Preliminary

Drainage Report

For

Tentative Tract Map No. 20488

Victorville, CA

Prepared
December 2021

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Project # 30181

This report has been prepared by or under the direction of the following registered civil engineer who attests to the technical information contained herein. The registered civil engineer has also judged the qualifications of any employees that have provided data and calculations upon which the recommendations, conclusions, and decisions are based.

Christopher F. Lenz, PE 63001

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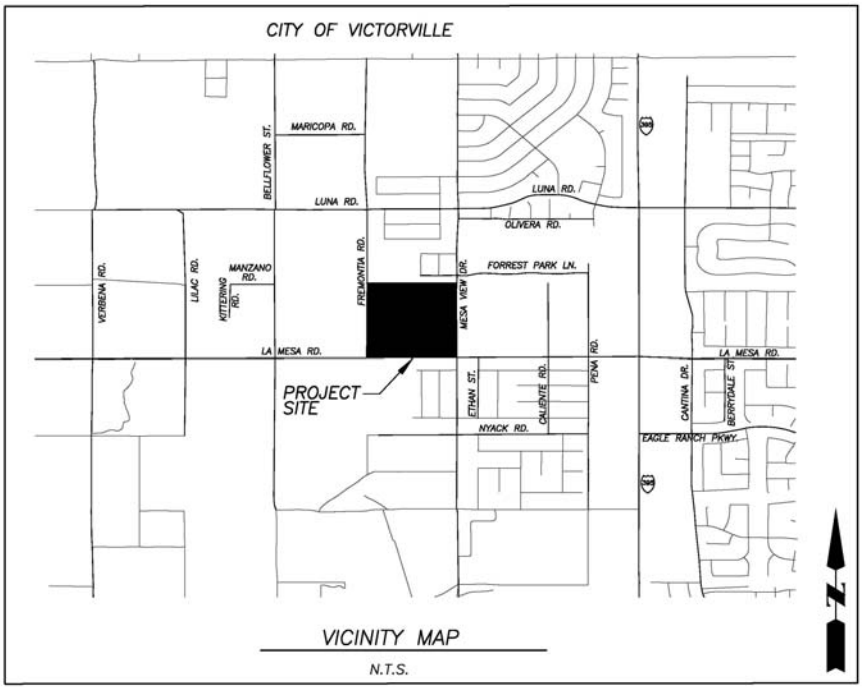
I. INTRODUCTION

TTM 20488 is a residential subdivision of approximately 40 gross acres into 133 single family residential lots, located at the northeast corner of Mesa View Drive and La Mesa Road in the City of Victorville. The property is square in shape. There is existing development north and south of the east side of the project. Minimum lot size is 7,200 sf. The project is considered a "priority project" and thus WQMP calculations will be provided. A fully executed WQMP will be prepared with the final drainage report and project design.



The purpose of this study is to determine the pre-development and post development runoff emanating from on-site for TTM 20488. The study will determine the peak flow rate for the existing condition, the peak flow rate for the proposed condition, and the proposed condition flow rate routed through combination water quality and detention basins. Additional analysis will confirm hydraulic capacity of proposed street sections compared to rationale expected runoff.

The scope of the study includes the following:

- Determination of points of flow concentration and watershed areas.
- Determination of the 10 and I00-year 24 hours storm runoff based upon the onsite drainage conditions utilizing the San Bernardino County Flood Control District (SBCFCD) SCS Unit Hydrograph Method.
- Determination of the 10-year and I00-year peak flow rates for the offsite area utilizing the San Bernardino County Flood Control District

(SBCFCD) Rational Method.

The project will be subject to and designed in compliance with the MS4 Phase II NPDES Permit, the Mojave River Watershed Group Stormwater Management Plan.

II. SITE DISCUSSION

The current property is vacant, undeveloped and undisturbed land with uniform slope of approximately 1.3 percent. The topography indicates that the runoff drains in northwesterly and northeasterly directions in the form of sheet flow, and there is a ridge near the middle of the site. There is a defined wash along the western edge of the site. That wash is the future City of Victorville Master Plan Line A-01. Refer to Appendix A for additional. The proposed development is for a 133 lot subdivision. No project phasing is proposed or evaluated at this time.

III. RAINFALL DATA

The San Bernardino County Flood Control District (SBCFCD) hydrology Manual, (Reference 1) was used to develop the hydrological parameters for the 10-year and 100-year storm events. The Rational Method was used to determine the peak flow rates associated with the existing project conditions as well as the time of concentration used in the Unit Hydrograph method. In addition, the Unit Hydrograph Method was utilized to determine the runoff volume. Computations were performed using the CivilCADD drainage software for San Bernardino County Developed by CivilDesign Corporation.

Rainfall data was taken from NOAA Atlas 14 Precipitation Frequency Date.

Return Period – Duration	Isohyetal (in)
10 year – 1 hour	0.69
10 year – 6 hour	1.46
10 year – 24 hour	2.97
2 year – 6 hour	0.89
2 year – 24 hour	1.64
100 year – 1 hour	1.15
100 year – 6 hour	2.51
100 year – 24 hour	5.41

Hydrologic Soil Group “A”, “Cajon Sand” is present for the study area. The percentage pervious is 60, and the SCS runoff is 32. Refer to Appendix B for additional detail.

The projects runoff is designed to be contained in three basins that will act as both water quality infiltration, and flood storage for peak runoff mitigation. The 100- year 24 runoff event is the limiting factor for design.

IV. ONSITE RUNOFF

Existing Condition/Pre Development

The runoff from the subject site in the existing condition is primarily sheet flow, so for this study two concentrations of flow were analyzed. The first Area, Area A, drains northeasterly to Mesa View Drive where it continues northerly within the road. The second area, Area B, drains northerly and leaves the site along the northern property line. They are shown as Area A and Area B and Nodes 101 to 103 and 201 to 203 on the Existing Conditions Drainage Exhibit in Appendix A. In the existing condition Area A has a 100 year peak of 13.7 cfs and a time of concentration of 31.2 minutes. Area B has a 100 year peak of 29.4 cfs and a time of concentration of 28.3 minutes. Post development conditions will be mitigated to 90% or 12.3 and 26.5 respectively.

Proposed Condition/Post Development

The proposed condition is to use three basins for water quality and flood routing for the project. The Rationale method was prepared for determination of time of concentration for use in the development of the Unit Hydrographs for the three areas. The un-routed post development peak flow is 33.2 cfs for area A, 20.9 cfs for area B, and 13.9 cfs for area C.

The post development runoff is then routed through the proposed basins to confirm post development runoff could be mitigated to less than pre-development runoff (90%). The basins are designed to be dual purpose retention and detention basins with the bottom for water quality retention only, with no outfall, relying on infiltration. The storage above that is detention for the flood storage and volume needed for peak flow mitigation. Basin C is designed to fully detain and infiltrate the 100-yr 24hr storm. Basin A and B, in order to drain the top volume, or flood storage, an outlet spillway has been shown and used for preliminary calculations. The following is the detail for the basins shown on the TTM;

Basin Stage-Storage-Outfall Chart					
	Depth [ft]	Area [sf]	Vol [acft]	Vol Total [acft]	Q out [cfs]*
Basin A	0	10376			
	2	13025	0.54	0.54	0.68
	4	15962	0.67	1.20	0.68
	6	19187	0.81	2.01	0.68
	6.36	19729	0.15	2.16	12.0

Basin Stage-Storage-Outfall Chart					
	Depth [ft]	Area [sf]	Vol [acft]	Vol Total [acft]	Q out [cfs]*
Basin B	0	7321			
	2	9832	0.39	0.39	0.48
	4	12631	0.52	0.91	0.48
	5	14139	0.31	1.22	10.00

Basin Stage-Storage-Outfall Chart					
	Depth [ft]	Area [sf]	Vol [acft]	Vol Total [acft]	Q out [cfs]*
Basin C	0	11713			
	1	13193	0.29	0.29	0.77
	2	14736	0.32	0.61	0.77

As discussed above, Basin C is designed to fully detain and infiltrate the 100yr 24hr runoff. After routing through Basin A the post development 100 year 24 hour runoff for the project has a peak of 6.8 cfs, with 2.1 ac-ft stored at a depth of 6.2 feet. After routing through Basin B the post development 100 year 24 hour runoff for the project has a peak of 6.3 cfs, with 1.1 ac-ft stored at a depth of 4.6 feet. Preliminary spillway capacities were used for calculations. At time of final design the final outlet structures shall be specified and designed per this report, and additional routing calculations should be prepared. Refer to Appendices B and C for detailed output files and the TTM for grading detail.

The primary hydraulic design elements are the roads and the storm drain. Roads within the project will be used to carry runoff. At the minimum design slope of 0.5% the roads can carry 37 cfs within the curbs and 52 cfs within the right-of-way. As design grades are increased, the streets can carry much more than that. Refer to Appendix C for details. The project storm drain will be designed at time of final design. The outlet spillways from the basin are preliminarily sized as 7' wide concrete scuppers transitioning to reverse curb openings. Refer to the Proposed Conditions Drainage Exhibit in Appendix A and Appendix B and C for additional detail.

V. OFFSITE RUNOFF

The project is bound of the west by an existing desert wash, identified in the City Master Plan of Drainage as Line A-01. Line A-01 has a design flow of 5,265 cfs. Through consultation with the City, it was determined that Line A-01 and required relocation of the Kinder Morgan Gas Line will likely require regional coordination and permitting, that may be led by the City of Victorville. As such, this TTM is designed to leave room for those facilities, as well as provide interim protection from the wash. Refer to Appendix C

for hydraulic analysis of the existing Line A-01 wash. Note that they design flow is used, although the actual existing condition flows are likely much less. These water surface elevations were used in the grading design of the western TTM limits.

VI. STORMWATER TREATMENT

Stormwater treatment through infiltration will be provided at the bottom of the proposed basins, where the required volume will infiltrate through the site soils and into the groundwater. As shown on the TTM, the basins exceeds the required water quality volume. At time of final design percolation testing will be required to confirm rates are sufficient to de-water the basins. Water quality calculations were prepared based on the San Bernardino County Model Water Quality Management Plan Guidance document. The following calculations were used in preliminary sizing of facilities;

- WQ Contributing area – 34.9 Acres
- 2 yr 1 hour rainfall – 0.40"
- Impervious ratio – 40% (from SBCFCD hydrology Manual)
- $C_{BMP} = 0.28$
- Drainage Area Region – Desert – Regression Coefficient $P_6 = 1.2371$
- $P_6 = 1.2371 \times 0.40" = 0.49"$
- Regression Constant a = 1.963 for 48 hours
- $P_0 = a * C_{BMP} * P_6 = 1.963 \times 0.28 \times 0.49 = 0.27$
- $V_0 = (P_0 * A)/12 = (0.27 \times 34.9)/12 = 0.78$ acft

Post construction BMP's should be implemented, including but not limited to; N1, N2, N3, N11, N12, N14, N15, SD-13, and SD-32. In addition the infiltration basins will require regular maintenance and inspection to ensure the 2 year 24hr storms are contained and infiltrated and the post development 10 year 24hr storm runoff does not exceed the pre-development conditions (as confirmed in the above results). Maintenance will be provided through inclusion of the basins into a City Managed Landscape Maintenance Assessment District (LMAD). Maintenance and inspection details will be included in the WQMP for the final plan check process.

VII. CONCLUSION

The proposed development of tract 20488, a 40 gross acres, 133 single family detached subdivision can be mitigated as designed and analyzed in this report to be compatible with the City of Victorville Master Plan of Drainage. The development of the subject site will not adversely affect area drainage patterns, impact any of the surrounding properties, or change any

of the regional master plan facilities contemplated in the MDP. The Site will construct combination retention and detention basins of sufficient size to handle water quality through infiltration, and flood mitigation through detention. The streets have been analyzed and confirmed to contain the 10 year runoff within the curb, and the 100 year runoff within the right of way. At time of final design, the basins and outlet structures will need be designed and analyzed in conjunction with final grading and paving plans, street grades and curb inlets will need to be designed and sized to confirm capacity with final street design.

REFERENCES

1. San Bernardino County Flood Control and Water Conservation District Hydrology Manual, August 1986.

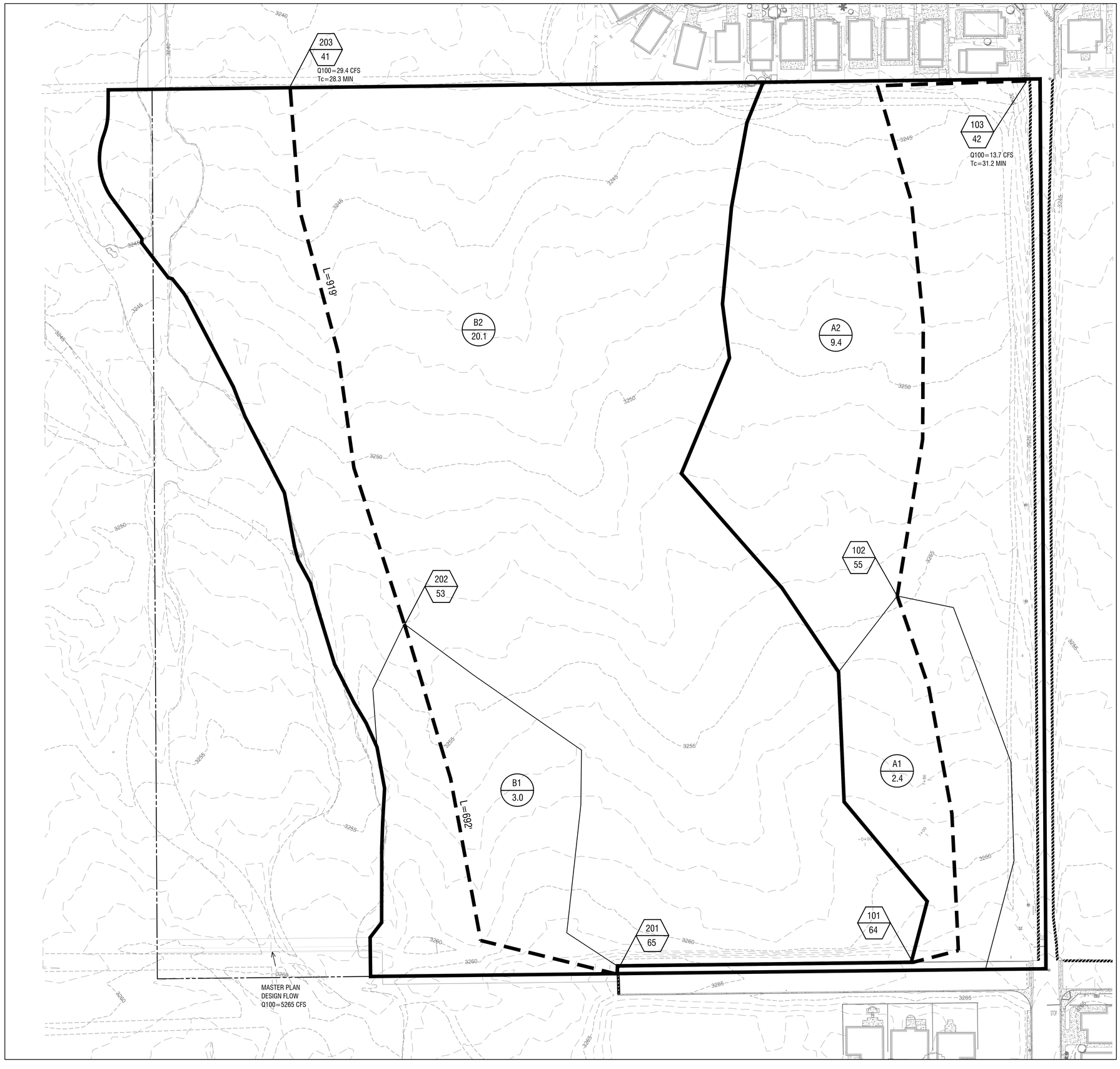
2. Baldy Mesa Master Plan of Drainage for Oro Grande Wash and Adjacent Watersheds that are Tributary to the Mojave River, Williamson & Schmid, March 1992.

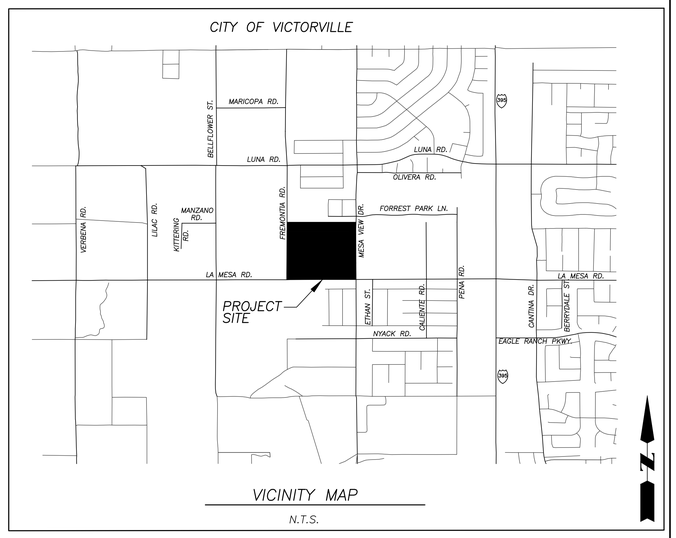
APPENDIX A:
PROJECT PRE AND POST CONDITION EXHIBITS

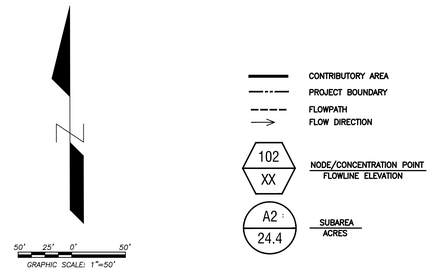
IN THE CITY OF ADELANTO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA.

EXISTING CONDITIONS EXHIBIT
TENTATIVE MAP - TRACT NO. 20488

UNITED ENGINEERING GROUP CA., INC NOVEMBER 2021







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DRAWN BY:
CHECKED BY:

REVISIONS		
NO.	DESCRIPTION	DATE

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VISTA VERDE

EXISTING CONDITIONS EXHIBIT
TRACT 20488

NOVEMBER 2021

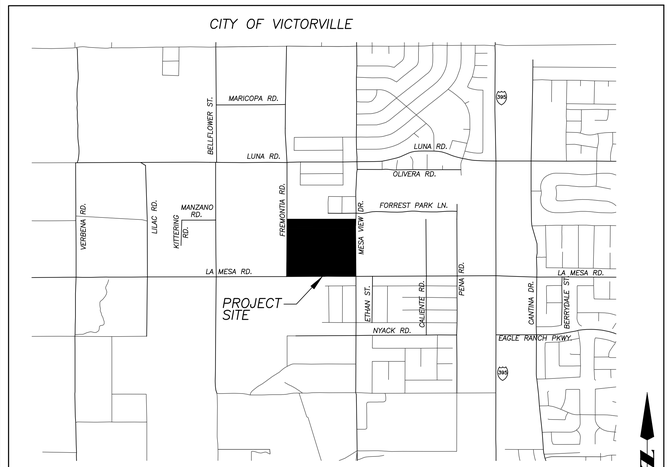
SHEET 1 OF 1

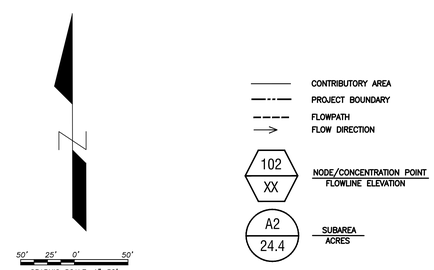
PROJECT NUMBER
CA-30181

IN THE CITY OF ADELANTO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA.

PROPOSED CONDITIONS EXHIBIT
TENTATIVE MAP - TRACT NO. 20488

UNITED ENGINEERING GROUP CA., INC NOVEMBER 2021





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VISTA VERDE

PROPOSED CONDITIONS EXHIBIT
TRACT 20488

NOVEMBER 2021

SHEET 1 OF 1

PROJECT NUMBER
CA-30181

APPENDIX B:
PROJECT RATIONAL
SCS UNIT HYDROGRAPH
HYDROLOGY STUDY INFORMATION

NOAA Atlas 14, Volume 6, Version 2
Location name: Victorville, California, USA*
Latitude: 34.4862°, Longitude: -117.4113°
Elevation: 3257.47 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	**0.078** (0.064-0.095)	**0.112** (0.093-0.137)	**0.158** (0.130-0.194)	**0.195** (0.159-0.241)	**0.245** (0.194-0.314)	**0.284** (0.220-0.371)	**0.324** (0.244-0.433)	**0.364** (0.267-0.501)	**0.419** (0.295-0.601)	**0.462** (0.314-0.685)
10-min	**0.111** (0.092-0.136)	**0.161** (0.133-0.197)	**0.226** (0.186-0.278)	**0.279** (0.228-0.346)	**0.352** (0.278-0.450)	**0.407** (0.315-0.532)	**0.464** (0.350-0.621)	**0.522** (0.383-0.718)	**0.601** (0.423-0.862)	**0.662** (0.450-0.982)
15-min	**0.135** (0.111-0.165)	**0.195** (0.161-0.238)	**0.274** (0.225-0.336)	**0.338** (0.276-0.418)	**0.425** (0.336-0.544)	**0.493** (0.381-0.643)	**0.561** (0.424-0.751)	**0.631** (0.464-0.869)	**0.727** (0.512-1.04)	**0.800** (0.544-1.19)
30-min	**0.204** (0.169-0.249)	**0.295** (0.243-0.361)	**0.414** (0.341-0.508)	**0.511** (0.418-0.632)	**0.643** (0.508-0.823)	**0.745** (0.576-0.973)	**0.849** (0.641-1.14)	**0.955** (0.701-1.31)	**1.10** (0.774-1.58)	**1.21** (0.824-1.80)
60-min	**0.276** (0.228-0.337)	**0.399** (0.330-0.488)	**0.561** (0.462-0.688)	**0.692** (0.565-0.856)	**0.871** (0.688-1.11)	**1.01** (0.781-1.32)	**1.15** (0.868-1.54)	**1.29** (0.949-1.78)	**1.49** (1.05-2.13)	**1.64** (1.12-2.43)
2-hr	**0.388** (0.321-0.474)	**0.528** (0.436-0.646)	**0.718** (0.591-0.881)	**0.878** (0.717-1.09)	**1.10** (0.872-1.41)	**1.28** (0.993-1.68)	**1.47** (1.11-1.97)	**1.67** (1.23-2.30)	**1.95** (1.37-2.79)	**2.17** (1.48-3.22)
3-hr	**0.488** (0.403-0.596)	**0.652** (0.538-0.797)	**0.878** (0.723-1.08)	**1.07** (0.875-1.33)	**1.35** (1.07-1.73)	**1.57** (1.22-2.05)	**1.81** (1.37-2.42)	**2.07** (1.52-2.85)	**2.43** (1.71-3.49)	**2.73** (1.86-4.05)
6-hr	**0.669** (0.553-0.817)	**0.885** (0.731-1.08)	**1.19** (0.980-1.46)	**1.46** (1.19-1.80)	**1.85** (1.46-2.36)	**2.17** (1.68-2.83)	**2.51** (1.90-3.36)	**2.89** (2.12-3.98)	**3.45** (2.43-4.94)	**3.91** (2.66-5.80)
12-hr	**0.834** (0.690-1.02)	**1.15** (0.949-1.41)	**1.60** (1.31-1.96)	**1.98** (1.62-2.45)	**2.55** (2.02-3.26)	**3.02** (2.34-3.95)	**3.53** (2.67-4.73)	**4.09** (3.00-5.63)	**4.90** (3.45-7.03)	**5.58** (3.80-8.29)
24-hr	**1.14** (1.01-1.31)	**1.64** (1.46-1.89)	**2.35** (2.08-2.72)	**2.97** (2.60-3.46)	**3.87** (3.28-4.66)	**4.61** (3.83-5.67)	**5.41** (4.38-6.81)	**6.29** (4.95-8.14)	**7.56** (5.72-10.2)	**8.62** (6.30-12.0)
2-day	**1.23** (1.09-1.41)	**1.76** (1.56-2.02)	**2.51** (2.22-2.90)	**3.17** (2.77-3.69)	**4.13** (3.50-4.98)	**4.94** (4.10-6.07)	**5.82** (4.71-7.33)	**6.78** (5.34-8.78)	**8.20** (6.20-11.1)	**9.39** (6.86-13.1)
3-day	**1.31** (1.16-1.51)	**1.86** (1.65-2.14)	**2.64** (2.33-3.05)	**3.33** (2.92-3.88)	**4.34** (3.68-5.23)	**5.19** (4.31-6.38)	**6.12** (4.96-7.71)	**7.14** (5.63-9.25)	**8.65** (6.54-11.7)	**9.92** (7.24-13.9)
4-day	**1.41** (1.25-1.63)	**1.99** (1.76-2.30)	**2.82** (2.49-3.26)	**3.55** (3.11-4.14)	**4.63** (3.92-5.58)	**5.53** (4.59-6.80)	**6.51** (5.27-8.20)	**7.59** (5.98-9.84)	**9.19** (6.95-12.4)	**10.5** (7.69-14.7)
7-day	**1.54** (1.36-1.77)	**2.15** (1.90-2.47)	**3.01** (2.66-3.48)	**3.77** (3.31-4.40)	**4.89** (4.14-5.89)	**5.81** (4.82-7.15)	**6.81** (5.52-8.58)	**7.91** (6.23-10.2)	**9.52** (7.19-12.8)	**10.9** (7.93-15.2)
10-day	**1.64** (1.46-1.89)	**2.28** (2.02-2.63)	**3.19** (2.82-3.69)	**3.98** (3.49-4.64)	**5.14** (4.36-6.19)	**6.10** (5.06-7.50)	**7.13** (5.78-8.98)	**8.26** (6.51-10.7)	**9.90** (7.48-13.4)	**11.3** (8.23-15.7)
20-day	**1.99** (1.77-2.30)	**2.75** (2.44-3.17)	**3.82** (3.37-4.41)	**4.75** (4.16-5.53)	**6.11** (5.18-7.36)	**7.22** (6.00-8.88)	**8.42** (6.82-10.6)	**9.73** (7.66-12.6)	**11.6** (8.77-15.7)	**13.2** (9.61-18.4)
30-day	**2.34** (2.07-2.69)	**3.20** (2.83-3.68)	**4.41** (3.90-5.10)	**5.47** (4.79-6.38)	**7.02** (5.95-8.45)	**8.29** (6.88-10.2)	**9.65** (7.82-12.2)	**11.1** (8.76-14.4)	**13.2** (10.0-17.9)	**15.0** (10.9-20.9)
45-day	**2.75** (2.44-3.16)	**3.71** (3.28-4.27)	**5.07** (4.48-5.86)	**6.26** (5.48-7.29)	**8.00** (6.78-9.63)	**9.43** (7.82-11.6)	**11.0** (8.87-13.8)	**12.6** (9.93-16.3)	**15.0** (11.3-20.2)	**16.9** (12.4-23.6)
60-day	**3.10** (2.75-3.56)	**4.12** (3.65-4.75)	**5.58** (4.93-6.45)	**6.85** (6.00-7.98)	**8.72** (7.39-10.5)	**10.3** (8.51-12.6)	**11.9** (9.64-15.0)	**13.7** (10.8-17.7)	**16.2** (12.3-21.9)	**18.3** (13.4-25.6)

[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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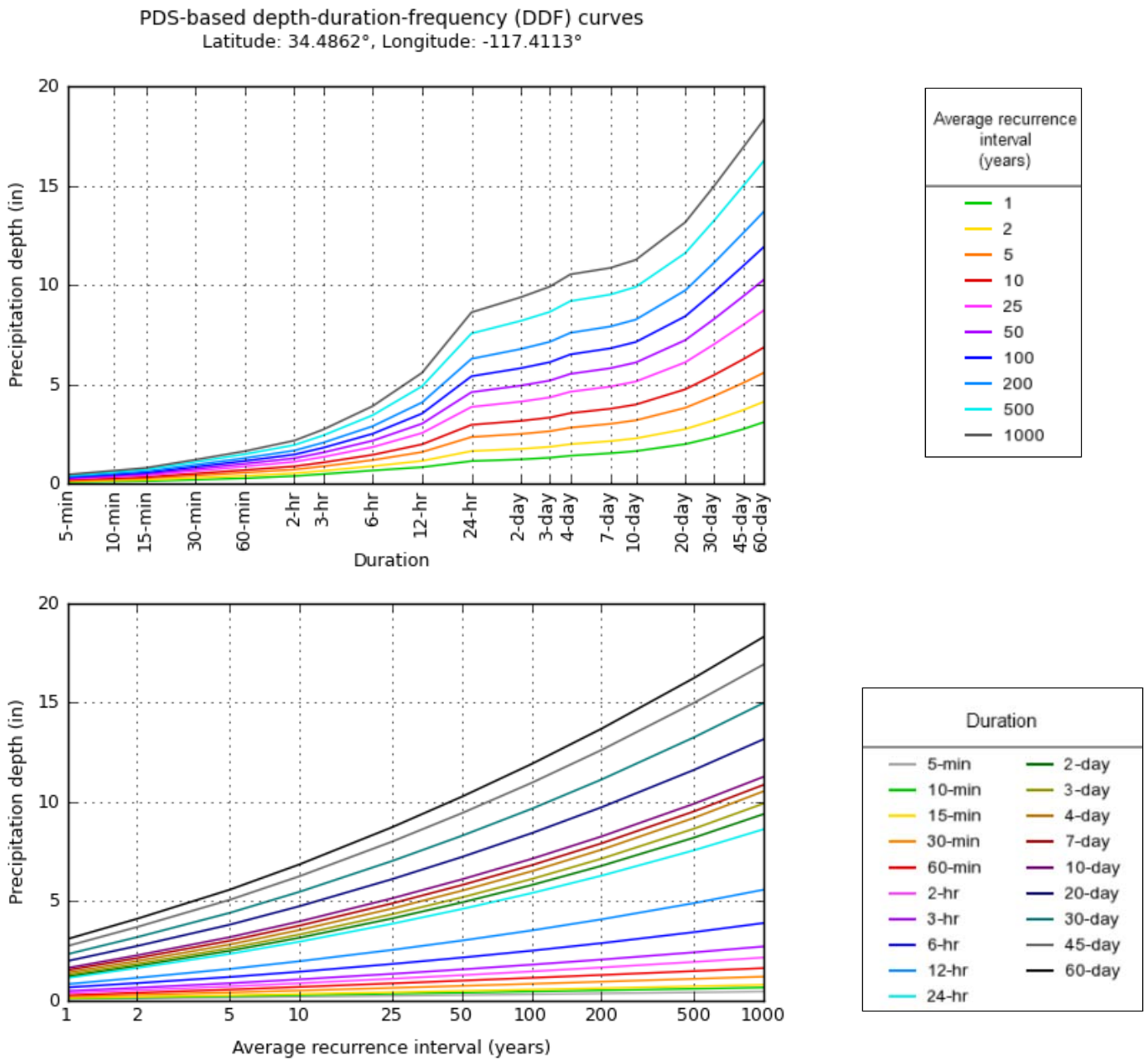
PF graphical



NOAA Atlas 14, Volume 6, Version 2

Created (GMT): Wed Oct 20 17:44:29 2021

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Maps & aerials

Small scale terrain

Large scale terrain

Large scale map

Large scale aerial

Back to Top

US Department of Commerce
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

Soil Map—San Bernardino County, California, Mojave River Area
(Vista Verde Soils Map)

Map Scale: 1:3,120 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: San Bernardino County, California, Mojave River Area
Survey Area Data: Version 13, Sep 13, 2021

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

Date(s) aerial images were photographed: Jun 26, 2019—Jul 8, 2019

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
112	CAJON SAND, 0 TO 2 PERCENT SLOPES	40.3	100.0%
Totals for Area of Interest		**40.3**	**100.0%**

San Bernardino County, California, Mojave River Area

112—CAJON SAND, 0 TO 2 PERCENT SLOPES

Map Unit Setting

National map unit symbol: hkrj
Elevation: 1,800 to 3,200 feet
Mean annual precipitation: 3 to 6 inches
Mean annual air temperature: 59 to 66 degrees F
Frost-free period: 180 to 290 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Cajon and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cajon

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite sources

Typical profile

H1 - 0 to 7 inches: sand
H2 - 7 to 25 inches: sand
H3 - 25 to 45 inches: gravelly sand
H4 - 45 to 60 inches: stratified sand to loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R030XF012CA - Sandy
Hydric soil rating: No

Minor Components

Manet
Percent of map unit: 5 percent
Landform: Playas
Hydric soil rating: Yes

Kimberlina
Percent of map unit: 5 percent

Helendale
Percent of map unit: 5 percent

Data Source Information

Soil Survey Area: San Bernardino County, California, Mojave River Area
Survey Area Data: Version 13, Sep 13, 2021

Curve (1) Numbers of Hydrologic Soil-Cover Complexes For Pervious Areas-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land)		78	86	91	93
Chaparral, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparral, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	71	78
Open Brush (Soft wood shrubs - buckwheat, sage, etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent.)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	25	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawn, shrubs, etc.)	Good	32	56	69	75
Turf (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
AGRICULTURAL COVERS -					
Fallow (Land plowed but not tilled or seeded)		77	86	91	94

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

CURVE NUMBERS FOR PERVIOUS AREAS

Figure C-3 (1 of 2)

ACTUAL IMPERVIOUS COVER

Land Use (1)	Range-Percent	Recommended Value For Average Conditions-Percent (2)
Natural or Agriculture	0 - 0	0
Public Park	10 - 25	15
School	30 - 50	40
Single Family Residential: (3)		
2.5 acre lots	5 - 15	10
1 acre lots	10 - 25	20
2 dwellings/acre	20 - 40	30
3-4 dwellings/acre	30 - 50	40
5-7 dwellings/acre	35 - 55	50
8-10 dwellings/acre	50 - 70	60
More than 10 dwellings/acre	65 - 90	80
Multiple Family Residential:		
Condominiums	45 - 70	65
Apartments	65 - 90	80
Mobile Home Park	60 - 85	75
Commercial, Downtown Business or Industrial	80 - 100	90

Notes:

1. Land use should be based on ultimate development of the watershed. Long range master plans for the County and incorporated cities should be reviewed to insure reasonable land use assumptions.

2. Recommended values are based on average conditions which may not apply to a particular study area. The percentage impervious may vary greatly even on comparable sized lots due to differences in dwelling size, improvements, etc. Landscape practices should also be considered as it is common in some areas to use ornamental gravels underlain by impervious plastic materials in place of lawns and shrubs. A field investigation of a study area shall always be made, and a review of aerial photos, where available, may assist in estimating the percentage of impervious cover in developed areas.

3. For typical equestrian subdivisions increase impervious area 5 percent over the values recommended in the table above.

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

ACTUAL IMPERVIOUS COVER
FOR
DEVELOPED AREAS

Figure C-4

APPENDIX A:
PROJECT PRE AND POST CONDITION EXHIBITS

RATIONAL STUDY INFORMATION

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: 10/22/21

Vista Verde
Rational
Existing Conditions
Area A

Program License Serial Number 6232

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

Rational hydrology study storm event year is 100.0
10 Year storm 1 hour rainfall = 0.692(In.)
100 Year storm 1 hour rainfall = 1.150(In.)
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.150 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++

Process from Point/Station 101.000 to Point/Station 102.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 50.00
Adjusted SCS curve number for AMC 3 = 70.00
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.532 (In/Hr)
Initial subarea data:
Initial area flow distance = 609.000(Ft.)
Top (of initial area) elevation = 64.000(Ft.)
Bottom (of initial area) elevation = 55.000(Ft.)
Difference in elevation = 9.000(Ft.)
Slope = 0.01478 s(%)= 1.48
TC = k(0.706)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 21.317 min.
Rainfall intensity = 2.373(In/Hr) for a 100.0 year storm

```
      Effective runoff coefficient used for area (Q=KCIA) is C = 0.698
      Subarea runoff =      3.976(CFS)
      Total initial stream area =        2.400(Ac.)
      Pervious area fraction = 1.000
      Initial area Fm value =    0.532(In/Hr)


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++
      Process from Point/Station      102.000 to Point/Station
103.000
      **** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
      ____________________________________________________________________
____
      Estimated mean flow rate at midpoint of channel =      0.000(CFS)
      Depth of flow =   0.324(Ft.), Average velocity =   1.683(Ft/s)
            ******* Irregular Channel Data ***********
      ------------------------------------------------------------------
      Information entered for subchannel number 1 :
      Point number      'X' coordinate     'Y' coordinate
            1              0.00              1.00
            2             50.00              0.00
            3            100.00              1.00
      Manning's 'N' friction factor =   0.030
      ------------------------------------------------------------------
      Sub-Channel flow  =      8.851(CFS)
        '     '    flow top width =     32.428(Ft.)
        '     '    velocity=    1.683(Ft/s)
        '     '    area =      5.258(Sq.Ft)
        '     '    Froude number =     0.737

      Upstream point elevation =    55.000(Ft.)
      Downstream point elevation =    42.000(Ft.)
      Flow length =   995.000(Ft.)
      Travel time  =    9.85 min.
      Time of concentration =   31.17 min.
      Depth of flow =   0.324(Ft.)
      Average velocity =   1.683(Ft/s)
      Total irregular channel flow =     8.851(CFS)
      Irregular channel normal depth above invert elev. =   0.324(Ft.)
      Average velocity of channel(s) =   1.683(Ft/s)
       Adding area flow to channel
      UNDEVELOPED (average cover) subarea
      Decimal fraction soil group A = 1.000
      Decimal fraction soil group B = 0.000
      Decimal fraction soil group C = 0.000
      Decimal fraction soil group D = 0.000
      SCS curve number for soil(AMC 2)  = 50.00
      Adjusted SCS curve number for AMC 3 = 70.00
      Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.532
(In/Hr)
      Rainfall intensity =      1.819(In/Hr) for a   100.0 year storm
      Effective runoff coefficient used for area,(total area with
modified
      rational method)(Q=KCIA) is C = 0.637
      Subarea runoff =      9.686(CFS) for    9.400(Ac.)
      Total runoff =     13.662(CFS)
      Effective area this stream =       11.80(Ac.)
      Total Study Area (Main Stream No. 1) =       11.80(Ac.)
      Area averaged Fm value =    0.532(In/Hr)
```

Depth of flow = 0.382(Ft.), Average velocity = 1.876(Ft/s)
End of computations, Total Study Area = 11.80 (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 = 50.0

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: 10/22/21

Vista Verde
Rational
Existing Conditions
Area B

Program License Serial Number 6232

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

Rational hydrology study storm event year is 100.0
10 Year storm 1 hour rainfall = 0.692(In.)
100 Year storm 1 hour rainfall = 1.150(In.)
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.150 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++

Process from Point/Station 201.000 to Point/Station 202.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 50.00
Adjusted SCS curve number for AMC 3 = 70.00
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.532 (In/Hr)
Initial subarea data:
Initial area flow distance = 692.000(Ft.)
Top (of initial area) elevation = 65.000(Ft.)
Bottom (of initial area) elevation = 53.000(Ft.)
Difference in elevation = 12.000(Ft.)
Slope = 0.01734 s(%)= 1.73
TC = k(0.706)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 21.729 min.
Rainfall intensity = 2.341(In/Hr) for a 100.0 year storm

```
      Effective runoff coefficient used for area (Q=KCIA) is C = 0.695
      Subarea runoff =      4.884(CFS)
      Total initial stream area =        3.000(Ac.)
      Pervious area fraction = 1.000
      Initial area Fm value =    0.532(In/Hr)


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++
      Process from Point/Station      202.000 to Point/Station
203.000
      **** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
      ____________________________________________________________________
____
      Estimated mean flow rate at midpoint of channel =      0.000(CFS)
      Depth of flow =   0.407(Ft.), Average velocity =   2.074(Ft/s)
            ******* Irregular Channel Data ***********
      ------------------------------------------------------------------
      Information entered for subchannel number 1 :
      Point number      'X' coordinate     'Y' coordinate
            1              0.00              1.00
            2             50.00              0.00
            3            100.00              1.00
      Manning's 'N' friction factor =   0.030
      ------------------------------------------------------------------
      Sub-Channel flow  =     17.173(CFS)
        '     '    flow top width =     40.695(Ft.)
        '     '    velocity=    2.074(Ft/s)
        '     '    area =      8.280(Sq.Ft)
        '     '    Froude number =     0.810

      Upstream point elevation =    53.000(Ft.)
      Downstream point elevation =    41.000(Ft.)
      Flow length =   819.000(Ft.)
      Travel time  =    6.58 min.
      Time of concentration =   28.31 min.
      Depth of flow =   0.407(Ft.)
      Average velocity =   2.074(Ft/s)
      Total irregular channel flow =    17.173(CFS)
      Irregular channel normal depth above invert elev. =   0.407(Ft.)
      Average velocity of channel(s) =   2.074(Ft/s)
       Adding area flow to channel
      UNDEVELOPED (average cover) subarea
      Decimal fraction soil group A = 1.000
      Decimal fraction soil group B = 0.000
      Decimal fraction soil group C = 0.000
      Decimal fraction soil group D = 0.000
      SCS curve number for soil(AMC 2)  = 50.00
      Adjusted SCS curve number for AMC 3 = 70.00
      Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.532
(In/Hr)
      Rainfall intensity =      1.946(In/Hr) for a   100.0 year storm
      Effective runoff coefficient used for area,(total area with
modified
      rational method)(Q=KCIA) is C = 0.654
      Subarea runoff =     24.494(CFS) for   20.100(Ac.)
      Total runoff =     29.378(CFS)
      Effective area this stream =       23.10(Ac.)
      Total Study Area (Main Stream No. 1) =       23.10(Ac.)
      Area averaged Fm value =    0.532(In/Hr)
```

Depth of flow = 0.498(Ft.), Average velocity = 2.372(Ft/s)
End of computations, Total Study Area = 23.10 (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) = 1.000
Area averaged SCS curve number = 50.0

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: 11/29/21

Vista Verde
Rational
Proposed Condition
Area A / Basin A

Program License Serial Number 6232

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.150 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++

Process from Point/Station 101.000 to Point/Station 102.000
**** INITIAL AREA EVALUATION ****

RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000 Max loss rate(Fm)= 0.471 (In/Hr)
Initial subarea data:
Initial area flow distance = 1000.000(Ft.)
Top (of initial area) elevation = 67.000(Ft.)
Bottom (of initial area) elevation = 51.000(Ft.)
Difference in elevation = 16.000(Ft.)
Slope = 0.01600 s(%)= 1.60
TC = k(0.412)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 14.930 min.
Rainfall intensity = 3.045(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.761
Subarea runoff = 14.824(CFS)

```
      Total initial stream area =        6.400(Ac.)
      Pervious area fraction = 0.600
      Initial area Fm value =    0.471(In/Hr)


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++
      Process from Point/Station      102.000 to Point/Station
103.000
      **** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
      ____________________________________________________________________
____
      Top of street segment elevation =    51.000(Ft.)
      End of street segment elevation =    40.000(Ft.)
      Length of street segment  =   569.000(Ft.)
      Height of curb above gutter flowline  =    6.0(In.)
      Width of half street (curb to crown)  =  18.000(Ft.)
      Distance from crown to crossfall grade break  =  16.000(Ft.)
      Slope from gutter to grade break (v/hz) =   0.020
      Slope from grade break to crown (v/hz)  =   0.020
      Street flow is on [2] side(s) of the street
      Distance from curb to property line  =  12.000(Ft.)
      Slope from curb to property line (v/hz) =   0.030
      Gutter width =   2.000(Ft.)
      Gutter hike from flowline =  2.000(In.)
       Manning's N in gutter =  0.0150
       Manning's N from gutter to grade break =  0.0150
       Manning's N from grade break to crown =  0.0150
      Estimated mean flow rate at midpoint of street =     24.057(CFS)
      Depth of flow =   0.458(Ft.), Average velocity =   4.200(Ft/s)
      Streetflow hydraulics at midpoint of street travel:
      Halfstreet flow width =  16.545(Ft.)
      Flow velocity =   4.20(Ft/s)
      Travel time =    2.26 min.     TC =   17.19  min.
       Adding area flow to street
      RESIDENTIAL(3 - 4 dwl/acre)
      Decimal fraction soil group A = 1.000
      Decimal fraction soil group B = 0.000
      Decimal fraction soil group C = 0.000
      Decimal fraction soil group D = 0.000
      SCS curve number for soil(AMC 2)  = 32.00
      Adjusted SCS curve number for AMC 3 = 52.00
      Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471
(In/Hr)
      Rainfall intensity =      2.759(In/Hr) for a   100.0 year storm
      Effective runoff coefficient used for area,(total area with
modified
      rational method)(Q=KCIA) is C = 0.746
      Subarea runoff =     18.326(CFS) for    9.700(Ac.)
      Total runoff =     33.150(CFS)
      Effective area this stream =       16.10(Ac.)
      Total Study Area (Main Stream No. 1) =       16.10(Ac.)
      Area averaged Fm value =    0.471(In/Hr)
      Street flow at end of street =     33.150(CFS)
      Half street flow at end of street =     16.575(CFS)
      Depth of flow =   0.499(Ft.), Average velocity =   4.616(Ft/s)
      Note:  depth of flow exceeds top of street crown.
      Flow width (from curb towards crown)=  18.000(Ft.)
      End of computations, Total Study Area =           16.10 (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) = 0.600
Area averaged SCS curve number = 32.0

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: 10/22/21

Vista Verde
Rational
Proposed Condition
Area B / Basin B

Program License Serial Number 6232

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

Rational hydrology study storm event year is 100.0
10 Year storm 1 hour rainfall = 0.692(In.)
100 Year storm 1 hour rainfall = 1.150(In.)
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.150 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++

Process from Point/Station 201.000 to Point/Station 202.000

**** INITIAL AREA EVALUATION ****

RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000 Max loss rate(Fm)= 0.471 (In/Hr)
Initial subarea data:
Initial area flow distance = 596.000(Ft.)
Top (of initial area) elevation = 54.000(Ft.)
Bottom (of initial area) elevation = 41.500(Ft.)
Difference in elevation = 12.500(Ft.)
Slope = 0.02097 s(%)= 2.10
TC = k(0.412)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 11.499 min.
Rainfall intensity = 3.655(In/Hr) for a 100.0 year storm

```
      Effective runoff coefficient used for area (Q=KCIA) is C = 0.784
      Subarea runoff =      9.744(CFS)
      Total initial stream area =        3.400(Ac.)
      Pervious area fraction = 0.600
      Initial area Fm value =    0.471(In/Hr)


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++
      Process from Point/Station      102.000 to Point/Station
103.000
      **** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
      ____________________________________________________________________
____
      Top of street segment elevation =    41.500(Ft.)
      End of street segment elevation =    39.500(Ft.)
      Length of street segment  =   399.000(Ft.)
      Height of curb above gutter flowline  =    6.0(In.)
      Width of half street (curb to crown)  =  18.000(Ft.)
      Distance from crown to crossfall grade break  =  16.000(Ft.)
      Slope from gutter to grade break (v/hz) =   0.020
      Slope from grade break to crown (v/hz)  =   0.020
      Street flow is on [1] side(s) of the street
      Distance from curb to property line  =  12.000(Ft.)
      Slope from curb to property line (v/hz) =   0.020
      Gutter width =   2.000(Ft.)
      Gutter hike from flowline =  0.040(In.)
       Manning's N in gutter =  0.0120
       Manning's N from gutter to grade break =  0.0120
       Manning's N from grade break to crown =  0.0150
      Estimated mean flow rate at midpoint of street =     15.350(CFS)
      Depth of flow =   0.426(Ft.), Average velocity =   3.035(Ft/s)
      Note:  depth of flow exceeds top of street crown.
      Streetflow hydraulics at midpoint of street travel:
      Halfstreet flow width =  18.000(Ft.)
      Flow velocity =   3.03(Ft/s)
      Travel time =    2.19 min.     TC =   13.69  min.
       Adding area flow to street
      RESIDENTIAL(3 - 4 dwl/acre)
      Decimal fraction soil group A = 1.000
      Decimal fraction soil group B = 0.000
      Decimal fraction soil group C = 0.000
      Decimal fraction soil group D = 0.000
      SCS curve number for soil(AMC 2)  = 32.00
      Adjusted SCS curve number for AMC 3 = 52.00
      Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471
(In/Hr)
      Rainfall intensity =      3.235(In/Hr) for a   100.0 year storm
      Effective runoff coefficient used for area,(total area with
modified
      rational method)(Q=KCIA) is C = 0.769
      Subarea runoff =     11.153(CFS) for    5.000(Ac.)
      Total runoff =     20.897(CFS)
      Effective area this stream =        8.40(Ac.)
      Total Study Area (Main Stream No. 1) =        8.40(Ac.)
      Area averaged Fm value =    0.471(In/Hr)
      Street flow at end of street =     20.897(CFS)
      Half street flow at end of street =     20.897(CFS)
      Depth of flow =   0.484(Ft.), Average velocity =   3.430(Ft/s)
      Note:  depth of flow exceeds top of street crown.
```

Flow width (from curb towards crown)= 18.000(Ft.)
End of computations, Total Study Area = 8.40 (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) = 0.600
Area averaged SCS curve number = 32.0

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: 10/22/21

Vista Verde
Rational
Proposed Condition
Area / Basin C

Program License Serial Number 6232

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

Rational hydrology study storm event year is 100.0
10 Year storm 1 hour rainfall = 0.692(In.)
100 Year storm 1 hour rainfall = 1.150(In.)
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.150 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++

Process from Point/Station 301.000 to Point/Station 302.000
**** INITIAL AREA EVALUATION ****

RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000 Max loss rate(Fm)= 0.471 (In/Hr)
Initial subarea data:
Initial area flow distance = 952.000(Ft.)
Top (of initial area) elevation = 61.000(Ft.)
Bottom (of initial area) elevation = 50.500(Ft.)
Difference in elevation = 10.500(Ft.)
Slope = 0.01103 s(%)= 1.10
TC = k(0.412)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 15.770 min.
Rainfall intensity = 2.930(In/Hr) for a 100.0 year storm

Effective runoff coefficient used for area (Q=KCIA) is C = 0.755
Subarea runoff = 13.944(CFS)
Total initial stream area = 6.300(Ac.)
Pervious area fraction = 0.600
Initial area Fm value = 0.471(In/Hr)
End of computations, Total Study Area = 6.30 (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) = 0.600
Area averaged SCS curve number = 32.0

APPENDIX A:
PROJECT PRE AND POST CONDITION EXHIBITS

SCS HYDROGRAPH INFORMATION

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

Study date 11/29/21

++

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

Program License Serial Number 6232

Vista Verde
SCS Hydrograph
Proposed Conditon
Area A

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		
16.10	1	1.15
Rainfall data for year 100		
16.10	6	2.51
Rainfall data for year 100		
16.10	24	5.41

++

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


      SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap
Fm
      No.(AMCII) NO.(AMC 3)    (Ac.)    Fraction     (In/Hr)  (dec.)
(In/Hr)
       32.0      52.0         16.10      1.000     0.785    0.600
0.471

      Area-averaged adjusted loss rate Fm (In/Hr) =  0.471

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

      Area       Area          SCS CN    SCS CN      S     Pervious
       (Ac.)      Fract         (AMC2)    (AMC3)           Yield Fr
           9.66   0.600         32.0      52.0       9.23     0.183
           6.44   0.400         98.0      98.0       0.20     0.956

      Area-averaged catchment yield fraction, Y =  0.493
      Area-averaged low loss fraction, Yb =  0.507
      User entry of time of concentration  =   0.299 (hours)
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++
      Watershed area =      16.10(Ac.)
      Catchment Lag time =   0.239 hours
      Unit interval =   5.000 minutes
      Unit interval percentage of lag time = 34.8384
      Hydrograph baseflow =     0.00(CFS)
      Average maximum watershed loss rate(Fm) =  0.471(In/Hr)
      Average low loss rate fraction (Yb) = 0.507 (decimal)
      DESERT S-Graph Selected
      Computed peak 5-minute rainfall =  0.546(In)
      Computed peak 30-minute rainfall =  0.934(In)
      Specified peak 1-hour rainfall =  1.150(In)
      Computed peak 3-hour rainfall =  1.856(In)
      Specified peak 6-hour rainfall =  2.510(In)
      Specified peak 24-hour rainfall =  5.410(In)


      Rainfall depth area reduction factors:
      Using a total area of      16.10(Ac.) (Ref: fig. E-4)

      5-minute factor = 0.999     Adjusted rainfall =  0.545(In)
      30-minute factor = 0.999    Adjusted rainfall =  0.933(In)
      1-hour factor = 0.999       Adjusted rainfall =  1.149(In)
      3-hour factor = 1.000       Adjusted rainfall =  1.856(In)
      6-hour factor = 1.000       Adjusted rainfall =  2.510(In)
      24-hour factor = 1.000      Adjusted rainfall =  5.410(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 =       194.71 (CFS))
```

1	2.217	4.317
2	13.241	21.464
3	40.653	53.375
4	59.783	37.248
5	70.008	19.909
6	76.828	13.279
7	81.669	9.425
8	85.374	7.215
9	88.337	5.770
10	90.526	4.262
11	92.354	3.559
12	93.881	2.973
13	95.105	2.383
14	96.128	1.992
15	96.976	1.650
16	97.614	1.242
17	98.048	0.846
18	98.418	0.719
19	98.834	0.811
20	99.252	0.814
21	99.588	0.653
22	99.806	0.426
23	100.000	0.377

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.5453	0.5453
2	0.6713	0.1260
3	0.7581	0.0868
4	0.8265	0.0683
5	0.8837	0.0572
6	0.9334	0.0497
7	0.9776	0.0442
8	1.0175	0.0400
9	1.0541	0.0366
10	1.0880	0.0339
11	1.1195	0.0316
12	1.1491	0.0296
13	1.1900	0.0408
14	1.2291	0.0391
15	1.2666	0.0376
16	1.3028	0.0362
17	1.3377	0.0349
18	1.3715	0.0338
19	1.4042	0.0327
20	1.4360	0.0318
21	1.4669	0.0309
22	1.4969	0.0301
23	1.5262	0.0293
24	1.5548	0.0286
25	1.5828	0.0279
26	1.6101	0.0273
27	1.6368	0.0267
28	1.6630	0.0262
29	1.6886	0.0257
30	1.7138	0.0252
31	1.7385	0.0247
32	1.7627	0.0242

33	1.7865	0.0238
34	1.8100	0.0234
35	1.8330	0.0230
36	1.8557	0.0227
37	1.8779	0.0223
38	1.8999	0.0219
39	1.9215	0.0216
40	1.9428	0.0213
41	1.9638	0.0210
42	1.9846	0.0207
43	2.0050	0.0205
44	2.0252	0.0202
45	2.0451	0.0199
46	2.0648	0.0197
47	2.0842	0.0194
48	2.1034	0.0192
49	2.1224	0.0190
50	2.1412	0.0188
51	2.1597	0.0186
52	2.1781	0.0183
53	2.1962	0.0182
54	2.2142	0.0180
55	2.2320	0.0178
56	2.2496	0.0176
57	2.2670	0.0174
58	2.2842	0.0172
59	2.3013	0.0171
60	2.3182	0.0169
61	2.3350	0.0168
62	2.3516	0.0166
63	2.3680	0.0165
64	2.3843	0.0163
65	2.4005	0.0162
66	2.4165	0.0160
67	2.4324	0.0159
68	2.4481	0.0158
69	2.4638	0.0156
70	2.4793	0.0155
71	2.4946	0.0154
72	2.5099	0.0152
73	2.5291	0.0193
74	2.5483	0.0191
75	2.5673	0.0190
76	2.5862	0.0189
77	2.6050	0.0188
78	2.6237	0.0187
79	2.6423	0.0186
80	2.6607	0.0185
81	2.6791	0.0184
82	2.6974	0.0183
83	2.7156	0.0182
84	2.7336	0.0181
85	2.7516	0.0180
86	2.7695	0.0179
87	2.7873	0.0178
88	2.8050	0.0177
89	2.8226	0.0176
90	2.8401	0.0175
91	2.8576	0.0174
92	2.8749	0.0174

93	2.8922	0.0173
94	2.9094	0.0172
95	2.9265	0.0171
96	2.9435	0.0170
97	2.9605	0.0169
98	2.9773	0.0169
99	2.9941	0.0168
100	3.0108	0.0167
101	3.0275	0.0166
102	3.0441	0.0166
103	3.0606	0.0165
104	3.0770	0.0164
105	3.0933	0.0164
106	3.1096	0.0163
107	3.1258	0.0162
108	3.1420	0.0162
109	3.1581	0.0161
110	3.1741	0.0160
111	3.1900	0.0160
112	3.2059	0.0159
113	3.2218	0.0158
114	3.2375	0.0158
115	3.2532	0.0157
116	3.2689	0.0156
117	3.2845	0.0156
118	3.3000	0.0155
119	3.3154	0.0155
120	3.3308	0.0154
121	3.3462	0.0153
122	3.3615	0.0153
123	3.3767	0.0152
124	3.3919	0.0152
125	3.4070	0.0151
126	3.4221	0.0151
127	3.4371	0.0150
128	3.4521	0.0150
129	3.4670	0.0149
130	3.4819	0.0149
131	3.4967	0.0148
132	3.5114	0.0148
133	3.5262	0.0147
134	3.5408	0.0147
135	3.5554	0.0146
136	3.5700	0.0146
137	3.5845	0.0145
138	3.5990	0.0145
139	3.6134	0.0144
140	3.6278	0.0144
141	3.6421	0.0143
142	3.6564	0.0143
143	3.6707	0.0142
144	3.6849	0.0142
145	3.6990	0.0142
146	3.7131	0.0141
147	3.7272	0.0141
148	3.7412	0.0140
149	3.7552	0.0140
150	3.7691	0.0139
151	3.7830	0.0139
152	3.7969	0.0139

153	3.8107	0.0138
154	3.8245	0.0138
155	3.8382	0.0137
156	3.8519	0.0137
157	3.8656	0.0137
158	3.8792	0.0136
159	3.8928	0.0136
160	3.9063	0.0135
161	3.9198	0.0135
162	3.9333	0.0135
163	3.9467	0.0134
164	3.9601	0.0134
165	3.9735	0.0134
166	3.9868	0.0133
167	4.0001	0.0133
168	4.0134	0.0133
169	4.0266	0.0132
170	4.0398	0.0132
171	4.0529	0.0131
172	4.0660	0.0131
173	4.0791	0.0131
174	4.0921	0.0130
175	4.1052	0.0130
176	4.1181	0.0130
177	4.1311	0.0129
178	4.1440	0.0129
179	4.1569	0.0129
180	4.1697	0.0128
181	4.1825	0.0128
182	4.1953	0.0128
183	4.2081	0.0128
184	4.2208	0.0127
185	4.2335	0.0127
186	4.2462	0.0127
187	4.2588	0.0126
188	4.2714	0.0126
189	4.2840	0.0126
190	4.2965	0.0125
191	4.3090	0.0125
192	4.3215	0.0125
193	4.3340	0.0125
194	4.3464	0.0124
195	4.3588	0.0124
196	4.3712	0.0124
197	4.3835	0.0123
198	4.3958	0.0123
199	4.4081	0.0123
200	4.4204	0.0123
201	4.4326	0.0122
202	4.4448	0.0122
203	4.4570	0.0122
204	4.4691	0.0121
205	4.4812	0.0121
206	4.4933	0.0121
207	4.5054	0.0121
208	4.5174	0.0120
209	4.5295	0.0120
210	4.5415	0.0120
211	4.5534	0.0120
212	4.5654	0.0119

213	4.5773	0.0119
214	4.5892	0.0119
215	4.6011	0.0119
216	4.6129	0.0118
217	4.6247	0.0118
218	4.6365	0.0118
219	4.6483	0.0118
220	4.6600	0.0117
221	4.6717	0.0117
222	4.6834	0.0117
223	4.6951	0.0117
224	4.7068	0.0117
225	4.7184	0.0116
226	4.7300	0.0116
227	4.7416	0.0116
228	4.7532	0.0116
229	4.7647	0.0115
230	4.7762	0.0115
231	4.7877	0.0115
232	4.7992	0.0115
233	4.8106	0.0114
234	4.8220	0.0114
235	4.8335	0.0114
236	4.8448	0.0114
237	4.8562	0.0114
238	4.8675	0.0113
239	4.8789	0.0113
240	4.8902	0.0113
241	4.9014	0.0113
242	4.9127	0.0113
243	4.9239	0.0112
244	4.9351	0.0112
245	4.9463	0.0112
246	4.9575	0.0112
247	4.9687	0.0112
248	4.9798	0.0111
249	4.9909	0.0111
250	5.0020	0.0111
251	5.0131	0.0111
252	5.0241	0.0111
253	5.0352	0.0110
254	5.0462	0.0110
255	5.0572	0.0110
256	5.0682	0.0110
257	5.0791	0.0110
258	5.0901	0.0109
259	5.1010	0.0109
260	5.1119	0.0109
261	5.1228	0.0109
262	5.1336	0.0109
263	5.1445	0.0108
264	5.1553	0.0108
265	5.1661	0.0108
266	5.1769	0.0108
267	5.1877	0.0108
268	5.1984	0.0108
269	5.2092	0.0107
270	5.2199	0.0107
271	5.2306	0.0107
272	5.2413	0.0107

273	5.2519	0.0107
274	5.2626	0.0106
275	5.2732	0.0106
276	5.2838	0.0106
277	5.2944	0.0106
278	5.3050	0.0106
279	5.3156	0.0106
280	5.3261	0.0105
281	5.3366	0.0105
282	5.3472	0.0105
283	5.3577	0.0105
284	5.3681	0.0105
285	5.3786	0.0105
286	5.3890	0.0104
287	5.3995	0.0104
288	5.4099	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0053	0.0051
2	0.0104	0.0053	0.0051
3	0.0105	0.0053	0.0052
4	0.0105	0.0053	0.0052
5	0.0105	0.0053	0.0052
6	0.0105	0.0053	0.0052
7	0.0106	0.0054	0.0052
8	0.0106	0.0054	0.0052
9	0.0106	0.0054	0.0052
10	0.0106	0.0054	0.0052
11	0.0107	0.0054	0.0053
12	0.0107	0.0054	0.0053
13	0.0107	0.0054	0.0053
14	0.0107	0.0054	0.0053
15	0.0108	0.0055	0.0053
16	0.0108	0.0055	0.0053
17	0.0108	0.0055	0.0053
18	0.0108	0.0055	0.0053
19	0.0109	0.0055	0.0054
20	0.0109	0.0055	0.0054
21	0.0109	0.0056	0.0054
22	0.0110	0.0056	0.0054
23	0.0110	0.0056	0.0054
24	0.0110	0.0056	0.0054
25	0.0111	0.0056	0.0054
26	0.0111	0.0056	0.0055
27	0.0111	0.0056	0.0055
28	0.0111	0.0057	0.0055
29	0.0112	0.0057	0.0055
30	0.0112	0.0057	0.0055
31	0.0112	0.0057	0.0055
32	0.0113	0.0057	0.0055
33	0.0113	0.0057	0.0056
34	0.0113	0.0057	0.0056
35	0.0114	0.0058	0.0056
36	0.0114	0.0058	0.0056
37	0.0114	0.0058	0.0056

38	0.0114	0.0058	0.0056
39	0.0115	0.0058	0.0057
40	0.0115	0.0058	0.0057
41	0.0116	0.0059	0.0057
42	0.0116	0.0059	0.0057
43	0.0116	0.0059	0.0057
44	0.0117	0.0059	0.0057
45	0.0117	0.0059	0.0058
46	0.0117	0.0059	0.0058
47	0.0118	0.0060	0.0058
48	0.0118	0.0060	0.0058
49	0.0118	0.0060	0.0058
50	0.0119	0.0060	0.0058
51	0.0119	0.0060	0.0059
52	0.0119	0.0061	0.0059
53	0.0120	0.0061	0.0059
54	0.0120	0.0061	0.0059
55	0.0121	0.0061	0.0059
56	0.0121	0.0061	0.0060
57	0.0121	0.0062	0.0060
58	0.0122	0.0062	0.0060
59	0.0122	0.0062	0.0060
60	0.0123	0.0062	0.0060
61	0.0123	0.0062	0.0061
62	0.0123	0.0063	0.0061
63	0.0124	0.0063	0.0061
64	0.0124	0.0063	0.0061
65	0.0125	0.0063	0.0061
66	0.0125	0.0063	0.0062
67	0.0126	0.0064	0.0062
68	0.0126	0.0064	0.0062
69	0.0127	0.0064	0.0062
70	0.0127	0.0064	0.0063
71	0.0128	0.0065	0.0063
72	0.0128	0.0065	0.0063
73	0.0128	0.0065	0.0063
74	0.0129	0.0065	0.0063
75	0.0129	0.0066	0.0064
76	0.0130	0.0066	0.0064
77	0.0130	0.0066	0.0064
78	0.0131	0.0066	0.0064
79	0.0131	0.0067	0.0065
80	0.0132	0.0067	0.0065
81	0.0133	0.0067	0.0065
82	0.0133	0.0067	0.0065
83	0.0134	0.0068	0.0066
84	0.0134	0.0068	0.0066
85	0.0135	0.0068	0.0066
86	0.0135	0.0069	0.0067
87	0.0136	0.0069	0.0067
88	0.0136	0.0069	0.0067
89	0.0137	0.0070	0.0067
90	0.0137	0.0070	0.0068
91	0.0138	0.0070	0.0068
92	0.0139	0.0070	0.0068
93	0.0139	0.0071	0.0069
94	0.0140	0.0071	0.0069
95	0.0141	0.0071	0.0069
96	0.0141	0.0072	0.0070
97	0.0142	0.0072	0.0070

98	0.0142	0.0072	0.0070
99	0.0143	0.0073	0.0071
100	0.0144	0.0073	0.0071
101	0.0145	0.0073	0.0071
102	0.0145	0.0074	0.0072
103	0.0146	0.0074	0.0072
104	0.0147	0.0074	0.0072
105	0.0148	0.0075	0.0073
106	0.0148	0.0075	0.0073
107	0.0149	0.0076	0.0073
108	0.0150	0.0076	0.0074
109	0.0151	0.0076	0.0074
110	0.0151	0.0077	0.0075
111	0.0152	0.0077	0.0075
112	0.0153	0.0078	0.0075
113	0.0154	0.0078	0.0076
114	0.0155	0.0078	0.0076
115	0.0156	0.0079	0.0077
116	0.0156	0.0079	0.0077
117	0.0158	0.0080	0.0078
118	0.0158	0.0080	0.0078
119	0.0160	0.0081	0.0079
120	0.0160	0.0081	0.0079
121	0.0162	0.0082	0.0080
122	0.0162	0.0082	0.0080
123	0.0164	0.0083	0.0081
124	0.0164	0.0083	0.0081
125	0.0166	0.0084	0.0082
126	0.0166	0.0084	0.0082
127	0.0168	0.0085	0.0083
128	0.0169	0.0086	0.0083
129	0.0170	0.0086	0.0084
130	0.0171	0.0087	0.0084
131	0.0173	0.0088	0.0085
132	0.0174	0.0088	0.0085
133	0.0175	0.0089	0.0086
134	0.0176	0.0089	0.0087
135	0.0178	0.0090	0.0088
136	0.0179	0.0091	0.0088
137	0.0181	0.0092	0.0089
138	0.0182	0.0092	0.0090
139	0.0184	0.0093	0.0091
140	0.0185	0.0094	0.0091
141	0.0187	0.0095	0.0092
142	0.0188	0.0095	0.0093
143	0.0190	0.0097	0.0094
144	0.0191	0.0097	0.0094
145	0.0152	0.0077	0.0075
146	0.0154	0.0078	0.0076
147	0.0156	0.0079	0.0077
148	0.0158	0.0080	0.0078
149	0.0160	0.0081	0.0079
150	0.0162	0.0082	0.0080
151	0.0165	0.0083	0.0081
152	0.0166	0.0084	0.0082
153	0.0169	0.0086	0.0083
154	0.0171	0.0087	0.0084
155	0.0174	0.0088	0.0086
156	0.0176	0.0089	0.0087
157	0.0180	0.0091	0.0088

158	0.0182	0.0092	0.0089
159	0.0186	0.0094	0.0091
160	0.0188	0.0095	0.0092
161	0.0192	0.0097	0.0095
162	0.0194	0.0099	0.0096
163	0.0199	0.0101	0.0098
164	0.0202	0.0102	0.0099
165	0.0207	0.0105	0.0102
166	0.0210	0.0107	0.0104
167	0.0216	0.0110	0.0107
168	0.0219	0.0111	0.0108
169	0.0227	0.0115	0.0112
170	0.0230	0.0117	0.0113
171	0.0238	0.0121	0.0117
172	0.0242	0.0123	0.0119
173	0.0252	0.0128	0.0124
174	0.0257	0.0130	0.0126
175	0.0267	0.0136	0.0132
176	0.0273	0.0139	0.0135
177	0.0286	0.0145	0.0141
178	0.0293	0.0149	0.0144
179	0.0309	0.0157	0.0152
180	0.0318	0.0161	0.0156
181	0.0338	0.0171	0.0166
182	0.0349	0.0177	0.0172
183	0.0376	0.0191	0.0185
184	0.0391	0.0198	0.0193
185	0.0296	0.0150	0.0146
186	0.0316	0.0160	0.0155
187	0.0366	0.0186	0.0180
188	0.0400	0.0203	0.0197
189	0.0497	0.0252	0.0245
190	0.0572	0.0290	0.0282
191	0.0868	0.0393	0.0476
192	0.1260	0.0393	0.0868
193	0.5453	0.0393	0.5060
194	0.0683	0.0347	0.0337
195	0.0442	0.0224	0.0218
196	0.0339	0.0172	0.0167
197	0.0408	0.0207	0.0201
198	0.0362	0.0184	0.0178
199	0.0327	0.0166	0.0161
200	0.0301	0.0153	0.0148
201	0.0279	0.0142	0.0138
202	0.0262	0.0133	0.0129
203	0.0247	0.0125	0.0122
204	0.0234	0.0119	0.0115
205	0.0223	0.0113	0.0110
206	0.0213	0.0108	0.0105
207	0.0205	0.0104	0.0101
208	0.0197	0.0100	0.0097
209	0.0190	0.0096	0.0093
210	0.0183	0.0093	0.0090
211	0.0178	0.0090	0.0088
212	0.0172	0.0088	0.0085
213	0.0168	0.0085	0.0083
214	0.0163	0.0083	0.0080
215	0.0159	0.0081	0.0078
216	0.0155	0.0079	0.0076
217	0.0193	0.0098	0.0095

218	0.0189	0.0096	0.0093
219	0.0186	0.0094	0.0092
220	0.0183	0.0093	0.0090
221	0.0180	0.0091	0.0089
222	0.0177	0.0090	0.0087
223	0.0174	0.0088	0.0086
224	0.0172	0.0087	0.0085
225	0.0169	0.0086	0.0083
226	0.0167	0.0085	0.0082
227	0.0165	0.0084	0.0081
228	0.0163	0.0083	0.0080
229	0.0161	0.0082	0.0079
230	0.0159	0.0081	0.0078
231	0.0157	0.0080	0.0077
232	0.0155	0.0079	0.0076
233	0.0153	0.0078	0.0076
234	0.0152	0.0077	0.0075
235	0.0150	0.0076	0.0074
236	0.0149	0.0075	0.0073
237	0.0147	0.0075	0.0072
238	0.0146	0.0074	0.0072
239	0.0144	0.0073	0.0071
240	0.0143	0.0073	0.0070
241	0.0142	0.0072	0.0070
242	0.0140	0.0071	0.0069
243	0.0139	0.0071	0.0068
244	0.0138	0.0070	0.0068
245	0.0137	0.0069	0.0067
246	0.0135	0.0069	0.0067
247	0.0134	0.0068	0.0066
248	0.0133	0.0068	0.0066
249	0.0132	0.0067	0.0065
250	0.0131	0.0067	0.0065
251	0.0130	0.0066	0.0064
252	0.0129	0.0066	0.0064
253	0.0128	0.0065	0.0063
254	0.0127	0.0065	0.0063
255	0.0126	0.0064	0.0062
256	0.0125	0.0064	0.0062
257	0.0125	0.0063	0.0061
258	0.0124	0.0063	0.0061
259	0.0123	0.0062	0.0061
260	0.0122	0.0062	0.0060
261	0.0121	0.0062	0.0060
262	0.0120	0.0061	0.0059
263	0.0120	0.0061	0.0059
264	0.0119	0.0060	0.0059
265	0.0118	0.0060	0.0058
266	0.0117	0.0060	0.0058
267	0.0117	0.0059	0.0058
268	0.0116	0.0059	0.0057
269	0.0115	0.0059	0.0057
270	0.0115	0.0058	0.0056
271	0.0114	0.0058	0.0056
272	0.0113	0.0058	0.0056
273	0.0113	0.0057	0.0056
274	0.0112	0.0057	0.0055
275	0.0112	0.0057	0.0055
276	0.0111	0.0056	0.0055
277	0.0110	0.0056	0.0054

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      278              0.0110           0.0056              0.0054
      279              0.0109           0.0055              0.0054
      280              0.0109           0.0055              0.0054
      281              0.0108           0.0055              0.0053
      282              0.0108           0.0055              0.0053
      283              0.0107           0.0054              0.0053
      284              0.0106           0.0054              0.0052
      285              0.0106           0.0054              0.0052
      286              0.0105           0.0054              0.0052
      287              0.0105           0.0053              0.0052
      288              0.0104           0.0053              0.0051
      ------------------------------------------------------------------
--
      ------------------------------------------------------------------
--
      Total soil rain loss =      2.48(In)
      Total effective rainfall =      2.93(In)
      Peak flow rate in flood hydrograph =     33.22(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       10.0      20.0      30.0
40.0

------------------------------------------------------------------------
    0+ 5       0.0002      0.02  Q         |         |         |
|
    0+10       0.0011      0.13  Q         |         |         |
|
    0+15       0.0039      0.41  Q         |         |         |
|
    0+20       0.0080      0.60  Q         |         |         |
|
    0+25       0.0128      0.70  Q         |         |         |
|
    0+30       0.0181      0.77  Q         |         |         |
|
    0+35       0.0238      0.82  Q         |         |         |
|
    0+40       0.0297      0.86  Q         |         |         |
|
    0+45       0.0359      0.89  Q         |         |         |
|
    0+50       0.0422      0.92  Q         |         |         |
|
    0+55       0.0486      0.94  Q         |         |         |
|
    1+ 0       0.0552      0.95  Q         |         |         |
|
    1+ 5       0.0619      0.97  Q         |         |         |
|
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1+10	0.0686	0.98	Q			
1+15	0.0754	0.99	Q			
1+20	0.0823	1.00	VQ			
1+25	0.0893	1.01	VQ			
1+30	0.0963	1.01	VQ			
1+35	0.1033	1.02	|Q			
1+40	0.1104	1.03	|Q			
1+45	0.1175	1.03	|Q			
1+50	0.1246	1.04	|Q			
1+55	0.1318	1.04	|Q			
2+ 0	0.1390	1.05	|Q			
2+ 5	0.1462	1.05	|Q			
2+10	0.1535	1.05	|Q			
2+15	0.1607	1.05	|Q			
2+20	0.1680	1.06	|Q			
2+25	0.1753	1.06	|Q			
2+30	0.1826	1.06	|Q			
2+35	0.1899	1.06	|Q			
2+40	0.1973	1.07	|QV			
2+45	0.2047	1.07	|QV			
2+50	0.2121	1.07	|QV			
2+55	0.2195	1.08	|QV			
3+ 0	0.2269	1.08	|QV			
3+ 5	0.2344	1.08	|QV			
3+10	0.2418	1.09	|QV			
3+15	0.2493	1.09	|QV			
3+20	0.2569	1.09	|QV			
3+25	0.2644	1.09	|QV			
3+30	0.2720	1.10	|QV			
3+35	0.2795	1.10	|QV			

3+40	0.2871	1.10	|QV	|	|	|
3+45	0.2948	1.11	|QV	|	|	|
3+50	0.3024	1.11	|Q V	|	|	|
3+55	0.3101	1.11	|Q V	|	|	|
4+ 0	0.3178	1.12	|Q V	|	|	|
4+ 5	0.3255	1.12	|Q V	|	|	|
4+10	0.3333	1.12	|Q V	|	|	|
4+15	0.3410	1.13	|Q V	|	|	|
4+20	0.3488	1.13	|Q V	|	|	|
4+25	0.3566	1.13	|Q V	|	|	|
4+30	0.3645	1.14	|Q V	|	|	|
4+35	0.3723	1.14	|Q V	|	|	|
4+40	0.3802	1.15	|Q V	|	|	|
4+45	0.3881	1.15	|Q V	|	|	|
4+50	0.3961	1.15	|Q V	|	|	|
4+55	0.4040	1.16	|Q V	|	|	|
5+ 0	0.4120	1.16	|Q V	|	|	|
5+ 5	0.4200	1.16	|Q V	|	|	|
5+10	0.4281	1.17	|Q V	|	|	|
5+15	0.4361	1.17	|Q V	|	|	|
5+20	0.4442	1.18	|Q V	|	|	|
5+25	0.4524	1.18	|Q V	|	|	|
5+30	0.4605	1.18	|Q V	|	|	|
5+35	0.4687	1.19	|Q V	|	|	|
5+40	0.4769	1.19	|Q V	|	|	|
5+45	0.4851	1.20	|Q V	|	|	|
5+50	0.4934	1.20	|Q V	|	|	|
5+55	0.5017	1.20	|Q V	|	|	|
6+ 0	0.5100	1.21	|Q V	|	|	|
6+ 5	0.5184	1.21	|Q V	|	|	|

6+10	0.5267	1.22	|Q V |	|	|
6+15	0.5352	1.22	|Q V |	|	|
6+20	0.5436	1.23	|Q V |	|	|
6+25	0.5521	1.23	|Q V |	|	|
6+30	0.5606	1.24	|Q V |	|	|
6+35	0.5691	1.24	|Q V |	|	|
6+40	0.5777	1.24	|Q V |	|	|
6+45	0.5863	1.25	|Q V |	|	|
6+50	0.5949	1.25	|Q V |	|	|
6+55	0.6036	1.26	|Q V |	|	|
7+ 0	0.6123	1.26	|Q V |	|	|
7+ 5	0.6211	1.27	|Q V |	|	|
7+10	0.6298	1.27	|Q V |	|	|
7+15	0.6387	1.28	|Q V |	|	|
7+20	0.6475	1.28	|Q V |	|	|
7+25	0.6564	1.29	|Q V |	|	|
7+30	0.6653	1.30	|Q V |	|	|
7+35	0.6743	1.30	|Q V |	|	|
7+40	0.6833	1.31	|Q V |	|	|
7+45	0.6923	1.31	|Q V |	|	|
7+50	0.7014	1.32	|Q V |	|	|
7+55	0.7105	1.32	|Q V |	|	|
8+ 0	0.7196	1.33	|Q V |	|	|
8+ 5	0.7288	1.34	|Q V |	|	|
8+10	0.7381	1.34	|Q V |	|	|
8+15	0.7473	1.35	|Q V |	|	|
8+20	0.7567	1.35	|Q V |	|	|
8+25	0.7660	1.36	|Q V |	|	|
8+30	0.7754	1.37	|Q V |	|	|
8+35	0.7849	1.37	|Q V |	|	|

8+40	0.7944	1.38	|Q	V |	|	|
8+45	0.8039	1.39	|Q	V |	|	|
8+50	0.8135	1.39	|Q	V |	|	|
8+55	0.8232	1.40	|Q	V |	|	|
9+ 0	0.8328	1.41	|Q	V |	|	|
9+ 5	0.8426	1.41	|Q	V |	|	|
9+10	0.8524	1.42	|Q	V |	|	|
9+15	0.8622	1.43	|Q	V |	|	|
9+20	0.8721	1.44	|Q	V |	|	|
9+25	0.8820	1.44	|Q	V |	|	|
9+30	0.8920	1.45	|Q	V|	|	|
9+35	0.9021	1.46	|Q	V|	|	|
9+40	0.9122	1.47	|Q	V|	|	|
9+45	0.9223	1.48	|Q	V|	|	|
9+50	0.9325	1.48	|Q	V|	|	|
9+55	0.9428	1.49	|Q	V|	|	|
10+ 0	0.9531	1.50	|Q	V|	|	|
10+ 5	0.9635	1.51	|Q	V|	|	|
10+10	0.9740	1.52	|Q	V|	|	|
10+15	0.9845	1.53	|Q	V	|	|
10+20	0.9951	1.54	|Q	V	|	|
10+25	1.0057	1.55	|Q	V	|	|
10+30	1.0165	1.56	|Q	V	|	|
10+35	1.0272	1.57	|Q	V	|	|
10+40	1.0381	1.58	|Q	V	|	|
10+45	1.0490	1.59	|Q	V	|	|
10+50	1.0600	1.60	|Q	V	|	|
10+55	1.0711	1.61	|Q	V	|	|
11+ 0	1.0822	1.62	|Q	|V	|	|
11+ 5	1.0935	1.63	|Q	|V	|	|

11+10	1.1048	1.64	Q	V		
11+15	1.1161	1.65	Q	V		
11+20	1.1276	1.66	Q	V		
11+25	1.1392	1.68	Q	V		
11+30	1.1508	1.69	Q	V		
11+35	1.1625	1.70	Q	V		
11+40	1.1743	1.72	Q	V		
11+45	1.1863	1.73	Q	V		
11+50	1.1983	1.74	Q	V		
11+55	1.2104	1.76	Q	V		
12+ 0	1.2226	1.77	Q	V		
12+ 5	1.2349	1.78	Q	V		
12+10	1.2469	1.75	Q	V		
12+15	1.2583	1.66	Q	V		
12+20	1.2694	1.60	Q	V		
12+25	1.2802	1.58	Q	V		
12+30	1.2910	1.57	Q	V		
12+35	1.3018	1.57	Q	V		
12+40	1.3126	1.57	Q	V		
12+45	1.3235	1.58	Q	V		
12+50	1.3345	1.59	Q	V		
12+55	1.3455	1.60	Q	V		
13+ 0	1.3566	1.62	Q	V		
13+ 5	1.3679	1.64	Q	V		
13+10	1.3793	1.66	Q	V		
13+15	1.3909	1.68	Q	V		
13+20	1.4026	1.70	Q	V		
13+25	1.4145	1.73	Q	V		
13+30	1.4266	1.75	Q	V		
13+35	1.4388	1.78	Q	V		

13+40	1.4513	1.81	|Q	| V	|	|
13+45	1.4639	1.84	|Q	| V	|	|
13+50	1.4768	1.87	|Q	| V	|	|
13+55	1.4900	1.91	|Q	| V	|	|
14+ 0	1.5033	1.94	|Q	| V	|	|
14+ 5	1.5170	1.98	|Q	| V	|	|
14+10	1.5310	2.03	| Q	| V	|	|
14+15	1.5452	2.07	| Q	| V	|	|
14+20	1.5598	2.12	| Q	| V	|	|
14+25	1.5748	2.17	| Q	| V	|	|
14+30	1.5901	2.22	| Q	| V	|	|
14+35	1.6058	2.28	| Q	| V	|	|
14+40	1.6220	2.34	| Q	| V	|	|
14+45	1.6386	2.41	| Q	| V	|	|
14+50	1.6557	2.49	| Q	| V	|	|
14+55	1.6734	2.57	| Q	| V	|	|
15+ 0	1.6917	2.65	| Q	| V	|	|
15+ 5	1.7106	2.75	| Q	| V	|	|
15+10	1.7303	2.86	| Q	| V	|	|
15+15	1.7509	2.98	| Q	| V	|	|
15+20	1.7723	3.12	| Q	| V	|	|
15+25	1.7947	3.25	| Q	| V	|	|
15+30	1.8173	3.29	| Q	| V	|	|
15+35	1.8391	3.16	| Q	| V	|	|
15+40	1.8608	3.15	| Q	| V	|	|
15+45	1.8837	3.32	| Q	| V|	|	|
15+50	1.9086	3.61	| Q	| V|	|	|
15+55	1.9371	4.14	| Q	| V|	|	|
16+ 0	1.9726	5.16	| Q	| V	|	|
16+ 5	2.0355	9.12	| Q|	V	|	|

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   16+10       2.1668     19.07  |         |        Q| V       |
|
   16+15       2.3956     33.22  |         |         |   V     |  Q
|
   16+20       2.5641     24.47  |         |         |   Q V   |
|
   16+25       2.6693     15.27  |         |    Q    |      V  |
|
   16+30       2.7474     11.34  |         |Q        |      V  |
|
   16+35       2.8105      9.16  |        Q|         |       V |
|
   16+40       2.8641      7.78  |      Q  |         |        V|
|
   16+45       2.9105      6.74  |     Q   |         |        V|
|
   16+50       2.9499      5.73  |    Q    |         |         V
|
   16+55       2.9852      5.12  |    Q    |         |         V
|
   17+ 0       3.0169      4.61  |   Q     |         |         V
|
   17+ 5       3.0453      4.12  |   Q     |         |         V
|
   17+10       3.0711      3.74  |  Q      |         |         |V
|
   17+15       3.0945      3.41  |  Q      |         |         |V
|
   17+20       3.1156      3.06  |  Q      |         |         |V
|
   17+25       3.1346      2.75  | Q       |         |         |V
|
   17+30       3.1524      2.59  | Q       |         |         | V
|
   17+35       3.1699      2.54  | Q       |         |         | V
|
   17+40       3.1867      2.44  | Q       |         |         | V
|
   17+45       3.2024      2.27  | Q       |         |         | V
|
   17+50       3.2167      2.08  | Q       |         |         | V
|
   17+55       3.2302      1.96  |Q        |         |         | V
|
   18+ 0       3.2421      1.72  |Q        |         |         | V
|
   18+ 5       3.2536      1.67  |Q        |         |         |  V
|
   18+10       3.2650      1.66  |Q        |         |         |  V
|
   18+15       3.2769      1.73  |Q        |         |         |  V
|
   18+20       3.2891      1.76  |Q        |         |         |  V
|
   18+25       3.3012      1.76  |Q        |         |         |  V
|
   18+30       3.3133      1.75  |Q        |         |         |  V
|
   18+35       3.3252      1.74  |Q        |         |         |  V
|
```

18+40	3.3370	1.72	|Q	|	|	|	V
18+45	3.3488	1.70	|Q	|	|	|	V
18+50	3.3603	1.68	|Q	|	|	|	V
18+55	3.3718	1.66	|Q	|	|	|	V
19+ 0	3.3831	1.64	|Q	|	|	|	V
19+ 5	3.3942	1.62	|Q	|	|	|	V
19+10	3.4053	1.60	|Q	|	|	|	V
19+15	3.4162	1.58	|Q	|	|	|	V
19+20	3.4269	1.56	|Q	|	|	|	V
19+25	3.4376	1.55	|Q	|	|	|	V
19+30	3.4481	1.53	|Q	|	|	|	V
19+35	3.4585	1.51	|Q	|	|	|	V
19+40	3.4688	1.50	|Q	|	|	|	V
19+45	3.4790	1.48	|Q	|	|	|	V
19+50	3.4891	1.46	|Q	|	|	|	V
19+55	3.4991	1.45	|Q	|	|	|	V
20+ 0	3.5089	1.43	|Q	|	|	|	V
20+ 5	3.5187	1.42	|Q	|	|	|	V
20+10	3.5284	1.40	|Q	|	|	|	V
20+15	3.5380	1.39	|Q	|	|	|	V
20+20	3.5474	1.38	|Q	|	|	|	V
20+25	3.5568	1.36	|Q	|	|	|	V
20+30	3.5661	1.35	|Q	|	|	|	V
20+35	3.5754	1.34	|Q	|	|	|	V
20+40	3.5845	1.33	|Q	|	|	|	V
20+45	3.5936	1.32	|Q	|	|	|	V
20+50	3.6025	1.30	|Q	|	|	|	V
20+55	3.6114	1.29	|Q	|	|	|	V
21+ 0	3.6203	1.28	|Q	|	|	|	V
21+ 5	3.6290	1.27	|Q	|	|	|	V

21+10	3.6377	1.26	|Q	|	|	|	V |
21+15	3.6464	1.25	|Q	|	|	|	V |
21+20	3.6549	1.24	|Q	|	|	|	V |
21+25	3.6634	1.23	|Q	|	|	|	V |
21+30	3.6718	1.22	|Q	|	|	|	V |
21+35	3.6802	1.22	|Q	|	|	|	V |
21+40	3.6885	1.21	|Q	|	|	|	V |
21+45	3.6968	1.20	|Q	|	|	|	V |
21+50	3.7050	1.19	|Q	|	|	|	V |
21+55	3.7131	1.18	|Q	|	|	|	V |
22+ 0	3.7212	1.17	|Q	|	|	|	V |
22+ 5	3.7292	1.17	|Q	|	|	|	V |
22+10	3.7372	1.16	|Q	|	|	|	V |
22+15	3.7451	1.15	|Q	|	|	|	V |
22+20	3.7530	1.14	|Q	|	|	|	V |
22+25	3.7608	1.14	|Q	|	|	|	V |
22+30	3.7686	1.13	|Q	|	|	|	V |
22+35	3.7763	1.12	|Q	|	|	|	V |
22+40	3.7840	1.12	|Q	|	|	|	V |
22+45	3.7916	1.11	|Q	|	|	|	V |
22+50	3.7992	1.10	|Q	|	|	|	V |
22+55	3.8068	1.10	|Q	|	|	|	V |
23+ 0	3.8143	1.09	|Q	|	|	|	V |
23+ 5	3.8218	1.08	|Q	|	|	|	V |
23+10	3.8292	1.08	|Q	|	|	|	V |
23+15	3.8366	1.07	|Q	|	|	|	V |
23+20	3.8439	1.07	|Q	|	|	|	V |
23+25	3.8512	1.06	|Q	|	|	|	V |
23+30	3.8585	1.05	|Q	|	|	|	V |
23+35	3.8657	1.05	|Q	|	|	|	V |

```
   23+40       3.8729      1.04  |Q        |         |         |
V|
   23+45       3.8800      1.04  |Q        |         |         |
V|
   23+50       3.8872      1.03  |Q        |         |         |
V|
   23+55       3.8942      1.03  |Q        |         |         |
V|
   24+ 0       3.9013      1.02  |Q        |         |         |
V|
   24+ 5       3.9082      1.00  Q         |         |         |
V|
   24+10       3.9142      0.88  Q         |         |         |
V|
   24+15       3.9184      0.60  Q         |         |         |
V|
   24+20       3.9212      0.41  Q         |         |         |
V|
   24+25       3.9233      0.31  Q         |         |         |
V|
   24+30       3.9249      0.24  Q         |         |         |
V|
   24+35       3.9262      0.19  Q         |         |         |
V|
   24+40       3.9273      0.15  Q         |         |         |
V|
   24+45       3.9281      0.12  Q         |         |         |
V|
   24+50       3.9287      0.10  Q         |         |         |
V|
   24+55       3.9293      0.08  Q         |         |         |
V|
   25+ 0       3.9297      0.06  Q         |         |         |
V|
   25+ 5       3.9301      0.05  Q         |         |         |
V|
   25+10       3.9303      0.04  Q         |         |         |
V|
   25+15       3.9305      0.03  Q         |         |         |
V|
   25+20       3.9307      0.02  Q         |         |         |
V|
   25+25       3.9308      0.02  Q         |         |         |
V|
   25+30       3.9309      0.02  Q         |         |         |
V|
   25+35       3.9310      0.01  Q         |         |         |
V|
   25+40       3.9311      0.01  Q         |         |         |
V|
   25+45       3.9311      0.00  Q         |         |         |
V|
   25+50       3.9311      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 10/22/21

++

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

Program License Serial Number 6232

Vista Verde
SCS Hydrograph
Developed Condition
Area / Basin B

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	8.40	1	1.15
Rainfall data for year 100	8.40	6	2.51
Rainfall data for year 100	8.40	24	5.41

++

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


      SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap
Fm
      No.(AMCII) NO.(AMC 3)    (Ac.)    Fraction     (In/Hr)  (dec.)
(In/Hr)
       32.0      52.0          8.40      1.000     0.785    0.500
0.393

      Area-averaged adjusted loss rate Fm (In/Hr) =  0.393

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

      Area       Area          SCS CN    SCS CN      S     Pervious
       (Ac.)      Fract         (AMC2)    (AMC3)           Yield Fr
           4.20   0.500         32.0      52.0       9.23     0.183
           4.20   0.500         98.0      98.0       0.20     0.956

      Area-averaged catchment yield fraction, Y =  0.570
      Area-averaged low loss fraction, Yb =  0.430
      User entry of time of concentration  =   0.187 (hours)
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++
      Watershed area =       8.40(Ac.)
      Catchment Lag time =   0.150 hours
      Unit interval =   5.000 minutes
      Unit interval percentage of lag time = 55.7041
      Hydrograph baseflow =     0.00(CFS)
      Average maximum watershed loss rate(Fm) =  0.393(In/Hr)
      Average low loss rate fraction (Yb) = 0.430 (decimal)
      DESERT S-Graph Selected
      Computed peak 5-minute rainfall =  0.546(In)
      Computed peak 30-minute rainfall =  0.934(In)
      Specified peak 1-hour rainfall =  1.150(In)
      Computed peak 3-hour rainfall =  1.856(In)
      Specified peak 6-hour rainfall =  2.510(In)
      Specified peak 24-hour rainfall =  5.410(In)


      Rainfall depth area reduction factors:
      Using a total area of       8.40(Ac.) (Ref: fig. E-4)

      5-minute factor = 1.000     Adjusted rainfall =  0.545(In)
      30-minute factor = 1.000    Adjusted rainfall =  0.934(In)
      1-hour factor = 1.000       Adjusted rainfall =  1.150(In)
      3-hour factor = 1.000       Adjusted rainfall =  1.856(In)
      6-hour factor = 1.000       Adjusted rainfall =  2.510(In)
      24-hour factor = 1.000      Adjusted rainfall =  5.410(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 =       101.59 (CFS))
```

1	4.819	4.895
2	36.973	32.665
3	65.180	28.654
4	77.243	12.254
5	84.282	7.151
6	88.996	4.790
7	92.154	3.207
8	94.495	2.379
9	96.209	1.741
10	97.422	1.232
11	98.152	0.742
12	98.787	0.645
13	99.426	0.648
14	99.825	0.406
15	100.000	0.178

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.5455	0.5455
2	0.6716	0.1261
3	0.7584	0.0869
4	0.8268	0.0684
5	0.8840	0.0572
6	0.9337	0.0497
7	0.9779	0.0442
8	1.0179	0.0400
9	1.0545	0.0366
10	1.0884	0.0339
11	1.1199	0.0316
12	1.1495	0.0296
13	1.1904	0.0408
14	1.2295	0.0391
15	1.2670	0.0375
16	1.3031	0.0362
17	1.3380	0.0349
18	1.3718	0.0338
19	1.4045	0.0327
20	1.4363	0.0318
21	1.4671	0.0309
22	1.4972	0.0301
23	1.5265	0.0293
24	1.5551	0.0286
25	1.5830	0.0279
26	1.6103	0.0273
27	1.6370	0.0267
28	1.6632	0.0262
29	1.6888	0.0256
30	1.7140	0.0251
31	1.7386	0.0247
32	1.7629	0.0242
33	1.7867	0.0238
34	1.8101	0.0234
35	1.8331	0.0230
36	1.8557	0.0227
37	1.8780	0.0223
38	1.9000	0.0219
39	1.9216	0.0216
40	1.9429	0.0213

41	1.9639	0.0210
42	1.9846	0.0207
43	2.0051	0.0204
44	2.0253	0.0202
45	2.0452	0.0199
46	2.0649	0.0197
47	2.0843	0.0194
48	2.1035	0.0192
49	2.1225	0.0190
50	2.1413	0.0188
51	2.1598	0.0186
52	2.1782	0.0183
53	2.1963	0.0182
54	2.2143	0.0180
55	2.2321	0.0178
56	2.2496	0.0176
57	2.2671	0.0174
58	2.2843	0.0172
59	2.3014	0.0171
60	2.3183	0.0169
61	2.3350	0.0168
62	2.3516	0.0166
63	2.3681	0.0164
64	2.3844	0.0163
65	2.4006	0.0162
66	2.4166	0.0160
67	2.4325	0.0159
68	2.4482	0.0158
69	2.4638	0.0156
70	2.4793	0.0155
71	2.4947	0.0154
72	2.5099	0.0152
73	2.5292	0.0193
74	2.5483	0.0191
75	2.5673	0.0190
76	2.5862	0.0189
77	2.6050	0.0188
78	2.6237	0.0187
79	2.6423	0.0186
80	2.6608	0.0185
81	2.6792	0.0184
82	2.6974	0.0183
83	2.7156	0.0182
84	2.7337	0.0181
85	2.7517	0.0180
86	2.7696	0.0179
87	2.7874	0.0178
88	2.8051	0.0177
89	2.8227	0.0176
90	2.8402	0.0175
91	2.8576	0.0174
92	2.8750	0.0174
93	2.8923	0.0173
94	2.9094	0.0172
95	2.9266	0.0171
96	2.9436	0.0170
97	2.9605	0.0169
98	2.9774	0.0169
99	2.9942	0.0168
100	3.0109	0.0167

101	3.0276	0.0166
102	3.0441	0.0166
103	3.0606	0.0165
104	3.0770	0.0164
105	3.0934	0.0164
106	3.1097	0.0163
107	3.1259	0.0162
108	3.1421	0.0162
109	3.1581	0.0161
110	3.1742	0.0160
111	3.1901	0.0160
112	3.2060	0.0159
113	3.2218	0.0158
114	3.2376	0.0158
115	3.2533	0.0157
116	3.2689	0.0156
117	3.2845	0.0156
118	3.3000	0.0155
119	3.3155	0.0155
120	3.3309	0.0154
121	3.3463	0.0153
122	3.3615	0.0153
123	3.3768	0.0152
124	3.3920	0.0152
125	3.4071	0.0151
126	3.4222	0.0151
127	3.4372	0.0150
128	3.4522	0.0150
129	3.4671	0.0149
130	3.4819	0.0149
131	3.4967	0.0148
132	3.5115	0.0148
133	3.5262	0.0147
134	3.5409	0.0147
135	3.5555	0.0146
136	3.5701	0.0146
137	3.5846	0.0145
138	3.5991	0.0145
139	3.6135	0.0144
140	3.6279	0.0144
141	3.6422	0.0143
142	3.6565	0.0143
143	3.6707	0.0142
144	3.6849	0.0142
145	3.6991	0.0142
146	3.7132	0.0141
147	3.7272	0.0141
148	3.7413	0.0140
149	3.7553	0.0140
150	3.7692	0.0139
151	3.7831	0.0139
152	3.7970	0.0139
153	3.8108	0.0138
154	3.8246	0.0138
155	3.8383	0.0137
156	3.8520	0.0137
157	3.8656	0.0137
158	3.8793	0.0136
159	3.8929	0.0136
160	3.9064	0.0135

161	3.9199	0.0135
162	3.9334	0.0135
163	3.9468	0.0134
164	3.9602	0.0134
165	3.9736	0.0134
166	3.9869	0.0133
167	4.0002	0.0133
168	4.0134	0.0133
169	4.0266	0.0132
170	4.0398	0.0132
171	4.0530	0.0131
172	4.0661	0.0131
173	4.0792	0.0131
174	4.0922	0.0130
175	4.1052	0.0130
176	4.1182	0.0130
177	4.1311	0.0129
178	4.1441	0.0129
179	4.1569	0.0129
180	4.1698	0.0128
181	4.1826	0.0128
182	4.1954	0.0128
183	4.2081	0.0128
184	4.2209	0.0127
185	4.2336	0.0127
186	4.2462	0.0127
187	4.2589	0.0126
188	4.2715	0.0126
189	4.2840	0.0126
190	4.2966	0.0125
191	4.3091	0.0125
192	4.3216	0.0125
193	4.3340	0.0125
194	4.3464	0.0124
195	4.3588	0.0124
196	4.3712	0.0124
197	4.3836	0.0123
198	4.3959	0.0123
199	4.4082	0.0123
200	4.4204	0.0123
201	4.4326	0.0122
202	4.4448	0.0122
203	4.4570	0.0122
204	4.4692	0.0121
205	4.4813	0.0121
206	4.4934	0.0121
207	4.5055	0.0121
208	4.5175	0.0120
209	4.5295	0.0120
210	4.5415	0.0120
211	4.5535	0.0120
212	4.5654	0.0119
213	4.5773	0.0119
214	4.5892	0.0119
215	4.6011	0.0119
216	4.6130	0.0118
217	4.6248	0.0118
218	4.6366	0.0118
219	4.6483	0.0118
220	4.6601	0.0117

221	4.6718	0.0117
222	4.6835	0.0117
223	4.6952	0.0117
224	4.7068	0.0117
225	4.7185	0.0116
226	4.7301	0.0116
227	4.7416	0.0116
228	4.7532	0.0116
229	4.7647	0.0115
230	4.7763	0.0115
231	4.7878	0.0115
232	4.7992	0.0115
233	4.8107	0.0114
234	4.8221	0.0114
235	4.8335	0.0114
236	4.8449	0.0114
237	4.8563	0.0114
238	4.8676	0.0113
239	4.8789	0.0113
240	4.8902	0.0113
241	4.9015	0.0113
242	4.9127	0.0113
243	4.9240	0.0112
244	4.9352	0.0112
245	4.9464	0.0112
246	4.9576	0.0112
247	4.9687	0.0112
248	4.9799	0.0111
249	4.9910	0.0111
250	5.0021	0.0111
251	5.0131	0.0111
252	5.0242	0.0111
253	5.0352	0.0110
254	5.0462	0.0110
255	5.0572	0.0110
256	5.0682	0.0110
257	5.0792	0.0110
258	5.0901	0.0109
259	5.1010	0.0109
260	5.1119	0.0109
261	5.1228	0.0109
262	5.1337	0.0109
263	5.1445	0.0108
264	5.1554	0.0108
265	5.1662	0.0108
266	5.1770	0.0108
267	5.1877	0.0108
268	5.1985	0.0108
269	5.2092	0.0107
270	5.2199	0.0107
271	5.2306	0.0107
272	5.2413	0.0107
273	5.2520	0.0107
274	5.2626	0.0106
275	5.2733	0.0106
276	5.2839	0.0106
277	5.2945	0.0106
278	5.3051	0.0106
279	5.3156	0.0106
280	5.3262	0.0105

281	5.3367	0.0105
282	5.3472	0.0105
283	5.3577	0.0105
284	5.3682	0.0105
285	5.3787	0.0105
286	5.3891	0.0104
287	5.3995	0.0104
288	5.4099	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0045	0.0059
2	0.0104	0.0045	0.0059
3	0.0105	0.0045	0.0060
4	0.0105	0.0045	0.0060
5	0.0105	0.0045	0.0060
6	0.0105	0.0045	0.0060
7	0.0106	0.0045	0.0060
8	0.0106	0.0046	0.0060
9	0.0106	0.0046	0.0060
10	0.0106	0.0046	0.0061
11	0.0107	0.0046	0.0061
12	0.0107	0.0046	0.0061
13	0.0107	0.0046	0.0061
14	0.0107	0.0046	0.0061
15	0.0108	0.0046	0.0061
16	0.0108	0.0046	0.0061
17	0.0108	0.0047	0.0062
18	0.0108	0.0047	0.0062
19	0.0109	0.0047	0.0062
20	0.0109	0.0047	0.0062
21	0.0109	0.0047	0.0062
22	0.0110	0.0047	0.0062
23	0.0110	0.0047	0.0063
24	0.0110	0.0047	0.0063
25	0.0111	0.0048	0.0063
26	0.0111	0.0048	0.0063
27	0.0111	0.0048	0.0063
28	0.0111	0.0048	0.0063
29	0.0112	0.0048	0.0064
30	0.0112	0.0048	0.0064
31	0.0112	0.0048	0.0064
32	0.0113	0.0048	0.0064
33	0.0113	0.0049	0.0064
34	0.0113	0.0049	0.0064
35	0.0114	0.0049	0.0065
36	0.0114	0.0049	0.0065
37	0.0114	0.0049	0.0065
38	0.0114	0.0049	0.0065
39	0.0115	0.0049	0.0065
40	0.0115	0.0050	0.0066
41	0.0116	0.0050	0.0066
42	0.0116	0.0050	0.0066
43	0.0116	0.0050	0.0066
44	0.0117	0.0050	0.0066
45	0.0117	0.0050	0.0067

46	0.0117	0.0050	0.0067
47	0.0118	0.0051	0.0067
48	0.0118	0.0051	0.0067
49	0.0118	0.0051	0.0067
50	0.0119	0.0051	0.0068
51	0.0119	0.0051	0.0068
52	0.0119	0.0051	0.0068
53	0.0120	0.0052	0.0068
54	0.0120	0.0052	0.0068
55	0.0121	0.0052	0.0069
56	0.0121	0.0052	0.0069
57	0.0121	0.0052	0.0069
58	0.0122	0.0052	0.0069
59	0.0122	0.0053	0.0070
60	0.0123	0.0053	0.0070
61	0.0123	0.0053	0.0070
62	0.0123	0.0053	0.0070
63	0.0124	0.0053	0.0071
64	0.0124	0.0053	0.0071
65	0.0125	0.0054	0.0071
66	0.0125	0.0054	0.0071
67	0.0126	0.0054	0.0072
68	0.0126	0.0054	0.0072
69	0.0127	0.0054	0.0072
70	0.0127	0.0055	0.0072
71	0.0128	0.0055	0.0073
72	0.0128	0.0055	0.0073
73	0.0128	0.0055	0.0073
74	0.0129	0.0055	0.0073
75	0.0129	0.0056	0.0074
76	0.0130	0.0056	0.0074
77	0.0130	0.0056	0.0074
78	0.0131	0.0056	0.0075
79	0.0131	0.0057	0.0075
80	0.0132	0.0057	0.0075
81	0.0133	0.0057	0.0076
82	0.0133	0.0057	0.0076
83	0.0134	0.0057	0.0076
84	0.0134	0.0058	0.0076
85	0.0135	0.0058	0.0077
86	0.0135	0.0058	0.0077
87	0.0136	0.0058	0.0077
88	0.0136	0.0059	0.0078
89	0.0137	0.0059	0.0078
90	0.0137	0.0059	0.0078
91	0.0138	0.0059	0.0079
92	0.0139	0.0060	0.0079
93	0.0139	0.0060	0.0079
94	0.0140	0.0060	0.0080
95	0.0141	0.0061	0.0080
96	0.0141	0.0061	0.0080
97	0.0142	0.0061	0.0081
98	0.0142	0.0061	0.0081
99	0.0143	0.0062	0.0082
100	0.0144	0.0062	0.0082
101	0.0145	0.0062	0.0082
102	0.0145	0.0062	0.0083
103	0.0146	0.0063	0.0083
104	0.0147	0.0063	0.0084
105	0.0148	0.0064	0.0084

106	0.0148	0.0064	0.0084
107	0.0149	0.0064	0.0085
108	0.0150	0.0064	0.0085
109	0.0151	0.0065	0.0086
110	0.0151	0.0065	0.0086
111	0.0152	0.0066	0.0087
112	0.0153	0.0066	0.0087
113	0.0154	0.0066	0.0088
114	0.0155	0.0067	0.0088
115	0.0156	0.0067	0.0089
116	0.0156	0.0067	0.0089
117	0.0158	0.0068	0.0090
118	0.0158	0.0068	0.0090
119	0.0160	0.0069	0.0091
120	0.0160	0.0069	0.0091
121	0.0162	0.0069	0.0092
122	0.0162	0.0070	0.0092
123	0.0164	0.0070	0.0093
124	0.0164	0.0071	0.0094
125	0.0166	0.0071	0.0094
126	0.0166	0.0072	0.0095
127	0.0168	0.0072	0.0096
128	0.0169	0.0073	0.0096
129	0.0170	0.0073	0.0097
130	0.0171	0.0074	0.0097
131	0.0173	0.0074	0.0098
132	0.0174	0.0075	0.0099
133	0.0175	0.0075	0.0100
134	0.0176	0.0076	0.0100
135	0.0178	0.0077	0.0101
136	0.0179	0.0077	0.0102
137	0.0181	0.0078	0.0103
138	0.0182	0.0078	0.0104
139	0.0184	0.0079	0.0105
140	0.0185	0.0079	0.0105
141	0.0187	0.0080	0.0106
142	0.0188	0.0081	0.0107
143	0.0190	0.0082	0.0108
144	0.0191	0.0082	0.0109
145	0.0152	0.0066	0.0087
146	0.0154	0.0066	0.0088
147	0.0156	0.0067	0.0089
148	0.0158	0.0068	0.0090
149	0.0160	0.0069	0.0091
150	0.0162	0.0070	0.0092
151	0.0164	0.0071	0.0094
152	0.0166	0.0071	0.0095
153	0.0169	0.0073	0.0096
154	0.0171	0.0073	0.0097
155	0.0174	0.0075	0.0099
156	0.0176	0.0076	0.0100
157	0.0180	0.0077	0.0102
158	0.0182	0.0078	0.0103
159	0.0186	0.0080	0.0106
160	0.0188	0.0081	0.0107
161	0.0192	0.0083	0.0109
162	0.0194	0.0084	0.0111
163	0.0199	0.0086	0.0114
164	0.0202	0.0087	0.0115
165	0.0207	0.0089	0.0118

166	0.0210	0.0090	0.0120
167	0.0216	0.0093	0.0123
168	0.0219	0.0094	0.0125
169	0.0227	0.0097	0.0129
170	0.0230	0.0099	0.0131
171	0.0238	0.0102	0.0136
172	0.0242	0.0104	0.0138
173	0.0251	0.0108	0.0143
174	0.0256	0.0110	0.0146
175	0.0267	0.0115	0.0152
176	0.0273	0.0117	0.0156
177	0.0286	0.0123	0.0163
178	0.0293	0.0126	0.0167
179	0.0309	0.0133	0.0176
180	0.0318	0.0137	0.0181
181	0.0338	0.0145	0.0192
182	0.0349	0.0150	0.0199
183	0.0375	0.0161	0.0214
184	0.0391	0.0168	0.0223
185	0.0296	0.0127	0.0169
186	0.0316	0.0136	0.0180
187	0.0366	0.0157	0.0209
188	0.0400	0.0172	0.0228
189	0.0497	0.0214	0.0283
190	0.0572	0.0246	0.0326
191	0.0869	0.0327	0.0541
192	0.1261	0.0327	0.0934
193	0.5455	0.0327	0.5128
194	0.0684	0.0294	0.0390
195	0.0442	0.0190	0.0252
196	0.0339	0.0146	0.0193
197	0.0408	0.0176	0.0233
198	0.0362	0.0156	0.0206
199	0.0327	0.0141	0.0186
200	0.0301	0.0129	0.0171
201	0.0279	0.0120	0.0159
202	0.0262	0.0113	0.0149
203	0.0247	0.0106	0.0141
204	0.0234	0.0101	0.0133
205	0.0223	0.0096	0.0127
206	0.0213	0.0092	0.0121
207	0.0204	0.0088	0.0117
208	0.0197	0.0085	0.0112
209	0.0190	0.0082	0.0108
210	0.0183	0.0079	0.0105
211	0.0178	0.0076	0.0101
212	0.0172	0.0074	0.0098
213	0.0168	0.0072	0.0095
214	0.0163	0.0070	0.0093
215	0.0159	0.0068	0.0091
216	0.0155	0.0067	0.0088
217	0.0193	0.0083	0.0110
218	0.0189	0.0081	0.0108
219	0.0186	0.0080	0.0106
220	0.0183	0.0079	0.0104
221	0.0180	0.0077	0.0102
222	0.0177	0.0076	0.0101
223	0.0174	0.0075	0.0099
224	0.0172	0.0074	0.0098
225	0.0169	0.0073	0.0097

226	0.0167	0.0072	0.0095
227	0.0165	0.0071	0.0094
228	0.0163	0.0070	0.0093
229	0.0161	0.0069	0.0092
230	0.0159	0.0068	0.0091
231	0.0157	0.0068	0.0089
232	0.0155	0.0067	0.0088
233	0.0153	0.0066	0.0087
234	0.0152	0.0065	0.0087
235	0.0150	0.0065	0.0086
236	0.0149	0.0064	0.0085
237	0.0147	0.0063	0.0084
238	0.0146	0.0063	0.0083
239	0.0144	0.0062	0.0082
240	0.0143	0.0061	0.0081
241	0.0142	0.0061	0.0081
242	0.0140	0.0060	0.0080
243	0.0139	0.0060	0.0079
244	0.0138	0.0059	0.0079
245	0.0137	0.0059	0.0078
246	0.0135	0.0058	0.0077
247	0.0134	0.0058	0.0077
248	0.0133	0.0057	0.0076
249	0.0132	0.0057	0.0075
250	0.0131	0.0056	0.0075
251	0.0130	0.0056	0.0074
252	0.0129	0.0056	0.0074
253	0.0128	0.0055	0.0073
254	0.0127	0.0055	0.0072
255	0.0126	0.0054	0.0072
256	0.0125	0.0054	0.0071
257	0.0125	0.0054	0.0071
258	0.0124	0.0053	0.0070
259	0.0123	0.0053	0.0070
260	0.0122	0.0052	0.0070
261	0.0121	0.0052	0.0069
262	0.0120	0.0052	0.0069
263	0.0120	0.0051	0.0068
264	0.0119	0.0051	0.0068
265	0.0118	0.0051	0.0067
266	0.0117	0.0051	0.0067
267	0.0117	0.0050	0.0067
268	0.0116	0.0050	0.0066
269	0.0115	0.0050	0.0066
270	0.0115	0.0049	0.0065
271	0.0114	0.0049	0.0065
272	0.0113	0.0049	0.0065
273	0.0113	0.0049	0.0064
274	0.0112	0.0048	0.0064
275	0.0112	0.0048	0.0064
276	0.0111	0.0048	0.0063
277	0.0110	0.0047	0.0063
278	0.0110	0.0047	0.0063
279	0.0109	0.0047	0.0062
280	0.0109	0.0047	0.0062
281	0.0108	0.0046	0.0062
282	0.0108	0.0046	0.0061
283	0.0107	0.0046	0.0061
284	0.0106	0.0046	0.0061
285	0.0106	0.0046	0.0060

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      286              0.0105           0.0045              0.0060
      287              0.0105           0.0045              0.0060
      288              0.0104           0.0045              0.0060
      ------------------------------------------------------------------------
--
      ------------------------------------------------------------------------
--
      Total soil rain loss =      2.10(In)
      Total effective rainfall =      3.31(In)
      Peak flow rate in flood hydrograph =     20.88(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        7.5      15.0      22.5
30.0

------------------------------------------------------------------------------
    0+ 5       0.0002      0.03  Q         |         |         |
|
    0+10       0.0017      0.22  Q         |         |         |
|
    0+15       0.0044      0.39  Q         |         |         |
|
    0+20       0.0077      0.47  Q         |         |         |
|
    0+25       0.0112      0.51  Q         |         |         |
|
    0+30       0.0149      0.54  Q         |         |         |
|
    0+35       0.0188      0.56  Q         |         |         |
|
    0+40       0.0227      0.58  Q         |         |         |
|
    0+45       0.0268      0.59  Q         |         |         |
|
    0+50       0.0309      0.60  Q         |         |         |
|
    0+55       0.0350      0.60  Q         |         |         |
|
    1+ 0       0.0392      0.61  Q         |         |         |
|
    1+ 5       0.0434      0.61  Q         |         |         |
|
    1+10       0.0477      0.62  Q         |         |         |
|
    1+15       0.0519      0.62  Q         |         |         |
|
    1+20       0.0562      0.62  Q         |         |         |
|
    1+25       0.0605      0.62  QV        |         |         |
|
```

1+30	0.0648	0.62	QV			
1+35	0.0691	0.63	QV			
1+40	0.0734	0.63	QV			
1+45	0.0778	0.63	QV			
1+50	0.0821	0.63	QV			
1+55	0.0864	0.63	QV			
2+ 0	0.0908	0.63	QV			
2+ 5	0.0952	0.64	QV			
2+10	0.0996	0.64	QV			
2+15	0.1040	0.64	QV			
2+20	0.1084	0.64	QV			
2+25	0.1128	0.64	QV			
2+30	0.1172	0.64	Q V			
2+35	0.1217	0.65	Q V			
2+40	0.1261	0.65	Q V			
2+45	0.1306	0.65	Q V			
2+50	0.1351	0.65	Q V			
2+55	0.1396	0.65	Q V			
3+ 0	0.1441	0.65	Q V			
3+ 5	0.1486	0.66	Q V			
3+10	0.1531	0.66	Q V			
3+15	0.1577	0.66	Q V			
3+20	0.1622	0.66	Q V			
3+25	0.1668	0.66	Q V			
3+30	0.1714	0.67	Q V			
3+35	0.1760	0.67	Q V			
3+40	0.1806	0.67	Q V			
3+45	0.1852	0.67	Q V			
3+50	0.1899	0.67	Q V			
3+55	0.1945	0.68	Q V			

4+ 0	0.1992	0.68	Q	V				
4+ 5	0.2039	0.68	Q	V				
4+10	0.2086	0.68	Q	V				
4+15	0.2133	0.68	Q	V				
4+20	0.2180	0.69	Q	V				
4+25	0.2227	0.69	Q	V				
4+30	0.2275	0.69	Q	V				
4+35	0.2323	0.69	Q		V			
4+40	0.2370	0.69	Q		V			
4+45	0.2418	0.70	Q		V			
4+50	0.2467	0.70	Q		V			
4+55	0.2515	0.70	Q		V			
5+ 0	0.2563	0.70	Q		V			
5+ 5	0.2612	0.71	Q		V			
5+10	0.2661	0.71	Q		V			
5+15	0.2710	0.71	Q		V			
5+20	0.2759	0.71	Q		V			
5+25	0.2808	0.72	Q		V			
5+30	0.2858	0.72	Q		V			
5+35	0.2907	0.72	Q			V		
5+40	0.2957	0.72	Q			V		
5+45	0.3007	0.73	Q			V		
5+50	0.3057	0.73	Q			V		
5+55	0.3107	0.73	Q			V		
6+ 0	0.3158	0.73	Q			V		
6+ 5	0.3209	0.74	Q			V		
6+10	0.3260	0.74	Q			V		
6+15	0.3311	0.74	Q			V		
6+20	0.3362	0.74	Q			V		
6+25	0.3413	0.75	Q			V		

6+30	0.3465	0.75	|Q V |			
6+35	0.3517	0.75	|Q V |			
6+40	0.3569	0.76	|Q V |			
6+45	0.3621	0.76	|Q V |			
6+50	0.3674	0.76	|Q V |			
6+55	0.3726	0.76	|Q V |			
7+ 0	0.3779	0.77	|Q V |			
7+ 5	0.3832	0.77	|Q V |			
7+10	0.3886	0.77	|Q V |			
7+15	0.3939	0.78	|Q V |			
7+20	0.3993	0.78	|Q V |			
7+25	0.4047	0.78	|Q V |			
7+30	0.4101	0.79	|Q V |			
7+35	0.4155	0.79	|Q V |			
7+40	0.4210	0.79	|Q V |			
7+45	0.4265	0.80	|Q V |			
7+50	0.4320	0.80	|Q V |			
7+55	0.4375	0.80	|Q V |			
8+ 0	0.4431	0.81	|Q V |			
8+ 5	0.4487	0.81	|Q V |			
8+10	0.4543	0.82	|Q V |			
8+15	0.4600	0.82	|Q V |			
8+20	0.4656	0.82	|Q V |			
8+25	0.4713	0.83	|Q V |			
8+30	0.4770	0.83	|Q V |			
8+35	0.4828	0.83	|Q V |			
8+40	0.4886	0.84	|Q V |			
8+45	0.4944	0.84	|Q V |			
8+50	0.5002	0.85	|Q V |			
8+55	0.5060	0.85	|Q V |			

9+ 0	0.5119	0.86	|Q	V |	|	|
9+ 5	0.5179	0.86	|Q	V |	|	|
9+10	0.5238	0.86	|Q	V|	|	|
9+15	0.5298	0.87	|Q	V|	|	|
9+20	0.5358	0.87	|Q	V|	|	|
9+25	0.5419	0.88	|Q	V|	|	|
9+30	0.5479	0.88	|Q	V|	|	|
9+35	0.5541	0.89	|Q	V|	|	|
9+40	0.5602	0.89	|Q	V|	|	|
9+45	0.5664	0.90	|Q	V|	|	|
9+50	0.5726	0.90	|Q	V|	|	|
9+55	0.5789	0.91	|Q	V|	|	|
10+ 0	0.5852	0.91	|Q	V	|	|
10+ 5	0.5915	0.92	|Q	V	|	|
10+10	0.5979	0.92	|Q	V	|	|
10+15	0.6043	0.93	|Q	V	|	|
10+20	0.6107	0.94	|Q	V	|	|
10+25	0.6172	0.94	|Q	V	|	|
10+30	0.6237	0.95	|Q	V	|	|
10+35	0.6303	0.95	|Q	V	|	|
10+40	0.6369	0.96	|Q	V	|	|
10+45	0.6436	0.97	|Q	|V	|	|
10+50	0.6503	0.97	|Q	|V	|	|
10+55	0.6570	0.98	|Q	|V	|	|
11+ 0	0.6638	0.99	|Q	|V	|	|
11+ 5	0.6707	0.99	|Q	|V	|	|
11+10	0.6776	1.00	|Q	|V	|	|
11+15	0.6845	1.01	|Q	|V	|	|
11+20	0.6915	1.02	|Q	|V	|	|
11+25	0.6986	1.02	|Q	| V	|	|

11+30	0.7057	1.03	Q	V		
11+35	0.7128	1.04	Q	V		
11+40	0.7201	1.05	Q	V		
11+45	0.7273	1.06	Q	V		
11+50	0.7347	1.07	Q	V		
11+55	0.7421	1.07	Q	V		
12+ 0	0.7496	1.08	Q	V		
12+ 5	0.7570	1.08	Q	V		
12+10	0.7640	1.02	Q	V		
12+15	0.7706	0.96	Q	V		
12+20	0.7771	0.94	Q	V		
12+25	0.7835	0.93	Q	V		
12+30	0.7899	0.93	Q	V		
12+35	0.7964	0.94	Q	V		
12+40	0.8029	0.94	Q	V		
12+45	0.8094	0.95	Q	V		
12+50	0.8161	0.96	Q	V		
12+55	0.8228	0.97	Q	V		
13+ 0	0.8296	0.99	Q	V		
13+ 5	0.8364	1.00	Q	V		
13+10	0.8434	1.01	Q	V		
13+15	0.8505	1.03	Q	V		
13+20	0.8577	1.04	Q	V		
13+25	0.8650	1.06	Q	V		
13+30	0.8724	1.08	Q	V		
13+35	0.8800	1.10	Q	V		
13+40	0.8877	1.12	Q	V		
13+45	0.8955	1.14	Q	V		
13+50	0.9035	1.16	Q	V		
13+55	0.9117	1.18	Q	V		

14+ 0	0.9200	1.21	Q		V		
14+ 5	0.9285	1.23	Q		V		
14+10	0.9371	1.26	Q		V		
14+15	0.9460	1.29	Q		V		
14+20	0.9551	1.32	Q		V		
14+25	0.9645	1.35	Q		V		
14+30	0.9740	1.39	Q		V		
14+35	0.9839	1.43	Q		V		
14+40	0.9940	1.47	Q		V		
14+45	1.0045	1.52	Q		V		
14+50	1.0152	1.57	Q		V		
14+55	1.0264	1.62	Q		V		
15+ 0	1.0380	1.68	Q		V		
15+ 5	1.0500	1.74	Q		V		
15+10	1.0625	1.82	Q		V		
15+15	1.0756	1.90	Q		V		
15+20	1.0894	2.00	Q		V		
15+25	1.1037	2.07	Q		V		
15+30	1.1172	1.96	Q		V		
15+35	1.1302	1.89	Q		V		
15+40	1.1439	1.98	Q		V		
15+45	1.1586	2.14	Q		V		
15+50	1.1753	2.43	Q		V		
15+55	1.1951	2.87	Q		V		
16+ 0	1.2226	3.98	Q		V		
16+ 5	1.2779	8.04	Q		V		
16+10	1.4217	20.88			V	Q	
16+15	1.5459	18.03			Q	V	
16+20	1.6115	9.53	Q		V		
16+25	1.6559	6.44	Q		V		

16+30	1.6905	5.03	| Q |	|	| V|
16+35	1.7187	4.09	| Q |	|	| V|
16+40	1.7426	3.47	| Q |	|	| V
16+45	1.7630	2.96	| Q |	|	| V
16+50	1.7804	2.53	| Q |	|	| V
16+55	1.7953	2.16	| Q |	|	| |V
17+ 0	1.8090	1.99	| Q |	|	| |V
17+ 5	1.8219	1.88	| Q |	|	| |V
17+10	1.8333	1.66	| Q |	|	| |V
17+15	1.8433	1.46	|Q |	|	| |V
17+20	1.8523	1.30	|Q |	|	| |V
17+25	1.8608	1.24	|Q |	|	| | V
17+30	1.8690	1.19	|Q |	|	| | V
17+35	1.8769	1.14	|Q |	|	| | V
17+40	1.8845	1.10	|Q |	|	| | V
17+45	1.8918	1.06	|Q |	|	| | V
17+50	1.8989	1.03	|Q |	|	| | V
17+55	1.9057	1.00	|Q |	|	| | V
18+ 0	1.9124	0.97	|Q |	|	| | V
18+ 5	1.9190	0.95	|Q |	|	| | V
18+10	1.9259	1.01	|Q |	|	| | V
18+15	1.9331	1.05	|Q |	|	| | V
18+20	1.9404	1.06	|Q |	|	| | V
18+25	1.9477	1.05	|Q |	|	| | V
18+30	1.9549	1.05	|Q |	|	| | V
18+35	1.9620	1.04	|Q |	|	| | V
18+40	1.9691	1.02	|Q |	|	| | V
18+45	1.9761	1.01	|Q |	|	| | V
18+50	1.9829	1.00	|Q |	|	| | V
18+55	1.9897	0.99	|Q |	|	| | V

19+ 0	1.9965	0.98	|Q	|	|	|	V
19+ 5	2.0031	0.96	|Q	|	|	|	V
19+10	2.0097	0.95	|Q	|	|	|	V
19+15	2.0161	0.94	|Q	|	|	|	V
19+20	2.0225	0.93	|Q	|	|	|	V
19+25	2.0288	0.92	|Q	|	|	|	V
19+30	2.0351	0.91	|Q	|	|	|	V
19+35	2.0413	0.90	|Q	|	|	|	V
19+40	2.0474	0.89	|Q	|	|	|	V
19+45	2.0534	0.88	|Q	|	|	|	V
19+50	2.0594	0.87	|Q	|	|	|	V
19+55	2.0653	0.86	|Q	|	|	|	V
20+ 0	2.0711	0.85	|Q	|	|	|	V
20+ 5	2.0769	0.84	|Q	|	|	|	V
20+10	2.0827	0.83	|Q	|	|	|	V
20+15	2.0883	0.83	|Q	|	|	|	V
20+20	2.0940	0.82	|Q	|	|	|	V
20+25	2.0996	0.81	|Q	|	|	|	V
20+30	2.1051	0.80	|Q	|	|	|	V
20+35	2.1106	0.80	|Q	|	|	|	V
20+40	2.1160	0.79	|Q	|	|	|	V
20+45	2.1214	0.78	|Q	|	|	|	V
20+50	2.1267	0.78	|Q	|	|	|	V
20+55	2.1320	0.77	|Q	|	|	|	V
21+ 0	2.1373	0.76	|Q	|	|	|	V
21+ 5	2.1425	0.76	|Q	|	|	|	V
21+10	2.1477	0.75	|Q	|	|	|	V
21+15	2.1528	0.75	Q	|	|	|	V
21+20	2.1579	0.74	Q	|	|	|	V
21+25	2.1630	0.74	Q	|	|	|	V

21+30	2.1680	0.73	Q	|	|	|	V |
21+35	2.1730	0.72	Q	|	|	|	V |
21+40	2.1780	0.72	Q	|	|	|	V |
21+45	2.1829	0.71	Q	|	|	|	V |
21+50	2.1878	0.71	Q	|	|	|	V |
21+55	2.1926	0.71	Q	|	|	|	V |
22+ 0	2.1974	0.70	Q	|	|	|	V |
22+ 5	2.2022	0.70	Q	|	|	|	V |
22+10	2.2070	0.69	Q	|	|	|	V |
22+15	2.2117	0.69	Q	|	|	|	V |
22+20	2.2164	0.68	Q	|	|	|	V |
22+25	2.2211	0.68	Q	|	|	|	V |
22+30	2.2258	0.67	Q	|	|	|	V |
22+35	2.2304	0.67	Q	|	|	|	V |
22+40	2.2350	0.67	Q	|	|	|	V |
22+45	2.2395	0.66	Q	|	|	|	V |
22+50	2.2441	0.66	Q	|	|	|	V |
22+55	2.2486	0.66	Q	|	|	|	V |
23+ 0	2.2531	0.65	Q	|	|	|	V |
23+ 5	2.2575	0.65	Q	|	|	|	V |
23+10	2.2620	0.64	Q	|	|	|	V|
23+15	2.2664	0.64	Q	|	|	|	V|
23+20	2.2708	0.64	Q	|	|	|	V|
23+25	2.2752	0.63	Q	|	|	|	V|
23+30	2.2795	0.63	Q	|	|	|	V|
23+35	2.2838	0.63	Q	|	|	|	V|
23+40	2.2881	0.62	Q	|	|	|	V|
23+45	2.2924	0.62	Q	|	|	|	V|
23+50	2.2967	0.62	Q	|	|	|	V|
23+55	2.3009	0.62	Q	|	|	|	V|

24+ 0	2.3051	0.61	Q	|	|	| V|
24+ 5	2.3091	0.58	Q	|	|	| V|
24+10	2.3118	0.38	Q	|	|	| V|
24+15	2.3132	0.21	Q	|	|	| V|
24+20	2.3142	0.14	Q	|	|	| V|
24+25	2.3149	0.10	Q	|	|	| V|
24+30	2.3153	0.07	Q	|	|	| V|
24+35	2.3157	0.05	Q	|	|	| V|
24+40	2.3159	0.03	Q	|	|	| V|
24+45	2.3160	0.02	Q	|	|	| V|
24+50	2.3162	0.02	Q	|	|	| V|
24+55	2.3162	0.01	Q	|	|	| V|
25+ 0	2.3163	0.01	Q	|	|	| V|
25+ 5	2.3163	0.00	Q	|	|	| V|
25+10	2.3163	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 10/25/21

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

Program License Serial Number 6232

Vista Verde
SCS Hydrograph
Devloped Condition
Area / Basin C

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		
6.30	1	1.15
Rainfall data for year 100		
6.30	6	2.51
Rainfall data for year 100		
6.30	24	5.41

++

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


      SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap
Fm
      No.(AMCII) NO.(AMC 3)    (Ac.)    Fraction     (In/Hr)  (dec.)
(In/Hr)
       32.0      52.0          6.30      1.000     0.785    0.600
0.471

      Area-averaged adjusted loss rate Fm (In/Hr) =  0.471

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

      Area       Area          SCS CN    SCS CN      S     Pervious
       (Ac.)      Fract         (AMC2)    (AMC3)           Yield Fr
           3.78   0.600         32.0      52.0       9.23     0.183
           2.52   0.400         98.0      98.0       0.20     0.956

      Area-averaged catchment yield fraction, Y =  0.493
      Area-averaged low loss fraction, Yb =  0.507
      User entry of time of concentration  =   0.270 (hours)
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++
      Watershed area =       6.30(Ac.)
      Catchment Lag time =   0.216 hours
      Unit interval =   5.000 minutes
      Unit interval percentage of lag time = 38.5802
      Hydrograph baseflow =     0.00(CFS)
      Average maximum watershed loss rate(Fm) =  0.471(In/Hr)
      Average low loss rate fraction (Yb) = 0.507 (decimal)
      DESERT S-Graph Selected
      Computed peak 5-minute rainfall =  0.546(In)
      Computed peak 30-minute rainfall =  0.934(In)
      Specified peak 1-hour rainfall =  1.150(In)
      Computed peak 3-hour rainfall =  1.856(In)
      Specified peak 6-hour rainfall =  2.510(In)
      Specified peak 24-hour rainfall =  5.410(In)


      Rainfall depth area reduction factors:
      Using a total area of       6.30(Ac.) (Ref: fig. E-4)

      5-minute factor = 1.000     Adjusted rainfall =  0.546(In)
      30-minute factor = 1.000    Adjusted rainfall =  0.934(In)
      1-hour factor = 1.000       Adjusted rainfall =  1.150(In)
      3-hour factor = 1.000       Adjusted rainfall =  1.856(In)
      6-hour factor = 1.000       Adjusted rainfall =  2.510(In)
      24-hour factor = 1.000      Adjusted rainfall =  5.410(In)
      ----------------------------------------------------------------
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                      U n i t  H y d r o g r a p h
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++
      Interval          'S' Graph          Unit Hydrograph
      Number            Mean values             ((CFS))
      ----------------------------------------------------------------
---
                 (K =        76.19 (CFS))
```

1	2.595	1.977
2	17.110	11.059
3	47.025	22.792
4	64.168	13.061
5	73.585	7.175
6	79.873	4.791
7	84.321	3.389
8	87.824	2.669
9	90.350	1.925
10	92.386	1.551
11	94.047	1.266
12	95.367	1.006
13	96.438	0.816
14	97.275	0.637
15	97.884	0.464
16	98.288	0.308
17	98.739	0.344
18	99.202	0.353
19	99.584	0.291
20	99.827	0.185
21	100.000	0.132

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.5455	0.5455
2	0.6716	0.1261
3	0.7585	0.0869
4	0.8269	0.0684
5	0.8841	0.0572
6	0.9338	0.0497
7	0.9780	0.0442
8	1.0180	0.0400
9	1.0546	0.0366
10	1.0885	0.0339
11	1.1200	0.0316
12	1.1497	0.0296
13	1.1905	0.0408
14	1.2296	0.0391
15	1.2671	0.0375
16	1.3032	0.0361
17	1.3381	0.0349
18	1.3719	0.0338
19	1.4046	0.0327
20	1.4364	0.0318
21	1.4672	0.0309
22	1.4973	0.0301
23	1.5266	0.0293
24	1.5552	0.0286
25	1.5831	0.0279
26	1.6104	0.0273
27	1.6371	0.0267
28	1.6632	0.0262
29	1.6889	0.0256
30	1.7140	0.0251
31	1.7387	0.0247
32	1.7629	0.0242
33	1.7867	0.0238
34	1.8101	0.0234

35	1.8331	0.0230
36	1.8558	0.0226
37	1.8781	0.0223
38	1.9000	0.0219
39	1.9216	0.0216
40	1.9429	0.0213
41	1.9639	0.0210
42	1.9847	0.0207
43	2.0051	0.0204
44	2.0253	0.0202
45	2.0452	0.0199
46	2.0649	0.0197
47	2.0843	0.0194
48	2.1035	0.0192
49	2.1225	0.0190
50	2.1413	0.0188
51	2.1598	0.0186
52	2.1782	0.0183
53	2.1963	0.0182
54	2.2143	0.0180
55	2.2321	0.0178
56	2.2497	0.0176
57	2.2671	0.0174
58	2.2843	0.0172
59	2.3014	0.0171
60	2.3183	0.0169
61	2.3351	0.0168
62	2.3517	0.0166
63	2.3681	0.0164
64	2.3844	0.0163
65	2.4006	0.0162
66	2.4166	0.0160
67	2.4325	0.0159
68	2.4482	0.0158
69	2.4638	0.0156
70	2.4793	0.0155
71	2.4947	0.0154
72	2.5100	0.0152
73	2.5292	0.0193
74	2.5483	0.0191
75	2.5674	0.0190
76	2.5863	0.0189
77	2.6051	0.0188
78	2.6238	0.0187
79	2.6423	0.0186
80	2.6608	0.0185
81	2.6792	0.0184
82	2.6975	0.0183
83	2.7156	0.0182
84	2.7337	0.0181
85	2.7517	0.0180
86	2.7696	0.0179
87	2.7874	0.0178
88	2.8051	0.0177
89	2.8227	0.0176
90	2.8402	0.0175
91	2.8577	0.0174
92	2.8750	0.0174
93	2.8923	0.0173
94	2.9095	0.0172

95	2.9266	0.0171
96	2.9436	0.0170
97	2.9605	0.0169
98	2.9774	0.0169
99	2.9942	0.0168
100	3.0109	0.0167
101	3.0276	0.0166
102	3.0441	0.0166
103	3.0606	0.0165
104	3.0771	0.0164
105	3.0934	0.0164
106	3.1097	0.0163
107	3.1259	0.0162
108	3.1421	0.0162
109	3.1582	0.0161
110	3.1742	0.0160
111	3.1901	0.0160
112	3.2060	0.0159
113	3.2218	0.0158
114	3.2376	0.0158
115	3.2533	0.0157
116	3.2690	0.0156
117	3.2845	0.0156
118	3.3001	0.0155
119	3.3155	0.0155
120	3.3309	0.0154
121	3.3463	0.0153
122	3.3616	0.0153
123	3.3768	0.0152
124	3.3920	0.0152
125	3.4071	0.0151
126	3.4222	0.0151
127	3.4372	0.0150
128	3.4522	0.0150
129	3.4671	0.0149
130	3.4819	0.0149
131	3.4968	0.0148
132	3.5115	0.0148
133	3.5262	0.0147
134	3.5409	0.0147
135	3.5555	0.0146
136	3.5701	0.0146
137	3.5846	0.0145
138	3.5991	0.0145
139	3.6135	0.0144
140	3.6279	0.0144
141	3.6422	0.0143
142	3.6565	0.0143
143	3.6707	0.0142
144	3.6849	0.0142
145	3.6991	0.0142
146	3.7132	0.0141
147	3.7273	0.0141
148	3.7413	0.0140
149	3.7553	0.0140
150	3.7692	0.0139
151	3.7831	0.0139
152	3.7970	0.0139
153	3.8108	0.0138
154	3.8246	0.0138

155	3.8383	0.0137
156	3.8520	0.0137
157	3.8657	0.0137
158	3.8793	0.0136
159	3.8929	0.0136
160	3.9064	0.0135
161	3.9199	0.0135
162	3.9334	0.0135
163	3.9468	0.0134
164	3.9602	0.0134
165	3.9736	0.0134
166	3.9869	0.0133
167	4.0002	0.0133
168	4.0134	0.0133
169	4.0267	0.0132
170	4.0398	0.0132
171	4.0530	0.0131
172	4.0661	0.0131
173	4.0792	0.0131
174	4.0922	0.0130
175	4.1052	0.0130
176	4.1182	0.0130
177	4.1312	0.0129
178	4.1441	0.0129
179	4.1570	0.0129
180	4.1698	0.0128
181	4.1826	0.0128
182	4.1954	0.0128
183	4.2082	0.0128
184	4.2209	0.0127
185	4.2336	0.0127
186	4.2462	0.0127
187	4.2589	0.0126
188	4.2715	0.0126
189	4.2840	0.0126
190	4.2966	0.0125
191	4.3091	0.0125
192	4.3216	0.0125
193	4.3340	0.0125
194	4.3465	0.0124
195	4.3589	0.0124
196	4.3712	0.0124
197	4.3836	0.0123
198	4.3959	0.0123
199	4.4082	0.0123
200	4.4204	0.0123
201	4.4327	0.0122
202	4.4449	0.0122
203	4.4570	0.0122
204	4.4692	0.0121
205	4.4813	0.0121
206	4.4934	0.0121
207	4.5055	0.0121
208	4.5175	0.0120
209	4.5295	0.0120
210	4.5415	0.0120
211	4.5535	0.0120
212	4.5654	0.0119
213	4.5774	0.0119
214	4.5893	0.0119

215	4.6011	0.0119
216	4.6130	0.0118
217	4.6248	0.0118
218	4.6366	0.0118
219	4.6484	0.0118
220	4.6601	0.0117
221	4.6718	0.0117
222	4.6835	0.0117
223	4.6952	0.0117
224	4.7068	0.0117
225	4.7185	0.0116
226	4.7301	0.0116
227	4.7417	0.0116
228	4.7532	0.0116
229	4.7648	0.0115
230	4.7763	0.0115
231	4.7878	0.0115
232	4.7992	0.0115
233	4.8107	0.0114
234	4.8221	0.0114
235	4.8335	0.0114
236	4.8449	0.0114
237	4.8563	0.0114
238	4.8676	0.0113
239	4.8789	0.0113
240	4.8902	0.0113
241	4.9015	0.0113
242	4.9128	0.0113
243	4.9240	0.0112
244	4.9352	0.0112
245	4.9464	0.0112
246	4.9576	0.0112
247	4.9687	0.0112
248	4.9799	0.0111
249	4.9910	0.0111
250	5.0021	0.0111
251	5.0132	0.0111
252	5.0242	0.0111
253	5.0352	0.0110
254	5.0463	0.0110
255	5.0573	0.0110
256	5.0682	0.0110
257	5.0792	0.0110
258	5.0901	0.0109
259	5.1010	0.0109
260	5.1119	0.0109
261	5.1228	0.0109
262	5.1337	0.0109
263	5.1445	0.0108
264	5.1554	0.0108
265	5.1662	0.0108
266	5.1770	0.0108
267	5.1877	0.0108
268	5.1985	0.0108
269	5.2092	0.0107
270	5.2200	0.0107
271	5.2307	0.0107
272	5.2413	0.0107
273	5.2520	0.0107
274	5.2627	0.0106

275	5.2733	0.0106
276	5.2839	0.0106
277	5.2945	0.0106
278	5.3051	0.0106
279	5.3156	0.0106
280	5.3262	0.0105
281	5.3367	0.0105
282	5.3472	0.0105
283	5.3577	0.0105
284	5.3682	0.0105
285	5.3787	0.0105
286	5.3891	0.0104
287	5.3995	0.0104
288	5.4100	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0053	0.0051
2	0.0104	0.0053	0.0051
3	0.0105	0.0053	0.0052
4	0.0105	0.0053	0.0052
5	0.0105	0.0053	0.0052
6	0.0105	0.0053	0.0052
7	0.0106	0.0054	0.0052
8	0.0106	0.0054	0.0052
9	0.0106	0.0054	0.0052
10	0.0106	0.0054	0.0052
11	0.0107	0.0054	0.0053
12	0.0107	0.0054	0.0053
13	0.0107	0.0054	0.0053
14	0.0107	0.0054	0.0053
15	0.0108	0.0055	0.0053
16	0.0108	0.0055	0.0053
17	0.0108	0.0055	0.0053
18	0.0108	0.0055	0.0053
19	0.0109	0.0055	0.0054
20	0.0109	0.0055	0.0054
21	0.0109	0.0056	0.0054
22	0.0110	0.0056	0.0054
23	0.0110	0.0056	0.0054
24	0.0110	0.0056	0.0054
25	0.0111	0.0056	0.0054
26	0.0111	0.0056	0.0055
27	0.0111	0.0056	0.0055
28	0.0111	0.0057	0.0055
29	0.0112	0.0057	0.0055
30	0.0112	0.0057	0.0055
31	0.0112	0.0057	0.0055
32	0.0113	0.0057	0.0055
33	0.0113	0.0057	0.0056
34	0.0113	0.0057	0.0056
35	0.0114	0.0058	0.0056
36	0.0114	0.0058	0.0056
37	0.0114	0.0058	0.0056
38	0.0114	0.0058	0.0056
39	0.0115	0.0058	0.0057

40	0.0115	0.0058	0.0057
41	0.0116	0.0059	0.0057
42	0.0116	0.0059	0.0057
43	0.0116	0.0059	0.0057
44	0.0117	0.0059	0.0057
45	0.0117	0.0059	0.0058
46	0.0117	0.0059	0.0058
47	0.0118	0.0060	0.0058
48	0.0118	0.0060	0.0058
49	0.0118	0.0060	0.0058
50	0.0119	0.0060	0.0058
51	0.0119	0.0060	0.0059
52	0.0119	0.0061	0.0059
53	0.0120	0.0061	0.0059
54	0.0120	0.0061	0.0059
55	0.0121	0.0061	0.0059
56	0.0121	0.0061	0.0060
57	0.0121	0.0062	0.0060
58	0.0122	0.0062	0.0060
59	0.0122	0.0062	0.0060
60	0.0123	0.0062	0.0060
61	0.0123	0.0062	0.0061
62	0.0123	0.0063	0.0061
63	0.0124	0.0063	0.0061
64	0.0124	0.0063	0.0061
65	0.0125	0.0063	0.0061
66	0.0125	0.0063	0.0062
67	0.0126	0.0064	0.0062
68	0.0126	0.0064	0.0062
69	0.0127	0.0064	0.0062
70	0.0127	0.0064	0.0063
71	0.0128	0.0065	0.0063
72	0.0128	0.0065	0.0063
73	0.0128	0.0065	0.0063
74	0.0129	0.0065	0.0063
75	0.0129	0.0066	0.0064
76	0.0130	0.0066	0.0064
77	0.0130	0.0066	0.0064
78	0.0131	0.0066	0.0064
79	0.0131	0.0067	0.0065
80	0.0132	0.0067	0.0065
81	0.0133	0.0067	0.0065
82	0.0133	0.0067	0.0065
83	0.0134	0.0068	0.0066
84	0.0134	0.0068	0.0066
85	0.0135	0.0068	0.0066
86	0.0135	0.0069	0.0067
87	0.0136	0.0069	0.0067
88	0.0136	0.0069	0.0067
89	0.0137	0.0070	0.0067
90	0.0137	0.0070	0.0068
91	0.0138	0.0070	0.0068
92	0.0139	0.0070	0.0068
93	0.0139	0.0071	0.0069
94	0.0140	0.0071	0.0069
95	0.0141	0.0071	0.0069
96	0.0141	0.0072	0.0070
97	0.0142	0.0072	0.0070
98	0.0142	0.0072	0.0070
99	0.0143	0.0073	0.0071

100	0.0144	0.0073	0.0071
101	0.0145	0.0073	0.0071
102	0.0145	0.0074	0.0072
103	0.0146	0.0074	0.0072
104	0.0147	0.0074	0.0072
105	0.0148	0.0075	0.0073
106	0.0148	0.0075	0.0073
107	0.0149	0.0076	0.0073
108	0.0150	0.0076	0.0074
109	0.0151	0.0076	0.0074
110	0.0151	0.0077	0.0075
111	0.0152	0.0077	0.0075
112	0.0153	0.0078	0.0075
113	0.0154	0.0078	0.0076
114	0.0155	0.0078	0.0076
115	0.0156	0.0079	0.0077
116	0.0156	0.0079	0.0077
117	0.0158	0.0080	0.0078
118	0.0158	0.0080	0.0078
119	0.0160	0.0081	0.0079
120	0.0160	0.0081	0.0079
121	0.0162	0.0082	0.0080
122	0.0162	0.0082	0.0080
123	0.0164	0.0083	0.0081
124	0.0164	0.0083	0.0081
125	0.0166	0.0084	0.0082
126	0.0166	0.0084	0.0082
127	0.0168	0.0085	0.0083
128	0.0169	0.0086	0.0083
129	0.0170	0.0086	0.0084
130	0.0171	0.0087	0.0084
131	0.0173	0.0088	0.0085
132	0.0174	0.0088	0.0085
133	0.0175	0.0089	0.0086
134	0.0176	0.0089	0.0087
135	0.0178	0.0090	0.0088
136	0.0179	0.0091	0.0088
137	0.0181	0.0092	0.0089
138	0.0182	0.0092	0.0090
139	0.0184	0.0093	0.0091
140	0.0185	0.0094	0.0091
141	0.0187	0.0095	0.0092
142	0.0188	0.0095	0.0093
143	0.0190	0.0097	0.0094
144	0.0191	0.0097	0.0094
145	0.0152	0.0077	0.0075
146	0.0154	0.0078	0.0076
147	0.0156	0.0079	0.0077
148	0.0158	0.0080	0.0078
149	0.0160	0.0081	0.0079
150	0.0162	0.0082	0.0080
151	0.0164	0.0083	0.0081
152	0.0166	0.0084	0.0082
153	0.0169	0.0086	0.0083
154	0.0171	0.0087	0.0084
155	0.0174	0.0088	0.0086
156	0.0176	0.0089	0.0087
157	0.0180	0.0091	0.0088
158	0.0182	0.0092	0.0089
159	0.0186	0.0094	0.0091

160	0.0188	0.0095	0.0092
161	0.0192	0.0097	0.0095
162	0.0194	0.0099	0.0096
163	0.0199	0.0101	0.0098
164	0.0202	0.0102	0.0099
165	0.0207	0.0105	0.0102
166	0.0210	0.0107	0.0103
167	0.0216	0.0110	0.0106
168	0.0219	0.0111	0.0108
169	0.0226	0.0115	0.0112
170	0.0230	0.0117	0.0113
171	0.0238	0.0121	0.0117
172	0.0242	0.0123	0.0119
173	0.0251	0.0128	0.0124
174	0.0256	0.0130	0.0126
175	0.0267	0.0136	0.0132
176	0.0273	0.0139	0.0134
177	0.0286	0.0145	0.0141
178	0.0293	0.0149	0.0144
179	0.0309	0.0157	0.0152
180	0.0318	0.0161	0.0156
181	0.0338	0.0171	0.0166
182	0.0349	0.0177	0.0172
183	0.0375	0.0190	0.0185
184	0.0391	0.0198	0.0192
185	0.0296	0.0150	0.0146
186	0.0316	0.0160	0.0156
187	0.0366	0.0186	0.0180
188	0.0400	0.0203	0.0197
189	0.0497	0.0252	0.0245
190	0.0572	0.0291	0.0282
191	0.0869	0.0393	0.0476
192	0.1261	0.0393	0.0868
193	0.5455	0.0393	0.5063
194	0.0684	0.0347	0.0337
195	0.0442	0.0224	0.0218
196	0.0339	0.0172	0.0167
197	0.0408	0.0207	0.0201
198	0.0361	0.0183	0.0178
199	0.0327	0.0166	0.0161
200	0.0301	0.0153	0.0148
201	0.0279	0.0142	0.0138
202	0.0262	0.0133	0.0129
203	0.0247	0.0125	0.0122
204	0.0234	0.0119	0.0115
205	0.0223	0.0113	0.0110
206	0.0213	0.0108	0.0105
207	0.0204	0.0104	0.0101
208	0.0197	0.0100	0.0097
209	0.0190	0.0096	0.0093
210	0.0183	0.0093	0.0090
211	0.0178	0.0090	0.0088
212	0.0172	0.0087	0.0085
213	0.0168	0.0085	0.0083
214	0.0163	0.0083	0.0080
215	0.0159	0.0081	0.0078
216	0.0155	0.0079	0.0076
217	0.0193	0.0098	0.0095
218	0.0189	0.0096	0.0093
219	0.0186	0.0094	0.0092

220	0.0183	0.0093	0.0090
221	0.0180	0.0091	0.0089
222	0.0177	0.0090	0.0087
223	0.0174	0.0088	0.0086
224	0.0172	0.0087	0.0085
225	0.0169	0.0086	0.0083
226	0.0167	0.0085	0.0082
227	0.0165	0.0084	0.0081
228	0.0163	0.0083	0.0080
229	0.0161	0.0082	0.0079
230	0.0159	0.0081	0.0078
231	0.0157	0.0080	0.0077
232	0.0155	0.0079	0.0076
233	0.0153	0.0078	0.0076
234	0.0152	0.0077	0.0075
235	0.0150	0.0076	0.0074
236	0.0149	0.0075	0.0073
237	0.0147	0.0075	0.0072
238	0.0146	0.0074	0.0072
239	0.0144	0.0073	0.0071
240	0.0143	0.0073	0.0070
241	0.0142	0.0072	0.0070
242	0.0140	0.0071	0.0069
243	0.0139	0.0071	0.0068
244	0.0138	0.0070	0.0068
245	0.0137	0.0069	0.0067
246	0.0135	0.0069	0.0067
247	0.0134	0.0068	0.0066
248	0.0133	0.0068	0.0066
249	0.0132	0.0067	0.0065
250	0.0131	0.0067	0.0065
251	0.0130	0.0066	0.0064
252	0.0129	0.0066	0.0064
253	0.0128	0.0065	0.0063
254	0.0127	0.0065	0.0063
255	0.0126	0.0064	0.0062
256	0.0125	0.0064	0.0062
257	0.0125	0.0063	0.0061
258	0.0124	0.0063	0.0061
259	0.0123	0.0062	0.0061
260	0.0122	0.0062	0.0060
261	0.0121	0.0062	0.0060
262	0.0120	0.0061	0.0059
263	0.0120	0.0061	0.0059
264	0.0119	0.0060	0.0059
265	0.0118	0.0060	0.0058
266	0.0117	0.0060	0.0058
267	0.0117	0.0059	0.0058
268	0.0116	0.0059	0.0057
269	0.0115	0.0059	0.0057
270	0.0115	0.0058	0.0056
271	0.0114	0.0058	0.0056
272	0.0113	0.0058	0.0056
273	0.0113	0.0057	0.0056
274	0.0112	0.0057	0.0055
275	0.0112	0.0057	0.0055
276	0.0111	0.0056	0.0055
277	0.0110	0.0056	0.0054
278	0.0110	0.0056	0.0054
279	0.0109	0.0055	0.0054

280	0.0109	0.0055	0.0054
281	0.0108	0.0055	0.0053
282	0.0108	0.0055	0.0053
283	0.0107	0.0054	0.0053
284	0.0106	0.0054	0.0052
285	0.0106	0.0054	0.0052
286	0.0105	0.0054	0.0052
287	0.0105	0.0053	0.0052
288	0.0104	0.0053	0.0051

Total soil rain loss = 2.48(In)
Total effective rainfall = 2.93(In)
Peak flow rate in flood hydrograph = 13.85(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	0.0001	0.01	Q
0+10	0.0005	0.07	Q
0+15	0.0018	0.18	Q
0+20	0.0035	0.25	Q
0+25	0.0055	0.29	Q
0+30	0.0077	0.31	Q
0+35	0.0100	0.33	Q
0+40	0.0124	0.35	Q
0+45	0.0148	0.36	Q
0+50	0.0173	0.37	Q
0+55	0.0199	0.37	Q
1+ 0	0.0225	0.38	Q
1+ 5	0.0252	0.38	Q
1+10	0.0278	0.39	Q

1+15	0.0305	0.39	Q			
1+20	0.0333	0.39	Q			
1+25	0.0360	0.40	Q			
1+30	0.0388	0.40	QV			
1+35	0.0415	0.40	QV			
1+40	0.0443	0.40	QV			
1+45	0.0471	0.41	QV			
1+50	0.0499	0.41	QV			
1+55	0.0527	0.41	QV			
2+ 0	0.0556	0.41	QV			
2+ 5	0.0584	0.41	QV			
2+10	0.0612	0.41	QV			
2+15	0.0641	0.41	QV			
2+20	0.0669	0.41	QV			
2+25	0.0698	0.41	QV			
2+30	0.0726	0.42	QV			
2+35	0.0755	0.42	QV			
2+40	0.0784	0.42	Q V			
2+45	0.0813	0.42	Q V			
2+50	0.0842	0.42	Q V			
2+55	0.0871	0.42	Q V			
3+ 0	0.0900	0.42	Q V			
3+ 5	0.0929	0.42	Q V			
3+10	0.0958	0.43	Q V			
3+15	0.0988	0.43	Q V			
3+20	0.1017	0.43	Q V			
3+25	0.1047	0.43	Q V			
3+30	0.1076	0.43	Q V			
3+35	0.1106	0.43	Q V			
3+40	0.1136	0.43	Q V			

3+45	0.1166	0.43	Q	V				
3+50	0.1196	0.44	Q	V				
3+55	0.1226	0.44	Q	V				
4+ 0	0.1256	0.44	Q	V				
4+ 5	0.1286	0.44	Q	V				
4+10	0.1316	0.44	Q	V				
4+15	0.1347	0.44	Q	V				
4+20	0.1377	0.44	Q	V				
4+25	0.1408	0.44	Q	V				
4+30	0.1439	0.45	Q	V				
4+35	0.1470	0.45	Q	V				
4+40	0.1500	0.45	Q	V				
4+45	0.1531	0.45	Q	V				
4+50	0.1563	0.45	Q	V				
4+55	0.1594	0.45	Q	V				
5+ 0	0.1625	0.45	Q	V				
5+ 5	0.1656	0.46	Q	V				
5+10	0.1688	0.46	Q	V				
5+15	0.1720	0.46	Q	V				
5+20	0.1751	0.46	Q	V				
5+25	0.1783	0.46	Q	V				
5+30	0.1815	0.46	Q	V				
5+35	0.1847	0.47	Q	V				
5+40	0.1879	0.47	Q	V				
5+45	0.1912	0.47	Q	V				
5+50	0.1944	0.47	Q	V				
5+55	0.1976	0.47	Q	V				
6+ 0	0.2009	0.47	Q	V				
6+ 5	0.2042	0.48	Q	V				
6+10	0.2075	0.48	Q	V				

6+15	0.2108	0.48	Q	V			
6+20	0.2141	0.48	Q	V			
6+25	0.2174	0.48	Q	V			
6+30	0.2207	0.48	Q	V			
6+35	0.2241	0.49	Q	V			
6+40	0.2274	0.49	Q	V			
6+45	0.2308	0.49	Q	V			
6+50	0.2342	0.49	Q	V			
6+55	0.2376	0.49	Q	V			
7+ 0	0.2410	0.50	Q	V			
7+ 5	0.2444	0.50	Q	V			
7+10	0.2479	0.50	Q	V			
7+15	0.2513	0.50	|Q	V			
7+20	0.2548	0.50	|Q	V			
7+25	0.2583	0.51	|Q	V			
7+30	0.2618	0.51	|Q	V			
7+35	0.2653	0.51	|Q	V			
7+40	0.2688	0.51	|Q	V			
7+45	0.2723	0.51	|Q	V			
7+50	0.2759	0.52	|Q	V			
7+55	0.2795	0.52	|Q	V			
8+ 0	0.2831	0.52	|Q	V			
8+ 5	0.2867	0.52	|Q	V			
8+10	0.2903	0.53	|Q	V			
8+15	0.2939	0.53	|Q	V			
8+20	0.2976	0.53	|Q	V			
8+25	0.3012	0.53	|Q	V			
8+30	0.3049	0.54	|Q	V			
8+35	0.3086	0.54	|Q	V			
8+40	0.3124	0.54	|Q	V			

8+45	0.3161	0.54	|Q	V |	|	|
8+50	0.3199	0.55	|Q	V |	|	|
8+55	0.3236	0.55	|Q	V |	|	|
9+ 0	0.3274	0.55	|Q	V |	|	|
9+ 5	0.3313	0.55	|Q	V |	|	|
9+10	0.3351	0.56	|Q	V |	|	|
9+15	0.3389	0.56	|Q	V |	|	|
9+20	0.3428	0.56	|Q	V |	|	|
9+25	0.3467	0.57	|Q	V|	|	|
9+30	0.3506	0.57	|Q	V|	|	|
9+35	0.3546	0.57	|Q	V|	|	|
9+40	0.3585	0.58	|Q	V|	|	|
9+45	0.3625	0.58	|Q	V|	|	|
9+50	0.3665	0.58	|Q	V|	|	|
9+55	0.3706	0.59	|Q	V|	|	|
10+ 0	0.3746	0.59	|Q	V|	|	|
10+ 5	0.3787	0.59	|Q	V|	|	|
10+10	0.3828	0.60	|Q	V|	|	|
10+15	0.3869	0.60	|Q	V	|	|
10+20	0.3911	0.60	|Q	V	|	|
10+25	0.3952	0.61	|Q	V	|	|
10+30	0.3994	0.61	|Q	V	|	|
10+35	0.4037	0.61	|Q	V	|	|
10+40	0.4079	0.62	|Q	V	|	|
10+45	0.4122	0.62	|Q	V	|	|
10+50	0.4165	0.63	|Q	V	|	|
10+55	0.4209	0.63	|Q	V	|	|
11+ 0	0.4252	0.63	|Q	|V	|	|
11+ 5	0.4297	0.64	|Q	|V	|	|
11+10	0.4341	0.64	|Q	|V	|	|

11+15	0.4386	0.65	Q	V		
11+20	0.4431	0.65	Q	V		
11+25	0.4476	0.66	Q	V		
11+30	0.4522	0.66	Q	V		
11+35	0.4568	0.67	Q	V		
11+40	0.4614	0.67	Q	V		
11+45	0.4661	0.68	Q	V		
11+50	0.4708	0.68	Q	V		
11+55	0.4755	0.69	Q	V		
12+ 0	0.4803	0.70	Q	V		
12+ 5	0.4851	0.70	Q	V		
12+10	0.4898	0.68	Q	V		
12+15	0.4943	0.64	Q	V		
12+20	0.4985	0.62	Q	V		
12+25	0.5028	0.61	Q	V		
12+30	0.5070	0.61	Q	V		
12+35	0.5112	0.61	Q	V		
12+40	0.5154	0.61	Q	V		
12+45	0.5197	0.62	Q	V		
12+50	0.5240	0.62	Q	V		
12+55	0.5283	0.63	Q	V		
13+ 0	0.5327	0.63	Q	V		
13+ 5	0.5371	0.64	Q	V		
13+10	0.5416	0.65	Q	V		
13+15	0.5461	0.66	Q	V		
13+20	0.5507	0.67	Q	V		
13+25	0.5554	0.68	Q	V		
13+30	0.5601	0.69	Q	V		
13+35	0.5649	0.70	Q	V		
13+40	0.5698	0.71	Q	V		

13+45	0.5748	0.72	Q	V		
13+50	0.5799	0.74	Q	V		
13+55	0.5851	0.75	Q	V		
14+ 0	0.5903	0.77	Q	V		
14+ 5	0.5957	0.78	Q	V		
14+10	0.6012	0.80	Q	V		
14+15	0.6068	0.82	Q	V		
14+20	0.6126	0.84	Q	V		
14+25	0.6185	0.86	Q	V		
14+30	0.6245	0.88	Q	V		
14+35	0.6307	0.90	Q	V		
14+40	0.6371	0.93	Q	V		
14+45	0.6437	0.95	Q	V		
14+50	0.6505	0.98	Q	V		
14+55	0.6575	1.02	Q	V		
15+ 0	0.6647	1.05	Q	V		
15+ 5	0.6722	1.09	Q	V		
15+10	0.6800	1.13	Q	V		
15+15	0.6881	1.18	Q	V		
15+20	0.6967	1.24	Q	V		
15+25	0.7055	1.29	Q	V		
15+30	0.7144	1.29	Q	V		
15+35	0.7229	1.23	Q	V		
15+40	0.7315	1.24	Q	V		
15+45	0.7406	1.32	Q	V		
15+50	0.7505	1.45	Q	V		
15+55	0.7621	1.67	Q	V		
16+ 0	0.7768	2.13	Q	V		
16+ 5	0.8039	3.94	Q	V		
16+10	0.8648	8.85		Q	V	

16+15	0.9603	13.85	|	|	| V Q	|
16+20	1.0210	8.83	|	| Q	| V	|
16+25	1.0597	5.62	|	|Q	| V	|
16+30	1.0887	4.20	| Q	|	| V	|
16+35	1.1122	3.42	| Q	|	| V	|
16+40	1.1324	2.93	| Q	|	| V	|
16+45	1.1492	2.44	| Q	|	| V	|
16+50	1.1640	2.15	| Q	|	| V	
16+55	1.1771	1.91	| Q	|	| V	
17+ 0	1.1888	1.69	| Q	|	| V	
17+ 5	1.1992	1.52	| Q	|	| V	
17+10	1.2086	1.36	| Q	|	| V	
17+15	1.2169	1.21	| Q	|	| V	
17+20	1.2244	1.09	| Q	|	| V	
17+25	1.2318	1.06	| Q	|	| V	
17+30	1.2388	1.02	| Q	|	| V	
17+35	1.2454	0.95	|Q	|	| V	
17+40	1.2513	0.86	|Q	|	| V	
17+45	1.2568	0.80	|Q	|	| V	
17+50	1.2617	0.71	|Q	|	| V	
17+55	1.2663	0.68	|Q	|	| V	
18+ 0	1.2709	0.66	|Q	|	| V	
18+ 5	1.2753	0.64	|Q	|	| V	
18+10	1.2798	0.65	|Q	|	| V	
18+15	1.2844	0.68	|Q	|	| V	
18+20	1.2891	0.69	|Q	|	| V	
18+25	1.2939	0.69	|Q	|	| V	
18+30	1.2986	0.68	|Q	|	| V	
18+35	1.3032	0.68	|Q	|	| V	
18+40	1.3078	0.67	|Q	|	| V	

18+45	1.3124	0.66	Q				V
18+50	1.3169	0.65	Q				V
18+55	1.3214	0.65	Q				V
19+ 0	1.3258	0.64	Q				V
19+ 5	1.3301	0.63	Q				V
19+10	1.3344	0.62	Q				V
19+15	1.3387	0.62	Q				V
19+20	1.3429	0.61	Q				V
19+25	1.3470	0.60	Q				V
19+30	1.3511	0.60	Q				V
19+35	1.3552	0.59	Q				V
19+40	1.3592	0.58	Q				V
19+45	1.3632	0.58	Q				V
19+50	1.3671	0.57	Q				V
19+55	1.3710	0.56	Q				V
20+ 0	1.3748	0.56	Q				V
20+ 5	1.3786	0.55	Q				V
20+10	1.3824	0.55	Q				V
20+15	1.3861	0.54	Q				V
20+20	1.3898	0.54	Q				V
20+25	1.3935	0.53	Q				V
20+30	1.3971	0.53	Q				V
20+35	1.4007	0.52	Q				V
20+40	1.4043	0.52	Q				V
20+45	1.4078	0.51	Q				V
20+50	1.4113	0.51	Q				V
20+55	1.4148	0.50	Q				V
21+ 0	1.4182	0.50	Q				V
21+ 5	1.4216	0.50	Q				V
21+10	1.4250	0.49	Q				V

21+15	1.4284	0.49	Q	|	|	|	V |
21+20	1.4317	0.48	Q	|	|	|	V |
21+25	1.4350	0.48	Q	|	|	|	V |
21+30	1.4383	0.48	Q	|	|	|	V |
21+35	1.4416	0.47	Q	|	|	|	V |
21+40	1.4448	0.47	Q	|	|	|	V |
21+45	1.4480	0.47	Q	|	|	|	V |
21+50	1.4512	0.46	Q	|	|	|	V |
21+55	1.4544	0.46	Q	|	|	|	V |
22+ 0	1.4576	0.46	Q	|	|	|	V |
22+ 5	1.4607	0.45	Q	|	|	|	V |
22+10	1.4638	0.45	Q	|	|	|	V |
22+15	1.4669	0.45	Q	|	|	|	V |
22+20	1.4700	0.45	Q	|	|	|	V |
22+25	1.4730	0.44	Q	|	|	|	V |
22+30	1.4761	0.44	Q	|	|	|	V |
22+35	1.4791	0.44	Q	|	|	|	V |
22+40	1.4821	0.44	Q	|	|	|	V |
22+45	1.4850	0.43	Q	|	|	|	V |
22+50	1.4880	0.43	Q	|	|	|	V |
22+55	1.4910	0.43	Q	|	|	|	V |
23+ 0	1.4939	0.43	Q	|	|	|	V |
23+ 5	1.4968	0.42	Q	|	|	|	V |
23+10	1.4997	0.42	Q	|	|	|	V |
23+15	1.5026	0.42	Q	|	|	|	V|
23+20	1.5055	0.42	Q	|	|	|	V|
23+25	1.5083	0.41	Q	|	|	|	V|
23+30	1.5111	0.41	Q	|	|	|	V|
23+35	1.5140	0.41	Q	|	|	|	V|
23+40	1.5168	0.41	Q	|	|	|	V|

23+45	1.5196	0.41	Q	|	|	|
23+50	1.5223	0.40	Q	|	|	|
23+55	1.5251	0.40	Q	|	|	|
24+ 0	1.5279	0.40	Q	|	|	|
24+ 5	1.5305	0.39	Q	|	|	|
24+10	1.5328	0.33	Q	|	|	|
24+15	1.5342	0.21	Q	|	|	|
24+20	1.5352	0.14	Q	|	|	|
24+25	1.5359	0.11	Q	|	|	|
24+30	1.5365	0.08	Q	|	|	|
24+35	1.5369	0.06	Q	|	|	|
24+40	1.5373	0.05	Q	|	|	|
24+45	1.5375	0.04	Q	|	|	|
24+50	1.5377	0.03	Q	|	|	|
24+55	1.5379	0.02	Q	|	|	|
25+ 0	1.5380	0.02	Q	|	|	|
25+ 5	1.5381	0.01	Q	|	|	|
25+10	1.5382	0.01	Q	|	|	|
25+15	1.5383	0.01	Q	|	|	|
25+20	1.5383	0.01	Q	|	|	|
25+25	1.5383	0.00	Q	|	|	|
25+30	1.5384	0.00	Q	|	|	|
25+35	1.5384	0.00	Q	|	|	|
25+40	1.5384	0.00	Q	|	|	|

APPENDIX A:
PROJECT PRE AND POST CONDITION EXHIBITS

BASIN ROUTING CALCULATIONS

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2012
Study date: 11/29/21

Vista Verde
Basin Routing
Proposed Condition
Area / Basin A

Program License Serial Number 6232

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

From study/file name: vistaverdeA.rte

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

Number of intervals = 310
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 33.220 (CFS)
Total volume = 3.931 (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 103.000 to Point/Station 104.000

**** RETARDING BASIN ROUTING ****

User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 310
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  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ------------------------------------------------------------------
---
          0.000      0.000      0.000      0.000        0.000
          2.000      0.540      0.680      0.538        0.542
          4.000      1.200      0.680      1.198        1.202
          6.000      2.010      0.680      2.008        2.012
          6.360      2.160     12.000      2.119        2.201
      ------------------------------------------------------------------
--
                  Hydrograph Detention Basin Routing
      ------------------------------------------------------------------
---

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ------------------------------------------------------------------
---
  Time   Inflow  Outflow    Storage
Depth
 (Hours)  (CFS)   (CFS)     (Ac.Ft) .0       8.3   16.61   24.92   33.22
(Ft.)
  0.083    0.02    0.00      0.000  O       |       |       |       |
0.00
  0.167    0.13    0.00      0.001  O       |       |       |       |
0.00
  0.250    0.41    0.00      0.002  O       |       |       |       |
0.01
  0.333    0.60    0.01      0.006  O       |       |       |       |
0.02
  0.417    0.70    0.01      0.010  O       |       |       |       |
0.04
  0.500    0.77    0.02      0.015  O       |       |       |       |
0.06
  0.583    0.82    0.03      0.021  O       |       |       |       |
0.08
  0.667    0.86    0.03      0.026  O       |       |       |       |
0.10
  0.750    0.89    0.04      0.032  O       |       |       |       |
0.12
  0.833    0.92    0.05      0.038  O       |       |       |       |
0.14
  0.917    0.94    0.06      0.044  O       |       |       |       |
0.16
  1.000    0.95    0.06      0.050  O       |       |       |       |
0.19
  1.083    0.97    0.07      0.056  O       |       |       |       |
0.21
  1.167    0.98    0.08      0.062  O       |       |       |       |
0.23
  1.250    0.99    0.09      0.069  O       |       |       |       |
```

0.25								
	1.333	1.00	0.09	0.075	O			
0.28								
	1.417	1.01	0.10	0.081	O			
0.30								
	1.500	1.01	0.11	0.087	O			
0.32								
	1.583	1.02	0.12	0.094	O			
0.35								
	1.667	1.03	0.13	0.100	O			
0.37								
	1.750	1.03	0.13	0.106	O			
0.39								
	1.833	1.04	0.14	0.112	O			
0.42								
	1.917	1.04	0.15	0.118	OI			
0.44								
	2.000	1.05	0.16	0.124	OI			
0.46								
	2.083	1.05	0.16	0.131	OI			
0.48								
	2.167	1.05	0.17	0.137	OI			
0.51								
	2.250	1.05	0.18	0.143	OI			
0.53								
	2.333	1.06	0.19	0.149	OI			
0.55								
	2.417	1.06	0.19	0.155	OI			
0.57								
	2.500	1.06	0.20	0.161	OI			
0.59								
	2.583	1.06	0.21	0.166	OI			
0.62								
	2.667	1.07	0.22	0.172	OI			
0.64								
	2.750	1.07	0.22	0.178	OI			
0.66								
	2.833	1.07	0.23	0.184	OI			
0.68								
	2.917	1.08	0.24	0.190	OI			
0.70								
	3.000	1.08	0.25	0.196	OI			
0.72								
	3.083	1.08	0.25	0.201	OI			
0.75								
	3.167	1.09	0.26	0.207	OI			
0.77								
	3.250	1.09	0.27	0.213	OI			
0.79								
	3.333	1.09	0.27	0.218	OI			
0.81								
	3.417	1.09	0.28	0.224	OI			
0.83								
	3.500	1.10	0.29	0.229	OI			
0.85								
	3.583	1.10	0.30	0.235	OI			
0.87								
	3.667	1.10	0.30	0.241	OI			
0.89								
	3.750	1.11	0.31	0.246	OI			

0.91								
3.833	1.11	0.32	0.252	OI				
0.93								
3.917	1.11	0.32	0.257	OI				
0.95								
4.000	1.12	0.33	0.262	OI				
0.97								
4.083	1.12	0.34	0.268	OI				
0.99								
4.167	1.12	0.34	0.273	OI				
1.01								
4.250	1.13	0.35	0.279	OI				
1.03								
4.333	1.13	0.36	0.284	OI				
1.05								
4.417	1.13	0.36	0.289	OI				
1.07								
4.500	1.14	0.37	0.295	OI				
1.09								
4.583	1.14	0.38	0.300	OI				
1.11								
4.667	1.15	0.38	0.305	OI				
1.13								
4.750	1.15	0.39	0.310	OI				
1.15								
4.833	1.15	0.40	0.315	OI				
1.17								
4.917	1.16	0.40	0.321	OI				
1.19								
5.000	1.16	0.41	0.326	OI				
1.21								
5.083	1.16	0.42	0.331	OI				
1.23								
5.167	1.17	0.42	0.336	OI				
1.24								
5.250	1.17	0.43	0.341	OI				
1.26								
5.333	1.18	0.44	0.346	OI				
1.28								
5.417	1.18	0.44	0.351	OI				
1.30								
5.500	1.18	0.45	0.357	OI				
1.32								
5.583	1.19	0.46	0.362	OI				
1.34								
5.667	1.19	0.46	0.367	OI				
1.36								
5.750	1.20	0.47	0.372	OI				
1.38								
5.833	1.20	0.47	0.377	OI				
1.39								
5.917	1.20	0.48	0.382	OI				
1.41								
6.000	1.21	0.49	0.387	OI				
1.43								
6.083	1.21	0.49	0.392	OI				
1.45								
6.167	1.22	0.50	0.396	OI				
1.47								
6.250	1.22	0.51	0.401	OI				

1.49								
6.333	1.23	0.51	0.406	OI				
1.51								
6.417	1.23	0.52	0.411	OI				
1.52								
6.500	1.24	0.52	0.416	OI				
1.54								
6.583	1.24	0.53	0.421	OI				
1.56								
6.667	1.24	0.54	0.426	OI				
1.58								
6.750	1.25	0.54	0.431	OI				
1.60								
6.833	1.25	0.55	0.436	OI				
1.61								
6.917	1.26	0.55	0.441	OI				
1.63								
7.000	1.26	0.56	0.445	OI				
1.65								
7.083	1.27	0.57	0.450	OI				
1.67								
7.167	1.27	0.57	0.455	OI				
1.69								
7.250	1.28	0.58	0.460	OI				
1.70								
7.333	1.28	0.59	0.465	OI				
1.72								
7.417	1.29	0.59	0.470	OI				
1.74								
7.500	1.30	0.60	0.474	OI				
1.76								
7.583	1.30	0.60	0.479	OI				
1.77								
7.667	1.31	0.61	0.484	OI				
1.79								
7.750	1.31	0.62	0.489	OI				
1.81								
7.833	1.32	0.62	0.494	OI				
1.83								
7.917	1.32	0.63	0.498	OI				
1.85								
8.000	1.33	0.63	0.503	OI				
1.86								
8.083	1.34	0.64	0.508	OI				
1.88								
8.167	1.34	0.65	0.513	OI				
1.90								
8.250	1.35	0.65	0.517	OI				
1.92								
8.333	1.35	0.66	0.522	OI				
1.93								
8.417	1.36	0.66	0.527	OI				
1.95								
8.500	1.37	0.67	0.532	OI				
1.97								
8.583	1.37	0.68	0.537	OI				
1.99								
8.667	1.38	0.68	0.541	OI				
2.00								
8.750	1.39	0.68	0.546	OI				

2.02								
8.833	1.39	0.68	0.551	OI				
2.03								
8.917	1.40	0.68	0.556	OI				
2.05								
9.000	1.41	0.68	0.561	OI				
2.06								
9.083	1.41	0.68	0.566	OI				
2.08								
9.167	1.42	0.68	0.571	OI				
2.09								
9.250	1.43	0.68	0.576	OI				
2.11								
9.333	1.44	0.68	0.582	OI				
2.13								
9.417	1.44	0.68	0.587	OI				
2.14								
9.500	1.45	0.68	0.592	OI				
2.16								
9.583	1.46	0.68	0.597	OI				
2.17								
9.667	1.47	0.68	0.603	OI				
2.19								
9.750	1.48	0.68	0.608	OI				
2.21								
9.833	1.48	0.68	0.614	OI				
2.22								
9.917	1.49	0.68	0.619	OI				
2.24								
10.000	1.50	0.68	0.625	OI				
2.26								
10.083	1.51	0.68	0.631	OI				
2.27								
10.167	1.52	0.68	0.636	OI				
2.29								
10.250	1.53	0.68	0.642	OI				
2.31								
10.333	1.54	0.68	0.648	OI				
2.33								
10.417	1.55	0.68	0.654	OI				
2.35								
10.500	1.56	0.68	0.660	OI				
2.36								
10.583	1.57	0.68	0.666	OI				
2.38								
10.667	1.58	0.68	0.672	OI				
2.40								
10.750	1.59	0.68	0.678	OI				
2.42								
10.833	1.60	0.68	0.685	OI				
2.44								
10.917	1.61	0.68	0.691	OI				
2.46								
11.000	1.62	0.68	0.697	OI				
2.48								
11.083	1.63	0.68	0.704	OI				
2.50								
11.167	1.64	0.68	0.710	OI				
2.52								
11.250	1.65	0.68	0.717	OI				

2.54								
11.333	1.66	0.68	0.724	OI				
2.56								
11.417	1.68	0.68	0.731	OI				
2.58								
11.500	1.69	0.68	0.738	OI				
2.60								
11.583	1.70	0.68	0.745	OI				
2.62								
11.667	1.72	0.68	0.752	OI				
2.64								
11.750	1.73	0.68	0.759	OI				
2.66								
11.833	1.74	0.68	0.766	OI				
2.69								
11.917	1.76	0.68	0.774	OI				
2.71								
12.000	1.77	0.68	0.781	OI				
2.73								
12.083	1.78	0.68	0.789	OI				
2.75								
12.167	1.75	0.68	0.796	OI				
2.78								
12.250	1.66	0.68	0.803	OI				
2.80								
12.333	1.60	0.68	0.810	OI				
2.82								
12.417	1.58	0.68	0.816	OI				
2.84								
12.500	1.57	0.68	0.822	OI				
2.85								
12.583	1.57	0.68	0.828	OI				
2.87								
12.667	1.57	0.68	0.834	OI				
2.89								
12.750	1.58	0.68	0.840	OI				
2.91								
12.833	1.59	0.68	0.847	OI				
2.93								
12.917	1.60	0.68	0.853	OI				
2.95								
13.000	1.62	0.68	0.859	OI				
2.97								
13.083	1.64	0.68	0.866	OI				
2.99								
13.167	1.66	0.68	0.873	OI				
3.01								
13.250	1.68	0.68	0.879	OI				
3.03								
13.333	1.70	0.68	0.886	OI				
3.05								
13.417	1.73	0.68	0.893	OI				
3.07								
13.500	1.75	0.68	0.901	OI				
3.09								
13.583	1.78	0.68	0.908	OI				
3.12								
13.667	1.81	0.68	0.916	OI				
3.14								
13.750	1.84	0.68	0.924	OI				

```
3.16
 13.833    1.87    0.68      0.932  OI      |       |       |       |
3.19
 13.917    1.91    0.68      0.940  OI      |       |       |       |
3.21
 14.000    1.94    0.68      0.949  OI      |       |       |       |
3.24
 14.083    1.98    0.68      0.958  OI      |       |       |       |
3.27
 14.167    2.03    0.68      0.967  OI      |       |       |       |
3.29
 14.250    2.07    0.68      0.976  OI      |       |       |       |
3.32
 14.333    2.12    0.68      0.986  O I     |       |       |       |
3.35
 14.417    2.17    0.68      0.996  O I     |       |       |       |
3.38
 14.500    2.22    0.68      1.006  O I     |       |       |       |
3.41
 14.583    2.28    0.68      1.017  O I     |       |       |       |
3.45
 14.667    2.34    0.68      1.029  O I     |       |       |       |
3.48
 14.750    2.41    0.68      1.040  O I     |       |       |       |
3.52
 14.833    2.49    0.68      1.052  O I     |       |       |       |
3.55
 14.917    2.57    0.68      1.065  O I     |       |       |       |
3.59
 15.000    2.65    0.68      1.078  O I     |       |       |       |
3.63
 15.083    2.75    0.68      1.092  O I     |       |       |       |
3.67
 15.167    2.86    0.68      1.107  O I     |       |       |       |
3.72
 15.250    2.98    0.68      1.122  O I     |       |       |       |
3.77
 15.333    3.12    0.68      1.139  O  I    |       |       |       |
3.81
 15.417    3.25    0.68      1.156  O  I    |       |       |       |
3.87
 15.500    3.29    0.68      1.174  O  I    |       |       |       |
3.92
 15.583    3.16    0.68      1.191  O  I    |       |       |       |
3.97
 15.667    3.15    0.68      1.208  O  I    |       |       |       |
4.02
 15.750    3.32    0.68      1.226  O  I    |       |       |       |
4.06
 15.833    3.61    0.68      1.245  O  I    |       |       |       |
4.11
 15.917    4.14    0.68      1.267  O  I    |       |       |       |
4.17
 16.000    5.16    0.68      1.295  O   I   |       |       |       |
4.23
 16.083    9.12    0.68      1.339  O      I|       |       |       |
4.34
 16.167   19.07    0.68      1.431  O       |       | I     |       |
4.57
 16.250   33.22    0.68      1.607  O       |       |       |       I
```

5.00
 16.333   24.47   0.68   1.801 O | | I| |
5.48
 16.417   15.27   0.68   1.933 O | I | | |
5.81
 16.500   11.34   1.28   2.018 |O | I | | |
6.02
 16.583   9.16   4.98   2.067 | O   I | | |
6.14
 16.667   7.78   6.42   2.086 | OI| | | |
6.18
 16.750   6.74   6.77   2.091 | O | | | |
6.19
 16.833   5.73   6.55   2.088 | IO | | | |
6.19
 16.917   5.12   6.08   2.082 | IO | | | |
6.17
 17.000   4.61   5.58   2.075 | IO | | | |
6.16
 17.083   4.12   5.08   2.068 | IO | | | |
6.14
 17.167   3.74   4.61   2.062 | IO | | | |
6.12
 17.250   3.41   4.18   2.056 | IO | | | |
6.11
 17.333   3.06   3.79   2.051 | IO | | | |
6.10
 17.417   2.75   3.42   2.046 | IO | | | |
6.09
 17.500   2.59   3.11   2.042 | O | | | |
6.08
 17.583   2.54   2.89   2.039 | O | | | |
6.07
 17.667   2.44   2.72   2.037 | O | | | |
6.07
 17.750   2.27   2.57   2.035 | O | | | |
6.06
 17.833   2.08   2.41   2.033 | O | | | |
6.05
 17.917   1.96   2.25   2.031 |IO | | | |
6.05
 18.000   1.72   2.08   2.029 |IO | | | |
6.04
 18.083   1.67   1.92   2.026 |O | | | |
6.04
 18.167   1.66   1.82   2.025 |O | | | |
6.04
 18.250   1.73   1.77   2.024 |O | | | |
6.03
 18.333   1.76   1.76   2.024 |O | | | |
6.03
 18.417   1.76   1.76   2.024 |O | | | |
6.03
 18.500   1.75   1.76   2.024 |O | | | |
6.03
 18.583   1.74   1.75   2.024 |O | | | |
6.03
 18.667   1.72   1.74   2.024 |O | | | |
6.03
 18.750   1.70   1.73   2.024 |O | | | |

6.03							
18.833	1.68	1.71	2.024	O			
6.03							
18.917	1.66	1.69	2.023	O			
6.03							
19.000	1.64	1.68	2.023	O			
6.03							
19.083	1.62	1.66	2.023	O			
6.03							
19.167	1.60	1.64	2.023	O			
6.03							
19.250	1.58	1.62	2.022	O			
6.03							
19.333	1.56	1.60	2.022	O			
6.03							
19.417	1.55	1.58	2.022	O			
6.03							
19.500	1.53	1.56	2.022	O			
6.03							
19.583	1.51	1.55	2.021	O			
6.03							
19.667	1.50	1.53	2.021	O			
6.03							
19.750	1.48	1.51	2.021	O			
6.03							
19.833	1.46	1.50	2.021	O			
6.03							
19.917	1.45	1.48	2.021	O			
6.03							
20.000	1.43	1.46	2.020	O			
6.02							
20.083	1.42	1.45	2.020	O			
6.02							
20.167	1.40	1.43	2.020	O			
6.02							
20.250	1.39	1.42	2.020	O			
6.02							
20.333	1.38	1.40	2.020	O			
6.02							
20.417	1.36	1.39	2.019	O			
6.02							
20.500	1.35	1.38	2.019	O			
6.02							
20.583	1.34	1.36	2.019	O			
6.02							
20.667	1.33	1.35	2.019	O			
6.02							
20.750	1.32	1.34	2.019	O			
6.02							
20.833	1.30	1.33	2.019	O			
6.02							
20.917	1.29	1.32	2.018	O			
6.02							
21.000	1.28	1.30	2.018	O			
6.02							
21.083	1.27	1.29	2.018	O			
6.02							
21.167	1.26	1.28	2.018	O			
6.02							
21.250	1.25	1.27	2.018	O			

0.00
111.333 0.00 0.00 0.001 O | | | |
0.00
111.417 0.00 0.00 0.001 O | | | |
0.00
111.500 0.00 0.00 0.001 O | | | |
0.00
111.583 0.00 0.00 0.001 O | | | |
0.00
111.667 0.00 0.00 0.001 O | | | |
0.00
111.750 0.00 0.00 0.001 O | | | |
0.00
111.833 0.00 0.00 0.001 O | | | |
0.00
111.917 0.00 0.00 0.001 O | | | |
0.00
112.000 0.00 0.00 0.001 O | | | |
0.00
112.083 0.00 0.00 0.001 O | | | |
0.00
112.167 0.00 0.00 0.001 O | | | |
0.00
112.250 0.00 0.00 0.001 O | | | |
0.00
112.333 0.00 0.00 0.001 O | | | |
0.00
112.417 0.00 0.00 0.001 O | | | |
0.00
112.500 0.00 0.00 0.001 O | | | |
0.00
112.583 0.00 0.00 0.001 O | | | |
0.00
112.667 0.00 0.00 0.001 O | | | |
0.00
112.750 0.00 0.00 0.001 O | | | |
0.00
112.833 0.00 0.00 0.001 O | | | |
0.00
112.917 0.00 0.00 0.001 O | | | |
0.00
113.000 0.00 0.00 0.001 O | | | |
0.00
113.083 0.00 0.00 0.001 O | | | |
0.00
113.167 0.00 0.00 0.001 O | | | |
0.00
113.250 0.00 0.00 0.001 O | | | |
0.00
113.333 0.00 0.00 0.001 O | | | |
0.00
113.417 0.00 0.00 0.001 O | | | |
0.00

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

Number of intervals = 1361
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 6.766 (CFS)
Total volume = 3.930 (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 - 2012
Study date: 11/29/21

Vista Verde
Basin Routing
Developed Condition
Area / Basin B

Program License Serial Number 6232

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

From study/file name: vistaverdeb.rte
**********HYDROGRAPH DATA**********
Number of intervals = 302
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 20.877 (CFS)
Total volume = 2.316 (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 203.000 to Point/Station 204.000
**** RETARDING BASIN ROUTING ****

User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 302
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  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ------------------------------------------------------------------
---
          0.000      0.000      0.000      0.000        0.000
          2.000      0.390      0.480      0.388        0.392
          4.000      0.910      0.480      0.908        0.912
          5.000      1.220     10.000      1.186        1.254
      ------------------------------------------------------------------
--
                  Hydrograph Detention Basin Routing
      ------------------------------------------------------------------
---

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ------------------------------------------------------------------
---
  Time   Inflow  Outflow    Storage
Depth
 (Hours)  (CFS)   (CFS)     (Ac.Ft) .0       5.2   10.44   15.66   20.88
(Ft.)
  0.083    0.03    0.00      0.000  O       |       |       |       |
0.00
  0.167    0.22    0.00      0.001  O       |       |       |       |
0.00
  0.250    0.39    0.00      0.003  O       |       |       |       |
0.02
  0.333    0.47    0.01      0.006  O       |       |       |       |
0.03
  0.417    0.51    0.01      0.009  O       |       |       |       |
0.05
  0.500    0.54    0.02      0.013  O       |       |       |       |
0.07
  0.583    0.56    0.02      0.016  O       |       |       |       |
0.08
  0.667    0.58    0.02      0.020  O       |       |       |       |
0.10
  0.750    0.59    0.03      0.024  O       |       |       |       |
0.12
  0.833    0.60    0.03      0.028  O       |       |       |       |
0.14
  0.917    0.60    0.04      0.032  O       |       |       |       |
0.16
  1.000    0.61    0.04      0.036  O       |       |       |       |
0.18
  1.083    0.61    0.05      0.040  O       |       |       |       |
0.20
  1.167    0.62    0.05      0.043  O       |       |       |       |
0.22
  1.250    0.62    0.06      0.047  O       |       |       |       |
0.24
```

1.333	0.62	0.06	0.051	O				
0.26								
1.417	0.62	0.07	0.055	O				
0.28								
1.500	0.62	0.07	0.059	O				
0.30								
1.583	0.63	0.08	0.063	O				
0.32								
1.667	0.63	0.08	0.066	O				
0.34								
1.750	0.63	0.09	0.070	O				
0.36								
1.833	0.63	0.09	0.074	O				
0.38								
1.917	0.63	0.10	0.078	O				
0.40								
2.000	0.63	0.10	0.081	O				
0.42								
2.083	0.64	0.10	0.085	O				
0.44								
2.167	0.64	0.11	0.089	O				
0.45								
2.250	0.64	0.11	0.092	O				
0.47								
2.333	0.64	0.12	0.096	O				
0.49								
2.417	0.64	0.12	0.099	O				
0.51								
2.500	0.64	0.13	0.103	O				
0.53								
2.583	0.65	0.13	0.106	O				
0.55								
2.667	0.65	0.14	0.110	O				
0.56								
2.750	0.65	0.14	0.114	O				
0.58								
2.833	0.65	0.14	0.117	O				
0.60								
2.917	0.65	0.15	0.120	OI				
0.62								
3.000	0.65	0.15	0.124	OI				
0.64								
3.083	0.66	0.16	0.127	OI				
0.65								
3.167	0.66	0.16	0.131	OI				
0.67								
3.250	0.66	0.17	0.134	OI				
0.69								
3.333	0.66	0.17	0.138	OI				
0.71								
3.417	0.66	0.17	0.141	OI				
0.72								
3.500	0.67	0.18	0.144	OI				
0.74								
3.583	0.67	0.18	0.148	OI				
0.76								
3.667	0.67	0.19	0.151	OI				
0.77								
3.750	0.67	0.19	0.154	OI				
0.79								

3.833	0.67	0.19	0.158	OI				
0.81								
3.917	0.68	0.20	0.161	OI				
0.83								
4.000	0.68	0.20	0.164	OI				
0.84								
4.083	0.68	0.21	0.168	OI				
0.86								
4.167	0.68	0.21	0.171	OI				
0.88								
4.250	0.68	0.21	0.174	OI				
0.89								
4.333	0.69	0.22	0.177	OI				
0.91								
4.417	0.69	0.22	0.181	OI				
0.93								
4.500	0.69	0.23	0.184	OI				
0.94								
4.583	0.69	0.23	0.187	OI				
0.96								
4.667	0.69	0.23	0.190	OI				
0.97								
4.750	0.70	0.24	0.193	OI				
0.99								
4.833	0.70	0.24	0.196	OI				
1.01								
4.917	0.70	0.25	0.200	OI				
1.02								
5.000	0.70	0.25	0.203	OI				
1.04								
5.083	0.71	0.25	0.206	OI				
1.06								
5.167	0.71	0.26	0.209	OI				
1.07								
5.250	0.71	0.26	0.212	OI				
1.09								
5.333	0.71	0.26	0.215	OI				
1.10								
5.417	0.72	0.27	0.218	OI				
1.12								
5.500	0.72	0.27	0.221	OI				
1.13								
5.583	0.72	0.28	0.224	OI				
1.15								
5.667	0.72	0.28	0.227	OI				
1.17								
5.750	0.73	0.28	0.230	OI				
1.18								
5.833	0.73	0.29	0.233	OI				
1.20								
5.917	0.73	0.29	0.237	OI				
1.21								
6.000	0.73	0.29	0.240	OI				
1.23								
6.083	0.74	0.30	0.243	OI				
1.24								
6.167	0.74	0.30	0.246	OI				
1.26								
6.250	0.74	0.31	0.249	OI				
1.27								

6.333	0.74	0.31	0.252	OI				
1.29								
6.417	0.75	0.31	0.255	OI				
1.31								
6.500	0.75	0.32	0.258	OI				
1.32								
6.583	0.75	0.32	0.261	OI				
1.34								
6.667	0.76	0.32	0.264	OI				
1.35								
6.750	0.76	0.33	0.266	OI				
1.37								
6.833	0.76	0.33	0.269	OI				
1.38								
6.917	0.76	0.34	0.272	OI				
1.40								
7.000	0.77	0.34	0.275	OI				
1.41								
7.083	0.77	0.34	0.278	OI				
1.43								
7.167	0.77	0.35	0.281	OI				
1.44								
7.250	0.78	0.35	0.284	OI				
1.46								
7.333	0.78	0.35	0.287	OI				
1.47								
7.417	0.78	0.36	0.290	OI				
1.49								
7.500	0.79	0.36	0.293	OI				
1.50								
7.583	0.79	0.36	0.296	OI				
1.52								
7.667	0.79	0.37	0.299	OI				
1.53								
7.750	0.80	0.37	0.302	OI				
1.55								
7.833	0.80	0.38	0.305	OI				
1.56								
7.917	0.80	0.38	0.308	OI				
1.58								
8.000	0.81	0.38	0.311	OI				
1.59								
8.083	0.81	0.39	0.314	OI				
1.61								
8.167	0.82	0.39	0.316	OI				
1.62								
8.250	0.82	0.39	0.319	OI				
1.64								
8.333	0.82	0.40	0.322	OI				
1.65								
8.417	0.83	0.40	0.325	OI				
1.67								
8.500	0.83	0.40	0.328	OI				
1.68								
8.583	0.83	0.41	0.331	OI				
1.70								
8.667	0.84	0.41	0.334	OI				
1.71								
8.750	0.84	0.41	0.337	OI				
1.73								

8.833	0.85	0.42	0.340	OI				
1.74								
8.917	0.85	0.42	0.343	OI				
1.76								
9.000	0.86	0.43	0.346	OI				
1.77								
9.083	0.86	0.43	0.349	OI				
1.79								
9.167	0.86	0.43	0.352	OI				
1.80								
9.250	0.87	0.44	0.355	OI				
1.82								
9.333	0.87	0.44	0.358	OI				
1.83								
9.417	0.88	0.44	0.361	OI				
1.85								
9.500	0.88	0.45	0.364	OI				
1.87								
9.583	0.89	0.45	0.367	OI				
1.88								
9.667	0.89	0.46	0.370	OI				
1.90								
9.750	0.90	0.46	0.373	OI				
1.91								
9.833	0.90	0.46	0.376	OI				
1.93								
9.917	0.91	0.47	0.379	OI				
1.94								
10.000	0.91	0.47	0.382	OI				
1.96								
10.083	0.92	0.47	0.385	OI				
1.97								
10.167	0.92	0.48	0.388	OI				
1.99								
10.250	0.93	0.48	0.391	OI				
2.00								
10.333	0.94	0.48	0.394	OI				
2.02								
10.417	0.94	0.48	0.397	OI				
2.03								
10.500	0.95	0.48	0.401	OI				
2.04								
10.583	0.95	0.48	0.404	OI				
2.05								
10.667	0.96	0.48	0.407	OI				
2.07								
10.750	0.97	0.48	0.410	OI				
2.08								
10.833	0.97	0.48	0.414	OI				
2.09								
10.917	0.98	0.48	0.417	OI				
2.10								
11.000	0.99	0.48	0.421	OI				
2.12								
11.083	0.99	0.48	0.424	OI				
2.13								
11.167	1.00	0.48	0.428	OI				
2.15								
11.250	1.01	0.48	0.431	OI				
2.16								

11.333	1.02	0.48	0.435	OI				
2.17								
11.417	1.02	0.48	0.439	OI				
2.19								
11.500	1.03	0.48	0.443	OI				
2.20								
11.583	1.04	0.48	0.446	OI				
2.22								
11.667	1.05	0.48	0.450	OI				
2.23								
11.750	1.06	0.48	0.454	OI				
2.25								
11.833	1.07	0.48	0.458	OI				
2.26								
11.917	1.07	0.48	0.462	OI				
2.28								
12.000	1.08	0.48	0.466	OI				
2.29								
12.083	1.08	0.48	0.471	OI				
2.31								
12.167	1.02	0.48	0.475	OI				
2.33								
12.250	0.96	0.48	0.478	OI				
2.34								
12.333	0.94	0.48	0.481	OI				
2.35								
12.417	0.93	0.48	0.484	OI				
2.36								
12.500	0.93	0.48	0.488	OI				
2.38								
12.583	0.94	0.48	0.491	OI				
2.39								
12.667	0.94	0.48	0.494	OI				
2.40								
12.750	0.95	0.48	0.497	OI				
2.41								
12.833	0.96	0.48	0.500	OI				
2.42								
12.917	0.97	0.48	0.504	OI				
2.44								
13.000	0.99	0.48	0.507	OI				
2.45								
13.083	1.00	0.48	0.511	OI				
2.46								
13.167	1.01	0.48	0.514	OI				
2.48								
13.250	1.03	0.48	0.518	OI				
2.49								
13.333	1.04	0.48	0.522	OI				
2.51								
13.417	1.06	0.48	0.526	OI				
2.52								
13.500	1.08	0.48	0.530	OI				
2.54								
13.583	1.10	0.48	0.534	OI				
2.55								
13.667	1.12	0.48	0.538	OI				
2.57								
13.750	1.14	0.48	0.543	OI				
2.59								

```
 13.833    1.16    0.48      0.547  OI      |       |       |       |
2.61
 13.917    1.18    0.48      0.552  OI      |       |       |       |
2.62
 14.000    1.21    0.48      0.557  OI      |       |       |       |
2.64
 14.083    1.23    0.48      0.562  OI      |       |       |       |
2.66
 14.167    1.26    0.48      0.567  OI      |       |       |       |
2.68
 14.250    1.29    0.48      0.573  OI      |       |       |       |
2.70
 14.333    1.32    0.48      0.579  O I     |       |       |       |
2.73
 14.417    1.35    0.48      0.585  O I     |       |       |       |
2.75
 14.500    1.39    0.48      0.591  O I     |       |       |       |
2.77
 14.583    1.43    0.48      0.597  O I     |       |       |       |
2.80
 14.667    1.47    0.48      0.604  O I     |       |       |       |
2.82
 14.750    1.52    0.48      0.611  O I     |       |       |       |
2.85
 14.833    1.57    0.48      0.618  O I     |       |       |       |
2.88
 14.917    1.62    0.48      0.626  O I     |       |       |       |
2.91
 15.000    1.68    0.48      0.634  O I     |       |       |       |
2.94
 15.083    1.74    0.48      0.642  O I     |       |       |       |
2.97
 15.167    1.82    0.48      0.651  O I     |       |       |       |
3.00
 15.250    1.90    0.48      0.661  O I     |       |       |       |
3.04
 15.333    2.00    0.48      0.671  O  I    |       |       |       |
3.08
 15.417    2.07    0.48      0.682  O  I    |       |       |       |
3.12
 15.500    1.96    0.48      0.692  O  I    |       |       |       |
3.16
 15.583    1.89    0.48      0.702  O I     |       |       |       |
3.20
 15.667    1.98    0.48      0.712  O  I    |       |       |       |
3.24
 15.750    2.14    0.48      0.723  O  I    |       |       |       |
3.28
 15.833    2.43    0.48      0.736  O  I    |       |       |       |
3.33
 15.917    2.87    0.48      0.751  O   I   |       |       |       |
3.39
 16.000    3.98    0.48      0.771  O     I |       |       |       |
3.46
 16.083    8.04    0.48      0.809  O       |   I   |       |       |
3.61
 16.167   20.88    0.48      0.905  O       |       |       |       I
3.98
 16.250   18.03    3.98      1.024  |     O |       |       |  I    |
4.37
```

16.333	9.53	5.85	1.085	| O I |	|	|	4.56
16.417	6.44	6.26	1.098	| |O |	|	|	4.61
16.500	5.03	6.16	1.095	| I|O |	|	|	4.60
16.583	4.09	5.85	1.085	| I O |	|	|	4.56
16.667	3.47	5.46	1.072	| I O |	|	|	4.52
16.750	2.96	5.03	1.058	| I O|	|	|	4.48
16.833	2.53	4.59	1.044	| I O|	|	|	4.43
16.917	2.16	4.16	1.030	| I O |	|	|	4.39
17.000	1.99	3.76	1.017	| I O |	|	|	4.34
17.083	1.88	3.41	1.006	| I O |	|	|	4.31
17.167	1.66	3.10	0.995	| I O |	|	|	4.27
17.250	1.46	2.80	0.986	| I O |	|	|	4.24
17.333	1.30	2.53	0.977	|I O |	|	|	4.22
17.417	1.24	2.29	0.969	|I O |	|	|	4.19
17.500	1.19	2.08	0.962	|I O |	|	|	4.17
17.583	1.14	1.91	0.957	|IO |	|	|	4.15
17.667	1.10	1.76	0.952	|IO |	|	|	4.13
17.750	1.06	1.63	0.947	|IO |	|	|	4.12
17.833	1.03	1.52	0.944	|IO |	|	|	4.11
17.917	1.00	1.42	0.941	|IO |	|	|	4.10
18.000	0.97	1.34	0.938	|IO |	|	|	4.09
18.083	0.95	1.26	0.936	|O |	|	|	4.08
18.167	1.01	1.21	0.934	|O |	|	|	4.08
18.250	1.05	1.18	0.933	|O |	|	|	4.07
18.333	1.06	1.15	0.932	|O |	|	|	4.07
18.417	1.05	1.13	0.931	|O |	|	|	4.07
18.500	1.05	1.12	0.931	|O |	|	|	4.07
18.583	1.04	1.10	0.930	|O |	|	|	4.07
18.667	1.02	1.09	0.930	|O |	|	|	4.06
18.750	1.01	1.08	0.929	|O |	|	|	4.06

18.833	1.00	1.06	0.929	O				4.06
18.917	0.99	1.05	0.929	O				4.06
19.000	0.98	1.04	0.928	O				4.06
19.083	0.96	1.02	0.928	O				4.06
19.167	0.95	1.01	0.927	O				4.06
19.250	0.94	1.00	0.927	O				4.05
19.333	0.93	0.99	0.926	O				4.05
19.417	0.92	0.97	0.926	O				4.05
19.500	0.91	0.96	0.926	O				4.05
19.583	0.90	0.95	0.925	O				4.05
19.667	0.89	0.94	0.925	O				4.05
19.750	0.88	0.93	0.925	O				4.05
19.833	0.87	0.92	0.924	O				4.05
19.917	0.86	0.91	0.924	O				4.04
20.000	0.85	0.90	0.924	O				4.04
20.083	0.84	0.89	0.923	O				4.04
20.167	0.83	0.88	0.923	O				4.04
20.250	0.83	0.87	0.923	O				4.04
20.333	0.82	0.86	0.922	O				4.04
20.417	0.81	0.85	0.922	O				4.04
20.500	0.80	0.84	0.922	O				4.04
20.583	0.80	0.83	0.922	O				4.04
20.667	0.79	0.83	0.921	O				4.04
20.750	0.78	0.82	0.921	O				4.04
20.833	0.78	0.81	0.921	O				4.03
20.917	0.77	0.80	0.921	O				4.03
21.000	0.76	0.80	0.920	O				4.03
21.083	0.76	0.79	0.920	O				4.03
21.167	0.75	0.78	0.920	O				4.03
21.250	0.75	0.78	0.920	O				4.03

21.333	0.74	0.77	0.919	|O	|	|	|	|
4.03								
21.417	0.74	0.76	0.919	|O	|	|	|	|
4.03								
21.500	0.73	0.76	0.919	|O	|	|	|	|
4.03								
21.583	0.72	0.75	0.919	|O	|	|	|	|
4.03								
21.667	0.72	0.75	0.919	|O	|	|	|	|
4.03								
21.750	0.71	0.74	0.918	|O	|	|	|	|
4.03								
21.833	0.71	0.74	0.918	|O	|	|	|	|
4.03								
21.917	0.71	0.73	0.918	|O	|	|	|	|
4.03								
22.000	0.70	0.72	0.918	|O	|	|	|	|
4.03								
22.083	0.70	0.72	0.918	|O	|	|	|	|
4.03								
22.167	0.69	0.71	0.918	|O	|	|	|	|
4.02								
22.250	0.69	0.71	0.917	|O	|	|	|	|
4.02								
22.333	0.68	0.71	0.917	|O	|	|	|	|
4.02								
22.417	0.68	0.70	0.917	|O	|	|	|	|
4.02								
22.500	0.67	0.70	0.917	|O	|	|	|	|
4.02								
22.583	0.67	0.69	0.917	|O	|	|	|	|
4.02								
22.667	0.67	0.69	0.917	|O	|	|	|	|
4.02								
22.750	0.66	0.68	0.917	|O	|	|	|	|
4.02								
22.833	0.66	0.68	0.916	|O	|	|	|	|
4.02								
22.917	0.66	0.67	0.916	|O	|	|	|	|
4.02								
23.000	0.65	0.67	0.916	IO	|	|	|	|
4.02								
23.083	0.65	0.67	0.916	IO	|	|	|	|
4.02								
23.167	0.64	0.66	0.916	IO	|	|	|	|
4.02								
23.250	0.64	0.66	0.916	IO	|	|	|	|
4.02								
23.333	0.64	0.66	0.916	IO	|	|	|	|
4.02								
23.417	0.63	0.65	0.916	O	|	|	|	|
4.02								
23.500	0.63	0.65	0.915	O	|	|	|	|
4.02								
23.583	0.63	0.64	0.915	O	|	|	|	|
4.02								
23.667	0.62	0.64	0.915	O	|	|	|	|
4.02								
23.750	0.62	0.64	0.915	O	|	|	|	|
4.02								

```
 96.333    0.00    0.00      0.001  O       |       |       |       |
0.01
 96.417    0.00    0.00      0.001  O       |       |       |       |
0.00
 96.500    0.00    0.00      0.001  O       |       |       |       |
0.00
 96.583    0.00    0.00      0.001  O       |       |       |       |
0.00
 96.667    0.00    0.00      0.001  O       |       |       |       |
0.00
 96.750    0.00    0.00      0.001  O       |       |       |       |
0.00
 96.833    0.00    0.00      0.001  O       |       |       |       |
0.00
 96.917    0.00    0.00      0.001  O       |       |       |       |
0.00
 97.000    0.00    0.00      0.001  O       |       |       |       |
0.00
 97.083    0.00    0.00      0.001  O       |       |       |       |
0.00
 97.167    0.00    0.00      0.001  O       |       |       |       |
0.00
 97.250    0.00    0.00      0.001  O       |       |       |       |
0.00
 97.333    0.00    0.00      0.001  O       |       |       |       |
0.00
 97.417    0.00    0.00      0.001  O       |       |       |       |
0.00
 97.500    0.00    0.00      0.001  O       |       |       |       |
0.00
 97.583    0.00    0.00      0.001  O       |       |       |       |
0.00
 97.667    0.00    0.00      0.001  O       |       |       |       |
0.00
 97.750    0.00    0.00      0.001  O       |       |       |       |
0.00
 97.833    0.00    0.00      0.001  O       |       |       |       |
0.00
 97.917    0.00    0.00      0.001  O       |       |       |       |
0.00
 98.000    0.00    0.00      0.001  O       |       |       |       |
0.00
 98.083    0.00    0.00      0.001  O       |       |       |       |
0.00
 98.167    0.00    0.00      0.001  O       |       |       |       |
0.00
 98.250    0.00    0.00      0.001  O       |       |       |       |
0.00

      ****************************HYDROGRAPH
DATA****************************
                  Number of intervals =  1179
                  Time interval =    5.0 (Min.)
                  Maximum/Peak flow rate =        6.259 (CFS)
                  Total volume =       2.316 (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 - 2012
Study date: 11/29/21

Vista Verde
Basin Routing
Developed Condition
Area / Basin C

Program License Serial Number 6232

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

From study/file name: vistaverdec.rte
**********HYDROGRAPH DATA**********
Number of intervals = 92
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 13.855 (CFS)
Total volume = 0.789 (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 302.000 to Point/Station 303.000
**** RETARDING BASIN ROUTING ****

User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 92
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  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ------------------------------------------------------------------
---
          0.000      0.000      0.000      0.000        0.000
          1.000      0.290      0.770      0.287        0.293
          2.000      0.610      0.770      0.607        0.613
      ------------------------------------------------------------------
--
                  Hydrograph Detention Basin Routing
      ------------------------------------------------------------------
---

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ------------------------------------------------------------------
---
  Time   Inflow  Outflow    Storage
Depth
 (Hours)  (CFS)   (CFS)     (Ac.Ft) .0       3.5    6.93   10.39   13.85
(Ft.)
  0.083    0.01    0.00      0.000  O       |       |       |       |
0.00
  0.167    0.10    0.00      0.000  O       |       |       |       |
0.00
  0.250    0.27    0.00      0.002  O       |       |       |       |
0.01
  0.333    0.37    0.01      0.004  O       |       |       |       |
0.01
  0.417    0.43    0.02      0.007  O       |       |       |       |
0.02
  0.500    0.47    0.03      0.009  OI      |       |       |       |
0.03
  0.583    0.50    0.03      0.013  OI      |       |       |       |
0.04
  0.667    0.53    0.04      0.016  OI      |       |       |       |
0.05
  0.750    0.55    0.05      0.019  OI      |       |       |       |
0.07
  0.833    0.57    0.06      0.023  OI      |       |       |       |
0.08
  0.917    0.59    0.07      0.026  OI      |       |       |       |
0.09
  1.000    0.60    0.08      0.030  OI      |       |       |       |
0.10
  1.083    0.62    0.09      0.033  OI      |       |       |       |
0.12
  1.167    0.63    0.10      0.037  OI      |       |       |       |
0.13
  1.250    0.64    0.11      0.041  OI      |       |       |       |
0.14
  1.333    0.66    0.12      0.045  OI      |       |       |       |
```

0.15
1.417 0.67 0.13 0.048 OI | | | |
0.17
1.500 0.68 0.14 0.052 OI | | | |
0.18
1.583 0.70 0.15 0.056 OI | | | |
0.19
1.667 0.71 0.16 0.060 OI | | | |
0.21
1.750 0.72 0.17 0.063 OI | | | |
0.22
1.833 0.74 0.18 0.067 OI | | | |
0.23
1.917 0.75 0.19 0.071 OI | | | |
0.24
2.000 0.77 0.20 0.075 OI | | | |
0.26
2.083 0.78 0.21 0.079 OI | | | |
0.27
2.167 0.80 0.22 0.083 OI | | | |
0.29
2.250 0.82 0.23 0.087 OI | | | |
0.30
2.333 0.84 0.24 0.091 OI | | | |
0.31
2.417 0.86 0.25 0.095 OI | | | |
0.33
2.500 0.88 0.26 0.099 O I | | | |
0.34
2.583 0.90 0.27 0.103 O I | | | |
0.36
2.667 0.93 0.29 0.108 O I | | | |
0.37
2.750 0.95 0.30 0.112 O I | | | |
0.39
2.833 0.98 0.31 0.117 O I | | | |
0.40
2.917 1.02 0.32 0.122 O I | | | |
0.42
3.000 1.05 0.34 0.126 O I | | | |
0.44
3.083 1.09 0.35 0.131 O I | | | |
0.45
3.167 1.13 0.36 0.137 O I | | | |
0.47
3.250 1.18 0.38 0.142 O I | | | |
0.49
3.333 1.24 0.39 0.148 O I | | | |
0.51
3.417 1.29 0.41 0.154 O I | | | |
0.53
3.500 1.29 0.42 0.160 O I | | | |
0.55
3.583 1.23 0.44 0.165 |OI | | | |
0.57
3.667 1.24 0.45 0.171 |OI | | | |
0.59
3.750 1.32 0.47 0.177 |O I | | | |
0.61
3.833 1.45 0.49 0.183 |O I | | | |

```
0.63
  3.917    1.67    0.50      0.190  |O I    |       |       |       |
0.66
  4.000    2.13    0.53      0.200  |O  I   |       |       |       |
0.69
  4.083    3.94    0.58      0.217  |O      |I      |       |       |
0.75
  4.167    8.85    0.68      0.256  |O      |       |   I   |       |
0.88
  4.250   13.85    0.77      0.330  |O      |       |       |       I
1.12
  4.333    8.83    0.77      0.402  |O      |       |   I   |       |
1.35
  4.417    5.62    0.77      0.447  |O      |   I   |       |       |
1.49
  4.500    4.20    0.77      0.475  |O      |I      |       |       |
1.58
  4.583    3.42    0.77      0.496  |O     I|       |       |       |
1.64
  4.667    2.93    0.77      0.513  |O    I |       |       |       |
1.70
  4.750    2.44    0.77      0.526  |O   I  |       |       |       |
1.74
  4.833    2.15    0.77      0.537  |O  I   |       |       |       |
1.77
  4.917    1.91    0.77      0.545  |O  I   |       |       |       |
1.80
  5.000    1.69    0.77      0.552  |O I    |       |       |       |
1.82
  5.083    1.52    0.77      0.558  |O I    |       |       |       |
1.84
  5.167    1.36    0.77      0.563  |O I    |       |       |       |
1.85
  5.250    1.21    0.77      0.566  |OI     |       |       |       |
1.86
  5.333    1.09    0.77      0.569  |OI     |       |       |       |
1.87
  5.417    1.06    0.77      0.571  |OI     |       |       |       |
1.88
  5.500    1.02    0.77      0.573  |OI     |       |       |       |
1.88
  5.583    0.95    0.77      0.574  |OI     |       |       |       |
1.89
  5.667    0.86    0.77      0.575  |O      |       |       |       |
1.89
  5.750    0.80    0.77      0.576  |O      |       |       |       |
1.89
  5.833    0.71    0.77      0.576  |O      |       |       |       |
1.89
  5.917    0.68    0.77      0.575  |O      |       |       |       |
1.89
  6.000    0.66    0.77      0.574  |O      |       |       |       |
1.89
  6.083    0.62    0.77      0.573  |O      |       |       |       |
1.89
  6.167    0.52    0.77      0.572  |O      |       |       |       |
1.88
  6.250    0.34    0.77      0.570  IO      |       |       |       |
1.87
  6.333    0.23    0.77      0.566  IO      |       |       |       |
```

1.86								
6.417	0.17	0.77	0.563	IO	|	|	|	|
1.85								
6.500	0.13	0.77	0.558	IO	|	|	|	|
1.84								
6.583	0.10	0.77	0.554	IO	|	|	|	|
1.82								
6.667	0.08	0.77	0.549	IO	|	|	|	|
1.81								
6.750	0.06	0.77	0.544	IO	|	|	|	|
1.79								
6.833	0.05	0.77	0.539	IO	|	|	|	|
1.78								
6.917	0.04	0.77	0.534	IO	|	|	|	|
1.76								
7.000	0.03	0.77	0.529	IO	|	|	|	|
1.75								
7.083	0.02	0.77	0.524	IO	|	|	|	|
1.73								
7.167	0.02	0.77	0.519	IO	|	|	|	|
1.72								
7.250	0.01	0.77	0.514	IO	|	|	|	|
1.70								
7.333	0.01	0.77	0.509	IO	|	|	|	|
1.68								
7.417	0.01	0.77	0.503	IO	|	|	|	|
1.67								
7.500	0.00	0.77	0.498	IO	|	|	|	|
1.65								
7.583	0.00	0.77	0.493	IO	|	|	|	|
1.63								
7.667	0.00	0.77	0.487	IO	|	|	|	|
1.62								
7.750	0.00	0.77	0.482	IO	|	|	|	|
1.60								
7.833	0.00	0.77	0.477	IO	|	|	|	|
1.58								
7.917	0.00	0.77	0.472	IO	|	|	|	|
1.57								
8.000	0.00	0.77	0.466	IO	|	|	|	|
1.55								
8.083	0.00	0.77	0.461	IO	|	|	|	|
1.53								
8.167	0.00	0.77	0.456	IO	|	|	|	|
1.52								
8.250	0.00	0.77	0.450	IO	|	|	|	|
1.50								
8.333	0.00	0.77	0.445	IO	|	|	|	|
1.48								
8.417	0.00	0.77	0.440	IO	|	|	|	|
1.47								
8.500	0.00	0.77	0.434	IO	|	|	|	|
1.45								
8.583	0.00	0.77	0.429	IO	|	|	|	|
1.43								
8.667	0.00	0.77	0.424	IO	|	|	|	|
1.42								
8.750	0.00	0.77	0.419	IO	|	|	|	|
1.40								
8.833	0.00	0.77	0.413	IO	|	|	|	|

1.39								
8.917	0.00	0.77	0.408	IO	|	|	|	|
1.37								
9.000	0.00	0.77	0.403	IO	|	|	|	|
1.35								
9.083	0.00	0.77	0.397	IO	|	|	|	|
1.34								
9.167	0.00	0.77	0.392	IO	|	|	|	|
1.32								
9.250	0.00	0.77	0.387	IO	|	|	|	|
1.30								
9.333	0.00	0.77	0.381	IO	|	|	|	|
1.29								
9.417	0.00	0.77	0.376	IO	|	|	|	|
1.27								
9.500	0.00	0.77	0.371	IO	|	|	|	|
1.25								
9.583	0.00	0.77	0.365	IO	|	|	|	|
1.24								
9.667	0.00	0.77	0.360	IO	|	|	|	|
1.22								
9.750	0.00	0.77	0.355	IO	|	|	|	|
1.20								
9.833	0.00	0.77	0.350	IO	|	|	|	|
1.19								
9.917	0.00	0.77	0.344	IO	|	|	|	|
1.17								
10.000	0.00	0.77	0.339	IO	|	|	|	|
1.15								
10.083	0.00	0.77	0.334	IO	|	|	|	|
1.14								
10.167	0.00	0.77	0.328	IO	|	|	|	|
1.12								
10.250	0.00	0.77	0.323	IO	|	|	|	|
1.10								
10.333	0.00	0.77	0.318	IO	|	|	|	|
1.09								
10.417	0.00	0.77	0.312	IO	|	|	|	|
1.07								
10.500	0.00	0.77	0.307	IO	|	|	|	|
1.05								
10.583	0.00	0.77	0.302	IO	|	|	|	|
1.04								
10.667	0.00	0.77	0.297	IO	|	|	|	|
1.02								
10.750	0.00	0.77	0.291	IO	|	|	|	|
1.00								
10.833	0.00	0.76	0.286	IO	|	|	|	|
0.99								
10.917	0.00	0.75	0.281	IO	|	|	|	|
0.97								
11.000	0.00	0.73	0.276	IO	|	|	|	|
0.95								
11.083	0.00	0.72	0.271	IO	|	|	|	|
0.93								
11.167	0.00	0.71	0.266	IO	|	|	|	|
0.92								
11.250	0.00	0.69	0.261	IO	|	|	|	|
0.90								
11.333	0.00	0.68	0.256	IO	|	|	|	|

0.88
 11.417 0.00 0.67 0.252 IO | | | |
0.87
 11.500 0.00 0.66 0.247 IO | | | |
0.85
 11.583 0.00 0.64 0.243 IO | | | |
0.84
 11.667 0.00 0.63 0.238 IO | | | |
0.82
 11.750 0.00 0.62 0.234 IO | | | |
0.81
 11.833 0.00 0.61 0.230 IO | | | |
0.79
 11.917 0.00 0.60 0.225 IO | | | |
0.78
 12.000 0.00 0.59 0.221 IO | | | |
0.76
 12.083 0.00 0.58 0.217 IO | | | |
0.75
 12.167 0.00 0.57 0.213 IO | | | |
0.74
 12.250 0.00 0.56 0.210 IO | | | |
0.72
 12.333 0.00 0.55 0.206 IO | | | |
0.71
 12.417 0.00 0.54 0.202 IO | | | |
0.70
 12.500 0.00 0.53 0.198 IO | | | |
0.68
 12.583 0.00 0.52 0.195 IO | | | |
0.67
 12.667 0.00 0.51 0.191 IO | | | |
0.66
 12.750 0.00 0.50 0.188 IO | | | |
0.65
 12.833 0.00 0.49 0.184 IO | | | |
0.64
 12.917 0.00 0.48 0.181 IO | | | |
0.62
 13.000 0.00 0.47 0.178 IO | | | |
0.61
 13.083 0.00 0.46 0.175 IO | | | |
0.60
 13.167 0.00 0.46 0.171 IO | | | |
0.59
 13.250 0.00 0.45 0.168 IO | | | |
0.58
 13.333 0.00 0.44 0.165 IO | | | |
0.57
 13.417 0.00 0.43 0.162 O | | | |
0.56
 13.500 0.00 0.42 0.159 O | | | |
0.55
 13.583 0.00 0.42 0.156 O | | | |
0.54
 13.667 0.00 0.41 0.154 O | | | |
0.53
 13.750 0.00 0.40 0.151 O | | | |
0.52
 13.833 0.00 0.39 0.148 O | | | |

0.51
 13.917 0.00 0.39 0.145 O | | | |
0.50
 14.000 0.00 0.38 0.143 O | | | |
0.49
 14.083 0.00 0.37 0.140 O | | | |
0.48
 14.167 0.00 0.37 0.138 O | | | |
0.47
 14.250 0.00 0.36 0.135 O | | | |
0.47
 14.333 0.00 0.35 0.133 O | | | |
0.46
 14.417 0.00 0.35 0.130 O | | | |
0.45
 14.500 0.00 0.34 0.128 O | | | |
0.44
 14.583 0.00 0.33 0.126 O | | | |
0.43
 14.667 0.00 0.33 0.123 O | | | |
0.43
 14.750 0.00 0.32 0.121 O | | | |
0.42
 14.833 0.00 0.32 0.119 O | | | |
0.41
 14.917 0.00 0.31 0.117 O | | | |
0.40
 15.000 0.00 0.30 0.115 O | | | |
0.40
 15.083 0.00 0.30 0.113 O | | | |
0.39
 15.167 0.00 0.29 0.110 O | | | |
0.38
 15.250 0.00 0.29 0.108 O | | | |
0.37
 15.333 0.00 0.28 0.107 O | | | |
0.37
 15.417 0.00 0.28 0.105 O | | | |
0.36
 15.500 0.00 0.27 0.103 O | | | |
0.35
 15.583 0.00 0.27 0.101 O | | | |
0.35
 15.667 0.00 0.26 0.099 O | | | |
0.34
 15.750 0.00 0.26 0.097 O | | | |
0.34
 15.833 0.00 0.25 0.095 O | | | |
0.33
 15.917 0.00 0.25 0.094 O | | | |
0.32
 16.000 0.00 0.24 0.092 O | | | |
0.32
 16.083 0.00 0.24 0.090 O | | | |
0.31
 16.167 0.00 0.24 0.089 O | | | |
0.31
 16.250 0.00 0.23 0.087 O | | | |
0.30
 16.333 0.00 0.23 0.086 O | | | |

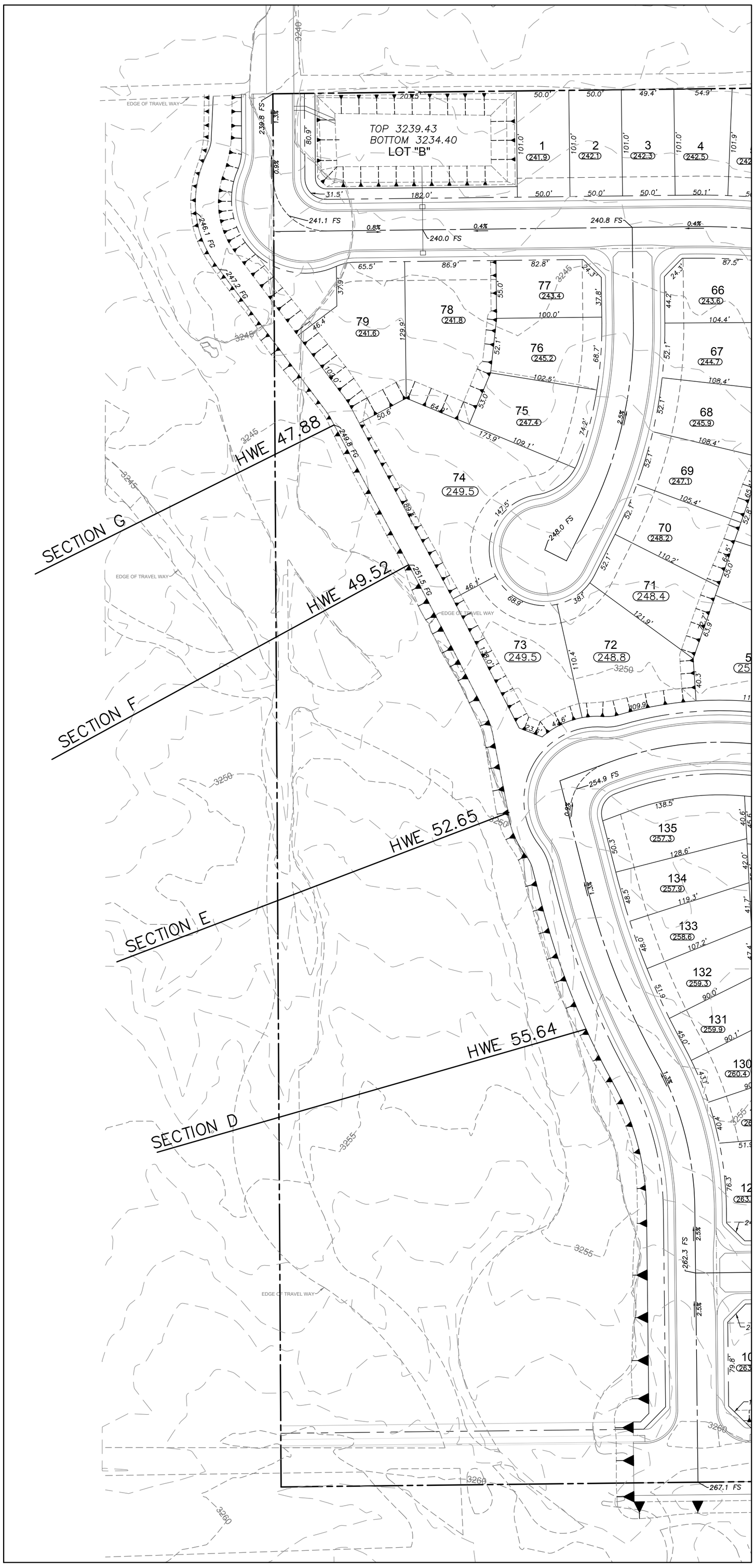
0.00
 38.917   0.00   0.00   0.001 O | | | |
0.00
 39.000   0.00   0.00   0.001 O | | | |
0.00
 39.083   0.00   0.00   0.001 O | | | |
0.00
 39.167   0.00   0.00   0.001 O | | | |
0.00
 39.250   0.00   0.00   0.001 O | | | |
0.00
 39.333   0.00   0.00   0.001 O | | | |
0.00
 39.417   0.00   0.00   0.001 O | | | |
0.00
 39.500   0.00   0.00   0.001 O | | | |
0.00
 39.583   0.00   0.00   0.001 O | | | |
0.00
 39.667   0.00   0.00   0.001 O | | | |
0.00
 39.750   0.00   0.00   0.001 O | | | |
0.00
 39.833   0.00   0.00   0.000 O | | | |
0.00
 39.917   0.00   0.00   0.000 O | | | |
0.00
 40.000   0.00   0.00   0.000 O | | | |
0.00
 40.083   0.00   0.00   0.000 O | | | |
0.00
 40.167   0.00   0.00   0.000 O | | | |
0.00
 40.250   0.00   0.00   0.000 O | | | |
0.00
 40.333   0.00   0.00   0.000 O | | | |
0.00
 40.417   0.00   0.00   0.000 O | | | |
0.00
 40.500   0.00   0.00   0.000 O | | | |
0.00
 40.583   0.00   0.00   0.000 O | | | |
0.00
 40.667   0.00   0.00   0.000 O | | | |
0.00
 40.750   0.00   0.00   0.000 O | | | |
0.00
 40.833   0.00   0.00   0.000 O | | | |
0.00
 40.917   0.00   0.00   0.000 O | | | |
0.00
 41.000   0.00   0.00   0.000 O | | | |
0.00
 41.083   0.00   0.00   0.000 O | | | |
0.00

     **************************HYDROGRAPH
DATA**************************
                Number of intervals =   493
                Time interval =   5.0 (Min.)

```
                  Maximum/Peak flow rate =        0.770 (CFS)
                  Total volume =       0.788 (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 C:
PROJECT HYDRAULIC CALCULATIONS



50' 25' 0' 50'

GRAPHIC SCALE: 1"=50'

SUBMITTALS:

DESIGNED BY:
DRAWN BY:
CHECKED BY:

REGISTERED PROFESSIONAL ENGINEER
CHRISTOPHER F. LENZ
NO. 63001
EXP. 6/30/23
CIVIL
STATE OF CALIFORNIA

CHRISTOPHER F. LENZ DATE
R.C.E. No. 63001

united engineering group
8885 Haven Avenue
Suite 195
Rancho Cucamonga,
CA 91730
Phone: 909.466.9240
www.unitedeng.com

VISTA VERDE

LINE A-01 INTERIM WSE EXHIBIT
TRACT 20488

NOVEMBER 2021

SHEET 1 OF 1

PROJECT NUMBER
CA-30181

Channel Report

Hydraflow Express Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. Thursday, Sep 30 2021

Section G Post Dev HW

User-defined

Invert Elev (ft)	= 45.00
Slope (%)	= 1.30
N-Value	= 0.030

Calculations

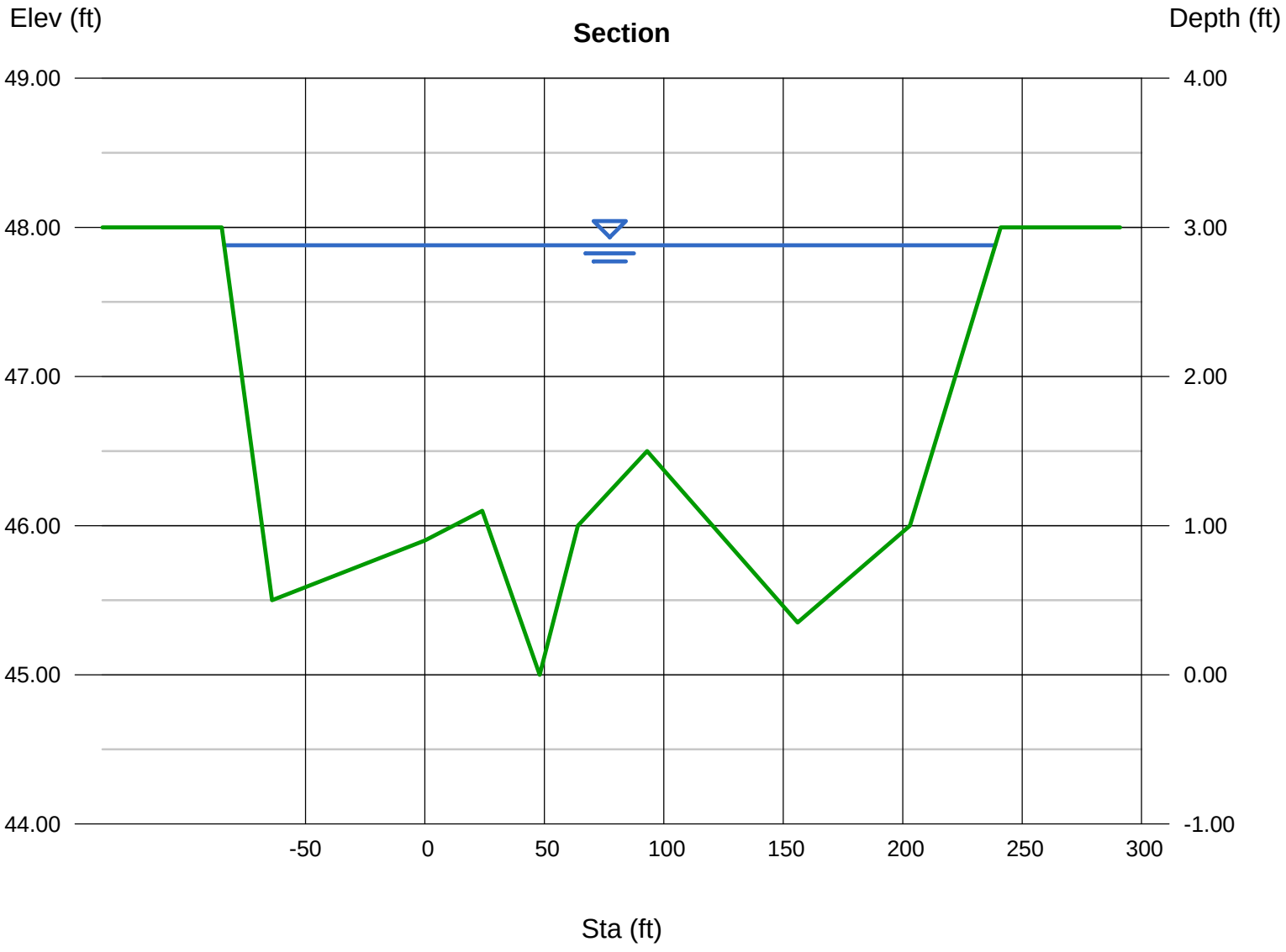
Compute by:	Known Q
Known Q (cfs)	= 5265.00

Highlighted

Depth (ft)	= 2.88
Q (cfs)	= 5,265
Area (sqft)	= 610.08
Velocity (ft/s)	= 8.63
Wetted Perim (ft)	= 322.98
Crit Depth, Yc (ft)	= 3.00
Top Width (ft)	= 322.71
EGL (ft)	= 4.04

(Sta, El, n)-(Sta, El, n)...

(-85.00, 48.00)-(24.00, 46.10, 0.030)-(48.00, 45.00, 0.030)-(64.00, 46.00, 0.030)-(93.00, 46.50, 0.030)-(156.00, 45.35, 0.030)-(203.00, 46.00, 0.030)-(241.00, 48.00, 0.030)



Channel Report

Hydraflow Express Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. Thursday, Sep 30 2021

Section F Post Dev HW

User-defined

Invert Elev (ft)	= 47.00
Slope (%)	= 1.30
N-Value	= 0.030

Calculations

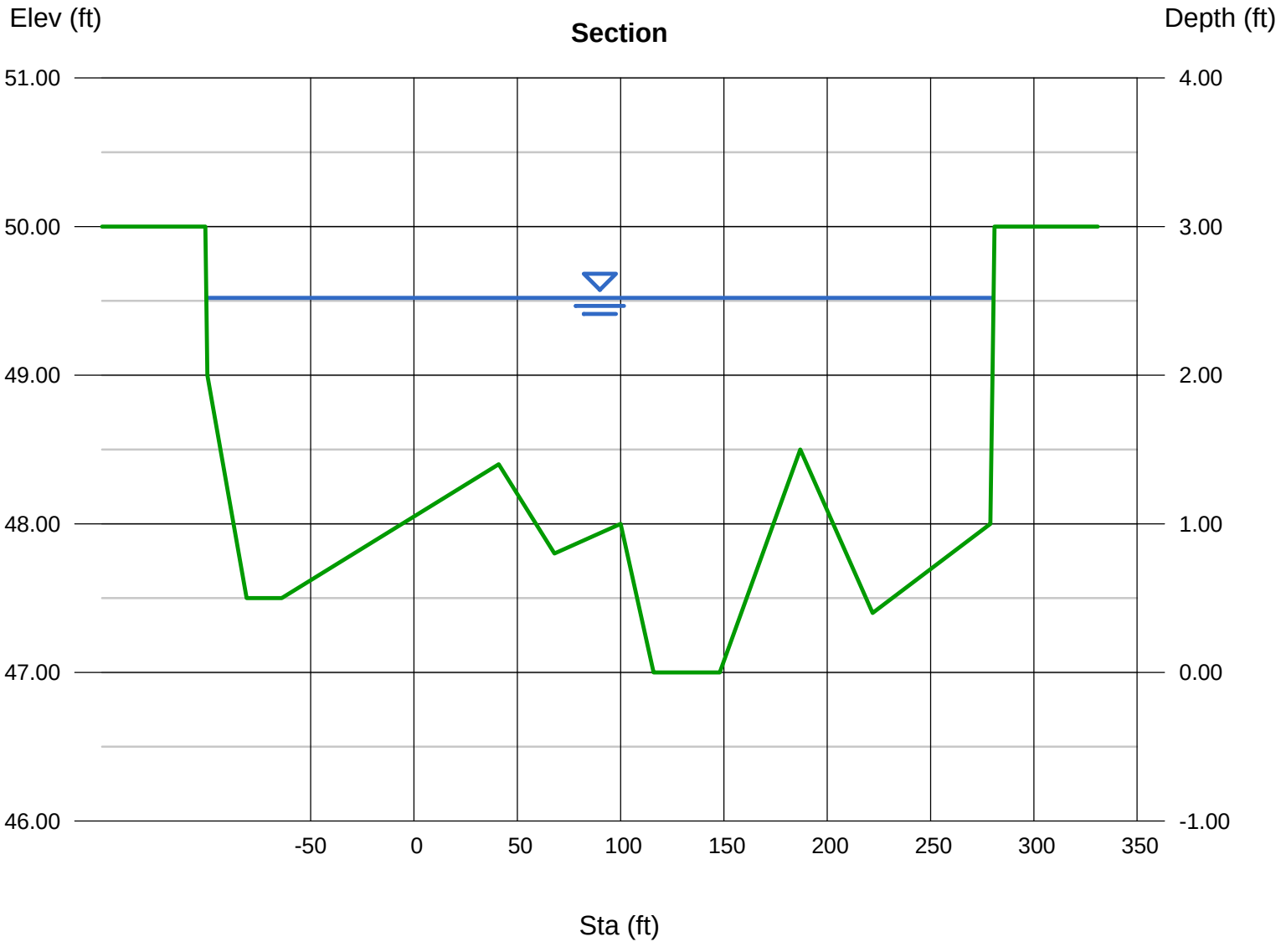
Compute by:	Known Q
Known Q (cfs)	= 5265.00

Highlighted

Depth (ft)	= 2.52
Q (cfs)	= 5,265
Area (sqft)	= 655.47
Velocity (ft/s)	= 8.03
Wetted Perim (ft)	= 382.04
Crit Depth, Yc (ft)	= 2.62
Top Width (ft)	= 381.04
EGL (ft)	= 3.52

(Sta, El, n)-(Sta, El, n)...

(-101.00, 50.00)-(41.00, 48.40, 0.030)-(68.00, 47.80, 0.030)-(100.00, 48.00, 0.030)-(116.00, 47.00, 0.030)-(148.00, 47.00, 0.030)-(187.00, 48.50, 0.030)-(222.00, 47.40, 0.030)-(279.00, 48.00, 0.030)-(280.00, 49.00, 0.030)-(281.00, 50.00, 0.030)



Channel Report

Hydraflow Express Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. Thursday, Sep 30 2021

Section E Post Dev HW

User-defined

Invert Elev (ft)	= 50.00
Slope (%)	= 1.30
N-Value	= 0.030

Calculations

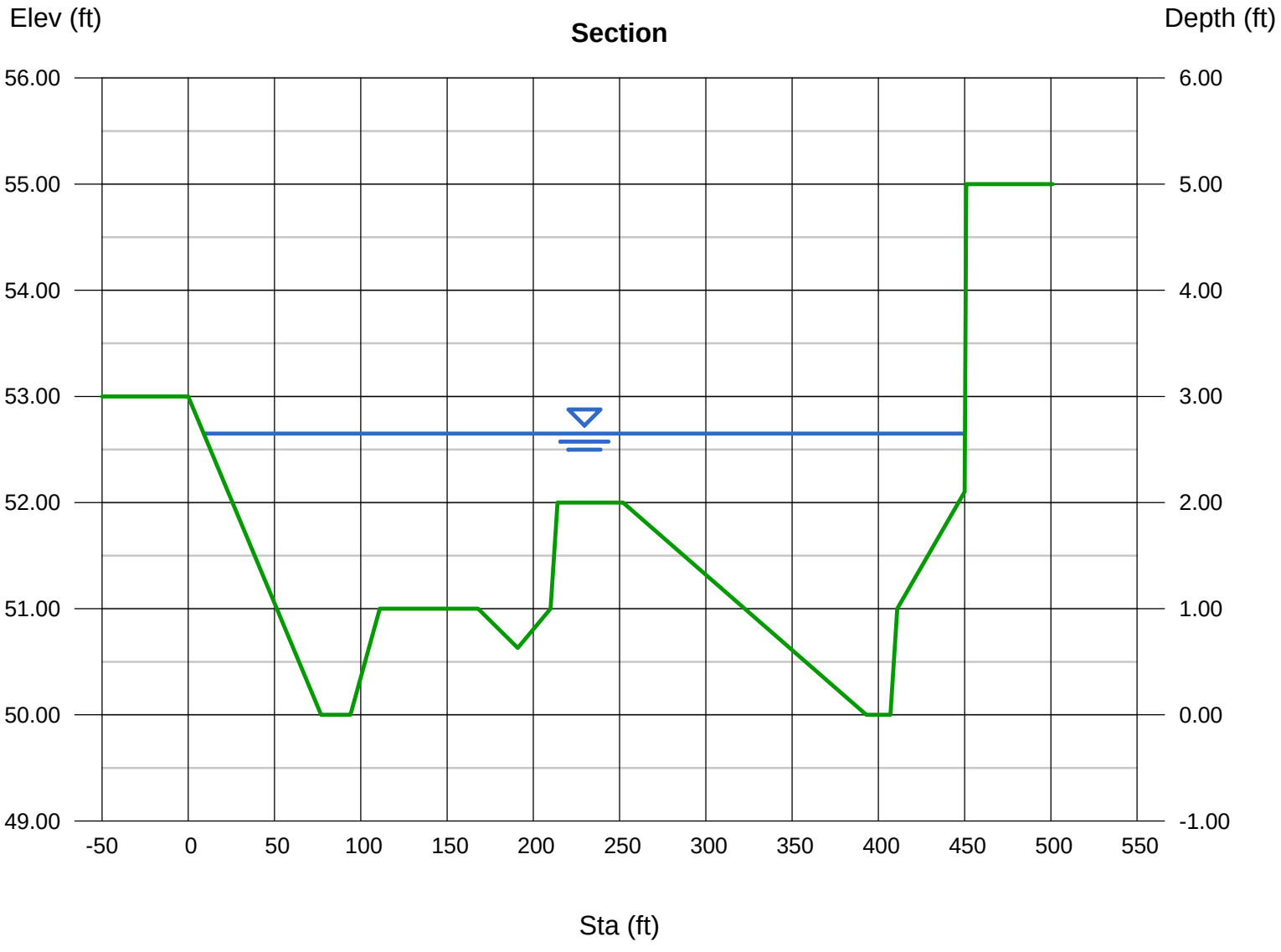
Compute by:	Known Q
Known Q (cfs)	= 5265.00

Highlighted

Depth (ft)	= 2.65
Q (cfs)	= 5,265
Area (sqft)	= 693.44
Velocity (ft/s)	= 7.59
Wetted Perim (ft)	= 441.96
Crit Depth, Yc (ft)	= 2.73
Top Width (ft)	= 441.21
EGL (ft)	= 3.55

(Sta, El, n)-(Sta, El, n)...

(0.00, 53.00)-(77.00, 50.00, 0.030)-(94.00, 50.00, 0.030)-(111.00, 51.00, 0.030)-(168.00, 51.00, 0.030)-(191.00, 50.63, 0.030)-(210.00, 51.00, 0.030)
-(214.00, 52.00, 0.030)-(252.00, 52.00, 0.030)-(393.00, 50.00, 0.030)-(407.00, 50.00, 0.030)-(411.00, 51.00, 0.030)-(450.00, 52.10, 0.030)-(451.00, 55.00, 0.030)



Channel Report

Hydraflow Express Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. Thursday, Sep 30 2021

Section D Post Dev HW

User-defined

Invert Elev (ft)	= 52.80
Slope (%)	= 1.30
N-Value	= 0.030

Calculations

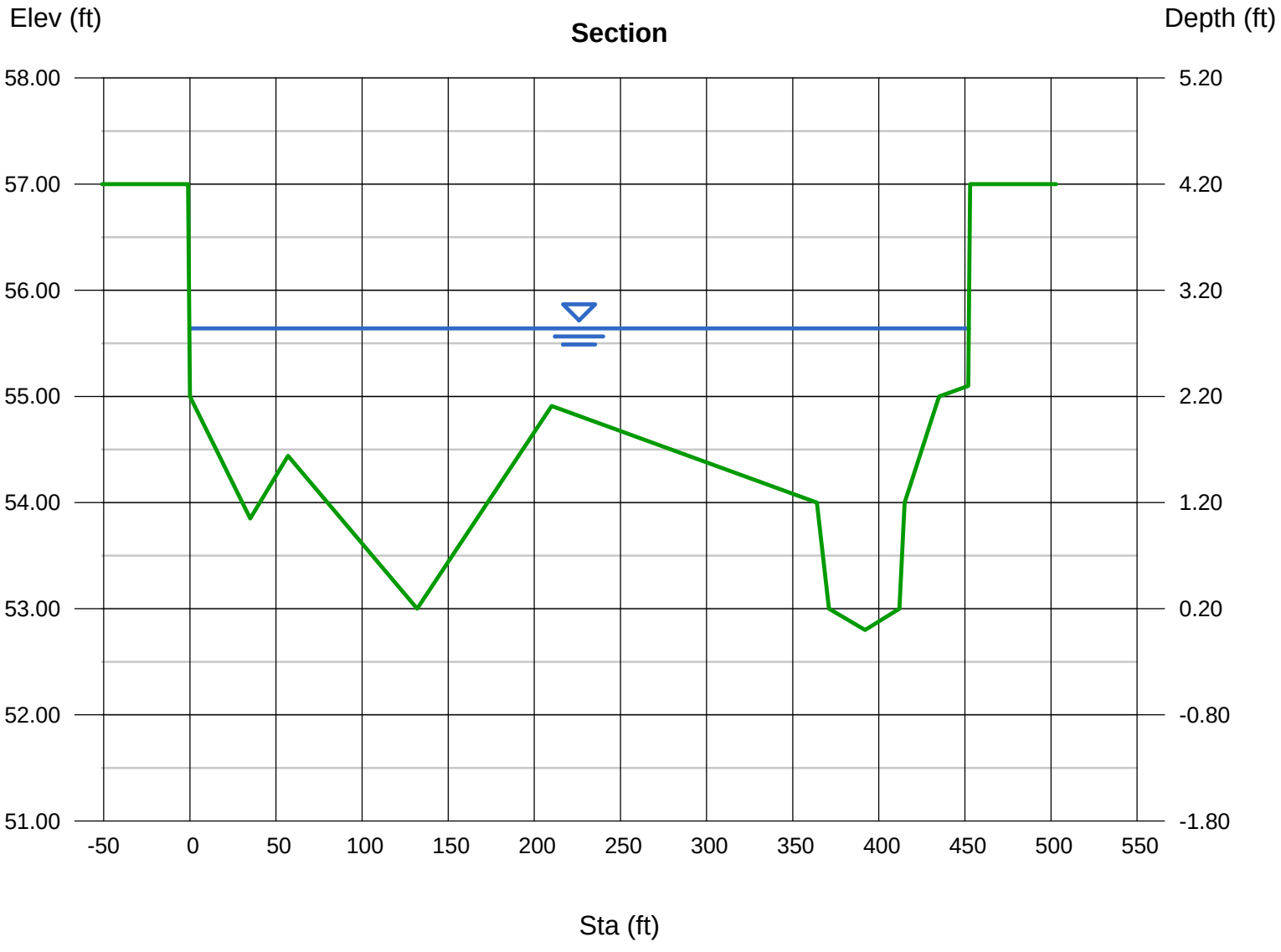
Compute by:	Known Q
Known Q (cfs)	= 5265.00

Highlighted

Depth (ft)	= 2.84
Q (cfs)	= 5,265
Area (sqft)	= 700.08
Velocity (ft/s)	= 7.52
Wetted Perim (ft)	= 453.65
Crit Depth, Yc (ft)	= 2.91
Top Width (ft)	= 452.60
EGL (ft)	= 3.72

(Sta, El, n)-(Sta, El, n)...

(-1.00, 57.00)-(35.00, 53.85, 0.030)-(57.00, 54.44, 0.030)-(132.00, 53.00, 0.030)-(210.00, 54.91, 0.030)-(364.00, 54.00, 0.030)-(371.00, 53.00, 0.030)-(392.00, 52.80, 0.030)-(412.00, 53.00, 0.030)-(415.00, 54.00, 0.030)-(435.00, 55.00, 0.030)-(452.00, 55.10, 0.030)-(453.00, 57.00, 0.030)



APPENDIX D:
PRIORITY PROJECT CHECKLIST AND APN'S

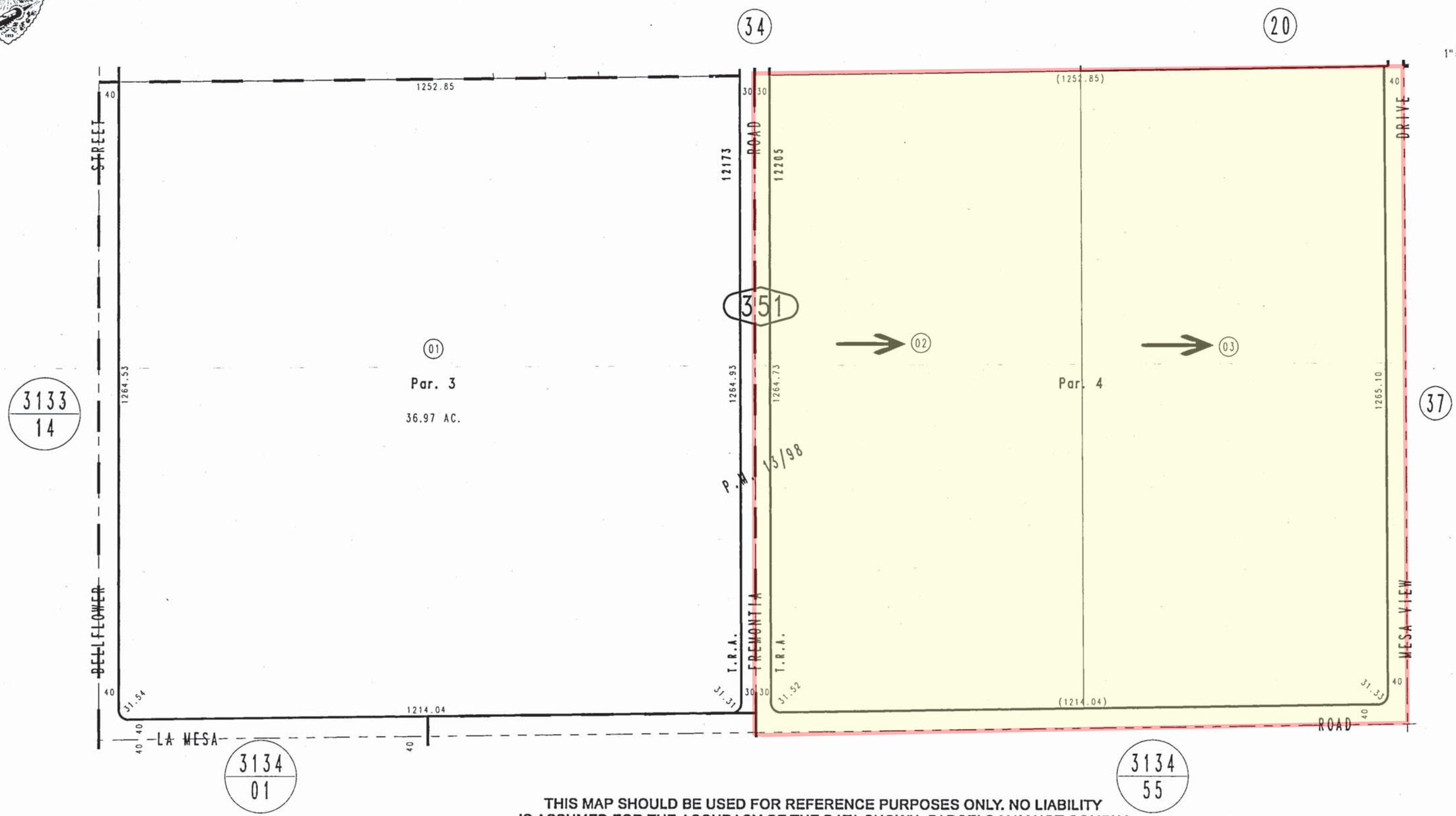
THIS MAP IS FOR THE PURPOSE OF AD VALOREM TAXATION ONLY.

S. 1/2, S.W. 1/4, Sec. 28, T.5N., R.5W., S.B.M.

City of Victorville
Tax Rate Area
12173 12205

3096 - 35

1" = 200'



THIS MAP SHOULD BE USED FOR REFERENCE PURPOSES ONLY. NO LIABILITY IS ASSUMED FOR THE ACCURACY OF THE DATA SHOWN. PARCELS MAY NOT COMPLY WITH LOCAL SUBDIVISION OR BUILDING ORDINANCES.

REVISED
03/10/10 LH

DEC. 1991

Pln. Parcel Map No. 1612, P.M. 13/98

Assessor's Map
Book 3096 Page 35
San Bernardino County

STORMWATER PLANNING PROGRAM PRIORITY PROJECT CHECKLIST

FORM PC

Project Name: VISTA VERDE	Owner Name: GUARDIAN CAPITAL	Developer Name: SAME AS OWNER
Project Address: NEC MESA VIEW AND	Owner Address: 15780 FLEET STREET, SUITE 225	Developer Address:
LA MESA, VICTORVILLE, CA	CARLSBAD, CA 92008	
Plan Check #: TTM 20488	Owner Phone:	Developer Phone:

TYPE OF PROJECT

Does the proposed project fall into one of the following categories? Please check Yes/No	YES	NO
PRIORITY PROJECTS		
1. A new project equal to 1 acre or greater of disturbed area and adding more than 10,000 square feet of impervious* surface area	X	
2. A new industrial park with 10,000 square feet or more of surface area		X
3. A new commercial mall with 10,000 square feet or more surface area		X
4. A new retail gasoline outlet with 5,000 square feet or more of surface area		X
5. A new restaurant (SIC 5812) with 5,000 square feet or more of surface area		X
6. A new parking lot with either 5,000 ft^2 or more of impervious* surface or with 25 or more parking spaces		X
7. A new automotive service facility (SIC 5013, 5014, 5511, 5541, 7532-7534 and 7536-7539) with 5,000 square feet or more of surface area		X
8. Projects located in or directly adjacent to, or discharging directly to a Significant Ecological Area (SEA)*, where the development will: a. Discharge stormwater runoff that is likely to impact a sensitive biological species or habitat; and b. Create 2,500 square feet or more of impervious surface area		X
9. Redevelopment*		X
SPECIAL PROVISION PROJECTS		
10. Green street* project		X
11. Single family hillside* home		X

If checked YES, numerical criteria will apply to items 1,2,6-9 and items 3-5 (for project areas of 5,000 ft^2 or more of surface area.) If any of the boxes are checked YES, this project will require the preparation of a Low Impact Development (LID) Plan and a Maintenance Agreement Transfer*

* Defined on back.

GLEN POWLES
Applicant Name

TO BE SINGED AT FINAL
Applicant Signature

Applicant Title

TBD
Date

DEFINITIONS:

Impervious are those surfaces that do not allow stormwater runoff to percolate into the ground. Typical impervious surfaces include: concrete, asphalt, roofing materials, etc. However, some specially designed concrete/asphalt do allow water to percolate (pervious).

Hillside means property where the slope is 25% or greater and where grading contemplates cut or fill slopes. Single family hillside homes will require a less extensive plan. During the construction of a single-family hillside home, the following measures are implemented:

a. Conserve natural areas

b. Protect slopes and channels

c. Provide storm drain system stenciling and signage

d. Divert roof runoff to vegetated areas before discharge unless the diversion would result in slope instability

e. Direct surface flow to vegetated areas before discharge unless the diversion would result in slope instability.

Green Streets means any street and road construction of 10,000 square feet or more of impervious surface area

a. These projects will follow an approved green streets manual to the maximum extent practicable. Street and road construction applies to standalone streets, roads, highways, and freeway projects, and also applies to streets within larger projects. Stormwater mitigation measures must be in compliance with the approved green streets manual requirements.

Redevelopment means land-disturbing activities that result in the creation, addition, or replacement of 5,000 ft^2 or more of impervious surface area on an already developed site.

Redevelopment does not include routine maintenance activities that are conducted to maintain the original line and grade, hydraulic capacity, or original purpose of facility, nor does it include modifications to existing single family structures, or emergency construction activities required to immediately protect public health and safety.

Significant Ecological Area means an area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and would be disturbed or degraded by human activities and developments. Also, an area designated by the City as approved by the Regional Water Quality Control Board.

Maintenance Agreement and Transfer: All developments subject to LID and site specific plan requirements provide verification of maintenance provisions for Structural and Treatment Control BMPs, including but not limited to legal agreements, covenants, CEQA mitigation requirements, and/or conditional use permits. Verification at a minimum shall include:

- The developer's and/or owner's signed statement accepting responsibility for maintenance until the responsibility is legally transferred; and
- A signed statement from the public entity assuming responsibility for Structural or Treatment Control BMP maintenance and conduct a maintenance inspection at least once a year; or
- Written conditions in the sales or lease agreement, which requires the recipient to assume responsibility for maintenance and conduct a maintenance inspection at least once a year; or
- Written text in project conditions, covenants and restrictions (CCRs) for residential properties assigning maintenance responsibilities to the Home Owners Association for maintenance of the Structural and Treatment Control BMPs; or
- Any other legally enforceable agreement that assigns responsibility for the maintenance of post-construction Structural or Treatment Control BMPs.