5.08
23.083	4.53	7.31	4.629	IO				5.06
23.167	4.50	7.20	4.610	IO				5.05
23.250	4.47	7.10	4.592	IO				5.03
23.333	4.44	6.99	4.574	IO				5.01
23.417	4.41	6.89	4.557	IO				5.00
23.500	4.38	6.80	4.540	IO				4.98
23.583	4.35	6.70	4.523	IO				4.97
23.667	4.32	6.61	4.507	IO				4.95
23.750	4.30	6.52	4.492	IO				4.94
23.833	4.27	6.43	4.477	IO				4.92
23.917	4.25	6.35	4.462	IO				4.91
24.000	4.22	6.27	4.448	IO				4.90
24.083	3.97	6.18	4.433	IO				4.88
24.167	2.47	6.07	4.413	IO				4.86
24.250	1.35	5.90	4.385	IO				4.84
24.333	0.87	5.72	4.353	IO				4.81
24.417	0.59	5.52	4.319	IO				4.78
24.500	0.41	5.33	4.285	IO				4.74
24.583	0.28	5.13	4.251	O				4.71
24.667	0.19	4.94	4.218	O				4.68
24.750	0.13	4.76	4.186	O				4.65
24.833	0.09	4.58	4.155	O				4.62
24.917	0.06	4.40	4.124	O				4.59
25.000	0.03	4.23	4.095	O				4.57

25.083	0.01	4.07	4.066	O	|	|	|	|	4.54
25.167	0.00	3.91	4.039	O	|	|	|	|	4.51
25.250	0.00	3.76	4.012	O	|	|	|	|	4.49
25.333	0.00	3.61	3.987	O	|	|	|	|	4.47
25.417	0.00	3.47	3.963	O	|	|	|	|	4.44
25.500	0.00	3.34	3.939	O	|	|	|	|	4.42
25.583	0.00	3.21	3.917	O	|	|	|	|	4.40
25.667	0.00	3.08	3.895	O	|	|	|	|	4.38
25.750	0.00	2.96	3.874	O	|	|	|	|	4.36
25.833	0.00	2.85	3.854	O	|	|	|	|	4.34
25.917	0.00	2.74	3.835	O	|	|	|	|	4.33
26.000	0.00	2.63	3.816	O	|	|	|	|	4.31
26.083	0.00	2.53	3.799	O	|	|	|	|	4.29
26.167	0.00	2.43	3.782	O	|	|	|	|	4.28
26.250	0.00	2.33	3.765	O	|	|	|	|	4.26
26.333	0.00	2.27	3.749	O	|	|	|	|	4.25
26.417	0.00	2.27	3.734	O	|	|	|	|	4.23
26.500	0.00	2.27	3.718	O	|	|	|	|	4.22
26.583	0.00	2.27	3.702	O	|	|	|	|	4.20
26.667	0.00	2.27	3.687	O	|	|	|	|	4.19
26.750	0.00	2.27	3.671	O	|	|	|	|	4.17
26.833	0.00	2.27	3.656	O	|	|	|	|	4.16
26.917	0.00	2.27	3.640	O	|	|	|	|	4.14
27.000	0.00	2.27	3.624	O	|	|	|	|	4.13
27.083	0.00	2.27	3.609	O	|	|	|	|	4.11
27.167	0.00	2.27	3.593	O	|	|	|	|	4.10
27.250	0.00	2.27	3.577	O	|	|	|	|	4.08
27.333	0.00	2.27	3.562	O	|	|	|	|	4.07
27.417	0.00	2.27	3.546	O	|	|	|	|	4.05
27.500	0.00	2.27	3.531	O	|	|	|	|	4.04
27.583	0.00	2.27	3.515	O	|	|	|	|	4.02
27.667	0.00	2.27	3.499	O	|	|	|	|	4.01
27.750	0.00	2.27	3.484	O	|	|	|	|	3.99
27.833	0.00	2.27	3.468	O	|	|	|	|	3.98
27.917	0.00	2.27	3.452	O	|	|	|	|	3.96
28.000	0.00	2.27	3.437	O	|	|	|	|	3.95
28.083	0.00	2.27	3.421	O	|	|	|	|	3.93
28.167	0.00	2.27	3.405	O	|	|	|	|	3.92
28.250	0.00	2.27	3.390	O	|	|	|	|	3.90
28.333	0.00	2.27	3.374	O	|	|	|	|	3.89
28.417	0.00	2.27	3.359	O	|	|	|	|	3.87
28.500	0.00	2.27	3.343	O	|	|	|	|	3.86
28.583	0.00	2.27	3.327	O	|	|	|	|	3.84
28.667	0.00	2.27	3.312	O	|	|	|	|	3.83
28.750	0.00	2.27	3.296	O	|	|	|	|	3.81
28.833	0.00	2.27	3.280	O	|	|	|	|	3.80
28.917	0.00	2.27	3.265	O	|	|	|	|	3.78
29.000	0.00	2.27	3.249	O	|	|	|	|	3.77
29.083	0.00	2.27	3.233	O	|	|	|	|	3.75
29.167	0.00	2.27	3.218	O	|	|	|	|	3.74
29.250	0.00	2.27	3.202	O	|	|	|	|	3.72
29.333	0.00	2.27	3.187	O	|	|	|	|	3.71
29.417	0.00	2.27	3.171	O	|	|	|	|	3.69
29.500	0.00	2.27	3.155	O	|	|	|	|	3.68
29.583	0.00	2.27	3.140	O	|	|	|	|	3.66
29.667	0.00	2.27	3.124	O	|	|	|	|	3.65
29.750	0.00	2.27	3.108	O	|	|	|	|	3.63
29.833	0.00	2.27	3.093	O	|	|	|	|	3.62
29.917	0.00	2.27	3.077	O	|	|	|	|	3.61
30.000	0.00	2.27	3.062	O	|	|	|	|	3.59
30.083	0.00	2.27	3.046	O	|	|	|	|	3.58
30.167	0.00	2.27	3.030	O	|	|	|	|	3.56
30.250	0.00	2.27	3.015	O	|	|	|	|	3.55

30.333	0.00	2.27	2.999	O				3.53
30.417	0.00	2.27	2.983	O				3.52
30.500	0.00	2.27	2.968	O				3.50
30.583	0.00	2.27	2.952	O				3.49
30.667	0.00	2.27	2.936	O				3.47
30.750	0.00	2.27	2.921	O				3.46
30.833	0.00	2.27	2.905	O				3.44
30.917	0.00	2.27	2.890	O				3.43
31.000	0.00	2.27	2.874	O				3.41
31.083	0.00	2.27	2.858	O				3.40
31.167	0.00	2.27	2.843	O				3.38
31.250	0.00	2.27	2.827	O				3.37
31.333	0.00	2.27	2.811	O				3.35
31.417	0.00	2.27	2.796	O				3.34
31.500	0.00	2.27	2.780	O				3.32
31.583	0.00	2.27	2.764	O				3.31
31.667	0.00	2.27	2.749	O				3.29
31.750	0.00	2.27	2.733	O				3.28
31.833	0.00	2.27	2.718	O				3.26
31.917	0.00	2.27	2.702	O				3.25
32.000	0.00	2.27	2.686	O				3.23
32.083	0.00	2.27	2.671	O				3.22
32.167	0.00	2.27	2.655	O				3.20
32.250	0.00	2.27	2.639	O				3.19
32.333	0.00	2.27	2.624	O				3.17
32.417	0.00	2.27	2.608	O				3.16
32.500	0.00	2.27	2.592	O				3.14
32.583	0.00	2.27	2.577	O				3.13
32.667	0.00	2.27	2.561	O				3.11
32.750	0.00	2.27	2.546	O				3.10
32.833	0.00	2.27	2.530	O				3.08
32.917	0.00	2.27	2.514	O				3.07
33.000	0.00	2.27	2.499	O				3.05
33.083	0.00	2.27	2.483	O				3.04
33.167	0.00	2.27	2.467	O				3.02
33.250	0.00	2.27	2.452	O				3.01
33.333	0.00	2.27	2.436	O				2.99
33.417	0.00	2.27	2.421	O				2.98
33.500	0.00	2.27	2.405	O				2.96
33.583	0.00	2.27	2.389	O				2.95
33.667	0.00	2.27	2.374	O				2.93
33.750	0.00	2.27	2.358	O				2.92
33.833	0.00	2.27	2.342	O				2.90
33.917	0.00	2.27	2.327	O				2.88
34.000	0.00	2.27	2.311	O				2.87
34.083	0.00	2.27	2.295	O				2.85
34.167	0.00	2.27	2.280	O				2.84
34.250	0.00	2.27	2.264	O				2.82
34.333	0.00	2.27	2.249	O				2.81
34.417	0.00	2.27	2.233	O				2.79
34.500	0.00	2.27	2.217	O				2.78
34.583	0.00	2.27	2.202	O				2.76
34.667	0.00	2.27	2.186	O				2.74
34.750	0.00	2.27	2.170	O				2.73
34.833	0.00	2.27	2.155	O				2.71
34.917	0.00	2.27	2.139	O				2.70
35.000	0.00	2.27	2.123	O				2.68
35.083	0.00	2.27	2.108	O				2.67
35.167	0.00	2.27	2.092	O				2.65
35.250	0.00	2.27	2.077	O				2.64
35.333	0.00	2.27	2.061	O				2.62
35.417	0.00	2.27	2.045	O				2.60
35.500	0.00	2.27	2.030	O				2.59

35.583	0.00	2.27	2.014	O	|	|	|	|	2.57
35.667	0.00	2.27	1.998	O	|	|	|	|	2.56
35.750	0.00	2.27	1.983	O	|	|	|	|	2.54
35.833	0.00	2.27	1.967	O	|	|	|	|	2.53
35.917	0.00	2.27	1.952	O	|	|	|	|	2.51
36.000	0.00	2.27	1.936	O	|	|	|	|	2.49
36.083	0.00	2.27	1.920	O	|	|	|	|	2.48
36.167	0.00	2.27	1.905	O	|	|	|	|	2.46
36.250	0.00	2.27	1.889	O	|	|	|	|	2.44
36.333	0.00	2.27	1.873	O	|	|	|	|	2.43
36.417	0.00	2.27	1.858	O	|	|	|	|	2.41
36.500	0.00	2.27	1.842	O	|	|	|	|	2.39
36.583	0.00	2.27	1.826	O	|	|	|	|	2.38
36.667	0.00	2.27	1.811	O	|	|	|	|	2.36
36.750	0.00	2.27	1.795	O	|	|	|	|	2.34
36.833	0.00	2.27	1.780	O	|	|	|	|	2.33
36.917	0.00	2.27	1.764	O	|	|	|	|	2.31
37.000	0.00	2.27	1.748	O	|	|	|	|	2.29
37.083	0.00	2.27	1.733	O	|	|	|	|	2.28
37.167	0.00	2.27	1.717	O	|	|	|	|	2.26
37.250	0.00	2.27	1.701	O	|	|	|	|	2.24
37.333	0.00	2.27	1.686	O	|	|	|	|	2.23
37.417	0.00	2.27	1.670	O	|	|	|	|	2.21
37.500	0.00	2.27	1.654	O	|	|	|	|	2.19
37.583	0.00	2.27	1.639	O	|	|	|	|	2.18
37.667	0.00	2.27	1.623	O	|	|	|	|	2.16
37.750	0.00	2.27	1.608	O	|	|	|	|	2.14
37.833	0.00	2.27	1.592	O	|	|	|	|	2.13
37.917	0.00	2.27	1.576	O	|	|	|	|	2.11
38.000	0.00	2.27	1.561	O	|	|	|	|	2.09
38.083	0.00	2.27	1.545	O	|	|	|	|	2.07
38.167	0.00	2.27	1.529	O	|	|	|	|	2.06
38.250	0.00	2.27	1.514	O	|	|	|	|	2.04
38.333	0.00	2.27	1.498	O	|	|	|	|	2.02
38.417	0.00	2.27	1.483	O	|	|	|	|	2.01
38.500	0.00	2.27	1.467	O	|	|	|	|	1.99
38.583	0.00	2.27	1.451	O	|	|	|	|	1.97
38.667	0.00	2.27	1.436	O	|	|	|	|	1.96
38.750	0.00	2.27	1.420	O	|	|	|	|	1.94
38.833	0.00	2.27	1.404	O	|	|	|	|	1.92
38.917	0.00	2.27	1.389	O	|	|	|	|	1.91
39.000	0.00	2.27	1.373	O	|	|	|	|	1.89
39.083	0.00	2.27	1.357	O	|	|	|	|	1.87
39.167	0.00	2.27	1.342	O	|	|	|	|	1.86
39.250	0.00	2.27	1.326	O	|	|	|	|	1.84
39.333	0.00	2.27	1.311	O	|	|	|	|	1.82
39.417	0.00	2.27	1.295	O	|	|	|	|	1.81
39.500	0.00	2.27	1.279	O	|	|	|	|	1.79
39.583	0.00	2.27	1.264	O	|	|	|	|	1.77
39.667	0.00	2.27	1.248	O	|	|	|	|	1.76
39.750	0.00	2.27	1.232	O	|	|	|	|	1.74
39.833	0.00	2.27	1.217	O	|	|	|	|	1.72
39.917	0.00	2.27	1.201	O	|	|	|	|	1.71
40.000	0.00	2.27	1.185	O	|	|	|	|	1.69
40.083	0.00	2.27	1.170	O	|	|	|	|	1.67
40.167	0.00	2.27	1.154	O	|	|	|	|	1.65
40.250	0.00	2.27	1.139	O	|	|	|	|	1.64
40.333	0.00	2.27	1.123	O	|	|	|	|	1.62
40.417	0.00	2.27	1.107	O	|	|	|	|	1.60
40.500	0.00	2.27	1.092	O	|	|	|	|	1.59
40.583	0.00	2.27	1.076	O	|	|	|	|	1.57
40.667	0.00	2.27	1.060	O	|	|	|	|	1.55
40.750	0.00	2.27	1.045	O	|	|	|	|	1.54

40.833	0.00	2.27	1.029	O				1.52
40.917	0.00	2.27	1.013	O				1.50
41.000	0.00	2.27	0.998	O				1.48
41.083	0.00	2.27	0.982	O				1.46
41.167	0.00	2.27	0.967	O				1.44
41.250	0.00	2.27	0.951	O				1.42
41.333	0.00	2.27	0.935	O				1.40
41.417	0.00	2.27	0.920	O				1.38
41.500	0.00	2.27	0.904	O				1.36
41.583	0.00	2.27	0.888	O				1.34
41.667	0.00	2.27	0.873	O				1.32
41.750	0.00	2.27	0.857	O				1.30
41.833	0.00	2.27	0.842	O				1.28
41.917	0.00	2.27	0.826	O				1.26
42.000	0.00	2.27	0.810	O				1.24
42.083	0.00	2.27	0.795	O				1.21
42.167	0.00	2.27	0.779	O				1.19
42.250	0.00	2.27	0.763	O				1.17
42.333	0.00	2.27	0.748	O				1.15
42.417	0.00	2.27	0.732	O				1.13
42.500	0.00	2.27	0.716	O				1.11
42.583	0.00	2.27	0.701	O				1.09
42.667	0.00	2.27	0.685	O				1.07
42.750	0.00	2.27	0.670	O				1.05
42.833	0.00	2.27	0.654	O				1.03
42.917	0.00	2.27	0.638	O				1.01
43.000	0.00	2.27	0.623	O				0.99
43.083	0.00	2.27	0.607	O				0.97
43.167	0.00	2.27	0.591	O				0.95
43.250	0.00	2.27	0.576	O				0.92
43.333	0.00	2.27	0.560	O				0.90
43.417	0.00	2.27	0.544	O				0.88
43.500	0.00	2.27	0.529	O				0.86
43.583	0.00	2.27	0.513	O				0.84
43.667	0.00	2.27	0.498	O				0.82
43.750	0.00	2.27	0.482	O				0.80
43.833	0.00	2.27	0.466	O				0.78
43.917	0.00	2.27	0.451	O				0.76
44.000	0.00	2.27	0.435	O				0.74
44.083	0.00	2.27	0.419	O				0.72
44.167	0.00	2.27	0.404	O				0.70
44.250	0.00	2.27	0.388	O				0.68
44.333	0.00	2.27	0.373	O				0.66
44.417	0.00	2.27	0.357	O				0.63
44.500	0.00	2.27	0.341	O				0.61
44.583	0.00	2.27	0.326	O				0.59
44.667	0.00	2.27	0.310	O				0.57
44.750	0.00	2.27	0.294	O				0.55
44.833	0.00	2.27	0.279	O				0.53
44.917	0.00	2.27	0.263	O				0.51
45.000	0.00	2.20	0.248	O				0.49
45.083	0.00	2.07	0.233	O				0.46
45.167	0.00	1.95	0.219	O				0.43
45.250	0.00	1.83	0.206	O				0.40
45.333	0.00	1.73	0.194	O				0.38
45.417	0.00	1.62	0.182	O				0.36
45.500	0.00	1.53	0.171	O				0.34
45.583	0.00	1.44	0.161	O				0.32
45.667	0.00	1.35	0.152	O				0.30
45.750	0.00	1.27	0.143	O				0.28
45.833	0.00	1.19	0.134	O				0.26
45.917	0.00	1.12	0.126	O				0.25
46.000	0.00	1.06	0.119	O				0.23

46.083	0.00	0.99	0.112	O	|	|	|	0.22
46.167	0.00	0.93	0.105	O	|	|	|	0.21
46.250	0.00	0.88	0.099	O	|	|	|	0.19
46.333	0.00	0.83	0.093	O	|	|	|	0.18
46.417	0.00	0.78	0.087	O	|	|	|	0.17
46.500	0.00	0.73	0.082	O	|	|	|	0.16
46.583	0.00	0.69	0.077	O	|	|	|	0.15
46.667	0.00	0.65	0.073	O	|	|	|	0.14
46.750	0.00	0.61	0.068	O	|	|	|	0.13
46.833	0.00	0.57	0.064	O	|	|	|	0.13
46.917	0.00	0.54	0.060	O	|	|	|	0.12
47.000	0.00	0.51	0.057	O	|	|	|	0.11
47.083	0.00	0.48	0.053	O	|	|	|	0.10
47.167	0.00	0.45	0.050	O	|	|	|	0.10
47.250	0.00	0.42	0.047	O	|	|	|	0.09
47.333	0.00	0.40	0.044	O	|	|	|	0.09
47.417	0.00	0.37	0.042	O	|	|	|	0.08
47.500	0.00	0.35	0.039	O	|	|	|	0.08
47.583	0.00	0.33	0.037	O	|	|	|	0.07
47.667	0.00	0.31	0.035	O	|	|	|	0.07
47.750	0.00	0.29	0.033	O	|	|	|	0.06
47.833	0.00	0.27	0.031	O	|	|	|	0.06
47.917	0.00	0.26	0.029	O	|	|	|	0.06
48.000	0.00	0.24	0.027	O	|	|	|	0.05
48.083	0.00	0.23	0.026	O	|	|	|	0.05
48.167	0.00	0.21	0.024	O	|	|	|	0.05
48.250	0.00	0.20	0.023	O	|	|	|	0.04
48.333	0.00	0.19	0.021	O	|	|	|	0.04
48.417	0.00	0.18	0.020	O	|	|	|	0.04
48.500	0.00	0.17	0.019	O	|	|	|	0.04
48.583	0.00	0.16	0.018	O	|	|	|	0.03
48.667	0.00	0.15	0.017	O	|	|	|	0.03
48.750	0.00	0.14	0.016	O	|	|	|	0.03
48.833	0.00	0.13	0.015	O	|	|	|	0.03
48.917	0.00	0.12	0.014	O	|	|	|	0.03
49.000	0.00	0.12	0.013	O	|	|	|	0.03
49.083	0.00	0.11	0.012	O	|	|	|	0.02
49.167	0.00	0.10	0.012	O	|	|	|	0.02
49.250	0.00	0.10	0.011	O	|	|	|	0.02
49.333	0.00	0.09	0.010	O	|	|	|	0.02
49.417	0.00	0.09	0.010	O	|	|	|	0.02
49.500	0.00	0.08	0.009	O	|	|	|	0.02
49.583	0.00	0.08	0.008	O	|	|	|	0.02
49.667	0.00	0.07	0.008	O	|	|	|	0.02
49.750	0.00	0.07	0.008	O	|	|	|	0.01
49.833	0.00	0.06	0.007	O	|	|	|	0.01
49.917	0.00	0.06	0.007	O	|	|	|	0.01
50.000	0.00	0.06	0.006	O	|	|	|	0.01
50.083	0.00	0.05	0.006	O	|	|	|	0.01
50.167	0.00	0.05	0.006	O	|	|	|	0.01
50.250	0.00	0.05	0.005	O	|	|	|	0.01
50.333	0.00	0.04	0.005	O	|	|	|	0.01
50.417	0.00	0.04	0.005	O	|	|	|	0.01
50.500	0.00	0.04	0.004	O	|	|	|	0.01
50.583	0.00	0.04	0.004	O	|	|	|	0.01
50.667	0.00	0.03	0.004	O	|	|	|	0.01
50.750	0.00	0.03	0.004	O	|	|	|	0.01
50.833	0.00	0.03	0.003	O	|	|	|	0.01
50.917	0.00	0.03	0.003	O	|	|	|	0.01
51.000	0.00	0.03	0.003	O	|	|	|	0.01
51.083	0.00	0.03	0.003	O	|	|	|	0.01
51.167	0.00	0.02	0.003	O	|	|	|	0.01
51.250	0.00	0.02	0.002	O	|	|	|	0.00

51.333	0.00	0.02	0.002	O	|	|	|	|	0.00
51.417	0.00	0.02	0.002	O	|	|	|	|	0.00
51.500	0.00	0.02	0.002	O	|	|	|	|	0.00
51.583	0.00	0.02	0.002	O	|	|	|	|	0.00
51.667	0.00	0.02	0.002	O	|	|	|	|	0.00
51.750	0.00	0.02	0.002	O	|	|	|	|	0.00
51.833	0.00	0.01	0.002	O	|	|	|	|	0.00
51.917	0.00	0.01	0.002	O	|	|	|	|	0.00
52.000	0.00	0.01	0.001	O	|	|	|	|	0.00
52.083	0.00	0.01	0.001	O	|	|	|	|	0.00
52.167	0.00	0.01	0.001	O	|	|	|	|	0.00
52.250	0.00	0.01	0.001	O	|	|	|	|	0.00
52.333	0.00	0.01	0.001	O	|	|	|	|	0.00
52.417	0.00	0.01	0.001	O	|	|	|	|	0.00
52.500	0.00	0.01	0.001	O	|	|	|	|	0.00
52.583	0.00	0.01	0.001	O	|	|	|	|	0.00
52.667	0.00	0.01	0.001	O	|	|	|	|	0.00
52.750	0.00	0.01	0.001	O	|	|	|	|	0.00
52.833	0.00	0.01	0.001	O	|	|	|	|	0.00
52.917	0.00	0.01	0.001	O	|	|	|	|	0.00
53.000	0.00	0.01	0.001	O	|	|	|	|	0.00
53.083	0.00	0.01	0.001	O	|	|	|	|	0.00
53.167	0.00	0.01	0.001	O	|	|	|	|	0.00
53.250	0.00	0.01	0.001	O	|	|	|	|	0.00
53.333	0.00	0.00	0.001	O	|	|	|	|	0.00
53.417	0.00	0.00	0.001	O	|	|	|	|	0.00

**********HYDROGRAPH DATA**********

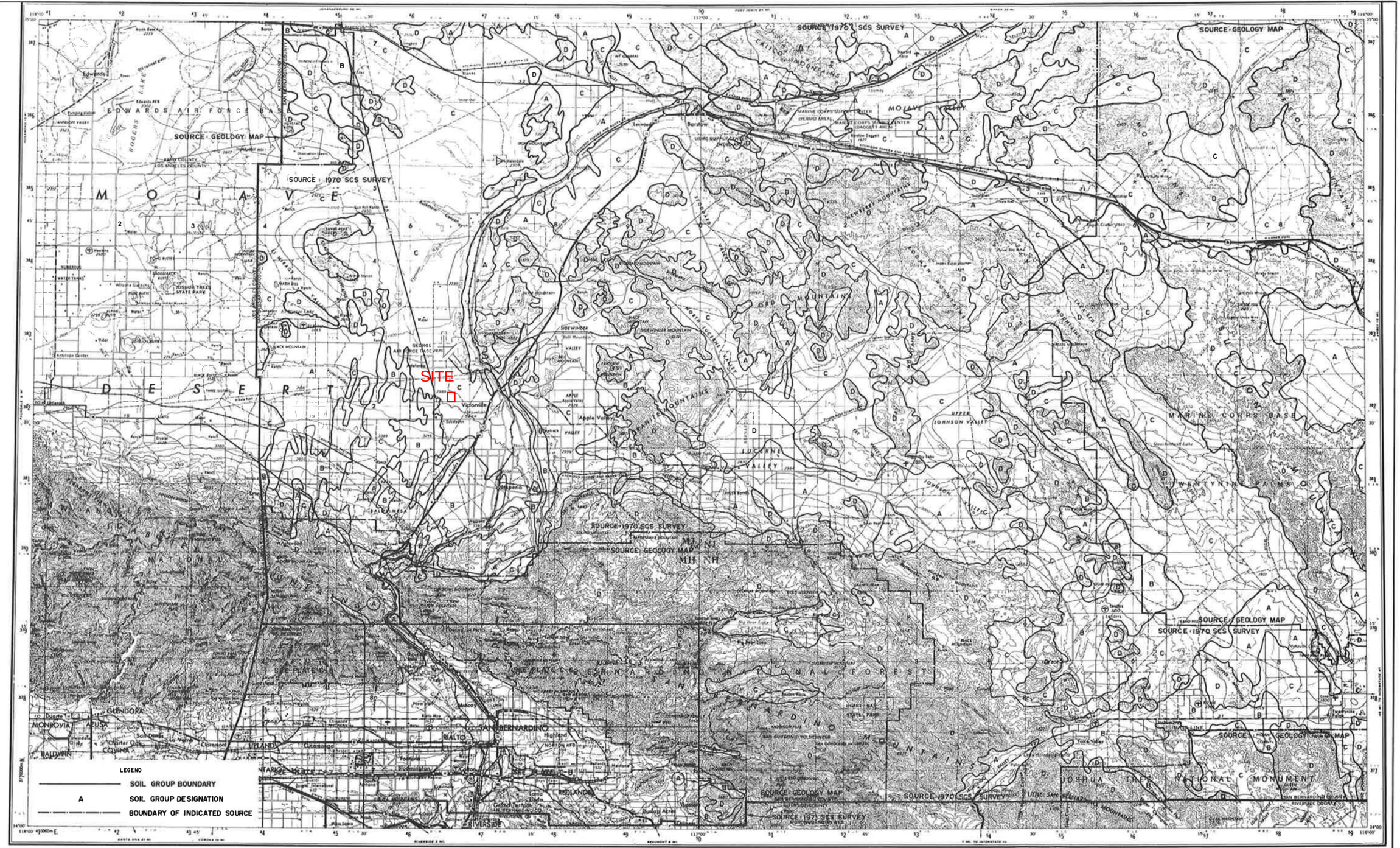
Number of intervals = 641
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 26.376 (CFS)
Total volume = 18.713 (Ac.Ft)

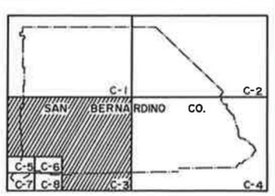
Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

Appendix E
Soil Group Map and NOAA 14 ATLAS





INDEX MAP

Scale 1:250,000

5 0 5 10 15 20 Statute Miles

5 0 5 10 15 20 25 30 Kilometers

5 0 5 10 15 Nautical Miles

CONTOUR INTERVAL 200 FEET
WITH SUPPLEMENTARY CONTOURS AT 100 FOOT INTERVALS

TRANSVERSE MERCATOR PROJECTION

BLACK NUMBERED LINES INDICATE THE 10,000 METER UNIVERSAL TRANSVERSE MERCATOR GRID, ZONE 11

1965 MAGNETIC DECLINATION FROM TRUE NORTH VARIES FROM 15½° (260 MILS) EASTERLY FOR THE CENTER OF THE WEST EDGE TO 15° (270 MILS) EASTERLY FOR THE CENTER OF THE EAST EDGE

BASE MAP REPRODUCED FROM U.S.G.S. "SAN BERNARDINO" TOPOGRAPHIC MAP

SCALE REDUCED BY 1/2

LOCATION DIAGRAM

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

HYDROLOGIC SOILS GROUP MAP FOR SOUTHCENTRAL AREA

NOAA Atlas 14, Volume 6, Version 2
Location name: Victorville, California, USA*
Latitude: 34.5358°, Longitude: -117.3842°
Elevation: 2987.66 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	0.086 (0.071-0.105)	0.121 (0.100-0.148)	0.168 (0.138-0.206)	0.208 (0.169-0.257)	0.264 (0.208-0.338)	0.309 (0.239-0.403)	0.356 (0.269-0.477)	0.406 (0.298-0.559)	0.476 (0.335-0.683)	0.533 (0.362-0.791)
10-min	0.123 (0.102-0.151)	0.173 (0.143-0.212)	0.241 (0.198-0.296)	0.298 (0.243-0.369)	0.378 (0.299-0.484)	0.443 (0.342-0.578)	0.510 (0.385-0.683)	0.582 (0.427-0.801)	0.683 (0.481-0.979)	0.763 (0.519-1.13)
15-min	0.149 (0.123-0.183)	0.209 (0.173-0.256)	0.291 (0.240-0.358)	0.360 (0.294-0.446)	0.458 (0.361-0.586)	0.535 (0.414-0.699)	0.617 (0.466-0.826)	0.704 (0.516-0.969)	0.825 (0.581-1.18)	0.923 (0.628-1.37)
30-min	0.209 (0.173-0.256)	0.294 (0.242-0.360)	0.408 (0.336-0.502)	0.505 (0.412-0.625)	0.642 (0.506-0.821)	0.751 (0.580-0.981)	0.865 (0.653-1.16)	0.987 (0.724-1.36)	1.16 (0.815-1.66)	1.30 (0.881-1.92)
60-min	0.257 (0.213-0.315)	0.361 (0.298-0.442)	0.502 (0.413-0.617)	0.621 (0.507-0.769)	0.789 (0.623-1.01)	0.923 (0.714-1.21)	1.06 (0.803-1.42)	1.21 (0.890-1.67)	1.42 (1.00-2.04)	1.59 (1.08-2.36)
2-hr	0.359 (0.296-0.439)	0.484 (0.399-0.593)	0.657 (0.541-0.807)	0.804 (0.656-0.995)	1.01 (0.800-1.30)	1.18 (0.914-1.54)	1.36 (1.03-1.82)	1.55 (1.14-2.13)	1.81 (1.28-2.60)	2.03 (1.38-3.01)
3-hr	0.436 (0.360-0.533)	0.581 (0.479-0.711)	0.782 (0.643-0.960)	0.953 (0.777-1.18)	1.20 (0.945-1.53)	1.40 (1.08-1.82)	1.61 (1.21-2.15)	1.83 (1.34-2.52)	2.14 (1.51-3.08)	2.40 (1.63-3.56)
6-hr	0.587 (0.485-0.718)	0.778 (0.642-0.953)	1.04 (0.857-1.28)	1.27 (1.03-1.57)	1.59 (1.25-2.04)	1.85 (1.43-2.42)	2.13 (1.61-2.85)	2.43 (1.78-3.34)	2.85 (2.01-4.09)	3.19 (2.17-4.74)
12-hr	0.736 (0.607-0.900)	0.998 (0.823-1.22)	1.36 (1.12-1.67)	1.67 (1.36-2.06)	2.10 (1.66-2.69)	2.45 (1.90-3.20)	2.82 (2.13-3.78)	3.22 (2.36-4.43)	3.77 (2.66-5.42)	4.22 (2.87-6.27)
24-hr	0.966 (0.856-1.11)	1.35 (1.20-1.56)	1.87 (1.66-2.17)	2.32 (2.03-2.70)	2.94 (2.49-3.54)	3.44 (2.85-4.22)	3.96 (3.21-4.99)	4.52 (3.56-5.85)	5.30 (4.01-7.16)	5.94 (4.33-8.29)
2-day	1.07 (0.947-1.23)	1.51 (1.33-1.73)	2.11 (1.86-2.43)	2.61 (2.29-3.04)	3.33 (2.82-4.01)	3.90 (3.24-4.80)	4.51 (3.65-5.68)	5.15 (4.06-6.67)	6.06 (4.58-8.18)	6.80 (4.96-9.50)
3-day	1.15 (1.02-1.32)	1.63 (1.44-1.87)	2.28 (2.02-2.64)	2.83 (2.48-3.30)	3.62 (3.06-4.35)	4.24 (3.52-5.22)	4.90 (3.97-6.18)	5.61 (4.42-7.27)	6.61 (5.00-8.93)	7.43 (5.43-10.4)
4-day	1.23 (1.09-1.41)	1.73 (1.53-2.00)	2.43 (2.15-2.81)	3.03 (2.65-3.52)	3.86 (3.27-4.65)	4.53 (3.76-5.56)	5.23 (4.24-6.59)	5.98 (4.71-7.75)	7.05 (5.33-9.51)	7.91 (5.77-11.0)
7-day	1.31 (1.16-1.50)	1.84 (1.63-2.12)	2.58 (2.28-2.98)	3.20 (2.81-3.73)	4.08 (3.46-4.91)	4.77 (3.96-5.87)	5.50 (4.45-6.92)	6.26 (4.93-8.11)	7.34 (5.55-9.91)	8.20 (5.99-11.5)
10-day	1.38 (1.22-1.59)	1.94 (1.72-2.24)	2.72 (2.40-3.14)	3.37 (2.95-3.93)	4.29 (3.64-5.17)	5.02 (4.17-6.18)	5.78 (4.68-7.28)	6.58 (5.18-8.52)	7.70 (5.82-10.4)	8.59 (6.27-12.0)
20-day	1.60 (1.42-1.84)	2.27 (2.01-2.61)	3.20 (2.83-3.70)	4.00 (3.50-4.65)	5.13 (4.35-6.18)	6.03 (5.01-7.42)	6.97 (5.65-8.78)	7.96 (6.27-10.3)	9.33 (7.05-12.6)	10.4 (7.60-14.5)
30-day	1.81 (1.61-2.09)	2.58 (2.29-2.97)	3.67 (3.24-4.24)	4.61 (4.04-5.37)	5.97 (5.06-7.18)	7.05 (5.85-8.67)	8.19 (6.63-10.3)	9.38 (7.39-12.2)	11.0 (8.35-14.9)	12.3 (9.01-17.2)
45-day	2.10 (1.87-2.42)	3.00 (2.66-3.46)	4.29 (3.79-4.96)	5.42 (4.75-6.31)	7.08 (6.00-8.52)	8.43 (7.00-10.4)	9.85 (7.98-12.4)	11.4 (8.95-14.7)	13.5 (10.2-18.2)	15.1 (11.1-21.1)
60-day	2.32 (2.06-2.67)	3.30 (2.92-3.80)	4.73 (4.18-5.47)	6.01 (5.26-7.00)	7.89 (6.68-9.50)	9.45 (7.84-11.6)	11.1 (9.01-14.0)	12.9 (10.1-16.7)	15.4 (11.6-20.8)	17.4 (12.7-24.3)

[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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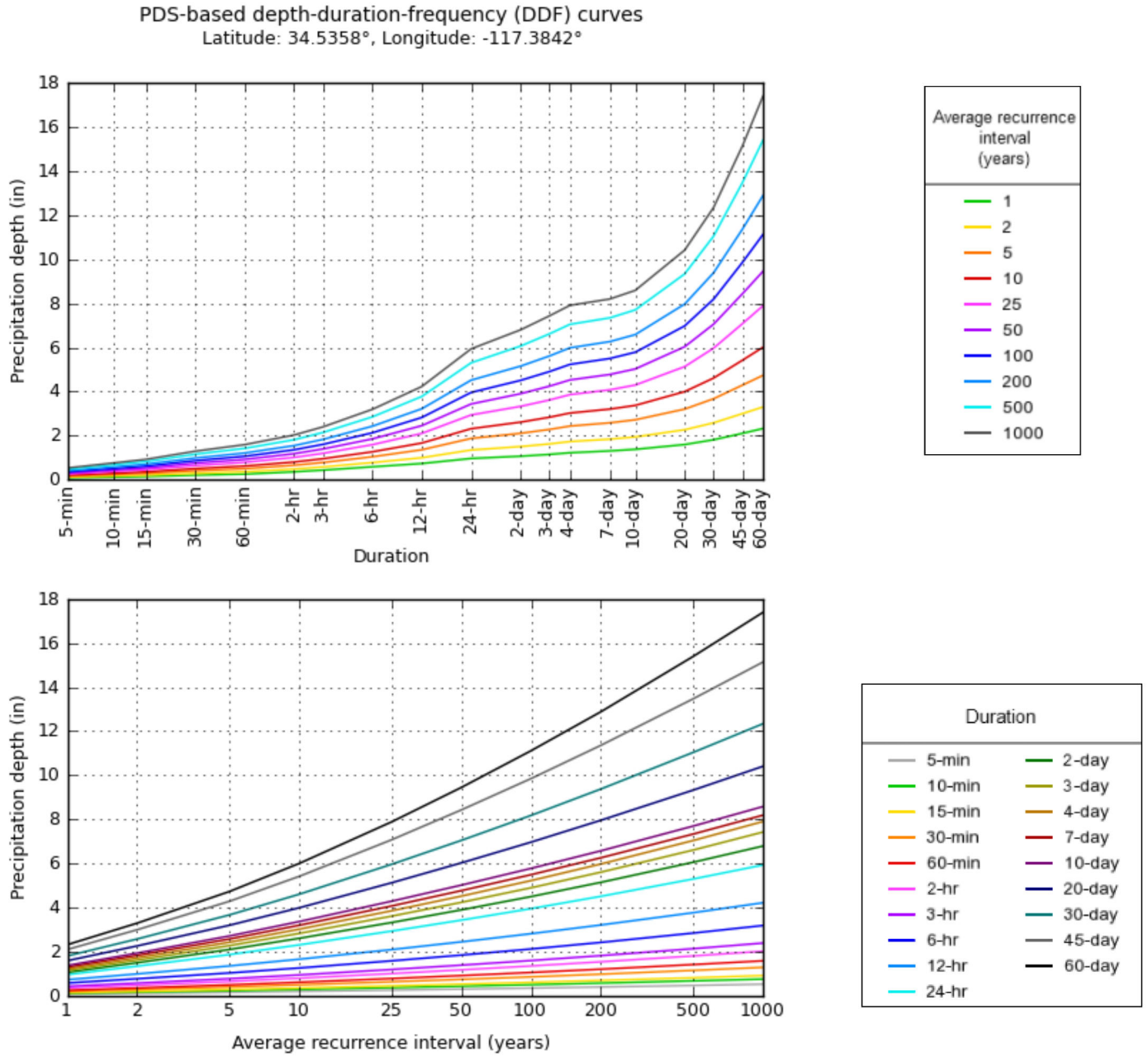
PF graphical



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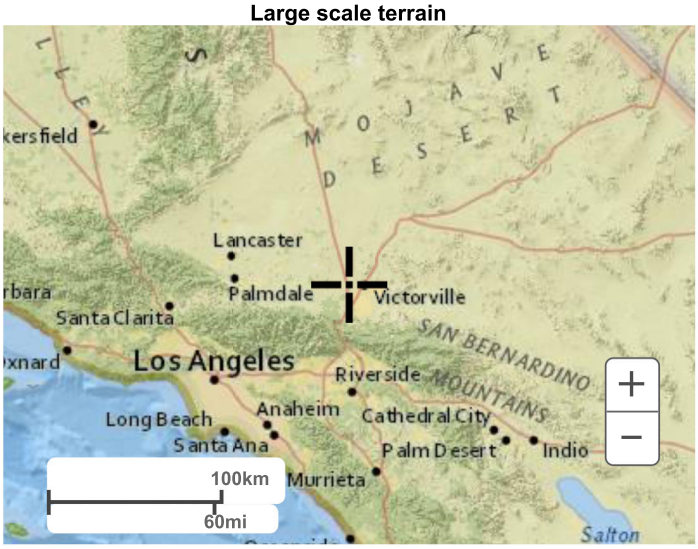
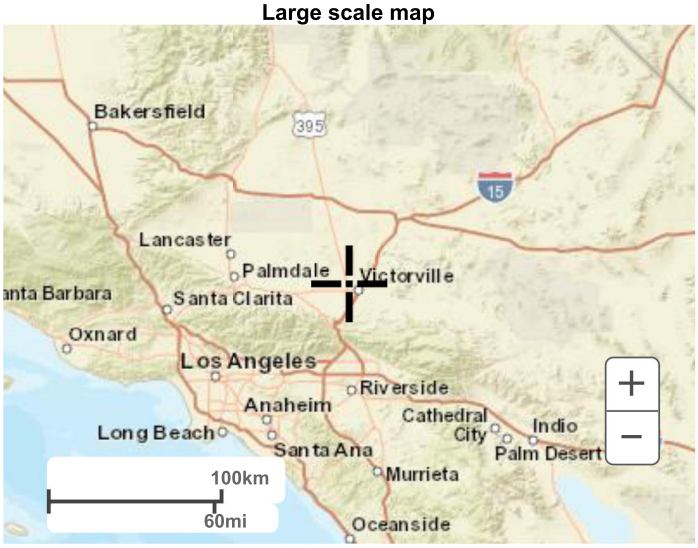
Maps & aerials

Small scale terrain

Large scale terrain



Large scale map



Large scale aerial

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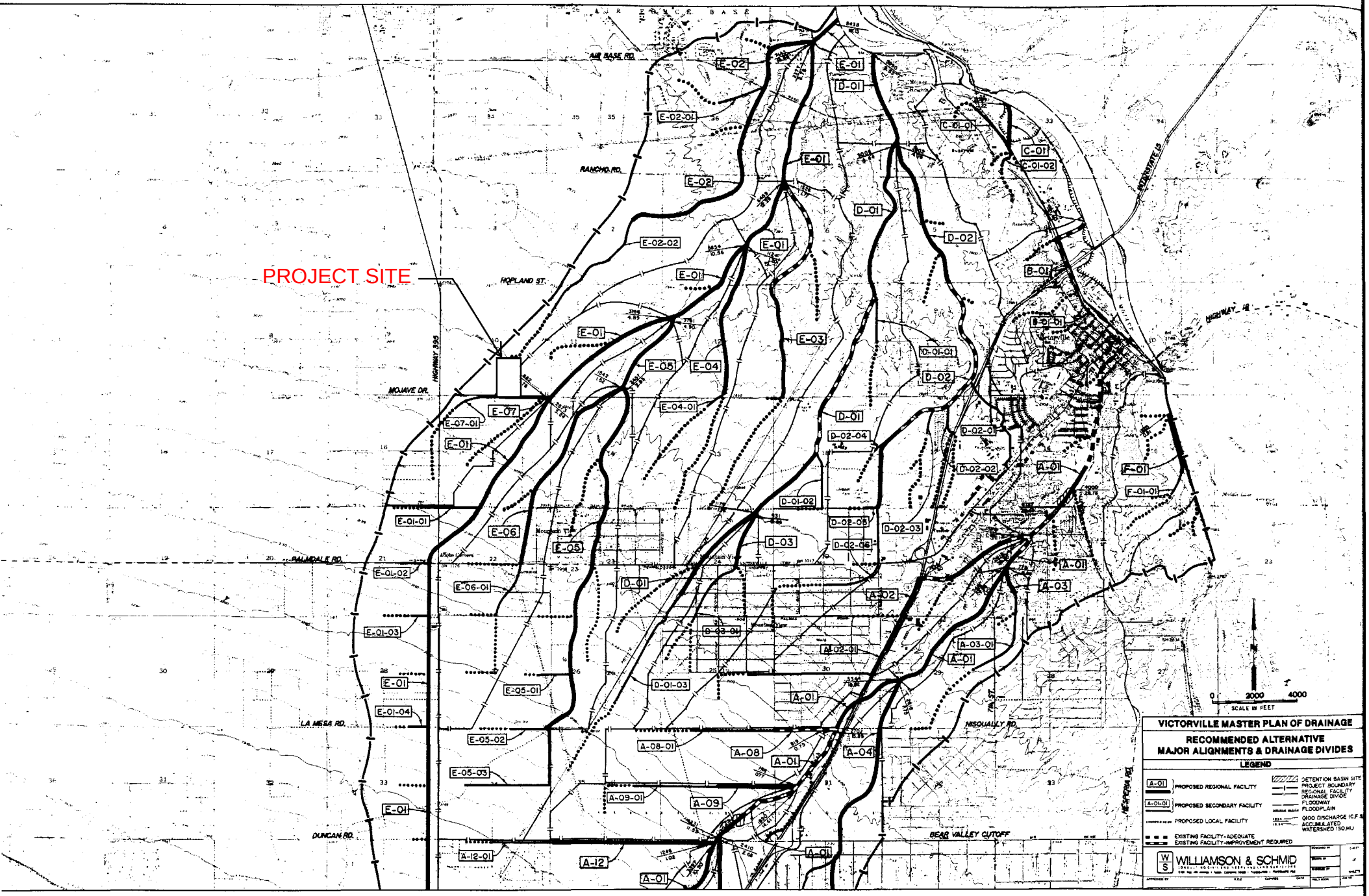
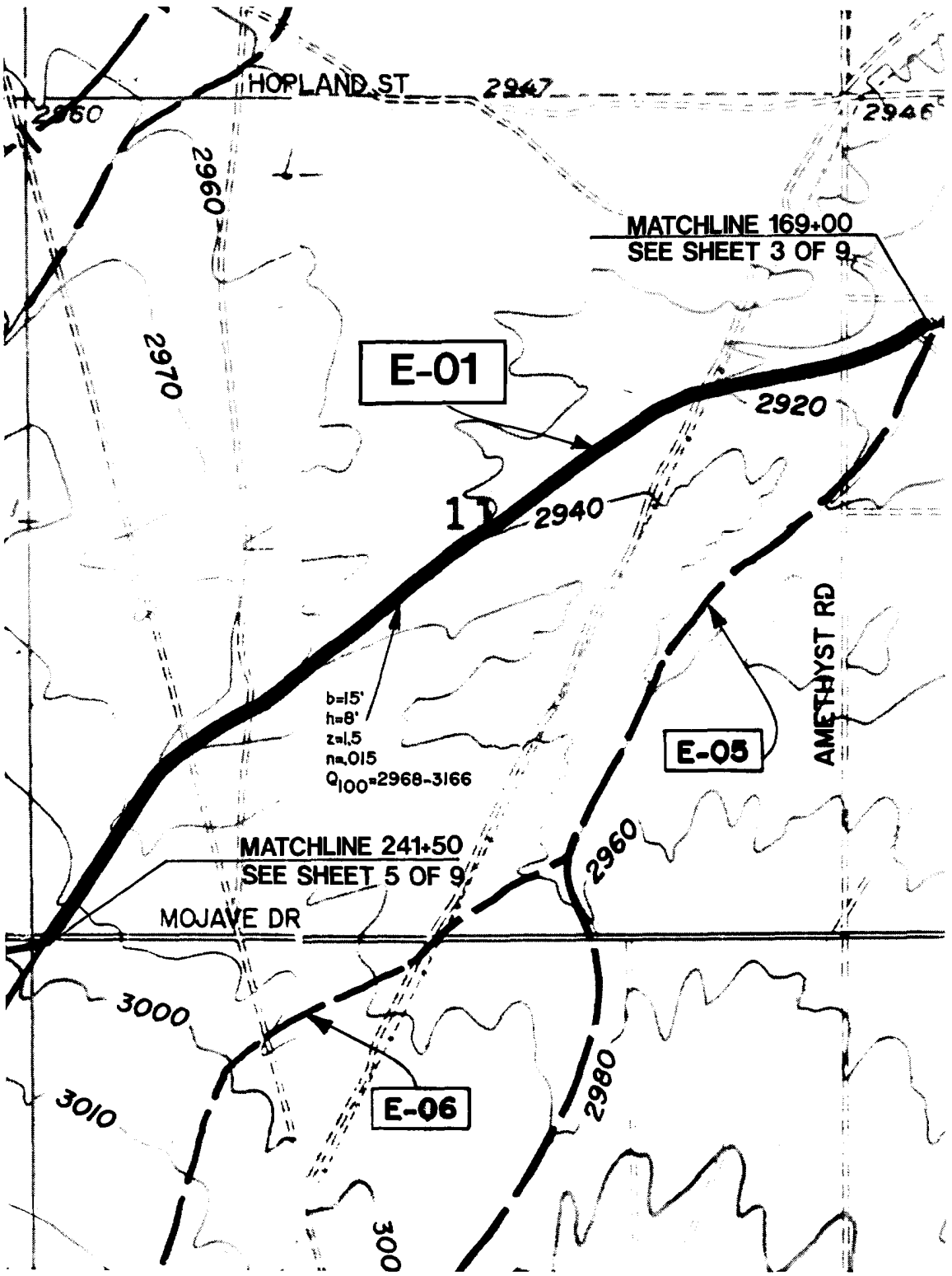
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Appendix F
Reference Plans


PROJECT SITE
AIR BASE RD.
RANCHO RD.
HOPLAND ST.
MOJAVE DR.
PALMDALE RD.
LA MESA RD.
DUNCAN RD.
BEAR VALLEY CUTOFF
NISQUALLY RD.
HESPERIA RD.
HIGHWAY 395
INTERSTATE 15
HIGHWAY 18
SCALE IN FEET
0
2000
4000
VICTORVILLE MASTER PLAN OF DRAINAGE
RECOMMENDED ALTERNATIVE
MAJOR ALIGNMENTS & DRAINAGE DIVIDES
LEGEND
PROPOSED REGIONAL FACILITY
PROPOSED SECONDARY FACILITY
PROPOSED LOCAL FACILITY
EXISTING FACILITY-ADEQUATE
EXISTING FACILITY-IMPROVEMENT REQUIRED
DETENTION BASIN SITE
PROJECT BOUNDARY
REGIONAL FACILITY DRAINAGE DIVIDE
FLOODWAY
FLOODPLAIN
Q100 DISCHARGE (C.F.S.) ACCUMULATED WATERSHED (SQ.MI.)
WILLIAMSON & SCHMID



LEGEND

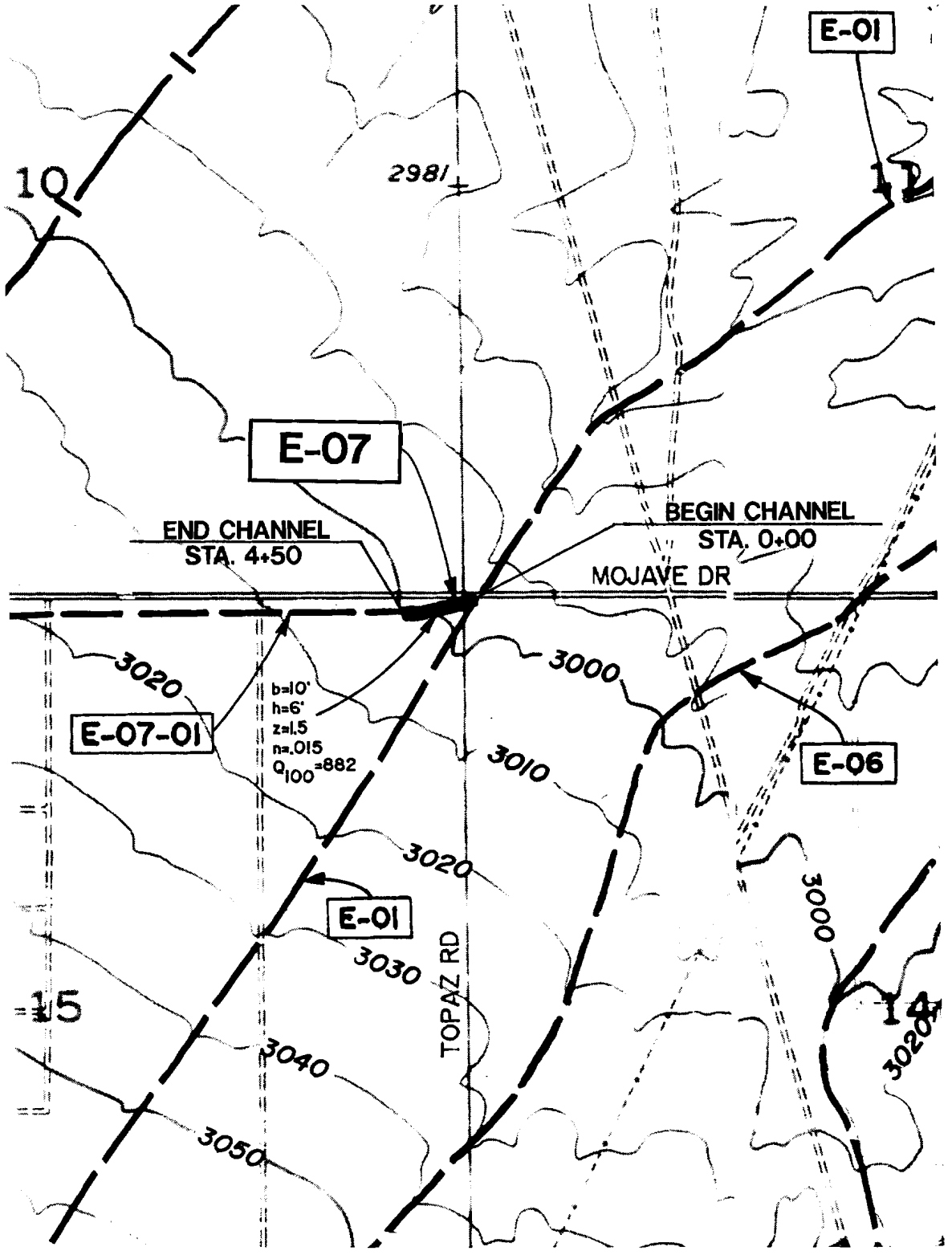
- PROPOSED FACILITY
- FACILITY SHOWN ELSEWHERE
- WATERSHED BOUNDARY
- FLOODPLAIN
- FLOODWAY
- DETENTION BASIN

VICTORVILLE MASTER PLAN OF DRAINAGE

COMPREHENSIVE STORM DRAIN PLAN
LINE E-01
SHEET 4 OF 9

SCALE 1"=1000'

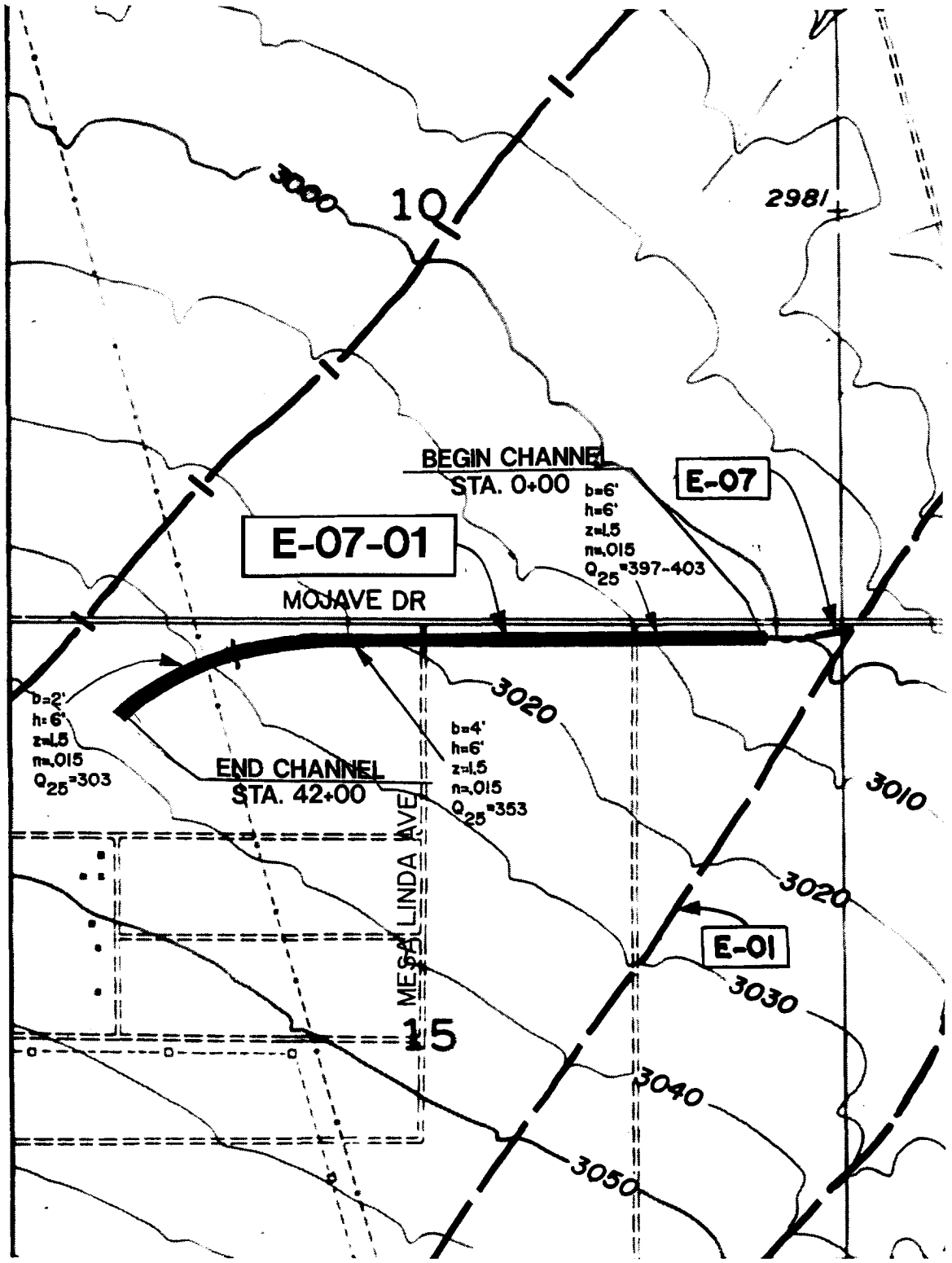
WILLIAMSON & SCHMID



LEGEND

- PROPOSED FACILITY
- FACILITY SHOWN ELSEWHERE
- WATERSHED BOUNDARY
- FLOODPLAIN
- FLOODWAY
- DETENTION BASIN

VICTORVILLE MASTER PLAN OF DRAINAGE	COMPREHENSIVE STORM DRAIN PLAN LINE E-07 SHEET 1 OF 1	SCALE 1"=1000' WILLIAMSON & SCHMID



LEGEND

- PROPOSED FACILITY
- FACILITY SHOWN ELSEWHERE
- WATERSHED BOUNDARY
- FLOODPLAIN
- FLOODWAY
- DETENTION BASIN

VICTORVILLE MASTER PLAN OF DRAINAGE	COMPREHENSIVE STORM DRAIN PLAN LINE E-07-01 SHEET 1 OF 1	SCALE 1"=1000' WILLIAMSON & SCHMID

MASTER STORM DRAIN PLAN
LINE E-01

COMBINE FLOWS TO EXISTING TRIPLE 6' X 9' R.C.B. *POST DEVELOPED CONDITION* TOTAL Q100= 1508 CFS

60'IN DIA. STORM DRAIN Q100=230 CFS

SURFACE FLOW Q100= 770 CFS - 642 CFS(INFLOW TO PIPE) Q100= 128 CFS

END 1 - 108" DIA. C.L.P.P. *POST DEVELOPED CONDITION* Q100= 1150 CFS

START 1 - 108" DIA. C.L.P.P. *POST DEVELOPED CONDITION* Q100= 1150 CFS SOUTHERLY SIDE OF C.L.

1- 108" DIA. C.L.P.P. *POST DEVELOPED CONDITION* Q100= 1150 CFS (CAPACITY) SOUTHERLY SIDE OF C.L.

1 - 108" DIA. C.L.P.P. *POST DEVELOPED CONDITION* Q100= 1074 CFS EASTERLY SIDE OF C.L.

1 - 96" DIA. C.L.P.P. *POST DEVELOPED CONDITION* Q100= 961 CFS EASTERLY SIDE OF C.L.

1 - 96" DIAMETER C.L.P.P. *POST DEVELOPED CONDITION* Q100= 961 CFS WESTERLY SIDE OF C.L.

1 - 96' DIAMETER C.L.P.P. *POST DEVELOPED CONDITION* Q100= 720 CFS NORTHERLY SIDE OF C.L.

LINE -E-01- 01
60" DIAMETER C.L.P.P. @ S=0.7%
Q100= 207 CFS
Q10= 113 CFS

LINE E-01 *POST-DEVELOPED* Q100= 424 CFS Q10= 375 CFS

LINE E-01 *POST DEVEVELOPED* Q100= 479 CFS

LINE E-01-02 Q= 120 CFS 60" R.C.P.

EXISTING BUBBLE UP DRAINAGE STRUCTURE THAT SURFACE DRAINS TO HIGHWAY 395 Q100= 544 CFS

EXISTING DOUBLE 8'W X 7'D R.C.B.

EXTG. DOUBLE 7'W X 3'D R.C.B. (WITH Q= 424 CFS CAPACITY)

BEGIN SECOND PHASE OF C.L.P.P. FROM U.S. HWY 395 TO DETENTION BASIN BY BORING A CONNECTION UNDER HIGHWAY 395 FROM FIRST PHASE TO EXISTING DOUBLE FRENCH DRAIN UNDER 8' X 7' R.C.B. (PROJECT BY OTHERS)

END FIRST PHASE OF C.I.P.P. FROM MOJAVE DRIVE TO U.S. HWY 395

DOUBLE 108" DIAMETER R.C.P. EXISTING MASTER STORM DRAIN *POST DEVELOPED CONDITION* Q100= 544 CFS EASTERLY OF HIGHWAY 395

PALMDALE ROAD STORM DRAIN CROSSING *PRE-DEVELOPED CONDITION* Q100= 544 CFS COMBINE FLOW LINE E-01-02 AND BASIN FLOWBY

Q100= 285 CFS FLOW THROUGH 1- 48" DIAMETER C.L.P.P. TOWARDS PALMDALE ROAD CROSSING TO EXISTING DOUBLE - 3'DEEP X 7'WIDE R.C.B.

Q100= 1875 CFS FLOWBY/DETENTION BASIN 100-YEAR 24-HOURS UNIT HYDROGRAPH WEIR LENGTH = 168 LF.

Q100= 2160 CFS INFLOW 100 YEAR, 24-HOURS UNIT HYDROGRAPH POST DEVELOPED CONDITION SOUTHERLY AREAS OF DOS PALMAS ROAD

EXISTING 3.7 AC. VICTORVILLE DETENTION BASIN TO BE MODIFIED BY OTHERS

END DOUBLE - 108" DIA. R.C.P. EXISTING MASTER STORM DRAIN START 1 - 96' DIA. C.L.P.P. *POST DEVELOPED CONDITION* Q100= 544 CFS

INFLOW TO STORM DRAIN Q=113 CFS

INFLOW TO STORM DRAIN Q=241 CFS

INFLOW TO STORM DRAIN Q=176 CFS

INFLOW TO STORM DRAIN Q=76 CFS

SEE LINE E-01 SOUTH OF DOS PALMAS ROAD HYDROLOGY STUDY

MOJAVE DRIVE
SENECA ROAD
BEGONIA ROAD
HOOK BLVD.
DOS PALMAS ROAD
PALMDALE ROAD
MESA LINDA AVE.
ONYX STREET
TOPAZ ROAD
HIGHWAY 395
CITY OF VICTORVILLE PROPERTY
WALMART
STATER BROS
ZENDA STREET

STREET CAPACITY AND LINE E-07-01 Q100= 116 CFS Q10= 62 CFS
STREET CAPACITY AND LINE E-07-01 Q100= 282 CFS Q10= 149 CFS
NODE 6.8 Q100= 463 CFS Q10= 233 CFS
LINE E-07-01 60'IN DIA. STORM DRAIN Q100=182 CFS AS PER TR. 16894 PHASE-1
TR. 16894 39 AC Q100=27 CFS AS PER TR. 16894(PH 1)
AS PER TR. 1719 CATCH BASIN Q100=60.7 CFS Q10= 40.2 CFS
AS PER TR. 1719 CATCH BASIN Q100=55.9 CFS Q10=36.4 CFS
Q100= 230 CFS Q10= 76.6 CFS TR. 16894(PHASE 1), TR. 16719, TR. 16718
GG5 55 AC 2908 LF. Q100= 170 CFS Q10= 89 CFS
HH4 40 AC 4054 LF. Q100= 47 CFS Q10= 15 CFS
GG4 36 AC 1490 LF. Q100= 104 CFS Q10= 58 CFS
HH3 59 AC 3700 LF Q100= 181 CFS Q10= 149 CFS
TR. 16718
FF3 39.5 AC 1572 LF. Q100= 83 CFS Q10= 35 CFS
EE8 2.6 AC 1335 LF. Q100=510 CFS Q10= 270 CFS
TT 17836
FF1 10 AC 854 LF. Q100= 21 CFS Q10= 10 CFS
NODE 5.5 Q100= 478 CFS Q10= 238 CFS
TT 17956
FF2 10 AC 646 LF. Q100= 23 CFS Q10= 12 CFS
EE5 2.6 AC 1335 LF. Q100=478 CFS Q10= 238 CFS
GG3 10 AC 1000 LF. Q100= 30 CFS Q10= 17 CFS
GG2 55 AC 3631 LF. Q100= 116 CFS Q10= 62 CFS
EE2 2.5 AC 1327 LF. Q100= 402 CFS Q10= 203 CFS
NODE 8 Q100=510 CFS Q10= 270 CFS
TT 16447
EE7 20 AC 942 LF. Q100= 48 CFS Q10= 21 CFS
HH2 88 AC 2000 LF. Q100= 171 CFS Q10= 73 CFS
EE4 62 AC 2730 LF. Q100= 84 CFS Q10= 30 CFS
TT 16121
EE1 70 AC 2600 LF. Q100=402 CFS Q10= 203 CFS
EE6 9.4 AC 970 LF. Q100= 19 CFS Q10= 9 CFS
½ STREET CAPACITY AND LINE E-01-01 Q100= 207 CFS + 34 CFS = 241 CFS Q10= 113 CFS + 34 CFS= 147 CFS
HH1 10 AC 587 LF. Q100=26 CFS Q10= 13 CFS
NODE 5.3 Q100= 402 CFS Q10= 203 CFS
EE3 10 AC 1000 LF. Q100= 12 CFS Q10= 6 CFS
GG1 10 AC 789 LF. Q100= 32 CFS Q10= 19 CFS
CC6 35.6 AC 1200 LF. Q100= 207 CFS Q10= 113 CFS
DD2 74 AC 2638 LF. Q100= 100 CFS Q10= 34 CFS
DD1 10 AC 910 LF. Q100= 20 CFS Q10= 10 CFS
NODE 3.5 Q100= 303 CFS Q10= 166 CFS
BB7 3.26 AC 2222 LF. Q100= 303 CFS Q10= 166 CFS
TT 16618
CC5 62.7 AC 1257 LF. Q100= 195 CFS Q10= 96 CFS
BB6 32 AC 1740 LF. Q100= 96 CFS Q10= 51 CFS
BB5 10 AC 824 LF. Q100= 32 CFS Q10= 19 CFS
NODE 3.4 Q100= 174.5 CFS Q10= 99 CFS
BB4 33.9 AC 1865 LF. Q100= 220.5 CFS Q10= 120 CFS
CC4 40 AC 1190 LF. Q100= 114 CFS Q10= 50.5 CFS
AA5 7.6 AC 554 LF. Q100= 32 CFS Q10= 25 CFS
BB3 30.5 AC 1315 LF. Q100= 174.5 CFS Q10= 99 CFS
POST-DEVELOPED LINE E-01-02 Q100=75 CFS Q10=10 CFS
POST-DEVELOPED LINE E-01-02 Q100=29 CFS Q10=29 CFS
CC3 34 AC 1220 LF. Q100= 104 CFS Q10= 48 CFS
AA8 19.75 AC 1719 LF. Q100= 94 CFS Q10= 47 CFS
AA4 5.7 AC 470 LF. Q100= 43 CFS Q10= 25 CFS
PIPE FLOW Q100=403 CFS
PIPE FLOW Q100=374 CFS
AA7 35 AC 977 LF. Q100=72 CFS Q10= 31 CFS
AA1 10 AC 650 LF. Q100= 25 CFS Q10= 13 CFS
AA3 5.9 AC 470 LF. Q100= 25 CFS Q10= 15 CFS
BB2 32.8 AC 1132LF. Q100= 123.4CFS Q10= 71 CFS
CC2 20 AC 1228 LF. Q100= 58 CFS Q10= 29 CFS
AA2 15 AC 680 LF. Q100= 59.8 CFS Q10= 33 CFS
48"DIA. C.L.P.P PIPE FLOW Q=285 CFS
24" DIA. RCP PIPE FLOW Q=42 CFS
BB1 10 AC 900 LF. Q100=35.8 CFS Q10= 21 CFS
CC1 10 AC 777 LF. Q100= 25 CFS Q10= 14 CFS
AA6 10 AC 977 LF. Q100=21 CFS Q10= 11 CFS
TT 16877
TT 16717
TT 16138
TT 16397
TT 16107

N

0 500' 1000'
(IN FEET)
1 INCH = 500 FEET

LEGEND:
- INDICATES SHEET FLOW STORM RUNOFF
- INDICATES CONCENTRATED STORM RUNOFF
- AA1 10 AC / 1000 LF. / Q100= XX CFS / Q10= XX CFS
- INDICATES SUBAREA
- INDICATES ACREAGE
- INDICATES RUN-OFF TRAVEL LENGHT
- INDICATES RUN-OFF
- 3169' INDICATES NODE NUMBER
- INDICATES INDICATES SUBAREA BOUNDARY
- INDICATES WATERSHED BOUNDARY
- INDICATES INDICATES PROPOSED STORM DRAIN

EXHIBIT "A"

DRAINAGE MAP DEPICTING
AN ALTERNATE METHOD OF IMPLEMENTATING
MASTER PLANNED CHANNEL E-01
FROM DOS PALMAS ROAD TO MOJAVE DRIVE
CITY OF VICTORVILLE
NOVEMBER 6, 2018

REGISTERED PROFESSIONAL ENGINEER JIMMY J. FRY NO. C040692 Exp. 3-31-19 CIVIL STATE OF CALIFORNIA

REV.	DESCRIPTION	DATE	BY

Ludwig Engineering ASSOCIATES, INC.
Civil Engineering • Surveying • Planning
109 East Third Street, San Bernardino, CA 92410, Phone: 909-884-8217, Fax: 909-889-0153
5890 Hwy. 95, Ste. B, Fort Mohave, AZ 86426, Phone: 928-768-1857, Fax: 928-768-7086
15252 Seneca Rd., Victorville, CA 92392, Phone: 760-951-7676, Fax: 760-241-0573
2126 McCulloch Blvd., Ste. 8, Lake Havasu City, AZ 86403, Phone: 928-680-6060, Fax: 928-854-6530

CITY OF VICTORVILLE
ALTERNATIVE STORM DRAIN PLAN POST-DEVELOPED
VICTORVILLE MASTER PLAN LINE E-01

CLIENT:
CITY OF VICTORVILLE
14343 CIVIC DRIVE, VITORVILLE, CA. 92393

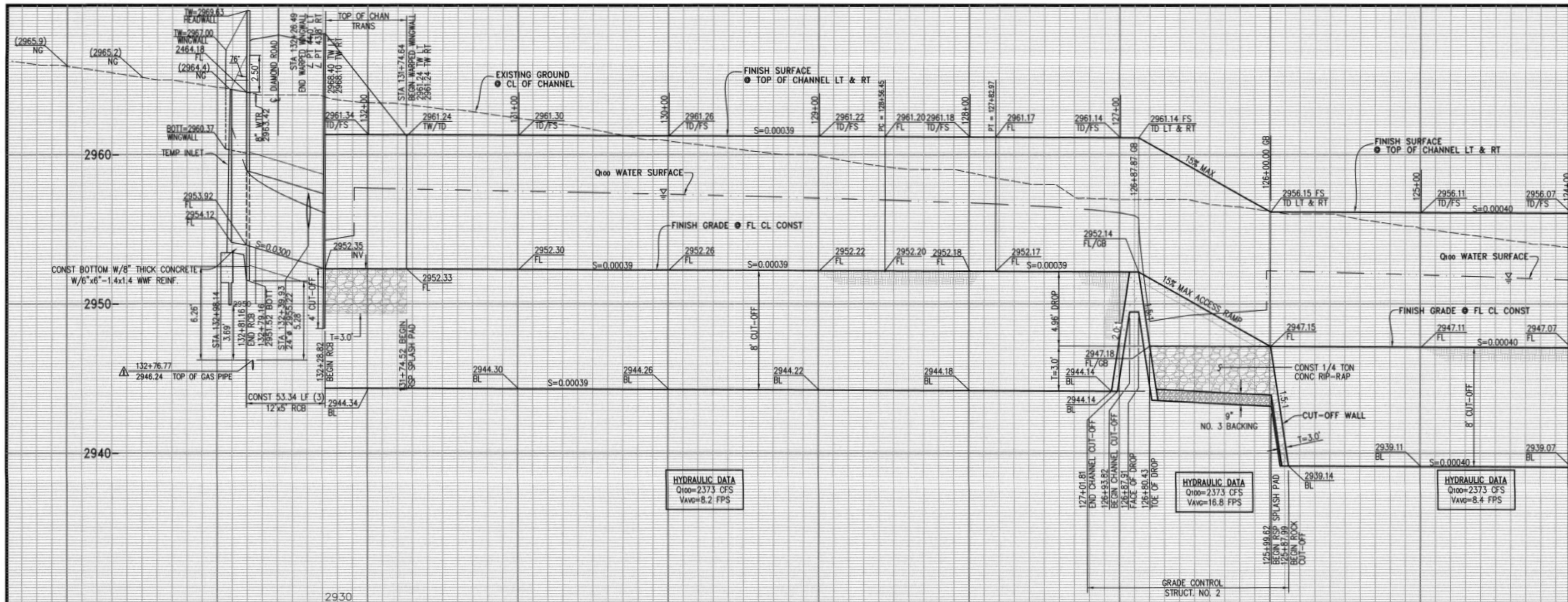
SCALE 1" = 500'

SHEET 1.1 OF 20

DESIGNED BY:	DRAWN BY:	CHECKED BY:
AG	LC	JJF

LINE E-01

PLOT STYLE: NCS US Standard.stb PROJECT LOCATION & NAME: C:\Users\larry\Desktop\back-up\Line E-01\STORM DRAIN PLAN LINE E-01_1-9-2019.dwg PLOT TIME: Wednesday, January 09, 2019 2:20:37 PM LAYOUT: SHT 1 OF 20 POST-DEV_IMAGE



CHANNEL CONSTRUCTION NOTES

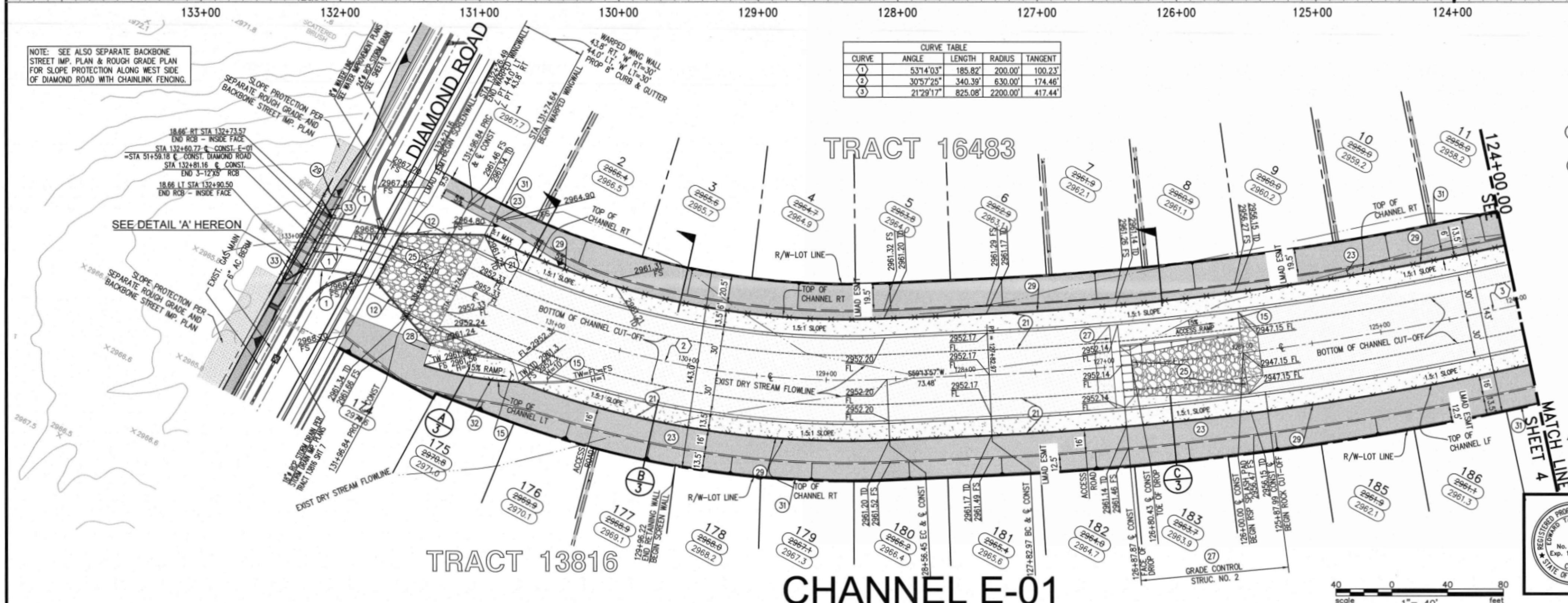
1. CONST 12'X5' TRIPLE BOX CULVERT (FLAT INVERT) PER CALTRANS STD D81 & D82 SEE SHEET No 12
12. CONST. BOX CULVERT WARPED WINGWALLS PER CALTRANS STD. D86A SEE SHEET No 4
13. CONSTRUCT SLOPED PROTECTION BARRIER PER APWA STD 360-0
15. CONST 6" THK CONC DRIVE ACCESS RAMP & NOTES PER CITY OF VICTORVILLE STD No S-03
21. CONST CONCRETE CHANNEL PER DETAIL SEE SHEET 2
23. CONST 4" THK. AC PAVING OVER COMPACTED BASE MATERIAL ACCESS RD.
24. NOT USED
25. CONST CONCRETED RIP RAP (SIZE SHOWN ON PLAN) OVER 9" No. 3 BACKING ON MARAFI 700X FILTER FABRIC OR APPROVED EQUAL PER CALTRANS STD SPEC 72-1 & 72-5 METHOD 'B' PLACEMENT SEE SHEET No 11
27. CONST GRADE CONTROL STRUCTURE PER DETAIL SEE SHEET 2
28. CONST ACCESS GATE PER SBCFCD STD SP 209 SEE SHEET No 14
29. CONST CHANNEL FENCING AND GATES PER APWA STD 600-1 SEE SHEET No. 14
31. CONST PERIMETER WALL PER WALL PLANS AS SHOWN ON DETAIL "A" SHEET 2
32. CONST RET. WALL TYPE 2 PER CALTRANS STD. B 3-4. SPREAD FOOTING OPTION. H=PER PLAN. W,C,B,F DIMENSIONS PER STD. CALTRANS DRAWING.
33. CONST HEADWALL AND WINGWALLS PER CALTRANS STANDARD PLAN D86A. SEE SHEET No. 14.

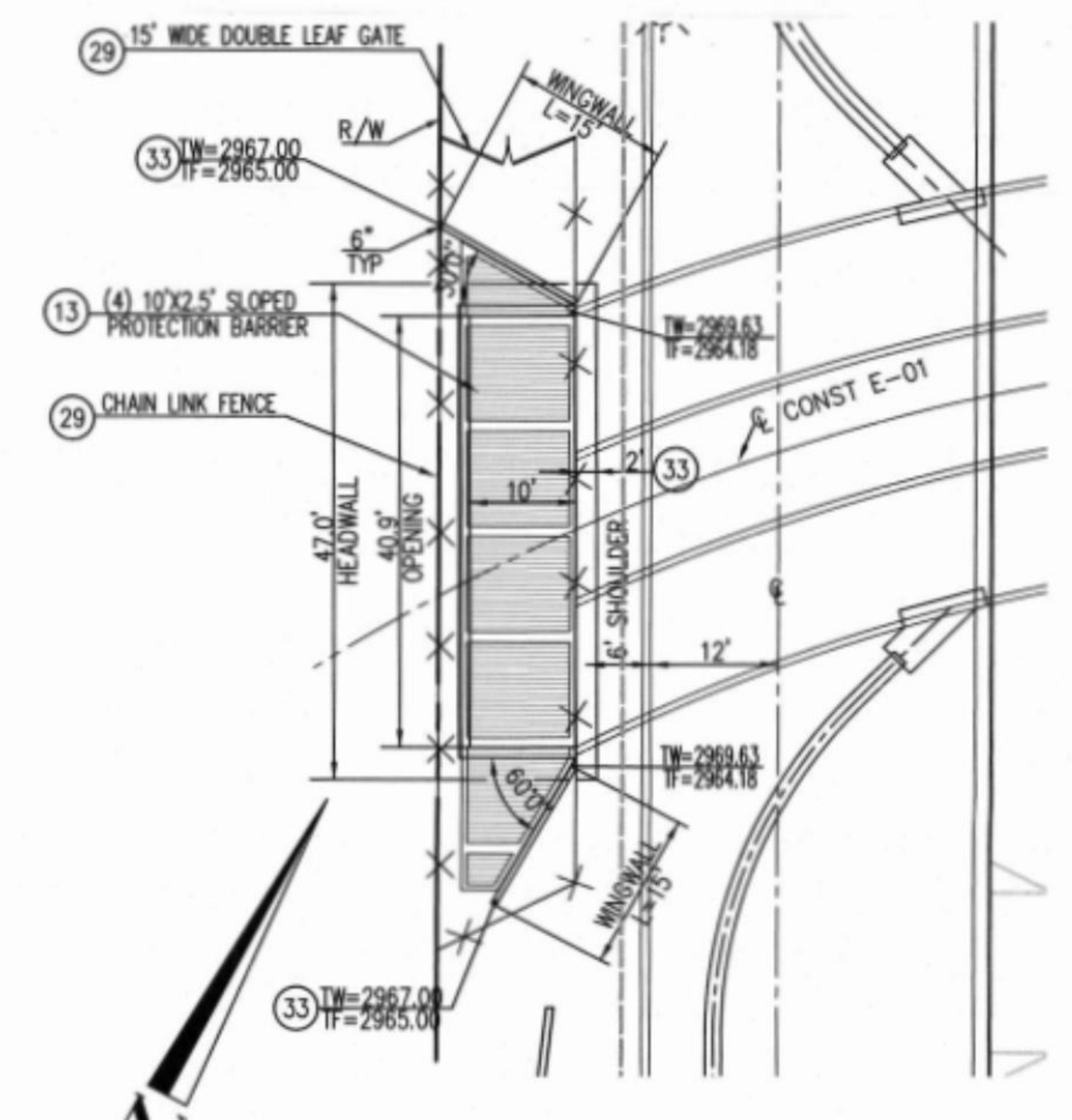
PROFILE SCALES
HORIZ. 1"=40'
VERT. 1"=4'

NOTE: SEE ALSO SEPARATE BACKBONE STREET IMP. PLAN & ROUGH GRADE PLAN FOR SLOPE PROTECTION ALONG WEST SIDE OF DIAMOND ROAD WITH CHAINLINK FENCING.

CURVE TABLE

CURVE	ANGLE	LENGTH	RADIUS	TANGENT
1	53°14'03"	185.82'	200.00'	100.23'
2	30°57'25"	340.39'	630.00'	174.46'
3	21°29'17"	825.08'	2200.00'	417.44'





INLET DETAIL 'A'

NO SCALE

APPROVED *Brian Gengler* 7-18-22
EROW22-00036 BRIAN GENGLER, CITY ENGINEER R.C.E. 44760 EXP. 3-31-24

REGISTERED PROFESSIONAL ENGINEER EDWARD TATSUYA OUNE No. 73632 Exp. 12/31/22 CIVIL STATE OF CALIFORNIA

DAVID EVANS AND ASSOCIATES INC.
4141 Inland Empire Blvd, Ste 250
Ontario California 91764
Phone: 909.481.5750

EDWARD TATSUYA OUNE, P.E. R.C.E. 73632 — DATE: 06/06/2022

40 0 40 80
scale 1"= 40' feet
CONTOUR INTERVAL = 1'

CHANNEL E-01

SEE TYPICAL SECTION SHEET NO 2

Underground Service Alert
Call: TOLL FREE 1-800 227-2600
TWO WORKING DAYS BEFORE YOU DIG

BENCHMARK No. V-215 CITY OF VICTORVILLE
DESC.: MOJAVE DR. @ TOPAZ RD. TC OF CENTER ISLAND NOSE 48' EAST OF INTERSECTION
ELEV.: 2998.27

REGISTERED PROFESSIONAL ENGINEER DURRY M. ATASSI No. C048122 Exp. 6/30/08 CIVIL STATE OF CALIFORNIA

Hall & Foreman, Inc.
Engineering · Surveying · Planning · Landscape Architecture
420 Exchange, Ste 100 · Irvine, CA 92602-1301 · 714-665-4500
DURRY M. ATASSI, P.E. R.C.E. C048122 — DATE 2-1-07

FIELD BOOK REF.

MARK	REVISIONS	APP.	DATE
1	ADDED EX. GAS MAIN IN PROFILE		3/3/21

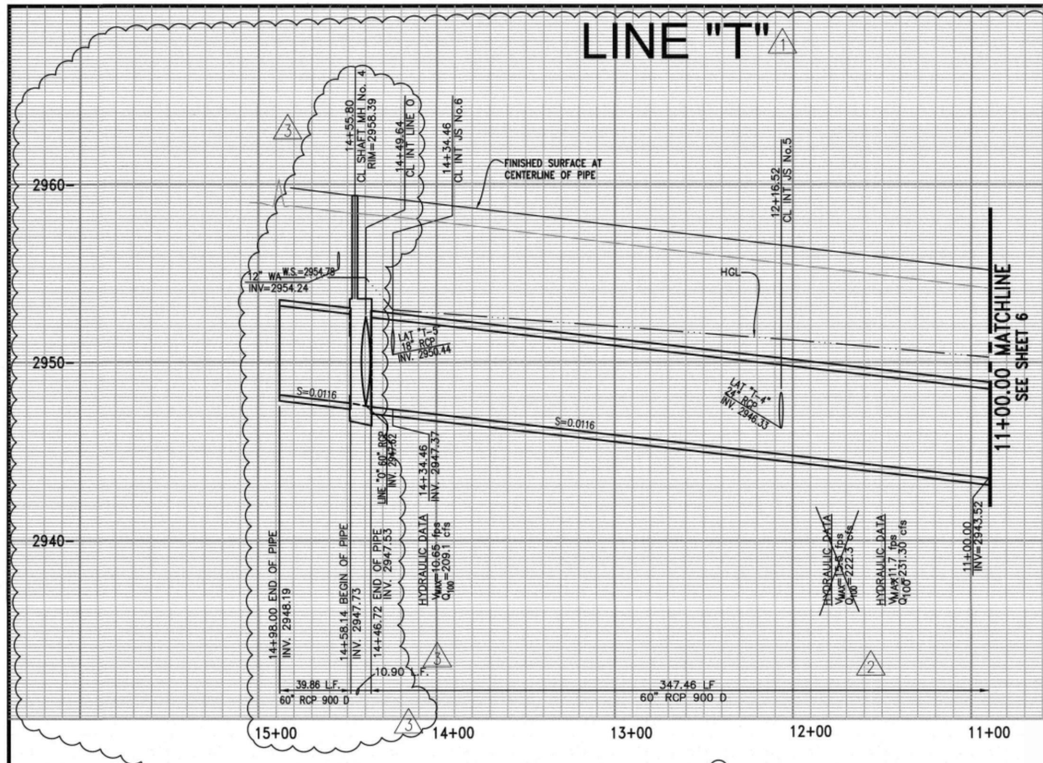
CITY OF VICTORVILLE
DESIGNED BY BML/KFS
DRAWN BY BML
CHECKED BY KFS
RECOMMENDED BY
APPROVED 2/7/07
JOHN A. McGLADE, CITY ENGINEER R.C.E. 40935 EXP. 3-31-07

STORM DRAIN IMPROVEMENT PLANS
TRACT 16463
CHANNEL E-01
STA: 133+00 TO 124+00
CITY OF VICTORVILLE, CA

P-791

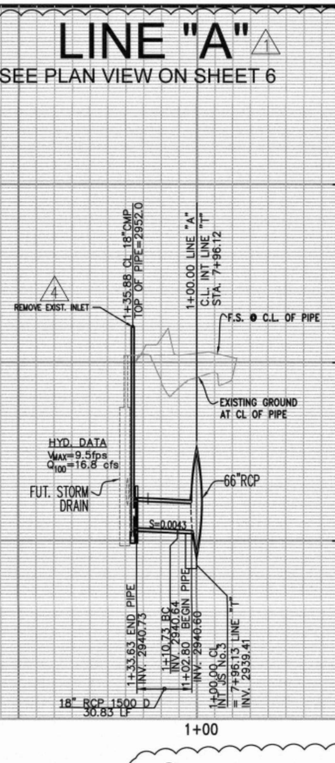
SHEET 3 OF 19

LINE "T"

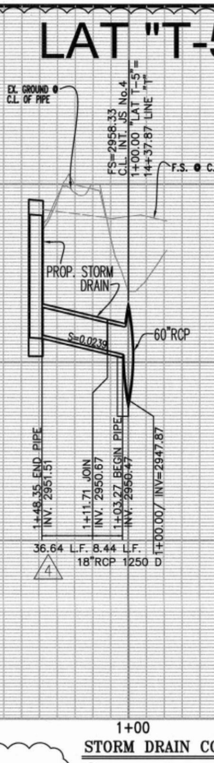


LINE "A"

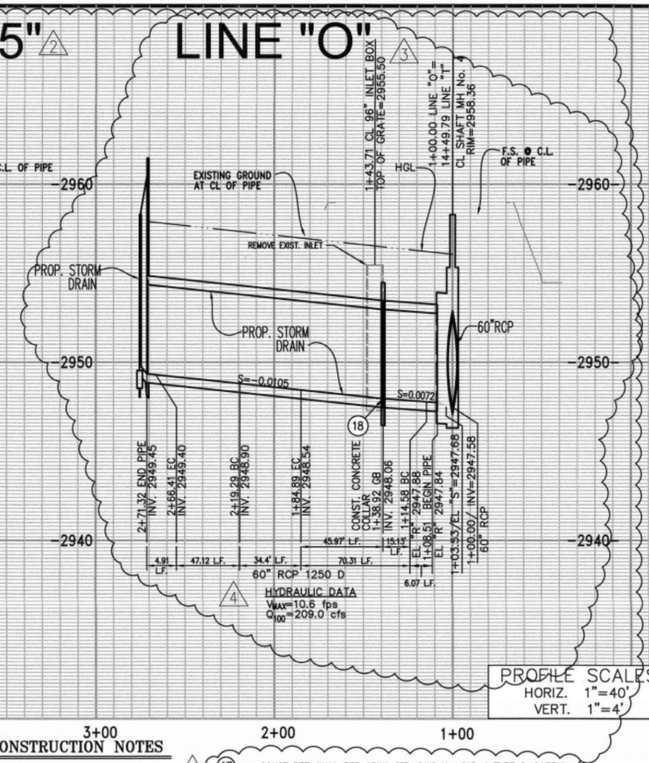
SEE PLAN VIEW ON SHEET 6



LAT "T-5"



LINE "O"



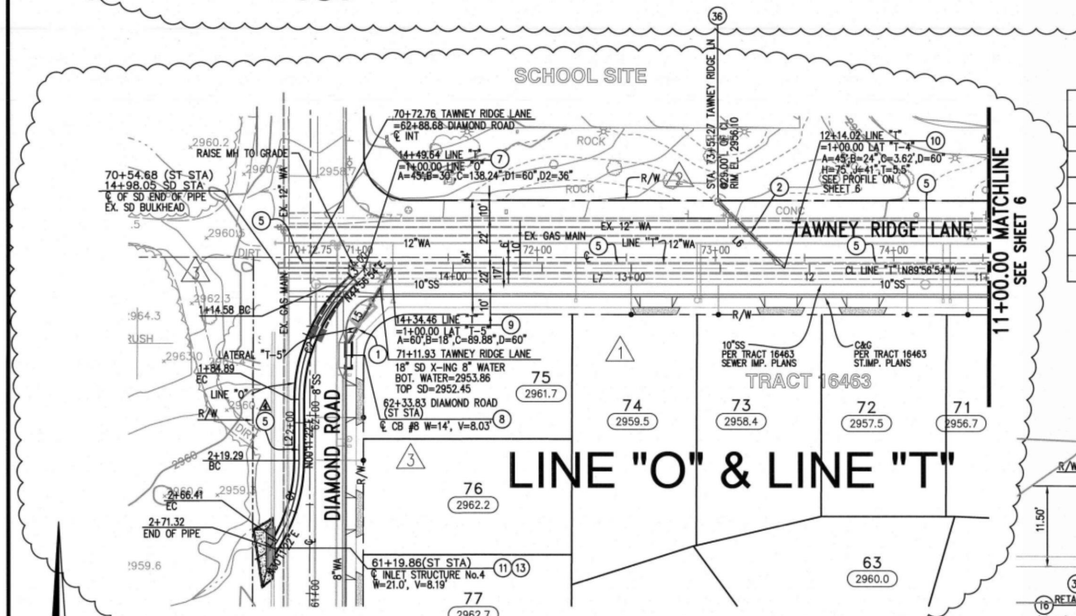
PROFILE SCALES
HORIZ. 1"=40'
VERT. 1"=4'

STORM DRAIN CONSTRUCTION NOTES

1. CONSTRUCT 18" RCP STORM DRAIN
2. CONSTRUCT 24" RCP STORM DRAIN
3. CONSTRUCT 36" RCP STORM DRAIN
4. CONSTRUCT 30" RCP STORM DRAIN
5. CONSTRUCT 60" RCP STORM DRAIN
7. CONSTRUCT MANHOLE PIPE TO PIPE APWA STD. DWG NO. 322-2 SEE SHEET No.16&17
8. CONSTRUCT STANDARD DROP INLET (CB) PER CITY OF VICTORVILLE STD. NO. D-02 (W & Y PER PLAN)
9. CONSTRUCT JUNCTION STRUCTURE APWA STD. DWG NO. 331-3, 332-2 SEE SHEET No.14-16
10. CONSTRUCT JUNCTION STRUCTURE APWA STD. DWG NO. 331-3 SEE SHEET No.17
11. CONSTRUCT STORM DRAIN INLET PER DETAIL HERE ON
13. PROPOSED 96" X 96" PRE-CAST CONCRETE DROP INLET BOX WITH DEBRIS GRATE BY JENSEN PRE CAST OR ENGINEERS APPROVED EQUAL. SEE DETAIL THIS SHEET.
16. CONST RET. WALL PER APWA STD. DWG No. 612-2 TYPE 7B, CASE II
17. CONST RET. WALL PER APWA STD. DWG No. 615-4 TYPE 6, CASE II H=8', W=5', S=4', F=18" SEE SHEET No.19
18. CONSTRUCT CONCRETE COLLAR PER APWA STD. DWG. NO 380-4
19. REMOVE CONCRETE BULKHEAD PER DETAIL ON SHEET No.5
20. REMOVE 30"CMP RISER AND DEBRIS RACK PER DETAIL ON SHEET No.5 TOP OF PIPE=2957.2, FINISHED GRADE=2955.2.
29. CONST CHANNEL FENCING AND GATES PER APWA STD 600-3 SEE SHEET No.18&19
33. CONST HEADWALL PER CALTRANS 2010 STANDARD PLAN D90 TYPE B. DESIGN H=9', W=7'-10", C=2'-3", B=5'-7", F=1'-2", D=8", S=1' SEE SHEET No.19
36. CONSTRUCT MANHOLE STRUCTURE PER COV STD. D-05 SEE SHEET No.19

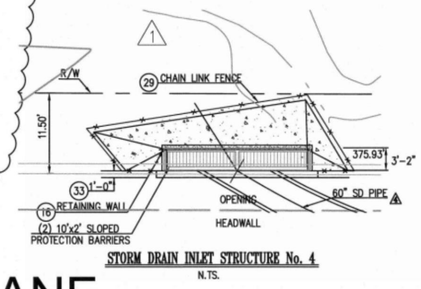
LINE TABLE		
LINE	DIRECTION	LENGTH
L1	N30°11'22"E	4.91'
L2	N00°11'22"E	34.4'
L3	N44°56'54"E	14.58'
L5	N29°59'60"E	36.64'
L6	N44°56'54"W	52.73'

CURVE TABLE				
CURVE	ANGLE	LENGTH	RADIUS	TANGENT
C1	29°59'60"	47.12'	90.00'	24.12'
C2	44°45'33"	70.31'	90.00'	37.06'

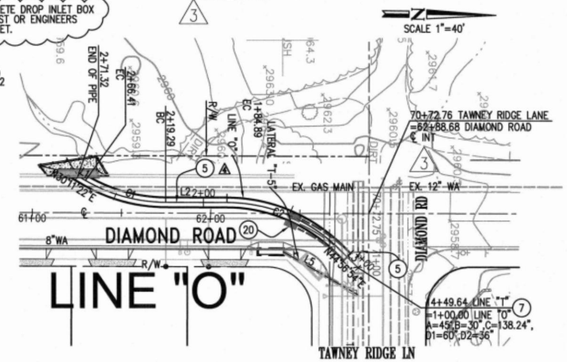


LINE "O" & LINE "T"

TAWNEY RIDGE LANE



STORM DRAIN INLET STRUCTURE No. 4
N.TS.



APPROVED	Brian Gengler 7-18-22
EROW22-00036	BRIAN GENGLER, CITY ENGINEER R.C.E. 44760 EXP. 3-31-24

REGISTERED PROFESSIONAL ENGINEER EDWARD TATSUYA OUNE No. 73632 Exp. 12/31/22 CIVIL STATE OF CALIFORNIA

DAVID EVANS AND ASSOCIATES INC.
4141 Inland Empire Blvd, Ste 250
Ontario California 91764
Phone: 909.481.5750

EDWARD TATSUYA OUNE, P.E. R.C.E. 73632 — DATE: 06/06/2022

Underground Service Alert
Call: TOLL FREE 1-800 227-2600
TWO WORKING DAYS BEFORE YOU DIG

BENCHMARK No. V-215 CITY OF VICTORVILLE
DESC.: MOJAVE DR. @ TOPAZ RD. TC OF CENTER ISLAND NOSE 48' EAST OF INTERSECTION
ELEV.: 2998.27

NO.	REVISIONS	BY	DATE
	REVD. LINE O 60" RCP		3/3/21
1	REVISED STORM DRAIN IMPROVEMENTS ALONG TAWNEY RIDGE LANE.		3/11/13
2	ADDED LATERAL "T-4" AND NOTES 2,10 & 36. CORRECTED NOTE 9 AND PROFILE LAT "T-5"		4/10/13
	CORRECTED HYDRAULIC DATA AND CHANGED		
3	RECONFIGURED STORM DRAIN INLET. REMOVED INLET STRUCTURE No.3		9/20/13

CITY CASE NO. ENG 12-00241

CITY OF VICTORVILLE ENGINEERING DEPARTMENT
14343 Civic Drive, Victorville, CA 92392 (760) 955-5000
Approved By: Brian W. Gengler, RCE 44760, City Engineer — DATE: 11-13-13

REGISTERED PROFESSIONAL ENGINEER DEAN A. PARADISE No. C39830 CIVIL STATE OF CALIFORNIA

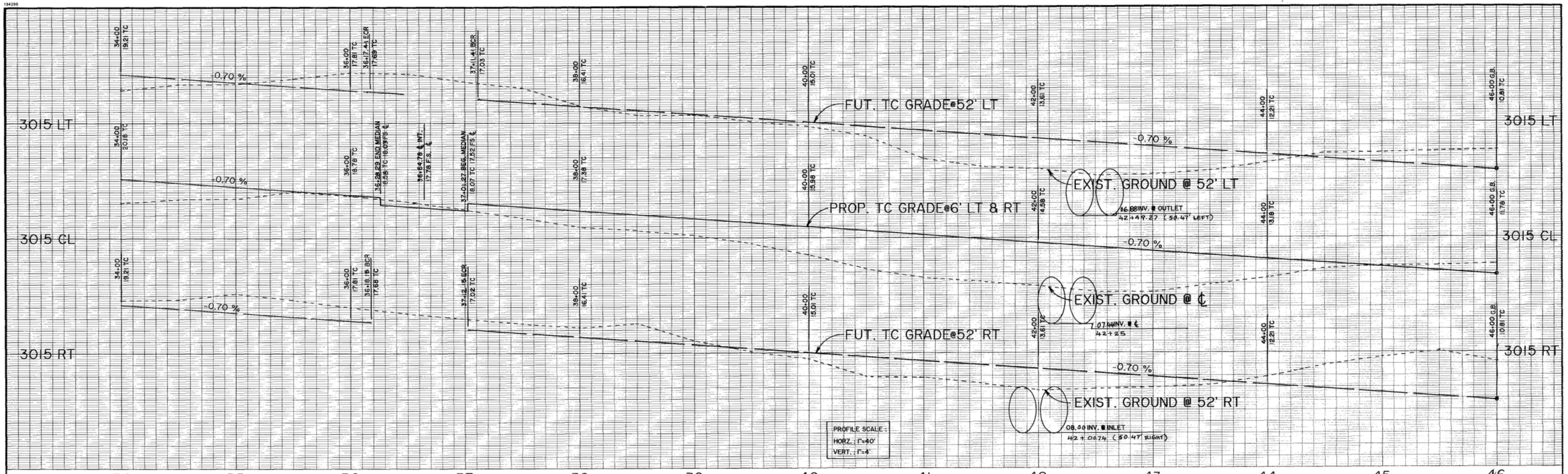
Hall & Foreman, Inc.
Engineering · Planning · Surveying
14297 CAJON ST, SUITE 101 · VICTORVILLE, CA 92392 · 760-524-9100
PREPARED UNDER THE SUPERVISION OF: DEAN A. PARADISE R.C.E. NO. C39830 — DATE: 11/12/13

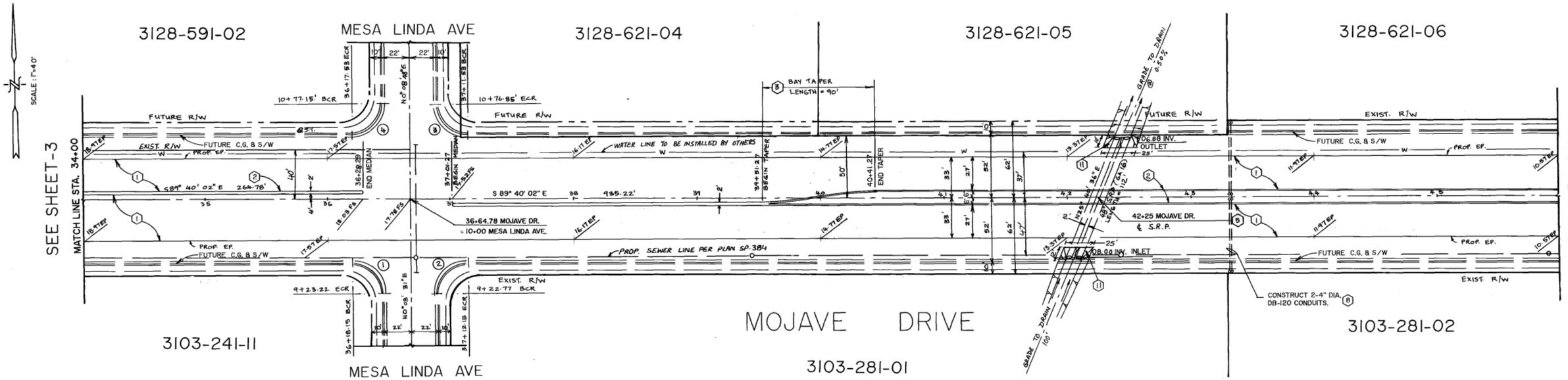
STORM DRAIN IMPROVEMENT PLANS
TRACT 16463
LINE "T"
FROM STA 11+00.00 TO STA 15+07.35
LINE "O"
FROM STA 1+00.00 TO STA 2+78.75

P-791

SHEET 7 OF 19

Drawing Name: P:\S-Drive\Projects\16463\Eng\Tract-16463\Final Plots\Storm Drain\C3D\07_25482-16463st.dwg
Last Opened: Jul 12, 2022 - 6:46pm by Eto





CONSTRUCTION NOTES

(1) CONSTRUCT 6" A.C. PAVEMENT OVER 8" CLASS II BASE, LESS 1" FUTURE CAP.

(2) CONSTRUCT 8" CURB PER CALTRANS STDS. TYPE B1 FOR MEDIAN ISLAND. (DETAIL ON SHEET 1)

(5) INSTALL 2-48" DIA. SPIRAL RIB PIPE, GAGE-16, FULLY ASPHALT COATED, PLACED PARALLEL @ N 25°-40'-36" E AND @ 2' INBETWEEN. LENGTH OF EACH PIPE =112' AND PROVIDE 2 SACK SAND SLURRY BETWEEN & UP TO SPRING LINE OF THE PIPES.

(3) CONSTRUCT MEDIAN BAY TAPER LENGTH = 90' PER CALTRANS HIGHWAY DESIGN MANUAL TABLE 405.2A.

(8) CONSTRUCT 2-4" DIA. DB-120 CONDUITS, WITH END SWEEPS, CAPS & PULL ROPE.

(11) CONSTRUCT 2" THICK A.C. DRAINAGE APRON OVER COMPACTED NATIVE.

CURVE DATA				
	△	R	L	T
(1)	89° 43' 33"	25.00'	39.15'	24.88'
(2)	90° 16' 27"	25.00'	39.39'	25.12'
(3)	89° 48' 50"	26.00'	39.19'	24.92'
(4)	90° 11' 10"	28.00'	39.35'	25.08'

REGISTERED PROFESSIONAL ENGINEER JON B. ROBERTS No. 38936 EXP. 3-31-93 CIVIL STATE OF CALIFORNIA

CITY OF VICTORVILLE

REVISIONS	BY	DATE

STREET IMPROVEMENT PLANS

MOJAVE DRIVE

STA. 34+00 TO STA. 46+00

FIELD BOOK NO (S): 49/15-44

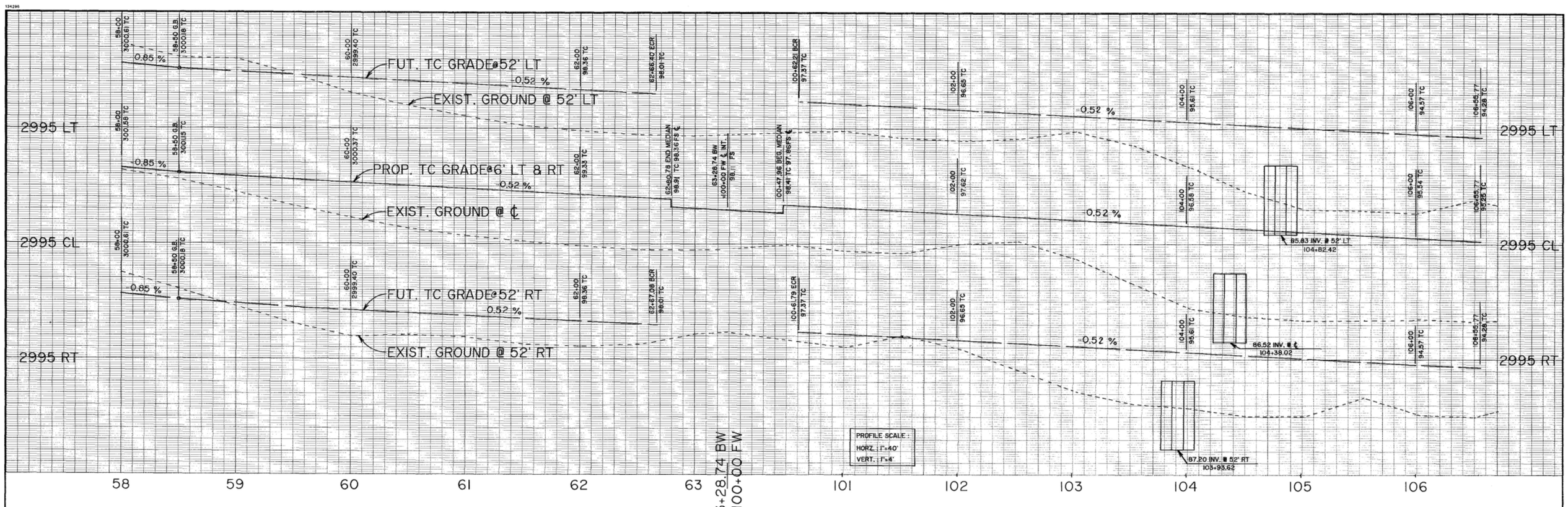
BENCH MARK: CITY OF VICTORVILLE BM V-6 RESET ELEVATION = 2926.81 2.5" BRASS CAP IN CONC. BCR N-W COR. OF MOJAVE DR. & AMARGOSA RD.

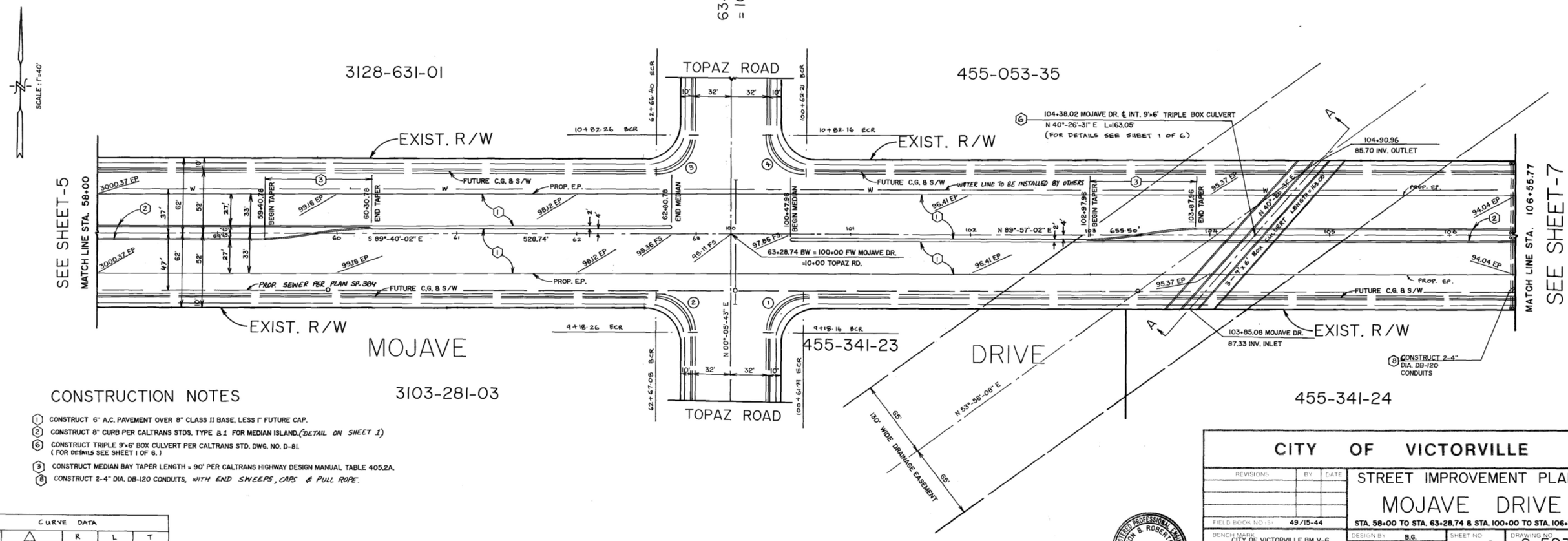
DESIGN BY: B.G.
DR BY: B.G.
CHK'D BY: AS
DATE:

SHEET NO: 4 OF 9
DRAWING NO: S-593
PROJECT NO:

APPROVED BY:
CITY ENGINEER: Jon B. Roberts DATE 8-19-92 R.C.E. 38936 EXPIRES 3/31/93

134296





CONSTRUCTION NOTES

1. CONSTRUCT 6" A.C. PAVEMENT OVER 8" CLASS II BASE, LESS 1" FUTURE CAP.
2. CONSTRUCT 8" CURB PER CALTRANS STDS. TYPE 8.1 FOR MEDIAN ISLAND. (DETAIL ON SHEET 1)
6. CONSTRUCT TRIPLE 9'x6' BOX CULVERT PER CALTRANS STD. DWG. NO. D-81. (FOR DETAILS SEE SHEET 1 OF 6.)
3. CONSTRUCT MEDIAN BAY TAPER LENGTH = 90' PER CALTRANS HIGHWAY DESIGN MANUAL TABLE 405.2A.
8. CONSTRUCT 2-4" DIA. DB-120 CONDUITS, WITH END SWEEPS, CAPS & PULL ROPE.

CURVE DATA				
	△	R	L	T
1	89° 51' 19"	30.00'	47.05'	29.92'
2	89° 45' 45"	30.00'	47.00'	29.88'
3	90° 14' 15"	30.00'	47.25'	30.12'
4	90° 08' 41"	30.00'	47.20'	30.08'

REGISTERED PROFESSIONAL ENGINEER JON B. ROBERTS No. 38936 EXP. 3-31-93 CIVIL STATE OF CALIFORNIA

CITY OF VICTORVILLE

REVISIONS	BY	DATE

STREET IMPROVEMENT PLANS

MOJAVE DRIVE

STA. 58+00 TO STA. 63+28.74 & STA. 100+00 TO STA. 106+55.50

FIELD BOOK NO(S): 49/15-44

BENCH MARK: CITY OF VICTORVILLE BM V-6 RESET ELEVATION = 2926.81 2.5" BRASS CAP IN CONC. BCR N-W COR. OF MOJAVE DR.& AMARGOSA RD.

DESIGN BY: B.G.
DR. BY: B.G.
CHK'D BY: AS
DATE:

SHEET NO: 6 OF 9

DRAWING NO: S-593

PROJECT NO:

APPROVED BY CITY ENGINEER: Jon B Roberts DATE 8-17-93 R.C.E. 38936 EXPIRES 3/31/93