HYDROLOGY & HYDRAULICS REPORT

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Best 4 Less - Jurupa Xxxx Jurupa Avenue Riverside, CA 92504

Prepared for:

Galaxy Oil Company

303 North Placentia Ave., Suite 200 Fullerton, CA 92831 (714) 687-1450

Prepared by:



22672 Lambert Street, Suite 606 Lake Forest, CA 92630 Phone: (949) 753-0600



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1. Introduction

The purpose of this study is to establish the sufficiency of the proposed drainage facilities, in relation to design flows, for the proposed 0.98-acre fueling station development at the southeast corner of Jurupa Avenue and Dales Street, in the City of Riverside, California.

2. Project Description

The 0.98-acre project site resides in the City of Riverside, at the southeast corner of Jurupa Avenue and Dales Street. The intent of the project is to clear and grub the existing site and develop a fueling station, complete with paved drive aisles, sidewalks, and landscaping.

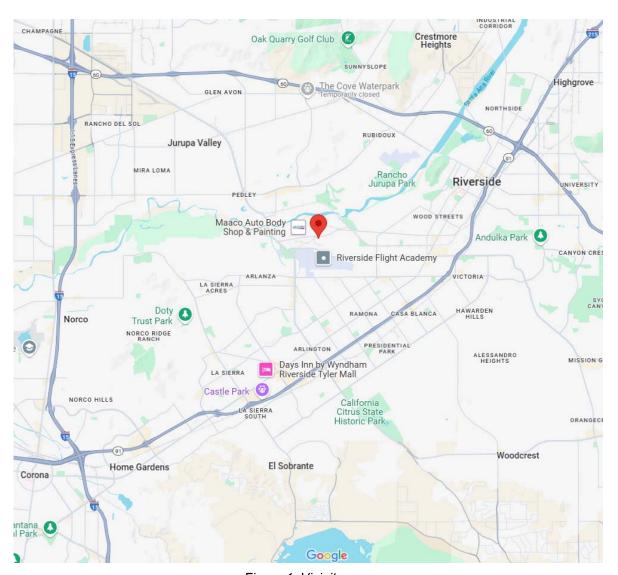


Figure 1: Vicinity map

3. Existing & Proposed Site Summary

The existing site is undeveloped, consisting of gravel and natural vegetation ground cover. The site slopes from its high point at the southeast corner of the site, to the low point at the northwest corner. The site is moderately sloped at around 5%. Runoff is allowed to flow into the adjacent street untreated and flows westerly in Jurupa Avenue until it is collected in a curb inlet catch basin along the southerly curb and gutter. Storm water then flows in surface and below-grade storm drain infrastructures and ultimately reaches the Pacific Ocean.

The project will clear and grub the existing vegetation over the entire site, and construct a new fueling station, with concrete paved drive aisles, concrete sidewalks, a trash enclosure, and landscaping. Approximately 23% of the proposed project site will be pervious surfaces, in the form of landscaping. In general, the proposed project will convey storm water in the northwesterly direction, via sheet flow concentrated within the onsite concrete gutters, and in a below grade storm drain pipe system. Runoff will be discharged into the proposed proprietary biofiltration device. Overflow will bypass the biofiltration unit, through the internal overflow system within the proprietary BMP, and convey storm water to a bubbler structure at the northwest corner of the property. From the bubbler water will flow through an under sidewalk parkway drain and into the curb and gutter of Jurupa Avenue. No offsite flows will make their way onsite.



Figure 2: Existing site conditions – satellite view

4. Project Site Hydrology Methodology

The drainage system was designed to meet or exceed the requirements of the City of Riverside to establish onsite storm drain facility sizing. Flow rates were calculated via the CIVILCADD/CIVILDESIGN Engineering Software Riverside County Rational Method Hydrology Program, with the 10, 25 and 100-year rainfall events selected as the design storms. The calculation outputs can be found in Appendix B, and are further summarized in the table in Section 5. Soil types 'B' and 'C' were used in the Analysis. See the Soil Map and Soil Descriptions in Appendix D of this report.

5. Post Development Calculation Summary:

Site Condition	DMA	Area (acres)	Q 10-year (cfs)	Q 25-year (cfs)	Q 100-year (cfs)
	Α	0.36	0.871	1.022	1.250
	В	0.03	0.071	0.084	0.104
Drangad	С	0.06	0.145	0.170	0.208
Proposed	D	0.06	0.145	0.170	0.208
	E	0.36	0.871	1.022	1.250
	Total	0.87	2.103	2.468	3.020

Table 1: Rational Method Hydrology Outputs

It can be seen on the HCOC Applicability Map in Appendix D that the project is located in an area that is designated as not applicable. Therefore, no hydrologic conditions of concern are present.

6. Pipe Sizing:

This section, along with the channel sizing software outputs in Appendix C of this report, demonstrate that the proposed onsite piping is adequately sized to convey the 25-year storm event.

Hydraflow Express Extension channel reports are included in Appendix C of this report. For each individual drainage management area (DMA), said channel reports demonstrate that the 25-year storm event flowrates can be conveyed in the outlet pipe as sized and sloped in the construction drawings. DMA delineations can be found on the Proposed Condition Exhibit in Appendix B.

As flows combine with flows from other drainage areas, the combined flowrates must be evaluated to determine an appropriate pipe size based on proposed pipe slopes. Descriptions of flowrate combinations are below. Channel Reports – Pipe Sizing can be found in Appendix C of this report.

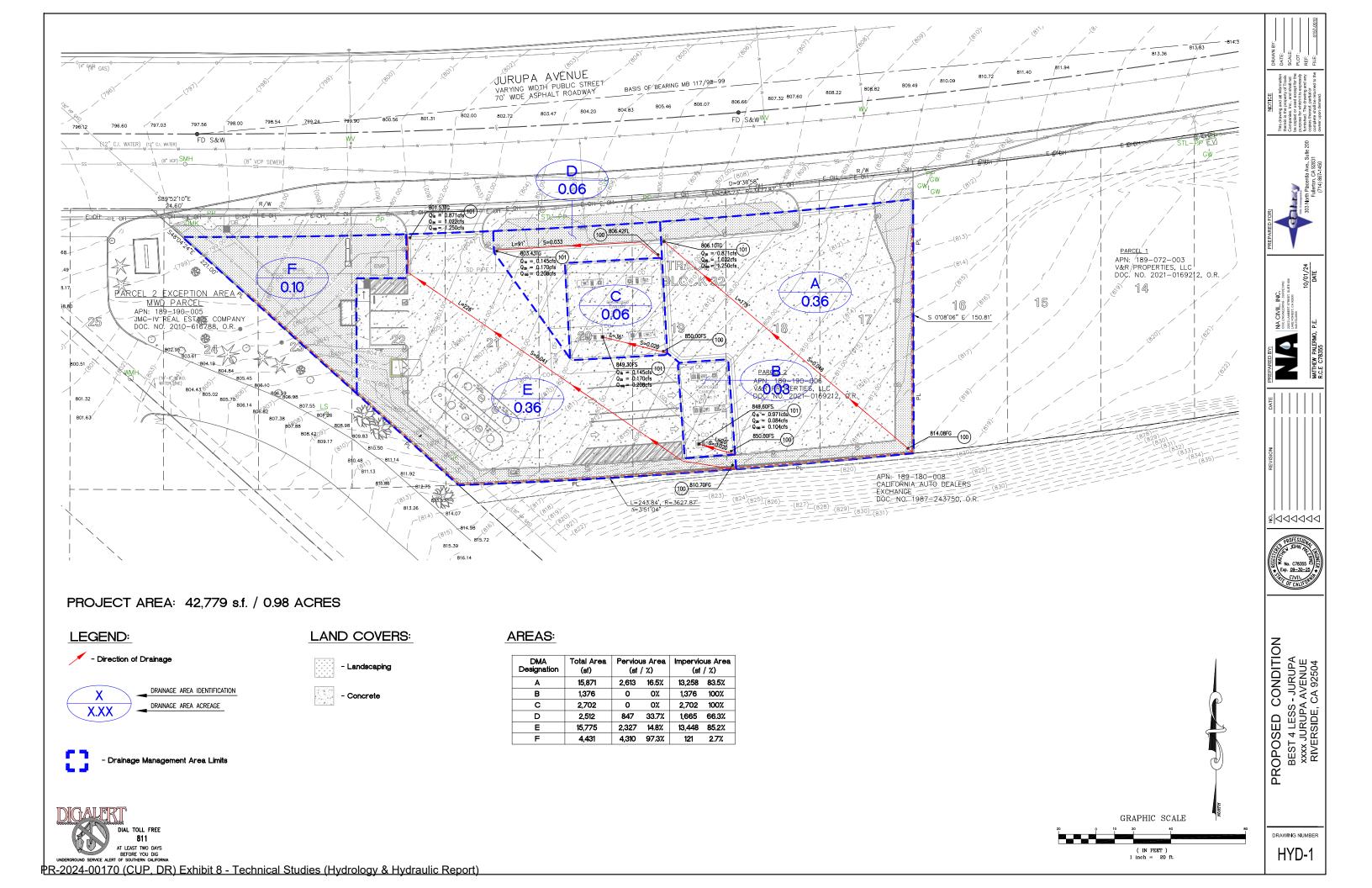
- DMA-B + DMA-C = 0.254 cfs
 Per channel report, a 6" pipe at 1.0% will convey the required flows
- DMA-A + DMA-B + DMA-C = 1.276 cfs
 Per channel report, an 8" pipe at 1.0% will convey the required flows
- DMA-A + DMA-B + DMA-C + DMA-D = 1.446 cfs
 Per channel report, an 8" pipe at 1.0% will convey the required flows
- DMA-A + DMA-B + DMA-C + DMA-D + DMA-E = 2.468 cfs
 Per channel report, a 12" pipe at 1.0% will convey the required flows

As demonstrated above and shown in the channel sizing software outputs in Appendix C of this report, the proposed onsite piping is adequately sized to convey the 25-year storm event.

7. Conclusion

It has been shown above and in Appendix C of this report that the site storm drain facilities have been adequately sized to handle the runoff from rain events of at least a 25-year frequency. Additionally, the site is located in an area that is exempt from a hydraulic condition of concern evaluation. Therefore, drainage goals and requirements, set by the City of Riverside, have been met or exceeded by this design.

Appendix A Proposed Condition Exhibit



Appendix B Hydrology Calculations

```
Riverside County Rational Hydrology Program
CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
     Rational Hydrology Study Date: 11/14/24 File:240506Ap10.out
-----
******* Hydrology Study Control Information *******
English (in-lb) Units used in input data file
______
Program License Serial Number 6113
Area A: Proposed 10-year
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 [ Riverside ] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.700(In/Hr)
100 year storm 10 minute intensity = 2.680(In/Hr)
100 year storm 60 minute intensity = 1.000(In/Hr)
Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.700(In/Hr)
Slope of intensity duration curve = 0.5500
Process from Point/Station 100.000 to Point/Station 101.000
**** INITIAL AREA EVALUATION ****
Initial area flow distance = 175.000(Ft.)
Top (of initial area) elevation = 814.080(Ft.)
Bottom (of initial area) elevation = 806.100(Ft.)
Difference in elevation = 7.980(Ft.)
Slope = 0.04560 \text{ s(percent)} = 4.56
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 = 2.746(In/Hr) for a 10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.881
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.380
Decimal fraction soil group C = 0.620
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 64.06
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 0.871(CFS)
Total initial stream area = 0.360(Ac.)
Pervious area fraction = 0.100
End of computations, total study area =
                                              0.36 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number = 64.1
```

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Riverside County Rational Hydrology Program
CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
     Rational Hydrology Study Date: 11/14/24 File:240506Ap25.out
-----
******* Hydrology Study Control Information *******
English (in-lb) Units used in input data file
______
Program License Serial Number 6113
Area A: Proposed 25-year
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual
Storm event (year) = 25.00 Antecedent Moisture Condition = 2
Standard intensity-duration curves data (Plate D-4.1)
For the [ Riverside ] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.700(In/Hr)
100 year storm 10 minute intensity = 2.680(In/Hr)
100 year storm 60 minute intensity = 1.000(In/Hr)
Storm event year = 25.0
Calculated rainfall intensity data:
1 hour intensity = 0.819(In/Hr)
Slope of intensity duration curve = 0.5500
Process from Point/Station 100.000 to Point/Station 101.000
**** INITIAL AREA EVALUATION ****
Initial area flow distance = 175.000(Ft.)
Top (of initial area) elevation = 814.080(Ft.)
Bottom (of initial area) elevation = 806.100(Ft.)
Difference in elevation = 7.980(Ft.)
Slope = 0.04560 \text{ s(percent)} = 4.56
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 = 3.214(In/Hr) for a 25.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.883
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.380
Decimal fraction soil group C = 0.620
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 64.06
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 1.022(CFS)
Total initial stream area = 0.360(Ac.)
Pervious area fraction = 0.100
End of computations, total study area =
                                              0.36 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number = 64.1
```

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Riverside County Rational Hydrology Program
CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
    Rational Hydrology Study Date: 11/14/24 File:240506Ap100.out
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******* Hydrology Study Control Information *******
English (in-lb) Units used in input data file
______
Program License Serial Number 6113
Area A: Proposed 100-year
______
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 [ Riverside ] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.700(In/Hr)
100 year storm 10 minute intensity = 2.680(In/Hr)
100 year storm 60 minute intensity = 1.000(In/Hr)
Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.000(In/Hr)
Slope of intensity duration curve = 0.5500
Process from Point/Station 100.000 to Point/Station 101.000
**** INITIAL AREA EVALUATION ****
Initial area flow distance = 175.000(Ft.)
Top (of initial area) elevation = 814.080(Ft.)
Bottom (of initial area) elevation = 806.100(Ft.)
Difference in elevation = 7.980(Ft.)
Slope = 0.04560 \text{ s(percent)} = 4.56
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 = 3.922(In/Hr) for a 100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.886
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.380
Decimal fraction soil group C = 0.620
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 64.06
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 1.250(CFS)
Total initial stream area = 0.360(Ac.)
Pervious area fraction = 0.100
End of computations, total study area =
                                             0.36 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number = 64.1
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Riverside County Rational Hydrology Program
CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
     Rational Hydrology Study Date: 11/14/24 File:240506Bp10.out
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******* Hydrology Study Control Information ********
English (in-lb) Units used in input data file
______
Program License Serial Number 6113
Area B: Proposed 10-year
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual
Storm event (year) = 10.00 Antecedent Moisture Condition = 1
Standard intensity-duration curves data (Plate D-4.1)
For the [ Riverside ] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.700(In/Hr)
100 year storm 10 minute intensity = 2.680(In/Hr)
100 year storm 60 minute intensity = 1.000(In/Hr)
Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.700(In/Hr)
Slope of intensity duration curve = 0.5500
Process from Point/Station 100.000 to Point/Station 101.000
**** INITIAL AREA EVALUATION ****
Initial area flow distance = 20.000(Ft.)
Top (of initial area) elevation = 850.000(Ft.)
Bottom (of initial area) elevation = 849.600(Ft.)
Difference in elevation = 0.400(Ft.)
Slope = 0.02000 \text{ s(percent)} = 2.00
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 = 2.746(In/Hr) for a 10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.866
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.380
Decimal fraction soil group C = 0.620
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1) = 44.06
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 0.071(CFS)
Total initial stream area = 0.030(Ac.)
Pervious area fraction = 0.100
End of computations, total study area =
                                              0.03 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number = 64.1
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Riverside County Rational Hydrology Program
CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
     Rational Hydrology Study Date: 11/14/24 File:240506Bp25.out
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******* Hydrology Study Control Information ********
English (in-lb) Units used in input data file
______
Program License Serial Number 6113
Area B: Proposed 25-year
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual
Storm event (year) = 25.00 Antecedent Moisture Condition = 1
Standard intensity-duration curves data (Plate D-4.1)
For the [ Riverside ] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.700(In/Hr)
100 year storm 10 minute intensity = 2.680(In/Hr)
100 year storm 60 minute intensity = 1.000(In/Hr)
Storm event year = 25.0
Calculated rainfall intensity data:
1 hour intensity = 0.819(In/Hr)
Slope of intensity duration curve = 0.5500
Process from Point/Station 100.000 to Point/Station 101.000
**** INITIAL AREA EVALUATION ****
Initial area flow distance = 20.000(Ft.)
Top (of initial area) elevation = 850.000(Ft.)
Bottom (of initial area) elevation = 849.600(Ft.)
Difference in elevation = 0.400(Ft.)
Slope = 0.02000 \text{ s(percent)} = 2.00
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 = 3.214(In/Hr) for a 25.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.869
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.380
Decimal fraction soil group C = 0.620
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1) = 44.06
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 0.084(CFS)
Total initial stream area = 0.030(Ac.)
Pervious area fraction = 0.100
End of computations, total study area =
                                              0.03 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number = 64.1
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Riverside County Rational Hydrology Program
CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
    Rational Hydrology Study Date: 11/14/24 File:240506Bp100.out
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******* Hydrology Study Control Information *******
English (in-lb) Units used in input data file
______
Program License Serial Number 6113
Area B: Proposed 100-year
______
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 [ Riverside ] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.700(In/Hr)
100 year storm 10 minute intensity = 2.680(In/Hr)
100 year storm 60 minute intensity = 1.000(In/Hr)
Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.000(In/Hr)
Slope of intensity duration curve = 0.5500
Process from Point/Station 100.000 to Point/Station 101.000
**** INITIAL AREA EVALUATION ****
Initial area flow distance = 20.000(Ft.)
Top (of initial area) elevation = 850.000(Ft.)
Bottom (of initial area) elevation = 849.600(Ft.)
Difference in elevation = 0.400(Ft.)
Slope = 0.02000 \text{ s(percent)} = 2.00
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 = 3.922(In/Hr) for a 100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.886
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.380
Decimal fraction soil group C = 0.620
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 64.06
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 0.104(CFS)
Total initial stream area = 0.030(Ac.)
Pervious area fraction = 0.100
End of computations, total study area =
                                             0.03 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number = 64.1
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Riverside County Rational Hydrology Program
CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
     Rational Hydrology Study Date: 11/15/24 File:240506Cp10.out
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******* Hydrology Study Control Information ********
English (in-lb) Units used in input data file
______
Program License Serial Number 6113
Area C: Proposed 10-year
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 [ Riverside ] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.700(In/Hr)
100 year storm 10 minute intensity = 2.680(In/Hr)
100 year storm 60 minute intensity = 1.000(In/Hr)
Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.700(In/Hr)
Slope of intensity duration curve = 0.5500
Process from Point/Station 100.000 to Point/Station 101.000
**** INITIAL AREA EVALUATION ****
Initial area flow distance = 20.000(Ft.)
Top (of initial area) elevation = 850.000(Ft.)
Bottom (of initial area) elevation = 849.600(Ft.)
Difference in elevation = 0.400(Ft.)
Slope = 0.02000 \text{ s(percent)} = 2.00
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 = 2.746(In/Hr) for a 10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.881
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.380
Decimal fraction soil group C = 0.620
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 64.06
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 0.145(CFS)
Total initial stream area = 0.060(Ac.)
Pervious area fraction = 0.100
End of computations, total study area =
                                              0.06 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number = 64.1
```

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Riverside County Rational Hydrology Program
CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
     Rational Hydrology Study Date: 11/14/24 File:240506Cp25.out
-----
******* Hydrology Study Control Information ********
English (in-lb) Units used in input data file
______
Program License Serial Number 6113
Area C: Proposed 25-year
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual
Storm event (year) = 25.00 Antecedent Moisture Condition = 2
Standard intensity-duration curves data (Plate D-4.1)
For the [ Riverside ] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.700(In/Hr)
100 year storm 10 minute intensity = 2.680(In/Hr)
100 year storm 60 minute intensity = 1.000(In/Hr)
Storm event year = 25.0
Calculated rainfall intensity data:
1 hour intensity = 0.819(In/Hr)
Slope of intensity duration curve = 0.5500
Process from Point/Station 100.000 to Point/Station 101.000
**** INITIAL AREA EVALUATION ****
Initial area flow distance = 36.000(Ft.)
Top (of initial area) elevation = 850.000(Ft.)
Bottom (of initial area) elevation = 849.300(Ft.)
Difference in elevation = 0.700(Ft.)
Slope = 0.01944 \text{ s(percent)} = 1.94
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 = 3.214(In/Hr) for a 25.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.883
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.380
Decimal fraction soil group C = 0.620
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 64.06
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 0.170(CFS)
Total initial stream area = 0.060(Ac.)
Pervious area fraction = 0.100
End of computations, total study area =
                                              0.06 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number = 64.1
```

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Riverside County Rational Hydrology Program
CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
    Rational Hydrology Study Date: 11/14/24 File:240506Cp100.out
.-----
******* Hydrology Study Control Information *******
English (in-lb) Units used in input data file
______
Program License Serial Number 6113
Area C: Proposed 100-year
______
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 [ Riverside ] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.700(In/Hr)
100 year storm 10 minute intensity = 2.680(In/Hr)
100 year storm 60 minute intensity = 1.000(In/Hr)
Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.000(In/Hr)
Slope of intensity duration curve = 0.5500
Process from Point/Station 100.000 to Point/Station 101.000
**** INITIAL AREA EVALUATION ****
Initial area flow distance = 36.000(Ft.)
Top (of initial area) elevation = 850.000(Ft.)
Bottom (of initial area) elevation = 849.300(Ft.)
Difference in elevation = 0.700(Ft.)
Slope = 0.01944 \text{ s(percent)} = 1.94
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 = 3.922(In/Hr) for a 100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.886
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.380
Decimal fraction soil group C = 0.620
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 64.06
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 0.208(CFS)
Total initial stream area = 0.060(Ac.)
Pervious area fraction = 0.100
End of computations, total study area =
                                             0.06 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number = 64.1
```

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Riverside County Rational Hydrology Program
CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
     Rational Hydrology Study Date: 11/14/24 File:240506Dp10.out
-----
******* Hydrology Study Control Information ********
English (in-lb) Units used in input data file
______
Program License Serial Number 6113
Area D: Proposed 10-year
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 [ Riverside ] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.700(In/Hr)
100 year storm 10 minute intensity = 2.680(In/Hr)
100 year storm 60 minute intensity = 1.000(In/Hr)
Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.700(In/Hr)
Slope of intensity duration curve = 0.5500
Process from Point/Station 100.000 to Point/Station 101.000
**** INITIAL AREA EVALUATION ****
Initial area flow distance = 91.000(Ft.)
Top (of initial area) elevation = 806.420(Ft.)
Bottom (of initial area) elevation = 803.430(Ft.)
Difference in elevation = 2.990(Ft.)
Slope = 0.03286 \text{ s(percent)} = 3.29
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 = 2.746(In/Hr) for a 10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.881
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.380
Decimal fraction soil group C = 0.620
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 64.06
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 0.145(CFS)
Total initial stream area = 0.060(Ac.)
Pervious area fraction = 0.100
End of computations, total study area =
                                              0.06 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number = 64.1
```

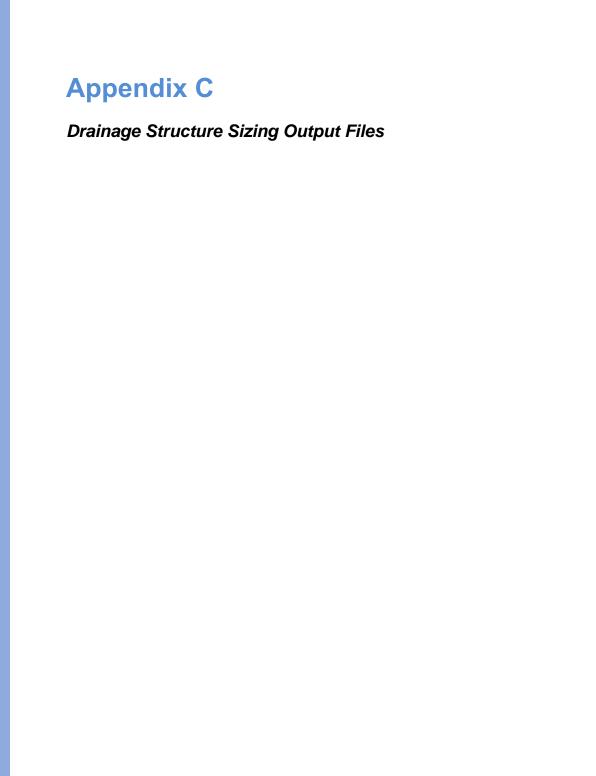
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Riverside County Rational Hydrology Program
CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
     Rational Hydrology Study Date: 11/14/24 File:240506Dp25.out
-----
******* Hydrology Study Control Information ********
English (in-lb) Units used in input data file
______
Program License Serial Number 6113
Area D: Proposed 25-year
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual
Storm event (year) = 25.00 Antecedent Moisture Condition = 2
Standard intensity-duration curves data (Plate D-4.1)
For the [ Riverside ] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.700(In/Hr)
100 year storm 10 minute intensity = 2.680(In/Hr)
100 year storm 60 minute intensity = 1.000(In/Hr)
Storm event year = 25.0
Calculated rainfall intensity data:
1 hour intensity = 0.819(In/Hr)
Slope of intensity duration curve = 0.5500
Process from Point/Station 100.000 to Point/Station 101.000
**** INITIAL AREA EVALUATION ****
Initial area flow distance = 91.000(Ft.)
Top (of initial area) elevation = 806.420(Ft.)
Bottom (of initial area) elevation = 803.430(Ft.)
Difference in elevation = 2.990(Ft.)
Slope = 0.03286 \text{ s(percent)} = 3.29
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 = 3.214(In/Hr) for a 25.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.883
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.380
Decimal fraction soil group C = 0.620
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 64.06
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 0.170(CFS)
Total initial stream area = 0.060(Ac.)
Pervious area fraction = 0.100
End of computations, total study area =
                                              0.06 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number = 64.1
```

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Riverside County Rational Hydrology Program
CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
    Rational Hydrology Study Date: 11/14/24 File:240506Dp100.out
-----
******* Hydrology Study Control Information *******
English (in-lb) Units used in input data file
______
Program License Serial Number 6113
Area D: Proposed 100-year
______
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 [ Riverside ] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.700(In/Hr)
100 year storm 10 minute intensity = 2.680(In/Hr)
100 year storm 60 minute intensity = 1.000(In/Hr)
Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.000(In/Hr)
Slope of intensity duration curve = 0.5500
Process from Point/Station 100.000 to Point/Station 101.000
**** INITIAL AREA EVALUATION ****
Initial area flow distance = 91.000(Ft.)
Top (of initial area) elevation = 806.420(Ft.)
Bottom (of initial area) elevation = 803.430(Ft.)
Difference in elevation = 2.990(Ft.)
Slope = 0.03286 \text{ s(percent)} = 3.29
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 = 3.922(In/Hr) for a 100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.886
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.380
Decimal fraction soil group C = 0.620
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 64.06
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 0.208(CFS)
Total initial stream area = 0.060(Ac.)
Pervious area fraction = 0.100
End of computations, total study area =
                                             0.06 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number = 64.1
```

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Riverside County Rational Hydrology Program
CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
     Rational Hydrology Study Date: 11/14/24 File:240506Ep10.out
-----
******* Hydrology Study Control Information *******
English (in-lb) Units used in input data file
______
Program License Serial Number 6113
Area e: Proposed 10-year
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 [ Riverside ] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.700(In/Hr)
100 year storm 10 minute intensity = 2.680(In/Hr)
100 year storm 60 minute intensity = 1.000(In/Hr)
Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.700(In/Hr)
Slope of intensity duration curve = 0.5500
Process from Point/Station 100.000 to Point/Station 101.000
**** INITIAL AREA EVALUATION ****
Initial area flow distance = 226.000(Ft.)
Top (of initial area) elevation = 810.700(Ft.)
Bottom (of initial area) elevation = 801.530(Ft.)
Difference in elevation = 9.170(Ft.)
Slope = 0.04058 \text{ s(percent)} = 4.06
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 = 2.746(In/Hr) for a 10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.881
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.380
Decimal fraction soil group C = 0.620
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 64.06
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 0.871(CFS)
Total initial stream area = 0.360(Ac.)
Pervious area fraction = 0.100
End of computations, total study area =
                                              0.36 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number = 64.1
```

```
Riverside County Rational Hydrology Program
CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
     Rational Hydrology Study Date: 11/14/24 File:240506Ep25.out
-----
****** Hydrology Study Control Information *******
English (in-lb) Units used in input data file
______
Program License Serial Number 6113
Area E: Proposed 25-year
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual
Storm event (year) = 25.00 Antecedent Moisture Condition = 2
Standard intensity-duration curves data (Plate D-4.1)
For the [ Riverside ] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.700(In/Hr)
100 year storm 10 minute intensity = 2.680(In/Hr)
100 year storm 60 minute intensity = 1.000(In/Hr)
Storm event year = 25.0
Calculated rainfall intensity data:
1 hour intensity = 0.819(In/Hr)
Slope of intensity duration curve = 0.5500
Process from Point/Station 100.000 to Point/Station 101.000
**** INITIAL AREA EVALUATION ****
Initial area flow distance = 226.000(Ft.)
Top (of initial area) elevation = 810.700(Ft.)
Bottom (of initial area) elevation = 801.530(Ft.)
Difference in elevation = 9.170(Ft.)
Slope = 0.04058 \text{ s(percent)} = 4.06
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 = 3.214(In/Hr) for a 25.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.883
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.380
Decimal fraction soil group C = 0.620
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 64.06
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 1.022(CFS)
Total initial stream area = 0.360(Ac.)
Pervious area fraction = 0.100
End of computations, total study area =
                                              0.36 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number = 64.1
```

```
Riverside County Rational Hydrology Program
CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
    Rational Hydrology Study Date: 11/14/24 File:240506Ep100.out
-----
******* Hydrology Study Control Information *******
English (in-lb) Units used in input data file
______
Program License Serial Number 6113
Area E: Proposed 100-year
______
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 [ Riverside ] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.700(In/Hr)
100 year storm 10 minute intensity = 2.680(In/Hr)
100 year storm 60 minute intensity = 1.000(In/Hr)
Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.000(In/Hr)
Slope of intensity duration curve = 0.5500
Process from Point/Station 100.000 to Point/Station 101.000
**** INITIAL AREA EVALUATION ****
Initial area flow distance = 226.000(Ft.)
Top (of initial area) elevation = 810.700(Ft.)
Bottom (of initial area) elevation = 801.530(Ft.)
Difference in elevation = 9.170(Ft.)
Slope = 0.04058 \text{ s(percent)} = 4.06
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 = 3.922(In/Hr) for a 100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.886
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.380
Decimal fraction soil group C = 0.620
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 64.06
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 1.250(CFS)
Total initial stream area = 0.360(Ac.)
Pervious area fraction = 0.100
End of computations, total study area =
                                             0.36 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number = 64.1
```

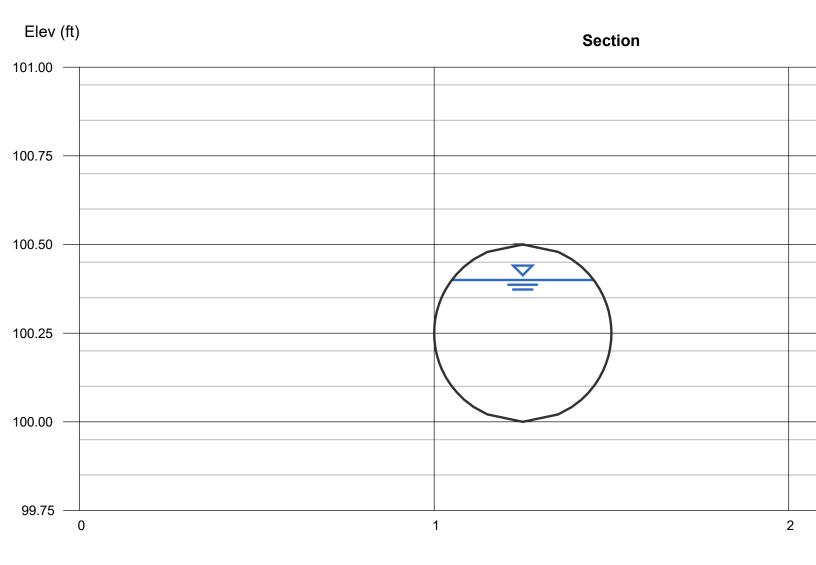


Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Thursday, Nov 14 2024

Area A

Circular		Highlighted	
Diameter (ft)	= 0.50	Depth (ft)	= 0.40
		Q (cfs)	= 1.020
		Area (sqft)	= 0.17
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 6.06
Slope (%)	= 2.50	Wetted Perim (ft)	= 1.11
N-Value	= 0.011	Crit Depth, Yc (ft)	= 0.48
		Top Width (ft)	= 0.40
Calculations		EGL (ft)	= 0.97
Compute by:	Known Q	, ,	
Known Q (cfs)	= 1.02		

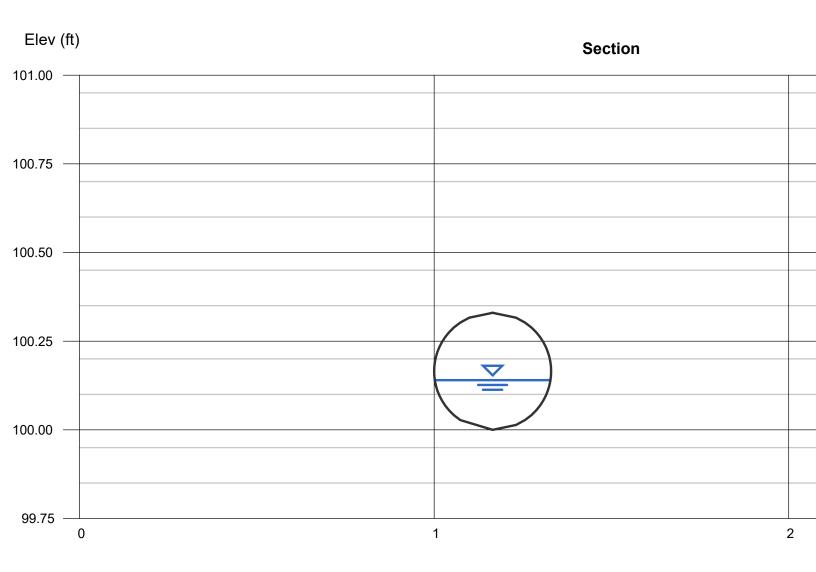


Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Thursday, Nov 14 2024

Area B

Circular		Highlighted	
Diameter (ft)	= 0.33	Depth (ft)	= 0.14
		Q (cfs)	= 0.080
		Area (sqft)	= 0.03
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 2.31
Slope (%)	= 1.00	Wetted Perim (ft)	= 0.47
N-Value	= 0.011	Crit Depth, Yc (ft)	= 0.16
		Top Width (ft)	= 0.33
Calculations		EGL (ft)	= 0.22
Compute by:	Known Q		
Known Q (cfs)	= 0.08		

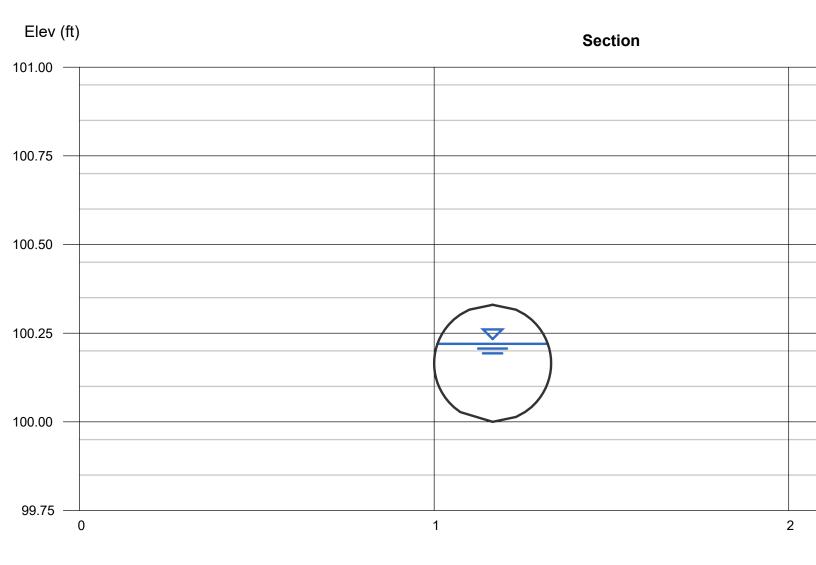


Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Thursday, Nov 14 2024

Area C

Circular		Highlighted	
Diameter (ft)	= 0.33	Depth (ft)	= 0.22
		Q (cfs)	= 0.170
		Area (sqft)	= 0.06
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 2.80
Slope (%)	= 1.00	Wetted Perim (ft)	= 0.63
N-Value	= 0.011	Crit Depth, Yc (ft)	= 0.24
		Top Width (ft)	= 0.31
Calculations		EGL (ft)	= 0.34
Compute by:	Known Q		
Known Q (cfs)	= 0.17		

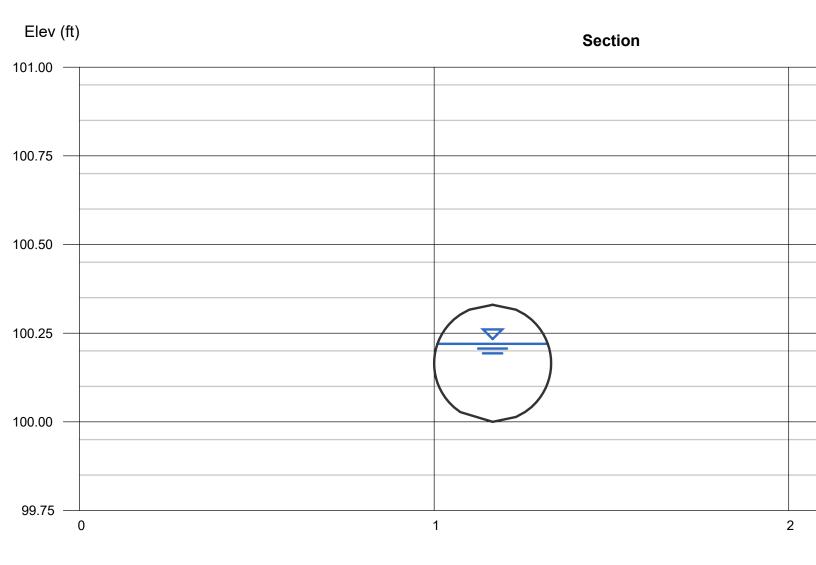


Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Thursday, Nov 14 2024

Area D

Circular		Highlighted	
Diameter (ft)	= 0.33	Depth (ft)	= 0.22
		Q (cfs)	= 0.170
		Area (sqft)	= 0.06
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 2.80
Slope (%)	= 1.00	Wetted Perim (ft)	= 0.63
N-Value	= 0.011	Crit Depth, Yc (ft)	= 0.24
		Top Width (ft)	= 0.31
Calculations		EGL (ft)	= 0.34
Compute by:	Known Q		
Known Q (cfs)	= 0.17		

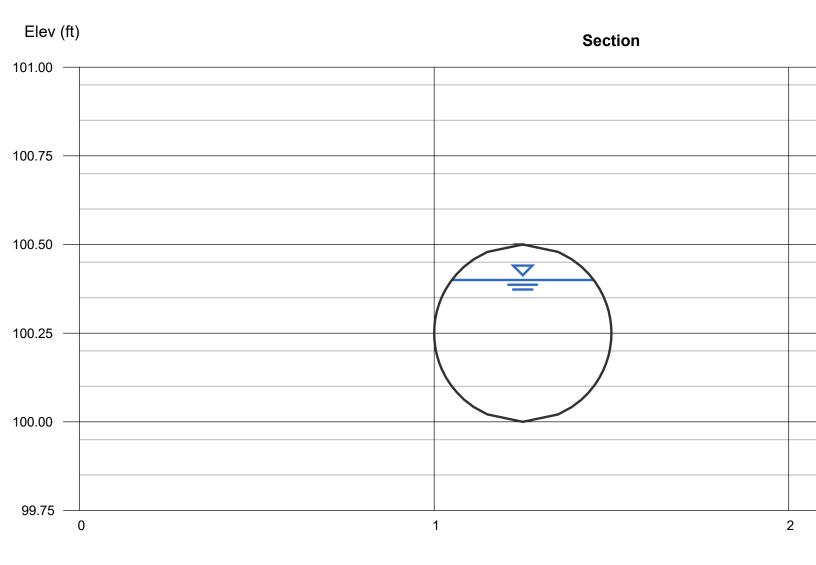


Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Thursday, Nov 14 2024

Area E

Circular		Highlighted	
Diameter (ft)	= 0.50	Depth (ft)	= 0.40
. ,		Q (cfs)	= 1.020
		Area (sqft)	= 0.17
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 6.06
Slope (%)	= 2.50	Wetted Perim (ft)	= 1.11
N-Value	= 0.011	Crit Depth, Yc (ft)	= 0.48
		Top Width (ft)	= 0.40
Calculations		EGL (ft)	= 0.97
Compute by:	Known Q		
Known Q (cfs)	= 1.02		

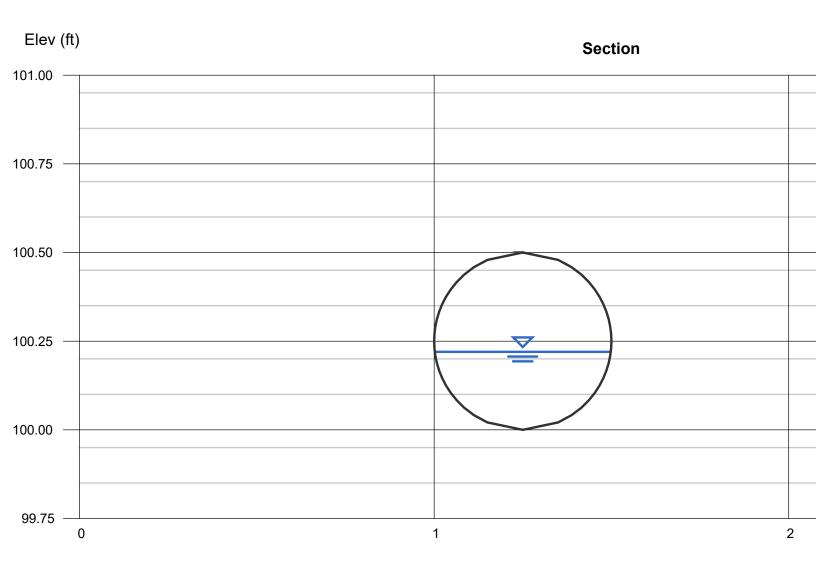


Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Thursday, Nov 14 2024

Area B + C

Circular		Highlighted	
Diameter (ft)	= 0.50	Depth (ft)	= 0.22
		Q (cfs)	= 0.250
		Area (sqft)	= 0.08
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 2.98
Slope (%)	= 1.00	Wetted Perim (ft)	= 0.73
N-Value	= 0.011	Crit Depth, Yc (ft)	= 0.26
		Top Width (ft)	= 0.50
Calculations		EGL (ft)	= 0.36
Compute by:	Known Q		
Known Q (cfs)	= 0.25		

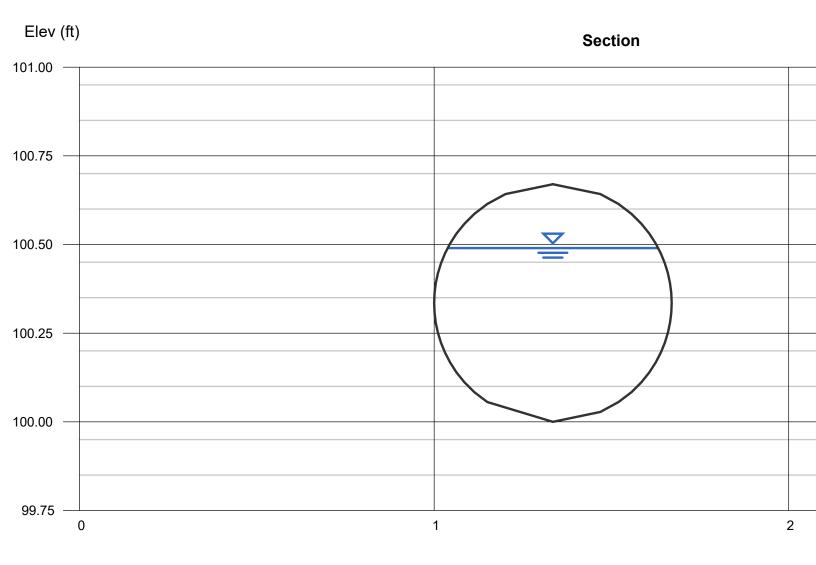


Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Thursday, Nov 14 2024

Area A + B + C

Circular		Highlighted	
Diameter (ft)	= 0.67	Depth (ft)	= 0.49
. ,		Q (cfs)	= 1.280
		Area (sqft)	= 0.28
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 4.62
Slope (%)	= 1.00	Wetted Perim (ft)	= 1.38
N-Value	= 0.011	Crit Depth, Yc (ft)	= 0.54
		Top Width (ft)	= 0.59
Calculations		EGL (ft)	= 0.82
Compute by:	Known Q		
Known Q (cfs)	= 1.28		

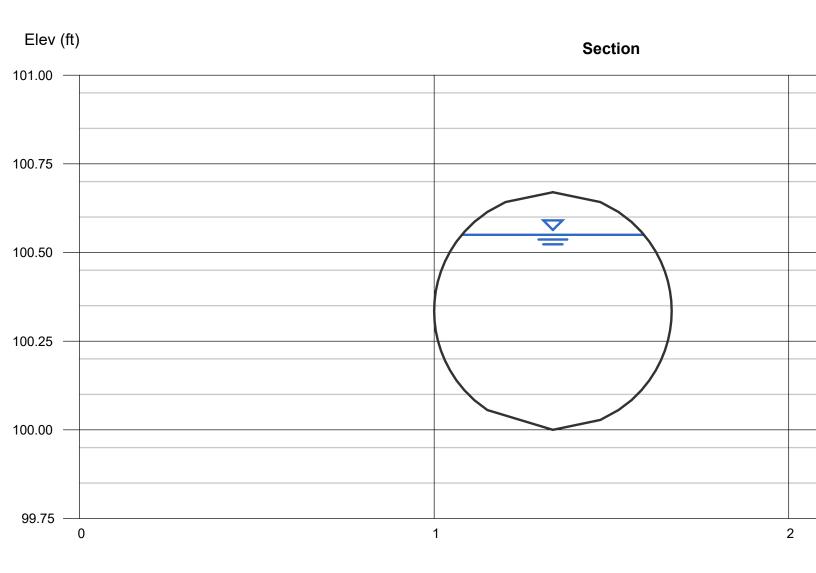


Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Thursday, Nov 14 2024

Area A + B + C + D

Circular		Highlighted	
Diameter (ft)	= 0.67	Depth (ft)	= 0.55
		Q (cfs)	= 1.446
		Area (sqft)	= 0.31
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 4.66
Slope (%)	= 1.00	Wetted Perim (ft)	= 1.52
N-Value	= 0.011	Crit Depth, Yc (ft)	= 0.57
		Top Width (ft)	= 0.51
Calculations		EGL (ft)	= 0.89
Compute by:	Known Q		
Known Q (cfs)	= 1.45		

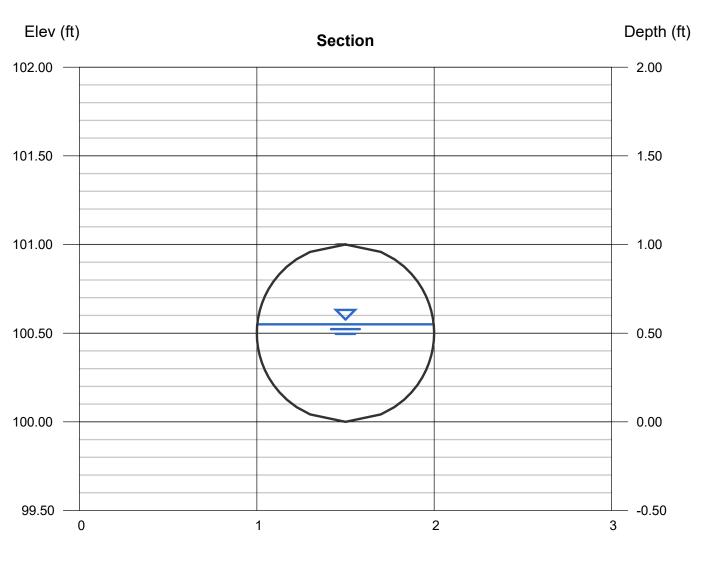


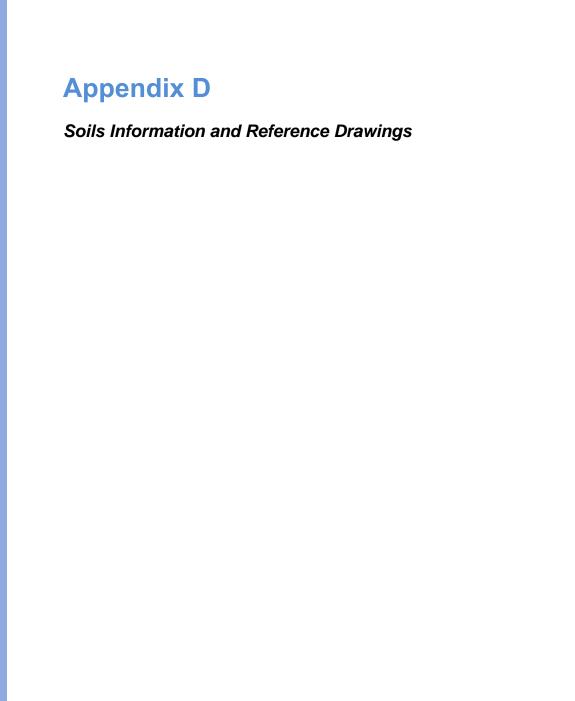
Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Thursday, Nov 14 2024

Area A + B + C + D + E

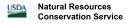
Circular		Highlighted	
Diameter (ft)	= 1.00	Depth (ft)	= 0.55
		Q (cfs)	= 2.470
		Area (sqft)	= 0.44
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 5.56
Slope (%)	= 1.00	Wetted Perim (ft)	= 1.67
N-Value	= 0.011	Crit Depth, Yc (ft)	= 0.68
		Top Width (ft)	= 0.99
Calculations		EGL (ft)	= 1.03
Compute by:	Known Q		
Known Q (cfs)	= 2.47		







MAP LEGEND MAP INFORMATION The soil surveys that comprise your AOI were mapped at Area of Interest (AOI) Spoil Area 1:15,800. Area of Interest (AOI) Stony Spot â Soils Warning: Soil Map may not be valid at this scale. 0 Very Stony Spot Soil Map Unit Polygons Enlargement of maps beyond the scale of mapping can cause Wet Spot Soil Map Unit Lines misunderstanding of the detail of mapping and accuracy of soil Other Δ line placement. The maps do not show the small areas of Soil Map Unit Points contrasting soils that could have been shown at a more detailed Special Line Features **Special Point Features** Water Features Blowout \odot Please rely on the bar scale on each map sheet for map Streams and Canals Borrow Pit measurements Transportation Clay Spot × Source of Map: Natural Resources Conservation Service Rails ---Web Soil Survey URL: Closed Depression \Diamond Interstate Highways Coordinate System: Web Mercator (EPSG:3857) Gravel Pit × **US Routes** Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts Gravelly Spot Major Roads distance and area. A projection that preserves area, such as the 0 Landfill Local Roads Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required. Lava Flow Background This product is generated from the USDA-NRCS certified data as Marsh or swamp Aerial Photography of the version date(s) listed below. 杂 Mine or Quarry Soil Survey Area: Western Riverside Area, California Miscellaneous Water Survey Area Data: Version 17, Aug 30, 2024 Perennial Water Soil map units are labeled (as space allows) for map scales 1:50,000 or larger. Rock Outcrop Date(s) aerial images were photographed: Mar 14, 2022—Mar Saline Spot 17, 2022 Sandy Spot The orthophoto or other base map on which the soil lines were Severely Eroded Spot compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor Sinkhole shifting of map unit boundaries may be evident. Slide or Slip Sodic Spot



Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI	
BhC	Buchenau loam, slightly saline- alkali, 2 to 8 percent slopes	0.4	38.2%	
FaD2	Fallbrook sandy loam, 8 to 15 percent slopes, eroded	0.6	61.8%	
Totals for Area of Interest		0.9	100.0%	



Western Riverside Area, California

BhC—Buchenau loam, slightly saline-alkali, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: hcrl Elevation: 500 to 1,500 feet

Mean annual precipitation: 13 inches Mean annual air temperature: 63 degrees F

Frost-free period: 250 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Buchenau and similar soils: 85 percent Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of

the mapunit.

Description of Buchenau

Setting

Landform: Alluvial fans

Landform position (three-dimensional): Tread

Down-slope shape: Linear Across-slope shape: Linear

Parent material: Alluvium derived from mixed sources

Typical profile

H1 - 0 to 10 inches: loam H2 - 10 to 52 inches: loam H3 - 52 to 61 inches: cemented

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: 40 to 60 inches to duripan

Drainage class: Moderately well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Very low

(0.00 to 0.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Calcium carbonate, maximum content: 10 percent

Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0

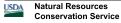
mmhos/cm)

Available water supply, 0 to 60 inches: Moderate (about 8.7

inches)

Interpretive groups

Land capability classification (irrigated): 2e Land capability classification (nonirrigated): 3e



Hydrologic Soil Group: B

Ecological site: R019XD029CA - LOAMY

Hydric soil rating: No

Minor Components

Buren

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

Greenfield

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

Arlington

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

Data Source Information

Soil Survey Area: Western Riverside Area, California

Survey Area Data: Version 17, Aug 30, 2024

Western Riverside Area, California

FaD2—Fallbrook sandy loam, 8 to 15 percent slopes, eroded

Map Unit Setting

National map unit symbol: hctp Elevation: 300 to 2,000 feet

Mean annual precipitation: 12 to 25 inches Mean annual air temperature: 59 to 64 degrees F

Frost-free period: 200 to 280 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Fallbrook and similar soils: 85 percent Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of

the mapunit.

Description of Fallbrook

Setting

Landform: Hills

Landform position (two-dimensional): Backslope Landform position (three-dimensional): Side slope

Down-slope shape: Concave Across-slope shape: Linear

Parent material: Residuum weathered from granodiorite and/or

residuum weathered from tonalite

Typical profile

H1 - 0 to 14 inches: sandy loam H2 - 14 to 24 inches: sandy clay loam H3 - 24 to 28 inches: 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: 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

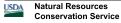
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): 4e Land capability classification (nonirrigated): 4e Hydrologic Soil Group: C

Ecological site: R019XD029CA - LOAMY

Hydric soil rating: No



Minor Components

Vista

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

Bonsall

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

Monserate

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

Buren

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

Cieneba

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

Data Source Information

Soil Survey Area: Western Riverside Area, California

Survey Area Data: Version 17, Aug 30, 2024



