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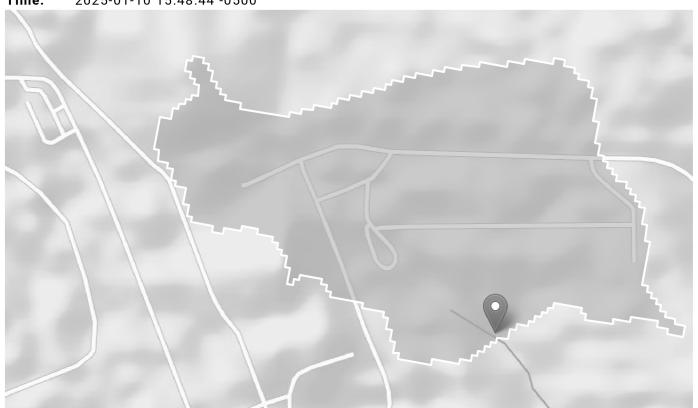
StreamStats Report

Region ID: PA

Workspace ID: PA20250110204822227000

Clicked Point (Latitude, Longitude): 40.51308, -79.19128

Time: 2025-01-10 15:48:44 -0500



Collapse All

➤ Basin Characteristics

Parameter Code	Parameter Description	Value	Unit	
DRNAREA	Area that drains to a point on a stream	0.13	square miles	

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1/10/25, 3:49 PM StreamStats

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Application Version: 4.25.0

StreamStats Services Version: 1.2.22

NSS Services Version: 2.2.1



100-Year Floodway Calculations



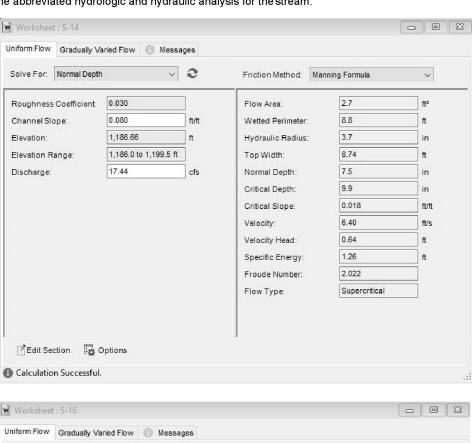
Subject: Homer City Generation LP Streams S-14 & S-16

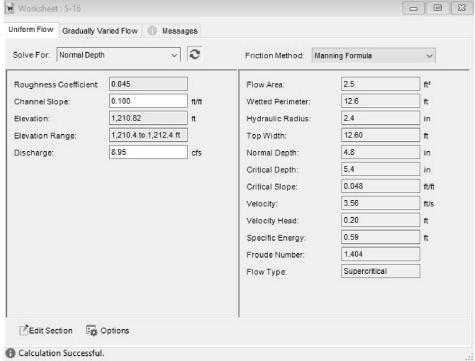
100 Year Storm Floodplain Calculations

Computed by: STM Checked by: SAM Date: January 2025

These sheets present the supporting calculations to determine the 100 year floodplain for stream crossings in the project area.

Peak flows were estimated using the SCS TR-55 method in the Hydraflow Hydrographs program. The flow depth and width was determined for the stream using Manning's equation in the Bentley FlowMaster program. Refer to the following pages for the abbreviated hydrologic and hydraulic analysis for the stream.





S.O. No.

Subject: Homer City Generation LP Streams S-14 & S-16

100 Year Storm Floodplain Calculations

Computed by: STM Checked by: SAM Date: January 2025



Curve Number, Type A hydrologic Group

30 Woods, good condition

39 Field/Pasture/open space, good condition

100 Open Water

98 Impervious/Urban

Curve Number, Type D hydrologic Group

77 Woods, good condition

80 Field/Pasture/open space, good condition

100 Open Water

98 Impervious/Urban

Drainage Area (acre)

_				Impervious/		
	Forest	Field/Open	Open Water	Urban	Total	$\mathbf{C}_{\mathbf{w}}$
S-14 (A)	1.7	2.1	0.0	1.0	4.8	51
S-14 (D)	0.0	2.4	0.0	0.0	2.4	80
S-14 (COMBINED)	1.7	4.5	0.0	1.0	7.2	58
S-16	0.4	1.1	0.0	1.1	2.6	63

Tc Calculations

S-14

95' Sheet flow @ 3%, forest, n = 0.40

24' Sheet flow @ 8%, grass, n = 0.24

22' Sheet flow @ 1%, paved, n = 0.011

587' Shallow concentrated flow @ 8%, unpaved

78' Open channel flow @ 8%, n = 0.025, A = 1.3, Wp = 4.1

S-16

50' Sheet flow @ 6%, grass, n = 0.24

194' Shallow concentrated flow @ 6.5%, unpaved

251' Open channel flow @ 9%, n = 0.025, A = 1.3, Wp = 2.0

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

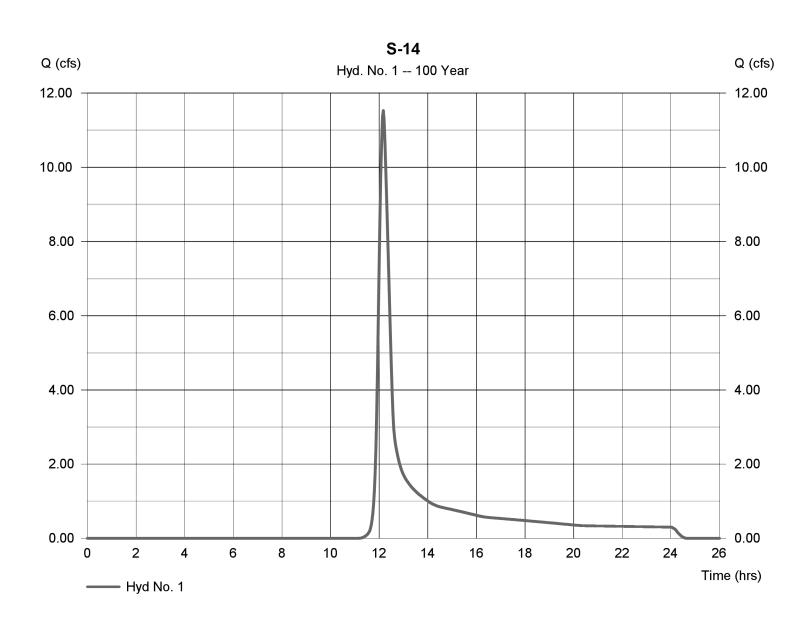
Friday, 01 / 10 / 2025

Hyd. No. 1

S-14

Hydrograph type = SCS Runoff Peak discharge = 11.53 cfsStorm frequency = 100 yrsTime to peak = 12.17 hrsTime interval = 2 min Hyd. volume = 45.938 cuft Drainage area = 7.190 acCurve number = 58* Basin Slope = 0.0 % Hydraulic length = 0 ft= 25.40 min Tc method = TR55 Time of conc. (Tc) Total precip. = 6.05 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484

^{*} Composite (Area/CN) = $[(1.700 \times 30) + (2.140 \times 39) + (0.960 \times 98) + (2.390 \times 80)] / 7.190$



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

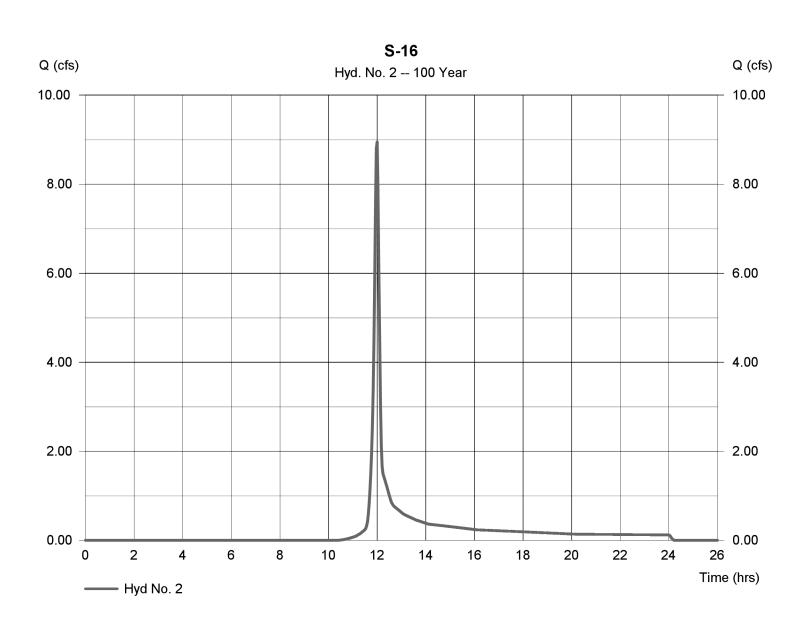
Friday, 01 / 10 / 2025

Hyd. No. 2

S-16

Hydrograph type = SCS Runoff Peak discharge $= 8.949 \, cfs$ Storm frequency = 100 yrsTime to peak = 12.00 hrsTime interval = 2 min Hyd. volume = 20.550 cuft Drainage area = 2.560 acCurve number = 63* Basin Slope = 0.0 % Hydraulic length = 0 ftTc method = TR55 Time of conc. (Tc) $= 7.10 \, \text{min}$ Total precip. = 6.05 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484

^{*} Composite (Area/CN) = $[(0.420 \times 30) + (1.040 \times 39) + (1.100 \times 98)] / 2.560$



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

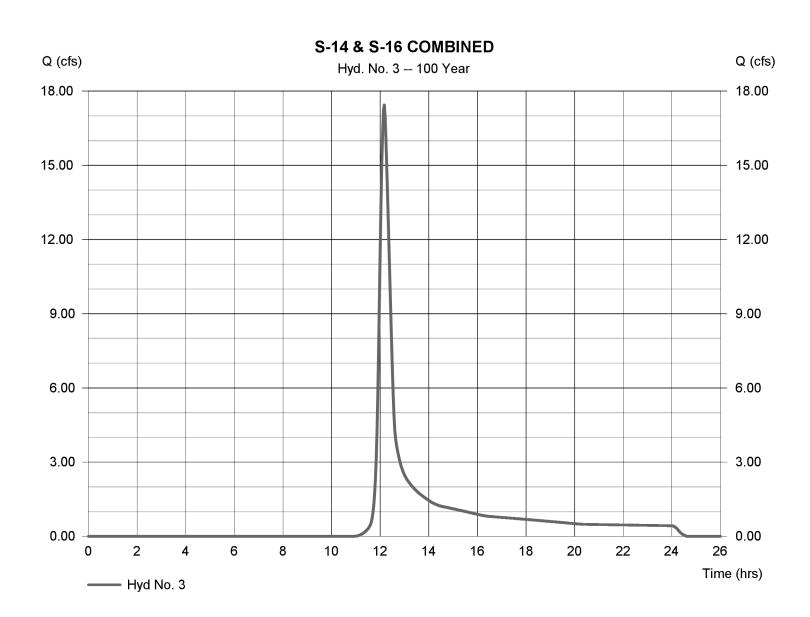
Friday, 01 / 10 / 2025

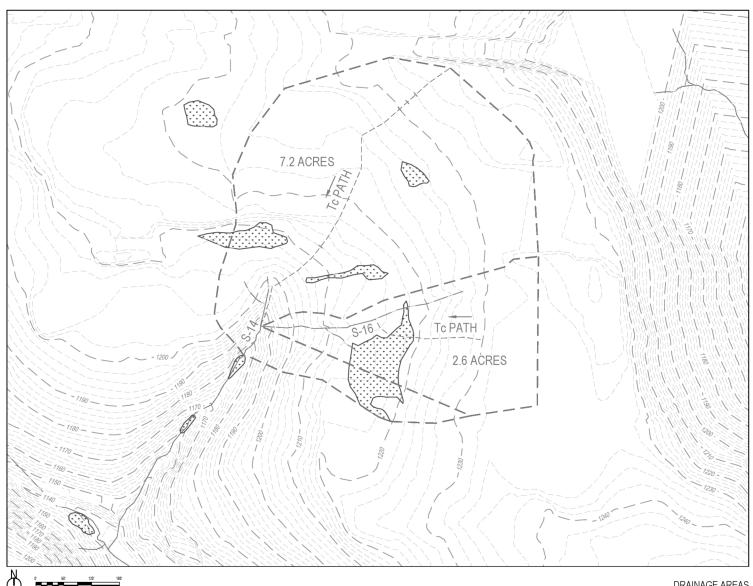
Hyd. No. 3

S-14 & S-16 COMBINED

Hydrograph type = SCS Runoff Peak discharge = 17.44 cfsStorm frequency = 100 yrsTime to peak = 12.17 hrsTime interval = 2 min Hyd. volume = 68.088 cuft Drainage area = 9.750 acCurve number = 60* Basin Slope = 0.0 % Hydraulic length = 0 ft= 25.40 min Tc method = TR55 Time of conc. (Tc) = 6.05 inTotal precip. Distribution = Type II Storm duration = 24 hrs Shape factor = 484

^{*} Composite (Area/CN) = $[(2.120 \times 30) + (3.180 \times 39) + (2.060 \times 98) + (2.390 \times 80)] / 9.750$





DRAINAGE AREAS

Table 2-2c
Runoff curve numbers for other agricultural lands $\underline{1}$

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	В	С	D
Pasture, grassland, or range—continuous forage for grazing. 2/	Poor Fair Good	68 49 39	79 69 61	86 79 74	89 84 80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	_	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. ${\mathcal Y}$	Poor Fair Good	48 35 30 4/	67 56 48	77 70 65	83 77 73
Woods—grass combination (orchard or tree farm). 5/	Poor Fair Good	57 43 32	73 65 58	82 76 72	86 82 79
Woods. 6/	Poor Fair Good	$\begin{array}{c} 45\\ 36\\ \hline 30 4 \end{array}$	66 60 55	77 73 70	83 79 77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	_	59	74	82	86

 $^{^{\}rm 1}$ $\,$ Average runoff condition, and $\rm I_a$ = 0.2S.

 $^{^2}$ $\,$ $Poor: \,$ <50%) ground cover or heavily grazed with no mulch.

Fair: 50 to 75% ground cover and not heavily grazed.

Good: > 75% ground cover and lightly or only occasionally grazed.

 $^{^3}$ *Poor*: <50% ground cover.

Fair: 50 to 75% ground cover.

Good: >75% ground cover.

 $^{^4}$ Actual curve number is less than 30; use CN = 30 for runoff computations.

⁵ CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

 $^{^6}$ Poor: Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.

Fair: Woods are grazed but not burned, and some forest litter covers the soil.

Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

Table 2-2a Runoff curve numbers for urban areas 1/

Cover description			Curve numbers for hydrologic soil group			
	Average percent	t				
Cover type and hydrologic condition	impervious area 2	/ A	В	C	D	
Fully developed urban areas (vegetation established)						
Open space (lawns, parks, golf courses, cemeteries, etc.) 3/2:						
Poor condition (grass cover < 50%)		68	79	86	89	
Fair condition (grass cover 50% to 75%)		49	69	79	_ 84	
→ Good condition (grass cover > 75%)		39	61	74	80	
Impervious areas:						
Paved parking lots, roofs, driveways, etc.						
(excluding right-of-way)		98	98	98	98	
Streets and roads:						
Paved; curbs and storm sewers (excluding						
right-of-way)		98	98	98	98	
Paved; open ditches (including right-of-way)		83	89	92	93	
Gravel (including right-of-way)		76	85	89	91	
Dirt (including right-of-way)		72	82	87	89	
Western desert urban areas:		22		~~		
Natural desert landscaping (pervious areas only) 4		63	77	85	88	
Artificial desert landscaping (impervious weed barrier,						
desert shrub with 1- to 2-inch sand or gravel mulch		oc	OC	OC	0.0	
and basin borders)		96	96	96	96	
Urban districts:	85	89	92	0.4	95	
Commercial and business		81	92 88	94 91	95 93	
Industrial Residential districts by average lot size:	12	01	00	91	95	
1/8 acre or less (town houses)	65	77	85	90	92	
1/4 acre		61	75	83	92 87	
1/3 acre		57	72	81	86	
1/2 acre		54	70	80	85	
1 acre		51	68	79	84	
2 acres		46	65	77	82	
	12	40	09	••	02	
Developing urban areas						
Newly graded areas						
(pervious areas only, no vegetation) 5/		77	86	91	94	
Idle lands (CN's are determined using cover types						
similar to those in table 2-2c).						

¹ Average runoff condition, and $I_a = 0.2S$.

² The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

 $^{^3}$ CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

⁴ Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

⁵ Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Manning's n-Values Page 1 of 1

Manning's n-Values

Pipes	Manning's n
Reinforced concrete	0.013
Vitrified clay pipe	0.013
Smooth welded pipe	0.011
Corrugated metal pipe	0.023
Polyvinyl chloride (PVC)	0.010
Natural Channels	
Gravel beds, Straight	0.025
Gravel beds, large boulders	0.040
Earth, straight, some grass	0.026
Earth, winding, no vegetation	0.030
Earth, winding	0.050
Overland Flow	
Smooth surfaces (concrete, asphalt, bare soil)	0.011
Fallow (no residue)	0.05
Cultivated soils, residue <=20%	0.06
Cultivated soils, residue >20%	0.17
Short grass	0.15
Dense grass	0.24
Bermuda grass	0.41
Light underbrush woods	0.40
Dense underbrush woods	0.80

Source: Soil Conservation Service TR-55