Paradise Valley Ranch

Center of Excellence and Wildlife Conservancy

43700 Cactus Valley Road
Riverside, CA
APNs: 569020026,569020013,569020024, 569020010, 569020025

Preliminary Hydrology Study

March 2021

Revised: July 2021
Revised: August 2021
Revised: November 2021

This report has been prepared under the direction of the following Registered Civil Engineer. The undersigned attests to the technical information contained herein and the qualifications of any technical specialist providing engineering data upon which recommendations, conclusions, and decisions are based:

_____
Registered Civil Engineer

Submitted by
Valued Engineering Inc.
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1.0 INTRODUCTION

The Paradise Valley Ranch property is located in the unincorporated southwest Riverside County, east of the City of Hemet, approximately 4 miles east of State Street, at the terminus of Cactus Valley Road. The site address is 43700 Cactus Valley Road. Currently, the County of Riverside is processing a Lot Line Adjustment (LLA) involving three parcels [Assessor Parcel Numbers (APN) 569-020-024, -025, and -026] on the Paradise Valley Ranch property. Once this LLA has been processed (LLA210115), one of the three parcels (approximately 48-acres) will be used for a Conditional Use Permit (CUP) that is required for the proposed Project. This parcel will be referred to as the "CUP Parcel". The ultimate APN for the CUP Parcel will be determined upon finalization and recordation of the LLA.

The Paradise Valley Ranch Project CUP proposes the remodeling of five (5) existing structures and potential future development of two (2) new structures into the west coast "Center of Excellence" for firefighter drug and alcohol addiction recovery and a research/training site for the Wildfire Conservancy hereby known as Facility 6 (located in Northeast) and Facility 7 (located in Southwest). Other improvements will include pervious parking area, landscape, curbs, and Class II base roadway for fire access.

The development will preserve the existing drainage pattern by ultimately draining stormwater runoff from the east to the westerly portion of the property for Facility 7, while Facility 6 flows southerly. Off-site storm water which flows on to the proposed property will flow along an existing berm and roadway just east of the proposed development. The onsite flows for Facility 7 flows into the basin on westerly part of the site for Facility 7. A large amount of offsite flow in Facility 6 will impact the development. In order to protect the new structural from off-site flood inundation, off-site flows will be initially capture in a swale north of the drive aisle, then it will be conveyed through a 48" pipe culvert under the drive aisle to the south side and discharge to its natural drainage course.

2.0 PURPOSE

The purpose of the study is to quantify the peak flow for the 2-year, 10-year and 100-year storm event for the pre-developed and post-developed conditions. The rational method calculations are presented in Appendix C of this report. For this preliminary drainage study, the basin will be sized for the difference between the pre-developed and the post-developed Unit Hydrograph Volume from the 10-year, 24-hour storm. The final drainage study will analyze all the required storm frequency to be routed to the proposed basins that will meet the County's Flood Increased Runoff Criteria.

3.0 METHODOLOGY

The analysis was performed in accordance with the Riverside County Hydrology Manual. This includes the determination of soil cover and subarea breakdowns. CivilDesign software by Bonadiman was used to perform rational method calculations. The 2,10, and 100 year, 1-hr storm

event with AMC II was used to simulate the developed hydrology condition, as recommended by the Riverside County Hydrology Manual. These methods were combined to understand how pre-developed and post-developed stormwater will flow.

4.0 SITE DESCRIPTION

Existing site conditions include dry vegetation with minimal tree coverings. The dry vegetation has fair to good ground cover, site photos can be found in Appendix A. Site hydrologic soils group classification was determined to be Hydrologic Soil Group "A" for Facility 7 and "B" and "D" for Facility 6 through WebSoilSurvey. The project site Facility 7 is estimated as having an infiltration rate of 7-13 in/hr. Facility 6 has an infiltration rate of 2.5-3.4 in/hr. This soils investigation can be seen in Appendix B of this report.

Existing Drainage Condition – FACILITY 7

Existing runoff at the site is delineated into Drainage Areas A1 and B1 located south of Cactus Valley Road (see the "Existing Hydrology Map" for Facility 7 in Appendix F).

The off-site subarea A1 generally drains westerly with average grade of 2.8%. Stormwater sheet flows across the lots then south to the existing channel. Subarea B1 consist mainly of the existing poor vegetated cover. The flow sheet flows westerly off the property.

Proposed Drainage Condition – FACILITY 7

The proposed on-site watershed is broken down into four drainage subareas A1, B1, B2 and B3 (See the "Post-developed Hydrology Map" Facility 6 in Appendix F of this report for the proposed drainage areas).

Subarea A1 consists of the offsite area east of the proposed developed location. Stormwater from this subarea begins at a high point at the easterly portion of the site. The stormwater will sheet flow westerly before the proposed property, where an existing dirt berm will channel the flow south to the existing channel.

Subarea B1, B2 and B3 will include the Permanent Facility 7, 5 temporary probable buildings, Aggregate Base Parking lots and driveway, PCC hardscape and ornamental landscape. The runoff from these subareas will be collected in a basin which is sized for both the 2-year, 24-hour storm to comply with HCOC Management to filter the stormwater runoff and the 10-yr, 24-hour to prevent any impact downstream due to the redevelopment. The 5 portable buildings will be used on a temporary basis while tenant improvements are done to several existing buildings on-site. The portable buildings will be anchored down to permanent concrete foundations due to them being located within the FEMA 100-year floodplain. All building finished floor will be set a

minimum of 1-foot above the Base Flood Elevation determined from the FEMA Letter of Map Revision dated July 14, 2021.

Existing Drainage Condition – Facility 6

Existing runoff at the site for is delineated into three drainage subareas A1, A2 and B1 located north of Cactus Valley Road east of the existing resident (see the "Existing Hydrology Map" for Facility 6 in Appendix F).

The drainage area A1 and A2 of offsite areas, generally drains southerly to subarea B1 then flows to an existing storm drain culvert.

Proposed Drainage Condition – Facility 6

The proposed on-site watershed is broken down into five drainage subareas A1, A2, B1, B2 and B3 (See the "Post-developed Hydrology Map" for Facility 6 in Appendix F of this report for the proposed drainage areas).

Subarea A1 and A2 include the Building, Aggregate Base Parking lot and driveway and ornamental landscape. The runoff from these subareas will be collected in a basin which is sized for 2-year, 24-hour storm to comply with HCOC Management to filter the stormwater runoff and the 10-yr,24-hour storm to mitigate downstream impact from redevelopment. The storm water will flow northwest to a low point in subarea A1 where it will be capture by an inlet then pipe flow southeast to capture storm water from subarea A2 before being detain in a basin to the east.

Subarea B1 and B2 are northern offsite areas that will flow south and channel through a proposed culvert crossing the proposed road of the developed location. The offsite flow will be diverted from going onto the onsite portion of the project with a proposed curb and swale to direct it into the proposed culvert. The stormwater then will flow south toward the exiting storm drain culvert.

5.0 RESULTS

The following table summarizes the data and results for the 2-year, 10-year and 100-year storm events for the pre-developed condition. Rational method calculations used to determine flows can be found in Appendix C of this report, respectively.

Pre-developed Hydrology – Rational Method – Facility 7				
		Frequency		
Proposed Subareas	ACRE (AC)	Q_2 (cfs)	Q_{10} (cfs)	Q_{100} (cfs)
A1	3.24	1.01	3.00	5.23
B1	3.59	1.22	3.55	5.16
Total	6.84	2.23	6.55	10.39

Pre-developed Hydrology – Rational Method – Facility 6				
		Frequency		
Proposed Subareas	ACRE (AC)	Q_2 (cfs)	Q_{10} (cfs)	Q_{100} (cfs)
A1	2.59	2.19	4.39	7.00
A2	32.87	22.00	46.99	76.54
Subtotal	35.46	24.19	51.38	83.54
B1	1.29	0.68	1.67	2.80
Total	36.75	24.87	53.05	86.34

The following table summarizes the data and results for the 2-year, 10-year and 100-year storm events for the post-developed condition. Rational method was use to determine peak flows can be found in Appendix C of this report.

Post-developed Hydrology – Rational Method – Facility 7				
		Frequency		
Proposed Subareas	ACRE (AC)	Q_2 (cfs)	Q_{10} (cfs)	Q_{100} (cfs)
A1	3.24	1.01	3.00	5.23
B1	1.08	1.56	2.62	4.12
B2	1.42	0.47	1.81	3.40
B3	1.10	0.11	0.51	1.01
Total	6.84	3.15	7.94	13.76

Post-developed Hydrology – Rational Method – Facility 6				
		Frequency		
Proposed Subareas	ACRE (AC)	Q_2 (cfs)	Q_{10} (cfs)	Q_{100} (cfs)
A1	0.33	0.47	0.79	1.23
A2	0.20	0.24	0.42	0.66
Subtotal	0.53	0.71	1.21	1.89
B1	2.59	2.19	4.39	7.00
B2	32.87	22.00	46.99	76.54
B3	0.76	0.49	1.06	1.73
Subtotal	36.22	24.67	52.44	85.27
Total	36.75	25.38	53.65	87.16

For the preliminary drainage study, the synthetic unit hydrographs of the 10-year, 24 hour was analyzed the pre-developed and post-developed conditions for each site location. The hydrograph volumes are summarized in the table below and the calculations can be found in Appendix D.

Unit Hydrograph Summary – FACILITY 7								
		Existing Condition			Proposed Condition			Difference Volume
		Q (cfs)	V (ac.ft)	V (cu.ft)	Q (cfs)	V (ac.ft)	V(cu.ft)	V (cu.ft)
10 Year	24 Hour	0.189	0.114	4,949	0.935	0.568	24,737	19,788

Unit Hydrograph Summary – FACILITY 6								
		Existing Condition			Proposed Condition			Difference Volume
		Q (cfs)	V (ac.ft)	V (cu.ft)	Q (cfs)	V (ac.ft)	V(cu.ft)	V (cu.ft)
10 Year	24 Hour	0.164	0.045	1,954	0.182	0.088	3,855	1,901

The proposed Facility 7 will consist of a basin that will be able to store 20,027 cu.ft. The basin will have a bottom surface area of 8,177 SF and a 2-foot depth. The proposed Facility 6 will consist of a basin that will be able to store 2,712 cu.ft. and a 2-foot depth The basin will have a bottom surface area of 770 sf and 2-feet deep. A more detail basin routing analysis for each of the required storm frequency to meet the Riverside County Flood Increase Runoff Criteria will be provided in the final drainage study.

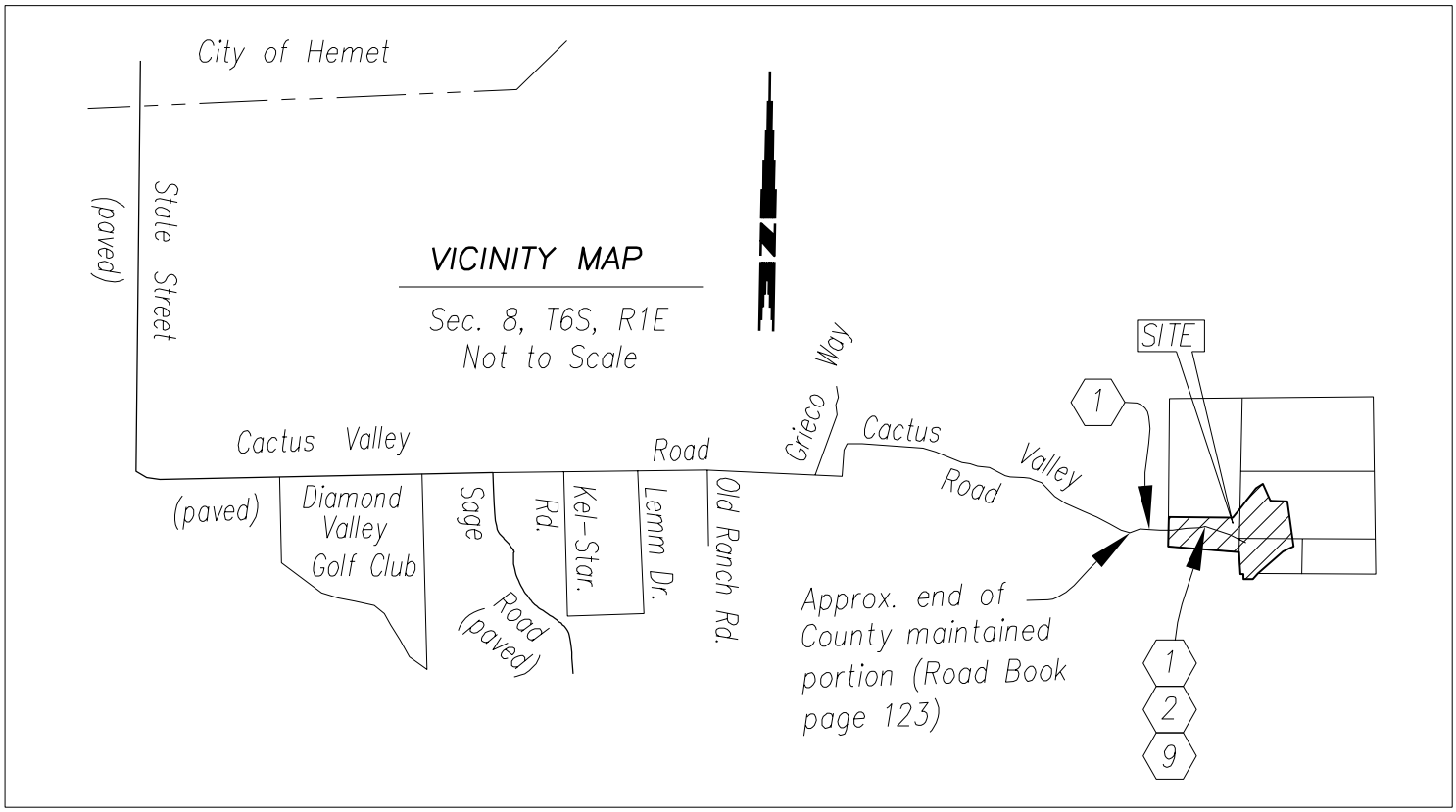
Proposed Basin – FACILITY 7			
Stage	Area	Storage	Cumulative Storage
0	8,177	0	0
1	9,988	9,083	9,083
2	11,900	10,944	20,027

Proposed Basin – FACILITY 6			
Stage	Area	Storage	Cumulative Storage
0	770	0	0
1	1,331	1,050	1,050
2	1,993	1,662	2,712

APPENDIX “A”

REFERENCE MATERIALS:

VICINITY MAP
POINT PRECIPITATION FREQUENCY ESTIMATES
SOIL CLASSIFICATION MAP
SOIL COVER TYPE
SITE PHOTOS


City of Hemet
State Street
(paved)
VICINITY MAP
Sec. 8, T6S, R1E
Not to Scale
Cactus Valley
(paved)
Diamond Valley Golf Club
Sage Road (paved)
Kel-Star. Rd.
Lemm Dr.
Old Ranch Rd.
Road
Grieco Way
Cactus Valley Road
SITE
1
Approx. end of County maintained portion (Road Book page 123)
1
2
9

NOAA Atlas 14, Volume 6, Version 2
Location name: Hemet, California, USA*
Latitude: 33.669°, Longitude: -116.8978°
Elevation: 2095.49 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

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

Duration	Annual exceedance probability (1/years)								
	1/2	1/5	1/10	1/25	1/50	1/100	1/200	1/500	1/1000
5-min	0.122 (0.102-0.147)	0.193 (0.161-0.234)	0.245 (0.203-0.299)	0.319 (0.255-0.403)	0.381 (0.298-0.493)	0.450 (0.343-0.597)	0.527 (0.389-0.720)	0.642 (0.454-0.916)	0.742 (0.507-1.10)
10-min	0.174 (0.146-0.210)	0.277 (0.231-0.335)	0.351 (0.291-0.428)	0.457 (0.365-0.578)	0.547 (0.427-0.707)	0.645 (0.491-0.856)	0.755 (0.558-1.03)	0.920 (0.651-1.31)	1.06 (0.726-1.57)
15-min	0.211 (0.176-0.254)	0.335 (0.279-0.405)	0.424 (0.351-0.518)	0.553 (0.442-0.699)	0.661 (0.516-0.855)	0.780 (0.594-1.04)	0.913 (0.675-1.25)	1.11 (0.788-1.59)	1.29 (0.878-1.90)
30-min	0.321 (0.268-0.387)	0.509 (0.425-0.616)	0.646 (0.534-0.788)	0.841 (0.672-1.06)	1.01 (0.785-1.30)	1.19 (0.904-1.58)	1.39 (1.03-1.90)	1.69 (1.20-2.42)	1.96 (1.34-2.90)
60-min	0.476 (0.398-0.575)	0.756 (0.631-0.915)	0.959 (0.794-1.17)	1.25 (0.998-1.58)	1.49 (1.17-1.93)	1.76 (1.34-2.34)	2.06 (1.53-2.82)	2.52 (1.78-3.59)	2.91 (1.98-4.30)
2-hr	0.670 (0.561-0.809)	1.01 (0.842-1.22)	1.25 (1.03-1.52)	1.59 (1.27-2.01)	1.86 (1.46-2.41)	2.17 (1.65-2.87)	2.50 (1.85-3.41)	2.98 (2.11-4.26)	3.40 (2.32-5.03)
3-hr	0.811 (0.678-0.979)	1.20 (0.999-1.45)	1.47 (1.22-1.79)	1.85 (1.48-2.34)	2.16 (1.69-2.79)	2.49 (1.90-3.31)	2.86 (2.11-3.91)	3.40 (2.40-4.85)	3.85 (2.63-5.70)
6-hr	1.14 (0.951-1.37)	1.65 (1.38-2.00)	2.01 (1.66-2.45)	2.50 (2.00-3.16)	2.90 (2.27-3.75)	3.34 (2.54-4.43)	3.81 (2.81-5.20)	4.50 (3.18-6.42)	5.08 (3.47-7.51)
12-hr	1.53 (1.28-1.84)	2.21 (1.85-2.68)	2.69 (2.23-3.29)	3.37 (2.69-4.26)	3.92 (3.06-5.07)	4.51 (3.43-5.99)	5.16 (3.82-7.06)	6.12 (4.33-8.73)	6.92 (4.72-10.2)
24-hr	2.04 (1.80-2.35)	3.00 (2.64-3.47)	3.68 (3.22-4.29)	4.64 (3.93-5.59)	5.44 (4.51-6.69)	6.31 (5.11-7.94)	7.26 (5.73-9.39)	8.67 (6.57-11.7)	9.87 (7.24-13.7)
2-day	2.50 (2.21-2.88)	3.77 (3.33-4.37)	4.68 (4.10-5.46)	5.97 (5.06-7.19)	7.03 (5.83-8.64)	8.18 (6.63-10.3)	9.44 (7.45-12.2)	11.3 (8.56-15.2)	12.9 (9.42-17.9)
3-day	2.69 (2.38-3.11)	4.16 (3.66-4.81)	5.19 (4.55-6.06)	6.66 (5.64-8.02)	7.87 (6.53-9.67)	9.18 (7.44-11.6)	10.6 (8.37-13.7)	12.7 (9.64-17.1)	14.5 (10.6-20.1)
4-day	2.90 (2.56-3.35)	4.53 (3.99-5.24)	5.69 (4.98-6.63)	7.33 (6.21-8.82)	8.68 (7.20-10.7)	10.1 (8.22-12.8)	11.7 (9.27-15.2)	14.1 (10.7-19.0)	16.1 (11.8-22.4)
7-day	3.32 (2.93-3.83)	5.27 (4.65-6.10)	6.67 (5.84-7.77)	8.65 (7.33-10.4)	10.3 (8.55-12.7)	12.1 (9.82-15.2)	14.1 (11.1-18.2)	17.0 (12.9-22.9)	19.5 (14.3-27.2)
10-day	3.58 (3.17-4.14)	5.75 (5.07-6.65)	7.30 (6.39-8.51)	9.52 (8.06-11.5)	11.4 (9.43-14.0)	13.4 (10.9-16.9)	15.6 (12.3-20.2)	18.9 (14.3-25.5)	21.7 (15.9-30.3)
20-day	4.34 (3.84-5.02)	7.06 (6.23-8.17)	9.01 (7.89-10.5)	11.8 (9.98-14.2)	14.1 (11.7-17.3)	16.6 (13.5-20.9)	19.4 (15.3-25.1)	23.5 (17.8-31.7)	27.1 (19.8-37.7)
30-day	5.14 (4.54-5.93)	8.36 (7.37-9.67)	10.7 (9.33-12.4)	13.9 (11.8-16.8)	16.6 (13.8-20.4)	19.6 (15.9-24.6)	22.8 (18.0-29.5)	27.6 (20.9-37.2)	31.7 (23.3-44.1)
45-day	6.08 (5.37-7.02)	9.81 (8.65-11.3)	12.4 (10.9-14.5)	16.1 (13.7-19.4)	19.2 (15.9-23.6)	22.5 (18.2-28.3)	26.2 (20.6-33.8)	31.5 (23.9-42.5)	36.1 (26.5-50.2)
60-day	7.07 (6.25-8.16)	11.3 (9.92-13.0)	14.2 (12.4-16.5)	18.3 (15.5-22.0)	21.6 (18.0-26.6)	25.3 (20.5-31.8)	29.3 (23.1-37.9)	35.1 (26.6-47.3)	40.1 (29.4-55.8)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of annual maxima series (AMS).

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 annual exceedance probability) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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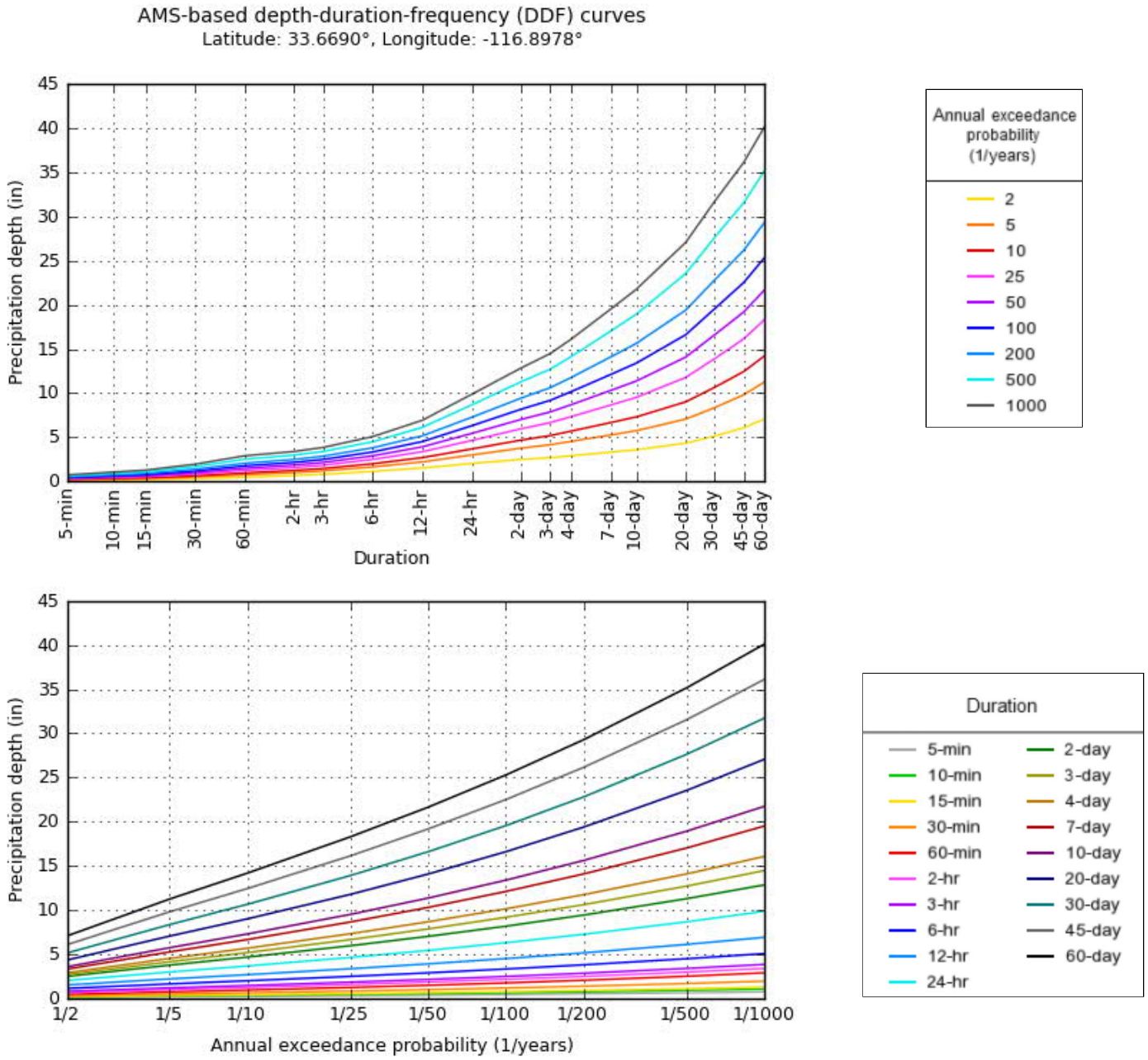
PF graphical



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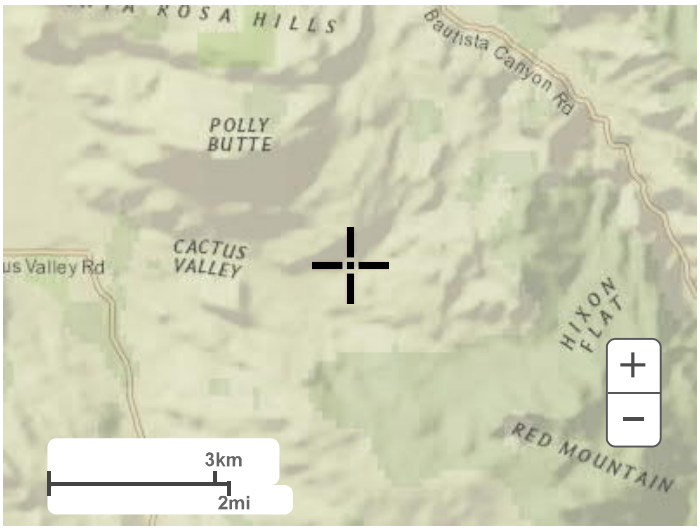
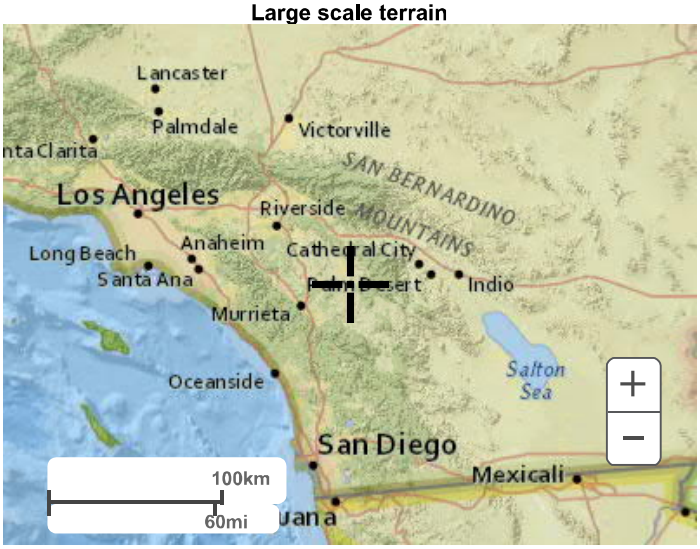
Maps & aerials

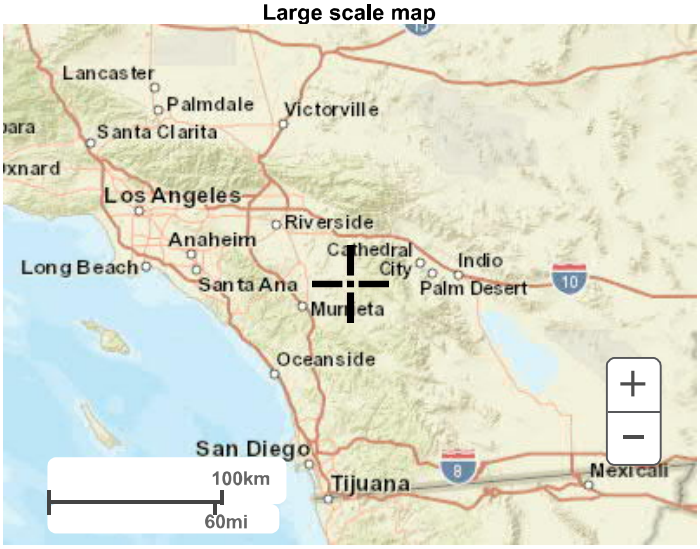
Small scale terrain



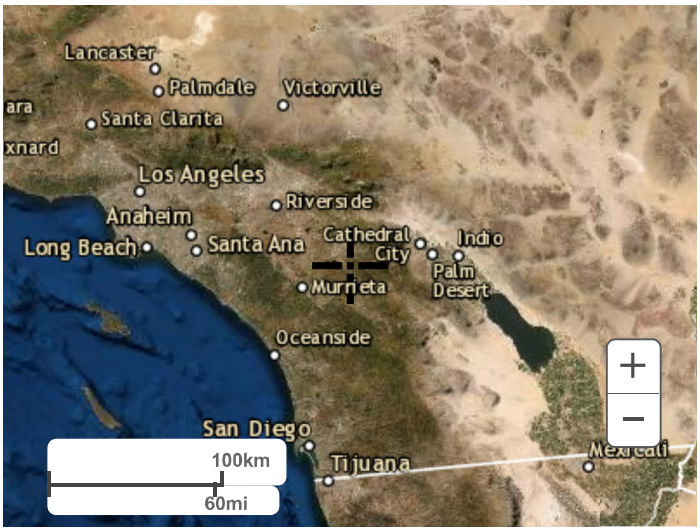
Large scale terrain



Large scale map



Large scale aerial



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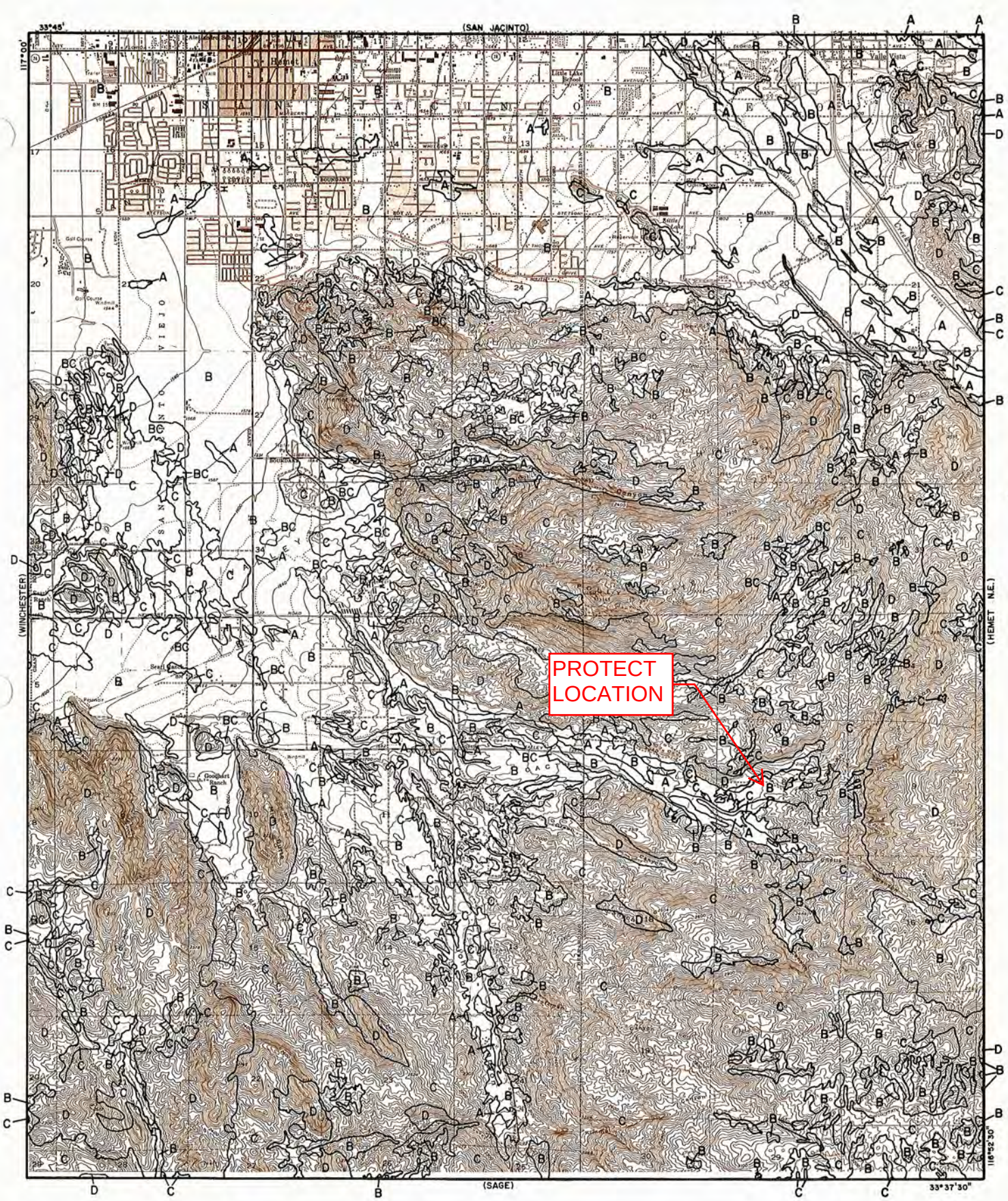
US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov



LEGEND

—— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

RCFC&WCD

HYDROLOGY MANUAL

N

0 FEET 5000

HYDROLOGIC SOILS GROUP MAP FOR HEMET

PLATE C-1.44

COVER TYPE DESCRIPTIONS

NATURAL COVERS -

Barren - Areas with 15 percent or less of the ground surface covered by plants or litter. It includes rockland, eroded land, and shaped or graded land. Barren land does not include fallow land.

Chaparral, Broadleaf - Areas on which the principal vegetation consists of evergreen shrubs with broad, hard, stiff leaves such as manzonita, ceanothus and scrub oak. The brush cover is usually dense or moderately dense.

Chaparral, Narrowleaf - Land on which the principal vegetation consists of diffusely branched evergreen shrubs with fine needle-like leaves such as chamise and redshank. The shrubs are usually widely spaced and low in growth. If the narrowleaf chaparral shrubs are dense and high; the land should be included with broadleaf chaparral cover.

Grass, Annual - Land on which the principal vegetation consists of annual grasses and weeds such as annual bromes, wild barley, soft chess, ryegrass and filaree.

Grass, Perennial - Areas on which the principal vegetation consists of perennial grass, either native or introduced, and which grows under normal dryland conditions. Examples are Stipa or needle grass, Harding grass and wheat grass. It does not include irrigated and meadow grasses.

Meadow - Land areas with seasonally high water table, often called cienegas. Principal vegetation consists of sod-forming grasses interspersed with other plants.

Open Brush - Principal vegetation consists of soft wood shrubs, usually grayish in color. Examples include California buckwheat, California sagebrush, black sage, white sage and purple sage. It also includes vegetation on desert facing slopes where broadleaf chaparral predominate in an open shrub cover.

Woodland - Areas on which coniferous or broadleaf trees predominate. The crown or canopy density, the amount of ground surface shaded at high noon, is at least 50 percent. Open areas may have a cover of annual or perennial grasses or of brush. Plant cover under the trees is usually sparse because of leaf or needle litter accumulation.

Woodland, Grass - Areas with an open cover of broadleaf or coniferous trees usually live oak and pines, with the intervening ground space occupied by annual grasses or weeds. The trees may occur singly or in small clumps. Canopy density, the amount of ground surface shaded at high noon, is from 20 to 50 percent.

URBAN COVERS -

Residential or Commercial Landscaping - The pervious portions of commercial establishments, single and multiple family dwellings, trailer parks and schools where the predominant land cover is lawn, shrubbery and trees.

RUNOFF INDEX 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
Chaparrel, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparrel, 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	72	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	28	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)		76	85	90	92

RCFC & WCD
HYDROLOGY MANUAL

RUNOFF INDEX NUMBERS FOR PERVIOUS AREA

ACTUAL IMPERVIOUS COVER

Land Use (1)	Range-Percent	Recommended Value For Average Conditions-Percent(2)
Natural or Agriculture	0 - 10	0
Single Family Residential: (3)		
40,000 S. F. (1 Acre) Lots	10 - 25	20
20,000 S. F. (½ Acre) Lots	30 - 45	40
7,200 - 10,000 S. F. Lots	45 - 55	50
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 should 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 horse ranch subdivisions increase impervious area 5 percent over the values recommended in the table above.

RCFC & WCD
HYDROLOGY MANUAL

IMPERVIOUS COVER FOR DEVELOPED AREAS

PLATE E-6.3


1075
NO PARKING


1075
2
NO
PARKING

APPENDIX “B”

SOILS REPORTS:
WEBSOIL REPORT

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Western Riverside Area, California

October 15, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

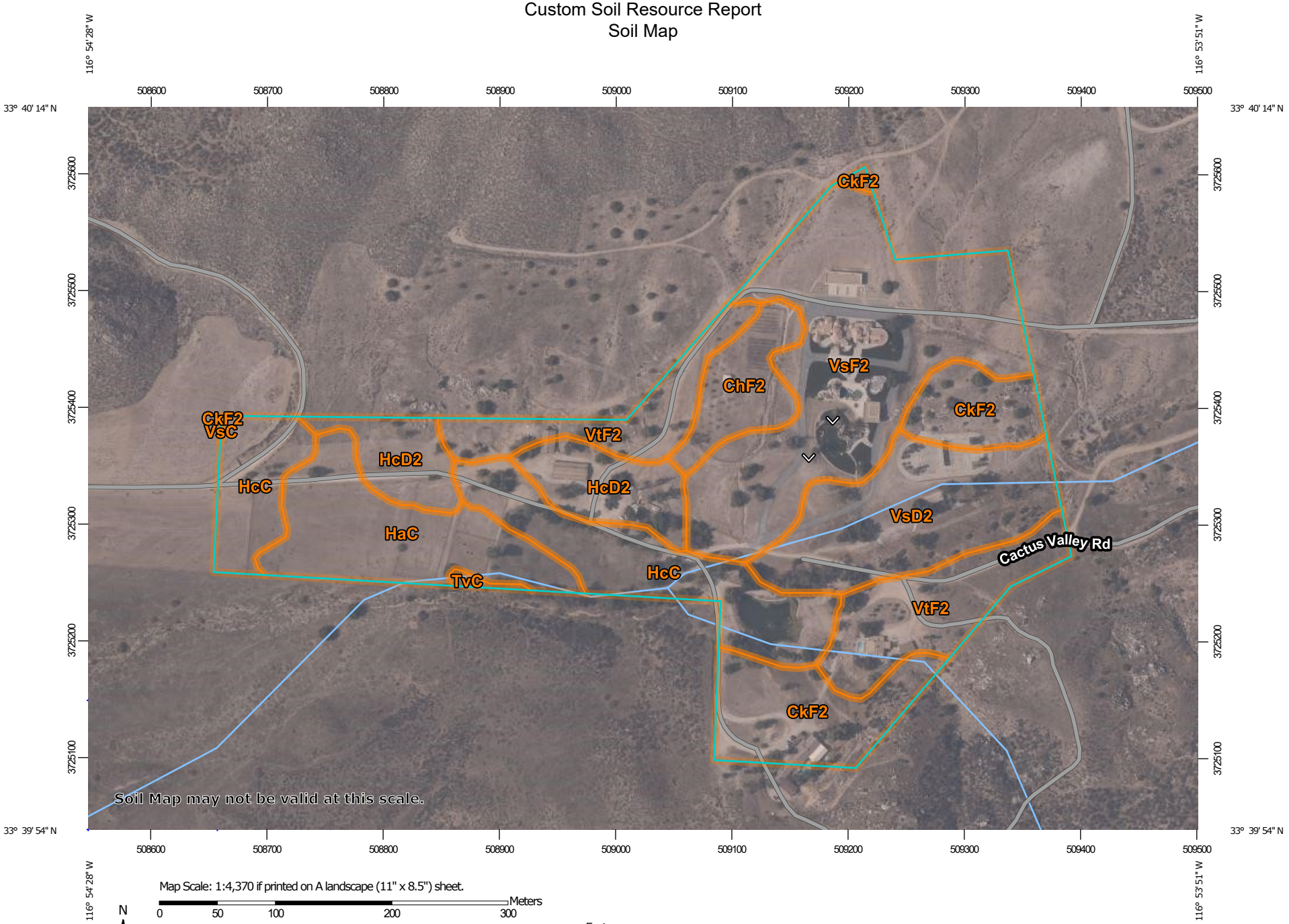
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:4,370 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

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 1:15,800.

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: Western Riverside Area, California
Survey Area Data: Version 14, 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: Aug 18, 2018—Aug 22, 2018

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
ChF2	Cieneba sandy loam, 15 to 50 percent slopes, eroded	2.0	4.6%
CkF2	Cieneba rocky sandy loam, 15 to 50 percent slopes, eroded	5.1	11.6%
HaC	Hanford loamy fine sand, 0 to 8 percent slopes	4.5	10.3%
HcC	Hanford coarse sandy loam, 2 to 8 percent slopes	6.5	14.8%
HcD2	Hanford coarse sandy loam, 8 to 15 percent slopes, eroded	3.6	8.3%
TvC	Tujunga loamy sand, channeled, 0 to 8 percent slopes	0.1	0.3%
VsC	Vista coarse sandy loam, 2 to 8 percent slopes	0.0	0.0%
VsD2	Vista coarse sandy loam, 8 to 15 percent slopes, eroded	5.5	12.6%
VsF2	Vista coarse sandy loam, 15 to 35 percent slopes, eroded	10.7	24.4%
VtF2	Vista rocky coarse sandy loam, 2 to 35 percent slopes, eroded	5.7	13.1%
Totals for Area of Interest		**43.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a

particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Western Riverside Area, California

ChF2—Cieneba sandy loam, 15 to 50 percent slopes, eroded

Map Unit Setting

National map unit symbol: hcsc
Elevation: 500 to 4,000 feet
Mean annual precipitation: 12 to 35 inches
Mean annual air temperature: 57 to 64 degrees F
Frost-free period: 200 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Cieneba

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from igneous rock

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 22 inches: weathered bedrock

Properties and qualities

Slope: 15 to 50 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R019XD060CA - SHALLOW LOAMY (1975)
Hydric soil rating: No

Minor Components

Friant

Percent of map unit: 5 percent
Hydric soil rating: No

Fallbrook
Percent of map unit: 5 percent
Hydric soil rating: No

Vista
Percent of map unit: 5 percent
Hydric soil rating: No

CkF2—Cieneba rocky sandy loam, 15 to 50 percent slopes, eroded

Map Unit Setting
National map unit symbol: hcsf
Elevation: 500 to 4,000 feet
Mean annual precipitation: 12 to 35 inches
Mean annual air temperature: 57 to 64 degrees F
Frost-free period: 200 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition
Cieneba and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cieneba

Setting
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from igneous rock

Typical profile
H1 - 0 to 14 inches: sandy loam
H2 - 14 to 22 inches: weathered bedrock

Properties and qualities
Slope: 15 to 50 percent
Depth to restrictive feature: 14 to 22 inches to paralithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.4 inches)

Interpretive groups
Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R019XD060CA - SHALLOW LOAMY (1975)
Hydric soil rating: No

Minor Components

Rock outcrop
Percent of map unit: 10 percent
Hydric soil rating: No

Vista
Percent of map unit: 3 percent
Hydric soil rating: No

Fallbrook
Percent of map unit: 3 percent
Hydric soil rating: No

Escondido
Percent of map unit: 3 percent
Hydric soil rating: No

Friant
Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed
Percent of map unit: 3 percent
Hydric soil rating: No

HaC—Hanford loamy fine sand, 0 to 8 percent slopes

Map Unit Setting
National map unit symbol: 2y8tt
Elevation: 840 to 2,490 feet
Mean annual precipitation: 10 to 16 inches
Mean annual air temperature: 63 to 65 degrees F
Frost-free period: 280 to 365 days
Farmland classification: Prime farmland if irrigated

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

Description of Hanford

Setting
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear

Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

A - 0 to 8 inches: loamy fine sand
C1 - 8 to 40 inches: fine sandy loam
C2 - 40 to 60 inches: stratified loamy sand to coarse sandy loam

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: R020XD012CA - SANDY
Hydric soil rating: No

Minor Components

Greenfield

Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Ramona

Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Tujunga

Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

HcC—Hanford coarse sandy loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2y8tk
Elevation: 680 to 2,930 feet
Mean annual precipitation: 9 to 17 inches
Mean annual air temperature: 63 to 65 degrees F
Frost-free period: 290 to 365 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Hanford

Setting

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

Typical profile

A - 0 to 8 inches: coarse sandy loam
C1 - 8 to 40 inches: fine sandy loam
C2 - 40 to 60 inches: stratified loamy sand to coarse sandy loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: R020XD012CA - SANDY
Hydric soil rating: No

Minor Components

Greenfield
Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Ramona
Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Tujunga
Percent of map unit: 2 percent
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Unnamed
Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed
Percent of map unit: 1 percent
Hydric soil rating: No

HcD2—Hanford coarse sandy loam, 8 to 15 percent slopes, eroded

Map Unit Setting
National map unit symbol: 2y8tm
Elevation: 790 to 3,440 feet
Mean annual precipitation: 9 to 18 inches
Mean annual air temperature: 62 to 65 degrees F
Frost-free period: 250 to 365 days
Farmland classification: Farmland of statewide importance

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

Description of Hanford

Setting

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

Typical profile

A - 0 to 8 inches: coarse sandy loam
C1 - 8 to 40 inches: fine sandy loam
C2 - 40 to 60 inches: stratified loamy sand to coarse sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: R020XD012CA - SANDY
Hydric soil rating: No

Minor Components

Tujunga

Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Ramona

Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Greenfield

Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Concave

Across-slope shape: Linear
Hydric soil rating: No

TvC—Tujunga loamy sand, channeled, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: hczl
Elevation: 10 to 2,900 feet
Mean annual precipitation: 8 to 25 inches
Mean annual air temperature: 46 to 64 degrees F
Frost-free period: 110 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

Tujunga and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tujunga

Setting

Landform: Alluvial fans, flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium derived from granite

Typical profile

H1 - 0 to 10 inches: loamy sand
H2 - 10 to 60 inches: loamy sand

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
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: NoneOccasional
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A
Ecological site: R019XD069CA - SANDY ALLUVIAL (1975)
Hydric soil rating: No

Minor Components

Riverwash
Percent of map unit: 10 percent
Landform: Drainageways
Hydric soil rating: Yes

Delhi
Percent of map unit: 10 percent
Hydric soil rating: No

Soboba
Percent of map unit: 5 percent
Hydric soil rating: No

VsC—Vista coarse sandy loam, 2 to 8 percent slopes

Map Unit Setting
National map unit symbol: hczx
Elevation: 400 to 3,900 feet
Mean annual precipitation: 10 to 18 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 210 to 300 days
Farmland classification: Farmland of statewide importance

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

Description of Vista

Setting
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum weathered from granite and/or residuum weathered from granodiorite

Typical profile
H1 - 0 to 15 inches: coarse sandy loam
H2 - 15 to 24 inches: coarse sandy loam
H3 - 24 to 30 inches: weathered bedrock

Properties and qualities
Slope: 2 to 8 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R019XD029CA - LOAMY
Hydric soil rating: No

Minor Components

Bonsall

Percent of map unit: 5 percent
Hydric soil rating: No

Fallbrook

Percent of map unit: 5 percent
Hydric soil rating: No

Cieneba

Percent of map unit: 5 percent
Hydric soil rating: No

VsD2—Vista coarse sandy loam, 8 to 15 percent slopes, eroded

Map Unit Setting

National map unit symbol: hczy
Elevation: 400 to 3,900 feet
Mean annual precipitation: 10 to 18 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 210 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Vista

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex

Parent material: Residuum weathered from granite and/or residuum weathered from granodiorite

Typical profile

H1 - 0 to 15 inches: coarse sandy loam
H2 - 15 to 24 inches: coarse sandy loam
H3 - 24 to 28 inches: weathered bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R019XD029CA - LOAMY
Hydric soil rating: No

Minor Components

Fallbrook

Percent of map unit: 5 percent
Hydric soil rating: No

Bonsall

Percent of map unit: 5 percent
Hydric soil rating: No

Cieneba

Percent of map unit: 5 percent
Hydric soil rating: No

VsF2—Vista coarse sandy loam, 15 to 35 percent slopes, eroded

Map Unit Setting

National map unit symbol: hczz
Elevation: 400 to 3,900 feet
Mean annual precipitation: 10 to 18 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 210 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Vista

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from granite and/or residuum weathered from granodiorite

Typical profile

H1 - 0 to 15 inches: coarse sandy loam
H2 - 15 to 24 inches: coarse sandy loam
H3 - 24 to 28 inches: weathered bedrock

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: R019XD029CA - LOAMY
Hydric soil rating: No

Minor Components

Bonsall

Percent of map unit: 5 percent
Hydric soil rating: No

Cieneba

Percent of map unit: 5 percent
Hydric soil rating: No

Fallbrook

Percent of map unit: 5 percent
Hydric soil rating: No

VtF2—Vista rocky coarse sandy loam, 2 to 35 percent slopes, eroded

Map Unit Setting

National map unit symbol: hd00
Elevation: 400 to 3,900 feet
Mean annual precipitation: 10 to 18 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 210 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Vista and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Vista

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from granodiorite and/or residuum weathered from granite

Typical profile

H1 - 0 to 15 inches: coarse sandy loam
H2 - 15 to 24 inches: coarse sandy loam
H3 - 24 to 28 inches: weathered bedrock

Properties and qualities

Slope: 2 to 35 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: R019XD029CA - LOAMY
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 10 percent
Hydric soil rating: No

Cieneba

Percent of map unit: 5 percent
Hydric soil rating: No

Fallbrook

Percent of map unit: 5 percent
Hydric soil rating: No

Bonsall

Percent of map unit: 5 percent
Hydric soil rating: No

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Physical Properties

Soil Physical Properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

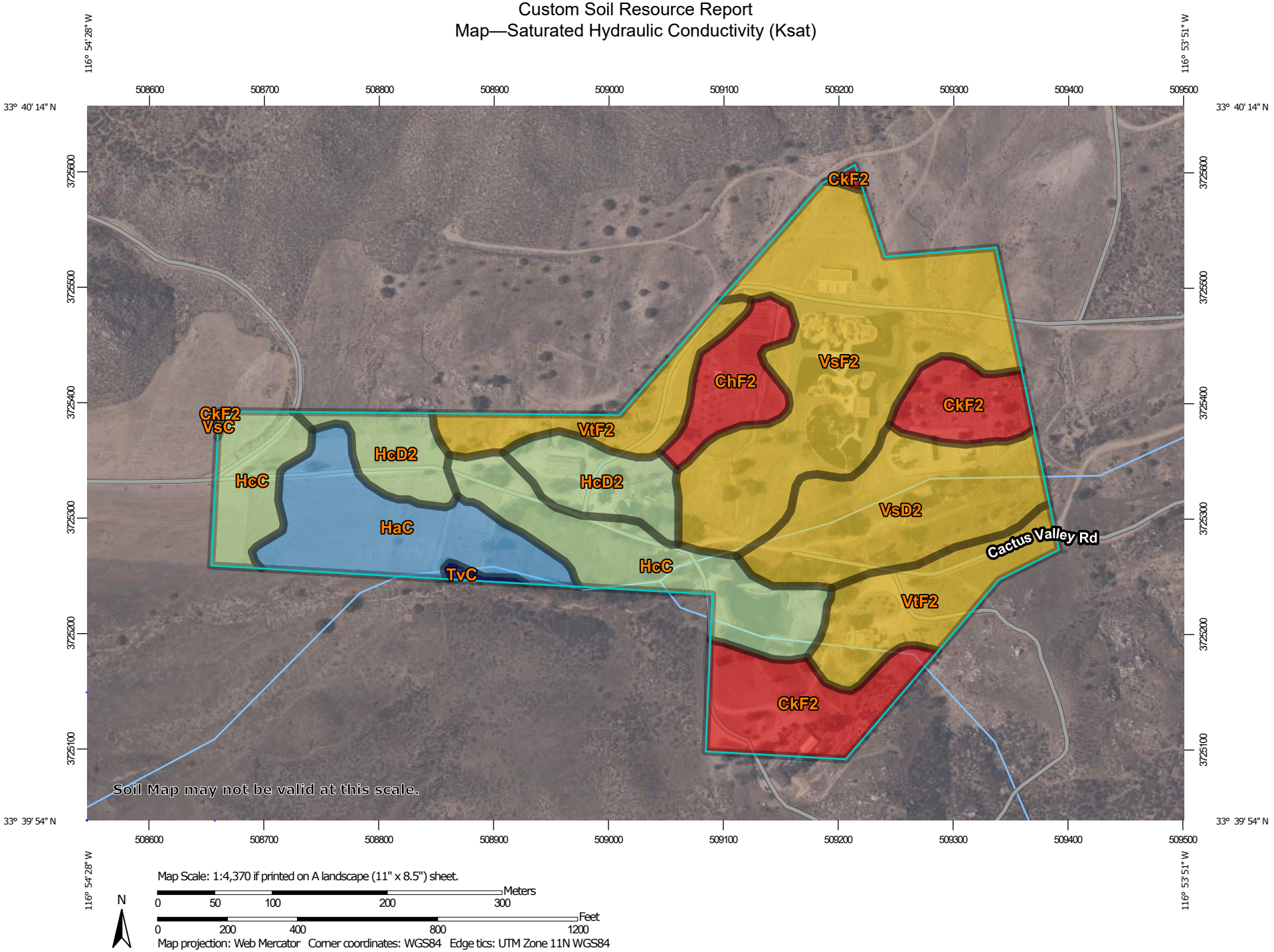
Saturated Hydraulic Conductivity (Ksat)

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits.

Custom Soil Resource Report
Map—Saturated Hydraulic Conductivity (Ksat)



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- <= 18.0750
- > 18.0750 and <= 24.0859
- > 24.0859 and <= 49.0526
- > 49.0526 and <= 57.4737
- > 57.4737 and <= 92.0000
- Not rated or not available

Soil Rating Lines

- <= 18.0750
- > 18.0750 and <= 24.0859
- > 24.0859 and <= 49.0526
- > 49.0526 and <= 57.4737
- > 57.4737 and <= 92.0000
- Not rated or not available

Soil Rating Points

- <= 18.0750
- > 18.0750 and <= 24.0859
- > 24.0859 and <= 49.0526
- > 49.0526 and <= 57.4737
- > 57.4737 and <= 92.0000
- Not rated or not available

Water Features

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 1:15,800.

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: Western Riverside Area, California
Survey Area Data: Version 14, 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: Aug 18, 2018—Aug 22, 2018

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 LEGEND

Streams and Canals

MAP INFORMATION

Table—Saturated Hydraulic Conductivity (Ksat)

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
ChF2	Cieneba sandy loam, 15 to 50 percent slopes, eroded	18.0750	2.0	4.6%
CkF2	Cieneba rocky sandy loam, 15 to 50 percent slopes, eroded	18.0750	5.1	11.6%
HaC	Hanford loamy fine sand, 0 to 8 percent slopes	57.4737	4.5	10.3%
HcC	Hanford coarse sandy loam, 2 to 8 percent slopes	49.0526	6.5	14.8%
HcD2	Hanford coarse sandy loam, 8 to 15 percent slopes, eroded	49.0526	3.6	8.3%
TvC	Tujunga loamy sand, channeled, 0 to 8 percent slopes	92.0000	0.1	0.3%
VsC	Vista coarse sandy loam, 2 to 8 percent slopes	22.5151	0.0	0.0%
VsD2	Vista coarse sandy loam, 8 to 15 percent slopes, eroded	24.0859	5.5	12.6%
VsF2	Vista coarse sandy loam, 15 to 35 percent slopes, eroded	24.0859	10.7	24.4%
VtF2	Vista rocky coarse sandy loam, 2 to 35 percent slopes, eroded	24.0859	5.7	13.1%
Totals for Area of Interest			**43.7**	**100.0%**

Rating Options—Saturated Hydraulic Conductivity (Ksat)

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Fastest

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): All Layers (Weighted Average)

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

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

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

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

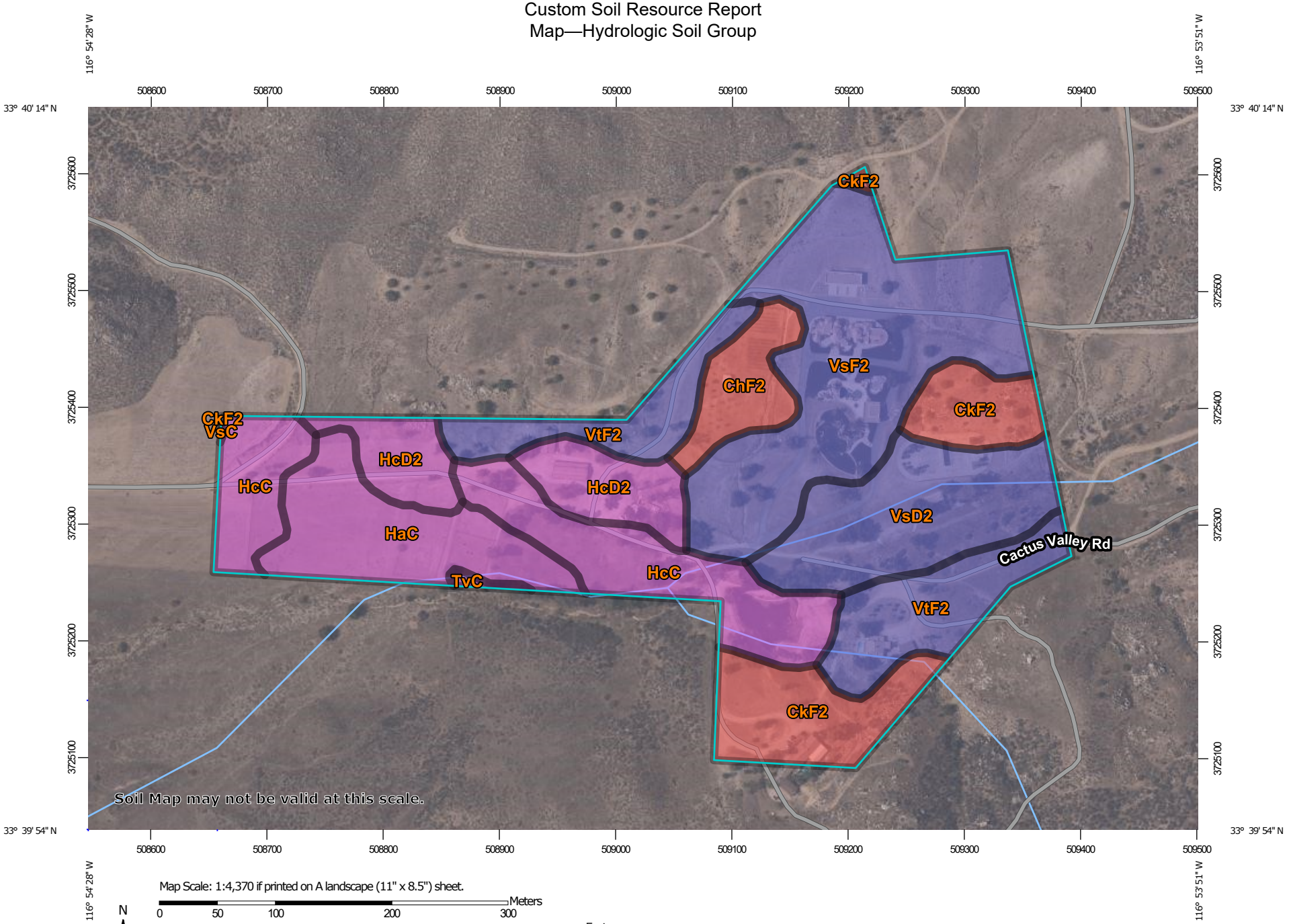
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

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

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

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

Custom Soil Resource Report
Map—Hydrologic Soil Group



MAP LEGEND

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

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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: Western Riverside Area, California
Survey Area Data: Version 14, 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: Aug 18, 2018—Aug 22, 2018

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.

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
ChF2	Cieneba sandy loam, 15 to 50 percent slopes, eroded	D	2.0	4.6%
CkF2	Cieneba rocky sandy loam, 15 to 50 percent slopes, eroded	D	5.1	11.6%
HaC	Hanford loamy fine sand, 0 to 8 percent slopes	A	4.5	10.3%
HcC	Hanford coarse sandy loam, 2 to 8 percent slopes	A	6.5	14.8%
HcD2	Hanford coarse sandy loam, 8 to 15 percent slopes, eroded	A	3.6	8.3%
TvC	Tujunga loamy sand, channeled, 0 to 8 percent slopes	A	0.1	0.3%
VsC	Vista coarse sandy loam, 2 to 8 percent slopes	B	0.0	0.0%
VsD2	Vista coarse sandy loam, 8 to 15 percent slopes, eroded	B	5.5	12.6%
VsF2	Vista coarse sandy loam, 15 to 35 percent slopes, eroded	B	10.7	24.4%
VtF2	Vista rocky coarse sandy loam, 2 to 35 percent slopes, eroded	B	5.7	13.1%
Totals for Area of Interest			**43.7**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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APPENDIX “C”

RATIONAL METHOD:

PRE-DEVELOPED CONDITION Q_2, Q_{10} & Q_{100}
POST-DEVELOPED CONDITION Q_2, Q_{10} & Q_{100}

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 08/24/21 File:1162008EXA2.out

VALUED ENGINEERING, INC
1162008 - PARADISE VALLEY RANCH
EXISTING HYDROLOGY STUDY - LOCATION A
2-YR STORM EVENT

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

English (in-lb) Units used in input data file

Program License Serial Number 6335

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 2.00 Antecedent Moisture Condition = 1

Standard intensity-duration curves data (Plate D-4.1)
For the [Hemet] area used.
10 year storm 10 minute intensity = 1.960(In/Hr)
10 year storm 60 minute intensity = 0.760(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.180(In/Hr)

Storm event year = 2.0
Calculated rainfall intensity data:
1 hour intensity = 0.466(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 1.000 to Point/Station 1.100
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 874.000(Ft.)
Top (of initial area) elevation = 2007.800(Ft.)
Bottom (of initial area) elevation = 1988.200(Ft.)
Difference in elevation = 19.600(Ft.)
Slope = 0.02243 s(percent)= 2.24
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 17.011 min.
Rainfall intensity = 0.910(In/Hr) for a 2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.343
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
RI index for soil(AMC 1) = 47.40
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 1.011(CFS)
Total initial stream area = 3.244(Ac.)
Pervious area fraction = 1.000

++

Process from Point/Station 2.000 to Point/Station 2.100
**** INITIAL AREA EVALUATION ****

```
Initial area flow distance =   637.000(Ft.)
Top (of initial area) elevation =  1989.200(Ft.)
Bottom (of initial area) elevation =  1976.800(Ft.)
Difference in elevation =    12.400(Ft.)
Slope =    0.01947  s(percent)=       1.95
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.420 min.
Rainfall intensity =      0.958(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.354
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
RI index for soil(AMC 1)  =  47.40
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      1.217(CFS)
Total initial stream area =        3.590(Ac.)
Pervious area fraction = 1.000
End of computations, total study area =            6.83 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  67.0
```

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 08/20/21 File:1162008EXB2.out

VALUED ENGINEERING, INC.
1162008 - PARADISE VALLEY RANCH
EXISTING HYDROLOGY STUDY- LOCATION B
2-YR STORM EVENT

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

English (in-lb) Units used in input data file

Program License Serial Number 6335

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 2.00 Antecedent Moisture Condition = 1

Standard intensity-duration curves data (Plate D-4.1)
For the [Hemet] area used.
10 year storm 10 minute intensity = 1.960(In/Hr)
10 year storm 60 minute intensity = 0.760(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.180(In/Hr)

Storm event year = 2.0
Calculated rainfall intensity data:
1 hour intensity = 0.466(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 1.000 to Point/Station 1.100
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 340.000(Ft.)
Top (of initial area) elevation = 2450.000(Ft.)
Bottom (of initial area) elevation = 2427.000(Ft.)
Difference in elevation = 23.000(Ft.)
Slope = 0.06765 s(percent)= 6.76
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 9.350 min.
Rainfall intensity = 1.249(In/Hr) for a 2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.677
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1) = 76.40
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 2.190(CFS)
Total initial stream area = 2.590(Ac.)
Pervious area fraction = 1.000

++

Process from Point/Station 1.100 to Point/Station 1.200
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

```
Estimated mean flow rate at midpoint of channel =     13.217(CFS)
Depth of flow =   0.821(Ft.), Average velocity =   9.797(Ft/s)
       ******* Irregular Channel Data ***********
-----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              2.50
       2              5.00              0.00
       3             10.00              2.50
Manning's 'N' friction factor =   0.030
-----------------------------------------------------------------
Sub-Channel flow  =     13.217(CFS)
  '     '        flow top width =      3.285(Ft.)
  '     '    velocity=    9.797(Ft/s)
  '     '        area =      1.349(Sq.Ft)
  '     '        Froude number =     2.694

Upstream point elevation =  2427.000(Ft.)
Downstream point elevation =  2085.800(Ft.)
Flow length =  2294.000(Ft.)
Travel time  =    3.90 min.
Time of concentration =   13.25 min.
Depth of flow =   0.821(Ft.)
Average velocity =   9.797(Ft/s)
Total irregular channel flow =    13.217(CFS)
Irregular channel normal depth above invert elev. =   0.821(Ft.)
Average velocity of channel(s) =   9.797(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.644
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1)  =  76.40
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.038(In/Hr) for a     2.0 year storm
Subarea runoff =     21.997(CFS) for     32.870(Ac.)
Total runoff =     24.187(CFS)  Total area =      35.460(Ac.)
Depth of flow =   1.030(Ft.), Average velocity =  11.395(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.200 to Point/Station        1.300
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
-----------------------------------------------------------------
Estimated mean flow rate at midpoint of channel =     24.552(CFS)
Depth of flow =   1.080(Ft.), Average velocity =  10.523(Ft/s)
       ******* Irregular Channel Data ***********
-----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              2.50
       2              5.00              0.00
       3             10.00              2.50
Manning's 'N' friction factor =   0.030
-----------------------------------------------------------------
Sub-Channel flow  =     24.552(CFS)
  '     '        flow top width =      4.320(Ft.)
  '     '    velocity=   10.523(Ft/s)
  '     '        area =      2.333(Sq.Ft)
  '     '        Froude number =     2.524

Upstream point elevation =  2085.800(Ft.)
Downstream point elevation =  2044.000(Ft.)
Flow length =   351.000(Ft.)
Travel time  =    0.56 min.
Time of concentration =   13.81 min.
Depth of flow =   1.080(Ft.)
Average velocity =  10.523(Ft/s)
```

```
Total irregular channel flow =    24.552(CFS)
Irregular channel normal depth above invert elev. =   1.080(Ft.)
Average velocity of channel(s) =  10.523(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.518
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.750
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.250
RI index for soil(AMC 1)  =  64.05
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.016(In/Hr) for a     2.0 year storm
Subarea runoff =      0.679(CFS) for      1.290(Ac.)
Total runoff =     24.866(CFS)  Total area =      36.750(Ac.)
Depth of flow =   1.085(Ft.), Average velocity =  10.557(Ft/s)
End of computations, total study area =           36.75 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  88.7
```

Riverside County Rational Hydrology Program

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Rational Hydrology Study Date: 08/24/21 File:1162008EXA10.out

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VALUED ENGINEERING, INC
1162008 - PARADISE VALLEY RANCH
EXISTING HYDROLOGY STUDY - LOCATION A
10-YR STORM EVENT

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

English (in-lb) Units used in input data file

Program License Serial Number 6335

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Hemet] area used.
10 year storm 10 minute intensity = 1.960(In/Hr)
10 year storm 60 minute intensity = 0.760(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.180(In/Hr)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.760(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 1.000 to Point/Station 1.100
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 874.000(Ft.)
Top (of initial area) elevation = 2007.800(Ft.)
Bottom (of initial area) elevation = 1988.200(Ft.)
Difference in elevation = 19.600(Ft.)
Slope = 0.02243 s(percent)= 2.24
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 17.011 min.
Rainfall intensity = 1.482(In/Hr) for a 10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.624
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
RI index for soil(AMC 2) = 67.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 2.999(CFS)
Total initial stream area = 3.244(Ac.)
Pervious area fraction = 1.000

++

Process from Point/Station 2.000 to Point/Station 2.100
**** INITIAL AREA EVALUATION ****

```
Initial area flow distance =   637.000(Ft.)
Top (of initial area) elevation =  1989.200(Ft.)
Bottom (of initial area) elevation =  1976.800(Ft.)
Difference in elevation =    12.400(Ft.)
Slope =    0.01947  s(percent)=       1.95
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.420 min.
Rainfall intensity =      1.562(In/Hr) for a    10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.634
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
RI index for soil(AMC 2)  =  67.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      3.552(CFS)
Total initial stream area =        3.590(Ac.)
Pervious area fraction = 1.000
End of computations, total study area =            6.83 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  67.0
```

Riverside County Rational Hydrology Program

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Rational Hydrology Study Date: 08/20/21 File:1162008EXB10.out

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VALUED ENGINEERING, INC.
1162008 - PARADISE VALLEY RANCH
EXISTING HYDROLOGY STUDY- LOCATION B
10-YR STORM EVENT

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

English (in-lb) Units used in input data file

Program License Serial Number 6335

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Hemet] area used.
10 year storm 10 minute intensity = 1.960(In/Hr)
10 year storm 60 minute intensity = 0.760(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.180(In/Hr)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.760(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 1.000 to Point/Station 1.100
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 340.000(Ft.)
Top (of initial area) elevation = 2450.000(Ft.)
Bottom (of initial area) elevation = 2427.000(Ft.)
Difference in elevation = 23.000(Ft.)
Slope = 0.06765 s(percent)= 6.76
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 9.350 min.
Rainfall intensity = 2.036(In/Hr) for a 10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.833
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2) = 89.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 4.390(CFS)
Total initial stream area = 2.590(Ac.)
Pervious area fraction = 1.000

++

Process from Point/Station 1.100 to Point/Station 1.200
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

```
Estimated mean flow rate at midpoint of channel =     27.925(CFS)
Depth of flow =   1.087(Ft.), Average velocity =  11.812(Ft/s)
       ******* Irregular Channel Data ***********
--------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              2.50
       2              5.00              0.00
       3             10.00              2.50
Manning's 'N' friction factor =   0.030
--------------------------------------------------------------------
Sub-Channel flow  =     27.925(CFS)
  '     '        flow top width =      4.349(Ft.)
  '     '    velocity=   11.812(Ft/s)
  '     '        area =      2.364(Sq.Ft)
  '     '        Froude number =     2.823

Upstream point elevation =  2427.000(Ft.)
Downstream point elevation =  2085.800(Ft.)
Flow length =  2294.000(Ft.)
Travel time  =    3.24 min.
Time of concentration =   12.59 min.
Depth of flow =   1.087(Ft.)
Average velocity =  11.812(Ft/s)
Total irregular channel flow =    27.925(CFS)
Irregular channel normal depth above invert elev. =   1.087(Ft.)
Average velocity of channel(s) =  11.812(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.822
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  89.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.739(In/Hr) for a    10.0 year storm
Subarea runoff =     46.989(CFS) for     32.870(Ac.)
Total runoff =     51.379(CFS)  Total area =      35.460(Ac.)
Depth of flow =   1.367(Ft.), Average velocity =  13.757(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.200 to Point/Station        1.300
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
--------------------------------------------------------------------
Estimated mean flow rate at midpoint of channel =     52.263(CFS)
Depth of flow =   1.434(Ft.), Average velocity =  12.711(Ft/s)
       ******* Irregular Channel Data ***********
--------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              2.50
       2              5.00              0.00
       3             10.00              2.50
Manning's 'N' friction factor =   0.030
--------------------------------------------------------------------
Sub-Channel flow  =     52.263(CFS)
  '     '        flow top width =      5.735(Ft.)
  '     '    velocity=   12.711(Ft/s)
  '     '        area =      4.112(Sq.Ft)
  '     '        Froude number =     2.646

Upstream point elevation =  2085.800(Ft.)
Downstream point elevation =  2044.000(Ft.)
Flow length =   351.000(Ft.)
Travel time  =    0.46 min.
Time of concentration =   13.05 min.
Depth of flow =   1.434(Ft.)
Average velocity =  12.711(Ft/s)
```

```
Total irregular channel flow =    52.263(CFS)
Irregular channel normal depth above invert elev. =   1.434(Ft.)
Average velocity of channel(s) =  12.711(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.759
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.750
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.250
RI index for soil(AMC 2)  =  80.75
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.706(In/Hr) for a    10.0 year storm
Subarea runoff =      1.670(CFS) for      1.290(Ac.)
Total runoff =     53.048(CFS)  Total area =      36.750(Ac.)
Depth of flow =   1.442(Ft.), Average velocity =  12.758(Ft/s)
End of computations, total study area =           36.75 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  88.7
```

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 08/24/21 File:1162008EXA100.out

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VALUED ENGINEERING, INC
1162008 - PARADISE VALLEY RANCH
EXISTING HYDROLOGY STUDY - LOCATION A
100-YR STORM EVENT

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

English (in-lb) Units used in input data file

Program License Serial Number 6335

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Hemet] area used.
10 year storm 10 minute intensity = 1.960(In/Hr)
10 year storm 60 minute intensity = 0.760(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.180(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.180(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 1.000 to Point/Station 1.100
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 874.000(Ft.)
Top (of initial area) elevation = 2007.800(Ft.)
Bottom (of initial area) elevation = 1988.200(Ft.)
Difference in elevation = 19.600(Ft.)
Slope = 0.02243 s(percent)= 2.24
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 17.011 min.
Rainfall intensity = 2.302(In/Hr) for a 100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.700
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
RI index for soil(AMC 2) = 67.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 5.228(CFS)
Total initial stream area = 3.244(Ac.)
Pervious area fraction = 1.000

++

Process from Point/Station 2.000 to Point/Station 2.100
**** INITIAL AREA EVALUATION ****

```
Initial area flow distance =   637.000(Ft.)
Top (of initial area) elevation =  1989.200(Ft.)
Bottom (of initial area) elevation =  1976.800(Ft.)
Difference in elevation =    12.400(Ft.)
Slope =    0.01947  s(percent)=       1.95
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.420 min.
Rainfall intensity =      2.425(In/Hr) for a   100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.708
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
RI index for soil(AMC 2)  =  67.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      6.164(CFS)
Total initial stream area =        3.590(Ac.)
Pervious area fraction = 1.000
End of computations, total study area =            6.83 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  67.0
```

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 08/20/21 File:1162008EXB100.out

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VALUED ENGINEERING, INC.
1162008 - PARADISE VALLEY RANCH
EXISTING HYDROLOGY STUDY- LOCATION B
100-YR STORMEVENT

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

English (in-lb) Units used in input data file

Program License Serial Number 6335

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Hemet] area used.
10 year storm 10 minute intensity = 1.960(In/Hr)
10 year storm 60 minute intensity = 0.760(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.180(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.180(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 1.000 to Point/Station 1.100
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 340.000(Ft.)
Top (of initial area) elevation = 2450.000(Ft.)
Bottom (of initial area) elevation = 2427.000(Ft.)
Difference in elevation = 23.000(Ft.)
Slope = 0.06765 s(percent)= 6.76
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 9.350 min.
Rainfall intensity = 3.161(In/Hr) for a 100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.855
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2) = 89.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 7.002(CFS)
Total initial stream area = 2.590(Ac.)
Pervious area fraction = 1.000

++

Process from Point/Station 1.100 to Point/Station 1.200
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

```
Estimated mean flow rate at midpoint of channel =     45.302(CFS)
Depth of flow =   1.304(Ft.), Average velocity =  13.331(Ft/s)
       ******* Irregular Channel Data ***********
-----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              2.50
       2              5.00              0.00
       3             10.00              2.50
Manning's 'N' friction factor =   0.030
-----------------------------------------------------------------
Sub-Channel flow  =     45.301(CFS)
  '     '        flow top width =      5.214(Ft.)
  '     '    velocity=   13.331(Ft/s)
  '     '        area =      3.398(Sq.Ft)
  '     '        Froude number =     2.910

Upstream point elevation =  2427.000(Ft.)
Downstream point elevation =  2085.800(Ft.)
Flow length =  2294.000(Ft.)
Travel time  =    2.87 min.
Time of concentration =   12.22 min.
Depth of flow =   1.304(Ft.)
Average velocity =  13.331(Ft/s)
Total irregular channel flow =    45.302(CFS)
Irregular channel normal depth above invert elev. =   1.304(Ft.)
Average velocity of channel(s) =  13.331(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.849
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  89.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      2.743(In/Hr) for a   100.0 year storm
Subarea runoff =     76.540(CFS) for     32.870(Ac.)
Total runoff =     83.543(CFS)  Total area =      35.460(Ac.)
Depth of flow =   1.640(Ft.), Average velocity =  15.535(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.200 to Point/Station        1.300
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
-----------------------------------------------------------------
Estimated mean flow rate at midpoint of channel =     84.972(CFS)
Depth of flow =   1.720(Ft.), Average velocity =  14.353(Ft/s)
       ******* Irregular Channel Data ***********
-----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              2.50
       2              5.00              0.00
       3             10.00              2.50
Manning's 'N' friction factor =   0.030
-----------------------------------------------------------------
Sub-Channel flow  =     84.972(CFS)
  '     '        flow top width =      6.882(Ft.)
  '     '    velocity=   14.353(Ft/s)
  '     '        area =      5.920(Sq.Ft)
  '     '        Froude number =     2.727

Upstream point elevation =  2085.800(Ft.)
Downstream point elevation =  2044.000(Ft.)
Flow length =   351.000(Ft.)
Travel time  =    0.41 min.
Time of concentration =   12.63 min.
Depth of flow =   1.720(Ft.)
Average velocity =  14.353(Ft/s)
```

```
Total irregular channel flow =    84.972(CFS)
Irregular channel normal depth above invert elev. =   1.720(Ft.)
Average velocity of channel(s) =  14.353(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.805
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.750
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.250
RI index for soil(AMC 2)  =  80.75
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      2.695(In/Hr) for a   100.0 year storm
Subarea runoff =      2.799(CFS) for      1.290(Ac.)
Total runoff =     86.342(CFS)  Total area =      36.750(Ac.)
Depth of flow =   1.731(Ft.), Average velocity =  14.411(Ft/s)
End of computations, total study area =           36.75 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  88.7
```

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 08/24/21 File:1162008PROA2.out

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VALUED ENGINEERING, INC
1162008 - PARADISE VALLEY RANCH
PROPOSED HYDROLOGY STUDY - LOCATION A
2-YR STORM EVENT

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

English (in-lb) Units used in input data file

Program License Serial Number 6335

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 2.00 Antecedent Moisture Condition = 1

Standard intensity-duration curves data (Plate D-4.1)
For the [Hemet] area used.
10 year storm 10 minute intensity = 1.960(In/Hr)
10 year storm 60 minute intensity = 0.760(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.180(In/Hr)

Storm event year = 2.0
Calculated rainfall intensity data:
1 hour intensity = 0.466(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 1.000 to Point/Station 1.100
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 874.000(Ft.)
Top (of initial area) elevation = 2007.800(Ft.)
Bottom (of initial area) elevation = 1988.200(Ft.)
Difference in elevation = 19.600(Ft.)
Slope = 0.02243 s(percent)= 2.24
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 17.011 min.
Rainfall intensity = 0.910(In/Hr) for a 2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.343
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
RI index for soil(AMC 1) = 47.40
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 1.011(CFS)
Total initial stream area = 3.244(Ac.)
Pervious area fraction = 1.000

++

Process from Point/Station 2.000 to Point/Station 2.100
**** INITIAL AREA EVALUATION ****

```
Initial area flow distance =   360.000(Ft.)
Top (of initial area) elevation =  1988.500(Ft.)
Bottom (of initial area) elevation =   985.900(Ft.)
Difference in elevation =  1002.600(Ft.)
Slope =    2.78500  s(percent)=     278.50
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =    5.000 min.
Rainfall intensity =      1.741(In/Hr) for a     2.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.828
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
RI index for soil(AMC 1)  =  16.20
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      1.560(CFS)
Total initial stream area =        1.082(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.100 to Point/Station       10.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
------------------------------------------------------------------------
Estimated mean flow rate at midpoint of channel =      1.844(CFS)
Depth of flow =   0.456(Ft.), Average velocity =   5.922(Ft/s)
        ******* Irregular Channel Data ***********
----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              1.00
        2              1.50              0.00
        3              3.00              1.00
Manning's 'N' friction factor =   0.013
----------------------------------------------------------------
Sub-Channel flow  =      1.844(CFS)
  '     '        flow top width =      1.367(Ft.)
  '     '    velocity=    5.922(Ft/s)
  '     '        area =      0.311(Sq.Ft)
  '     '        Froude number =     2.187

Upstream point elevation =  1985.900(Ft.)
Downstream point elevation =  1977.000(Ft.)
Flow length =   361.000(Ft.)
Travel time  =    1.02 min.
Time of concentration =    6.02 min.
Depth of flow =   0.456(Ft.)
Average velocity =   5.922(Ft/s)
Total irregular channel flow =     1.844(CFS)
Irregular channel normal depth above invert elev. =   0.456(Ft.)
Average velocity of channel(s) =   5.922(Ft/s)
 Adding area flow to channel
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.209
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
RI index for soil(AMC 1)  =  20.40
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.578(In/Hr) for a     2.0 year storm
Subarea runoff =      0.468(CFS) for      1.415(Ac.)
Total runoff =      2.028(CFS)  Total area =       2.497(Ac.)
Depth of flow =   0.472(Ft.), Average velocity =   6.065(Ft/s)


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```
Process from Point/Station        2.100 to Point/Station       10.000
**** CONFLUENCE OF MINOR STREAMS ****
____________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      2.497(Ac.)
Runoff from this stream =      2.028(CFS)
Time of concentration =    6.02 min.
Rainfall intensity =     1.578(In/Hr)


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Process from Point/Station        3.000 to Point/Station       10.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________________
Initial area flow distance =   357.000(Ft.)
Top (of initial area) elevation =  1986.600(Ft.)
Bottom (of initial area) elevation =  1977.000(Ft.)
Difference in elevation =     9.600(Ft.)
Slope =    0.02689  s(percent)=       2.69
TC = k(0.940)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   20.336 min.
Rainfall intensity =      0.828(In/Hr) for a     2.0 year storm
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.124
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
RI index for soil(AMC 1)  =  20.40
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      0.112(CFS)
Total initial stream area =        1.097(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station       10.000
**** CONFLUENCE OF MINOR STREAMS ****
____________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      1.097(Ac.)
Runoff from this stream =      0.112(CFS)
Time of concentration =   20.34 min.
Rainfall intensity =     0.828(In/Hr)
Summary of stream data:

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


1        2.028      6.02                 1.578
2        0.112     20.34                 0.828
Largest stream flow has longer or shorter time of concentration
Qp =      2.028 + sum of
          Qa          Tb/Ta
           0.112 *    0.296 =      0.033
Qp =      2.061

Total of 2 streams to confluence:
Flow rates before confluence point:
       2.028       0.112
Area of streams before confluence:
        2.497        1.097
Results of confluence:
Total flow rate =      2.061(CFS)
Time of concentration =     6.016 min.
Effective stream area after confluence =      3.594(Ac.)
End of computations, total study area =            6.84 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
```

```
Area averaged pervious area fraction(Ap) = 0.858
Area averaged RI index number =  50.8
```

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 08/20/21 File:1162008PROB2.out

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VALUED ENGINEERING, INC.
1162008 - PARADISE VALLEY RANCH
PROPOSED HYDROLOGY STUDY - LOCATION B
2-YR STORM EVENT

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

English (in-lb) Units used in input data file

Program License Serial Number 6335

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 2.00 Antecedent Moisture Condition = 1

Standard intensity-duration curves data (Plate D-4.1)
For the [Hemet] area used.
10 year storm 10 minute intensity = 1.960(In/Hr)
10 year storm 60 minute intensity = 0.760(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.180(In/Hr)

Storm event year = 2.0
Calculated rainfall intensity data:
1 hour intensity = 0.466(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 1.000 to Point/Station 1.100
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 197.000(Ft.)
Top (of initial area) elevation = 2087.800(Ft.)
Bottom (of initial area) elevation = 2084.100(Ft.)
Difference in elevation = 3.700(Ft.)
Slope = 0.01878 s(percent)= 1.88
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 5.497 min.
Rainfall intensity = 1.655(In/Hr) for a 2.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.865
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.075
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.925
RI index for soil(AMC 1) = 55.29
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 0.472(CFS)
Total initial stream area = 0.330(Ac.)
Pervious area fraction = 0.100

++

Process from Point/Station 1.100 to Point/Station 1.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

```
Upstream point/station elevation =  2084.100(Ft.)
Downstream point/station elevation =  2073.000(Ft.)
Pipe length  =   115.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.472(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     0.472(CFS)
Normal flow depth in pipe =    2.13(In.)
Flow top width inside pipe =    5.74(In.)
Critical Depth =    4.20(In.)
Pipe flow velocity =      7.54(Ft/s)
Travel time through pipe =    0.25 min.
Time of concentration (TC) =     5.75 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.200 to Point/Station        1.300
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  2073.000(Ft.)
Downstream point/station elevation =  2071.900(Ft.)
Pipe length  =   223.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.472(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     0.472(CFS)
Normal flow depth in pipe =    4.00(In.)
Flow top width inside pipe =    8.94(In.)
Critical Depth =    3.72(In.)
Pipe flow velocity =      2.49(Ft/s)
Travel time through pipe =    1.49 min.
Time of concentration (TC) =     7.24 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.200 to Point/Station        1.300
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Runoff Coefficient = 0.848
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.750
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.250
RI index for soil(AMC 1)  =  40.75
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =     7.24 min.
Rainfall intensity =      1.431(In/Hr) for a     2.0 year storm
Subarea runoff =      0.243(CFS) for      0.200(Ac.)
Total runoff =      0.715(CFS)  Total area =       0.530(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        2.100
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
Initial area flow distance =   340.000(Ft.)
Top (of initial area) elevation =  2450.000(Ft.)
Bottom (of initial area) elevation =  2427.000(Ft.)
Difference in elevation =    23.000(Ft.)
Slope =    0.06765  s(percent)=       6.76
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.350 min.
Rainfall intensity =      1.249(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.677
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1)  =  76.40
Pervious area fraction =  1.000; Impervious fraction =  0.000
```

```
Initial subarea runoff =      2.190(CFS)
Total initial stream area =        2.590(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.100 to Point/Station        2.200
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
----------------------------------------------------------------------
Estimated mean flow rate at midpoint of channel =     13.217(CFS)
Depth of flow =   0.821(Ft.), Average velocity =   9.797(Ft/s)
        ******* Irregular Channel Data ***********
----------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              2.50
        2              5.00              0.00
        3             10.00              2.50
Manning's 'N' friction factor =   0.030
----------------------------------------------------------------------
Sub-Channel flow  =     13.217(CFS)
  '     '        flow top width =      3.285(Ft.)
  '     '    velocity=    9.797(Ft/s)
  '     '        area =      1.349(Sq.Ft)
  '     '        Froude number =     2.694

Upstream point elevation =  2427.000(Ft.)
Downstream point elevation =  2085.800(Ft.)
Flow length =  2294.000(Ft.)
Travel time  =    3.90 min.
Time of concentration =   13.25 min.
Depth of flow =   0.821(Ft.)
Average velocity =   9.797(Ft/s)
Total irregular channel flow =    13.217(CFS)
Irregular channel normal depth above invert elev. =   0.821(Ft.)
Average velocity of channel(s) =   9.797(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.644
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1)  =  76.40
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.038(In/Hr) for a     2.0 year storm
Subarea runoff =     21.997(CFS) for     32.870(Ac.)
Total runoff =     24.187(CFS)  Total area =      35.460(Ac.)
Depth of flow =   1.030(Ft.), Average velocity =  11.395(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.200 to Point/Station        2.300
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  2085.800(Ft.)
Downstream point/station elevation =  2084.400(Ft.)
Pipe length  =    31.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    24.187(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    24.187(CFS)
Normal flow depth in pipe =   13.17(In.)
Flow top width inside pipe =   20.31(In.)
Critical depth could not be calculated.
Pipe flow velocity =     15.23(Ft/s)
Travel time through pipe =    0.03 min.
Time of concentration (TC) =    13.29 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.300 to Point/Station        2.400
```

```
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
_____________________________________________________________________
Estimated mean flow rate at midpoint of channel =     24.446(CFS)
Depth of flow =   1.063(Ft.), Average velocity =  10.821(Ft/s)
        ******* Irregular Channel Data ***********
-----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              2.50
        2              5.00              0.00
        3             10.00              2.50
Manning's 'N' friction factor =   0.030
-----------------------------------------------------------------
Sub-Channel flow  =     24.446(CFS)
  '     '        flow top width =      4.251(Ft.)
  '     '    velocity=   10.821(Ft/s)
  '     '        area =      2.259(Sq.Ft)
  '     '        Froude number =     2.616

Upstream point elevation =  2084.400(Ft.)
Downstream point elevation =  2044.000(Ft.)
Flow length =   314.000(Ft.)
Travel time  =    0.48 min.
Time of concentration =   13.77 min.
Depth of flow =   1.063(Ft.)
Average velocity =  10.821(Ft/s)
Total irregular channel flow =    24.446(CFS)
Irregular channel normal depth above invert elev. =   1.063(Ft.)
Average velocity of channel(s) =  10.821(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.627
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.075
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.925
RI index for soil(AMC 1)  =  75.08
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.018(In/Hr) for a     2.0 year storm
Subarea runoff =      0.485(CFS) for      0.760(Ac.)
Total runoff =     24.672(CFS)  Total area =      36.220(Ac.)
Depth of flow =   1.066(Ft.), Average velocity =  10.846(Ft/s)
End of computations, total study area =           36.75 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.987
Area averaged RI index number =  88.7
```

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 08/24/21 File:1162008PROA10.out

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VALUED ENGINEERING, INC
1162008 - PARADISE VALLEY RANCH
PEOPOSED HYDROLOGY STUDY - LOCATION A
10-YR STORM EVENT

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

English (in-lb) Units used in input data file

Program License Serial Number 6335

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Hemet] area used.
10 year storm 10 minute intensity = 1.960(In/Hr)
10 year storm 60 minute intensity = 0.760(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.180(In/Hr)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.760(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 1.000 to Point/Station 1.100
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 874.000(Ft.)
Top (of initial area) elevation = 2007.800(Ft.)
Bottom (of initial area) elevation = 1988.200(Ft.)
Difference in elevation = 19.600(Ft.)
Slope = 0.02243 s(percent)= 2.24
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 17.011 min.
Rainfall intensity = 1.482(In/Hr) for a 10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.624
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
RI index for soil(AMC 2) = 67.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 2.999(CFS)
Total initial stream area = 3.244(Ac.)
Pervious area fraction = 1.000

++

Process from Point/Station 2.000 to Point/Station 2.100
**** INITIAL AREA EVALUATION ****

```
Initial area flow distance =   360.000(Ft.)
Top (of initial area) elevation =  1988.500(Ft.)
Bottom (of initial area) elevation =   985.900(Ft.)
Difference in elevation =  1002.600(Ft.)
Slope =    2.78500  s(percent)=     278.50
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =    5.000 min.
Rainfall intensity =      2.836(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.855
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
RI index for soil(AMC 2)  =  32.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      2.624(CFS)
Total initial stream area =        1.082(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.100 to Point/Station       10.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
------------------------------------------------------------------------
Estimated mean flow rate at midpoint of channel =      3.555(CFS)
Depth of flow =   0.583(Ft.), Average velocity =   6.978(Ft/s)
        ******* Irregular Channel Data ***********
----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              1.00
        2              1.50              0.00
        3              3.00              1.00
Manning's 'N' friction factor =   0.013
----------------------------------------------------------------
Sub-Channel flow  =      3.555(CFS)
  '     '        flow top width =      1.748(Ft.)
  '     '    velocity=    6.979(Ft/s)
  '     '        area =      0.509(Sq.Ft)
  '     '        Froude number =     2.278

Upstream point elevation =  1985.900(Ft.)
Downstream point elevation =  1977.000(Ft.)
Flow length =   361.000(Ft.)
Travel time  =    0.86 min.
Time of concentration =    5.86 min.
Depth of flow =   0.583(Ft.)
Average velocity =   6.978(Ft/s)
Total irregular channel flow =     3.555(CFS)
Irregular channel normal depth above invert elev. =   0.583(Ft.)
Average velocity of channel(s) =   6.978(Ft/s)
 Adding area flow to channel
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.491
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
RI index for soil(AMC 2)  =  38.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      2.607(In/Hr) for a    10.0 year storm
Subarea runoff =      1.810(CFS) for      1.415(Ac.)
Total runoff =      4.434(CFS)  Total area =       2.497(Ac.)
Depth of flow =   0.633(Ft.), Average velocity =   7.375(Ft/s)


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```
Process from Point/Station        2.100 to Point/Station       10.000
**** CONFLUENCE OF MINOR STREAMS ****
____________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      2.497(Ac.)
Runoff from this stream =      4.434(CFS)
Time of concentration =    5.86 min.
Rainfall intensity =     2.607(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station       10.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________________
Initial area flow distance =   357.000(Ft.)
Top (of initial area) elevation =  1986.600(Ft.)
Bottom (of initial area) elevation =  1977.000(Ft.)
Difference in elevation =     9.600(Ft.)
Slope =    0.02689  s(percent)=       2.69
TC = k(0.940)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   20.336 min.
Rainfall intensity =      1.348(In/Hr) for a    10.0 year storm
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.344
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
RI index for soil(AMC 2)  =  38.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      0.509(CFS)
Total initial stream area =        1.097(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station       10.000
**** CONFLUENCE OF MINOR STREAMS ****
____________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      1.097(Ac.)
Runoff from this stream =      0.509(CFS)
Time of concentration =   20.34 min.
Rainfall intensity =     1.348(In/Hr)
Summary of stream data:

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


1        4.434      5.86                 2.607
2        0.509     20.34                 1.348
Largest stream flow has longer or shorter time of concentration
Qp =      4.434 + sum of
          Qa          Tb/Ta
           0.509 *    0.288 =      0.147
Qp =      4.581

Total of 2 streams to confluence:
Flow rates before confluence point:
       4.434       0.509
Area of streams before confluence:
        2.497        1.097
Results of confluence:
Total flow rate =      4.581(CFS)
Time of concentration =     5.862 min.
Effective stream area after confluence =      3.594(Ac.)
End of computations, total study area =            6.84 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
```

```
Area averaged pervious area fraction(Ap) = 0.858
Area averaged RI index number =  50.8
```

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 08/20/21 File:1162008PROB10.out

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VALUED ENGINEERING, INC.
1162008 - PARADISE VALLEY RANCH
PROPOSED HYDROLOGY STUDY - LOCATION B
10-YR STORM EVENT

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

English (in-lb) Units used in input data file

Program License Serial Number 6335

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Hemet] area used.
10 year storm 10 minute intensity = 1.960(In/Hr)
10 year storm 60 minute intensity = 0.760(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.180(In/Hr)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.760(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 1.000 to Point/Station 1.100
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 197.000(Ft.)
Top (of initial area) elevation = 2087.800(Ft.)
Bottom (of initial area) elevation = 2084.100(Ft.)
Difference in elevation = 3.700(Ft.)
Slope = 0.01878 s(percent)= 1.88
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 5.497 min.
Rainfall intensity = 2.697(In/Hr) for a 10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.886
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.075
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.925
RI index for soil(AMC 2) = 73.58
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 0.789(CFS)
Total initial stream area = 0.330(Ac.)
Pervious area fraction = 0.100

++

Process from Point/Station 1.100 to Point/Station 1.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

```
Upstream point/station elevation =  2084.100(Ft.)
Downstream point/station elevation =  2073.000(Ft.)
Pipe length  =   115.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.789(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     0.789(CFS)
Normal flow depth in pipe =    2.83(In.)
Flow top width inside pipe =    5.99(In.)
Critical Depth =    5.30(In.)
Pipe flow velocity =      8.66(Ft/s)
Travel time through pipe =    0.22 min.
Time of concentration (TC) =     5.72 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.200 to Point/Station        1.300
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  2073.000(Ft.)
Downstream point/station elevation =  2071.900(Ft.)
Pipe length  =   223.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.789(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     0.789(CFS)
Normal flow depth in pipe =    5.44(In.)
Flow top width inside pipe =    8.80(In.)
Critical Depth =    4.86(In.)
Pipe flow velocity =      2.83(Ft/s)
Travel time through pipe =    1.31 min.
Time of concentration (TC) =     7.03 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.200 to Point/Station        1.300
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Runoff Coefficient = 0.876
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.750
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.250
RI index for soil(AMC 2)  =  60.75
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =     7.03 min.
Rainfall intensity =      2.367(In/Hr) for a    10.0 year storm
Subarea runoff =      0.415(CFS) for      0.200(Ac.)
Total runoff =      1.204(CFS)  Total area =       0.530(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        2.100
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
Initial area flow distance =   340.000(Ft.)
Top (of initial area) elevation =  2450.000(Ft.)
Bottom (of initial area) elevation =  2427.000(Ft.)
Difference in elevation =    23.000(Ft.)
Slope =    0.06765  s(percent)=       6.76
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.350 min.
Rainfall intensity =      2.036(In/Hr) for a    10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.833
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  89.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
```

```
Initial subarea runoff =      4.390(CFS)
Total initial stream area =        2.590(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.100 to Point/Station        2.200
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
----------------------------------------------------------------------
Estimated mean flow rate at midpoint of channel =     27.925(CFS)
Depth of flow =   1.087(Ft.), Average velocity =  11.812(Ft/s)
        ******* Irregular Channel Data ***********
----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              2.50
        2              5.00              0.00
        3             10.00              2.50
Manning's 'N' friction factor =   0.030
----------------------------------------------------------------
Sub-Channel flow  =     27.925(CFS)
  '     '        flow top width =      4.349(Ft.)
  '     '    velocity=   11.812(Ft/s)
  '     '        area =      2.364(Sq.Ft)
  '     '        Froude number =     2.823

Upstream point elevation =  2427.000(Ft.)
Downstream point elevation =  2085.800(Ft.)
Flow length =  2294.000(Ft.)
Travel time  =    3.24 min.
Time of concentration =   12.59 min.
Depth of flow =   1.087(Ft.)
Average velocity =  11.812(Ft/s)
Total irregular channel flow =    27.925(CFS)
Irregular channel normal depth above invert elev. =   1.087(Ft.)
Average velocity of channel(s) =  11.812(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.822
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  89.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.739(In/Hr) for a    10.0 year storm
Subarea runoff =     46.989(CFS) for     32.870(Ac.)
Total runoff =     51.379(CFS)  Total area =      35.460(Ac.)
Depth of flow =   1.367(Ft.), Average velocity =  13.757(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.200 to Point/Station        2.300
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  2085.800(Ft.)
Downstream point/station elevation =  2084.400(Ft.)
Pipe length  =    31.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    51.379(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    51.379(CFS)
Normal flow depth in pipe =   17.95(In.)
Flow top width inside pipe =   25.49(In.)
Critical depth could not be calculated.
Pipe flow velocity =     18.31(Ft/s)
Travel time through pipe =    0.03 min.
Time of concentration (TC) =    12.62 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.300 to Point/Station        2.400
```

```
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
_____________________________________________________________________
Estimated mean flow rate at midpoint of channel =     51.929(CFS)
Depth of flow =   1.410(Ft.), Average velocity =  13.064(Ft/s)
        ******* Irregular Channel Data ***********
-----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              2.50
        2              5.00              0.00
        3             10.00              2.50
Manning's 'N' friction factor =   0.030
-----------------------------------------------------------------
Sub-Channel flow  =     51.929(CFS)
  '     '        flow top width =      5.639(Ft.)
  '     '    velocity=   13.064(Ft/s)
  '     '        area =      3.975(Sq.Ft)
  '     '        Froude number =     2.742

Upstream point elevation =  2084.400(Ft.)
Downstream point elevation =  2044.000(Ft.)
Flow length =   314.000(Ft.)
Travel time  =    0.40 min.
Time of concentration =   13.02 min.
Depth of flow =   1.410(Ft.)
Average velocity =  13.064(Ft/s)
Total irregular channel flow =    51.929(CFS)
Irregular channel normal depth above invert elev. =   1.410(Ft.)
Average velocity of channel(s) =  13.064(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.815
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.075
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.925
RI index for soil(AMC 2)  =  88.17
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.708(In/Hr) for a    10.0 year storm
Subarea runoff =      1.058(CFS) for      0.760(Ac.)
Total runoff =     52.436(CFS)  Total area =      36.220(Ac.)
Depth of flow =   1.415(Ft.), Average velocity =  13.096(Ft/s)
End of computations, total study area =           36.75 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.987
Area averaged RI index number =  88.7
```

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 08/24/21 File:1162008PROA100.out

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VALUED ENGINEERING, INC
1162008 - PARADISE VALLEY RANCH
PROPOSED HYDROLOGY STUDY - LOCATION A
100-YR STORM EVENT

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

English (in-lb) Units used in input data file

Program License Serial Number 6335

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Hemet] area used.
10 year storm 10 minute intensity = 1.960(In/Hr)
10 year storm 60 minute intensity = 0.760(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.180(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.180(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 1.000 to Point/Station 1.100
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 874.000(Ft.)
Top (of initial area) elevation = 2007.800(Ft.)
Bottom (of initial area) elevation = 1988.200(Ft.)
Difference in elevation = 19.600(Ft.)
Slope = 0.02243 s(percent)= 2.24
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 17.011 min.
Rainfall intensity = 2.302(In/Hr) for a 100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.700
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
RI index for soil(AMC 2) = 67.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 5.228(CFS)
Total initial stream area = 3.244(Ac.)
Pervious area fraction = 1.000

++

Process from Point/Station 2.000 to Point/Station 2.100
**** INITIAL AREA EVALUATION ****

```
Initial area flow distance =   360.000(Ft.)
Top (of initial area) elevation =  1988.500(Ft.)
Bottom (of initial area) elevation =   985.900(Ft.)
Difference in elevation =  1002.600(Ft.)
Slope =    2.78500  s(percent)=     278.50
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =    5.000 min.
Rainfall intensity =      4.404(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.865
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
RI index for soil(AMC 2)  =  32.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      4.121(CFS)
Total initial stream area =        1.082(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.100 to Point/Station       10.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
------------------------------------------------------------------------
Estimated mean flow rate at midpoint of channel =      5.850(CFS)
Depth of flow =   0.702(Ft.), Average velocity =   7.904(Ft/s)
       ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              1.00
       2              1.50              0.00
       3              3.00              1.00
Manning's 'N' friction factor =   0.013
------------------------------------------------------------------
Sub-Channel flow  =      5.850(CFS)
  '     '        flow top width =      2.107(Ft.)
  '     '    velocity=    7.904(Ft/s)
  '     '        area =      0.740(Sq.Ft)
  '     '        Froude number =     2.350

Upstream point elevation =  1985.900(Ft.)
Downstream point elevation =  1977.000(Ft.)
Flow length =   361.000(Ft.)
Travel time  =    0.76 min.
Time of concentration =    5.76 min.
Depth of flow =   0.702(Ft.)
Average velocity =   7.904(Ft/s)
Total irregular channel flow =     5.850(CFS)
Irregular channel normal depth above invert elev. =   0.702(Ft.)
Average velocity of channel(s) =   7.904(Ft/s)
 Adding area flow to channel
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.587
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
RI index for soil(AMC 2)  =  38.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      4.085(In/Hr) for a   100.0 year storm
Subarea runoff =      3.395(CFS) for      1.415(Ac.)
Total runoff =      7.516(CFS)  Total area =       2.497(Ac.)
Depth of flow =   0.772(Ft.), Average velocity =   8.415(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

```
Process from Point/Station        2.100 to Point/Station       10.000
**** CONFLUENCE OF MINOR STREAMS ****
____________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      2.497(Ac.)
Runoff from this stream =      7.516(CFS)
Time of concentration =    5.76 min.
Rainfall intensity =     4.085(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station       10.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________________
Initial area flow distance =   357.000(Ft.)
Top (of initial area) elevation =  1986.600(Ft.)
Bottom (of initial area) elevation =  1977.000(Ft.)
Difference in elevation =     9.600(Ft.)
Slope =    0.02689  s(percent)=       2.69
TC = k(0.940)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   20.336 min.
Rainfall intensity =      2.094(In/Hr) for a   100.0 year storm
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.441
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
RI index for soil(AMC 2)  =  38.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      1.014(CFS)
Total initial stream area =        1.097(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station       10.000
**** CONFLUENCE OF MINOR STREAMS ****
____________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      1.097(Ac.)
Runoff from this stream =      1.014(CFS)
Time of concentration =   20.34 min.
Rainfall intensity =     2.094(In/Hr)
Summary of stream data:

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


1        7.516      5.76                 4.085
2        1.014     20.34                 2.094
Largest stream flow has longer or shorter time of concentration
Qp =      7.516 + sum of
          Qa          Tb/Ta
           1.014 *    0.283 =      0.287
Qp =      7.803

Total of 2 streams to confluence:
Flow rates before confluence point:
       7.516       1.014
Area of streams before confluence:
        2.497        1.097
Results of confluence:
Total flow rate =      7.803(CFS)
Time of concentration =     5.761 min.
Effective stream area after confluence =      3.594(Ac.)
End of computations, total study area =            6.84 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
```

```
Area averaged pervious area fraction(Ap) = 0.858
Area averaged RI index number =  50.8
```

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 08/20/21 File:1162008PROB100.out

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VALUED ENGINEERING, INC.
1162008 - PARADISE VALLEY RANCH
PROPOSED HYDROLOGY STUDY - LOCATION B
100-YR STORM EVENT

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

English (in-lb) Units used in input data file

Program License Serial Number 6335

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Hemet] area used.
10 year storm 10 minute intensity = 1.960(In/Hr)
10 year storm 60 minute intensity = 0.760(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.180(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.180(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 1.000 to Point/Station 1.100
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 197.000(Ft.)
Top (of initial area) elevation = 2087.800(Ft.)
Bottom (of initial area) elevation = 2084.100(Ft.)
Difference in elevation = 3.700(Ft.)
Slope = 0.01878 s(percent)= 1.88
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 5.497 min.
Rainfall intensity = 4.188(In/Hr) for a 100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.891
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.075
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.925
RI index for soil(AMC 2) = 73.58
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 1.231(CFS)
Total initial stream area = 0.330(Ac.)
Pervious area fraction = 0.100

++

Process from Point/Station 1.100 to Point/Station 1.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

```
Upstream point/station elevation =  2084.100(Ft.)
Downstream point/station elevation =  2073.000(Ft.)
Pipe length  =   115.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.231(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     1.231(CFS)
Normal flow depth in pipe =    3.72(In.)
Flow top width inside pipe =    5.82(In.)
Critical depth could not be calculated.
Pipe flow velocity =      9.62(Ft/s)
Travel time through pipe =    0.20 min.
Time of concentration (TC) =     5.70 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.200 to Point/Station        1.300
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  2073.000(Ft.)
Downstream point/station elevation =  2071.900(Ft.)
Pipe length  =   223.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.231(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     1.231(CFS)
Normal flow depth in pipe =    5.94(In.)
Flow top width inside pipe =   12.00(In.)
Critical Depth =    5.62(In.)
Pipe flow velocity =      3.17(Ft/s)
Travel time through pipe =    1.17 min.
Time of concentration (TC) =     6.87 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.200 to Point/Station        1.300
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Runoff Coefficient = 0.883
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.750
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.250
RI index for soil(AMC 2)  =  60.75
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =     6.87 min.
Rainfall intensity =      3.722(In/Hr) for a   100.0 year storm
Subarea runoff =      0.657(CFS) for      0.200(Ac.)
Total runoff =      1.888(CFS)  Total area =       0.530(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        2.100
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
Initial area flow distance =   340.000(Ft.)
Top (of initial area) elevation =  2450.000(Ft.)
Bottom (of initial area) elevation =  2427.000(Ft.)
Difference in elevation =    23.000(Ft.)
Slope =    0.06765  s(percent)=       6.76
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.350 min.
Rainfall intensity =      3.161(In/Hr) for a   100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.855
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  89.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
```

```
Initial subarea runoff =      7.002(CFS)
Total initial stream area =        2.590(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.100 to Point/Station        2.200
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
----------------------------------------------------------------------
Estimated mean flow rate at midpoint of channel =     45.302(CFS)
Depth of flow =   1.304(Ft.), Average velocity =  13.331(Ft/s)
        ******* Irregular Channel Data ***********
----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              2.50
        2              5.00              0.00
        3             10.00              2.50
Manning's 'N' friction factor =   0.030
----------------------------------------------------------------
Sub-Channel flow  =     45.301(CFS)
  '     '        flow top width =      5.214(Ft.)
  '     '    velocity=   13.331(Ft/s)
  '     '        area =      3.398(Sq.Ft)
  '     '        Froude number =     2.910

Upstream point elevation =  2427.000(Ft.)
Downstream point elevation =  2085.800(Ft.)
Flow length =  2294.000(Ft.)
Travel time  =    2.87 min.
Time of concentration =   12.22 min.
Depth of flow =   1.304(Ft.)
Average velocity =  13.331(Ft/s)
Total irregular channel flow =    45.302(CFS)
Irregular channel normal depth above invert elev. =   1.304(Ft.)
Average velocity of channel(s) =  13.331(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.849
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  89.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      2.743(In/Hr) for a   100.0 year storm
Subarea runoff =     76.540(CFS) for     32.870(Ac.)
Total runoff =     83.543(CFS)  Total area =      35.460(Ac.)
Depth of flow =   1.640(Ft.), Average velocity =  15.535(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.200 to Point/Station        2.300
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  2085.800(Ft.)
Downstream point/station elevation =  2084.400(Ft.)
Pipe length  =    31.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    83.543(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    83.543(CFS)
Normal flow depth in pipe =   23.53(In.)
Flow top width inside pipe =   24.68(In.)
Critical depth could not be calculated.
Pipe flow velocity =     20.22(Ft/s)
Travel time through pipe =    0.03 min.
Time of concentration (TC) =    12.24 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.300 to Point/Station        2.400
```

```
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
_____________________________________________________________________
Estimated mean flow rate at midpoint of channel =     84.438(CFS)
Depth of flow =   1.692(Ft.), Average velocity =  14.752(Ft/s)
        ******* Irregular Channel Data ***********
-----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              2.50
        2              5.00              0.00
        3             10.00              2.50
Manning's 'N' friction factor =   0.030
-----------------------------------------------------------------
Sub-Channel flow  =     84.438(CFS)
  '     '        flow top width =      6.767(Ft.)
  '     '    velocity=   14.752(Ft/s)
  '     '        area =      5.724(Sq.Ft)
  '     '        Froude number =     2.827

Upstream point elevation =  2084.400(Ft.)
Downstream point elevation =  2044.000(Ft.)
Flow length =   314.000(Ft.)
Travel time  =    0.35 min.
Time of concentration =   12.60 min.
Depth of flow =   1.692(Ft.)
Average velocity =  14.752(Ft/s)
Total irregular channel flow =    84.438(CFS)
Irregular channel normal depth above invert elev. =   1.692(Ft.)
Average velocity of channel(s) =  14.752(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.844
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.075
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.925
RI index for soil(AMC 2)  =  88.17
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      2.699(In/Hr) for a   100.0 year storm
Subarea runoff =      1.731(CFS) for      0.760(Ac.)
Total runoff =     85.274(CFS)  Total area =      36.220(Ac.)
Depth of flow =   1.698(Ft.), Average velocity =  14.788(Ft/s)
End of computations, total study area =           36.75 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.987
Area averaged RI index number =  88.7
```

APPENDIX “D”

UNIT HYDROGRAPH:

PRE-DEVELOPED CONDITION Q_{10} -24 HR
POST-DEVELOPED CONDITION Q_{10} – 24 HR
EXISTING OFFSITE Q_2 AND Q_{100}

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

Study date 01/06/22 File: 1162008EXUHA2410.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6335

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

VALUED ENGINEERING, INC
1162008 - PARADISE VALLEY RANCH
EXISTING UNIT HYDROGRAPH - FACILITY 7
10-YR, 24-HR STORMEVENT

Drainage Area = 3.59(Ac.) = 0.006 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 3.59(Ac.) = 0.006 Sq. Mi.
Length along longest watercourse = 637.00(Ft.)
Length along longest watercourse measured to centroid = 281.00(Ft.)
Length along longest watercourse = 0.121 Mi.
Length along longest watercourse measured to centroid = 0.053 Mi.
Difference in elevation = 12.40(Ft.)
Slope along watercourse = 102.7818 Ft./Mi.
Average Manning's 'N' = 0.025
Lag time = 0.037 Hr.
Lag time = 2.19 Min.
25% of lag time = 0.55 Min.
40% of lag time = 0.88 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

```
Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        3.59            2.04                  7.32

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        3.59            6.31                 22.65

STORM EVENT (YEAR) =   10.00
Area Averaged 2-Year Rainfall =    2.040(In)
Area Averaged 100-Year Rainfall =    6.310(In)

Point rain (area averaged) =    3.797(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    3.797(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     3.590           53.00         0.000
 Total Area Entered =      3.59(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
53.0  53.0      0.541     0.000        0.541       1.000      0.541
                                                 Sum (F) =   0.541
Area averaged mean soil loss (F) (In/Hr) =  0.541
Minimum soil loss rate ((In/Hr)) =  0.271
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
------------------------------------------------------------------------

                U n i t  H y d r o g r a p h
                        VALLEY S-Curve
------------------------------------------------------------------------
                Unit Hydrograph Data
------------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %            (CFS)
------------------------------------------------------------------------
    1   0.083        228.061         47.865              1.732
    2   0.167        456.123         41.456              1.500
    3   0.250        684.184          7.758              0.281
    4   0.333        912.246          2.921              0.106
                               Sum = 100.000   Sum=       3.618
------------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated
loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain
value
```

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	0.07	0.030	(0.960)		0.027	0.003
2	0.17	0.07	0.030	(0.956)		0.027	0.003
3	0.25	0.07	0.030	(0.952)		0.027	0.003
4	0.33	0.10	0.046	(0.949)		0.041	0.005
5	0.42	0.10	0.046	(0.945)		0.041	0.005
6	0.50	0.10	0.046	(0.941)		0.041	0.005
7	0.58	0.10	0.046	(0.938)		0.041	0.005
8	0.67	0.10	0.046	(0.934)		0.041	0.005
9	0.75	0.10	0.046	(0.930)		0.041	0.005
10	0.83	0.13	0.061	(0.927)		0.055	0.006
11	0.92	0.13	0.061	(0.923)		0.055	0.006
12	1.00	0.13	0.061	(0.919)		0.055	0.006
13	1.08	0.10	0.046	(0.916)		0.041	0.005
14	1.17	0.10	0.046	(0.912)		0.041	0.005
15	1.25	0.10	0.046	(0.908)		0.041	0.005
16	1.33	0.10	0.046	(0.905)		0.041	0.005
17	1.42	0.10	0.046	(0.901)		0.041	0.005
18	1.50	0.10	0.046	(0.898)		0.041	0.005
19	1.58	0.10	0.046	(0.894)		0.041	0.005
20	1.67	0.10	0.046	(0.890)		0.041	0.005
21	1.75	0.10	0.046	(0.887)		0.041	0.005
22	1.83	0.13	0.061	(0.883)		0.055	0.006
23	1.92	0.13	0.061	(0.880)		0.055	0.006
24	2.00	0.13	0.061	(0.876)		0.055	0.006
25	2.08	0.13	0.061	(0.873)		0.055	0.006
26	2.17	0.13	0.061	(0.869)		0.055	0.006
27	2.25	0.13	0.061	(0.866)		0.055	0.006
28	2.33	0.13	0.061	(0.862)		0.055	0.006
29	2.42	0.13	0.061	(0.859)		0.055	0.006
30	2.50	0.13	0.061	(0.855)		0.055	0.006
31	2.58	0.17	0.076	(0.852)		0.068	0.008
32	2.67	0.17	0.076	(0.848)		0.068	0.008
33	2.75	0.17	0.076	(0.845)		0.068	0.008
34	2.83	0.17	0.076	(0.841)		0.068	0.008
35	2.92	0.17	0.076	(0.838)		0.068	0.008
36	3.00	0.17	0.076	(0.834)		0.068	0.008
37	3.08	0.17	0.076	(0.831)		0.068	0.008
38	3.17	0.17	0.076	(0.827)		0.068	0.008
39	3.25	0.17	0.076	(0.824)		0.068	0.008
40	3.33	0.17	0.076	(0.820)		0.068	0.008
41	3.42	0.17	0.076	(0.817)		0.068	0.008
42	3.50	0.17	0.076	(0.814)		0.068	0.008
43	3.58	0.17	0.076	(0.810)		0.068	0.008
44	3.67	0.17	0.076	(0.807)		0.068	0.008
45	3.75	0.17	0.076	(0.803)		0.068	0.008
46	3.83	0.20	0.091	(0.800)		0.082	0.009
47	3.92	0.20	0.091	(0.797)		0.082	0.009
48	4.00	0.20	0.091	(0.793)		0.082	0.009
49	4.08	0.20	0.091	(0.790)		0.082	0.009
50	4.17	0.20	0.091	(0.786)		0.082	0.009
51	4.25	0.20	0.091	(0.783)		0.082	0.009
52	4.33	0.23	0.106	(0.780)		0.096	0.011

53	4.42	0.23	0.106	(0.776)	0.096	0.011
54	4.50	0.23	0.106	(0.773)	0.096	0.011
55	4.58	0.23	0.106	(0.770)	0.096	0.011
56	4.67	0.23	0.106	(0.767)	0.096	0.011
57	4.75	0.23	0.106	(0.763)	0.096	0.011
58	4.83	0.27	0.121	(0.760)	0.109	0.012
59	4.92	0.27	0.121	(0.757)	0.109	0.012
60	5.00	0.27	0.121	(0.753)	0.109	0.012
61	5.08	0.20	0.091	(0.750)	0.082	0.009
62	5.17	0.20	0.091	(0.747)	0.082	0.009
63	5.25	0.20	0.091	(0.744)	0.082	0.009
64	5.33	0.23	0.106	(0.740)	0.096	0.011
65	5.42	0.23	0.106	(0.737)	0.096	0.011
66	5.50	0.23	0.106	(0.734)	0.096	0.011
67	5.58	0.27	0.121	(0.731)	0.109	0.012
68	5.67	0.27	0.121	(0.727)	0.109	0.012
69	5.75	0.27	0.121	(0.724)	0.109	0.012
70	5.83	0.27	0.121	(0.721)	0.109	0.012
71	5.92	0.27	0.121	(0.718)	0.109	0.012
72	6.00	0.27	0.121	(0.715)	0.109	0.012
73	6.08	0.30	0.137	(0.711)	0.123	0.014
74	6.17	0.30	0.137	(0.708)	0.123	0.014
75	6.25	0.30	0.137	(0.705)	0.123	0.014
76	6.33	0.30	0.137	(0.702)	0.123	0.014
77	6.42	0.30	0.137	(0.699)	0.123	0.014
78	6.50	0.30	0.137	(0.696)	0.123	0.014
79	6.58	0.33	0.152	(0.693)	0.137	0.015
80	6.67	0.33	0.152	(0.689)	0.137	0.015
81	6.75	0.33	0.152	(0.686)	0.137	0.015
82	6.83	0.33	0.152	(0.683)	0.137	0.015
83	6.92	0.33	0.152	(0.680)	0.137	0.015
84	7.00	0.33	0.152	(0.677)	0.137	0.015
85	7.08	0.33	0.152	(0.674)	0.137	0.015
86	7.17	0.33	0.152	(0.671)	0.137	0.015
87	7.25	0.33	0.152	(0.668)	0.137	0.015
88	7.33	0.37	0.167	(0.665)	0.150	0.017
89	7.42	0.37	0.167	(0.662)	0.150	0.017
90	7.50	0.37	0.167	(0.659)	0.150	0.017
91	7.58	0.40	0.182	(0.656)	0.164	0.018
92	7.67	0.40	0.182	(0.653)	0.164	0.018
93	7.75	0.40	0.182	(0.650)	0.164	0.018
94	7.83	0.43	0.197	(0.647)	0.178	0.020
95	7.92	0.43	0.197	(0.644)	0.178	0.020
96	8.00	0.43	0.197	(0.641)	0.178	0.020
97	8.08	0.50	0.228	(0.638)	0.205	0.023
98	8.17	0.50	0.228	(0.635)	0.205	0.023
99	8.25	0.50	0.228	(0.632)	0.205	0.023
100	8.33	0.50	0.228	(0.629)	0.205	0.023
101	8.42	0.50	0.228	(0.626)	0.205	0.023
102	8.50	0.50	0.228	(0.623)	0.205	0.023
103	8.58	0.53	0.243	(0.620)	0.219	0.024
104	8.67	0.53	0.243	(0.617)	0.219	0.024
105	8.75	0.53	0.243	(0.614)	0.219	0.024
106	8.83	0.57	0.258	(0.611)	0.232	0.026

107	8.92	0.57	0.258	(0.608)	0.232	0.026
108	9.00	0.57	0.258	(0.606)	0.232	0.026
109	9.08	0.63	0.289	(0.603)	0.260	0.029
110	9.17	0.63	0.289	(0.600)	0.260	0.029
111	9.25	0.63	0.289	(0.597)	0.260	0.029
112	9.33	0.67	0.304	(0.594)	0.273	0.030
113	9.42	0.67	0.304	(0.591)	0.273	0.030
114	9.50	0.67	0.304	(0.588)	0.273	0.030
115	9.58	0.70	0.319	(0.586)	0.287	0.032
116	9.67	0.70	0.319	(0.583)	0.287	0.032
117	9.75	0.70	0.319	(0.580)	0.287	0.032
118	9.83	0.73	0.334	(0.577)	0.301	0.033
119	9.92	0.73	0.334	(0.574)	0.301	0.033
120	10.00	0.73	0.334	(0.572)	0.301	0.033
121	10.08	0.50	0.228	(0.569)	0.205	0.023
122	10.17	0.50	0.228	(0.566)	0.205	0.023
123	10.25	0.50	0.228	(0.563)	0.205	0.023
124	10.33	0.50	0.228	(0.561)	0.205	0.023
125	10.42	0.50	0.228	(0.558)	0.205	0.023
126	10.50	0.50	0.228	(0.555)	0.205	0.023
127	10.58	0.67	0.304	(0.553)	0.273	0.030
128	10.67	0.67	0.304	(0.550)	0.273	0.030
129	10.75	0.67	0.304	(0.547)	0.273	0.030
130	10.83	0.67	0.304	(0.544)	0.273	0.030
131	10.92	0.67	0.304	(0.542)	0.273	0.030
132	11.00	0.67	0.304	(0.539)	0.273	0.030
133	11.08	0.63	0.289	(0.536)	0.260	0.029
134	11.17	0.63	0.289	(0.534)	0.260	0.029
135	11.25	0.63	0.289	(0.531)	0.260	0.029
136	11.33	0.63	0.289	(0.529)	0.260	0.029
137	11.42	0.63	0.289	(0.526)	0.260	0.029
138	11.50	0.63	0.289	(0.523)	0.260	0.029
139	11.58	0.57	0.258	(0.521)	0.232	0.026
140	11.67	0.57	0.258	(0.518)	0.232	0.026
141	11.75	0.57	0.258	(0.516)	0.232	0.026
142	11.83	0.60	0.273	(0.513)	0.246	0.027
143	11.92	0.60	0.273	(0.510)	0.246	0.027
144	12.00	0.60	0.273	(0.508)	0.246	0.027
145	12.08	0.83	0.380	(0.505)	0.342	0.038
146	12.17	0.83	0.380	(0.503)	0.342	0.038
147	12.25	0.83	0.380	(0.500)	0.342	0.038
148	12.33	0.87	0.395	(0.498)	0.355	0.039
149	12.42	0.87	0.395	(0.495)	0.355	0.039
150	12.50	0.87	0.395	(0.493)	0.355	0.039
151	12.58	0.93	0.425	(0.490)	0.383	0.043
152	12.67	0.93	0.425	(0.488)	0.383	0.043
153	12.75	0.93	0.425	(0.485)	0.383	0.043
154	12.83	0.97	0.440	(0.483)	0.396	0.044
155	12.92	0.97	0.440	(0.481)	0.396	0.044
156	13.00	0.97	0.440	(0.478)	0.396	0.044
157	13.08	1.13	0.516	(0.476)	0.465	0.052
158	13.17	1.13	0.516	(0.473)	0.465	0.052
159	13.25	1.13	0.516	(0.471)	0.465	0.052
160	13.33	1.13	0.516	(0.468)	0.465	0.052

161	13.42	1.13	0.516	(0.466)	0.465	0.052
162	13.50	1.13	0.516	0.464	(0.465)	0.053
163	13.58	0.77	0.349	(0.461)	0.314	0.035
164	13.67	0.77	0.349	(0.459)	0.314	0.035
165	13.75	0.77	0.349	(0.457)	0.314	0.035
166	13.83	0.77	0.349	(0.454)	0.314	0.035
167	13.92	0.77	0.349	(0.452)	0.314	0.035
168	14.00	0.77	0.349	(0.450)	0.314	0.035
169	14.08	0.90	0.410	(0.447)	0.369	0.041
170	14.17	0.90	0.410	(0.445)	0.369	0.041
171	14.25	0.90	0.410	(0.443)	0.369	0.041
172	14.33	0.87	0.395	(0.441)	0.355	0.039
173	14.42	0.87	0.395	(0.438)	0.355	0.039
174	14.50	0.87	0.395	(0.436)	0.355	0.039
175	14.58	0.87	0.395	(0.434)	0.355	0.039
176	14.67	0.87	0.395	(0.432)	0.355	0.039
177	14.75	0.87	0.395	(0.429)	0.355	0.039
178	14.83	0.83	0.380	(0.427)	0.342	0.038
179	14.92	0.83	0.380	(0.425)	0.342	0.038
180	15.00	0.83	0.380	(0.423)	0.342	0.038
181	15.08	0.80	0.364	(0.421)	0.328	0.036
182	15.17	0.80	0.364	(0.419)	0.328	0.036
183	15.25	0.80	0.364	(0.416)	0.328	0.036
184	15.33	0.77	0.349	(0.414)	0.314	0.035
185	15.42	0.77	0.349	(0.412)	0.314	0.035
186	15.50	0.77	0.349	(0.410)	0.314	0.035
187	15.58	0.63	0.289	(0.408)	0.260	0.029
188	15.67	0.63	0.289	(0.406)	0.260	0.029
189	15.75	0.63	0.289	(0.404)	0.260	0.029
190	15.83	0.63	0.289	(0.402)	0.260	0.029
191	15.92	0.63	0.289	(0.400)	0.260	0.029
192	16.00	0.63	0.289	(0.398)	0.260	0.029
193	16.08	0.13	0.061	(0.396)	0.055	0.006
194	16.17	0.13	0.061	(0.394)	0.055	0.006
195	16.25	0.13	0.061	(0.392)	0.055	0.006
196	16.33	0.13	0.061	(0.390)	0.055	0.006
197	16.42	0.13	0.061	(0.388)	0.055	0.006
198	16.50	0.13	0.061	(0.386)	0.055	0.006
199	16.58	0.10	0.046	(0.384)	0.041	0.005
200	16.67	0.10	0.046	(0.382)	0.041	0.005
201	16.75	0.10	0.046	(0.380)	0.041	0.005
202	16.83	0.10	0.046	(0.378)	0.041	0.005
203	16.92	0.10	0.046	(0.376)	0.041	0.005
204	17.00	0.10	0.046	(0.374)	0.041	0.005
205	17.08	0.17	0.076	(0.372)	0.068	0.008
206	17.17	0.17	0.076	(0.370)	0.068	0.008
207	17.25	0.17	0.076	(0.368)	0.068	0.008
208	17.33	0.17	0.076	(0.366)	0.068	0.008
209	17.42	0.17	0.076	(0.365)	0.068	0.008
210	17.50	0.17	0.076	(0.363)	0.068	0.008
211	17.58	0.17	0.076	(0.361)	0.068	0.008
212	17.67	0.17	0.076	(0.359)	0.068	0.008
213	17.75	0.17	0.076	(0.357)	0.068	0.008
214	17.83	0.13	0.061	(0.356)	0.055	0.006

215	17.92	0.13	0.061	(0.354)	0.055	0.006
216	18.00	0.13	0.061	(0.352)	0.055	0.006
217	18.08	0.13	0.061	(0.350)	0.055	0.006
218	18.17	0.13	0.061	(0.349)	0.055	0.006
219	18.25	0.13	0.061	(0.347)	0.055	0.006
220	18.33	0.13	0.061	(0.345)	0.055	0.006
221	18.42	0.13	0.061	(0.344)	0.055	0.006
222	18.50	0.13	0.061	(0.342)	0.055	0.006
223	18.58	0.10	0.046	(0.340)	0.041	0.005
224	18.67	0.10	0.046	(0.339)	0.041	0.005
225	18.75	0.10	0.046	(0.337)	0.041	0.005
226	18.83	0.07	0.030	(0.335)	0.027	0.003
227	18.92	0.07	0.030	(0.334)	0.027	0.003
228	19.00	0.07	0.030	(0.332)	0.027	0.003
229	19.08	0.10	0.046	(0.331)	0.041	0.005
230	19.17	0.10	0.046	(0.329)	0.041	0.005
231	19.25	0.10	0.046	(0.328)	0.041	0.005
232	19.33	0.13	0.061	(0.326)	0.055	0.006
233	19.42	0.13	0.061	(0.325)	0.055	0.006
234	19.50	0.13	0.061	(0.323)	0.055	0.006
235	19.58	0.10	0.046	(0.322)	0.041	0.005
236	19.67	0.10	0.046	(0.320)	0.041	0.005
237	19.75	0.10	0.046	(0.319)	0.041	0.005
238	19.83	0.07	0.030	(0.317)	0.027	0.003
239	19.92	0.07	0.030	(0.316)	0.027	0.003
240	20.00	0.07	0.030	(0.314)	0.027	0.003
241	20.08	0.10	0.046	(0.313)	0.041	0.005
242	20.17	0.10	0.046	(0.312)	0.041	0.005
243	20.25	0.10	0.046	(0.310)	0.041	0.005
244	20.33	0.10	0.046	(0.309)	0.041	0.005
245	20.42	0.10	0.046	(0.308)	0.041	0.005
246	20.50	0.10	0.046	(0.306)	0.041	0.005
247	20.58	0.10	0.046	(0.305)	0.041	0.005
248	20.67	0.10	0.046	(0.304)	0.041	0.005
249	20.75	0.10	0.046	(0.302)	0.041	0.005
250	20.83	0.07	0.030	(0.301)	0.027	0.003
251	20.92	0.07	0.030	(0.300)	0.027	0.003
252	21.00	0.07	0.030	(0.299)	0.027	0.003
253	21.08	0.10	0.046	(0.298)	0.041	0.005
254	21.17	0.10	0.046	(0.296)	0.041	0.005
255	21.25	0.10	0.046	(0.295)	0.041	0.005
256	21.33	0.07	0.030	(0.294)	0.027	0.003
257	21.42	0.07	0.030	(0.293)	0.027	0.003
258	21.50	0.07	0.030	(0.292)	0.027	0.003
259	21.58	0.10	0.046	(0.291)	0.041	0.005
260	21.67	0.10	0.046	(0.290)	0.041	0.005
261	21.75	0.10	0.046	(0.289)	0.041	0.005
262	21.83	0.07	0.030	(0.288)	0.027	0.003
263	21.92	0.07	0.030	(0.287)	0.027	0.003
264	22.00	0.07	0.030	(0.286)	0.027	0.003
265	22.08	0.10	0.046	(0.285)	0.041	0.005
266	22.17	0.10	0.046	(0.284)	0.041	0.005
267	22.25	0.10	0.046	(0.283)	0.041	0.005
268	22.33	0.07	0.030	(0.282)	0.027	0.003

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269  22.42     0.07      0.030       (  0.281)       0.027        0.003
270  22.50     0.07      0.030       (  0.281)       0.027        0.003
271  22.58     0.07      0.030       (  0.280)       0.027        0.003
272  22.67     0.07      0.030       (  0.279)       0.027        0.003
273  22.75     0.07      0.030       (  0.278)       0.027        0.003
274  22.83     0.07      0.030       (  0.277)       0.027        0.003
275  22.92     0.07      0.030       (  0.277)       0.027        0.003
276  23.00     0.07      0.030       (  0.276)       0.027        0.003
277  23.08     0.07      0.030       (  0.275)       0.027        0.003
278  23.17     0.07      0.030       (  0.275)       0.027        0.003
279  23.25     0.07      0.030       (  0.274)       0.027        0.003
280  23.33     0.07      0.030       (  0.274)       0.027        0.003
281  23.42     0.07      0.030       (  0.273)       0.027        0.003
282  23.50     0.07      0.030       (  0.273)       0.027        0.003
283  23.58     0.07      0.030       (  0.272)       0.027        0.003
284  23.67     0.07      0.030       (  0.272)       0.027        0.003
285  23.75     0.07      0.030       (  0.271)       0.027        0.003
286  23.83     0.07      0.030       (  0.271)       0.027        0.003
287  23.92     0.07      0.030       (  0.271)       0.027        0.003
288  24.00     0.07      0.030       (  0.271)       0.027        0.003
                (Loss Rate Not Used)
    Sum =     100.0                                    Sum =     4.6
       Flood volume = Effective rainfall      0.38(In)
        times area       3.6(Ac.)/[(In)/(Ft.)] =       0.1(Ac.Ft)
       Total soil loss =      3.42(In)
       Total soil loss =     1.022(Ac.Ft)
       Total rainfall =      3.80(In)
       Flood volume =        4948.8 Cubic Feet
       Total soil loss =       44528.5 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =      0.189(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        2.5       5.0       7.5      10.0
 ------------------------------------------------------------------------
   0+ 5       0.0000      0.01  Q         |         |         |         |
   0+10       0.0001      0.01  Q         |         |         |         |
   0+15       0.0002      0.01  Q         |         |         |         |
   0+20       0.0003      0.01  Q         |         |         |         |
   0+25       0.0004      0.02  Q         |         |         |         |
   0+30       0.0005      0.02  Q         |         |         |         |
   0+35       0.0006      0.02  Q         |         |         |         |
   0+40       0.0007      0.02  Q         |         |         |         |
   0+45       0.0008      0.02  Q         |         |         |         |
   0+50       0.0010      0.02  Q         |         |         |         |
   0+55       0.0011      0.02  Q         |         |         |         |
   1+ 0       0.0013      0.02  Q         |         |         |         |
   1+ 5       0.0014      0.02  Q         |         |         |         |
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1+10	0.0015	0.02	Q	|	|	|	|
1+15	0.0016	0.02	Q	|	|	|	|
1+20	0.0017	0.02	Q	|	|	|	|
1+25	0.0019	0.02	Q	|	|	|	|
1+30	0.0020	0.02	Q	|	|	|	|
1+35	0.0021	0.02	Q	|	|	|	|
1+40	0.0022	0.02	Q	|	|	|	|
1+45	0.0023	0.02	Q	|	|	|	|
1+50	0.0024	0.02	Q	|	|	|	|
1+55	0.0026	0.02	Q	|	|	|	|
2+ 0	0.0027	0.02	Q	|	|	|	|
2+ 5	0.0029	0.02	QV	|	|	|	|
2+10	0.0030	0.02	QV	|	|	|	|
2+15	0.0032	0.02	QV	|	|	|	|
2+20	0.0033	0.02	QV	|	|	|	|
2+25	0.0035	0.02	QV	|	|	|	|
2+30	0.0036	0.02	QV	|	|	|	|
2+35	0.0038	0.02	QV	|	|	|	|
2+40	0.0040	0.03	QV	|	|	|	|
2+45	0.0042	0.03	QV	|	|	|	|
2+50	0.0044	0.03	QV	|	|	|	|
2+55	0.0046	0.03	QV	|	|	|	|
3+ 0	0.0048	0.03	QV	|	|	|	|
3+ 5	0.0049	0.03	QV	|	|	|	|
3+10	0.0051	0.03	QV	|	|	|	|
3+15	0.0053	0.03	QV	|	|	|	|
3+20	0.0055	0.03	QV	|	|	|	|
3+25	0.0057	0.03	Q V	|	|	|	|
3+30	0.0059	0.03	Q V	|	|	|	|
3+35	0.0061	0.03	Q V	|	|	|	|
3+40	0.0063	0.03	Q V	|	|	|	|
3+45	0.0065	0.03	Q V	|	|	|	|
3+50	0.0067	0.03	Q V	|	|	|	|
3+55	0.0069	0.03	Q V	|	|	|	|
4+ 0	0.0071	0.03	Q V	|	|	|	|
4+ 5	0.0073	0.03	Q V	|	|	|	|
4+10	0.0076	0.03	Q V	|	|	|	|
4+15	0.0078	0.03	Q V	|	|	|	|
4+20	0.0080	0.04	Q V	|	|	|	|
4+25	0.0083	0.04	Q V	|	|	|	|
4+30	0.0086	0.04	Q V	|	|	|	|
4+35	0.0088	0.04	Q V	|	|	|	|
4+40	0.0091	0.04	Q V	|	|	|	|
4+45	0.0094	0.04	Q V	|	|	|	|
4+50	0.0097	0.04	Q V	|	|	|	|
4+55	0.0099	0.04	Q V	|	|	|	|
5+ 0	0.0103	0.04	Q V	|	|	|	|
5+ 5	0.0105	0.04	Q V	|	|	|	|
5+10	0.0108	0.03	Q V	|	|	|	|
5+15	0.0110	0.03	Q V	|	|	|	|
5+20	0.0112	0.04	Q V	|	|	|	|
5+25	0.0115	0.04	Q V	|	|	|	|
5+30	0.0118	0.04	Q V	|	|	|	|
5+35	0.0120	0.04	Q V	|	|	|	|

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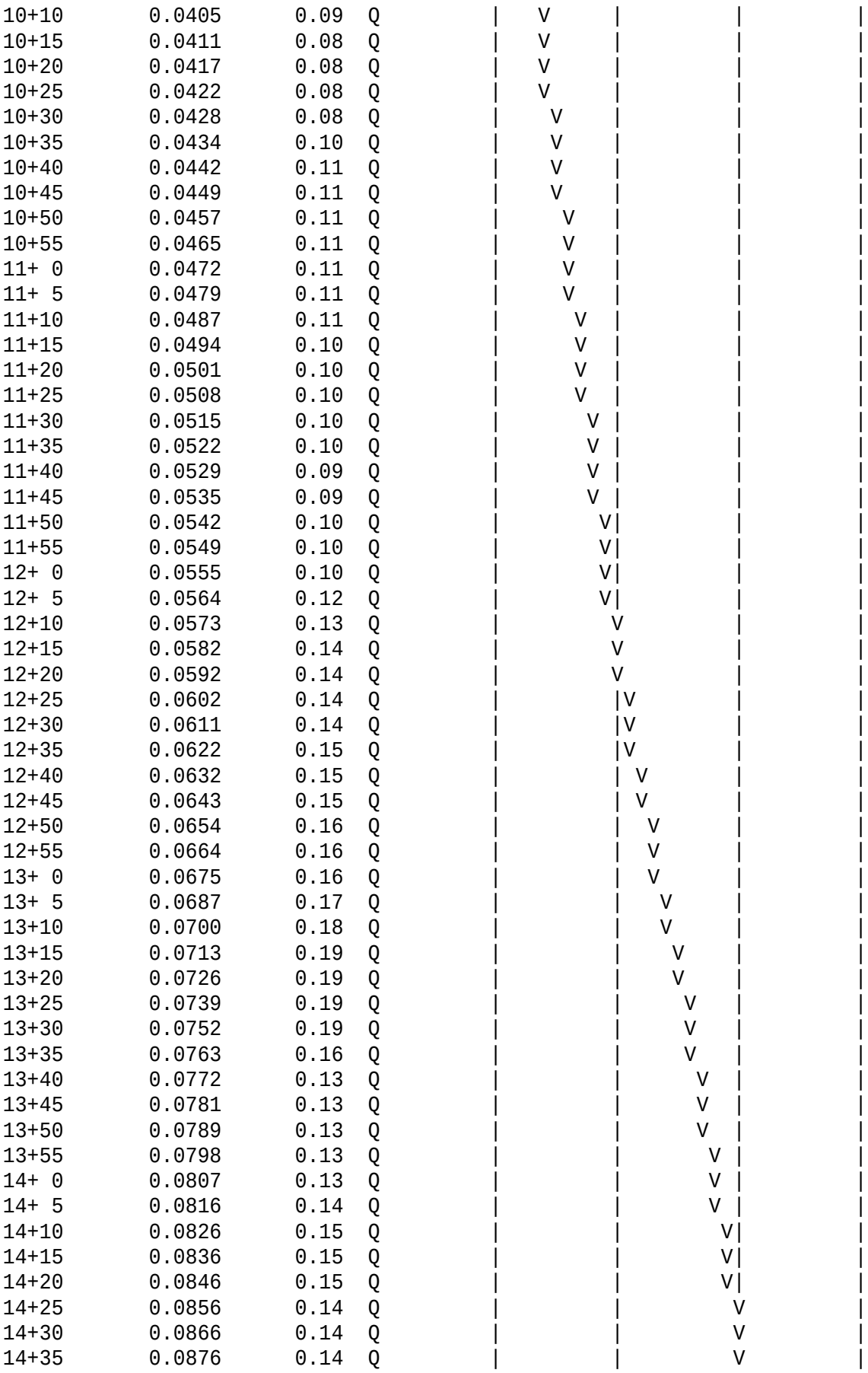
 5+40       0.0123      0.04  Q   V     |          |          |          |
 5+45       0.0126      0.04  Q   V     |          |          |          |
 5+50       0.0129      0.04  Q   V     |          |          |          |
 5+55       0.0132      0.04  Q   V     |          |          |          |
 6+ 0       0.0135      0.04  Q   V     |          |          |          |
 6+ 5       0.0139      0.05  Q   V     |          |          |          |
 6+10       0.0142      0.05  Q    V    |          |          |          |
 6+15       0.0145      0.05  Q    V    |          |          |          |
 6+20       0.0149      0.05  Q    V    |          |          |          |
 6+25       0.0152      0.05  Q    V    |          |          |          |
 6+30       0.0156      0.05  Q    V    |          |          |          |
 6+35       0.0159      0.05  Q    V    |          |          |          |
 6+40       0.0163      0.05  Q    V    |          |          |          |
 6+45       0.0167      0.05  Q    V    |          |          |          |
 6+50       0.0171      0.05  Q     V   |          |          |          |
 6+55       0.0174      0.05  Q     V   |          |          |          |
 7+ 0       0.0178      0.05  Q     V   |          |          |          |
 7+ 5       0.0182      0.05  Q     V   |          |          |          |
 7+10       0.0186      0.05  Q     V   |          |          |          |
 7+15       0.0189      0.05  Q     V   |          |          |          |
 7+20       0.0193      0.06  Q     V   |          |          |          |
 7+25       0.0198      0.06  Q     V   |          |          |          |
 7+30       0.0202      0.06  Q      V  |          |          |          |
 7+35       0.0206      0.06  Q      V  |          |          |          |
 7+40       0.0211      0.07  Q      V  |          |          |          |
 7+45       0.0215      0.07  Q      V  |          |          |          |
 7+50       0.0220      0.07  Q      V  |          |          |          |
 7+55       0.0225      0.07  Q      V  |          |          |          |
 8+ 0       0.0230      0.07  Q       V |          |          |          |
 8+ 5       0.0235      0.08  Q       V |          |          |          |
 8+10       0.0240      0.08  Q       V |          |          |          |
 8+15       0.0246      0.08  Q       V |          |          |          |
 8+20       0.0252      0.08  Q       V |          |          |          |
 8+25       0.0258      0.08  Q        V|          |          |          |
 8+30       0.0263      0.08  Q        V|          |          |          |
 8+35       0.0269      0.09  Q        V|          |          |          |
 8+40       0.0275      0.09  Q        V|          |          |          |
 8+45       0.0281      0.09  Q        V|          |          |          |
 8+50       0.0287      0.09  Q         V          |          |          |
 8+55       0.0294      0.09  Q         V          |          |          |
 9+ 0       0.0300      0.09  Q         V          |          |          |
 9+ 5       0.0307      0.10  Q         V          |          |          |
 9+10       0.0314      0.10  Q         |V         |          |          |
 9+15       0.0321      0.10  Q         |V         |          |          |
 9+20       0.0329      0.11  Q         |V         |          |          |
 9+25       0.0336      0.11  Q         |V         |          |          |
 9+30       0.0344      0.11  Q         | V        |          |          |
 9+35       0.0351      0.11  Q         | V        |          |          |
 9+40       0.0359      0.11  Q         | V        |          |          |
 9+45       0.0367      0.12  Q         | V        |          |          |
 9+50       0.0375      0.12  Q         |  V       |          |          |
 9+55       0.0384      0.12  Q         |  V       |          |          |
10+ 0       0.0392      0.12  Q         |  V       |          |          |
10+ 5       0.0399      0.10  Q         |   V      |          |          |
```



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14+40       0.0886      0.14  Q          |          |          |V         |
14+45       0.0896      0.14  Q          |          |          |V         |
14+50       0.0905      0.14  Q          |          |          |V         |
14+55       0.0915      0.14  Q          |          |          | V        |
15+ 0       0.0924      0.14  Q          |          |          | V        |
15+ 5       0.0934      0.13  Q          |          |          | V        |
15+10       0.0943      0.13  Q          |          |          |  V       |
15+15       0.0952      0.13  Q          |          |          |  V       |
15+20       0.0961      0.13  Q          |          |          |  V       |
15+25       0.0969      0.13  Q          |          |          |   V      |
15+30       0.0978      0.13  Q          |          |          |   V      |
15+35       0.0986      0.12  Q          |          |          |   V      |
15+40       0.0994      0.11  Q          |          |          |   V      |
15+45       0.1001      0.11  Q          |          |          |    V     |
15+50       0.1008      0.10  Q          |          |          |    V     |
15+55       0.1015      0.10  Q          |          |          |    V     |
16+ 0       0.1022      0.10  Q          |          |          |    V     |
16+ 5       0.1027      0.06  Q          |          |          |     V    |
16+10       0.1029      0.03  Q          |          |          |     V    |
16+15       0.1031      0.02  Q          |          |          |     V    |
16+20       0.1032      0.02  Q          |          |          |     V    |
16+25       0.1034      0.02  Q          |          |          |     V    |
16+30       0.1035      0.02  Q          |          |          |     V    |
16+35       0.1036      0.02  Q          |          |          |     V    |
16+40       0.1038      0.02  Q          |          |          |     V    |
16+45       0.1039      0.02  Q          |          |          |     V    |
16+50       0.1040      0.02  Q          |          |          |     V    |
16+55       0.1041      0.02  Q          |          |          |     V    |
17+ 0       0.1042      0.02  Q          |          |          |     V    |
17+ 5       0.1044      0.02  Q          |          |          |     V    |
17+10       0.1046      0.03  Q          |          |          |     V    |
17+15       0.1047      0.03  Q          |          |          |     V    |
17+20       0.1049      0.03  Q          |          |          |     V    |
17+25       0.1051      0.03  Q          |          |          |      V   |
17+30       0.1053      0.03  Q          |          |          |      V   |
17+35       0.1055      0.03  Q          |          |          |      V   |
17+40       0.1057      0.03  Q          |          |          |      V   |
17+45       0.1059      0.03  Q          |          |          |      V   |
17+50       0.1060      0.02  Q          |          |          |      V   |
17+55       0.1062      0.02  Q          |          |          |      V   |
18+ 0       0.1064      0.02  Q          |          |          |      V   |
18+ 5       0.1065      0.02  Q          |          |          |      V   |
18+10       0.1067      0.02  Q          |          |          |      V   |
18+15       0.1068      0.02  Q          |          |          |      V   |
18+20       0.1070      0.02  Q          |          |          |      V   |
18+25       0.1071      0.02  Q          |          |          |      V   |
18+30       0.1073      0.02  Q          |          |          |      V   |
18+35       0.1074      0.02  Q          |          |          |      V   |
18+40       0.1075      0.02  Q          |          |          |      V   |
18+45       0.1076      0.02  Q          |          |          |      V   |
18+50       0.1077      0.01  Q          |          |          |      V   |
18+55       0.1078      0.01  Q          |          |          |      V   |
19+ 0       0.1079      0.01  Q          |          |          |      V   |
19+ 5       0.1080      0.01  Q          |          |          |       V  |
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19+10	0.1081	0.02	Q	|	|	|	V |
19+15	0.1082	0.02	Q	|	|	|	V |
19+20	0.1083	0.02	Q	|	|	|	V |
19+25	0.1085	0.02	Q	|	|	|	V |
19+30	0.1086	0.02	Q	|	|	|	V |
19+35	0.1088	0.02	Q	|	|	|	V |
19+40	0.1089	0.02	Q	|	|	|	V |
19+45	0.1090	0.02	Q	|	|	|	V |
19+50	0.1091	0.01	Q	|	|	|	V |
19+55	0.1092	0.01	Q	|	|	|	V |
20+ 0	0.1092	0.01	Q	|	|	|	V |
20+ 5	0.1093	0.01	Q	|	|	|	V |
20+10	0.1094	0.02	Q	|	|	|	V |
20+15	0.1096	0.02	Q	|	|	|	V |
20+20	0.1097	0.02	Q	|	|	|	V |
20+25	0.1098	0.02	Q	|	|	|	V |
20+30	0.1099	0.02	Q	|	|	|	V |
20+35	0.1100	0.02	Q	|	|	|	V |
20+40	0.1101	0.02	Q	|	|	|	V |
20+45	0.1102	0.02	Q	|	|	|	V |
20+50	0.1103	0.01	Q	|	|	|	V |
20+55	0.1104	0.01	Q	|	|	|	V |
21+ 0	0.1105	0.01	Q	|	|	|	V |
21+ 5	0.1106	0.01	Q	|	|	|	V |
21+10	0.1107	0.02	Q	|	|	|	V |
21+15	0.1108	0.02	Q	|	|	|	V|
21+20	0.1109	0.01	Q	|	|	|	V|
21+25	0.1110	0.01	Q	|	|	|	V|
21+30	0.1111	0.01	Q	|	|	|	V|
21+35	0.1112	0.01	Q	|	|	|	V|
21+40	0.1113	0.02	Q	|	|	|	V|
21+45	0.1114	0.02	Q	|	|	|	V|
21+50	0.1115	0.01	Q	|	|	|	V|
21+55	0.1116	0.01	Q	|	|	|	V|
22+ 0	0.1116	0.01	Q	|	|	|	V|
22+ 5	0.1117	0.01	Q	|	|	|	V|
22+10	0.1118	0.02	Q	|	|	|	V|
22+15	0.1119	0.02	Q	|	|	|	V|
22+20	0.1120	0.01	Q	|	|	|	V|
22+25	0.1121	0.01	Q	|	|	|	V|
22+30	0.1122	0.01	Q	|	|	|	V|
22+35	0.1123	0.01	Q	|	|	|	V|
22+40	0.1123	0.01	Q	|	|	|	V|
22+45	0.1124	0.01	Q	|	|	|	V|
22+50	0.1125	0.01	Q	|	|	|	V|
22+55	0.1126	0.01	Q	|	|	|	V|
23+ 0	0.1127	0.01	Q	|	|	|	V|
23+ 5	0.1127	0.01	Q	|	|	|	V|
23+10	0.1128	0.01	Q	|	|	|	V|
23+15	0.1129	0.01	Q	|	|	|	V|
23+20	0.1130	0.01	Q	|	|	|	V|
23+25	0.1130	0.01	Q	|	|	|	V|
23+30	0.1131	0.01	Q	|	|	|	V|
23+35	0.1132	0.01	Q	|	|	|	V|

```
   23+40       0.1133      0.01  Q          |          |          |         V|
   23+45       0.1133      0.01  Q          |          |          |         V|
   23+50       0.1134      0.01  Q          |          |          |         V|
   23+55       0.1135      0.01  Q          |          |          |         V|
   24+ 0       0.1136      0.01  Q          |          |          |         V|
   24+ 5       0.1136      0.01  Q          |          |          |         V|
   24+10       0.1136      0.00  Q          |          |          |         V|
   24+15       0.1136      0.00  Q          |          |          |          V
-------------------------------------------------------------------------------
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U n i t H y d r o g r a p h A n a l y s i s

Study date 01/07/22 File: 1162008exuhb2410.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6335

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

VALUED ENGINEERING, INC
1162008 - PARADISE VALLEY RANCH
EXISTING UNIT HYDROGRAPH STUDY - FACILITY 6
10-YR, 24-HR STORM EVENT

Drainage Area = 0.53(Ac.) = 0.001 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 0.53(Ac.) = 0.001 Sq. Mi.
Length along longest watercourse = 145.00(Ft.)
Length along longest watercourse measured to centroid = 102.00(Ft.)
Length along longest watercourse = 0.027 Mi.
Length along longest watercourse measured to centroid = 0.019 Mi.
Difference in elevation = 15.80(Ft.)
Slope along watercourse = 575.3379 Ft./Mi.
Average Manning's 'N' = 0.040
Lag time = 0.016 Hr.
Lag time = 0.98 Min.
25% of lag time = 0.25 Min.
40% of lag time = 0.39 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

```
Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        0.53            2.04                  1.08

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        0.53            6.31                  3.34

STORM EVENT (YEAR) =   10.00
Area Averaged 2-Year Rainfall =    2.040(In)
Area Averaged 100-Year Rainfall =    6.310(In)

Point rain (area averaged) =    3.797(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    3.797(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     0.175           70.00         0.000
     0.355           85.00         0.000
 Total Area Entered =      0.53(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
70.0  70.0      0.362     0.000        0.362       0.330      0.120
85.0  85.0      0.187     0.000        0.187       0.670      0.125
                                                 Sum (F) =   0.245
Area averaged mean soil loss (F) (In/Hr) =  0.245
Minimum soil loss rate ((In/Hr)) =  0.122
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
------------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                       VALLEY S-Curve
------------------------------------------------------------------------
               Unit Hydrograph Data
------------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %           (CFS)
------------------------------------------------------------------------
    1   0.083        509.973         71.412              0.381
    2   0.167       1019.945         28.588              0.153
                                Sum = 100.000   Sum=       0.534
------------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated
loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain
value
```

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	0.07	0.030	(0.434)		0.027	0.003
2	0.17	0.07	0.030	(0.432)		0.027	0.003
3	0.25	0.07	0.030	(0.431)		0.027	0.003
4	0.33	0.10	0.046	(0.429)		0.041	0.005
5	0.42	0.10	0.046	(0.427)		0.041	0.005
6	0.50	0.10	0.046	(0.426)		0.041	0.005
7	0.58	0.10	0.046	(0.424)		0.041	0.005
8	0.67	0.10	0.046	(0.422)		0.041	0.005
9	0.75	0.10	0.046	(0.421)		0.041	0.005
10	0.83	0.13	0.061	(0.419)		0.055	0.006
11	0.92	0.13	0.061	(0.417)		0.055	0.006
12	1.00	0.13	0.061	(0.416)		0.055	0.006
13	1.08	0.10	0.046	(0.414)		0.041	0.005
14	1.17	0.10	0.046	(0.412)		0.041	0.005
15	1.25	0.10	0.046	(0.411)		0.041	0.005
16	1.33	0.10	0.046	(0.409)		0.041	0.005
17	1.42	0.10	0.046	(0.407)		0.041	0.005
18	1.50	0.10	0.046	(0.406)		0.041	0.005
19	1.58	0.10	0.046	(0.404)		0.041	0.005
20	1.67	0.10	0.046	(0.403)		0.041	0.005
21	1.75	0.10	0.046	(0.401)		0.041	0.005
22	1.83	0.13	0.061	(0.399)		0.055	0.006
23	1.92	0.13	0.061	(0.398)		0.055	0.006
24	2.00	0.13	0.061	(0.396)		0.055	0.006
25	2.08	0.13	0.061	(0.395)		0.055	0.006
26	2.17	0.13	0.061	(0.393)		0.055	0.006
27	2.25	0.13	0.061	(0.391)		0.055	0.006
28	2.33	0.13	0.061	(0.390)		0.055	0.006
29	2.42	0.13	0.061	(0.388)		0.055	0.006
30	2.50	0.13	0.061	(0.387)		0.055	0.006
31	2.58	0.17	0.076	(0.385)		0.068	0.008
32	2.67	0.17	0.076	(0.383)		0.068	0.008
33	2.75	0.17	0.076	(0.382)		0.068	0.008
34	2.83	0.17	0.076	(0.380)		0.068	0.008
35	2.92	0.17	0.076	(0.379)		0.068	0.008
36	3.00	0.17	0.076	(0.377)		0.068	0.008
37	3.08	0.17	0.076	(0.376)		0.068	0.008
38	3.17	0.17	0.076	(0.374)		0.068	0.008
39	3.25	0.17	0.076	(0.372)		0.068	0.008
40	3.33	0.17	0.076	(0.371)		0.068	0.008
41	3.42	0.17	0.076	(0.369)		0.068	0.008
42	3.50	0.17	0.076	(0.368)		0.068	0.008
43	3.58	0.17	0.076	(0.366)		0.068	0.008
44	3.67	0.17	0.076	(0.365)		0.068	0.008
45	3.75	0.17	0.076	(0.363)		0.068	0.008
46	3.83	0.20	0.091	(0.362)		0.082	0.009
47	3.92	0.20	0.091	(0.360)		0.082	0.009
48	4.00	0.20	0.091	(0.359)		0.082	0.009
49	4.08	0.20	0.091	(0.357)		0.082	0.009
50	4.17	0.20	0.091	(0.356)		0.082	0.009
51	4.25	0.20	0.091	(0.354)		0.082	0.009
52	4.33	0.23	0.106	(0.353)		0.096	0.011

53	4.42	0.23	0.106	(0.351)	0.096	0.011
54	4.50	0.23	0.106	(0.350)	0.096	0.011
55	4.58	0.23	0.106	(0.348)	0.096	0.011
56	4.67	0.23	0.106	(0.347)	0.096	0.011
57	4.75	0.23	0.106	(0.345)	0.096	0.011
58	4.83	0.27	0.121	(0.344)	0.109	0.012
59	4.92	0.27	0.121	(0.342)	0.109	0.012
60	5.00	0.27	0.121	(0.341)	0.109	0.012
61	5.08	0.20	0.091	(0.339)	0.082	0.009
62	5.17	0.20	0.091	(0.338)	0.082	0.009
63	5.25	0.20	0.091	(0.336)	0.082	0.009
64	5.33	0.23	0.106	(0.335)	0.096	0.011
65	5.42	0.23	0.106	(0.333)	0.096	0.011
66	5.50	0.23	0.106	(0.332)	0.096	0.011
67	5.58	0.27	0.121	(0.330)	0.109	0.012
68	5.67	0.27	0.121	(0.329)	0.109	0.012
69	5.75	0.27	0.121	(0.327)	0.109	0.012
70	5.83	0.27	0.121	(0.326)	0.109	0.012
71	5.92	0.27	0.121	(0.325)	0.109	0.012
72	6.00	0.27	0.121	(0.323)	0.109	0.012
73	6.08	0.30	0.137	(0.322)	0.123	0.014
74	6.17	0.30	0.137	(0.320)	0.123	0.014
75	6.25	0.30	0.137	(0.319)	0.123	0.014
76	6.33	0.30	0.137	(0.317)	0.123	0.014
77	6.42	0.30	0.137	(0.316)	0.123	0.014
78	6.50	0.30	0.137	(0.315)	0.123	0.014
79	6.58	0.33	0.152	(0.313)	0.137	0.015
80	6.67	0.33	0.152	(0.312)	0.137	0.015
81	6.75	0.33	0.152	(0.310)	0.137	0.015
82	6.83	0.33	0.152	(0.309)	0.137	0.015
83	6.92	0.33	0.152	(0.308)	0.137	0.015
84	7.00	0.33	0.152	(0.306)	0.137	0.015
85	7.08	0.33	0.152	(0.305)	0.137	0.015
86	7.17	0.33	0.152	(0.303)	0.137	0.015
87	7.25	0.33	0.152	(0.302)	0.137	0.015
88	7.33	0.37	0.167	(0.301)	0.150	0.017
89	7.42	0.37	0.167	(0.299)	0.150	0.017
90	7.50	0.37	0.167	(0.298)	0.150	0.017
91	7.58	0.40	0.182	(0.296)	0.164	0.018
92	7.67	0.40	0.182	(0.295)	0.164	0.018
93	7.75	0.40	0.182	(0.294)	0.164	0.018
94	7.83	0.43	0.197	(0.292)	0.178	0.020
95	7.92	0.43	0.197	(0.291)	0.178	0.020
96	8.00	0.43	0.197	(0.290)	0.178	0.020
97	8.08	0.50	0.228	(0.288)	0.205	0.023
98	8.17	0.50	0.228	(0.287)	0.205	0.023
99	8.25	0.50	0.228	(0.286)	0.205	0.023
100	8.33	0.50	0.228	(0.284)	0.205	0.023
101	8.42	0.50	0.228	(0.283)	0.205	0.023
102	8.50	0.50	0.228	(0.282)	0.205	0.023
103	8.58	0.53	0.243	(0.280)	0.219	0.024
104	8.67	0.53	0.243	(0.279)	0.219	0.024
105	8.75	0.53	0.243	(0.278)	0.219	0.024
106	8.83	0.57	0.258	(0.276)	0.232	0.026

107	8.92	0.57	0.258	(0.275)	0.232	0.026
108	9.00	0.57	0.258	(0.274)	0.232	0.026
109	9.08	0.63	0.289	(0.273)	0.260	0.029
110	9.17	0.63	0.289	(0.271)	0.260	0.029
111	9.25	0.63	0.289	(0.270)	0.260	0.029
112	9.33	0.67	0.304	0.269	(0.273)	0.035
113	9.42	0.67	0.304	0.267	(0.273)	0.036
114	9.50	0.67	0.304	0.266	(0.273)	0.038
115	9.58	0.70	0.319	0.265	(0.287)	0.054
116	9.67	0.70	0.319	0.264	(0.287)	0.055
117	9.75	0.70	0.319	0.262	(0.287)	0.057
118	9.83	0.73	0.334	0.261	(0.301)	0.073
119	9.92	0.73	0.334	0.260	(0.301)	0.074
120	10.00	0.73	0.334	0.258	(0.301)	0.076
121	10.08	0.50	0.228	(0.257)	0.205	0.023
122	10.17	0.50	0.228	(0.256)	0.205	0.023
123	10.25	0.50	0.228	(0.255)	0.205	0.023
124	10.33	0.50	0.228	(0.254)	0.205	0.023
125	10.42	0.50	0.228	(0.252)	0.205	0.023
126	10.50	0.50	0.228	(0.251)	0.205	0.023
127	10.58	0.67	0.304	0.250	(0.273)	0.054
128	10.67	0.67	0.304	0.249	(0.273)	0.055
129	10.75	0.67	0.304	0.247	(0.273)	0.056
130	10.83	0.67	0.304	0.246	(0.273)	0.058
131	10.92	0.67	0.304	0.245	(0.273)	0.059
132	11.00	0.67	0.304	0.244	(0.273)	0.060
133	11.08	0.63	0.289	0.243	(0.260)	0.046
134	11.17	0.63	0.289	0.241	(0.260)	0.047
135	11.25	0.63	0.289	0.240	(0.260)	0.048
136	11.33	0.63	0.289	0.239	(0.260)	0.050
137	11.42	0.63	0.289	0.238	(0.260)	0.051
138	11.50	0.63	0.289	0.237	(0.260)	0.052
139	11.58	0.57	0.258	(0.235)	0.232	0.026
140	11.67	0.57	0.258	(0.234)	0.232	0.026
141	11.75	0.57	0.258	(0.233)	0.232	0.026
142	11.83	0.60	0.273	0.232	(0.246)	0.041
143	11.92	0.60	0.273	0.231	(0.246)	0.043
144	12.00	0.60	0.273	0.230	(0.246)	0.044
145	12.08	0.83	0.380	0.228	(0.342)	0.151
146	12.17	0.83	0.380	0.227	(0.342)	0.152
147	12.25	0.83	0.380	0.226	(0.342)	0.153
148	12.33	0.87	0.395	0.225	(0.355)	0.170
149	12.42	0.87	0.395	0.224	(0.355)	0.171
150	12.50	0.87	0.395	0.223	(0.355)	0.172
151	12.58	0.93	0.425	0.222	(0.383)	0.204
152	12.67	0.93	0.425	0.221	(0.383)	0.205
153	12.75	0.93	0.425	0.219	(0.383)	0.206
154	12.83	0.97	0.440	0.218	(0.396)	0.222
155	12.92	0.97	0.440	0.217	(0.396)	0.223
156	13.00	0.97	0.440	0.216	(0.396)	0.224
157	13.08	1.13	0.516	0.215	(0.465)	0.301
158	13.17	1.13	0.516	0.214	(0.465)	0.302
159	13.25	1.13	0.516	0.213	(0.465)	0.303
160	13.33	1.13	0.516	0.212	(0.465)	0.305

161	13.42	1.13	0.516	0.211	(0.465)	0.306
162	13.50	1.13	0.516	0.210	(0.465)	0.307
163	13.58	0.77	0.349	0.209	(0.314)	0.141
164	13.67	0.77	0.349	0.208	(0.314)	0.142
165	13.75	0.77	0.349	0.206	(0.314)	0.143
166	13.83	0.77	0.349	0.205	(0.314)	0.144
167	13.92	0.77	0.349	0.204	(0.314)	0.145
168	14.00	0.77	0.349	0.203	(0.314)	0.146
169	14.08	0.90	0.410	0.202	(0.369)	0.208
170	14.17	0.90	0.410	0.201	(0.369)	0.209
171	14.25	0.90	0.410	0.200	(0.369)	0.210
172	14.33	0.87	0.395	0.199	(0.355)	0.196
173	14.42	0.87	0.395	0.198	(0.355)	0.197
174	14.50	0.87	0.395	0.197	(0.355)	0.198
175	14.58	0.87	0.395	0.196	(0.355)	0.199
176	14.67	0.87	0.395	0.195	(0.355)	0.200
177	14.75	0.87	0.395	0.194	(0.355)	0.201
178	14.83	0.83	0.380	0.193	(0.342)	0.187
179	14.92	0.83	0.380	0.192	(0.342)	0.188
180	15.00	0.83	0.380	0.191	(0.342)	0.188
181	15.08	0.80	0.364	0.190	(0.328)	0.174
182	15.17	0.80	0.364	0.189	(0.328)	0.175
183	15.25	0.80	0.364	0.188	(0.328)	0.176
184	15.33	0.77	0.349	0.187	(0.314)	0.162
185	15.42	0.77	0.349	0.186	(0.314)	0.163
186	15.50	0.77	0.349	0.185	(0.314)	0.164
187	15.58	0.63	0.289	0.184	(0.260)	0.104
188	15.67	0.63	0.289	0.183	(0.260)	0.105
189	15.75	0.63	0.289	0.183	(0.260)	0.106
190	15.83	0.63	0.289	0.182	(0.260)	0.107
191	15.92	0.63	0.289	0.181	(0.260)	0.108
192	16.00	0.63	0.289	0.180	(0.260)	0.109
193	16.08	0.13	0.061	(0.179)	0.055	0.006
194	16.17	0.13	0.061	(0.178)	0.055	0.006
195	16.25	0.13	0.061	(0.177)	0.055	0.006
196	16.33	0.13	0.061	(0.176)	0.055	0.006
197	16.42	0.13	0.061	(0.175)	0.055	0.006
198	16.50	0.13	0.061	(0.174)	0.055	0.006
199	16.58	0.10	0.046	(0.173)	0.041	0.005
200	16.67	0.10	0.046	(0.173)	0.041	0.005
201	16.75	0.10	0.046	(0.172)	0.041	0.005
202	16.83	0.10	0.046	(0.171)	0.041	0.005
203	16.92	0.10	0.046	(0.170)	0.041	0.005
204	17.00	0.10	0.046	(0.169)	0.041	0.005
205	17.08	0.17	0.076	(0.168)	0.068	0.008
206	17.17	0.17	0.076	(0.167)	0.068	0.008
207	17.25	0.17	0.076	(0.167)	0.068	0.008
208	17.33	0.17	0.076	(0.166)	0.068	0.008
209	17.42	0.17	0.076	(0.165)	0.068	0.008
210	17.50	0.17	0.076	(0.164)	0.068	0.008
211	17.58	0.17	0.076	(0.163)	0.068	0.008
212	17.67	0.17	0.076	(0.162)	0.068	0.008
213	17.75	0.17	0.076	(0.162)	0.068	0.008
214	17.83	0.13	0.061	(0.161)	0.055	0.006

215	17.92	0.13	0.061	(0.160)	0.055	0.006
216	18.00	0.13	0.061	(0.159)	0.055	0.006
217	18.08	0.13	0.061	(0.158)	0.055	0.006
218	18.17	0.13	0.061	(0.158)	0.055	0.006
219	18.25	0.13	0.061	(0.157)	0.055	0.006
220	18.33	0.13	0.061	(0.156)	0.055	0.006
221	18.42	0.13	0.061	(0.155)	0.055	0.006
222	18.50	0.13	0.061	(0.155)	0.055	0.006
223	18.58	0.10	0.046	(0.154)	0.041	0.005
224	18.67	0.10	0.046	(0.153)	0.041	0.005
225	18.75	0.10	0.046	(0.152)	0.041	0.005
226	18.83	0.07	0.030	(0.152)	0.027	0.003
227	18.92	0.07	0.030	(0.151)	0.027	0.003
228	19.00	0.07	0.030	(0.150)	0.027	0.003
229	19.08	0.10	0.046	(0.150)	0.041	0.005
230	19.17	0.10	0.046	(0.149)	0.041	0.005
231	19.25	0.10	0.046	(0.148)	0.041	0.005
232	19.33	0.13	0.061	(0.147)	0.055	0.006
233	19.42	0.13	0.061	(0.147)	0.055	0.006
234	19.50	0.13	0.061	(0.146)	0.055	0.006
235	19.58	0.10	0.046	(0.145)	0.041	0.005
236	19.67	0.10	0.046	(0.145)	0.041	0.005
237	19.75	0.10	0.046	(0.144)	0.041	0.005
238	19.83	0.07	0.030	(0.143)	0.027	0.003
239	19.92	0.07	0.030	(0.143)	0.027	0.003
240	20.00	0.07	0.030	(0.142)	0.027	0.003
241	20.08	0.10	0.046	(0.142)	0.041	0.005
242	20.17	0.10	0.046	(0.141)	0.041	0.005
243	20.25	0.10	0.046	(0.140)	0.041	0.005
244	20.33	0.10	0.046	(0.140)	0.041	0.005
245	20.42	0.10	0.046	(0.139)	0.041	0.005
246	20.50	0.10	0.046	(0.138)	0.041	0.005
247	20.58	0.10	0.046	(0.138)	0.041	0.005
248	20.67	0.10	0.046	(0.137)	0.041	0.005
249	20.75	0.10	0.046	(0.137)	0.041	0.005
250	20.83	0.07	0.030	(0.136)	0.027	0.003
251	20.92	0.07	0.030	(0.136)	0.027	0.003
252	21.00	0.07	0.030	(0.135)	0.027	0.003
253	21.08	0.10	0.046	(0.135)	0.041	0.005
254	21.17	0.10	0.046	(0.134)	0.041	0.005
255	21.25	0.10	0.046	(0.134)	0.041	0.005
256	21.33	0.07	0.030	(0.133)	0.027	0.003
257	21.42	0.07	0.030	(0.133)	0.027	0.003
258	21.50	0.07	0.030	(0.132)	0.027	0.003
259	21.58	0.10	0.046	(0.132)	0.041	0.005
260	21.67	0.10	0.046	(0.131)	0.041	0.005
261	21.75	0.10	0.046	(0.131)	0.041	0.005
262	21.83	0.07	0.030	(0.130)	0.027	0.003
263	21.92	0.07	0.030	(0.130)	0.027	0.003
264	22.00	0.07	0.030	(0.129)	0.027	0.003
265	22.08	0.10	0.046	(0.129)	0.041	0.005
266	22.17	0.10	0.046	(0.128)	0.041	0.005
267	22.25	0.10	0.046	(0.128)	0.041	0.005
268	22.33	0.07	0.030	(0.128)	0.027	0.003

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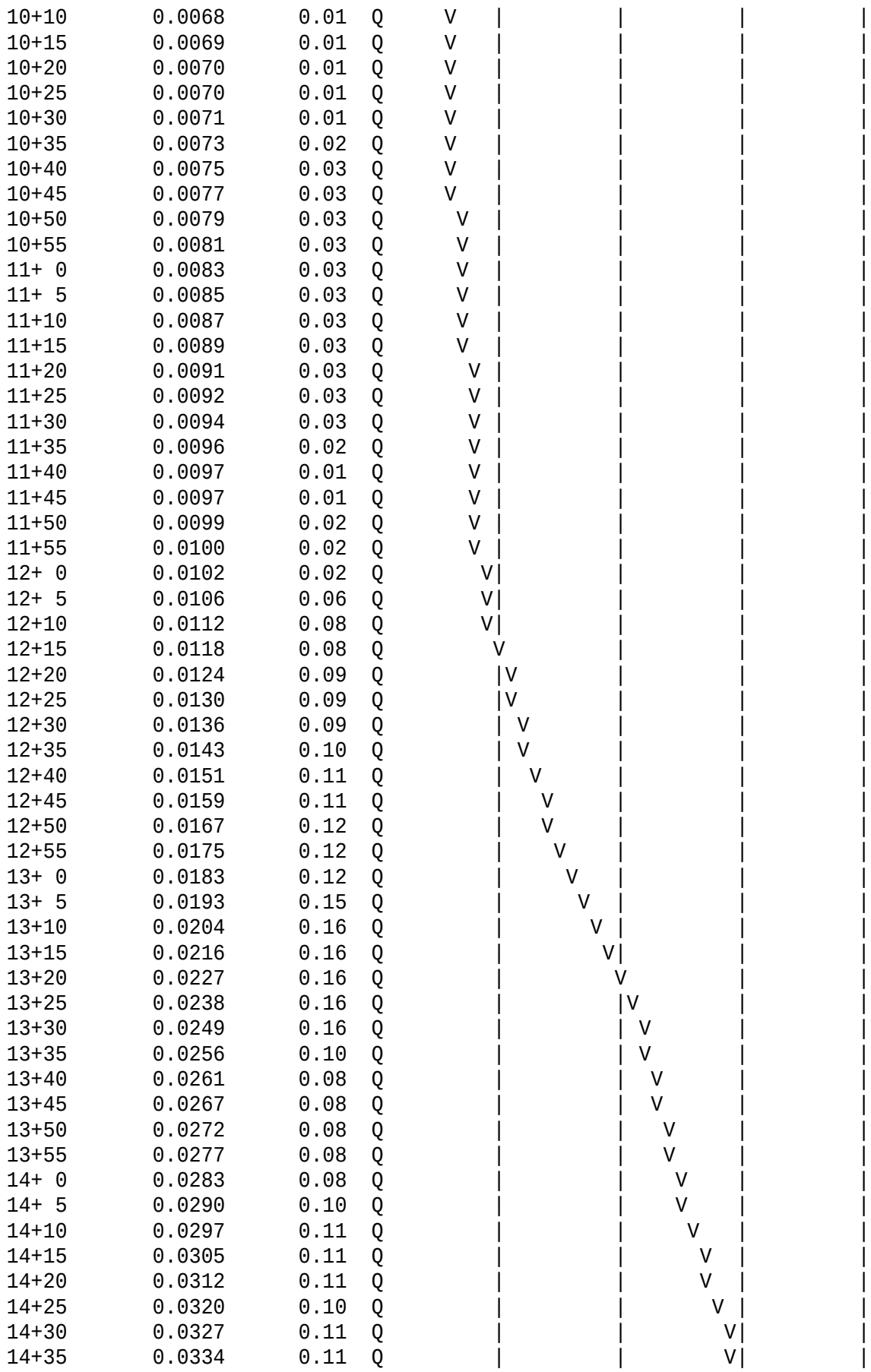
269  22.42     0.07      0.030       (  0.127)       0.027        0.003
270  22.50     0.07      0.030       (  0.127)       0.027        0.003
271  22.58     0.07      0.030       (  0.126)       0.027        0.003
272  22.67     0.07      0.030       (  0.126)       0.027        0.003
273  22.75     0.07      0.030       (  0.126)       0.027        0.003
274  22.83     0.07      0.030       (  0.125)       0.027        0.003
275  22.92     0.07      0.030       (  0.125)       0.027        0.003
276  23.00     0.07      0.030       (  0.125)       0.027        0.003
277  23.08     0.07      0.030       (  0.125)       0.027        0.003
278  23.17     0.07      0.030       (  0.124)       0.027        0.003
279  23.25     0.07      0.030       (  0.124)       0.027        0.003
280  23.33     0.07      0.030       (  0.124)       0.027        0.003
281  23.42     0.07      0.030       (  0.123)       0.027        0.003
282  23.50     0.07      0.030       (  0.123)       0.027        0.003
283  23.58     0.07      0.030       (  0.123)       0.027        0.003
284  23.67     0.07      0.030       (  0.123)       0.027        0.003
285  23.75     0.07      0.030       (  0.123)       0.027        0.003
286  23.83     0.07      0.030       (  0.123)       0.027        0.003
287  23.92     0.07      0.030       (  0.122)       0.027        0.003
288  24.00     0.07      0.030       (  0.122)       0.027        0.003
                (Loss Rate Not Used)
    Sum =     100.0                                    Sum =    12.2
       Flood volume = Effective rainfall      1.02(In)
        times area       0.5(Ac.)/[(In)/(Ft.)] =       0.0(Ac.Ft)
       Total soil loss =      2.78(In)
       Total soil loss =     0.123(Ac.Ft)
       Total rainfall =      3.80(In)
       Flood volume =        1954.2 Cubic Feet
       Total soil loss =        5350.3 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =      0.164(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        2.5       5.0       7.5      10.0
 ------------------------------------------------------------------------
   0+ 5       0.0000      0.00  Q         |         |         |         |
   0+10       0.0000      0.00  Q         |         |         |         |
   0+15       0.0000      0.00  Q         |         |         |         |
   0+20       0.0000      0.00  Q         |         |         |         |
   0+25       0.0001      0.00  Q         |         |         |         |
   0+30       0.0001      0.00  Q         |         |         |         |
   0+35       0.0001      0.00  Q         |         |         |         |
   0+40       0.0001      0.00  Q         |         |         |         |
   0+45       0.0001      0.00  Q         |         |         |         |
   0+50       0.0002      0.00  Q         |         |         |         |
   0+55       0.0002      0.00  Q         |         |         |         |
   1+ 0       0.0002      0.00  Q         |         |         |         |
   1+ 5       0.0002      0.00  Q         |         |         |         |
```

1+10	0.0002	0.00	Q				
1+15	0.0002	0.00	Q				
1+20	0.0003	0.00	Q				
1+25	0.0003	0.00	Q				
1+30	0.0003	0.00	Q				
1+35	0.0003	0.00	Q				
1+40	0.0003	0.00	Q				
1+45	0.0003	0.00	Q				
1+50	0.0004	0.00	Q				
1+55	0.0004	0.00	Q				
2+ 0	0.0004	0.00	Q				
2+ 5	0.0004	0.00	Q				
2+10	0.0005	0.00	Q				
2+15	0.0005	0.00	Q				
2+20	0.0005	0.00	Q				
2+25	0.0005	0.00	Q				
2+30	0.0005	0.00	Q				
2+35	0.0006	0.00	Q				
2+40	0.0006	0.00	Q				
2+45	0.0006	0.00	Q				
2+50	0.0007	0.00	Q				
2+55	0.0007	0.00	Q				
3+ 0	0.0007	0.00	Q				
3+ 5	0.0007	0.00	Q				
3+10	0.0008	0.00	Q				
3+15	0.0008	0.00	Q				
3+20	0.0008	0.00	Q				
3+25	0.0009	0.00	Q				
3+30	0.0009	0.00	Q				
3+35	0.0009	0.00	Q				
3+40	0.0009	0.00	Q				
3+45	0.0010	0.00	Q				
3+50	0.0010	0.00	Q				
3+55	0.0010	0.00	Q				
4+ 0	0.0011	0.00	Q				
4+ 5	0.0011	0.00	Q				
4+10	0.0011	0.00	QV				
4+15	0.0012	0.00	QV				
4+20	0.0012	0.01	QV				
4+25	0.0012	0.01	QV				
4+30	0.0013	0.01	QV				
4+35	0.0013	0.01	QV				
4+40	0.0014	0.01	QV				
4+45	0.0014	0.01	QV				
4+50	0.0014	0.01	QV				
4+55	0.0015	0.01	QV				
5+ 0	0.0015	0.01	QV				
5+ 5	0.0016	0.01	QV				
5+10	0.0016	0.00	QV				
5+15	0.0016	0.00	QV				
5+20	0.0017	0.01	QV				
5+25	0.0017	0.01	QV				
5+30	0.0017	0.01	QV				
5+35	0.0018	0.01	QV				

5+40	0.0018	0.01	QV	|	|	|	|
5+45	0.0019	0.01	QV	|	|	|	|
5+50	0.0019	0.01	QV	|	|	|	|
5+55	0.0020	0.01	QV	|	|	|	|
6+ 0	0.0020	0.01	QV	|	|	|	|
6+ 5	0.0021	0.01	QV	|	|	|	|
6+10	0.0021	0.01	QV	|	|	|	|
6+15	0.0022	0.01	QV	|	|	|	|
6+20	0.0022	0.01	QV	|	|	|	|
6+25	0.0023	0.01	Q V	|	|	|	|
6+30	0.0023	0.01	Q V	|	|	|	|
6+35	0.0024	0.01	Q V	|	|	|	|
6+40	0.0024	0.01	Q V	|	|	|	|
6+45	0.0025	0.01	Q V	|	|	|	|
6+50	0.0025	0.01	Q V	|	|	|	|
6+55	0.0026	0.01	Q V	|	|	|	|
7+ 0	0.0027	0.01	Q V	|	|	|	|
7+ 5	0.0027	0.01	Q V	|	|	|	|
7+10	0.0028	0.01	Q V	|	|	|	|
7+15	0.0028	0.01	Q V	|	|	|	|
7+20	0.0029	0.01	Q V	|	|	|	|
7+25	0.0029	0.01	Q V	|	|	|	|
7+30	0.0030	0.01	Q V	|	|	|	|
7+35	0.0031	0.01	Q V	|	|	|	|
7+40	0.0031	0.01	Q V	|	|	|	|
7+45	0.0032	0.01	Q V	|	|	|	|
7+50	0.0033	0.01	Q V	|	|	|	|
7+55	0.0033	0.01	Q V	|	|	|	|
8+ 0	0.0034	0.01	Q V	|	|	|	|
8+ 5	0.0035	0.01	Q V	|	|	|	|
8+10	0.0036	0.01	Q V	|	|	|	|
8+15	0.0037	0.01	Q V	|	|	|	|
8+20	0.0037	0.01	Q V	|	|	|	|
8+25	0.0038	0.01	Q V	|	|	|	|
8+30	0.0039	0.01	Q V	|	|	|	|
8+35	0.0040	0.01	Q V	|	|	|	|
8+40	0.0041	0.01	Q V	|	|	|	|
8+45	0.0042	0.01	Q V	|	|	|	|
8+50	0.0043	0.01	Q V	|	|	|	|
8+55	0.0044	0.01	Q V	|	|	|	|
9+ 0	0.0045	0.01	Q V	|	|	|	|
9+ 5	0.0046	0.01	Q V	|	|	|	|
9+10	0.0047	0.02	Q V	|	|	|	|
9+15	0.0048	0.02	Q V	|	|	|	|
9+20	0.0049	0.02	Q V	|	|	|	|
9+25	0.0050	0.02	Q V	|	|	|	|
9+30	0.0052	0.02	Q V	|	|	|	|
9+35	0.0054	0.03	Q V	|	|	|	|
9+40	0.0056	0.03	Q V	|	|	|	|
9+45	0.0058	0.03	Q V	|	|	|	|
9+50	0.0060	0.04	Q V	|	|	|	|
9+55	0.0063	0.04	Q V	|	|	|	|
10+ 0	0.0066	0.04	Q V	|	|	|	|
10+ 5	0.0067	0.02	Q V	|	|	|	|



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14+40       0.0341      0.11  Q          |          |          V          |
14+45       0.0349      0.11  Q          |          |          |V         |
14+50       0.0356      0.10  Q          |          |          |V         |
14+55       0.0363      0.10  Q          |          |          | V        |
15+ 0       0.0370      0.10  Q          |          |          | V        |
15+ 5       0.0376      0.10  Q          |          |          |  V       |
15+10       0.0383      0.09  Q          |          |          |   V      |
15+15       0.0389      0.09  Q          |          |          |   V      |
15+20       0.0395      0.09  Q          |          |          |    V     |
15+25       0.0401      0.09  Q          |          |          |    V     |
15+30       0.0407      0.09  Q          |          |          |     V    |
15+35       0.0412      0.06  Q          |          |          |     V    |
15+40       0.0416      0.06  Q          |          |          |      V   |
15+45       0.0420      0.06  Q          |          |          |      V   |
15+50       0.0423      0.06  Q          |          |          |      V   |
15+55       0.0427      0.06  Q          |          |          |       V  |
16+ 0       0.0431      0.06  Q          |          |          |       V  |
16+ 5       0.0433      0.02  Q          |          |          |       V  |
16+10       0.0433      0.00  Q          |          |          |       V  |
16+15       0.0433      0.00  Q          |          |          |       V  |
16+20       0.0433      0.00  Q          |          |          |       V  |
16+25       0.0434      0.00  Q          |          |          |       V  |
16+30       0.0434      0.00  Q          |          |          |       V  |
16+35       0.0434      0.00  Q          |          |          |       V  |
16+40       0.0434      0.00  Q          |          |          |       V  |
16+45       0.0434      0.00  Q          |          |          |       V  |
16+50       0.0434      0.00  Q          |          |          |       V  |
16+55       0.0435      0.00  Q          |          |          |       V  |
17+ 0       0.0435      0.00  Q          |          |          |       V  |
17+ 5       0.0435      0.00  Q          |          |          |       V  |
17+10       0.0435      0.00  Q          |          |          |       V  |
17+15       0.0436      0.00  Q          |          |          |       V  |
17+20       0.0436      0.00  Q          |          |          |       V  |
17+25       0.0436      0.00  Q          |          |          |       V  |
17+30       0.0436      0.00  Q          |          |          |       V  |
17+35       0.0437      0.00  Q          |          |          |       V  |
17+40       0.0437      0.00  Q          |          |          |       V  |
17+45       0.0437      0.00  Q          |          |          |       V  |
17+50       0.0438      0.00  Q          |          |          |        V |
17+55       0.0438      0.00  Q          |          |          |        V |
18+ 0       0.0438      0.00  Q          |          |          |        V |
18+ 5       0.0438      0.00  Q          |          |          |        V |
18+10       0.0438      0.00  Q          |          |          |        V |
18+15       0.0439      0.00  Q          |          |          |        V |
18+20       0.0439      0.00  Q          |          |          |        V |
18+25       0.0439      0.00  Q          |          |          |        V |
18+30       0.0439      0.00  Q          |          |          |        V |
18+35       0.0440      0.00  Q          |          |          |        V |
18+40       0.0440      0.00  Q          |          |          |        V |
18+45       0.0440      0.00  Q          |          |          |        V |
18+50       0.0440      0.00  Q          |          |          |        V |
18+55       0.0440      0.00  Q          |          |          |        V |
19+ 0       0.0440      0.00  Q          |          |          |        V |
19+ 5       0.0440      0.00  Q          |          |          |        V |
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19+10	0.0441	0.00	Q	|	|	|	V|
19+15	0.0441	0.00	Q	|	|	|	V|
19+20	0.0441	0.00	Q	|	|	|	V|
19+25	0.0441	0.00	Q	|	|	|	V|
19+30	0.0441	0.00	Q	|	|	|	V|
19+35	0.0442	0.00	Q	|	|	|	V|
19+40	0.0442	0.00	Q	|	|	|	V|
19+45	0.0442	0.00	Q	|	|	|	V|
19+50	0.0442	0.00	Q	|	|	|	V|
19+55	0.0442	0.00	Q	|	|	|	V|
20+ 0	0.0442	0.00	Q	|	|	|	V|
20+ 5	0.0442	0.00	Q	|	|	|	V|
20+10	0.0443	0.00	Q	|	|	|	V|
20+15	0.0443	0.00	Q	|	|	|	V|
20+20	0.0443	0.00	Q	|	|	|	V|
20+25	0.0443	0.00	Q	|	|	|	V|
20+30	0.0443	0.00	Q	|	|	|	V|
20+35	0.0443	0.00	Q	|	|	|	V|
20+40	0.0444	0.00	Q	|	|	|	V|
20+45	0.0444	0.00	Q	|	|	|	V|
20+50	0.0444	0.00	Q	|	|	|	V|
20+55	0.0444	0.00	Q	|	|	|	V|
21+ 0	0.0444	0.00	Q	|	|	|	V|
21+ 5	0.0444	0.00	Q	|	|	|	V|
21+10	0.0444	0.00	Q	|	|	|	V|
21+15	0.0445	0.00	Q	|	|	|	V|
21+20	0.0445	0.00	Q	|	|	|	V|
21+25	0.0445	0.00	Q	|	|	|	V|
21+30	0.0445	0.00	Q	|	|	|	V|
21+35	0.0445	0.00	Q	|	|	|	V|
21+40	0.0445	0.00	Q	|	|	|	V|
21+45	0.0445	0.00	Q	|	|	|	V|
21+50	0.0446	0.00	Q	|	|	|	V|
21+55	0.0446	0.00	Q	|	|	|	V|
22+ 0	0.0446	0.00	Q	|	|	|	V|
22+ 5	0.0446	0.00	Q	|	|	|	V|
22+10	0.0446	0.00	Q	|	|	|	V|
22+15	0.0446	0.00	Q	|	|	|	V|
22+20	0.0446	0.00	Q	|	|	|	V|
22+25	0.0446	0.00	Q	|	|	|	V|
22+30	0.0447	0.00	Q	|	|	|	V|
22+35	0.0447	0.00	Q	|	|	|	V|
22+40	0.0447	0.00	Q	|	|	|	V|
22+45	0.0447	0.00	Q	|	|	|	V|
22+50	0.0447	0.00	Q	|	|	|	V|
22+55	0.0447	0.00	Q	|	|	|	V|
23+ 0	0.0447	0.00	Q	|	|	|	V|
23+ 5	0.0447	0.00	Q	|	|	|	V|
23+10	0.0447	0.00	Q	|	|	|	V|
23+15	0.0448	0.00	Q	|	|	|	V|
23+20	0.0448	0.00	Q	|	|	|	V|
23+25	0.0448	0.00	Q	|	|	|	V|
23+30	0.0448	0.00	Q	|	|	|	V|
23+35	0.0448	0.00	Q	|	|	|	V|

```
   23+40       0.0448      0.00  Q          |          |          |         V|
   23+45       0.0448      0.00  Q          |          |          |         V|
   23+50       0.0448      0.00  Q          |          |          |         V|
   23+55       0.0448      0.00  Q          |          |          |         V|
   24+ 0       0.0449      0.00  Q          |          |          |         V|
   24+ 5       0.0449      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 01/06/22 File: 1162008UHA2410.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6335

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

VALUED ENGINEERING, INC
1162008 - PARADISE VALLEY RANCH
PROPOSED UNIT HYDROGRAPH STUDY - FACILITY 7
10-YR, 24-HR STORMEVENT

Drainage Area = 3.59(Ac.) = 0.006 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 3.59(Ac.) = 0.006 Sq. Mi.
Length along longest watercourse = 721.00(Ft.)
Length along longest watercourse measured to centroid = 321.00(Ft.)
Length along longest watercourse = 0.137 Mi.
Length along longest watercourse measured to centroid = 0.061 Mi.
Difference in elevation = 11.50(Ft.)
Slope along watercourse = 84.2164 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.025 Hr.
Lag time = 1.51 Min.
25% of lag time = 0.38 Min.
40% of lag time = 0.60 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

```
Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        3.59            2.04                  7.32

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        3.59            6.31                 22.65

STORM EVENT (YEAR) =   10.00
Area Averaged 2-Year Rainfall =    2.040(In)
Area Averaged 100-Year Rainfall =    6.310(In)

Point rain (area averaged) =    3.797(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    3.797(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     3.590           32.00         0.500
 Total Area Entered =      3.59(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
32.0  32.0      0.742     0.500        0.408       1.000      0.408
                                                 Sum (F) =   0.408
Area averaged mean soil loss (F) (In/Hr) =  0.408
Minimum soil loss rate ((In/Hr)) =  0.204
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.500
------------------------------------------------------------------------

                U n i t  H y d r o g r a p h
                        VALLEY S-Curve
------------------------------------------------------------------------
                Unit Hydrograph Data
------------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %            (CFS)
------------------------------------------------------------------------
    1   0.083        331.937         59.738              2.161
    2   0.167        663.875         35.439              1.282
    3   0.250        995.812          4.824              0.175
                               Sum = 100.000   Sum=       3.618
------------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated
loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain
value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
```

	(Hr.)	Percent	(In/Hr)	Max	Low	(In/Hr)
1	0.08	0.07	0.030	(0.723)	0.015	0.015
2	0.17	0.07	0.030	(0.721)	0.015	0.015
3	0.25	0.07	0.030	(0.718)	0.015	0.015
4	0.33	0.10	0.046	(0.715)	0.023	0.023
5	0.42	0.10	0.046	(0.712)	0.023	0.023
6	0.50	0.10	0.046	(0.710)	0.023	0.023
7	0.58	0.10	0.046	(0.707)	0.023	0.023
8	0.67	0.10	0.046	(0.704)	0.023	0.023
9	0.75	0.10	0.046	(0.701)	0.023	0.023
10	0.83	0.13	0.061	(0.698)	0.030	0.030
11	0.92	0.13	0.061	(0.696)	0.030	0.030
12	1.00	0.13	0.061	(0.693)	0.030	0.030
13	1.08	0.10	0.046	(0.690)	0.023	0.023
14	1.17	0.10	0.046	(0.688)	0.023	0.023
15	1.25	0.10	0.046	(0.685)	0.023	0.023
16	1.33	0.10	0.046	(0.682)	0.023	0.023
17	1.42	0.10	0.046	(0.679)	0.023	0.023
18	1.50	0.10	0.046	(0.677)	0.023	0.023
19	1.58	0.10	0.046	(0.674)	0.023	0.023
20	1.67	0.10	0.046	(0.671)	0.023	0.023
21	1.75	0.10	0.046	(0.669)	0.023	0.023
22	1.83	0.13	0.061	(0.666)	0.030	0.030
23	1.92	0.13	0.061	(0.663)	0.030	0.030
24	2.00	0.13	0.061	(0.660)	0.030	0.030
25	2.08	0.13	0.061	(0.658)	0.030	0.030
26	2.17	0.13	0.061	(0.655)	0.030	0.030
27	2.25	0.13	0.061	(0.652)	0.030	0.030
28	2.33	0.13	0.061	(0.650)	0.030	0.030
29	2.42	0.13	0.061	(0.647)	0.030	0.030
30	2.50	0.13	0.061	(0.645)	0.030	0.030
31	2.58	0.17	0.076	(0.642)	0.038	0.038
32	2.67	0.17	0.076	(0.639)	0.038	0.038
33	2.75	0.17	0.076	(0.637)	0.038	0.038
34	2.83	0.17	0.076	(0.634)	0.038	0.038
35	2.92	0.17	0.076	(0.631)	0.038	0.038
36	3.00	0.17	0.076	(0.629)	0.038	0.038
37	3.08	0.17	0.076	(0.626)	0.038	0.038
38	3.17	0.17	0.076	(0.624)	0.038	0.038
39	3.25	0.17	0.076	(0.621)	0.038	0.038
40	3.33	0.17	0.076	(0.618)	0.038	0.038
41	3.42	0.17	0.076	(0.616)	0.038	0.038
42	3.50	0.17	0.076	(0.613)	0.038	0.038
43	3.58	0.17	0.076	(0.611)	0.038	0.038
44	3.67	0.17	0.076	(0.608)	0.038	0.038
45	3.75	0.17	0.076	(0.606)	0.038	0.038
46	3.83	0.20	0.091	(0.603)	0.046	0.046
47	3.92	0.20	0.091	(0.600)	0.046	0.046
48	4.00	0.20	0.091	(0.598)	0.046	0.046
49	4.08	0.20	0.091	(0.595)	0.046	0.046
50	4.17	0.20	0.091	(0.593)	0.046	0.046
51	4.25	0.20	0.091	(0.590)	0.046	0.046
52	4.33	0.23	0.106	(0.588)	0.053	0.053
53	4.42	0.23	0.106	(0.585)	0.053	0.053

54	4.50	0.23	0.106	(0.583)	0.053	0.053
55	4.58	0.23	0.106	(0.580)	0.053	0.053
56	4.67	0.23	0.106	(0.578)	0.053	0.053
57	4.75	0.23	0.106	(0.575)	0.053	0.053
58	4.83	0.27	0.121	(0.573)	0.061	0.061
59	4.92	0.27	0.121	(0.570)	0.061	0.061
60	5.00	0.27	0.121	(0.568)	0.061	0.061
61	5.08	0.20	0.091	(0.565)	0.046	0.046
62	5.17	0.20	0.091	(0.563)	0.046	0.046
63	5.25	0.20	0.091	(0.560)	0.046	0.046
64	5.33	0.23	0.106	(0.558)	0.053	0.053
65	5.42	0.23	0.106	(0.556)	0.053	0.053
66	5.50	0.23	0.106	(0.553)	0.053	0.053
67	5.58	0.27	0.121	(0.551)	0.061	0.061
68	5.67	0.27	0.121	(0.548)	0.061	0.061
69	5.75	0.27	0.121	(0.546)	0.061	0.061
70	5.83	0.27	0.121	(0.543)	0.061	0.061
71	5.92	0.27	0.121	(0.541)	0.061	0.061
72	6.00	0.27	0.121	(0.539)	0.061	0.061
73	6.08	0.30	0.137	(0.536)	0.068	0.068
74	6.17	0.30	0.137	(0.534)	0.068	0.068
75	6.25	0.30	0.137	(0.532)	0.068	0.068
76	6.33	0.30	0.137	(0.529)	0.068	0.068
77	6.42	0.30	0.137	(0.527)	0.068	0.068
78	6.50	0.30	0.137	(0.524)	0.068	0.068
79	6.58	0.33	0.152	(0.522)	0.076	0.076
80	6.67	0.33	0.152	(0.520)	0.076	0.076
81	6.75	0.33	0.152	(0.517)	0.076	0.076
82	6.83	0.33	0.152	(0.515)	0.076	0.076
83	6.92	0.33	0.152	(0.513)	0.076	0.076
84	7.00	0.33	0.152	(0.510)	0.076	0.076
85	7.08	0.33	0.152	(0.508)	0.076	0.076
86	7.17	0.33	0.152	(0.506)	0.076	0.076
87	7.25	0.33	0.152	(0.503)	0.076	0.076
88	7.33	0.37	0.167	(0.501)	0.084	0.084
89	7.42	0.37	0.167	(0.499)	0.084	0.084
90	7.50	0.37	0.167	(0.497)	0.084	0.084
91	7.58	0.40	0.182	(0.494)	0.091	0.091
92	7.67	0.40	0.182	(0.492)	0.091	0.091
93	7.75	0.40	0.182	(0.490)	0.091	0.091
94	7.83	0.43	0.197	(0.487)	0.099	0.099
95	7.92	0.43	0.197	(0.485)	0.099	0.099
96	8.00	0.43	0.197	(0.483)	0.099	0.099
97	8.08	0.50	0.228	(0.481)	0.114	0.114
98	8.17	0.50	0.228	(0.478)	0.114	0.114
99	8.25	0.50	0.228	(0.476)	0.114	0.114
100	8.33	0.50	0.228	(0.474)	0.114	0.114
101	8.42	0.50	0.228	(0.472)	0.114	0.114
102	8.50	0.50	0.228	(0.470)	0.114	0.114
103	8.58	0.53	0.243	(0.467)	0.121	0.121
104	8.67	0.53	0.243	(0.465)	0.121	0.121
105	8.75	0.53	0.243	(0.463)	0.121	0.121
106	8.83	0.57	0.258	(0.461)	0.129	0.129
107	8.92	0.57	0.258	(0.459)	0.129	0.129

108	9.00	0.57	0.258	(0.456)	0.129	0.129
109	9.08	0.63	0.289	(0.454)	0.144	0.144
110	9.17	0.63	0.289	(0.452)	0.144	0.144
111	9.25	0.63	0.289	(0.450)	0.144	0.144
112	9.33	0.67	0.304	(0.448)	0.152	0.152
113	9.42	0.67	0.304	(0.446)	0.152	0.152
114	9.50	0.67	0.304	(0.444)	0.152	0.152
115	9.58	0.70	0.319	(0.441)	0.159	0.159
116	9.67	0.70	0.319	(0.439)	0.159	0.159
117	9.75	0.70	0.319	(0.437)	0.159	0.159
118	9.83	0.73	0.334	(0.435)	0.167	0.167
119	9.92	0.73	0.334	(0.433)	0.167	0.167
120	10.00	0.73	0.334	(0.431)	0.167	0.167
121	10.08	0.50	0.228	(0.429)	0.114	0.114
122	10.17	0.50	0.228	(0.427)	0.114	0.114
123	10.25	0.50	0.228	(0.425)	0.114	0.114
124	10.33	0.50	0.228	(0.423)	0.114	0.114
125	10.42	0.50	0.228	(0.421)	0.114	0.114
126	10.50	0.50	0.228	(0.419)	0.114	0.114
127	10.58	0.67	0.304	(0.417)	0.152	0.152
128	10.67	0.67	0.304	(0.414)	0.152	0.152
129	10.75	0.67	0.304	(0.412)	0.152	0.152
130	10.83	0.67	0.304	(0.410)	0.152	0.152
131	10.92	0.67	0.304	(0.408)	0.152	0.152
132	11.00	0.67	0.304	(0.406)	0.152	0.152
133	11.08	0.63	0.289	(0.404)	0.144	0.144
134	11.17	0.63	0.289	(0.402)	0.144	0.144
135	11.25	0.63	0.289	(0.400)	0.144	0.144
136	11.33	0.63	0.289	(0.398)	0.144	0.144
137	11.42	0.63	0.289	(0.396)	0.144	0.144
138	11.50	0.63	0.289	(0.395)	0.144	0.144
139	11.58	0.57	0.258	(0.393)	0.129	0.129
140	11.67	0.57	0.258	(0.391)	0.129	0.129
141	11.75	0.57	0.258	(0.389)	0.129	0.129
142	11.83	0.60	0.273	(0.387)	0.137	0.137
143	11.92	0.60	0.273	(0.385)	0.137	0.137
144	12.00	0.60	0.273	(0.383)	0.137	0.137
145	12.08	0.83	0.380	(0.381)	0.190	0.190
146	12.17	0.83	0.380	(0.379)	0.190	0.190
147	12.25	0.83	0.380	(0.377)	0.190	0.190
148	12.33	0.87	0.395	(0.375)	0.197	0.197
149	12.42	0.87	0.395	(0.373)	0.197	0.197
150	12.50	0.87	0.395	(0.371)	0.197	0.197
151	12.58	0.93	0.425	(0.370)	0.213	0.213
152	12.67	0.93	0.425	(0.368)	0.213	0.213
153	12.75	0.93	0.425	(0.366)	0.213	0.213
154	12.83	0.97	0.440	(0.364)	0.220	0.220
155	12.92	0.97	0.440	(0.362)	0.220	0.220
156	13.00	0.97	0.440	(0.360)	0.220	0.220
157	13.08	1.13	0.516	(0.359)	0.258	0.258
158	13.17	1.13	0.516	(0.357)	0.258	0.258
159	13.25	1.13	0.516	(0.355)	0.258	0.258
160	13.33	1.13	0.516	(0.353)	0.258	0.258
161	13.42	1.13	0.516	(0.351)	0.258	0.258

162	13.50	1.13	0.516	(0.350)	0.258	0.258
163	13.58	0.77	0.349	(0.348)	0.175	0.175
164	13.67	0.77	0.349	(0.346)	0.175	0.175
165	13.75	0.77	0.349	(0.344)	0.175	0.175
166	13.83	0.77	0.349	(0.342)	0.175	0.175
167	13.92	0.77	0.349	(0.341)	0.175	0.175
168	14.00	0.77	0.349	(0.339)	0.175	0.175
169	14.08	0.90	0.410	(0.337)	0.205	0.205
170	14.17	0.90	0.410	(0.336)	0.205	0.205
171	14.25	0.90	0.410	(0.334)	0.205	0.205
172	14.33	0.87	0.395	(0.332)	0.197	0.197
173	14.42	0.87	0.395	(0.330)	0.197	0.197
174	14.50	0.87	0.395	(0.329)	0.197	0.197
175	14.58	0.87	0.395	(0.327)	0.197	0.197
176	14.67	0.87	0.395	(0.325)	0.197	0.197
177	14.75	0.87	0.395	(0.324)	0.197	0.197
178	14.83	0.83	0.380	(0.322)	0.190	0.190
179	14.92	0.83	0.380	(0.320)	0.190	0.190
180	15.00	0.83	0.380	(0.319)	0.190	0.190
181	15.08	0.80	0.364	(0.317)	0.182	0.182
182	15.17	0.80	0.364	(0.315)	0.182	0.182
183	15.25	0.80	0.364	(0.314)	0.182	0.182
184	15.33	0.77	0.349	(0.312)	0.175	0.175
185	15.42	0.77	0.349	(0.311)	0.175	0.175
186	15.50	0.77	0.349	(0.309)	0.175	0.175
187	15.58	0.63	0.289	(0.307)	0.144	0.144
188	15.67	0.63	0.289	(0.306)	0.144	0.144
189	15.75	0.63	0.289	(0.304)	0.144	0.144
190	15.83	0.63	0.289	(0.303)	0.144	0.144
191	15.92	0.63	0.289	(0.301)	0.144	0.144
192	16.00	0.63	0.289	(0.300)	0.144	0.144
193	16.08	0.13	0.061	(0.298)	0.030	0.030
194	16.17	0.13	0.061	(0.297)	0.030	0.030
195	16.25	0.13	0.061	(0.295)	0.030	0.030
196	16.33	0.13	0.061	(0.294)	0.030	0.030
197	16.42	0.13	0.061	(0.292)	0.030	0.030
198	16.50	0.13	0.061	(0.291)	0.030	0.030
199	16.58	0.10	0.046	(0.289)	0.023	0.023
200	16.67	0.10	0.046	(0.288)	0.023	0.023
201	16.75	0.10	0.046	(0.286)	0.023	0.023
202	16.83	0.10	0.046	(0.285)	0.023	0.023
203	16.92	0.10	0.046	(0.283)	0.023	0.023
204	17.00	0.10	0.046	(0.282)	0.023	0.023
205	17.08	0.17	0.076	(0.280)	0.038	0.038
206	17.17	0.17	0.076	(0.279)	0.038	0.038
207	17.25	0.17	0.076	(0.278)	0.038	0.038
208	17.33	0.17	0.076	(0.276)	0.038	0.038
209	17.42	0.17	0.076	(0.275)	0.038	0.038
210	17.50	0.17	0.076	(0.273)	0.038	0.038
211	17.58	0.17	0.076	(0.272)	0.038	0.038
212	17.67	0.17	0.076	(0.271)	0.038	0.038
213	17.75	0.17	0.076	(0.269)	0.038	0.038
214	17.83	0.13	0.061	(0.268)	0.030	0.030
215	17.92	0.13	0.061	(0.267)	0.030	0.030

216	18.00	0.13	0.061	(0.265)	0.030	0.030
217	18.08	0.13	0.061	(0.264)	0.030	0.030
218	18.17	0.13	0.061	(0.263)	0.030	0.030
219	18.25	0.13	0.061	(0.262)	0.030	0.030
220	18.33	0.13	0.061	(0.260)	0.030	0.030
221	18.42	0.13	0.061	(0.259)	0.030	0.030
222	18.50	0.13	0.061	(0.258)	0.030	0.030
223	18.58	0.10	0.046	(0.257)	0.023	0.023
224	18.67	0.10	0.046	(0.255)	0.023	0.023
225	18.75	0.10	0.046	(0.254)	0.023	0.023
226	18.83	0.07	0.030	(0.253)	0.015	0.015
227	18.92	0.07	0.030	(0.252)	0.015	0.015
228	19.00	0.07	0.030	(0.250)	0.015	0.015
229	19.08	0.10	0.046	(0.249)	0.023	0.023
230	19.17	0.10	0.046	(0.248)	0.023	0.023
231	19.25	0.10	0.046	(0.247)	0.023	0.023
232	19.33	0.13	0.061	(0.246)	0.030	0.030
233	19.42	0.13	0.061	(0.245)	0.030	0.030
234	19.50	0.13	0.061	(0.243)	0.030	0.030
235	19.58	0.10	0.046	(0.242)	0.023	0.023
236	19.67	0.10	0.046	(0.241)	0.023	0.023
237	19.75	0.10	0.046	(0.240)	0.023	0.023
238	19.83	0.07	0.030	(0.239)	0.015	0.015
239	19.92	0.07	0.030	(0.238)	0.015	0.015
240	20.00	0.07	0.030	(0.237)	0.015	0.015
241	20.08	0.10	0.046	(0.236)	0.023	0.023
242	20.17	0.10	0.046	(0.235)	0.023	0.023
243	20.25	0.10	0.046	(0.234)	0.023	0.023
244	20.33	0.10	0.046	(0.233)	0.023	0.023
245	20.42	0.10	0.046	(0.232)	0.023	0.023
246	20.50	0.10	0.046	(0.231)	0.023	0.023
247	20.58	0.10	0.046	(0.230)	0.023	0.023
248	20.67	0.10	0.046	(0.229)	0.023	0.023
249	20.75	0.10	0.046	(0.228)	0.023	0.023
250	20.83	0.07	0.030	(0.227)	0.015	0.015
251	20.92	0.07	0.030	(0.226)	0.015	0.015
252	21.00	0.07	0.030	(0.225)	0.015	0.015
253	21.08	0.10	0.046	(0.224)	0.023	0.023
254	21.17	0.10	0.046	(0.223)	0.023	0.023
255	21.25	0.10	0.046	(0.223)	0.023	0.023
256	21.33	0.07	0.030	(0.222)	0.015	0.015
257	21.42	0.07	0.030	(0.221)	0.015	0.015
258	21.50	0.07	0.030	(0.220)	0.015	0.015
259	21.58	0.10	0.046	(0.219)	0.023	0.023
260	21.67	0.10	0.046	(0.218)	0.023	0.023
261	21.75	0.10	0.046	(0.218)	0.023	0.023
262	21.83	0.07	0.030	(0.217)	0.015	0.015
263	21.92	0.07	0.030	(0.216)	0.015	0.015
264	22.00	0.07	0.030	(0.215)	0.015	0.015
265	22.08	0.10	0.046	(0.215)	0.023	0.023
266	22.17	0.10	0.046	(0.214)	0.023	0.023
267	22.25	0.10	0.046	(0.213)	0.023	0.023
268	22.33	0.07	0.030	(0.213)	0.015	0.015
269	22.42	0.07	0.030	(0.212)	0.015	0.015

```
270  22.50     0.07      0.030       (  0.211)       0.015        0.015
271  22.58     0.07      0.030       (  0.211)       0.015        0.015
272  22.67     0.07      0.030       (  0.210)       0.015        0.015
273  22.75     0.07      0.030       (  0.210)       0.015        0.015
274  22.83     0.07      0.030       (  0.209)       0.015        0.015
275  22.92     0.07      0.030       (  0.209)       0.015        0.015
276  23.00     0.07      0.030       (  0.208)       0.015        0.015
277  23.08     0.07      0.030       (  0.208)       0.015        0.015
278  23.17     0.07      0.030       (  0.207)       0.015        0.015
279  23.25     0.07      0.030       (  0.207)       0.015        0.015
280  23.33     0.07      0.030       (  0.206)       0.015        0.015
281  23.42     0.07      0.030       (  0.206)       0.015        0.015
282  23.50     0.07      0.030       (  0.206)       0.015        0.015
283  23.58     0.07      0.030       (  0.205)       0.015        0.015
284  23.67     0.07      0.030       (  0.205)       0.015        0.015
285  23.75     0.07      0.030       (  0.205)       0.015        0.015
286  23.83     0.07      0.030       (  0.204)       0.015        0.015
287  23.92     0.07      0.030       (  0.204)       0.015        0.015
288  24.00     0.07      0.030       (  0.204)       0.015        0.015
                (Loss Rate Not Used)
    Sum =     100.0                                    Sum =    22.8
       Flood volume = Effective rainfall      1.90(In)
        times area       3.6(Ac.)/[(In)/(Ft.)] =       0.6(Ac.Ft)
       Total soil loss =      1.90(In)
       Total soil loss =     0.568(Ac.Ft)
       Total rainfall =      3.80(In)
       Flood volume =       24738.6 Cubic Feet
       Total soil loss =       24738.6 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =      0.935(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        2.5       5.0       7.5      10.0
 ------------------------------------------------------------------------
   0+ 5       0.0002      0.03  Q         |         |         |         |
   0+10       0.0006      0.05  Q         |         |         |         |
   0+15       0.0010      0.05  Q         |         |         |         |
   0+20       0.0015      0.07  Q         |         |         |         |
   0+25       0.0020      0.08  Q         |         |         |         |
   0+30       0.0026      0.08  Q         |         |         |         |
   0+35       0.0032      0.08  Q         |         |         |         |
   0+40       0.0037      0.08  Q         |         |         |         |
   0+45       0.0043      0.08  Q         |         |         |         |
   0+50       0.0050      0.10  Q         |         |         |         |
   0+55       0.0057      0.11  Q         |         |         |         |
   1+ 0       0.0065      0.11  Q         |         |         |         |
   1+ 5       0.0071      0.09  Q         |         |         |         |
   1+10       0.0077      0.08  Q         |         |         |         |
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1+15	0.0083	0.08	Q	|	|	|	|
1+20	0.0088	0.08	Q	|	|	|	|
1+25	0.0094	0.08	Q	|	|	|	|
1+30	0.0100	0.08	Q	|	|	|	|
1+35	0.0105	0.08	Q	|	|	|	|
1+40	0.0111	0.08	Q	|	|	|	|
1+45	0.0117	0.08	Q	|	|	|	|
1+50	0.0124	0.10	Q	|	|	|	|
1+55	0.0131	0.11	Q	|	|	|	|
2+ 0	0.0139	0.11	Q	|	|	|	|
2+ 5	0.0146	0.11	QV	|	|	|	|
2+10	0.0154	0.11	QV	|	|	|	|
2+15	0.0161	0.11	QV	|	|	|	|
2+20	0.0169	0.11	QV	|	|	|	|
2+25	0.0176	0.11	QV	|	|	|	|
2+30	0.0184	0.11	QV	|	|	|	|
2+35	0.0193	0.13	QV	|	|	|	|
2+40	0.0202	0.14	QV	|	|	|	|
2+45	0.0212	0.14	QV	|	|	|	|
2+50	0.0221	0.14	QV	|	|	|	|
2+55	0.0230	0.14	QV	|	|	|	|
3+ 0	0.0240	0.14	QV	|	|	|	|
3+ 5	0.0249	0.14	QV	|	|	|	|
3+10	0.0259	0.14	QV	|	|	|	|
3+15	0.0268	0.14	QV	|	|	|	|
3+20	0.0278	0.14	QV	|	|	|	|
3+25	0.0287	0.14	Q V	|	|	|	|
3+30	0.0297	0.14	Q V	|	|	|	|
3+35	0.0306	0.14	Q V	|	|	|	|
3+40	0.0316	0.14	Q V	|	|	|	|
3+45	0.0325	0.14	Q V	|	|	|	|
3+50	0.0336	0.15	Q V	|	|	|	|
3+55	0.0347	0.16	Q V	|	|	|	|
4+ 0	0.0358	0.16	Q V	|	|	|	|
4+ 5	0.0370	0.16	Q V	|	|	|	|
4+10	0.0381	0.16	Q V	|	|	|	|
4+15	0.0392	0.16	Q V	|	|	|	|
4+20	0.0405	0.18	Q V	|	|	|	|
4+25	0.0418	0.19	Q V	|	|	|	|
4+30	0.0431	0.19	Q V	|	|	|	|
4+35	0.0445	0.19	Q V	|	|	|	|
4+40	0.0458	0.19	Q V	|	|	|	|
4+45	0.0471	0.19	Q V	|	|	|	|
4+50	0.0485	0.21	Q V	|	|	|	|
4+55	0.0501	0.22	Q V	|	|	|	|
5+ 0	0.0516	0.22	Q V	|	|	|	|
5+ 5	0.0529	0.19	Q V	|	|	|	|
5+10	0.0540	0.17	Q V	|	|	|	|
5+15	0.0551	0.16	Q V	|	|	|	|
5+20	0.0564	0.18	Q V	|	|	|	|
5+25	0.0577	0.19	Q V	|	|	|	|
5+30	0.0590	0.19	Q V	|	|	|	|
5+35	0.0605	0.21	Q V	|	|	|	|
5+40	0.0620	0.22	Q V	|	|	|	|

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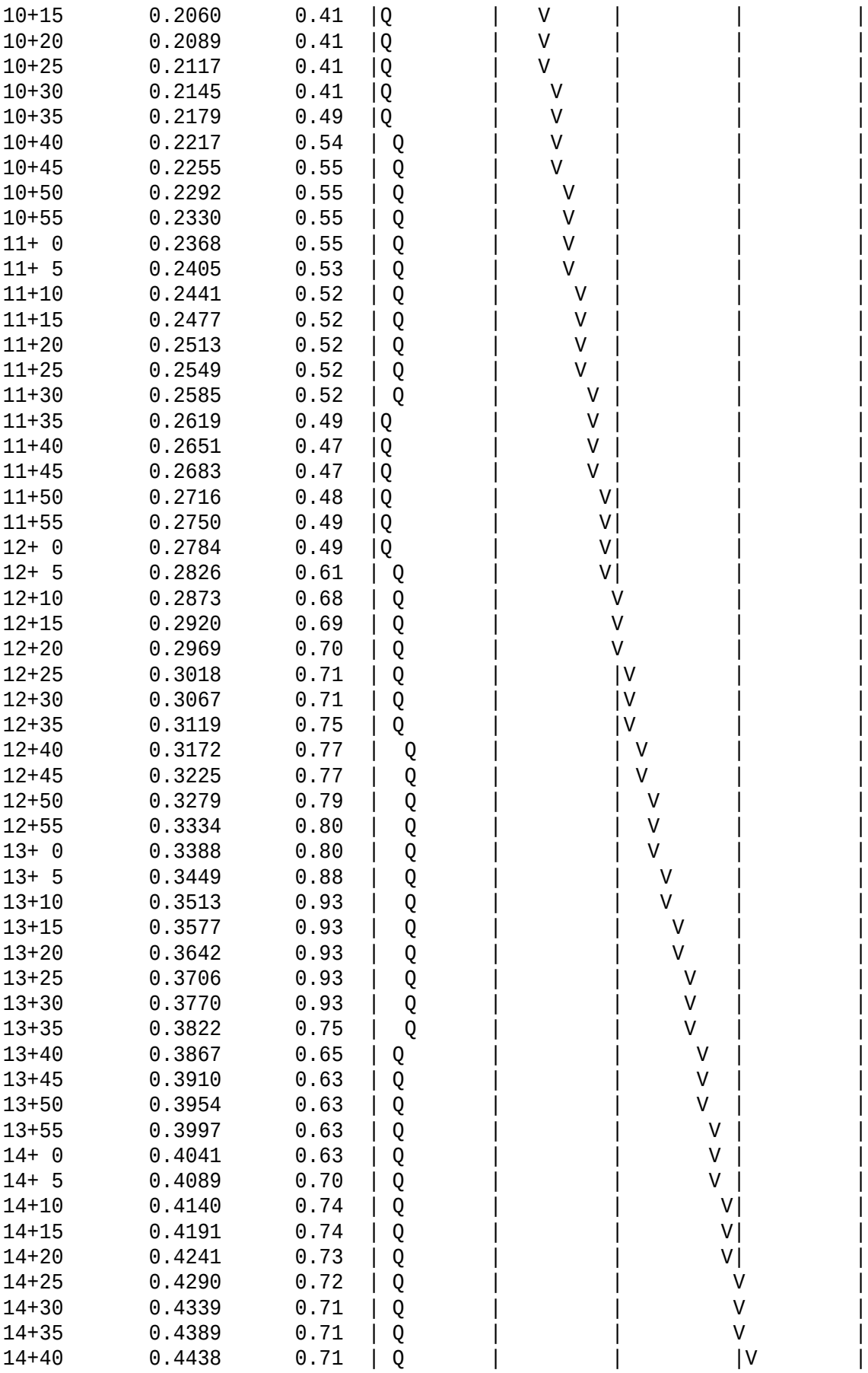
 5+45       0.0635      0.22  Q   V     |          |          |          |
 5+50       0.0650      0.22  Q   V     |          |          |          |
 5+55       0.0665      0.22  Q   V     |          |          |          |
 6+ 0       0.0680      0.22  Q   V     |          |          |          |
 6+ 5       0.0697      0.24  Q   V     |          |          |          |
 6+10       0.0714      0.25  Q    V    |          |          |          |
 6+15       0.0731      0.25  Q    V    |          |          |          |
 6+20       0.0748      0.25  Q    V    |          |          |          |
 6+25       0.0765      0.25  Q    V    |          |          |          |
 6+30       0.0782      0.25  Q    V    |          |          |          |
 6+35       0.0800      0.26  |Q   V    |          |          |          |
 6+40       0.0819      0.27  |Q   V    |          |          |          |
 6+45       0.0838      0.27  |Q   V    |          |          |          |
 6+50       0.0857      0.27  |Q    V   |          |          |          |
 6+55       0.0876      0.27  |Q    V   |          |          |          |
 7+ 0       0.0894      0.27  |Q    V   |          |          |          |
 7+ 5       0.0913      0.27  |Q    V   |          |          |          |
 7+10       0.0932      0.27  |Q    V   |          |          |          |
 7+15       0.0951      0.27  |Q    V   |          |          |          |
 7+20       0.0971      0.29  |Q    V   |          |          |          |
 7+25       0.0992      0.30  |Q    V   |          |          |          |
 7+30       0.1013      0.30  |Q     V  |          |          |          |
 7+35       0.1035      0.32  |Q     V  |          |          |          |
 7+40       0.1057      0.33  |Q     V  |          |          |          |
 7+45       0.1080      0.33  |Q     V  |          |          |          |
 7+50       0.1104      0.35  |Q     V  |          |          |          |
 7+55       0.1129      0.36  |Q     V  |          |          |          |
 8+ 0       0.1153      0.36  |Q      V |          |          |          |
 8+ 5       0.1180      0.39  |Q      V |          |          |          |
 8+10       0.1208      0.41  |Q      V |          |          |          |
 8+15       0.1237      0.41  |Q      V |          |          |          |
 8+20       0.1265      0.41  |Q      V |          |          |          |
 8+25       0.1293      0.41  |Q       V|          |          |          |
 8+30       0.1322      0.41  |Q       V|          |          |          |
 8+35       0.1351      0.43  |Q       V|          |          |          |
 8+40       0.1382      0.44  |Q       V|          |          |          |
 8+45       0.1412      0.44  |Q       V|          |          |          |
 8+50       0.1443      0.46  |Q        V          |          |          |
 8+55       0.1475      0.47  |Q        V          |          |          |
 9+ 0       0.1508      0.47  |Q        V          |          |          |
 9+ 5       0.1542      0.50  | Q       V          |          |          |
 9+10       0.1578      0.52  | Q       |V         |          |          |
 9+15       0.1614      0.52  | Q       |V         |          |          |
 9+20       0.1651      0.54  | Q       |V         |          |          |
 9+25       0.1689      0.55  | Q       |V         |          |          |
 9+30       0.1726      0.55  | Q       | V        |          |          |
 9+35       0.1765      0.57  | Q       | V        |          |          |
 9+40       0.1805      0.58  | Q       | V        |          |          |
 9+45       0.1845      0.58  | Q       | V        |          |          |
 9+50       0.1886      0.59  | Q       |  V       |          |          |
 9+55       0.1927      0.60  | Q       |  V       |          |          |
10+ 0       0.1969      0.60  | Q       |  V       |          |          |
10+ 5       0.2003      0.49  |Q        |   V      |          |          |
10+10       0.2032      0.42  |Q        |   V      |          |          |
```



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14+45       0.4487      0.71  | Q       |         |         |V        |
14+50       0.4535      0.70  | Q       |         |         |V        |
14+55       0.4583      0.69  | Q       |         |         | V       |
15+ 0       0.4630      0.69  | Q       |         |         | V       |
15+ 5       0.4676      0.67  | Q       |         |         | V       |
15+10       0.4722      0.66  | Q       |         |         |  V      |
15+15       0.4767      0.66  | Q       |         |         |  V      |
15+20       0.4811      0.64  | Q       |         |         |  V      |
15+25       0.4855      0.63  | Q       |         |         |   V     |
15+30       0.4899      0.63  | Q       |         |         |   V     |
15+35       0.4938      0.57  | Q       |         |         |   V     |
15+40       0.4974      0.53  | Q       |         |         |    V    |
15+45       0.5010      0.52  | Q       |         |         |    V    |
15+50       0.5046      0.52  | Q       |         |         |    V    |
15+55       0.5082      0.52  | Q       |         |         |    V    |
16+ 0       0.5118      0.52  | Q       |         |         |     V   |
16+ 5       0.5137      0.28  |Q        |         |         |     V   |
16+10       0.5146      0.13  Q         |         |         |     V   |
16+15       0.5153      0.11  Q         |         |         |     V   |
16+20       0.5161      0.11  Q         |         |         |     V   |
16+25       0.5168      0.11  Q         |         |         |     V   |
16+30       0.5176      0.11  Q         |         |         |     V   |
16+35       0.5182      0.09  Q         |         |         |     V   |
16+40       0.5188      0.08  Q         |         |         |     V   |
16+45       0.5194      0.08  Q         |         |         |     V   |
16+50       0.5200      0.08  Q         |         |         |     V   |
16+55       0.5205      0.08  Q         |         |         |     V   |
17+ 0       0.5211      0.08  Q         |         |         |     V   |
17+ 5       0.5219      0.12  Q         |         |         |     V   |
17+10       0.5228      0.13  Q         |         |         |     V   |
17+15       0.5238      0.14  Q         |         |         |     V   |
17+20       0.5247      0.14  Q         |         |         |     V   |
17+25       0.5257      0.14  Q         |         |         |      V  |
17+30       0.5266      0.14  Q         |         |         |      V  |
17+35       0.5276      0.14  Q         |         |         |      V  |
17+40       0.5285      0.14  Q         |         |         |      V  |
17+45       0.5294      0.14  Q         |         |         |      V  |
17+50       0.5303      0.12  Q         |         |         |      V  |
17+55       0.5310      0.11  Q         |         |         |      V  |
18+ 0       0.5318      0.11  Q         |         |         |      V  |
18+ 5       0.5326      0.11  Q         |         |         |      V  |
18+10       0.5333      0.11  Q         |         |         |      V  |
18+15       0.5341      0.11  Q         |         |         |      V  |
18+20       0.5348      0.11  Q         |         |         |      V  |
18+25       0.5356      0.11  Q         |         |         |      V  |
18+30       0.5363      0.11  Q         |         |         |      V  |
18+35       0.5370      0.09  Q         |         |         |      V  |
18+40       0.5376      0.08  Q         |         |         |      V  |
18+45       0.5381      0.08  Q         |         |         |      V  |
18+50       0.5386      0.07  Q         |         |         |      V  |
18+55       0.5390      0.06  Q         |         |         |      V  |
19+ 0       0.5394      0.05  Q         |         |         |      V  |
19+ 5       0.5398      0.07  Q         |         |         |       V |
19+10       0.5404      0.08  Q         |         |         |       V |
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19+15	0.5410	0.08	Q	|	|	|	V |
19+20	0.5417	0.10	Q	|	|	|	V |
19+25	0.5424	0.11	Q	|	|	|	V |
19+30	0.5432	0.11	Q	|	|	|	V |
19+35	0.5438	0.09	Q	|	|	|	V |
19+40	0.5444	0.08	Q	|	|	|	V |
19+45	0.5449	0.08	Q	|	|	|	V |
19+50	0.5454	0.07	Q	|	|	|	V |
19+55	0.5458	0.06	Q	|	|	|	V |
20+ 0	0.5462	0.05	Q	|	|	|	V |
20+ 5	0.5467	0.07	Q	|	|	|	V |
20+10	0.5472	0.08	Q	|	|	|	V |
20+15	0.5478	0.08	Q	|	|	|	V |
20+20	0.5484	0.08	Q	|	|	|	V |
20+25	0.5489	0.08	Q	|	|	|	V |
20+30	0.5495	0.08	Q	|	|	|	V |
20+35	0.5501	0.08	Q	|	|	|	V |
20+40	0.5506	0.08	Q	|	|	|	V |
20+45	0.5512	0.08	Q	|	|	|	V |
20+50	0.5517	0.07	Q	|	|	|	V |
20+55	0.5520	0.06	Q	|	|	|	V |
21+ 0	0.5524	0.05	Q	|	|	|	V |
21+ 5	0.5529	0.07	Q	|	|	|	V |
21+10	0.5535	0.08	Q	|	|	|	V |
21+15	0.5540	0.08	Q	|	|	|	V|
21+20	0.5545	0.07	Q	|	|	|	V|
21+25	0.5549	0.06	Q	|	|	|	V|
21+30	0.5553	0.05	Q	|	|	|	V|
21+35	0.5557	0.07	Q	|	|	|	V|
21+40	0.5563	0.08	Q	|	|	|	V|
21+45	0.5569	0.08	Q	|	|	|	V|
21+50	0.5573	0.07	Q	|	|	|	V|
21+55	0.5577	0.06	Q	|	|	|	V|
22+ 0	0.5581	0.05	Q	|	|	|	V|
22+ 5	0.5586	0.07	Q	|	|	|	V|
22+10	0.5591	0.08	Q	|	|	|	V|
22+15	0.5597	0.08	Q	|	|	|	V|
22+20	0.5602	0.07	Q	|	|	|	V|
22+25	0.5606	0.06	Q	|	|	|	V|
22+30	0.5609	0.05	Q	|	|	|	V|
22+35	0.5613	0.05	Q	|	|	|	V|
22+40	0.5617	0.05	Q	|	|	|	V|
22+45	0.5621	0.05	Q	|	|	|	V|
22+50	0.5624	0.05	Q	|	|	|	V|
22+55	0.5628	0.05	Q	|	|	|	V|
23+ 0	0.5632	0.05	Q	|	|	|	V|
23+ 5	0.5636	0.05	Q	|	|	|	V|
23+10	0.5640	0.05	Q	|	|	|	V|
23+15	0.5643	0.05	Q	|	|	|	V|
23+20	0.5647	0.05	Q	|	|	|	V|
23+25	0.5651	0.05	Q	|	|	|	V|
23+30	0.5655	0.05	Q	|	|	|	V|
23+35	0.5659	0.05	Q	|	|	|	V|
23+40	0.5662	0.05	Q	|	|	|	V|

```
   23+45       0.5666      0.05  Q          |          |          |         V|
   23+50       0.5670      0.05  Q          |          |          |         V|
   23+55       0.5674      0.05  Q          |          |          |         V|
   24+ 0       0.5678      0.05  Q          |          |          |         V|
   24+ 5       0.5679      0.02  Q          |          |          |         V|
   24+10       0.5679      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 01/06/22 File: 1162008UHB2410.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6335

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

VALUED ENGINEERING, INC
1162008 - PARADISE VALLEY RANCH
PROPOSED UNIT HYDROGRAPH STUDY - FACILITY 6
10-YR, 24-HR STORMEVENT

Drainage Area = 0.53(Ac.) = 0.001 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 0.53(Ac.) = 0.001 Sq. Mi.
Length along longest watercourse = 338.00(Ft.)
Length along longest watercourse measured to centroid = 185.00(Ft.)
Length along longest watercourse = 0.064 Mi.
Length along longest watercourse measured to centroid = 0.035 Mi.
Difference in elevation = 12.20(Ft.)
Slope along watercourse = 190.5799 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.013 Hr.
Lag time = 0.78 Min.
25% of lag time = 0.20 Min.
40% of lag time = 0.31 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

```
Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        0.53            2.04                  1.08

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        0.53            6.31                  3.34

STORM EVENT (YEAR) =   10.00
Area Averaged 2-Year Rainfall =    2.040(In)
Area Averaged 100-Year Rainfall =    6.310(In)

Point rain (area averaged) =    3.797(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    3.797(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     0.175           56.00         0.500
     0.355           75.00         0.500
 Total Area Entered =      0.53(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
56.0  56.0      0.511     0.500        0.281       0.330      0.093
75.0  75.0      0.303     0.500        0.167       0.670      0.112
                                                 Sum (F) =   0.204
Area averaged mean soil loss (F) (In/Hr) =  0.204
Minimum soil loss rate ((In/Hr)) =  0.102
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.500
------------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                       VALLEY S-Curve
------------------------------------------------------------------------
               Unit Hydrograph Data
------------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %           (CFS)
------------------------------------------------------------------------
    1   0.083        637.410         76.583              0.409
    2   0.167       1274.821         23.417              0.125
                                Sum = 100.000   Sum=       0.534
------------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated
loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain
value
```

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	0.07	0.030	(0.362)		0.015	0.015
2	0.17	0.07	0.030	(0.361)		0.015	0.015
3	0.25	0.07	0.030	(0.360)		0.015	0.015
4	0.33	0.10	0.046	(0.358)		0.023	0.023
5	0.42	0.10	0.046	(0.357)		0.023	0.023
6	0.50	0.10	0.046	(0.355)		0.023	0.023
7	0.58	0.10	0.046	(0.354)		0.023	0.023
8	0.67	0.10	0.046	(0.353)		0.023	0.023
9	0.75	0.10	0.046	(0.351)		0.023	0.023
10	0.83	0.13	0.061	(0.350)		0.030	0.030
11	0.92	0.13	0.061	(0.348)		0.030	0.030
12	1.00	0.13	0.061	(0.347)		0.030	0.030
13	1.08	0.10	0.046	(0.346)		0.023	0.023
14	1.17	0.10	0.046	(0.344)		0.023	0.023
15	1.25	0.10	0.046	(0.343)		0.023	0.023
16	1.33	0.10	0.046	(0.342)		0.023	0.023
17	1.42	0.10	0.046	(0.340)		0.023	0.023
18	1.50	0.10	0.046	(0.339)		0.023	0.023
19	1.58	0.10	0.046	(0.338)		0.023	0.023
20	1.67	0.10	0.046	(0.336)		0.023	0.023
21	1.75	0.10	0.046	(0.335)		0.023	0.023
22	1.83	0.13	0.061	(0.333)		0.030	0.030
23	1.92	0.13	0.061	(0.332)		0.030	0.030
24	2.00	0.13	0.061	(0.331)		0.030	0.030
25	2.08	0.13	0.061	(0.329)		0.030	0.030
26	2.17	0.13	0.061	(0.328)		0.030	0.030
27	2.25	0.13	0.061	(0.327)		0.030	0.030
28	2.33	0.13	0.061	(0.325)		0.030	0.030
29	2.42	0.13	0.061	(0.324)		0.030	0.030
30	2.50	0.13	0.061	(0.323)		0.030	0.030
31	2.58	0.17	0.076	(0.321)		0.038	0.038
32	2.67	0.17	0.076	(0.320)		0.038	0.038
33	2.75	0.17	0.076	(0.319)		0.038	0.038
34	2.83	0.17	0.076	(0.318)		0.038	0.038
35	2.92	0.17	0.076	(0.316)		0.038	0.038
36	3.00	0.17	0.076	(0.315)		0.038	0.038
37	3.08	0.17	0.076	(0.314)		0.038	0.038
38	3.17	0.17	0.076	(0.312)		0.038	0.038
39	3.25	0.17	0.076	(0.311)		0.038	0.038
40	3.33	0.17	0.076	(0.310)		0.038	0.038
41	3.42	0.17	0.076	(0.308)		0.038	0.038
42	3.50	0.17	0.076	(0.307)		0.038	0.038
43	3.58	0.17	0.076	(0.306)		0.038	0.038
44	3.67	0.17	0.076	(0.305)		0.038	0.038
45	3.75	0.17	0.076	(0.303)		0.038	0.038
46	3.83	0.20	0.091	(0.302)		0.046	0.046
47	3.92	0.20	0.091	(0.301)		0.046	0.046
48	4.00	0.20	0.091	(0.299)		0.046	0.046
49	4.08	0.20	0.091	(0.298)		0.046	0.046
50	4.17	0.20	0.091	(0.297)		0.046	0.046
51	4.25	0.20	0.091	(0.296)		0.046	0.046
52	4.33	0.23	0.106	(0.294)		0.053	0.053

53	4.42	0.23	0.106	(0.293)	0.053	0.053
54	4.50	0.23	0.106	(0.292)	0.053	0.053
55	4.58	0.23	0.106	(0.291)	0.053	0.053
56	4.67	0.23	0.106	(0.289)	0.053	0.053
57	4.75	0.23	0.106	(0.288)	0.053	0.053
58	4.83	0.27	0.121	(0.287)	0.061	0.061
59	4.92	0.27	0.121	(0.286)	0.061	0.061
60	5.00	0.27	0.121	(0.284)	0.061	0.061
61	5.08	0.20	0.091	(0.283)	0.046	0.046
62	5.17	0.20	0.091	(0.282)	0.046	0.046
63	5.25	0.20	0.091	(0.281)	0.046	0.046
64	5.33	0.23	0.106	(0.279)	0.053	0.053
65	5.42	0.23	0.106	(0.278)	0.053	0.053
66	5.50	0.23	0.106	(0.277)	0.053	0.053
67	5.58	0.27	0.121	(0.276)	0.061	0.061
68	5.67	0.27	0.121	(0.275)	0.061	0.061
69	5.75	0.27	0.121	(0.273)	0.061	0.061
70	5.83	0.27	0.121	(0.272)	0.061	0.061
71	5.92	0.27	0.121	(0.271)	0.061	0.061
72	6.00	0.27	0.121	(0.270)	0.061	0.061
73	6.08	0.30	0.137	(0.269)	0.068	0.068
74	6.17	0.30	0.137	(0.267)	0.068	0.068
75	6.25	0.30	0.137	(0.266)	0.068	0.068
76	6.33	0.30	0.137	(0.265)	0.068	0.068
77	6.42	0.30	0.137	(0.264)	0.068	0.068
78	6.50	0.30	0.137	(0.263)	0.068	0.068
79	6.58	0.33	0.152	(0.261)	0.076	0.076
80	6.67	0.33	0.152	(0.260)	0.076	0.076
81	6.75	0.33	0.152	(0.259)	0.076	0.076
82	6.83	0.33	0.152	(0.258)	0.076	0.076
83	6.92	0.33	0.152	(0.257)	0.076	0.076
84	7.00	0.33	0.152	(0.256)	0.076	0.076
85	7.08	0.33	0.152	(0.254)	0.076	0.076
86	7.17	0.33	0.152	(0.253)	0.076	0.076
87	7.25	0.33	0.152	(0.252)	0.076	0.076
88	7.33	0.37	0.167	(0.251)	0.084	0.084
89	7.42	0.37	0.167	(0.250)	0.084	0.084
90	7.50	0.37	0.167	(0.249)	0.084	0.084
91	7.58	0.40	0.182	(0.248)	0.091	0.091
92	7.67	0.40	0.182	(0.246)	0.091	0.091
93	7.75	0.40	0.182	(0.245)	0.091	0.091
94	7.83	0.43	0.197	(0.244)	0.099	0.099
95	7.92	0.43	0.197	(0.243)	0.099	0.099
96	8.00	0.43	0.197	(0.242)	0.099	0.099
97	8.08	0.50	0.228	(0.241)	0.114	0.114
98	8.17	0.50	0.228	(0.240)	0.114	0.114
99	8.25	0.50	0.228	(0.239)	0.114	0.114
100	8.33	0.50	0.228	(0.237)	0.114	0.114
101	8.42	0.50	0.228	(0.236)	0.114	0.114
102	8.50	0.50	0.228	(0.235)	0.114	0.114
103	8.58	0.53	0.243	(0.234)	0.121	0.121
104	8.67	0.53	0.243	(0.233)	0.121	0.121
105	8.75	0.53	0.243	(0.232)	0.121	0.121
106	8.83	0.57	0.258	(0.231)	0.129	0.129

107	8.92	0.57	0.258	(0.230)	0.129	0.129
108	9.00	0.57	0.258	(0.229)	0.129	0.129
109	9.08	0.63	0.289	(0.228)	0.144	0.144
110	9.17	0.63	0.289	(0.226)	0.144	0.144
111	9.25	0.63	0.289	(0.225)	0.144	0.144
112	9.33	0.67	0.304	(0.224)	0.152	0.152
113	9.42	0.67	0.304	(0.223)	0.152	0.152
114	9.50	0.67	0.304	(0.222)	0.152	0.152
115	9.58	0.70	0.319	(0.221)	0.159	0.159
116	9.67	0.70	0.319	(0.220)	0.159	0.159
117	9.75	0.70	0.319	(0.219)	0.159	0.159
118	9.83	0.73	0.334	(0.218)	0.167	0.167
119	9.92	0.73	0.334	(0.217)	0.167	0.167
120	10.00	0.73	0.334	(0.216)	0.167	0.167
121	10.08	0.50	0.228	(0.215)	0.114	0.114
122	10.17	0.50	0.228	(0.214)	0.114	0.114
123	10.25	0.50	0.228	(0.213)	0.114	0.114
124	10.33	0.50	0.228	(0.212)	0.114	0.114
125	10.42	0.50	0.228	(0.211)	0.114	0.114
126	10.50	0.50	0.228	(0.210)	0.114	0.114
127	10.58	0.67	0.304	(0.209)	0.152	0.152
128	10.67	0.67	0.304	(0.208)	0.152	0.152
129	10.75	0.67	0.304	(0.207)	0.152	0.152
130	10.83	0.67	0.304	(0.206)	0.152	0.152
131	10.92	0.67	0.304	(0.205)	0.152	0.152
132	11.00	0.67	0.304	(0.204)	0.152	0.152
133	11.08	0.63	0.289	(0.203)	0.144	0.144
134	11.17	0.63	0.289	(0.202)	0.144	0.144
135	11.25	0.63	0.289	(0.201)	0.144	0.144
136	11.33	0.63	0.289	(0.200)	0.144	0.144
137	11.42	0.63	0.289	(0.199)	0.144	0.144
138	11.50	0.63	0.289	(0.198)	0.144	0.144
139	11.58	0.57	0.258	(0.197)	0.129	0.129
140	11.67	0.57	0.258	(0.196)	0.129	0.129
141	11.75	0.57	0.258	(0.195)	0.129	0.129
142	11.83	0.60	0.273	(0.194)	0.137	0.137
143	11.92	0.60	0.273	(0.193)	0.137	0.137
144	12.00	0.60	0.273	(0.192)	0.137	0.137
145	12.08	0.83	0.380	(0.191)	0.190	0.190
146	12.17	0.83	0.380	(0.190)	0.190	0.190
147	12.25	0.83	0.380	0.189	(0.190)	0.191
148	12.33	0.87	0.395	0.188	(0.197)	0.207
149	12.42	0.87	0.395	0.187	(0.197)	0.208
150	12.50	0.87	0.395	0.186	(0.197)	0.209
151	12.58	0.93	0.425	0.185	(0.213)	0.240
152	12.67	0.93	0.425	0.184	(0.213)	0.241
153	12.75	0.93	0.425	0.183	(0.213)	0.242
154	12.83	0.97	0.440	0.182	(0.220)	0.258
155	12.92	0.97	0.440	0.181	(0.220)	0.259
156	13.00	0.97	0.440	0.180	(0.220)	0.260
157	13.08	1.13	0.516	0.180	(0.258)	0.337
158	13.17	1.13	0.516	0.179	(0.258)	0.338
159	13.25	1.13	0.516	0.178	(0.258)	0.339
160	13.33	1.13	0.516	0.177	(0.258)	0.339

161	13.42	1.13	0.516	0.176	(0.258)	0.340
162	13.50	1.13	0.516	0.175	(0.258)	0.341
163	13.58	0.77	0.349	0.174	(0.175)	0.175
164	13.67	0.77	0.349	0.173	(0.175)	0.176
165	13.75	0.77	0.349	0.172	(0.175)	0.177
166	13.83	0.77	0.349	0.172	(0.175)	0.178
167	13.92	0.77	0.349	0.171	(0.175)	0.179
168	14.00	0.77	0.349	0.170	(0.175)	0.180
169	14.08	0.90	0.410	0.169	(0.205)	0.241
170	14.17	0.90	0.410	0.168	(0.205)	0.242
171	14.25	0.90	0.410	0.167	(0.205)	0.243
172	14.33	0.87	0.395	0.166	(0.197)	0.229
173	14.42	0.87	0.395	0.165	(0.197)	0.229
174	14.50	0.87	0.395	0.165	(0.197)	0.230
175	14.58	0.87	0.395	0.164	(0.197)	0.231
176	14.67	0.87	0.395	0.163	(0.197)	0.232
177	14.75	0.87	0.395	0.162	(0.197)	0.233
178	14.83	0.83	0.380	0.161	(0.190)	0.218
179	14.92	0.83	0.380	0.160	(0.190)	0.219
180	15.00	0.83	0.380	0.160	(0.190)	0.220
181	15.08	0.80	0.364	0.159	(0.182)	0.206
182	15.17	0.80	0.364	0.158	(0.182)	0.206
183	15.25	0.80	0.364	0.157	(0.182)	0.207
184	15.33	0.77	0.349	0.156	(0.175)	0.193
185	15.42	0.77	0.349	0.156	(0.175)	0.194
186	15.50	0.77	0.349	0.155	(0.175)	0.195
187	15.58	0.63	0.289	(0.154)	0.144	0.144
188	15.67	0.63	0.289	(0.153)	0.144	0.144
189	15.75	0.63	0.289	(0.152)	0.144	0.144
190	15.83	0.63	0.289	(0.152)	0.144	0.144
191	15.92	0.63	0.289	(0.151)	0.144	0.144
192	16.00	0.63	0.289	(0.150)	0.144	0.144
193	16.08	0.13	0.061	(0.149)	0.030	0.030
194	16.17	0.13	0.061	(0.149)	0.030	0.030
195	16.25	0.13	0.061	(0.148)	0.030	0.030
196	16.33	0.13	0.061	(0.147)	0.030	0.030
197	16.42	0.13	0.061	(0.146)	0.030	0.030
198	16.50	0.13	0.061	(0.146)	0.030	0.030
199	16.58	0.10	0.046	(0.145)	0.023	0.023
200	16.67	0.10	0.046	(0.144)	0.023	0.023
201	16.75	0.10	0.046	(0.143)	0.023	0.023
202	16.83	0.10	0.046	(0.143)	0.023	0.023
203	16.92	0.10	0.046	(0.142)	0.023	0.023
204	17.00	0.10	0.046	(0.141)	0.023	0.023
205	17.08	0.17	0.076	(0.140)	0.038	0.038
206	17.17	0.17	0.076	(0.140)	0.038	0.038
207	17.25	0.17	0.076	(0.139)	0.038	0.038
208	17.33	0.17	0.076	(0.138)	0.038	0.038
209	17.42	0.17	0.076	(0.138)	0.038	0.038
210	17.50	0.17	0.076	(0.137)	0.038	0.038
211	17.58	0.17	0.076	(0.136)	0.038	0.038
212	17.67	0.17	0.076	(0.136)	0.038	0.038
213	17.75	0.17	0.076	(0.135)	0.038	0.038
214	17.83	0.13	0.061	(0.134)	0.030	0.030

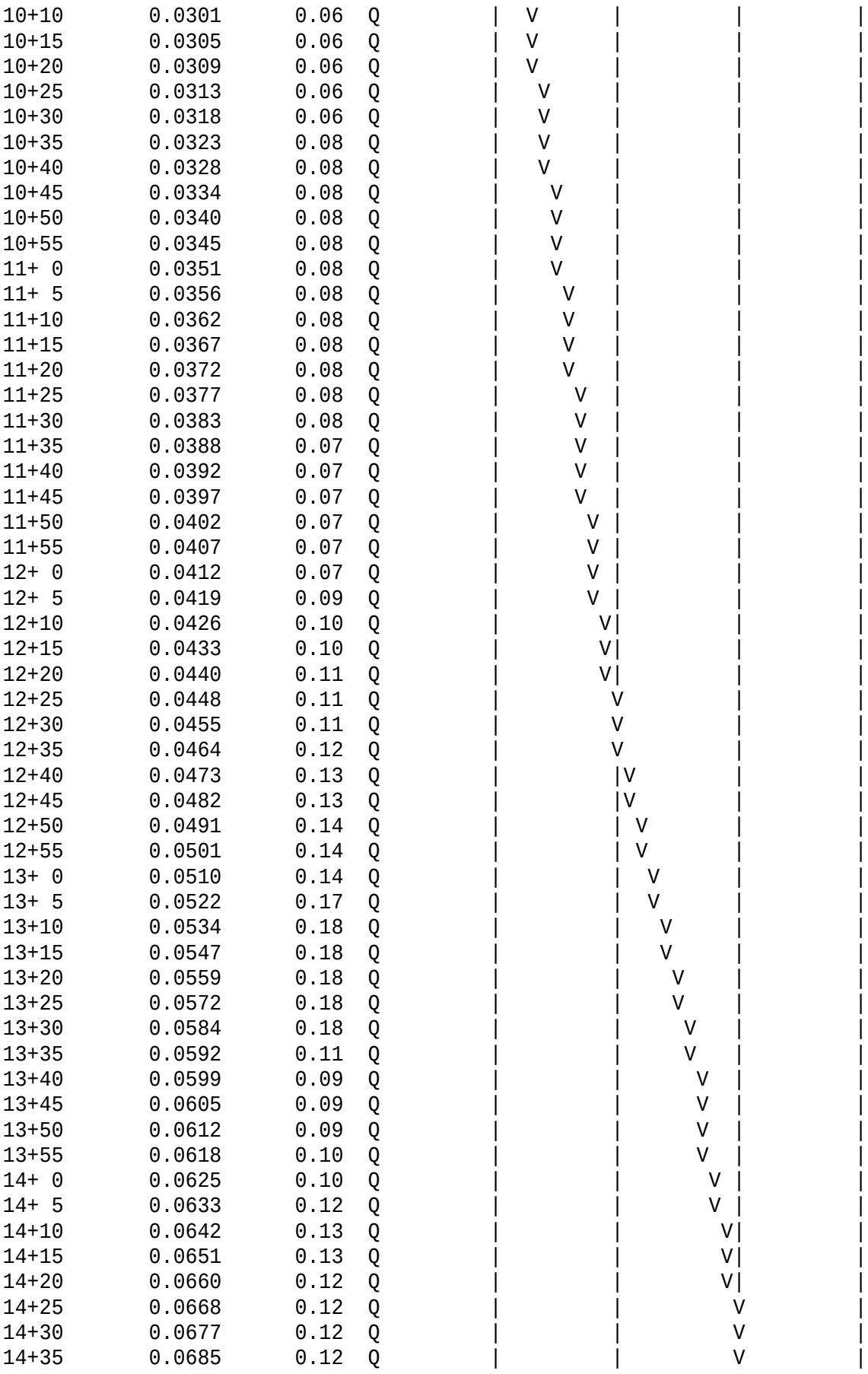
215	17.92	0.13	0.061	(0.134)	0.030	0.030
216	18.00	0.13	0.061	(0.133)	0.030	0.030
217	18.08	0.13	0.061	(0.132)	0.030	0.030
218	18.17	0.13	0.061	(0.132)	0.030	0.030
219	18.25	0.13	0.061	(0.131)	0.030	0.030
220	18.33	0.13	0.061	(0.130)	0.030	0.030
221	18.42	0.13	0.061	(0.130)	0.030	0.030
222	18.50	0.13	0.061	(0.129)	0.030	0.030
223	18.58	0.10	0.046	(0.128)	0.023	0.023
224	18.67	0.10	0.046	(0.128)	0.023	0.023
225	18.75	0.10	0.046	(0.127)	0.023	0.023
226	18.83	0.07	0.030	(0.127)	0.015	0.015
227	18.92	0.07	0.030	(0.126)	0.015	0.015
228	19.00	0.07	0.030	(0.125)	0.015	0.015
229	19.08	0.10	0.046	(0.125)	0.023	0.023
230	19.17	0.10	0.046	(0.124)	0.023	0.023
231	19.25	0.10	0.046	(0.124)	0.023	0.023
232	19.33	0.13	0.061	(0.123)	0.030	0.030
233	19.42	0.13	0.061	(0.123)	0.030	0.030
234	19.50	0.13	0.061	(0.122)	0.030	0.030
235	19.58	0.10	0.046	(0.121)	0.023	0.023
236	19.67	0.10	0.046	(0.121)	0.023	0.023
237	19.75	0.10	0.046	(0.120)	0.023	0.023
238	19.83	0.07	0.030	(0.120)	0.015	0.015
239	19.92	0.07	0.030	(0.119)	0.015	0.015
240	20.00	0.07	0.030	(0.119)	0.015	0.015
241	20.08	0.10	0.046	(0.118)	0.023	0.023
242	20.17	0.10	0.046	(0.118)	0.023	0.023
243	20.25	0.10	0.046	(0.117)	0.023	0.023
244	20.33	0.10	0.046	(0.117)	0.023	0.023
245	20.42	0.10	0.046	(0.116)	0.023	0.023
246	20.50	0.10	0.046	(0.116)	0.023	0.023
247	20.58	0.10	0.046	(0.115)	0.023	0.023
248	20.67	0.10	0.046	(0.115)	0.023	0.023
249	20.75	0.10	0.046	(0.114)	0.023	0.023
250	20.83	0.07	0.030	(0.114)	0.015	0.015
251	20.92	0.07	0.030	(0.113)	0.015	0.015
252	21.00	0.07	0.030	(0.113)	0.015	0.015
253	21.08	0.10	0.046	(0.112)	0.023	0.023
254	21.17	0.10	0.046	(0.112)	0.023	0.023
255	21.25	0.10	0.046	(0.111)	0.023	0.023
256	21.33	0.07	0.030	(0.111)	0.015	0.015
257	21.42	0.07	0.030	(0.111)	0.015	0.015
258	21.50	0.07	0.030	(0.110)	0.015	0.015
259	21.58	0.10	0.046	(0.110)	0.023	0.023
260	21.67	0.10	0.046	(0.109)	0.023	0.023
261	21.75	0.10	0.046	(0.109)	0.023	0.023
262	21.83	0.07	0.030	(0.109)	0.015	0.015
263	21.92	0.07	0.030	(0.108)	0.015	0.015
264	22.00	0.07	0.030	(0.108)	0.015	0.015
265	22.08	0.10	0.046	(0.108)	0.023	0.023
266	22.17	0.10	0.046	(0.107)	0.023	0.023
267	22.25	0.10	0.046	(0.107)	0.023	0.023
268	22.33	0.07	0.030	(0.107)	0.015	0.015

```
269  22.42     0.07      0.030       (  0.106)       0.015        0.015
270  22.50     0.07      0.030       (  0.106)       0.015        0.015
271  22.58     0.07      0.030       (  0.106)       0.015        0.015
272  22.67     0.07      0.030       (  0.105)       0.015        0.015
273  22.75     0.07      0.030       (  0.105)       0.015        0.015
274  22.83     0.07      0.030       (  0.105)       0.015        0.015
275  22.92     0.07      0.030       (  0.104)       0.015        0.015
276  23.00     0.07      0.030       (  0.104)       0.015        0.015
277  23.08     0.07      0.030       (  0.104)       0.015        0.015
278  23.17     0.07      0.030       (  0.104)       0.015        0.015
279  23.25     0.07      0.030       (  0.104)       0.015        0.015
280  23.33     0.07      0.030       (  0.103)       0.015        0.015
281  23.42     0.07      0.030       (  0.103)       0.015        0.015
282  23.50     0.07      0.030       (  0.103)       0.015        0.015
283  23.58     0.07      0.030       (  0.103)       0.015        0.015
284  23.67     0.07      0.030       (  0.103)       0.015        0.015
285  23.75     0.07      0.030       (  0.102)       0.015        0.015
286  23.83     0.07      0.030       (  0.102)       0.015        0.015
287  23.92     0.07      0.030       (  0.102)       0.015        0.015
288  24.00     0.07      0.030       (  0.102)       0.015        0.015
               (Loss Rate Not Used)
    Sum =     100.0                                    Sum =    24.0
       Flood volume = Effective rainfall      2.00(In)
        times area       0.5(Ac.)/[(In)/(Ft.)] =       0.1(Ac.Ft)
       Total soil loss =      1.79(In)
       Total soil loss =     0.079(Ac.Ft)
       Total rainfall =      3.80(In)
       Flood volume =        3854.8 Cubic Feet
       Total soil loss =        3449.7 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =      0.182(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        2.5       5.0       7.5      10.0
 ------------------------------------------------------------------------
   0+ 5       0.0000      0.01  Q         |         |         |         |
   0+10       0.0001      0.01  Q         |         |         |         |
   0+15       0.0002      0.01  Q         |         |         |         |
   0+20       0.0002      0.01  Q         |         |         |         |
   0+25       0.0003      0.01  Q         |         |         |         |
   0+30       0.0004      0.01  Q         |         |         |         |
   0+35       0.0005      0.01  Q         |         |         |         |
   0+40       0.0006      0.01  Q         |         |         |         |
   0+45       0.0007      0.01  Q         |         |         |         |
   0+50       0.0008      0.02  Q         |         |         |         |
   0+55       0.0009      0.02  Q         |         |         |         |
   1+ 0       0.0010      0.02  Q         |         |         |         |
   1+ 5       0.0011      0.01  Q         |         |         |         |
```

1+10	0.0012	0.01	Q	|	|	|	|
1+15	0.0012	0.01	Q	|	|	|	|
1+20	0.0013	0.01	Q	|	|	|	|
1+25	0.0014	0.01	Q	|	|	|	|
1+30	0.0015	0.01	Q	|	|	|	|
1+35	0.0016	0.01	Q	|	|	|	|
1+40	0.0017	0.01	Q	|	|	|	|
1+45	0.0017	0.01	Q	|	|	|	|
1+50	0.0018	0.02	Q	|	|	|	|
1+55	0.0020	0.02	Q	|	|	|	|
2+ 0	0.0021	0.02	Q	|	|	|	|
2+ 5	0.0022	0.02	Q	|	|	|	|
2+10	0.0023	0.02	QV	|	|	|	|
2+15	0.0024	0.02	QV	|	|	|	|
2+20	0.0025	0.02	QV	|	|	|	|
2+25	0.0026	0.02	QV	|	|	|	|
2+30	0.0027	0.02	QV	|	|	|	|
2+35	0.0029	0.02	QV	|	|	|	|
2+40	0.0030	0.02	QV	|	|	|	|
2+45	0.0032	0.02	QV	|	|	|	|
2+50	0.0033	0.02	QV	|	|	|	|
2+55	0.0034	0.02	QV	|	|	|	|
3+ 0	0.0036	0.02	QV	|	|	|	|
3+ 5	0.0037	0.02	QV	|	|	|	|
3+10	0.0039	0.02	QV	|	|	|	|
3+15	0.0040	0.02	QV	|	|	|	|
3+20	0.0041	0.02	QV	|	|	|	|
3+25	0.0043	0.02	QV	|	|	|	|
3+30	0.0044	0.02	QV	|	|	|	|
3+35	0.0046	0.02	Q V	|	|	|	|
3+40	0.0047	0.02	Q V	|	|	|	|
3+45	0.0048	0.02	Q V	|	|	|	|
3+50	0.0050	0.02	Q V	|	|	|	|
3+55	0.0052	0.02	Q V	|	|	|	|
4+ 0	0.0053	0.02	Q V	|	|	|	|
4+ 5	0.0055	0.02	Q V	|	|	|	|
4+10	0.0057	0.02	Q V	|	|	|	|
4+15	0.0058	0.02	Q V	|	|	|	|
4+20	0.0060	0.03	Q V	|	|	|	|
4+25	0.0062	0.03	Q V	|	|	|	|
4+30	0.0064	0.03	Q V	|	|	|	|
4+35	0.0066	0.03	Q V	|	|	|	|
4+40	0.0068	0.03	Q V	|	|	|	|
4+45	0.0070	0.03	Q V	|	|	|	|
4+50	0.0072	0.03	Q V	|	|	|	|
4+55	0.0074	0.03	Q V	|	|	|	|
5+ 0	0.0077	0.03	Q V	|	|	|	|
5+ 5	0.0078	0.03	Q V	|	|	|	|
5+10	0.0080	0.02	Q V	|	|	|	|
5+15	0.0082	0.02	Q V	|	|	|	|
5+20	0.0084	0.03	Q V	|	|	|	|
5+25	0.0086	0.03	Q V	|	|	|	|
5+30	0.0088	0.03	Q V	|	|	|	|
5+35	0.0090	0.03	Q V	|	|	|	|

```
 5+40       0.0092      0.03  Q   V     |          |          |          |
 5+45       0.0094      0.03  Q   V     |          |          |          |
 5+50       0.0096      0.03  Q   V     |          |          |          |
 5+55       0.0099      0.03  Q   V     |          |          |          |
 6+ 0       0.0101      0.03  Q   V     |          |          |          |
 6+ 5       0.0103      0.04  Q   V     |          |          |          |
 6+10       0.0106      0.04  Q   V     |          |          |          |
 6+15       0.0108      0.04  Q   V     |          |          |          |
 6+20       0.0111      0.04  Q    V    |          |          |          |
 6+25       0.0113      0.04  Q    V    |          |          |          |
 6+30       0.0116      0.04  Q    V    |          |          |          |
 6+35       0.0119      0.04  Q    V    |          |          |          |
 6+40       0.0121      0.04  Q    V    |          |          |          |
 6+45       0.0124      0.04  Q    V    |          |          |          |
 6+50       0.0127      0.04  Q    V    |          |          |          |
 6+55       0.0130      0.04  Q    V    |          |          |          |
 7+ 0       0.0133      0.04  Q    V    |          |          |          |
 7+ 5       0.0135      0.04  Q     V   |          |          |          |
 7+10       0.0138      0.04  Q     V   |          |          |          |
 7+15       0.0141      0.04  Q     V   |          |          |          |
 7+20       0.0144      0.04  Q     V   |          |          |          |
 7+25       0.0147      0.04  Q     V   |          |          |          |
 7+30       0.0150      0.04  Q     V   |          |          |          |
 7+35       0.0153      0.05  Q     V   |          |          |          |
 7+40       0.0157      0.05  Q      V  |          |          |          |
 7+45       0.0160      0.05  Q      V  |          |          |          |
 7+50       0.0164      0.05  Q      V  |          |          |          |
 7+55       0.0167      0.05  Q      V  |          |          |          |
 8+ 0       0.0171      0.05  Q      V  |          |          |          |
 8+ 5       0.0175      0.06  Q      V  |          |          |          |
 8+10       0.0179      0.06  Q       V |          |          |          |
 8+15       0.0183      0.06  Q       V |          |          |          |
 8+20       0.0188      0.06  Q       V |          |          |          |
 8+25       0.0192      0.06  Q       V |          |          |          |
 8+30       0.0196      0.06  Q       V |          |          |          |
 8+35       0.0200      0.06  Q        V|          |          |          |
 8+40       0.0205      0.06  Q        V|          |          |          |
 8+45       0.0209      0.06  Q        V|          |          |          |
 8+50       0.0214      0.07  Q        V|          |          |          |
 8+55       0.0219      0.07  Q        V|          |          |          |
 9+ 0       0.0224      0.07  Q         V          |          |          |
 9+ 5       0.0229      0.08  Q         V          |          |          |
 9+10       0.0234      0.08  Q         V          |          |          |
 9+15       0.0239      0.08  Q         V          |          |          |
 9+20       0.0245      0.08  Q         |V         |          |          |
 9+25       0.0251      0.08  Q         |V         |          |          |
 9+30       0.0256      0.08  Q         |V         |          |          |
 9+35       0.0262      0.08  Q         |V         |          |          |
 9+40       0.0268      0.09  Q         | V        |          |          |
 9+45       0.0274      0.09  Q         | V        |          |          |
 9+50       0.0280      0.09  Q         | V        |          |          |
 9+55       0.0286      0.09  Q         | V        |          |          |
10+ 0       0.0292      0.09  Q         |  V       |          |          |
10+ 5       0.0297      0.07  Q         |  V       |          |          |
```



```
14+40       0.0694      0.12  Q          |          |          |V         |
14+45       0.0702      0.12  Q          |          |          |V         |
14+50       0.0710      0.12  Q          |          |          | V        |
14+55       0.0718      0.12  Q          |          |          | V        |
15+ 0       0.0727      0.12  Q          |          |          | V        |
15+ 5       0.0734      0.11  Q          |          |          |  V       |
15+10       0.0742      0.11  Q          |          |          |  V       |
15+15       0.0749      0.11  Q          |          |          |  V       |
15+20       0.0757      0.10  Q          |          |          |   V      |
15+25       0.0764      0.10  Q          |          |          |   V      |
15+30       0.0771      0.10  Q          |          |          |   V      |
15+35       0.0777      0.08  Q          |          |          |    V     |
15+40       0.0782      0.08  Q          |          |          |    V     |
15+45       0.0787      0.08  Q          |          |          |    V     |
15+50       0.0793      0.08  Q          |          |          |    V     |
15+55       0.0798      0.08  Q          |          |          |     V    |
16+ 0       0.0803      0.08  Q          |          |          |     V    |
16+ 5       0.0805      0.03  Q          |          |          |     V    |
16+10       0.0806      0.02  Q          |          |          |     V    |
16+15       0.0808      0.02  Q          |          |          |     V    |
16+20       0.0809      0.02  Q          |          |          |     V    |
16+25       0.0810      0.02  Q          |          |          |     V    |
16+30       0.0811      0.02  Q          |          |          |     V    |
16+35       0.0812      0.01  Q          |          |          |     V    |
16+40       0.0813      0.01  Q          |          |          |     V    |
16+45       0.0813      0.01  Q          |          |          |     V    |
16+50       0.0814      0.01  Q          |          |          |     V    |
16+55       0.0815      0.01  Q          |          |          |     V    |
17+ 0       0.0816      0.01  Q          |          |          |     V    |
17+ 5       0.0817      0.02  Q          |          |          |     V    |
17+10       0.0819      0.02  Q          |          |          |      V   |
17+15       0.0820      0.02  Q          |          |          |      V   |
17+20       0.0821      0.02  Q          |          |          |      V   |
17+25       0.0823      0.02  Q          |          |          |      V   |
17+30       0.0824      0.02  Q          |          |          |      V   |
17+35       0.0826      0.02  Q          |          |          |      V   |
17+40       0.0827      0.02  Q          |          |          |      V   |
17+45       0.0828      0.02  Q          |          |          |      V   |
17+50       0.0830      0.02  Q          |          |          |      V   |
17+55       0.0831      0.02  Q          |          |          |      V   |
18+ 0       0.0832      0.02  Q          |          |          |      V   |
18+ 5       0.0833      0.02  Q          |          |          |      V   |
18+10       0.0834      0.02  Q          |          |          |      V   |
18+15       0.0835      0.02  Q          |          |          |      V   |
18+20       0.0836      0.02  Q          |          |          |      V   |
18+25       0.0837      0.02  Q          |          |          |      V   |
18+30       0.0839      0.02  Q          |          |          |      V   |
18+35       0.0839      0.01  Q          |          |          |      V   |
18+40       0.0840      0.01  Q          |          |          |      V   |
18+45       0.0841      0.01  Q          |          |          |       V  |
18+50       0.0842      0.01  Q          |          |          |       V  |
18+55       0.0842      0.01  Q          |          |          |       V  |
19+ 0       0.0843      0.01  Q          |          |          |       V  |
19+ 5       0.0844      0.01  Q          |          |          |       V  |
```

19+10	0.0845	0.01	Q	|	|	|	V |
19+15	0.0845	0.01	Q	|	|	|	V |
19+20	0.0846	0.02	Q	|	|	|	V |
19+25	0.0848	0.02	Q	|	|	|	V |
19+30	0.0849	0.02	Q	|	|	|	V |
19+35	0.0850	0.01	Q	|	|	|	V |
19+40	0.0850	0.01	Q	|	|	|	V |
19+45	0.0851	0.01	Q	|	|	|	V |
19+50	0.0852	0.01	Q	|	|	|	V |
19+55	0.0852	0.01	Q	|	|	|	V |
20+ 0	0.0853	0.01	Q	|	|	|	V |
20+ 5	0.0854	0.01	Q	|	|	|	V |
20+10	0.0855	0.01	Q	|	|	|	V |
20+15	0.0855	0.01	Q	|	|	|	V |
20+20	0.0856	0.01	Q	|	|	|	V |
20+25	0.0857	0.01	Q	|	|	|	V |
20+30	0.0858	0.01	Q	|	|	|	V |
20+35	0.0859	0.01	Q	|	|	|	V |
20+40	0.0860	0.01	Q	|	|	|	V |
20+45	0.0860	0.01	Q	|	|	|	V |
20+50	0.0861	0.01	Q	|	|	|	V |
20+55	0.0862	0.01	Q	|	|	|	V |
21+ 0	0.0862	0.01	Q	|	|	|	V |
21+ 5	0.0863	0.01	Q	|	|	|	V|
21+10	0.0864	0.01	Q	|	|	|	V|
21+15	0.0865	0.01	Q	|	|	|	V|
21+20	0.0865	0.01	Q	|	|	|	V|
21+25	0.0866	0.01	Q	|	|	|	V|
21+30	0.0866	0.01	Q	|	|	|	V|
21+35	0.0867	0.01	Q	|	|	|	V|
21+40	0.0868	0.01	Q	|	|	|	V|
21+45	0.0869	0.01	Q	|	|	|	V|
21+50	0.0869	0.01	Q	|	|	|	V|
21+55	0.0870	0.01	Q	|	|	|	V|
22+ 0	0.0871	0.01	Q	|	|	|	V|
22+ 5	0.0871	0.01	Q	|	|	|	V|
22+10	0.0872	0.01	Q	|	|	|	V|
22+15	0.0873	0.01	Q	|	|	|	V|
22+20	0.0874	0.01	Q	|	|	|	V|
22+25	0.0874	0.01	Q	|	|	|	V|
22+30	0.0875	0.01	Q	|	|	|	V|
22+35	0.0875	0.01	Q	|	|	|	V|
22+40	0.0876	0.01	Q	|	|	|	V|
22+45	0.0876	0.01	Q	|	|	|	V|
22+50	0.0877	0.01	Q	|	|	|	V|
22+55	0.0878	0.01	Q	|	|	|	V|
23+ 0	0.0878	0.01	Q	|	|	|	V|
23+ 5	0.0879	0.01	Q	|	|	|	V|
23+10	0.0879	0.01	Q	|	|	|	V|
23+15	0.0880	0.01	Q	|	|	|	V|
23+20	0.0880	0.01	Q	|	|	|	V|
23+25	0.0881	0.01	Q	|	|	|	V|
23+30	0.0881	0.01	Q	|	|	|	V|
23+35	0.0882	0.01	Q	|	|	|	V|

```
   23+40       0.0883      0.01  Q         |         |         |        V|
   23+45       0.0883      0.01  Q         |         |         |        V|
   23+50       0.0884      0.01  Q         |         |         |        V|
   23+55       0.0884      0.01  Q         |         |         |        V|
   24+ 0       0.0885      0.01  Q         |         |         |        V|
   24+ 5       0.0885      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 08/23/21 File: 1162008UH212.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6335

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

VALUED ENGINEERING, INC.
1162008 - PARADISE VALLEY RANCH
EXISTING UNIT HYDROGRAPH
2-YR STORM EVENT

Drainage Area = 1281.51(Ac.) = 2.002 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 1281.51(Ac.) = 2.002 Sq. Mi.
Length along longest watercourse = 11387.80(Ft.)
Length along longest watercourse measured to centroid = 4702.00(Ft.)
Length along longest watercourse = 2.157 Mi.
Length along longest watercourse measured to centroid = 0.891 Mi.
Difference in elevation = 1268.20(Ft.)
Slope along watercourse = 588.0061 Ft./Mi.
Average Manning's 'N' = 0.050
Lag time = 0.458 Hr.
Lag time = 27.47 Min.
25% of lag time = 6.87 Min.
40% of lag time = 10.99 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1281.51	0.48	610.00

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1281.51	1.76	2255.46

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 0.476(In)
Area Averaged 100-Year Rainfall = 1.760(In)

Point rain (area averaged) = 0.476(In)
Areal adjustment factor = 98.84 %
Adjusted average point rain = 0.470(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
1281.510	69.00	0.000

Total Area Entered = 1281.51(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
69.0	49.8	0.574	0.000	0.574	1.000	0.574
					Sum (F) =	0.574

Area averaged mean soil loss (F) (In/Hr) = 0.574
Minimum soil loss rate ((In/Hr)) = 0.287
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

Slope of intensity-duration curve for a 1 hour storm =0.5300

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

Combination of 'S' Curves:
VALLEY 'S' Curve Percentage = 0.00
FOOTHILL 'S' Curve Percentage = 1.00
MOUNTAIN 'S' Curve Percentage = 99.00
DESERT 'S' Curve Percentage = 0.00

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	18.202	2.027	26.183
2	0.167	36.403	5.610	72.455
3	0.250	54.605	9.954	128.555
4	0.333	72.806	13.932	179.934
5	0.417	91.008	10.822	139.767
6	0.500	109.209	7.471	96.495
7	0.583	127.411	5.234	67.594
8	0.667	145.612	4.110	53.081
9	0.750	163.814	3.477	44.912
10	0.833	182.015	2.914	37.641
11	0.917	200.217	2.568	33.161
12	1.000	218.418	2.333	30.129
13	1.083	236.620	2.129	27.495
14	1.167	254.821	1.905	24.600
15	1.250	273.023	1.682	21.727
16	1.333	291.224	1.545	19.951
17	1.417	309.426	1.428	18.438
18	1.500	327.627	1.261	16.285
19	1.583	345.829	1.144	14.772
20	1.667	364.030	1.047	13.518
21	1.750	382.232	0.948	12.243
22	1.833	400.433	0.942	12.172
23	1.917	418.635	0.846	10.930
24	2.000	436.836	0.759	9.803
25	2.083	455.038	0.758	9.785
26	2.167	473.239	0.732	9.455
27	2.250	491.441	0.723	9.333
28	2.333	509.642	0.702	9.070
29	2.417	527.844	0.594	7.668
30	2.500	546.045	0.578	7.461
31	2.583	564.247	0.567	7.320
32	2.667	582.448	0.543	7.011
33	2.750	600.650	0.542	7.000
34	2.833	618.851	0.503	6.497
35	2.917	637.053	0.469	6.060
36	3.000	655.254	0.468	6.041
37	3.083	673.456	0.442	5.709
38	3.167	691.657	0.433	5.590
39	3.250	709.859	0.422	5.453
40	3.333	728.060	0.368	4.752
41	3.417	746.262	0.360	4.655
42	3.500	764.463	0.349	4.508
43	3.583	782.665	0.325	4.199
44	3.667	800.866	0.324	4.189
45	3.750	819.068	0.324	4.189

46	3.833	837.269	0.324	4.189
47	3.917	855.471	0.324	4.189
48	4.000	873.672	0.324	4.189
49	4.083	891.874	0.324	4.189
50	4.167	910.075	0.324	4.189
51	4.250	928.277	0.324	4.189
52	4.333	946.478	0.324	4.189
53	4.417	964.680	0.324	4.189
54	4.500	982.881	0.324	4.189
55	4.583	1001.083	0.467	6.034
			Sum = 100.000	Sum= 1291.522

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	3.40	0.192	(0.574)	0.173	0.019
2	0.17	4.70	0.265	(0.574)	0.239	0.027
3	0.25	4.70	0.265	(0.574)	0.239	0.027
4	0.33	5.10	0.288	(0.574)	0.259	0.029
5	0.42	5.80	0.327	(0.574)	0.295	0.033
6	0.50	5.90	0.333	(0.574)	0.300	0.033
7	0.58	7.10	0.401	(0.574)	0.361	0.040
8	0.67	8.70	0.491	(0.574)	0.442	0.049
9	0.75	13.20	0.745	0.574	(0.671)	0.171
10	0.83	29.70	1.677	0.574	(1.509)	1.103
11	0.92	7.70	0.435	(0.574)	0.391	0.043
12	1.00	4.00	0.226	(0.574)	0.203	0.023
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	1.6

Flood volume = Effective rainfall 0.13(In)
times area 1281.5(Ac.)/[(In)/(Ft.)] = 14.2(Ac.Ft)
Total soil loss = 0.34(In)
Total soil loss = 36.036(Ac.Ft)
Total rainfall = 0.47(In)
Flood volume = 618869.5 Cubic Feet
Total soil loss = 1569709.9 Cubic Feet

Peak flow rate of this hydrograph = 243.699(CFS)

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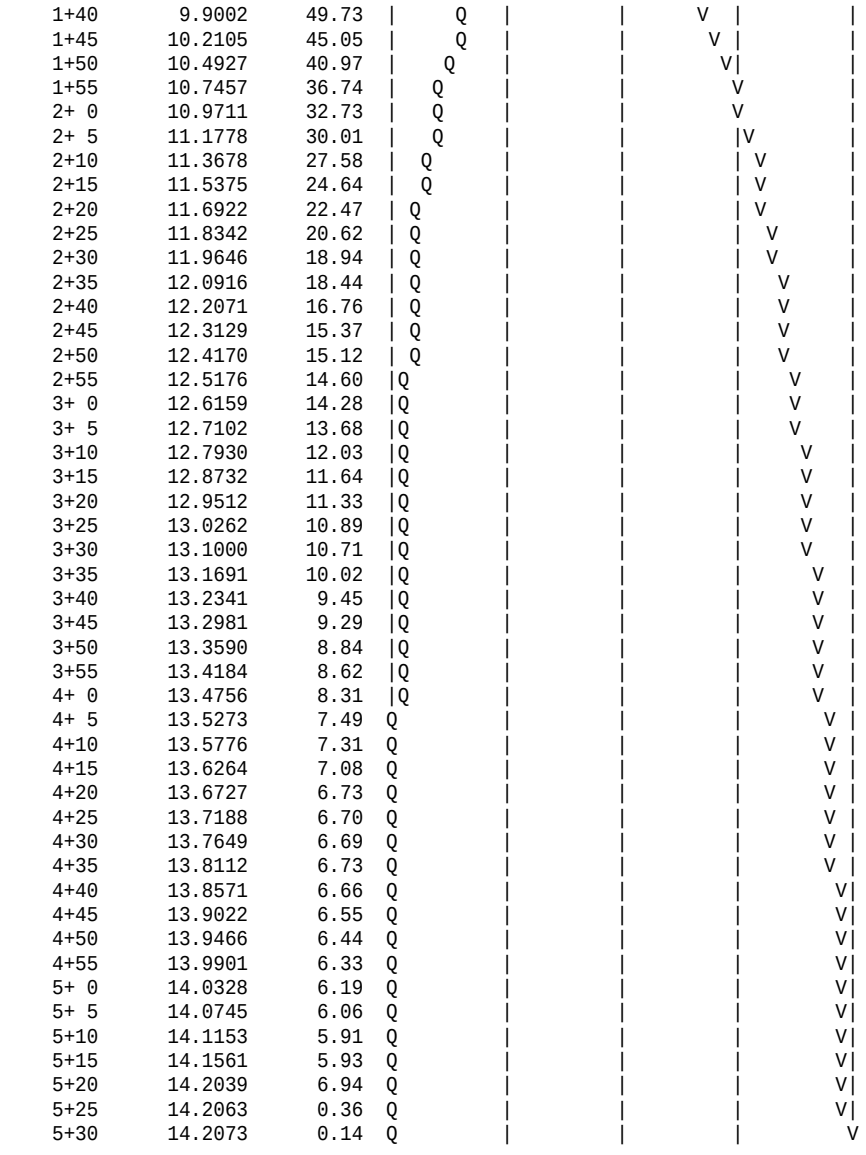
1 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	75.0	150.0	225.0	300.0
0+ 5	0.0035	0.50	Q				
0+10	0.0178	2.09	Q				
0+15	0.0529	5.09	Q				
0+20	0.1186	9.55	VQ				
0+25	0.2138	13.82	VQ				
0+30	0.3329	17.29	V Q				
0+35	0.4736	20.43	|VQ				
0+40	0.6373	23.77	|V Q				
0+45	0.8482	30.62	| V Q				
0+50	1.3161	67.93	| V Q|				
0+55	2.1931	127.35	| V | Q |				
1+ 0	3.5354	194.90	| V|		Q		
1+ 5	5.2138	243.70	| | V |		Q		
1+10	6.5403	192.62	| | V |		Q		
1+15	7.4881	137.62	| | Q |V				
1+20	8.1716	99.25	| Q | V				
1+25	8.7132	78.64	| Q | V				
1+30	9.1702	66.36	| Q | V				
1+35	9.5577	56.26	| 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 08/23/21 File: 1162008UH1001100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6335

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

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EXISTING UNIT HYDROGRAPH
100 YR STORM EVENT

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Length along longest watercourse measured to centroid = 4702.00(Ft.)
Length along longest watercourse = 2.157 Mi.
Length along longest watercourse measured to centroid = 0.891 Mi.
Difference in elevation = 1268.20(Ft.)
Slope along watercourse = 588.0061 Ft./Mi.
Average Manning's 'N' = 0.050
Lag time = 0.458 Hr.
Lag time = 27.47 Min.
25% of lag time = 6.87 Min.
40% of lag time = 10.99 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1281.51	0.48	610.00

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1281.51	1.76	2255.46

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.476(In)
Area Averaged 100-Year Rainfall = 1.760(In)

Point rain (area averaged) = 1.760(In)
Areal adjustment factor = 98.84 %
Adjusted average point rain = 1.740(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
1281.510	69.00	0.000

Total Area Entered = 1281.51(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
69.0	69.0	0.373	0.000	0.373	1.000	0.373
					Sum (F) =	0.373

Area averaged mean soil loss (F) (In/Hr) = 0.373
Minimum soil loss rate ((In/Hr)) = 0.186
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

Slope of intensity-duration curve for a 1 hour storm =0.5300

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

Combination of 'S' Curves:
VALLEY 'S' Curve Percentage = 0.00
FOOTHILL 'S' Curve Percentage = 1.00
MOUNTAIN 'S' Curve Percentage = 99.00
DESERT 'S' Curve Percentage = 0.00

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	18.202	2.027	26.183
2	0.167	36.403	5.610	72.455
3	0.250	54.605	9.954	128.555
4	0.333	72.806	13.932	179.934
5	0.417	91.008	10.822	139.767
6	0.500	109.209	7.471	96.495
7	0.583	127.411	5.234	67.594
8	0.667	145.612	4.110	53.081
9	0.750	163.814	3.477	44.912
10	0.833	182.015	2.914	37.641
11	0.917	200.217	2.568	33.161
12	1.000	218.418	2.333	30.129
13	1.083	236.620	2.129	27.495
14	1.167	254.821	1.905	24.600
15	1.250	273.023	1.682	21.727
16	1.333	291.224	1.545	19.951
17	1.417	309.426	1.428	18.438
18	1.500	327.627	1.261	16.285
19	1.583	345.829	1.144	14.772
20	1.667	364.030	1.047	13.518
21	1.750	382.232	0.948	12.243
22	1.833	400.433	0.942	12.172
23	1.917	418.635	0.846	10.930
24	2.000	436.836	0.759	9.803
25	2.083	455.038	0.758	9.785
26	2.167	473.239	0.732	9.455
27	2.250	491.441	0.723	9.333
28	2.333	509.642	0.702	9.070
29	2.417	527.844	0.594	7.668
30	2.500	546.045	0.578	7.461
31	2.583	564.247	0.567	7.320
32	2.667	582.448	0.543	7.011
33	2.750	600.650	0.542	7.000
34	2.833	618.851	0.503	6.497
35	2.917	637.053	0.469	6.060
36	3.000	655.254	0.468	6.041
37	3.083	673.456	0.442	5.709
38	3.167	691.657	0.433	5.590
39	3.250	709.859	0.422	5.453
40	3.333	728.060	0.368	4.752
41	3.417	746.262	0.360	4.655
42	3.500	764.463	0.349	4.508
43	3.583	782.665	0.325	4.199
44	3.667	800.866	0.324	4.189
45	3.750	819.068	0.324	4.189

46	3.833	837.269	0.324	4.189
47	3.917	855.471	0.324	4.189
48	4.000	873.672	0.324	4.189
49	4.083	891.874	0.324	4.189
50	4.167	910.075	0.324	4.189
51	4.250	928.277	0.324	4.189
52	4.333	946.478	0.324	4.189
53	4.417	964.680	0.324	4.189
54	4.500	982.881	0.324	4.189
55	4.583	1001.083	0.467	6.034
			Sum = 100.000	Sum= 1291.522

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	3.40	0.710	0.373	(0.639)	0.337
2	0.17	4.70	0.981	0.373	(0.883)	0.608
3	0.25	4.70	0.981	0.373	(0.883)	0.608
4	0.33	5.10	1.065	0.373	(0.958)	0.692
5	0.42	5.80	1.211	0.373	(1.090)	0.838
6	0.50	5.90	1.232	0.373	(1.108)	0.859
7	0.58	7.10	1.482	0.373	(1.334)	1.109
8	0.67	8.70	1.816	0.373	(1.634)	1.443
9	0.75	13.20	2.755	0.373	(2.480)	2.383
10	0.83	29.70	6.200	0.373	(5.580)	5.827
11	0.92	7.70	1.607	0.373	(1.447)	1.235
12	1.00	4.00	0.835	0.373	(0.751)	0.462
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	16.4

Flood volume = Effective rainfall 1.37(In)
times area 1281.5(Ac.)/[(In)/(Ft.)] = 146.0(Ac.Ft)
Total soil loss = 0.37(In)
Total soil loss = 39.812(Ac.Ft)
Total rainfall = 1.74(In)
Flood volume = 6358004.9 Cubic Feet
Total soil loss = 1734221.3 Cubic Feet

Peak flow rate of this hydrograph = 1945.972(CFS)

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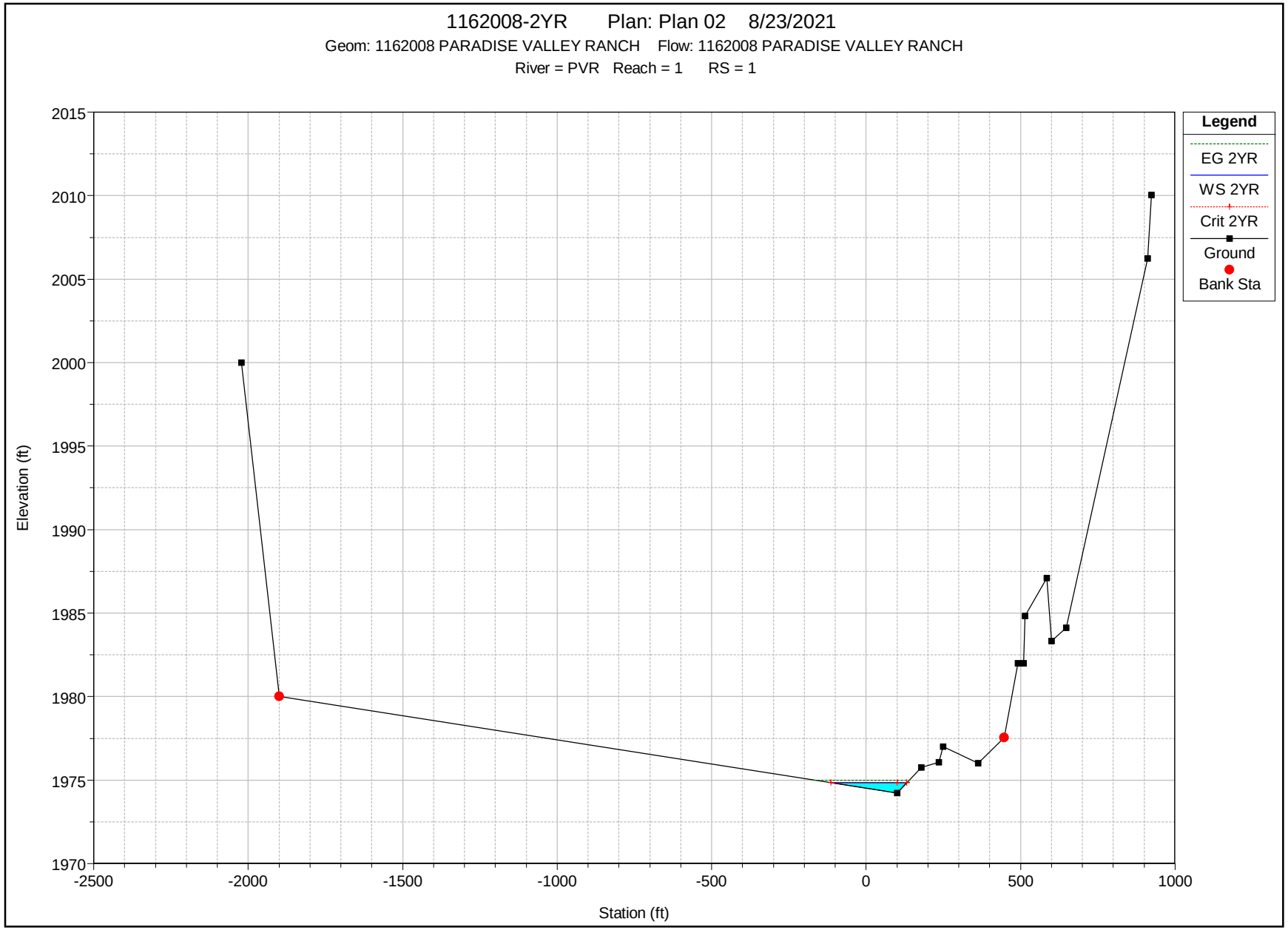
1 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 500.0 1000.0 1500.0 2000.0
0+ 5	0.0608	8.83	Q
0+10	0.3388	40.36	Q
0+15	1.0507	103.37	V Q
0+20	2.4358	201.12	V Q
0+25	4.5500	306.97	V Q
0+30	7.3002	399.33	V Q
0+35	10.6763	490.22	V Q
0+40	14.7675	594.04	V Q
0+45	19.8425	736.89	V Q
0+50	26.9419	1030.83	V Q
0+55	36.6796	1413.92	V Q
1+ 0	48.9101	1775.87	V Q
1+ 5	62.3121	1945.97	V Q
1+10	73.4661	1619.56	V Q
1+15	81.9102	1226.08	V Q
1+20	88.2378	918.77	Q V
1+25	93.2884	733.35	Q V
1+30	97.5437	617.86	Q V
1+35	101.2063	531.82	Q V

1+40	104.4504	471.04	| Q|	|	| V |	|
1+45	107.3734	424.42	| Q |	|	| V|	|
1+50	110.0216	384.51	| Q |	|	| V	|
1+55	112.4091	346.66	| Q |	|	| V	|
2+ 0	114.5571	311.89	| Q |	|	| |V	|
2+ 5	116.5172	284.61	| Q |	|	| |V	|
2+10	118.3129	260.74	| Q |	|	| | V	|
2+15	119.9419	236.53	| Q |	|	| | V	|
2+20	121.4367	217.05	| Q |	|	| | V	|
2+25	122.8171	200.43	| Q |	|	| | V	|
2+30	124.0987	186.08	| Q |	|	| | V	|
2+35	125.3198	177.31	| Q |	|	| | V	|
2+40	126.4541	164.70	| Q |	|	| | V	|
2+45	127.5153	154.09	| Q |	|	| | V	|
2+50	128.5409	148.92	| Q |	|	| | V	|
2+55	129.5276	143.26	| Q |	|	| | V	|
3+ 0	130.4799	138.28	| Q |	|	| | V	|
3+ 5	131.3865	131.64	| Q |	|	| | V	|
3+10	132.2202	121.06	| Q |	|	| | V	|
3+15	133.0196	116.07	| Q |	|	| | V	|
3+20	133.7911	112.02	| Q |	|	| | V	|
3+25	134.5335	107.79	| Q |	|	| | V	|
3+30	135.2525	104.41	| Q |	|	| | V	|
3+35	135.9339	98.93	|Q |	|	| | V	|
3+40	136.5816	94.05	|Q |	|	| | V	|
3+45	137.2088	91.07	|Q |	|	| | V	|
3+50	137.8094	87.22	|Q |	|	| | V	|
3+55	138.3898	84.27	|Q |	|	| | V	|
4+ 0	138.9471	80.92	|Q |	|	| | V	|
4+ 5	139.4693	75.81	|Q |	|	| | V	|
4+10	139.9755	73.51	|Q |	|	| | V	|
4+15	140.4676	71.46	|Q |	|	| | V	|
4+20	140.9456	69.41	|Q |	|	| | V	|
4+25	141.4202	68.90	|Q |	|	| | V	|
4+30	141.8936	68.75	|Q |	|	| | V	|
4+35	142.3713	69.36	|Q |	|	| | V|	
4+40	142.8428	68.45	|Q |	|	| | V|	
4+45	143.2966	65.90	|Q |	|	| | V|	
4+50	143.7340	63.51	|Q |	|	| | V|	
4+55	144.1533	60.88	|Q |	|	| | V|	
5+ 0	144.5486	57.40	|Q |	|	| | V|	
5+ 5	144.9223	54.27	|Q |	|	| | V|	
5+10	145.2683	50.23	|Q |	|	| | V|	
5+15	145.5845	45.92	Q |	|	| | V|	
5+20	145.8758	42.29	Q |	|	| | V|	
5+25	145.9405	9.39	Q |	|	| | V|	
5+30	145.9597	2.79	Q |	|	| | V	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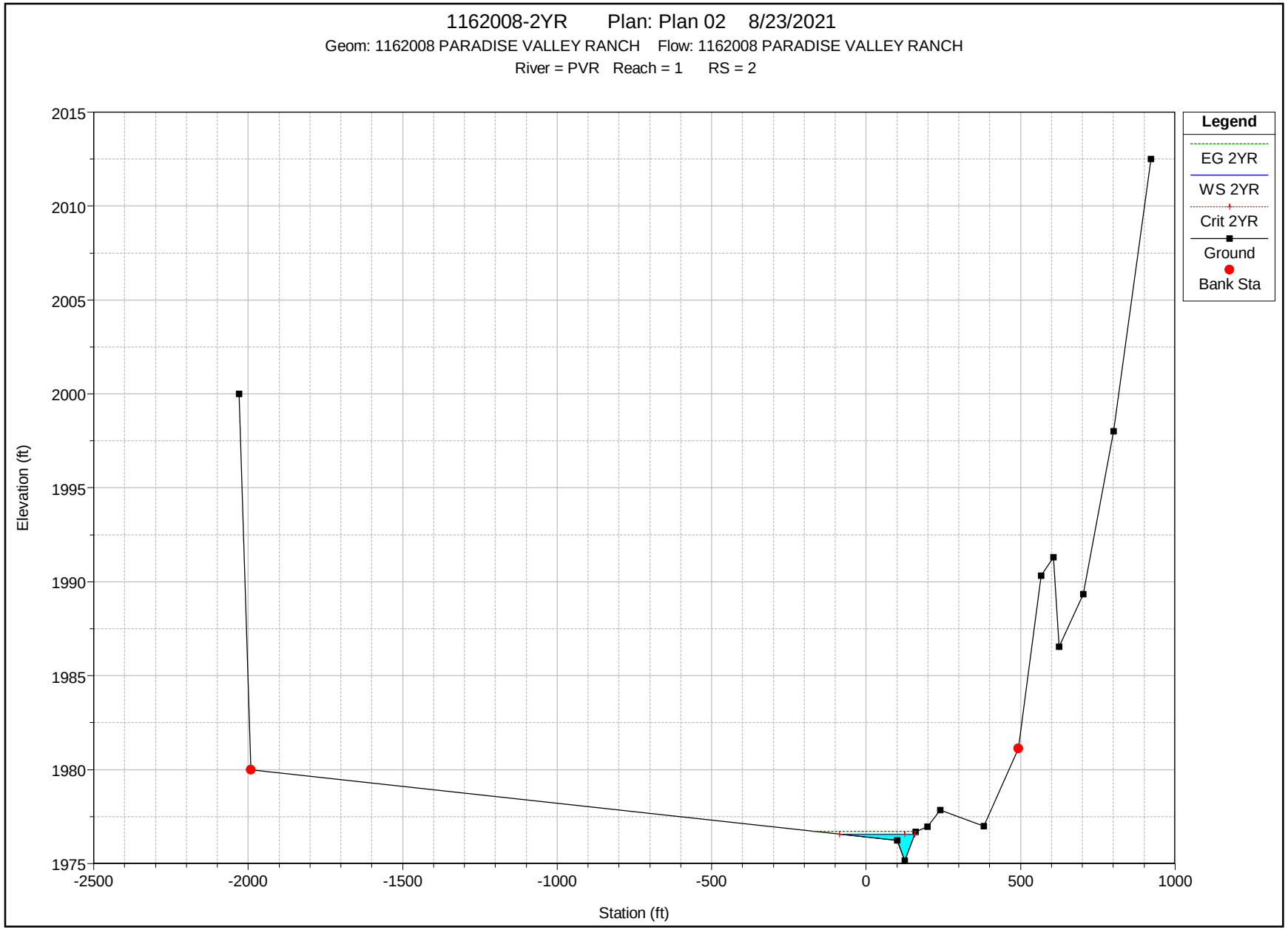
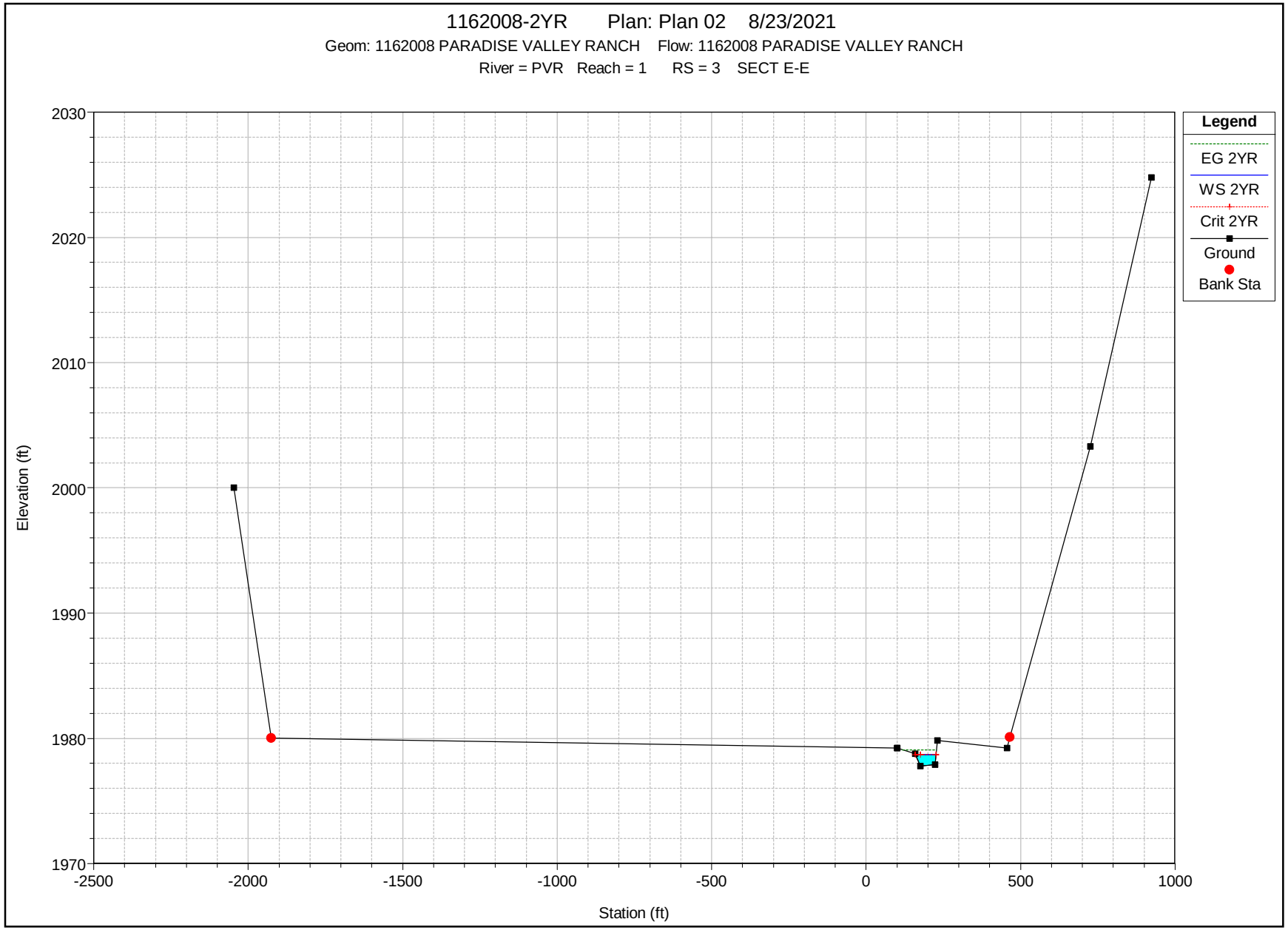
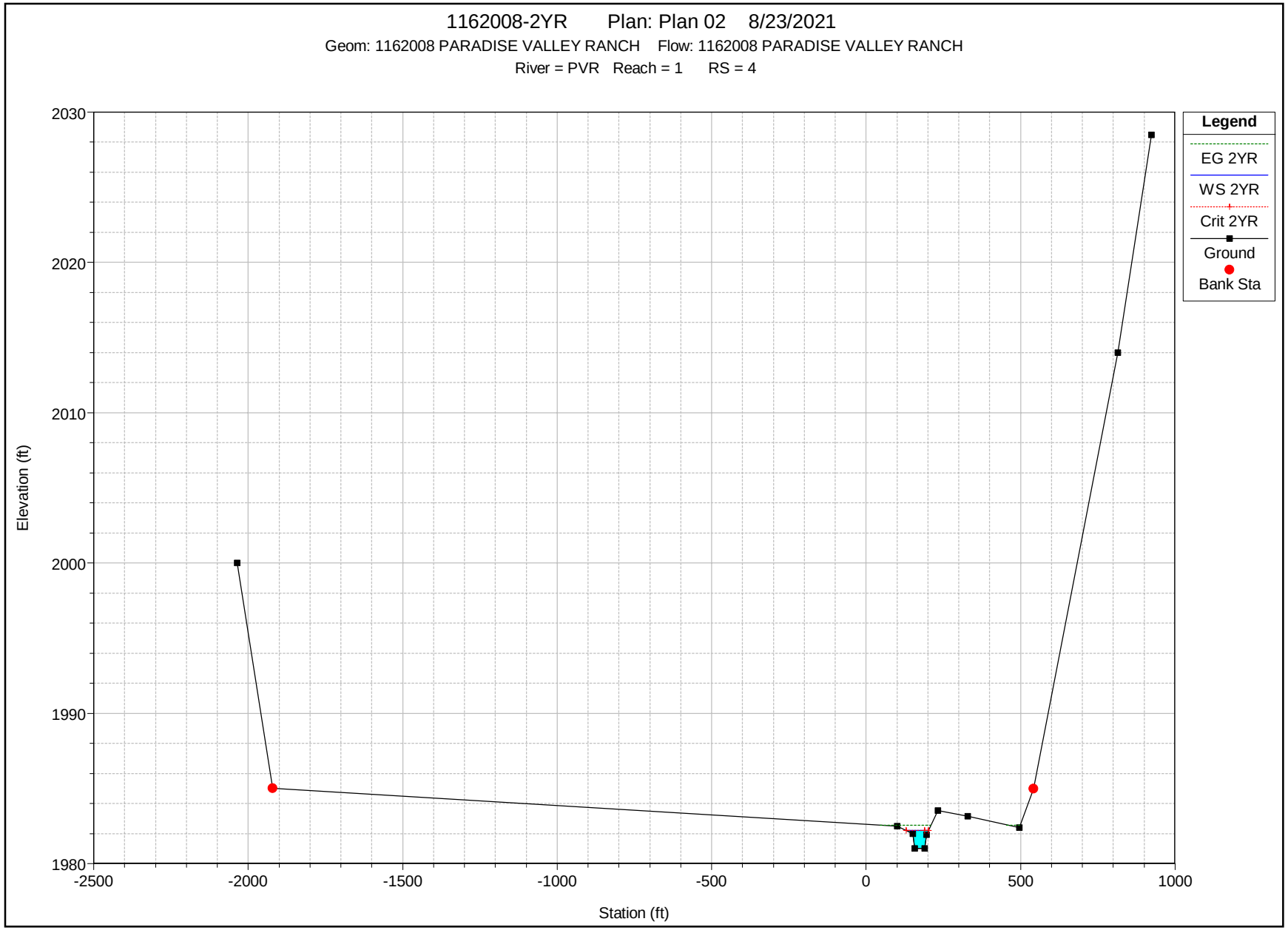
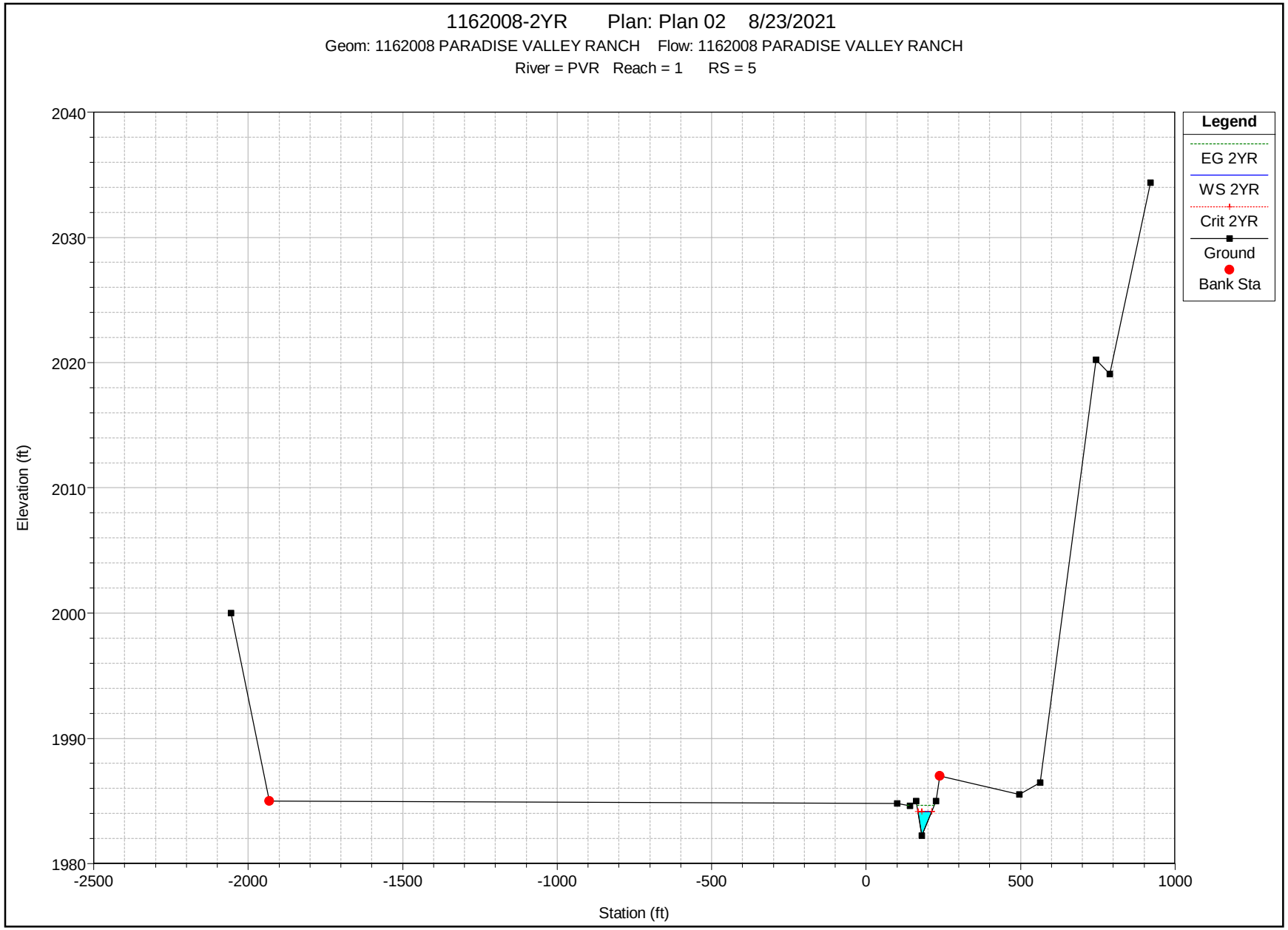
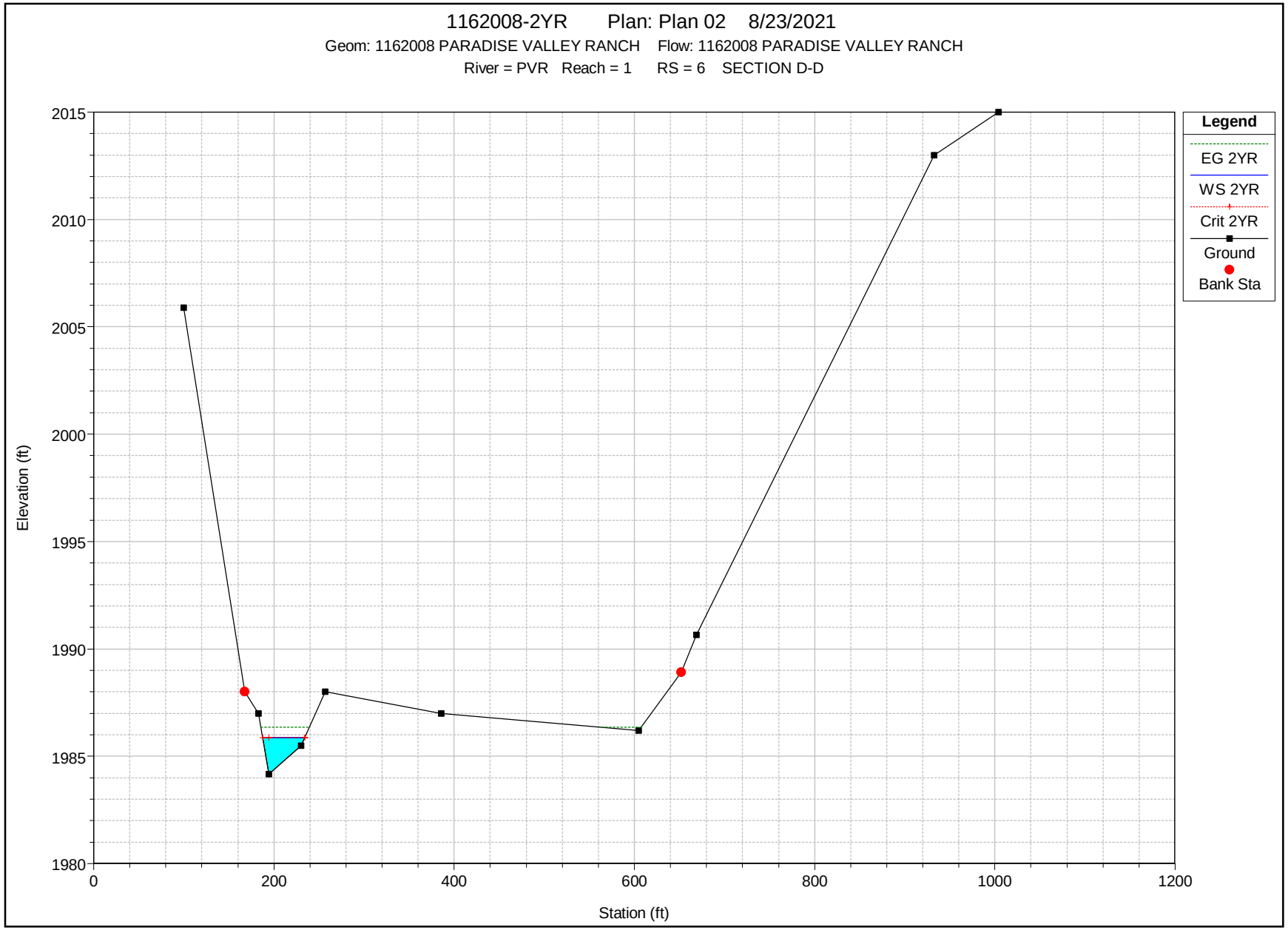
River = PVR Reach = 1 RS = 1
Legend
EG 2YR
WS 2YR
Crit 2YR
Ground
Bank Sta
Elevation (ft)
2015
2010
2005
2000
1995
1990
1985
1980
1975
1970
-2500
-2000
-1500
-1000
-500
0
500
1000
Station (ft)


1162008-2YR Plan: Plan 02 8/23/2021
Geom: 1162008 PARADISE VALLEY RANCH Flow: 1162008 PARADISE VALLEY RANCH
River = PVR Reach = 1 RS = 2
Legend
EG 2YR
WS 2YR
Crit 2YR
Ground
Bank Sta
Elevation (ft)
2015
2010
2005
2000
1995
1990
1985
1980
1975
-2500
-2000
-1500
-1000
-500
0
500
1000
Station (ft)


1162008-2YR Plan: Plan 02 8/23/2021
Geom: 1162008 PARADISE VALLEY RANCH Flow: 1162008 PARADISE VALLEY RANCH
River = PVR Reach = 1 RS = 3 SECT E-E
Legend
EG 2YR
WS 2YR
Crit 2YR
Ground
Bank Sta
Elevation (ft)
2030
2020
2010
2000
1990
1980
1970
-2500
-2000
-1500
-1000
-500
0
500
1000
Station (ft)


1162008-2YR Plan: Plan 02 8/23/2021
Geom: 1162008 PARADISE VALLEY RANCH Flow: 1162008 PARADISE VALLEY RANCH
River = PVR Reach = 1 RS = 4
Legend
EG 2YR
WS 2YR
Crit 2YR
Ground
Bank Sta
Elevation (ft)
2030
2020
2010
2000
1990
1980
-2500
-2000
-1500
-1000
-500
0
500
1000
Station (ft)


1162008-2YR Plan: Plan 02 8/23/2021
Geom: 1162008 PARADISE VALLEY RANCH Flow: 1162008 PARADISE VALLEY RANCH
River = PVR Reach = 1 RS = 5
Legend
EG 2YR
WS 2YR
Crit 2YR
Ground
Bank Sta
Elevation (ft)
2040
2030
2020
2010
2000
1990
1980
-2500
-2000
-1500
-1000
-500
0
500
1000
Station (ft)


1162008-2YR Plan: Plan 02 8/23/2021
Geom: 1162008 PARADISE VALLEY RANCH Flow: 1162008 PARADISE VALLEY RANCH
River = PVR Reach = 1 RS = 6 SECTION D-D
Legend
EG 2YR
WS 2YR
Crit 2YR
Ground
Bank Sta
Elevation (ft)
2015
2010
2005
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1995
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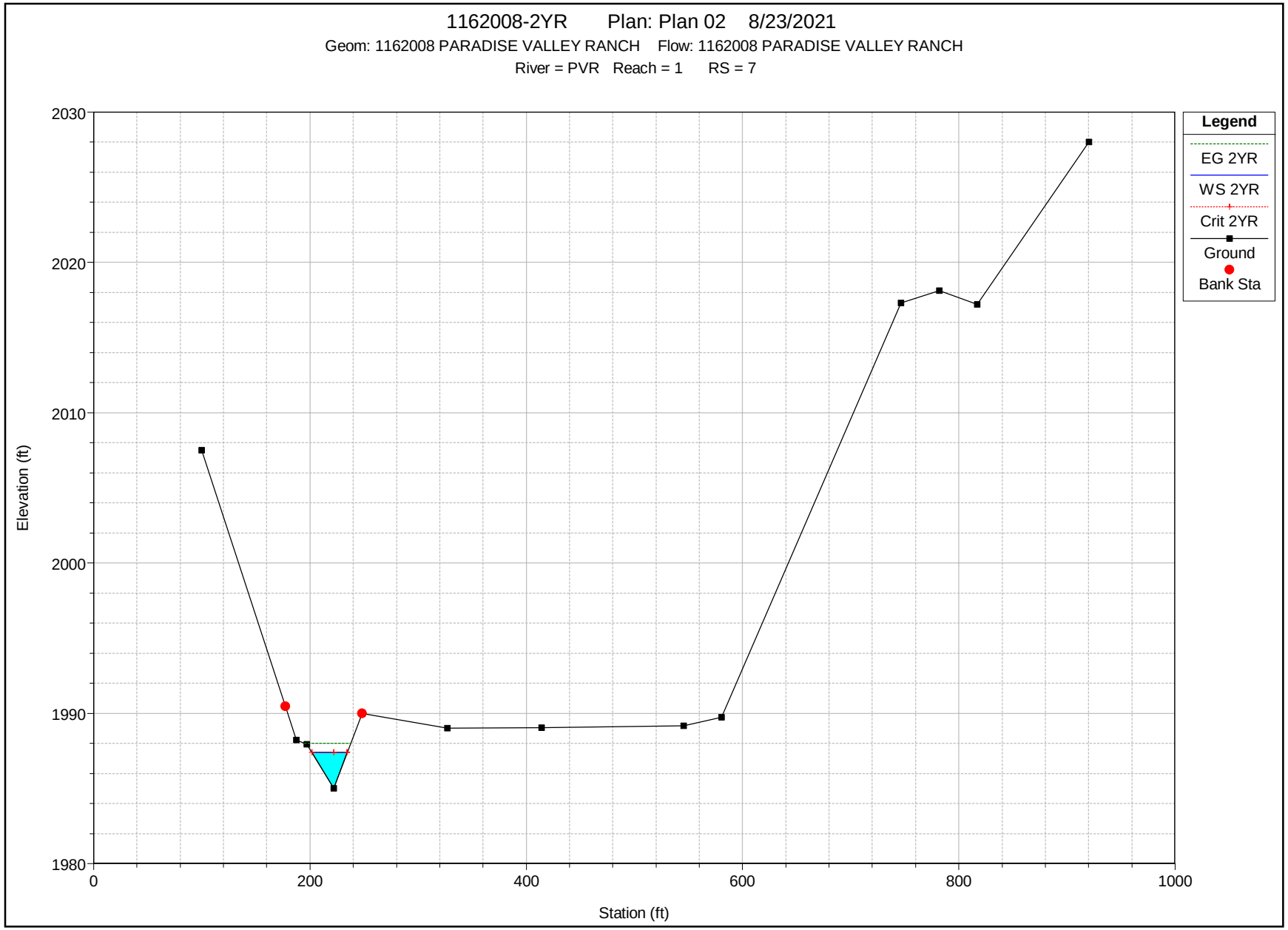
400
600
800
1000
1200
Station (ft)


1162008-2YR Plan: Plan 02 8/23/2021
Geom: 1162008 PARADISE VALLEY RANCH Flow: 1162008 PARADISE VALLEY RANCH
River = PVR Reach = 1 RS = 7
Legend
EG 2YR
WS 2YR
Crit 2YR
Ground
Bank Sta
Elevation (ft)
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800
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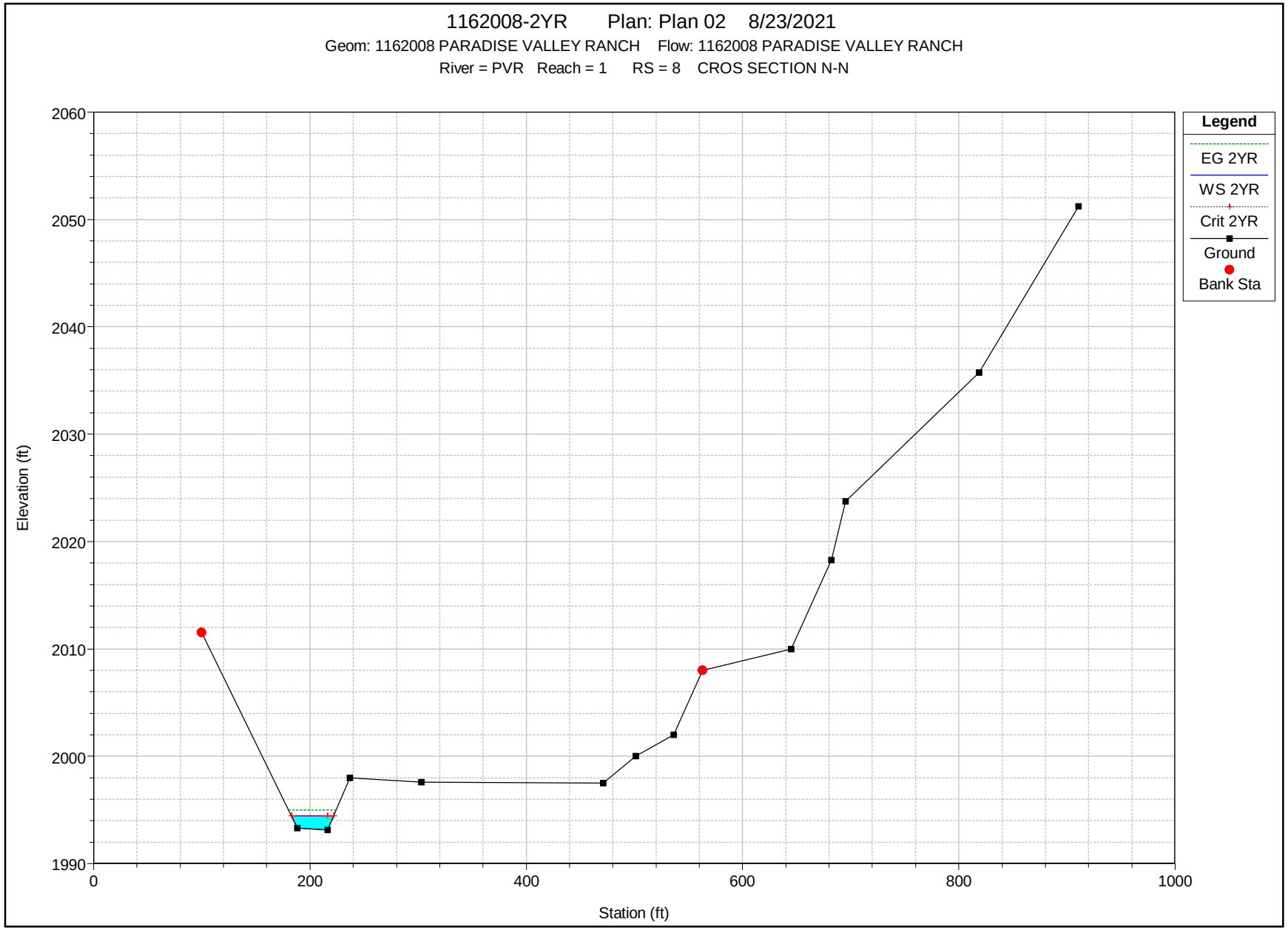
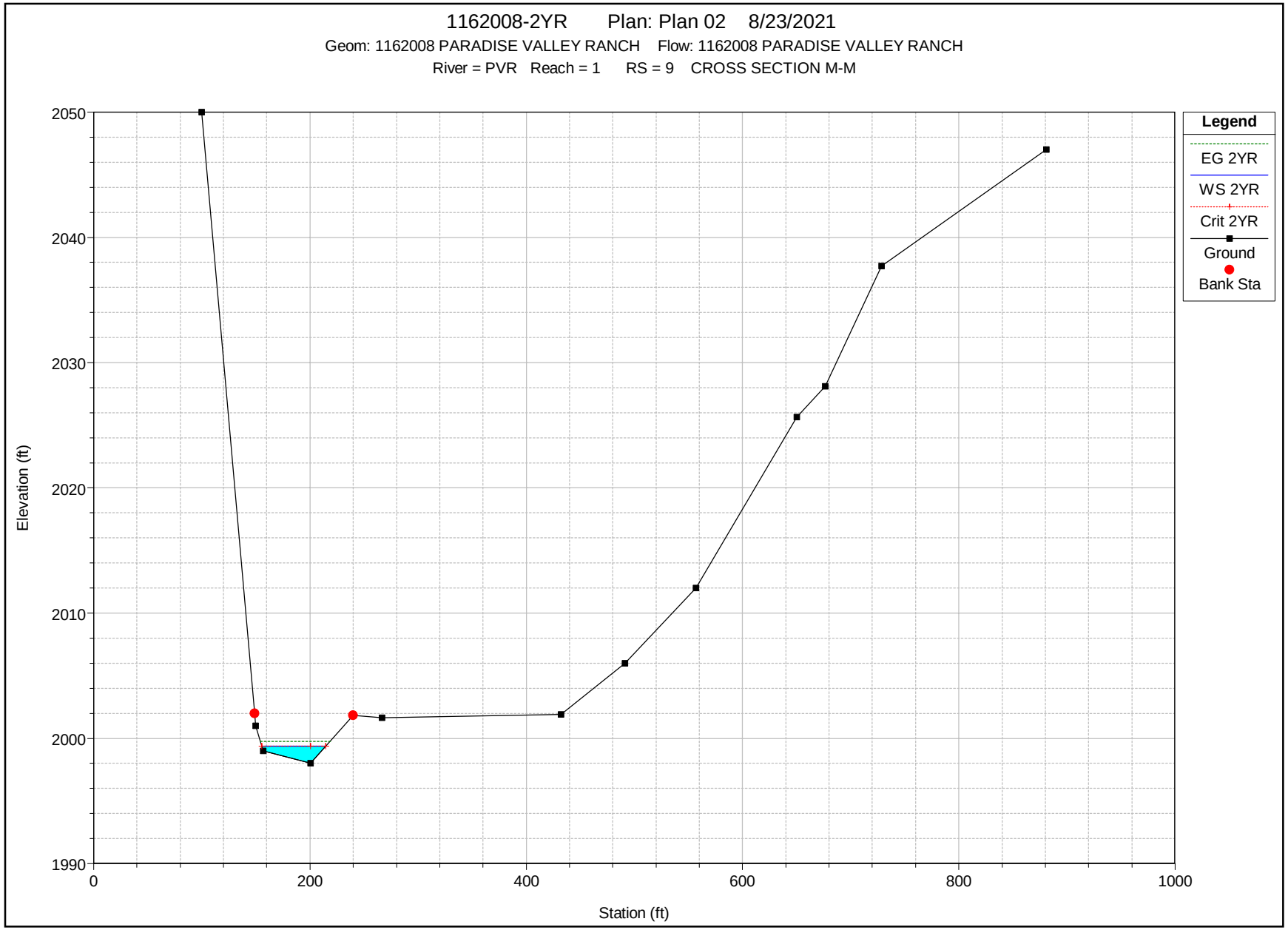
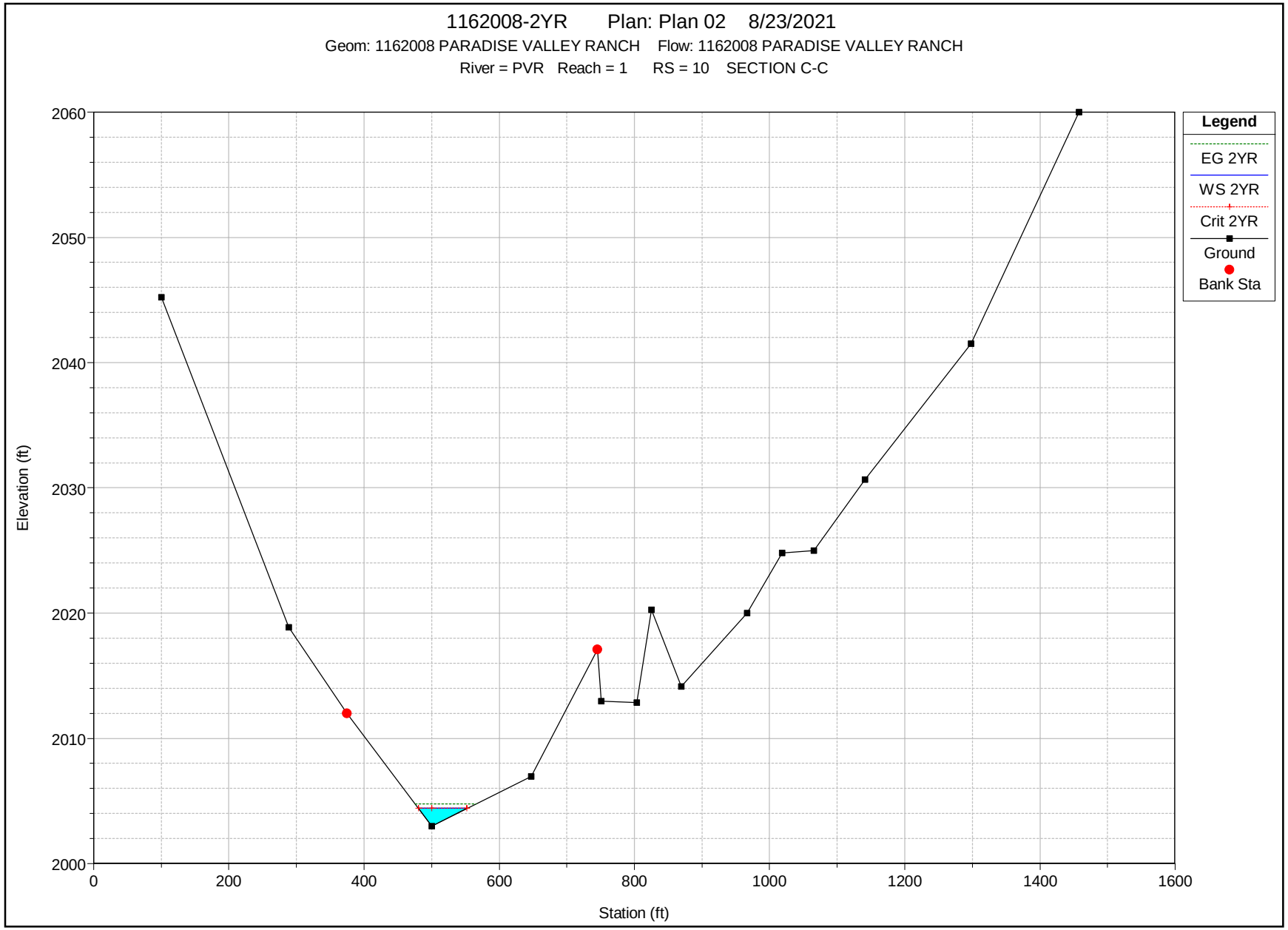
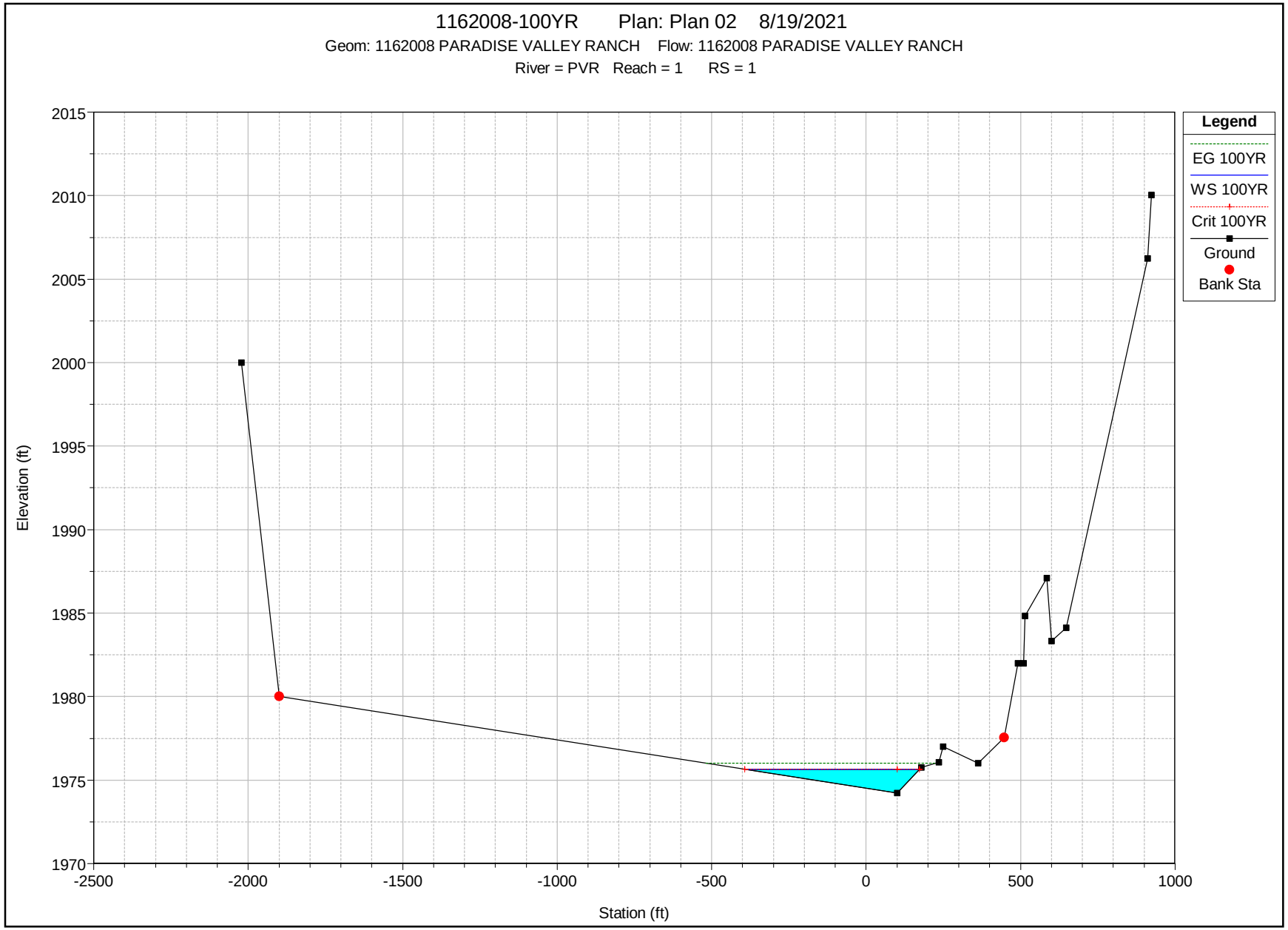
Station (ft)


1162008-2YR Plan: Plan 02 8/23/2021
Geom: 1162008 PARADISE VALLEY RANCH Flow: 1162008 PARADISE VALLEY RANCH
River = PVR Reach = 1 RS = 8 CROS SECTION N-N
Legend
EG 2YR
WS 2YR
Crit 2YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
2060
2050
2040
2030
2020
2010
2000
1990
0
200
400
600
800
1000


1162008-2YR Plan: Plan 02 8/23/2021
Geom: 1162008 PARADISE VALLEY RANCH Flow: 1162008 PARADISE VALLEY RANCH
River = PVR Reach = 1 RS = 9 CROSS SECTION M-M
Legend
EG 2YR
WS 2YR
Crit 2YR
Ground
Bank Sta
Elevation (ft)
2050
2040
2030
2020
2010
2000
1990
0
200
400
600
800
1000
Station (ft)


1162008-2YR Plan: Plan 02 8/23/2021
Geom: 1162008 PARADISE VALLEY RANCH Flow: 1162008 PARADISE VALLEY RANCH
River = PVR Reach = 1 RS = 10 SECTION C-C
Legend
EG 2YR
WS 2YR
Crit 2YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
2060
2050
2040
2030
2020
2010
2000
0
200
400
600
800
1000
1200
1400
1600


1162008-100YR Plan: Plan 02 8/19/2021
Geom: 1162008 PARADISE VALLEY RANCH Flow: 1162008 PARADISE VALLEY RANCH
River = PVR Reach = 1 RS = 1
Legend
EG 100YR
WS 100YR
Crit 100YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
2015
2010
2005
2000
1995
1990
1985
1980
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1970
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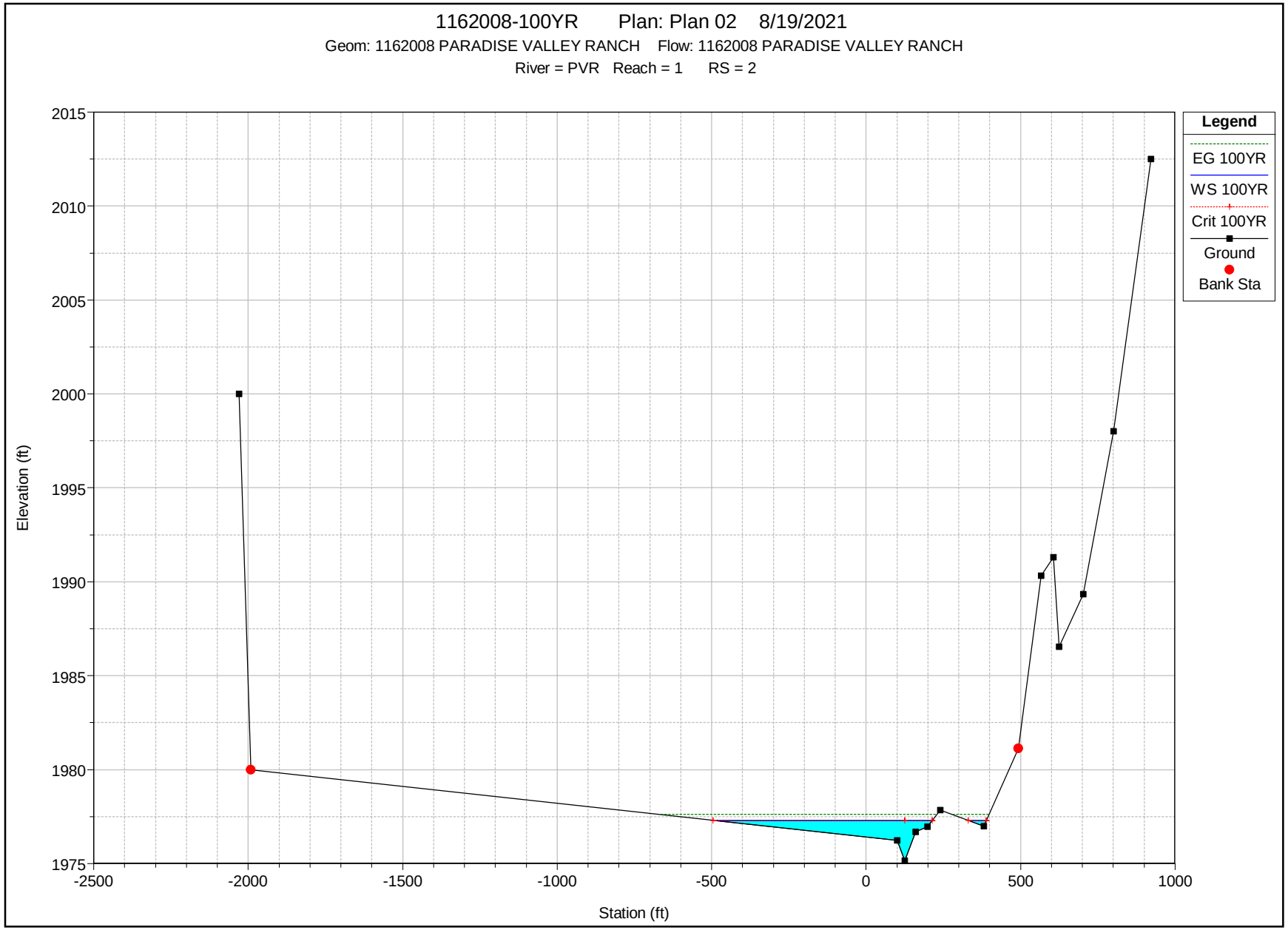
-2000
-1500
-1000
-500
0
500
1000


1162008-100YR Plan: Plan 02 8/19/2021
Geom: 1162008 PARADISE VALLEY RANCH Flow: 1162008 PARADISE VALLEY RANCH
River = PVR Reach = 1 RS = 2
Legend
EG 100YR
WS 100YR
Crit 100YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
2015
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1995
1990
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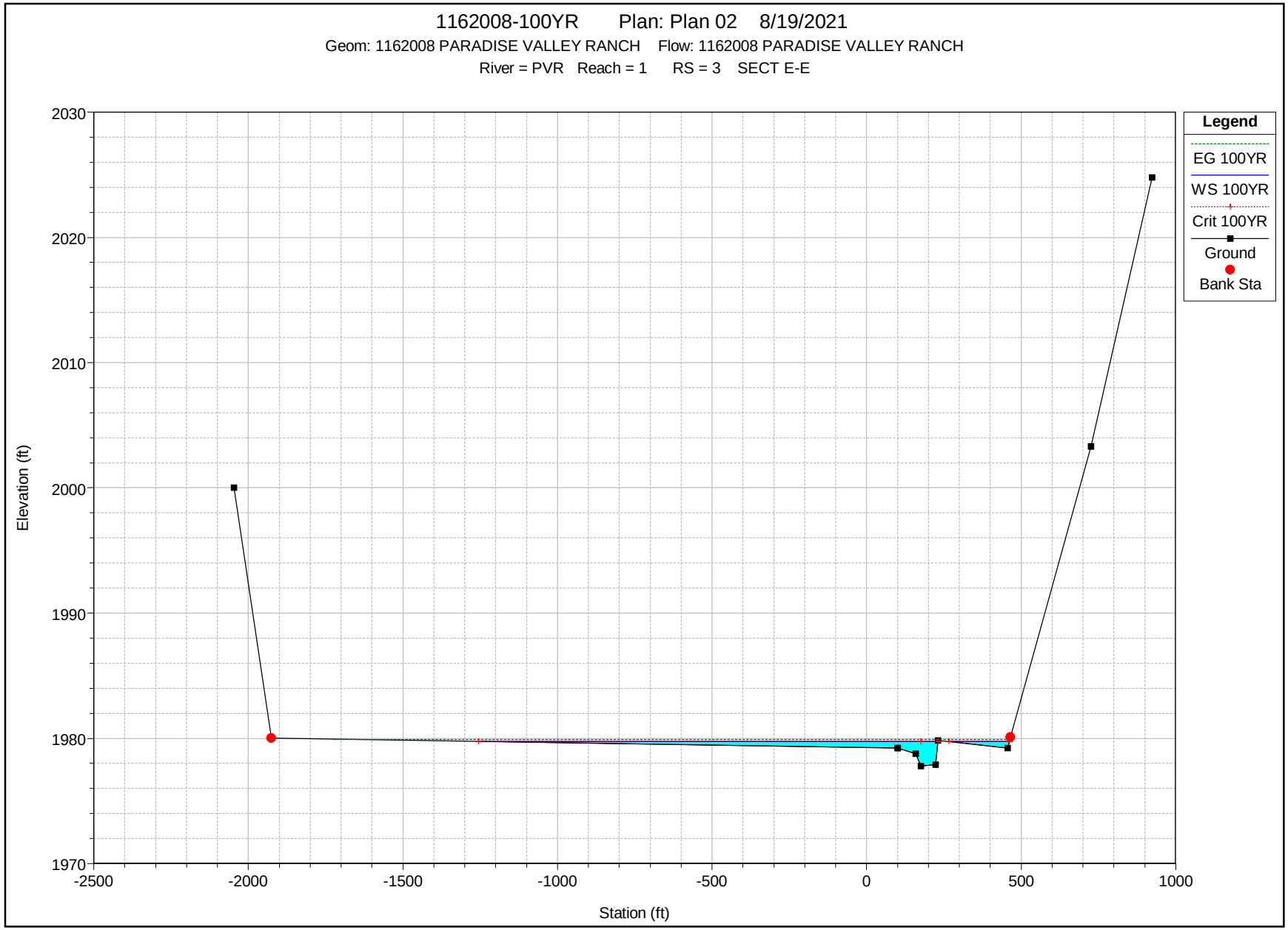
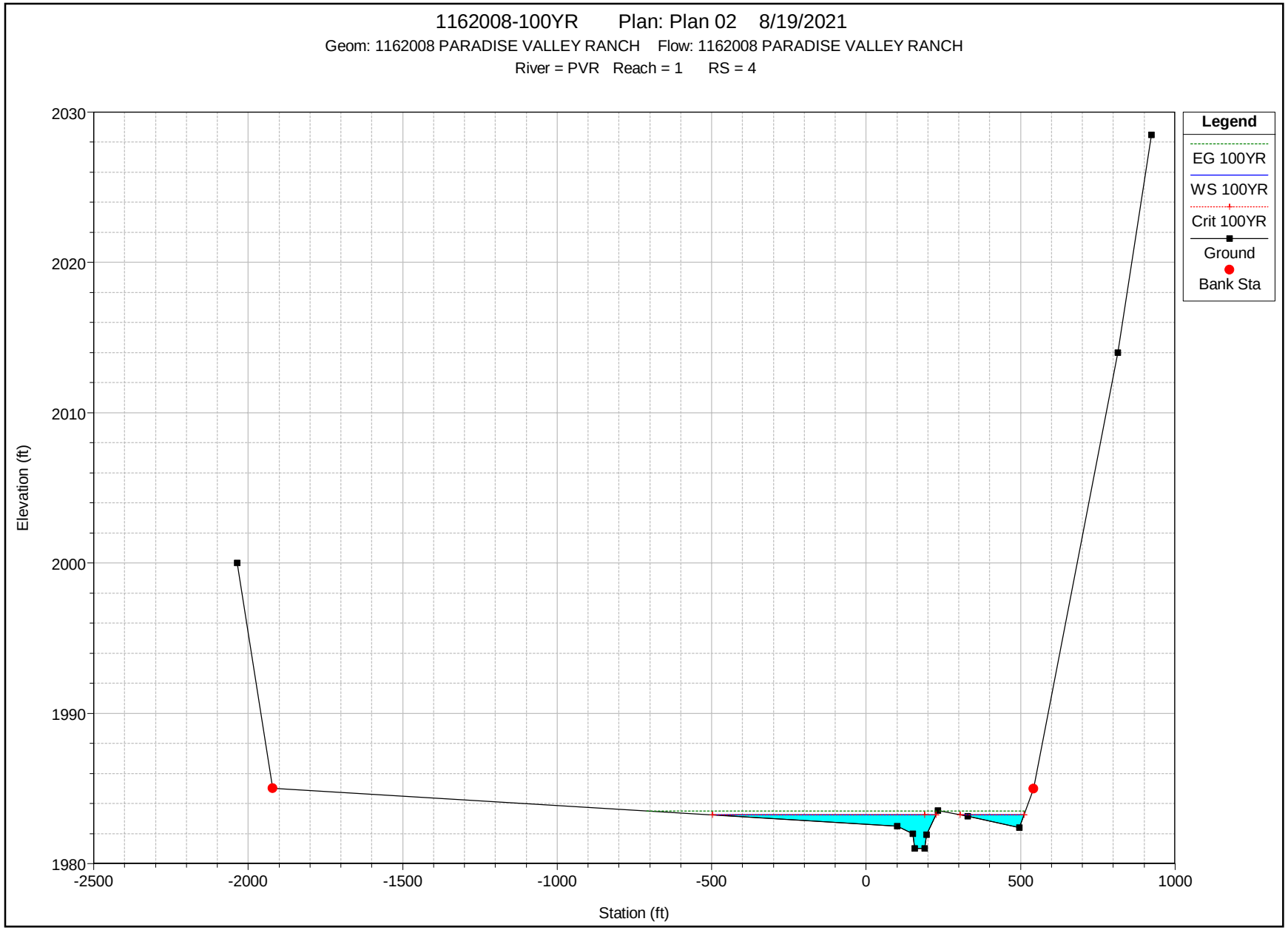
1975
-2500
-2000
-1500
-1000
-500
0
500
1000


1162008-100YR Plan: Plan 02 8/19/2021
Geom: 1162008 PARADISE VALLEY RANCH Flow: 1162008 PARADISE VALLEY RANCH
River = PVR Reach = 1 RS = 3 SECT E-E
Legend
EG 100YR
WS 100YR
Crit 100YR
Ground
Bank Sta
Elevation (ft)
2030
2020
2010
2000
1990
1980
1970
-2500
-2000
-1500
-1000
-500
0
500
1000
Station (ft)


1162008-100YR Plan: Plan 02 8/19/2021
Geom: 1162008 PARADISE VALLEY RANCH Flow: 1162008 PARADISE VALLEY RANCH
River = PVR Reach = 1 RS = 4
Legend
EG 100YR
WS 100YR
Crit 100YR
Ground
Bank Sta
Elevation (ft)
2030
2020
2010
2000
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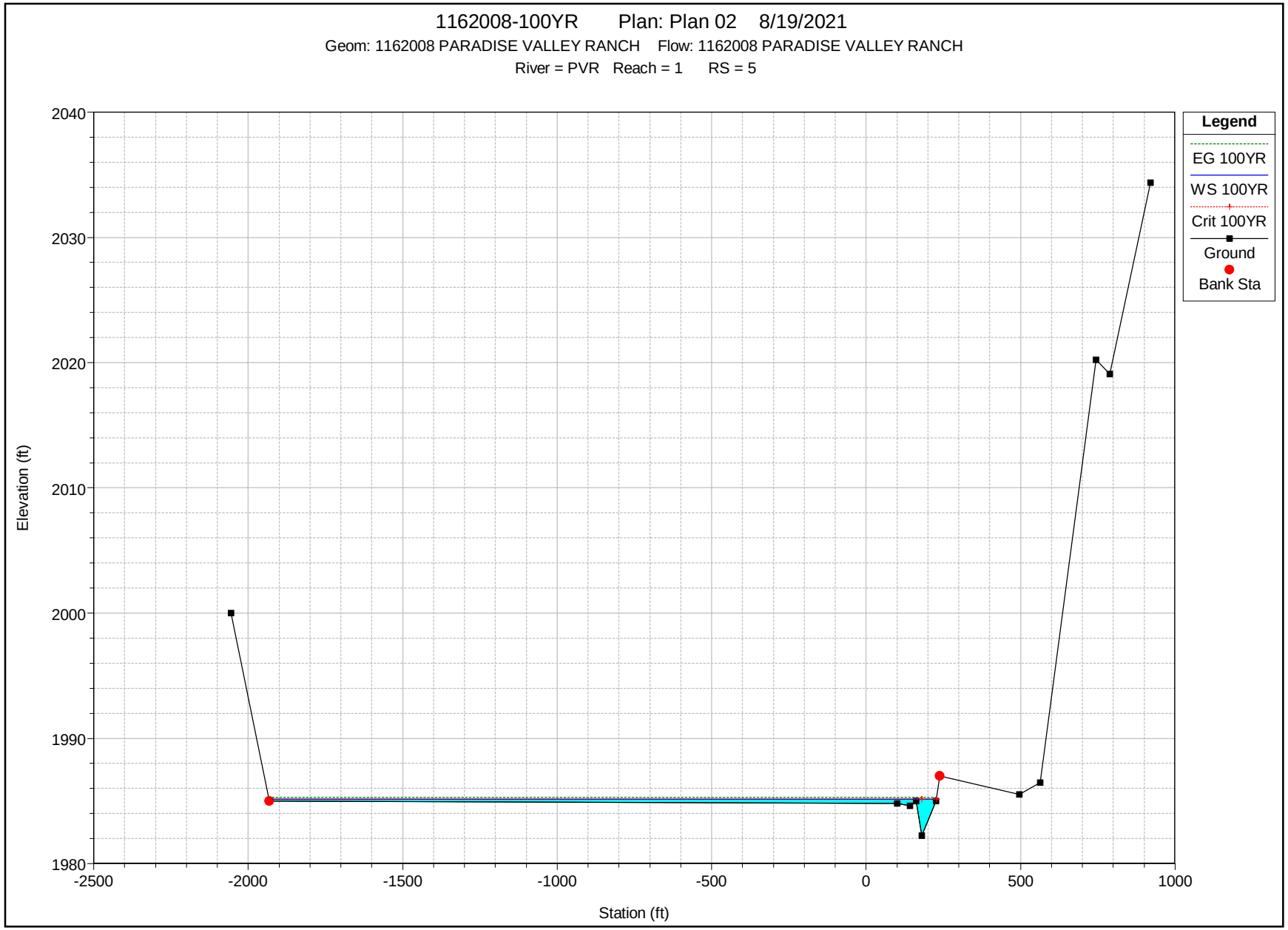
-2500
-2000
-1500
-1000
-500
0
500
1000
Station (ft)


1162008-100YR Plan: Plan 02 8/19/2021
Geom: 1162008 PARADISE VALLEY RANCH Flow: 1162008 PARADISE VALLEY RANCH
River = PVR Reach = 1 RS = 5
Legend
EG 100YR
WS 100YR
Crit 100YR
Ground
Bank Sta
Elevation (ft)
2040
2030
2020
2010
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-2500
-2000
-1500
-1000
-500
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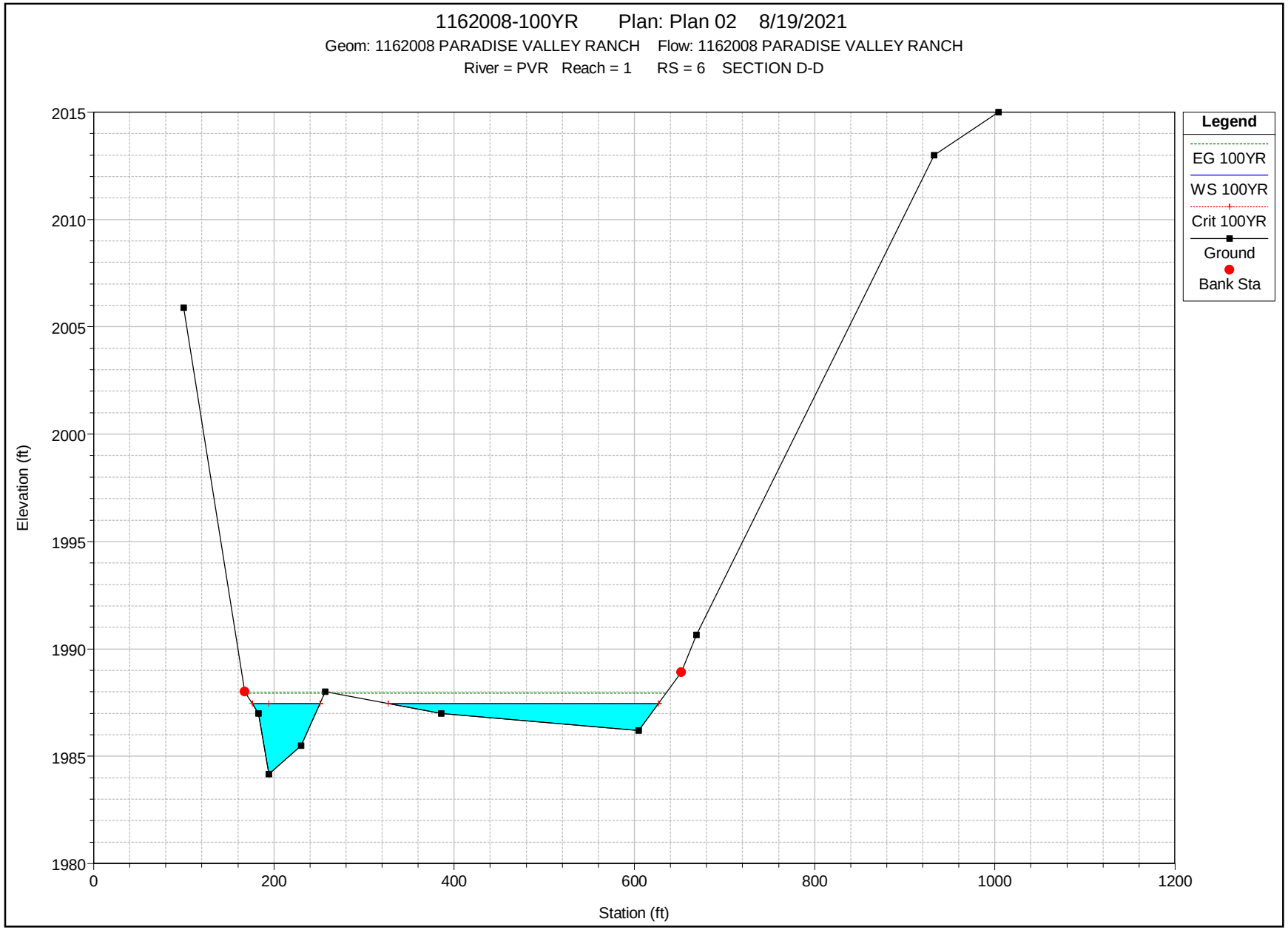
500
1000
Station (ft)


1162008-100YR Plan: Plan 02 8/19/2021
Geom: 1162008 PARADISE VALLEY RANCH Flow: 1162008 PARADISE VALLEY RANCH
River = PVR Reach = 1 RS = 6 SECTION D-D
Legend
EG 100YR
WS 100YR
Crit 100YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
2015
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1995
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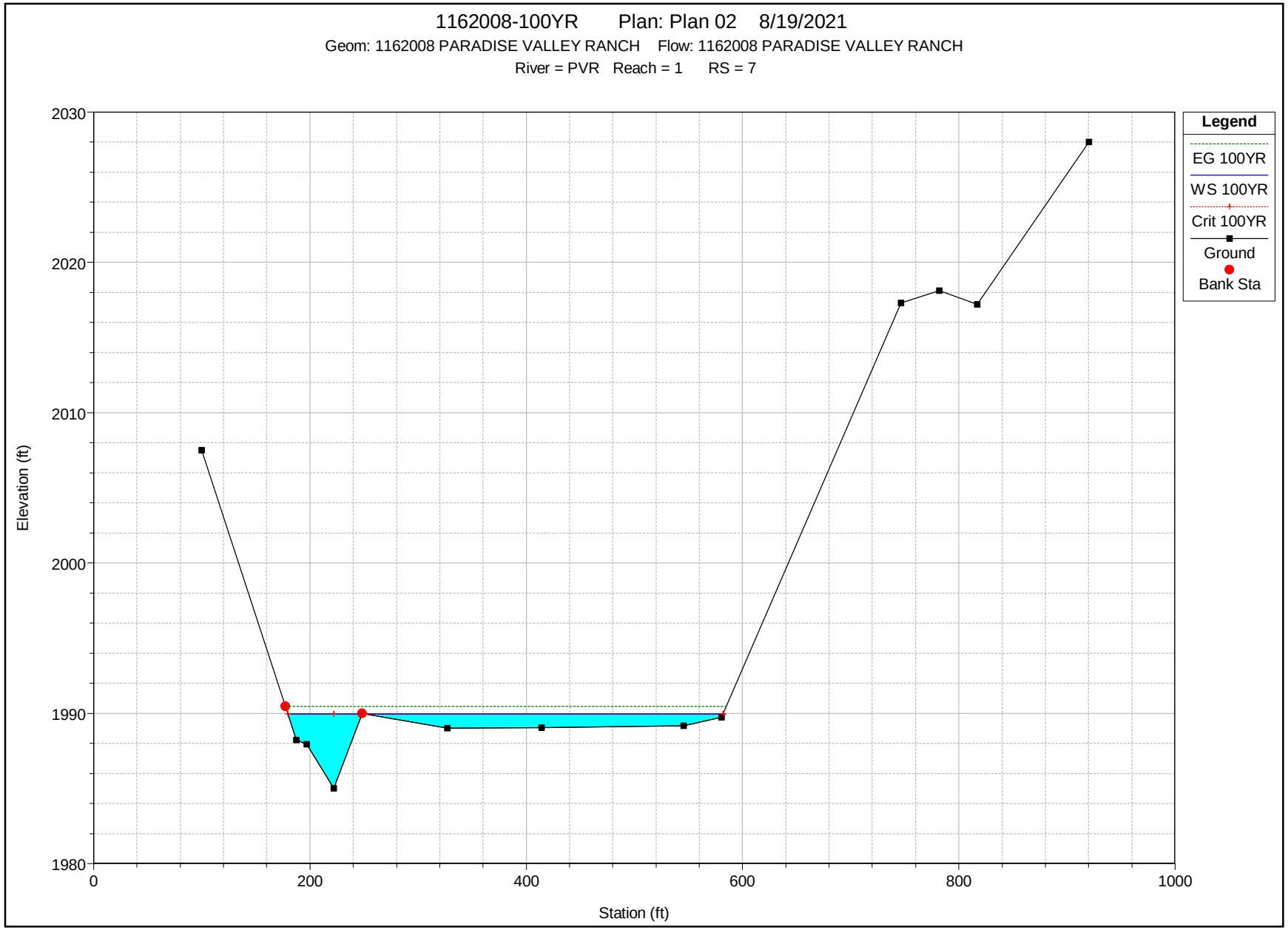
1200


1162008-100YR Plan: Plan 02 8/19/2021
Geom: 1162008 PARADISE VALLEY RANCH Flow: 1162008 PARADISE VALLEY RANCH
River = PVR Reach = 1 RS = 7
Legend
EG 100YR
WS 100YR
Crit 100YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
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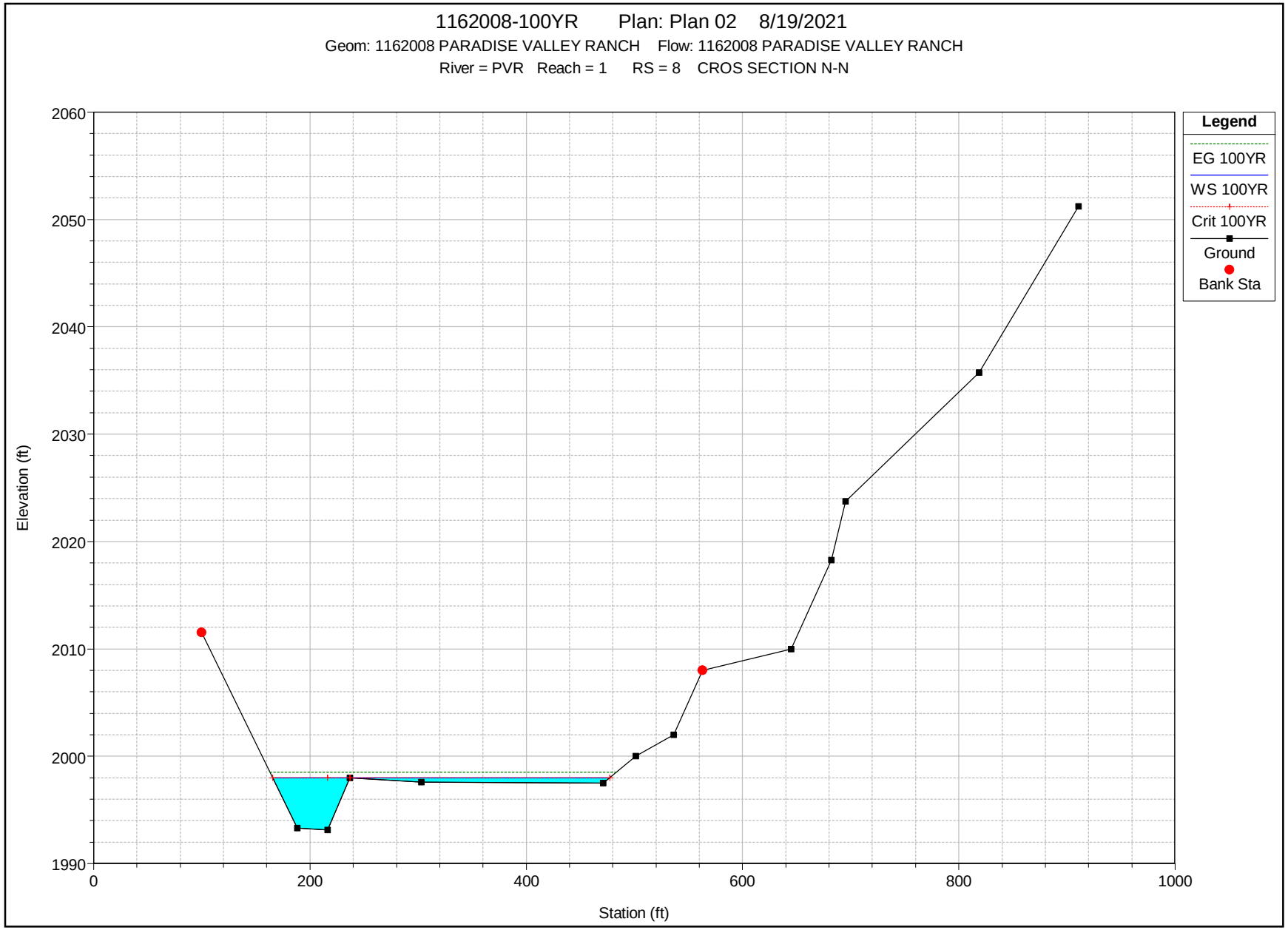
1162008-100YR Plan: Plan 02 8/19/2021
Geom: 1162008 PARADISE VALLEY RANCH Flow: 1162008 PARADISE VALLEY RANCH
River = PVR Reach = 1 RS = 8 CROS SECTION N-N
Legend
EG 100YR
WS 100YR
Crit 100YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
2060
2050
2040
2030
2020
2010
2000
1990
0
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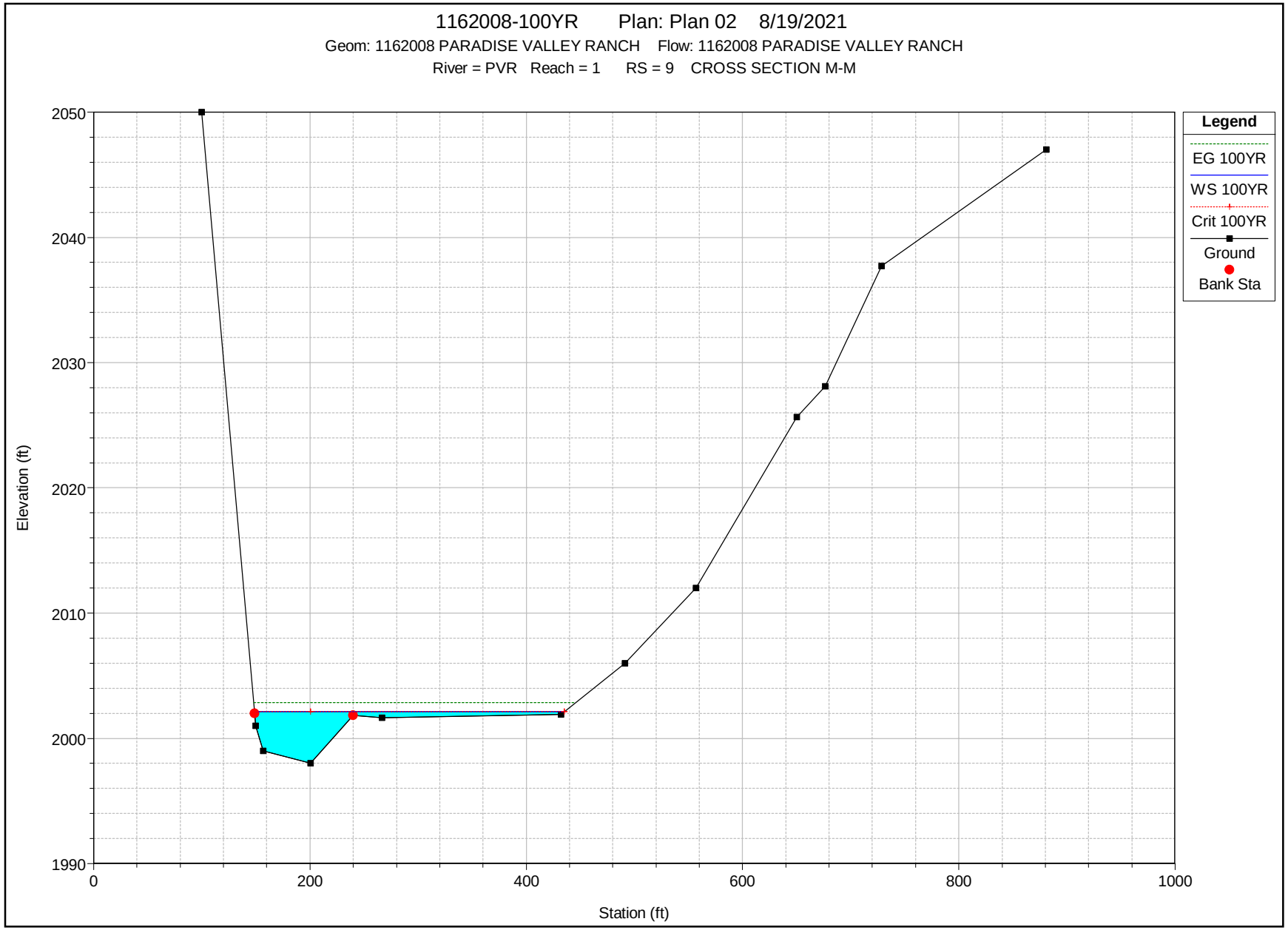
1000


1162008-100YR Plan: Plan 02 8/19/2021
Geom: 1162008 PARADISE VALLEY RANCH Flow: 1162008 PARADISE VALLEY RANCH
River = PVR Reach = 1 RS = 9 CROSS SECTION M-M
Legend
EG 100YR
WS 100YR
Crit 100YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
2050
2040
2030
2020
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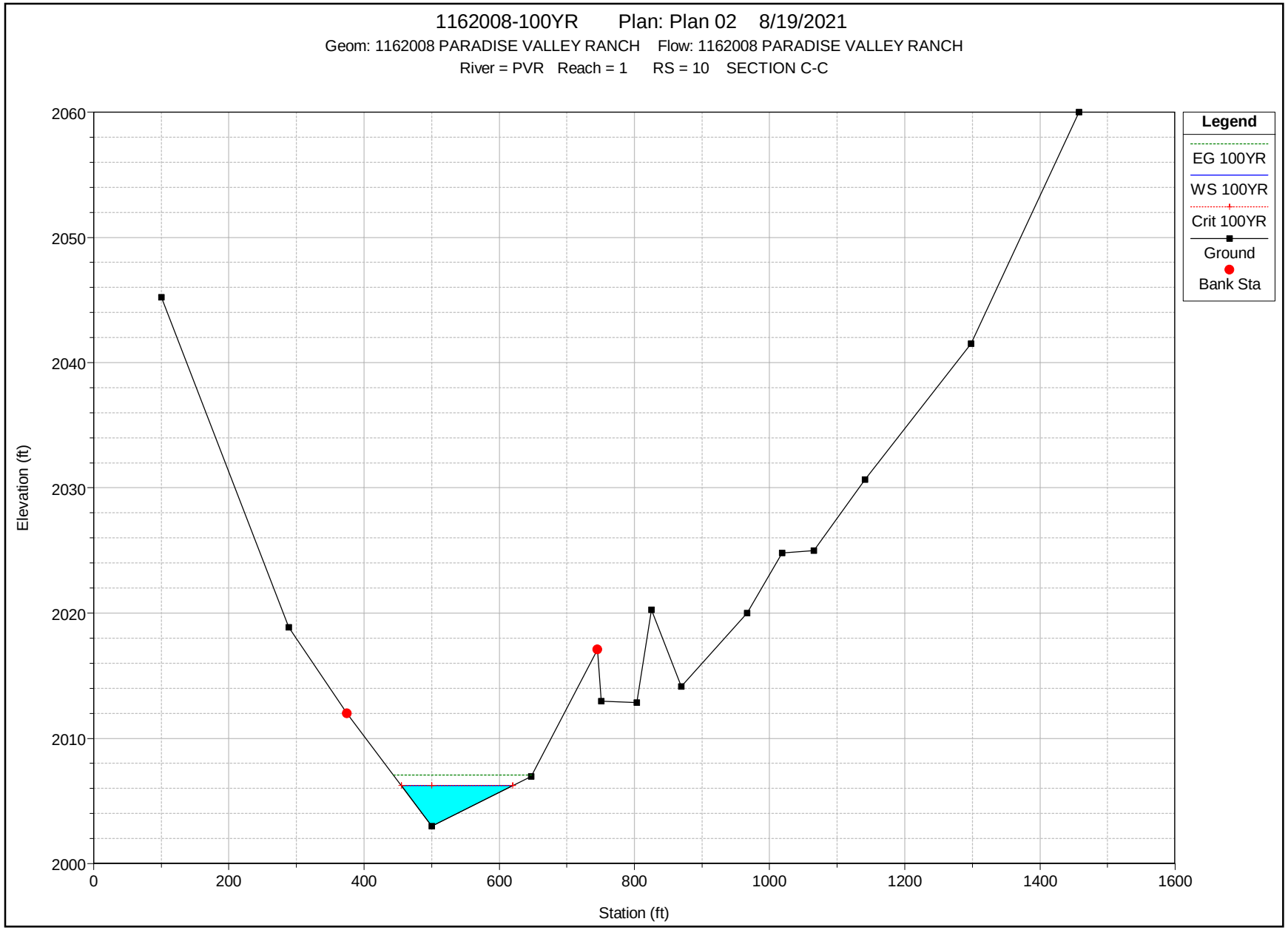

1162008-100YR Plan: Plan 02 8/19/2021
Geom: 1162008 PARADISE VALLEY RANCH Flow: 1162008 PARADISE VALLEY RANCH
River = PVR Reach = 1 RS = 10 SECTION C-C
Legend
EG 100YR
WS 100YR
Crit 100YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
2060
2050
2040
2030
2020
2010
2000
0
200
400
600
800
1000
1200
1400
1600

APPENDIX “E”

BASIN ROUTING:

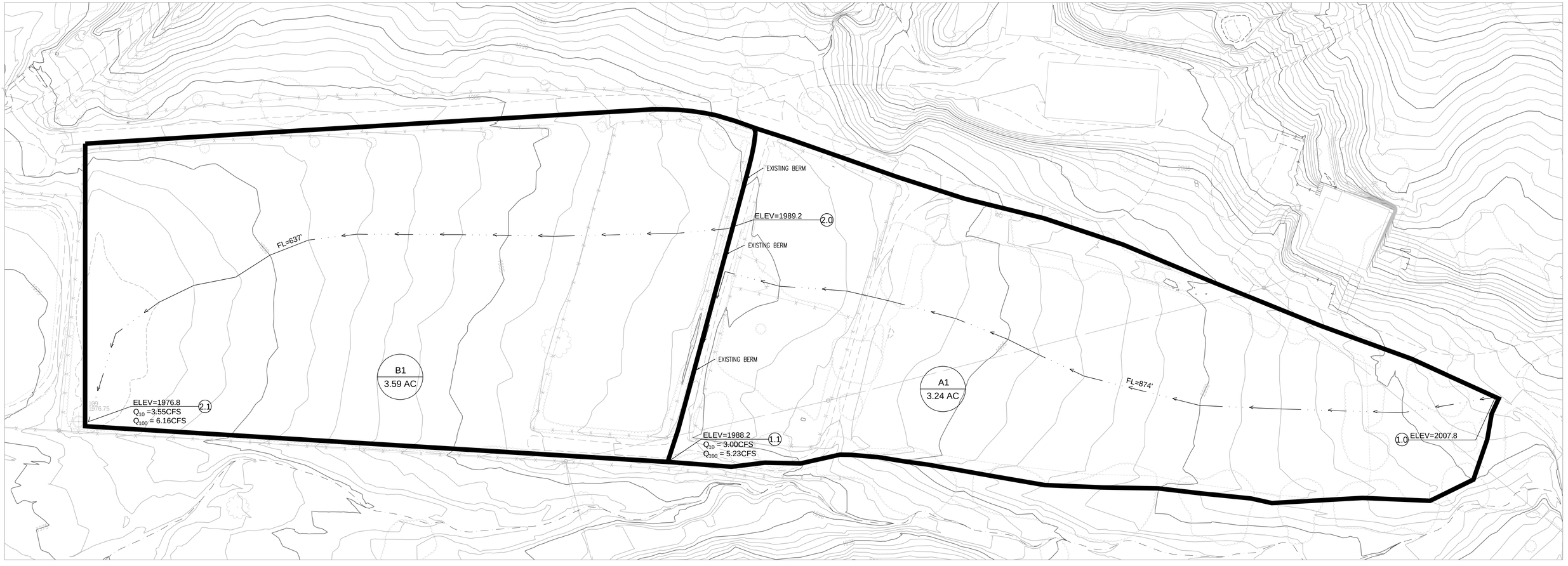
APPENDIX “F”

HYDROLOGY MAPS:

PRE-DEVELOPED HYDROLOGY MAP
POST-DEVELOPED HYDROLOGY MAP
OFFSITE HYDROLOGY MAP
HEC-RAS WATER SURFACE MAP

PRE-DEVELOPED HYDROLOGY MAP

43700 CACTUS VALLEY ROAD, RIVERSIDE, CA
FACILITY 7



SCALE 1"= 40'

0 20' 40' 80'

GRAPHIC SCALE

EXISTING HYDROLOGY				
SUBAREA	ACRE	Q_2	Q_{10}	Q_{100}
A1	3.24	1.01	3.00	5.23
B1	3.59	1.22	3.55	5.16
TOTAL	**6.84**	**2.23**	**6.55**	**10.39**

LEGEND

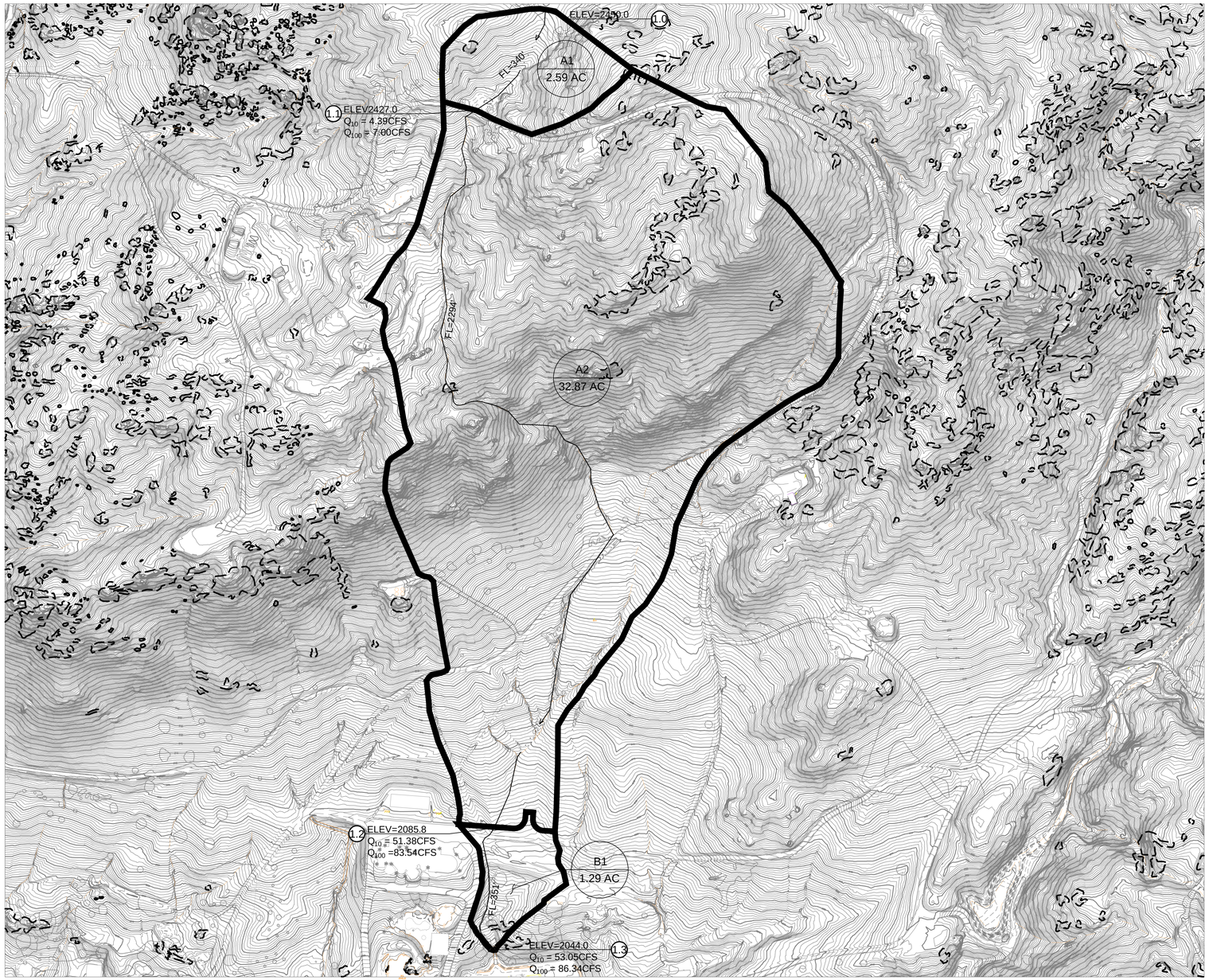
- BASIN BOUNDARY
- ELEV=978.61 (8) DENOTES NODE No. and ELEVATION
- FL FLOW LENGTH
- A BASIN AREA
- FLOW PATH

REGISTERED PROFESSIONAL ENGINEER
JEFFEREY D. METTER
No. 64696
CIVIL
STATE OF CALIFORNIA

VALUED
ENGINEERING, INC
CIVIL ENGINEERING • LAND SURVEYING • LAND PLANNING
600 N. MOUNTAIN AVE, STE C102, UPLAND, CA 91786
PHONE: (909) 982-4601

PRE-DEVELOPED HYDROLOGY MAP

43700 CACTUS VALLEY ROAD, RIVERSIDE, CA
FACILITY 6



EXISTING HYDROLOGY				
SUBAREA	ACRE	Q_2	Q_{10}	Q_{100}
A1	2.59	2.19	4.39	7.00
A2	32.87	22.00	46.99	76.54
SUBTOTAL	35.46	24.19	51.38	83.54
B1	1.29	0.68	1.67	2.80
TOTAL	**36.75**	**24.87**	**53.05**	**86.34**

SCALE 1"=150'

0 75' 150' 300'

GRAPHIC SCALE

LEGEND

- BASIN BOUNDARY
- ELEV=978.61 (8) DENOTES NODE No. and ELEVATION
- FL FLOW LENGTH
- A BASIN AREA
- FLOW PATH

REGISTERED PROFESSIONAL ENGINEER
JEFFEREY D. METTER
No. 64696
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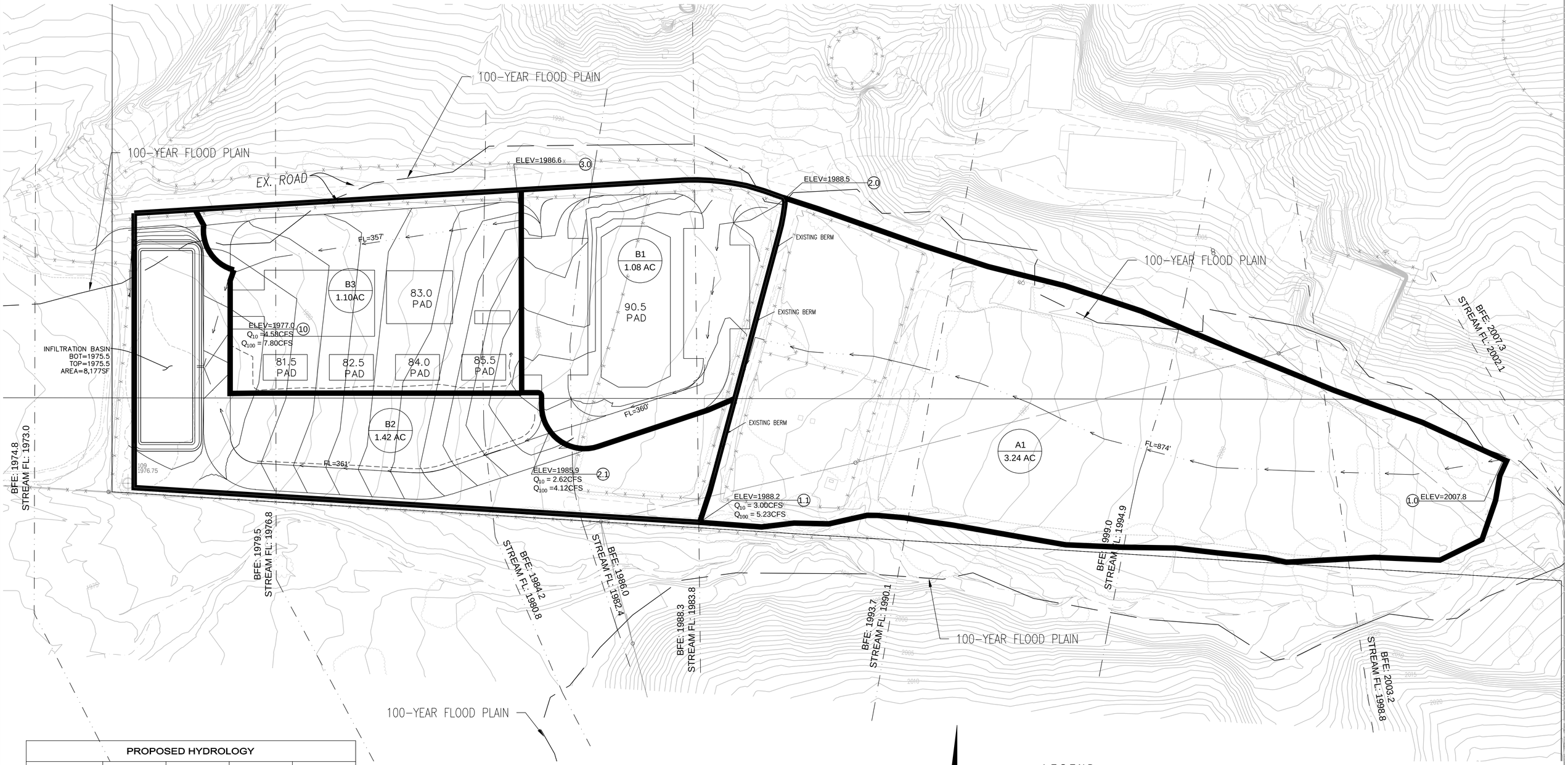
PHONE: (909) 982-4601

POST-DEVELOPED HYDROLOGY MAP

43700 CACTUS VALLEY ROAD, RIVERSIDE, CA

FACILITY 7



PROPOSED HYDROLOGY				
SUBAREA	ACRE	Q_2	Q_{10}	Q_{100}
A1	3.24	1.01	3.00	5.23
B1	1.08	1.56	2.62	4.12
B2	1.42	0.47	1.81	3.40
B3	1.10	0.11	0.51	1.01
TOTAL	**6.84**	**3.15**	**7.94**	**13.76**

SCALE 1"=40'

0 20' 40' 80'

GRAPHIC SCALE

LEGEND

BASIN BOUNDARY

ELEV=978.61 (8) DENOTES NODE No. and ELEVATION

FL FLOW LENGTH

A BASIN AREA

FLOW PATH

REGISTERED PROFESSIONAL ENGINEER
JEFFEREY D. METER
No. 64696
CIVIL
STATE OF CALIFORNIA

SHEET 1 OF 2

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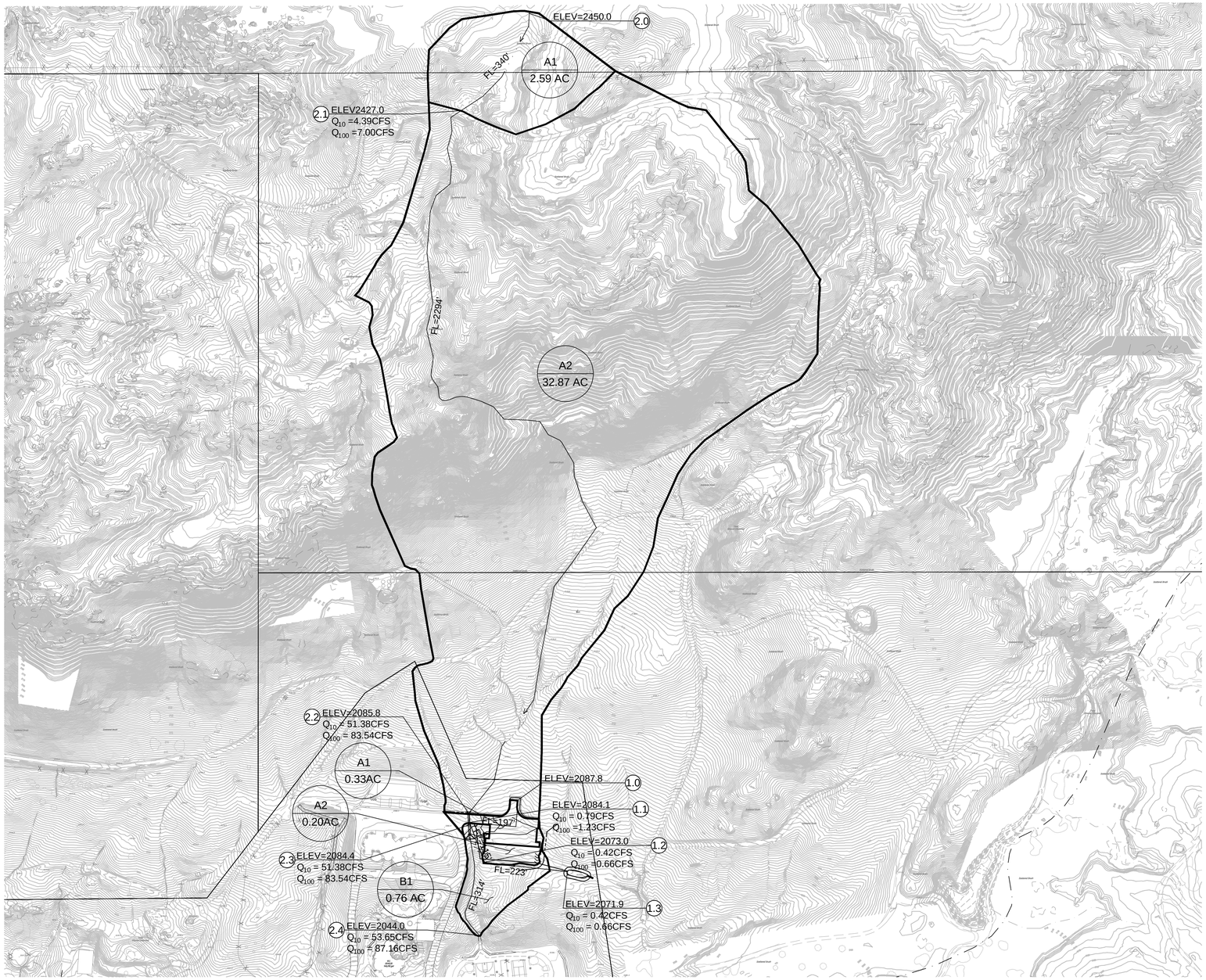
PHONE: (909) 982-4601

POST-DEVELOPED HYDROLOGY MAP

43700 CACTUS VALLEY ROAD, RIVERSIDE, CA
FACILITY 6



EXISTING HYDROLOGY				
SUBAREA	ACRE	Q_2	Q_{10}	Q_{100}
A1	0.33	0.47	0.79	1.23
A2	0.20	0.24	0.42	0.66
SUBTOTAL	0.53	0.71	1.21	1.89
B1	2.59	2.19	4.39	7.00
B2	32.87	22.00	46.99	76.54
B3	0.76	0.49	1.06	1.73
SUBTOTAL	36.22	24.67	52.44	85.27
TOTAL	**36.75**	**25.38**	**53.65**	**87.16**

LEGEND

- BASIN BOUNDARY
- ELEV=978.61 (8) DENOTES NODE No. and ELEVATION
- FL FLOW LENGTH
- A BASIN AREA
- FLOW PATH

SCALE 1"=150'

0 75' 150' 300'

GRAPHIC SCALE

SHEET 2 OF 2

REGISTERED PROFESSIONAL ENGINEER
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CIVIL
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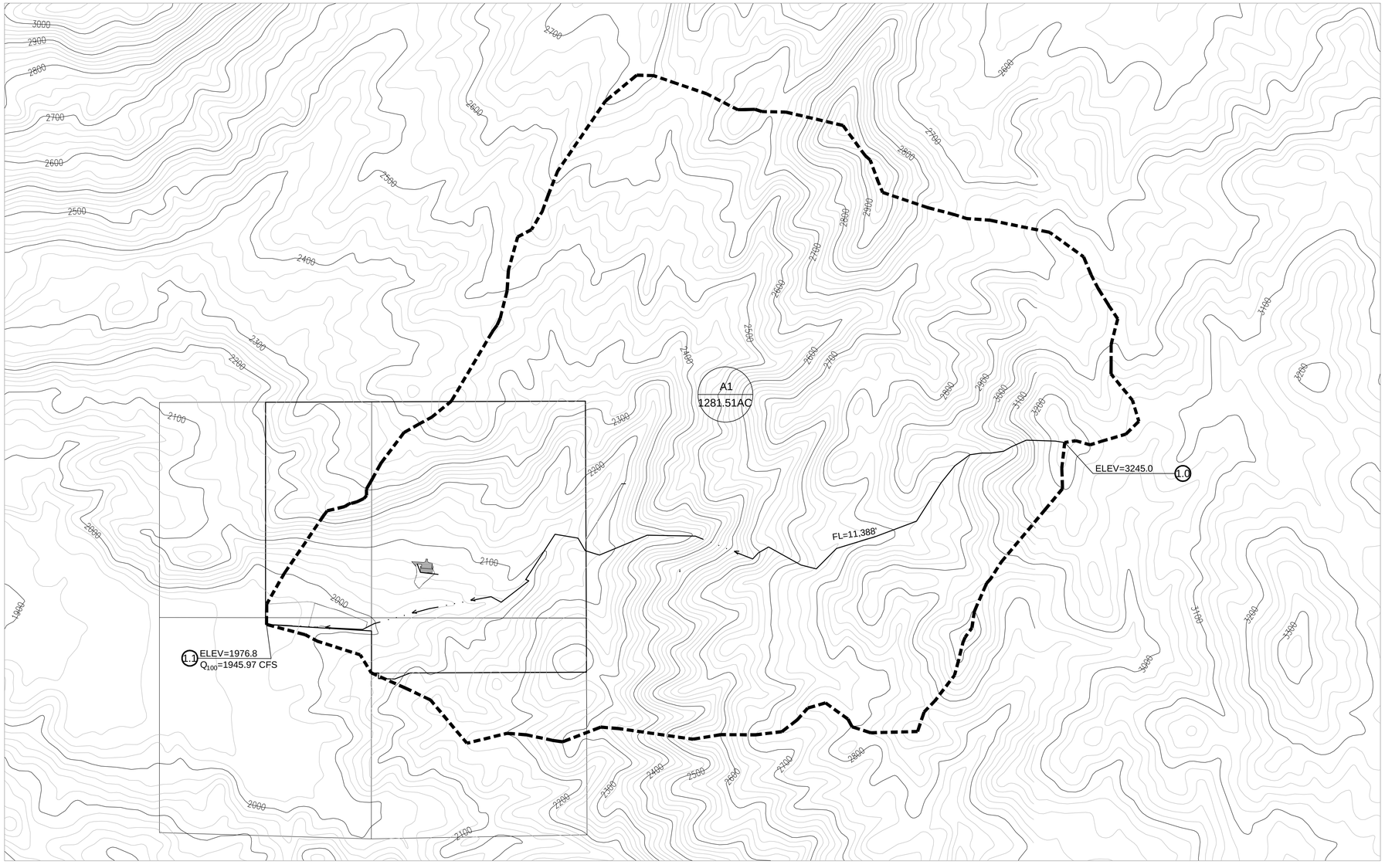
600 N. MOUNTAIN AVE, STE C102, UPLAND, CA 91786
PHONE: (909) 982-4601

OFFSITE HYDROLOGY MAP

43700 CACTUS VALLEY ROAD, RIVERSIDE, CA



OFFSITE HYDROLOGY		
SUBAREA	ACRE	Q_{100}
A1	1281.51	1945.97
TOTAL	**1281.51**	**1945.97**

SCALE 1"=1000'

0 500' 1000' 2000'

GRAPHIC SCALE

LEGEND

- BASIN BOUNDARY
- ELEV=978.61 (8) DENOTES NODE No. and ELEVATION
- FL FLOW LENGTH
- A BASIN AREA
- FLOW PATH

REGISTERED PROFESSIONAL ENGINEER
JEFFEREY D. MEITER
No. 64696
CIVIL
STATE OF CALIFORNIA

VALUED ENGINEERING, INC
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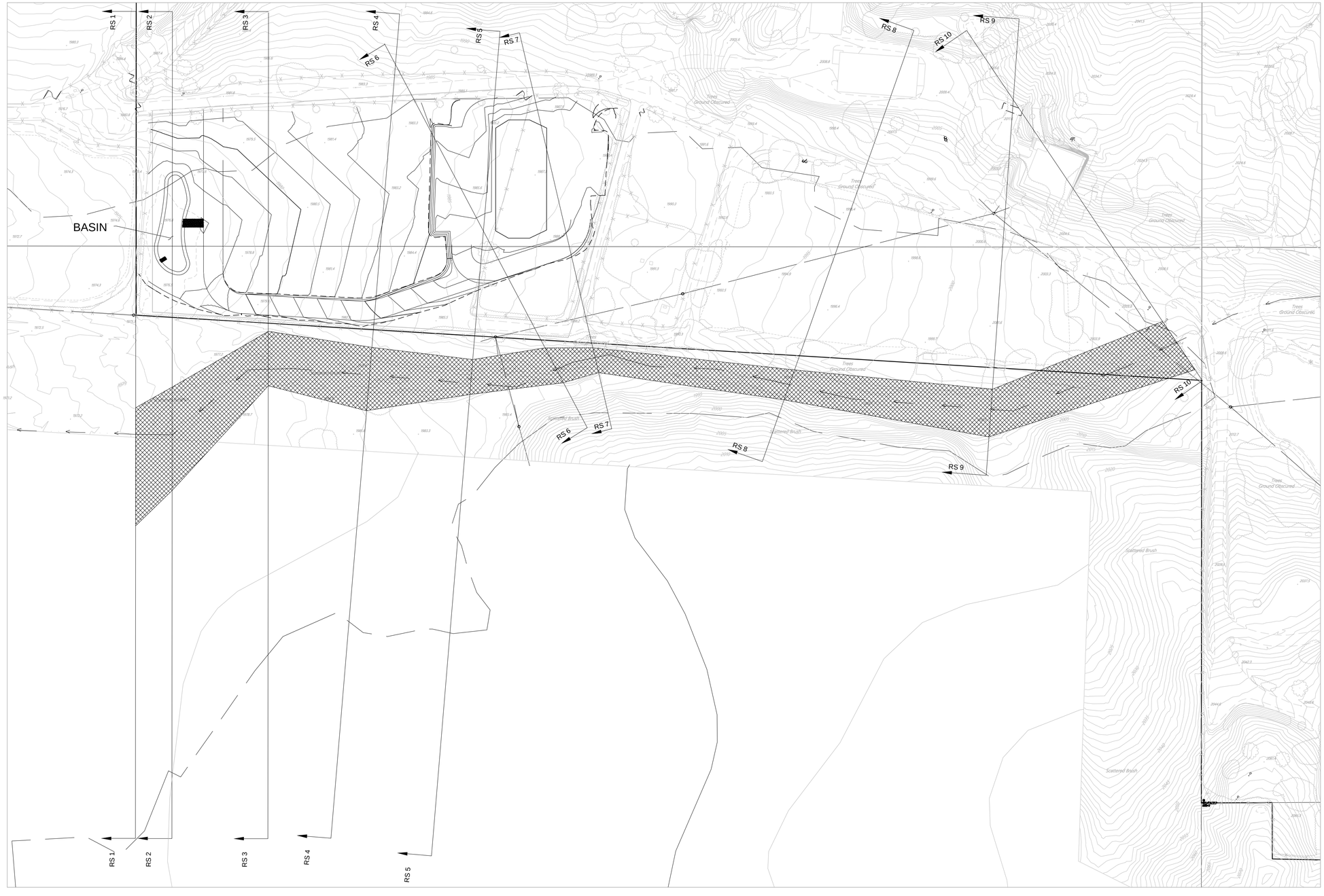
600 N. MOUNTAIN AVE, STE C102, UPLAND, CA 91786
PHONE: (909) 982-4601

HEC-RAS WATER SURFACE MAP

43700 CACTUS VALLEY ROAD, RIVERSIDE, CA



SCALE 1"=60'

0 30' 60' 120'

GRAPHIC SCALE

LEGEND

2 YR HEC-RAS WATER SURFCE

FLOW LINE

REGISTERED PROFESSIONAL ENGINEER
JEFFEREY D. MEITER
No. 64696
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VALUED
ENGINEERING, INC
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600 N. MOUNTAIN AVE, STE C102, UPLAND, CA 91786
PHONE: (909) 982-4601

APPENDIX “G”

HEC-Ras:
100-Year Results
2-Year Results

HEC-RAS HEC-RAS 6.1.0 September 2021
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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

PROJECT DATA
Project Title: 1162008-100YR
Project File : 1162008-100YR.prj
Run Date and Time: 7/15/2021 11:29:08 AM

Project in English units

PLAN DATA

Plan Title: Plan 02
Plan File : p:\JOBS\1162008\ADMIN\REPORTS\PHYDRO\HEC RAS\1162008-100YR.p02

Geometry Title: 1162008 PARADISE VALLEY RANCH
Geometry File : p:\JOBS\1162008\ADMIN\REPORTS\PHYDRO\HEC RAS\1162008-100YR.g01

Flow Title : 1162008 PARADISE VALLEY RANCH
Flow File : p:\JOBS\1162008\ADMIN\REPORTS\PHYDRO\HEC RAS\1162008-100YR.f01

Plan Summary Information:

Number of:	Cross Sections	= 10	Multiple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 0	Lateral Structures	=	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20

```
    Maximum difference tolerance         =  0.3
    Flow tolerance factor                =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Supercritical Flow



FLOW DATA

Flow Title: 1162008 PARADISE VALLEY RANCH
Flow File : p:\JOBS\1162008\ADMIN\REPORTS\PHYDRO\HEC RAS\1162008-100YR.f01

Flow Data (cfs)

  River           Reach           RS                  100YR
  PVR             1               10                1878.81


Boundary Conditions


  River           Reach           Profile                       Upstream
    Downstream


  PVR             1               100YR                       Normal S = 0.09
  Normal S = 0.09




GEOMETRY DATA

Geometry Title: 1162008 PARADISE VALLEY RANCH
Geometry File : p:\JOBS\1162008\ADMIN\REPORTS\PHYDRO\HEC RAS\1162008-100YR.g01

CROSS SECTION


RIVER: PVR
REACH: 1                 RS: 10

INPUT
Description: SECTION A-A
```

Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
102.86	2241	191.99	2217	259.83	2218.86	513.37	2157.99	563.13	2161.14
624.41	2165	747.2899	2133.11	801.6901	2108.53	909.74	2099.74	1000	2139
1148.75	2144.41	1500	2189.84	1747.25	2241				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
102.86	.11	624.41	.11	1000	.11

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
624.41	1000	1488	1488	.1	.3

CROSS SECTION OUTPUT Profile #100YR

E.G. Elev (ft)	2106.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.32	Wt. n-Val.		0.110	
W.S. Elev (ft)	2105.02	Reach Len. (ft)	1488.00	1488.00	1488.00
Crit W.S. (ft)	2105.02	Flow Area (sq ft)		203.58	
E.G. Slope (ft/ft)	0.130755	Area (sq ft)		203.58	
Q Total (cfs)	1878.81	Flow (cfs)		1878.81	
Top Width (ft)	77.08	Top Width (ft)		77.08	
Vel Total (ft/s)	9.23	Avg. Vel. (ft/s)		9.23	
Max Chl Dpth (ft)	5.28	Hydr. Depth (ft)		2.64	
Conv. Total (cfs)	5195.8	Conv. (cfs)		5195.8	
Length Wtd. (ft)	1488.00	Wetted Per. (ft)		78.39	
Min Ch El (ft)	2099.74	Shear (lb/sq ft)		21.20	
Alpha	1.00	Stream Power (lb/ft s)		195.64	
Frctn Loss (ft)		Cum Volume (acre-ft)		20.41	
0.87					
C & E Loss (ft)		Cum SA (acres)		11.84	
1.44					

Warning: Slope too shallow for slope area to converge during supercritical flow

calculations (normal depth is above critical
depth). Water surface set to critical depth.

CROSS SECTION

RIVER: PVR
REACH: 1 RS: 9

INPUT
Description: SECTION B-B
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
101.69	2120	165.8	2109.31	250	2115.98	375	2095.27	443.85	2086.13
699.45	2062.98	848.39	2028	902.43	2028.04	961.41	2043.41	1050.69	2041.35
1233.73	2078	1703.49	2110	1948.16	2143.25				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
101.69	.11	699.45	.11	1233.73	.11

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
699.45	1233.73	977	977	.1	.3

CROSS SECTION OUTPUT Profile #100YR

E.G. Elev (ft)	2032.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.31	Wt. n-Val.		0.110	
W.S. Elev (ft)	2031.10	Reach Len. (ft)	977.00	977.00	977.00
Crit W.S. (ft)	2031.10	Flow Area (sq ft)		204.55	
E.G. Slope (ft/ft)	0.131581	Area (sq ft)		204.55	
Q Total (cfs)	1878.81	Flow (cfs)		1878.81	
Top Width (ft)	78.95	Top Width (ft)		78.95	
Vel Total (ft/s)	9.19	Avg. Vel. (ft/s)		9.19	
Max Chl Dpth (ft)	3.10	Hydr. Depth (ft)		2.59	
Conv. Total (cfs)	5179.5	Conv. (cfs)		5179.5	
Length Wtd. (ft)	977.00	Wetted Per. (ft)		79.70	
Min Ch El (ft)	2028.00	Shear (lb/sq ft)		21.08	

Alpha	1.00	Stream Power (lb/ft s)	193.65
Frctn Loss (ft)	195.18	Cum Volume (acre-ft)	13.44
0.87			
C & E Loss (ft)	0.00	Cum SA (acres)	9.18
1.44			

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical
depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.

CROSS SECTION

RIVER: PVR
REACH: 1 RS: 8

INPUT
Description: SECTION C-C
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	2063.07	221.92	2053.23	303.64	2049.64	500	2030.3	767.13	2003
899.88	2008.47	1100	2032.88	1300	2039.3	1500	2058.41	1597.61	2067.03
1656.85	2075.41								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.11	500	.11	1100	.11

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
500	1100	745	745	.1	.3

CROSS SECTION OUTPUT Profile #100YR

E.G. Elev (ft)	2007.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.94	Wt. n-Val.		0.110	
W.S. Elev (ft)	2006.76	Reach Len. (ft)	745.00	745.00	745.00
Crit W.S. (ft)	2006.76	Flow Area (sq ft)		241.03	
E.G. Slope (ft/ft)	0.143781	Area (sq ft)		241.03	

Q Total (cfs)	1878.81	Flow (cfs)	1878.81
Top Width (ft)	128.13	Top Width (ft)	128.13
Vel Total (ft/s)	7.79	Avg. Vel. (ft/s)	7.79
Max Chl Dpth (ft)	3.76	Hydr. Depth (ft)	1.88
Conv. Total (cfs)	4954.9	Conv. (cfs)	4954.9
Length Wtd. (ft)	745.00	Wetted Per. (ft)	128.40
Min Ch El (ft)	2003.00	Shear (lb/sq ft)	16.85
Alpha	1.00	Stream Power (lb/ft s)	131.35
Frctn Loss (ft)	134.32	Cum Volume (acre-ft)	8.44
0.87			
C & E Loss (ft)	0.11	Cum SA (acres)	6.85
1.44			

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical
depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.

CROSS SECTION

RIVER: PVR
REACH: 1 RS: 7

INPUT
Description:
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	2007.5	180.16	1989.63	214.95	1985	244.01	1988	268.07	1990
480.7	1988.46	544.08	1989.15	566.03	1989.98	701.67	2003.39	836.61	2021.21
923.74	2036.2								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.11	100	.11	701.67	.11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

100 701.67 48 48 48 .1 .3

CROSS SECTION OUTPUT Profile #100YR

E.G. Elev (ft)	1990.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.54	Wt. n-Val.		0.110	
W.S. Elev (ft)	1989.57	Reach Len. (ft)	48.00	48.00	48.00
Crit W.S. (ft)	1989.57	Flow Area (sq ft)		319.73	
E.G. Slope (ft/ft)	0.182657	Area (sq ft)		319.73	
Q Total (cfs)	1878.81	Flow (cfs)		1878.81	
Top Width (ft)	310.83	Top Width (ft)		310.83	
Vel Total (ft/s)	5.88	Avg. Vel. (ft/s)		5.88	
Max Chl Dpth (ft)	4.57	Hydr. Depth (ft)		1.03	
Conv. Total (cfs)	4396.1	Conv. (cfs)		4396.1	
Length Wtd. (ft)	48.00	Wetted Per. (ft)		311.37	
Min Ch El (ft)	1985.00	Shear (lb/sq ft)		11.71	
Alpha	1.00	Stream Power (lb/ft s)		68.81	
Frctn Loss (ft)	120.30	Cum Volume (acre-ft)		3.64	0.87
C & E Loss (ft)	0.12	Cum SA (acres)		3.10	1.44

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical
depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.

CROSS SECTION

RIVER: PVR

REACH: 1 RS: 6

INPUT
Description: SECTION D-D
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	2002.87	169.76	1987.59	187.96	1986.64	194.78	1984	229.91	1985.84
268.45	1988.96	564.62	1988	652.26	1996.23	708.97	2012.66	762.22	2016.92
864.82	2027.01	923.74	2033.1						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.11	100	.11	652.26	.11

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100	652.26	104	104	.1	.3

CROSS SECTION OUTPUT Profile #100YR

E.G. Elev (ft)	1989.25	Element	Left OB	Channel
Right OB				
Vel Head (ft)	0.49	Wt. n-Val.		0.110
W.S. Elev (ft)	1988.75	Reach Len. (ft)	104.00	104.00
104.00				
Crit W.S. (ft)	1988.75	Flow Area (sq ft)		334.30
E.G. Slope (ft/ft)	0.179168	Area (sq ft)		334.30
Q Total (cfs)	1878.81	Flow (cfs)		1878.81
Top Width (ft)	342.21	Top Width (ft)		342.21
Vel Total (ft/s)	5.62	Avg. Vel. (ft/s)		5.62
Max Chl Dpth (ft)	4.75	Hydr. Depth (ft)		0.98
Conv. Total (cfs)	4438.7	Conv. (cfs)		4438.7
Length Wtd. (ft)	104.00	Wetted Per. (ft)		343.05
Min Ch El (ft)	1984.00	Shear (lb/sq ft)		10.90
Alpha	1.00	Stream Power (lb/ft s)		61.26
Frctn Loss (ft)	8.68	Cum Volume (acre-ft)		3.28
0.87				
C & E Loss (ft)	0.01	Cum SA (acres)		2.74
1.44				

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical
         depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: PVR
REACH: 1   RS: 5

INPUT
Description:
Station Elevation Data   num=   11
     Sta   Elev   Sta   Elev   Sta   Elev   Sta   Elev   Sta   Elev
     100 1984.67 163.87   1985 182.72 1982.22 228.19 1985.16 237.62   1987
     375 1986.04 518.24 1984.95   600   1990 698.16   2011 801.28 2015.6
  923.74 2033.54

Manning's n Values   num=   3
     Sta   n Val   Sta   n Val   Sta   n Val
     100   .11   100   .11 237.62   .11

Bank Sta: Left   Right   Lengths: Left Channel   Right   Coeff Contr.   Expan.
           100 237.62   125   125   125   .1   .3

CROSS SECTION OUTPUT Profile #100YR

  E.G. Elev (ft)   1986.69   Element   Left OB   Channel
Right OB
  Vel Head (ft)   0.59   Wt. n-Val.   0.110
  0.110
  W.S. Elev (ft)   1986.10   Reach Len. (ft)   125.00   125.00
 125.00
  Crit W.S. (ft)   1986.10   Flow Area (sq ft)   239.62
  97.68
  E.G. Slope (ft/ft)   0.110212   Area (sq ft)   239.62
  97.68
  Q Total (cfs)   1878.81   Flow (cfs)   1576.67
 302.14
  Top Width (ft)   303.50   Top Width (ft)   133.01
 170.49
  Vel Total (ft/s)   5.57   Avg. Vel. (ft/s)   6.58
   3.09
  Max Chl Dpth (ft)   3.88   Hydr. Depth (ft)   1.80
   0.57

Conv. Total (cfs)	5659.4	Conv. (cfs)	4749.3
910.1			
Length Wtd. (ft)	125.00	Wetted Per. (ft)	134.83
170.53			
Min Ch El (ft)	1982.22	Shear (lb/sq ft)	12.23
3.94			
Alpha	1.22	Stream Power (lb/ft s)	80.46
12.19			
Frctn Loss (ft)	14.40	Cum Volume (acre-ft)	2.60
0.75			
C & E Loss (ft)	0.01	Cum SA (acres)	2.17
1.23			

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: PVR
REACH: 1 RS: 4

INPUT
Description:
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	1982.21	150.68	1982	157.42	1981.01	190.05	1981	194.88	1981.93
232.75	1983.52	329.15	1983.14	496.15	1982.38	541.95	1984.99	814	2014
923.74	2028.48								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.11	100	.11	232.75	.11

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100	232.75	125	125	.1	.3

CROSS SECTION OUTPUT Profile #100YR

E.G. Elev (ft)	1984.04	Element	Left OB Channel

Right OB

Vel Head (ft)	0.43	Wt. n-Val.		0.110	0.110
W.S. Elev (ft)	1983.60	Reach Len. (ft)	125.00	125.00	125.00
Crit W.S. (ft)	1983.60	Flow Area (sq ft)		218.48	180.37
E.G. Slope (ft/ft)	0.102175	Area (sq ft)		218.48	180.37
Q Total (cfs)	1878.81	Flow (cfs)		1304.61	574.20
Top Width (ft)	417.62	Top Width (ft)		132.75	284.87
Vel Total (ft/s)	4.71	Avg. Vel. (ft/s)		5.97	3.18
Max Chl Dpth (ft)	2.60	Hydr. Depth (ft)		1.65	0.63
Conv. Total (cfs)	5877.7	Conv. (cfs)		4081.4	1796.3
Length Wtd. (ft)	125.00	Wetted Per. (ft)		134.34	284.91
Min Ch El (ft)	1981.00	Shear (lb/sq ft)		10.37	4.04
Alpha	1.26	Stream Power (lb/ft s)		61.95	12.86
Frctn Loss (ft)	13.26	Cum Volume (acre-ft)		1.94	0.35
C & E Loss (ft)	0.05	Cum SA (acres)		1.79	0.58

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical
depth for the water surface and continued on with the calculations.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.

CROSS SECTION

RIVER: PVR
REACH: 1 RS: 3

INPUT
Description: SECT E-E
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	1979.22	100.01	1979.22	158.38	1978.76	175.91	1977.8	223.31	1977.91
231.41	1979.84	455.66	1979.22	726.16	2003.29	923.74	2024.8		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.11	100	.11	455.66	.11

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100	455.66	119	119	.1	.3

CROSS SECTION OUTPUT Profile #100YR

E.G. Elev (ft)	1980.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.49	Wt. n-Val.		0.110	0.110
W.S. Elev (ft)	1980.08	Reach Len. (ft)	119.00	119.00	119.00
Crit W.S. (ft)	1980.08	Flow Area (sq ft)		332.39	4.12
E.G. Slope (ft/ft)	0.189616	Area (sq ft)		332.39	4.12
Q Total (cfs)	1878.81	Flow (cfs)		1865.08	13.73
Top Width (ft)	365.28	Top Width (ft)		355.66	9.62
Vel Total (ft/s)	5.58	Avg. Vel. (ft/s)		5.61	3.33
Max Chl Dpth (ft)	2.28	Hydr. Depth (ft)		0.93	0.43
Conv. Total (cfs)	4314.6	Conv. (cfs)		4283.1	31.5
Length Wtd. (ft)	119.00	Wetted Per. (ft)		356.77	9.66
Min Ch El (ft)	1977.80	Shear (lb/sq ft)		11.03	5.05
Alpha	1.01	Stream Power (lb/ft s)		61.88	16.82
Frctn Loss (ft)	16.99	Cum Volume (acre-ft)		1.15	0.09
C & E Loss (ft)	0.01	Cum SA (acres)		1.09	0.16

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical
depth for the water surface and continued on with the calculations.

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
         the need for additional cross sections.

CROSS SECTION

RIVER: PVR
REACH: 1 RS: 2

INPUT
Description:
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	1976.23	124.83	1975.14	160.52	1976.7	199.04	1976.97	240.31	1977.85
380.86	1977	492.86	1981.12	566.81	1990.33	605.99	1991.3	624.14	1986.55
702.06	1989.35	800.29	1998	922.28	2012.5				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.11	100	.11	380.86	.11

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100	380.86	45	45	.1	.3

CROSS SECTION OUTPUT Profile #100YR

E.G. Elev (ft)	1978.63	Element	Left OB	Channel
Right OB				
Vel Head (ft)	0.55	Wt. n-Val.	0.110	0.110
W.S. Elev (ft)	1978.07	Reach Len. (ft)	45.00	45.00
45.00				
Crit W.S. (ft)	1978.07	Flow Area (sq ft)	302.27	
15.65				
E.G. Slope (ft/ft)	0.181657	Area (sq ft)	302.27	
15.65				
Q Total (cfs)	1878.81	Flow (cfs)	1819.35	
59.46				
Top Width (ft)	310.03	Top Width (ft)	280.86	
29.17				
Vel Total (ft/s)	5.91	Avg. Vel. (ft/s)	6.02	
3.80				
Max Chl Dpth (ft)	2.93	Hydr. Depth (ft)	1.08	
0.54				
Conv. Total (cfs)	4408.2	Conv. (cfs)	4268.6	
139.5				

Length Wtd. (ft)	45.00	Wetted Per. (ft)	282.77
29.19			
Min Ch El (ft)	1975.14	Shear (lb/sq ft)	12.12
6.08			
Alpha	1.02	Stream Power (lb/ft s)	72.97
23.10			
Frctn Loss (ft)	22.08	Cum Volume (acre-ft)	0.28
0.06			
C & E Loss (ft)	0.01	Cum SA (acres)	0.22
0.11			

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical
depth for the water surface and continued on with the calculations.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.

CROSS SECTION

RIVER: PVR
REACH: 1 RS: 1

INPUT
Description:
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	1974.22	179.18	1975.76	234.76	1976.08	249.53	1977	363.04	1976.01
446.24	1977.54	490.83	1982	509.73	1982	514.52	1984.82	585.28	1987.1
600.73	1983.32	647.88	1984.13	911.1	2006.23	923.74	2010.04		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.11	100	.11	249.53	.11

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100	249.53	100	100	.1	.3

CROSS SECTION OUTPUT Profile #100YR

E.G. Elev (ft)	1977.66	Element	Left OB Channel
Right OB			
Vel Head (ft)	0.53	Wt. n-Val.	0.110
0.110			

W.S. Elev (ft)	1977.13	Reach Len. (ft)	
Crit W.S. (ft)	1977.13	Flow Area (sq ft)	245.32 104.94
E.G. Slope (ft/ft)	0.114168	Area (sq ft)	245.32 104.94
Q Total (cfs)	1878.81	Flow (cfs)	1537.40 341.41
Top Width (ft)	323.91	Top Width (ft)	149.53 174.38
Vel Total (ft/s)	5.36	Avg. Vel. (ft/s)	6.27 3.25
Max Chl Dpth (ft)	2.91	Hydr. Depth (ft)	1.64 0.60
Conv. Total (cfs)	5560.5	Conv. (cfs)	4550.1 1010.4
Length Wtd. (ft)		Wetted Per. (ft)	152.48 174.39
Min Ch El (ft)	1974.22	Shear (lb/sq ft)	11.47 4.29
Alpha	1.18	Stream Power (lb/ft s)	71.86 13.95
Frctn Loss (ft)	6.39	Cum Volume (acre-ft)	
C & E Loss (ft)	0.01	Cum SA (acres)	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The cross-section end points had to be extended vertically for the computed water surface.

SUMMARY OF MANNING'S N VALUES

River:PVR

Reach	River Sta.	n1	n2	n3
1	10	.11	.11	.11
1	9	.11	.11	.11
1	8	.11	.11	.11
1	7	.11	.11	.11
1	6	.11	.11	.11
1	5	.11	.11	.11
1	4	.11	.11	.11

1	3	.11	.11	.11
1	2	.11	.11	.11
1	1	.11	.11	.11

SUMMARY OF REACH LENGTHS

River: PVR

Reach	River Sta.	Left	Channel	Right
1	10	1488	1488	1488
1	9	977	977	977
1	8	745	745	745
1	7	48	48	48
1	6	104	104	104
1	5	125	125	125
1	4	125	125	125
1	3	119	119	119
1	2	45	45	45
1	1	100	100	100

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: PVR

Reach	River Sta.	Contr.	Expan.
1	10	.1	.3
1	9	.1	.3
1	8	.1	.3
1	7	.1	.3
1	6	.1	.3
1	5	.1	.3
1	4	.1	.3
1	3	.1	.3
1	2	.1	.3
1	1	.1	.3

HEC-RAS HEC-RAS 6.1.0 September 2021
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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

PROJECT DATA
Project Title: 1162008-2YR
Project File : 1162008-2YR.prj
Run Date and Time: 7/15/2021 11:17:24 AM

Project in English units

PLAN DATA

Plan Title: Plan 02
Plan File : p:\JOBS\1162008\ADMIN\REPORTS\PHYDRO\HEC RAS\1162008-2YR.p02

Geometry Title: 1162008 PARADISE VALLEY RANCH
Geometry File : p:\JOBS\1162008\ADMIN\REPORTS\PHYDRO\HEC RAS\1162008-2YR.g01

Flow Title : 1162008 PARADISE VALLEY RANCH
Flow File : p:\JOBS\1162008\ADMIN\REPORTS\PHYDRO\HEC RAS\1162008-2YR.f01

Plan Summary Information:

Number of:	Cross Sections	= 10	Multiple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 0	Lateral Structures	=	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20

```
    Maximum difference tolerance         =  0.3
    Flow tolerance factor                =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Supercritical Flow




FLOW DATA

Flow Title: 1162008 PARADISE VALLEY RANCH
Flow File : p:\JOBS\1162008\ADMIN\REPORTS\PHYDRO\HEC RAS\1162008-2YR.f01

Flow Data (cfs)

  River           Reach           RS                   2 YR
  PVR             1               10                307.018


Boundary Conditions


  River           Reach           Profile                       Upstream
    Downstream


  PVR             1               2 YR                        Normal S = 0.09
  Normal S = 0.09




GEOMETRY DATA

Geometry Title: 1162008 PARADISE VALLEY RANCH
Geometry File : p:\JOBS\1162008\ADMIN\REPORTS\PHYDRO\HEC RAS\1162008-2YR.g01

CROSS SECTION


RIVER: PVR
REACH: 1                 RS: 10

INPUT
Description: SECTION A-A
```

Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
102.86	2241	191.99	2217	259.83	2218.86	513.37	2157.99	563.13	2161.14
624.41	2165	747.2899	2133.11	801.6901	2108.53	909.74	2099.74	1000	2139
1148.75	2144.41	1500	2189.84	1747.25	2241				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
102.86	.11	624.41	.11	1000	.11

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
624.41	1000	1488	1488	.1	.3

CROSS SECTION OUTPUT Profile #2 YR

E.G. Elev (ft)	2102.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.		0.110	
W.S. Elev (ft)	2102.29	Reach Len. (ft)	1488.00	1488.00	1488.00
Crit W.S. (ft)	2102.29	Flow Area (sq ft)		47.34	
E.G. Slope (ft/ft)	0.170739	Area (sq ft)		47.34	
Q Total (cfs)	307.02	Flow (cfs)		307.02	
Top Width (ft)	37.17	Top Width (ft)		37.17	
Vel Total (ft/s)	6.49	Avg. Vel. (ft/s)		6.49	
Max Chl Dpth (ft)	2.55	Hydr. Depth (ft)		1.27	
Conv. Total (cfs)	743.0	Conv. (cfs)		743.0	
Length Wtd. (ft)	1488.00	Wetted Per. (ft)		37.80	
Min Ch El (ft)	2099.74	Shear (lb/sq ft)		13.35	
Alpha	1.00	Stream Power (lb/ft s)		86.57	
Frctn Loss (ft)		Cum Volume (acre-ft)		4.71	
C & E Loss (ft)		Cum SA (acres)		4.92	

Warning: Slope too shallow for slope area to converge during supercritical flow

calculations (normal depth is above critical
depth). Water surface set to critical depth.

CROSS SECTION

RIVER: PVR
REACH: 1 RS: 9

INPUT
Description: SECTION B-B
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
101.69	2120	165.8	2109.31	250	2115.98	375	2095.27	443.85	2086.13
699.45	2062.98	848.39	2028	902.43	2028.04	961.41	2043.41	1050.69	2041.35
1233.73	2078	1703.49	2110	1948.16	2143.25				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
101.69	.11	699.45	.11	1233.73	.11

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
699.45	1233.73	977	977	.1	.3

CROSS SECTION OUTPUT Profile #2 YR

E.G. Elev (ft)	2029.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.46	Wt. n-Val.		0.110	
W.S. Elev (ft)	2028.99	Reach Len. (ft)	977.00	977.00	977.00
Crit W.S. (ft)	2028.99	Flow Area (sq ft)		56.48	
E.G. Slope (ft/ft)	0.184072	Area (sq ft)		56.48	
Q Total (cfs)	307.02	Flow (cfs)		307.02	
Top Width (ft)	61.93	Top Width (ft)		61.93	
Vel Total (ft/s)	5.44	Avg. Vel. (ft/s)		5.44	
Max Chl Dpth (ft)	0.99	Hydr. Depth (ft)		0.91	
Conv. Total (cfs)	715.6	Conv. (cfs)		715.6	
Length Wtd. (ft)	977.00	Wetted Per. (ft)		62.17	
Min Ch El (ft)	2028.00	Shear (lb/sq ft)		10.44	

Alpha	1.00	Stream Power (lb/ft s)	56.75
Frctn Loss (ft)	263.70	Cum Volume (acre-ft)	2.93
C & E Loss (ft)	0.06	Cum SA (acres)	3.22

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical
depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.

CROSS SECTION

RIVER: PVR
REACH: 1 RS: 8

INPUT
Description: SECTION C-C
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	2063.07	221.92	2053.23	303.64	2049.64	500	2030.3	767.13	2003
899.88	2008.47	1100	2032.88	1300	2039.3	1500	2058.41	1597.61	2067.03
1656.85	2075.41								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.11	500	.11	1100	.11

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
500	1100	745	745	.1	.3

CROSS SECTION OUTPUT Profile #2 YR

E.G. Elev (ft)	2005.28	Element	Left OB	Channel
Right OB				
Vel Head (ft)	0.46	Wt. n-Val.		0.110
W.S. Elev (ft)	2004.82	Reach Len. (ft)	745.00	745.00
745.00				
Crit W.S. (ft)	2004.82	Flow Area (sq ft)		56.26
E.G. Slope (ft/ft)	0.185891	Area (sq ft)		56.26

Q Total (cfs)	307.02	Flow (cfs)	307.02
Top Width (ft)	61.90	Top Width (ft)	61.90
Vel Total (ft/s)	5.46	Avg. Vel. (ft/s)	5.46
Max Chl Dpth (ft)	1.82	Hydr. Depth (ft)	0.91
Conv. Total (cfs)	712.1	Conv. (cfs)	712.1
Length Wtd. (ft)	745.00	Wetted Per. (ft)	62.03
Min Ch El (ft)	2003.00	Shear (lb/sq ft)	10.53
Alpha	1.00	Stream Power (lb/ft s)	57.44
Frctn Loss (ft)	180.72	Cum Volume (acre-ft)	1.67
C & E Loss (ft)	0.00	Cum SA (acres)	1.83

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical
depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.

CROSS SECTION

RIVER: PVR
REACH: 1 RS: 7

INPUT
Description:
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	2007.5	180.16	1989.63	214.95	1985	244.01	1988	268.07	1990
480.7	1988.46	544.08	1989.15	566.03	1989.98	701.67	2003.39	836.61	2021.21
923.74	2036.2								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.11	100	.11	701.67	.11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

100 701.67 48 48 48 .1 .3

CROSS SECTION OUTPUT Profile #2 YR

E.G. Elev (ft)	1988.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.61	Wt. n-Val.		0.110	
W.S. Elev (ft)	1987.39	Reach Len. (ft)	48.00	48.00	48.00
Crit W.S. (ft)	1987.39	Flow Area (sq ft)		48.97	
E.G. Slope (ft/ft)	0.171817	Area (sq ft)		48.97	
Q Total (cfs)	307.02	Flow (cfs)		307.02	
Top Width (ft)	41.04	Top Width (ft)		41.04	
Vel Total (ft/s)	6.27	Avg. Vel. (ft/s)		6.27	
Max Chl Dpth (ft)	2.39	Hydr. Depth (ft)		1.19	
Conv. Total (cfs)	740.7	Conv. (cfs)		740.7	
Length Wtd. (ft)	48.00	Wetted Per. (ft)		41.32	
Min Ch El (ft)	1985.00	Shear (lb/sq ft)		12.71	
Alpha	1.00	Stream Power (lb/ft s)		79.69	
Frctn Loss (ft)	133.09	Cum Volume (acre-ft)		0.77	
C & E Loss (ft)	0.01	Cum SA (acres)		0.95	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical
depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.

CROSS SECTION

RIVER: PVR
REACH: 1 RS: 6

INPUT
Description: SECTION D-D
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	2002.87	169.76	1987.59	187.96	1986.64	194.78	1984	229.91	1985.84
268.45	1988.96	564.62	1988	652.26	1996.23	708.97	2012.66	762.22	2016.92
864.82	2027.01	923.74	2033.1						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.11	100	.11	652.26	.11

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100	652.26	104	104	.1	.3

CROSS SECTION OUTPUT Profile #2 YR

E.G. Elev (ft)	1986.74	Element	Left OB	Channel
Right OB				
Vel Head (ft)	0.58	Wt. n-Val.		0.110
W.S. Elev (ft)	1986.16	Reach Len. (ft)	104.00	104.00
104.00				
Crit W.S. (ft)	1986.16	Flow Area (sq ft)		50.24
E.G. Slope (ft/ft)	0.177364	Area (sq ft)		50.24
Q Total (cfs)	307.02	Flow (cfs)		307.02
Top Width (ft)	44.67	Top Width (ft)		44.67
Vel Total (ft/s)	6.11	Avg. Vel. (ft/s)		6.11
Max Chl Dpth (ft)	2.16	Hydr. Depth (ft)		1.12
Conv. Total (cfs)	729.0	Conv. (cfs)		729.0
Length Wtd. (ft)	104.00	Wetted Per. (ft)		45.14
Min Ch El (ft)	1984.00	Shear (lb/sq ft)		12.33
Alpha	1.00	Stream Power (lb/ft s)		75.32
Frctn Loss (ft)	8.38	Cum Volume (acre-ft)		0.71
C & E Loss (ft)	0.01	Cum SA (acres)		0.91

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical
         depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
         the need for additional cross sections.

CROSS SECTION

RIVER: PVR
REACH: 1 RS: 5

INPUT
Description:
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	1984.67	163.87	1985	182.72	1982.22	228.19	1985.16	237.62	1987
375	1986.04	518.24	1984.95	600	1990	698.16	2011	801.28	2015.6
923.74	2033.54								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.11	100	.11	237.62	.11

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100	237.62	125	125	.1	.3

CROSS SECTION OUTPUT Profile #2 YR

E.G. Elev (ft)	1984.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.54	Wt. n-Val.		0.110	
W.S. Elev (ft)	1984.38	Reach Len. (ft)	125.00	125.00	125.00
Crit W.S. (ft)	1984.38	Flow Area (sq ft)		52.09	
E.G. Slope (ft/ft)	0.172458	Area (sq ft)		52.09	
Q Total (cfs)	307.02	Flow (cfs)		307.02	
Top Width (ft)	48.14	Top Width (ft)		48.14	
Vel Total (ft/s)	5.89	Avg. Vel. (ft/s)		5.89	
Max Chl Dpth (ft)	2.16	Hydr. Depth (ft)		1.08	

Conv. Total (cfs)	739.3	Conv. (cfs)	739.3
Length Wtd. (ft)	125.00	Wetted Per. (ft)	48.37
Min Ch El (ft)	1982.22	Shear (lb/sq ft)	11.59
Alpha	1.00	Stream Power (lb/ft s)	68.34
Frctn Loss (ft)	18.19	Cum Volume (acre-ft)	0.59
C & E Loss (ft)	0.01	Cum SA (acres)	0.80

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical
depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.

CROSS SECTION

RIVER: PVR
REACH: 1 RS: 4

INPUT
Description:
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	1982.21	150.68	1982	157.42	1981.01	190.05	1981	194.88	1981.93
232.75	1983.52	329.15	1983.14	496.15	1982.38	541.95	1984.99	814	2014
923.74	2028.48								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.11	100	.11	232.75	.11

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100	232.75	125	125	.1	.3

CROSS SECTION OUTPUT Profile #2 YR

E.G. Elev (ft)	1982.66	Element	Left OB Channel Right OB
Vel Head (ft)	0.32	Wt. n-Val.	0.110

W.S. Elev (ft)	1982.35	Reach Len. (ft)	125.00	125.00 125.00
Crit W.S. (ft)	1982.35	Flow Area (sq ft)		67.96
E.G. Slope (ft/ft)	0.199986	Area (sq ft)		67.96
Q Total (cfs)	307.02	Flow (cfs)		307.02
Top Width (ft)	104.79	Top Width (ft)		104.79
Vel Total (ft/s)	4.52	Avg. Vel. (ft/s)		4.52
Max Chl Dpth (ft)	1.35	Hydr. Depth (ft)		0.65
Conv. Total (cfs)	686.5	Conv. (cfs)		686.5
Length Wtd. (ft)	125.00	Wetted Per. (ft)		105.10
Min Ch El (ft)	1981.00	Shear (lb/sq ft)		8.07
Alpha	1.00	Stream Power (lb/ft s)		36.47
Frctn Loss (ft)	23.18	Cum Volume (acre-ft)		0.42
C & E Loss (ft)	0.07	Cum SA (acres)		0.58

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical
depth for the water surface and continued on with the calculations.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.

CROSS SECTION

RIVER: PVR
REACH: 1 RS: 3

INPUT
Description: SECT E-E
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	1979.22	100.01	1979.22	158.38	1978.76	175.91	1977.8	223.31	1977.91

231.41 1979.84 455.66 1979.22 726.16 2003.29 923.74 2024.8

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.11	100	.11	455.66	.11

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100	455.66	119	119	.1	.3

CROSS SECTION OUTPUT Profile #2 YR

E.G. Elev (ft)	1979.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.37	Wt. n-Val.		0.110	
W.S. Elev (ft)	1978.89	Reach Len. (ft)	119.00	119.00	119.00
Crit W.S. (ft)	1978.89	Flow Area (sq ft)		62.96	
E.G. Slope (ft/ft)	0.197079	Area (sq ft)		62.96	
Q Total (cfs)	307.02	Flow (cfs)		307.02	
Top Width (ft)	85.73	Top Width (ft)		85.73	
Vel Total (ft/s)	4.88	Avg. Vel. (ft/s)		4.88	
Max Chl Dpth (ft)	1.09	Hydr. Depth (ft)		0.73	
Conv. Total (cfs)	691.6	Conv. (cfs)		691.6	
Length Wtd. (ft)	119.00	Wetted Per. (ft)		85.88	
Min Ch El (ft)	1977.80	Shear (lb/sq ft)		9.02	
Alpha	1.00	Stream Power (lb/ft s)		43.99	
Frctn Loss (ft)	24.82	Cum Volume (acre-ft)		0.23	
C & E Loss (ft)	0.01	Cum SA (acres)		0.30	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical
depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate

the need for additional cross sections.

CROSS SECTION

RIVER: PVR
REACH: 1 RS: 2

INPUT
Description:
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	1976.23	124.83	1975.14	160.52	1976.7	199.04	1976.97	240.31	1977.85
380.86	1977	492.86	1981.12	566.81	1990.33	605.99	1991.3	624.14	1986.55
702.06	1989.35	800.29	1998	922.28	2012.5				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.11	100	.11	380.86	.11

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100	380.86	45	45	.1	.3

CROSS SECTION OUTPUT Profile #2 YR

E.G. Elev (ft)	1977.21	Element	Left OB	Channel
Right OB				
Vel Head (ft)	0.40	Wt. n-Val.		0.110
W.S. Elev (ft)	1976.81	Reach Len. (ft)	45.00	45.00
45.00				
Crit W.S. (ft)	1976.81	Flow Area (sq ft)		60.78
E.G. Slope (ft/ft)	0.192559	Area (sq ft)		60.78
Q Total (cfs)	307.02	Flow (cfs)		307.02
Top Width (ft)	76.63	Top Width (ft)		76.63
Vel Total (ft/s)	5.05	Avg. Vel. (ft/s)		5.05
Max Chl Dpth (ft)	1.67	Hydr. Depth (ft)		0.79
Conv. Total (cfs)	699.7	Conv. (cfs)		699.7
Length Wtd. (ft)	45.00	Wetted Per. (ft)		77.27
Min Ch El (ft)	1975.14	Shear (lb/sq ft)		9.46

Alpha	1.00	Stream Power (lb/ft s)	47.77
Frctn Loss (ft)	23.18	Cum Volume (acre-ft)	0.06
C & E Loss (ft)	0.00	Cum SA (acres)	0.08

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical
depth for the water surface and continued on with the calculations.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.

CROSS SECTION

RIVER: PVR
REACH: 1 RS: 1

INPUT
Description:
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	1974.22	179.18	1975.76	234.76	1976.08	249.53	1977	363.04	1976.01
446.24	1977.54	490.83	1982	509.73	1982	514.52	1984.82	585.28	1987.1
600.73	1983.32	647.88	1984.13	911.1	2006.23	923.74	2010.04		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.11	100	.11	249.53	.11

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100	249.53	100	100	.1	.3

CROSS SECTION OUTPUT Profile #2 YR

E.G. Elev (ft)	1976.15	Element	Left OB Channel Right OB
Vel Head (ft)	0.38	Wt. n-Val.	0.110
W.S. Elev (ft)	1975.77	Reach Len. (ft)	
Crit W.S. (ft)	1975.77	Flow Area (sq ft)	62.05

E.G. Slope (ft/ft)	0.198005	Area (sq ft)	62.05
Q Total (cfs)	307.02	Flow (cfs)	307.02
Top Width (ft)	81.51	Top Width (ft)	81.51
Vel Total (ft/s)	4.95	Avg. Vel. (ft/s)	4.95
Max Chl Dpth (ft)	1.55	Hydr. Depth (ft)	0.76
Conv. Total (cfs)	690.0	Conv. (cfs)	690.0
Length Wtd. (ft)		Wetted Per. (ft)	83.08
Min Ch El (ft)	1974.22	Shear (lb/sq ft)	9.23
Alpha	1.00	Stream Power (lb/ft s)	45.68
Frctn Loss (ft)	8.79	Cum Volume (acre-ft)	
C & E Loss (ft)	0.00	Cum SA (acres)	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical
depth for the water surface and continued on with the calculations.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.

SUMMARY OF MANNING'S N VALUES

River:PVR

Reach	River Sta.	n1	n2	n3
1	10	.11	.11	.11
1	9	.11	.11	.11
1	8	.11	.11	.11
1	7	.11	.11	.11
1	6	.11	.11	.11
1	5	.11	.11	.11
1	4	.11	.11	.11
1	3	.11	.11	.11

1	2	.11	.11	.11
1	1	.11	.11	.11

SUMMARY OF REACH LENGTHS

River: PVR

Reach	River Sta.	Left	Channel	Right
1	10	1488	1488	1488
1	9	977	977	977
1	8	745	745	745
1	7	48	48	48
1	6	104	104	104
1	5	125	125	125
1	4	125	125	125
1	3	119	119	119
1	2	45	45	45
1	1	100	100	100

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: PVR

Reach	River Sta.	Contr.	Expan.
1	10	.1	.3
1	9	.1	.3
1	8	.1	.3
1	7	.1	.3
1	6	.1	.3
1	5	.1	.3
1	4	.1	.3
1	3	.1	.3
1	2	.1	.3
1	1	.1	.3