### **Exhibit C**



2800 Jefferson Street Napa, California 94558 707-253-1806 www.ppiengineering.com

#### **MEMORANDUM**

Date:

December 13<sup>th</sup>, 2018

To:

Patrick Ryan, Napa County Planning, Building and Environmental Services

From:

James R. Bushey, P.E.
Rachel L. Rosasco, E.I.T.

Rachel L. Rosasco, E.I.T.

Cc:

Brian Bordona, Napa County Planning, Building and Environmental Services

Re:

Darioush Estate Track I ECP – Hydrologic Analysis

2100 Curry Lane, Napa, CA 94558; APN 045-380-010

This memo transmits the findings of a hydrologic analysis for the above-referenced Track I Erosion Control Plan (ECP). HydroCAD software was used to estimate pre- and post-project runoff from watersheds containing the proposed development areas. The software uses the Natural Resource Conservation Service (NRCS) TR-20 method to calculate runoff. The analysis uses the Type IA 24-hr storm distribution and includes site-specific National Oceanic and Atmospheric Administration (NOAA) point precipitation data for the ranch.

Two (2) watersheds were delineated for the hydrologic modeling using 2-foot contours from American Aerial, Inc. and 5-foot contours from Napa County. Watershed 1 encompasses approximately 31 acres and drains directly into Kreuse Creek, which runs through the property. Watershed 2 is located south of Watershed 1 and contains approximately 12 acres that contribute flow to an unnamed blue-line stream that eventually drains to Kreuse Creek. Watersheds 1 and 2 converge and exit the property to the west where they flow into a neighboring unnamed reservoir. Please see the attached figures for the location of each watershed.

Soils within the watersheds were obtained from the NRCS Web Soil Survey and are classified as Haire loam 2-9% slopes, Hambright Rock – outcrop complex 30-75% slopes, and Sobrante loam 5-30% slopes. The Hambright Rock – outcrop complex soil group is classified as Hydrologic Soil Group (HSG) C. The remaining soils are classified as HSG D. Please see the attached figures for soil type delineations within the vicinity of each watershed.

Land use areas were initially delineated based on Napa County orthophotos. A site visit was then conducted on October 5, 2018 by Matt Bueno to ground truth the orthophotos and determine the existing land use conditions. The land use hydrologic conditions were classified based on the respective covers as poor (less than 50% cover), fair (50%-75% cover), or good (greater than or equal to 75% cover). The area has been historically grazed and is currently intermittently grazed for fire protection and fuel-load reduction purposes. The HydroCAD software analyzes the land use data along with the corresponding soil HSGs to determine a weighted Curve Number for

11713401 1 of 2 runoff calculations. Please see the attached figures for existing and proposed land use delineations.

The Time of Concentration (Tc) flow path within each watershed was determined using both American Aerial, Inc. and Napa County contours. The Tc did not change from pre- to post-project conditions for either watershed. Please see the attached figures for both the pre- and post-project Tc flow paths by watershed.

Pre- and post-project runoff calculations from the HydroCAD models for each watershed are summarized in Table 1 below. Runoff was calculated for the 2-, 10-, 50- and 100-year storms for each watershed.

Table 1. Hydrologic Analysis Summary

	Runoff (cfs)								
	W	atershe	d 1	Watershed 2					
	Pre- Project	Post- Project	Increase/ Decrease	Pre- Project	Post- Project	Increase/ Decrease			
2-Year Storm	5.98	5.98	0.00	2.77	2.77	0.00			
10-Year Storm	17.25	17.25	0.00	7.41	7.41	0.00			
50-Year Storm	30.16	30.16	0.00	12.60	12.60	0.00			
100-Year Storm	35.61	35.61	0.00	14.81	14.81	0.00			

The HydroCAD models for Watersheds 1 and 2 show no net change in runoff from pre- to post-project conditions for all storm events. This is due to the fact that neither the Curve Number nor the Time of Concentration changed for the post-project conditions in these watersheds.

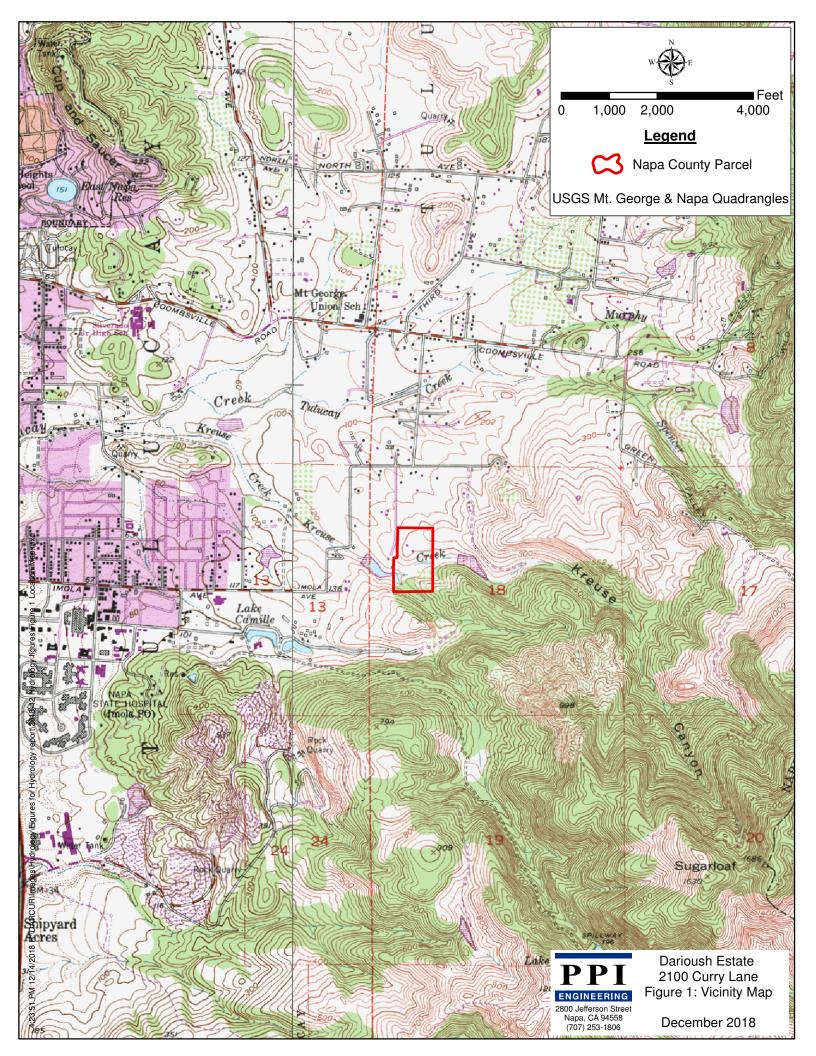
Please see the attached HydroCAD analyses for inputs, details, and summaries of the hydrologic modeling. Based on our analysis, there are no predicted runoff increases, and no negative hydrologic impacts are expected as a result of this project. The project as proposed is in compliance with Napa County's General Plan policy requiring no-net-increase in runoff.

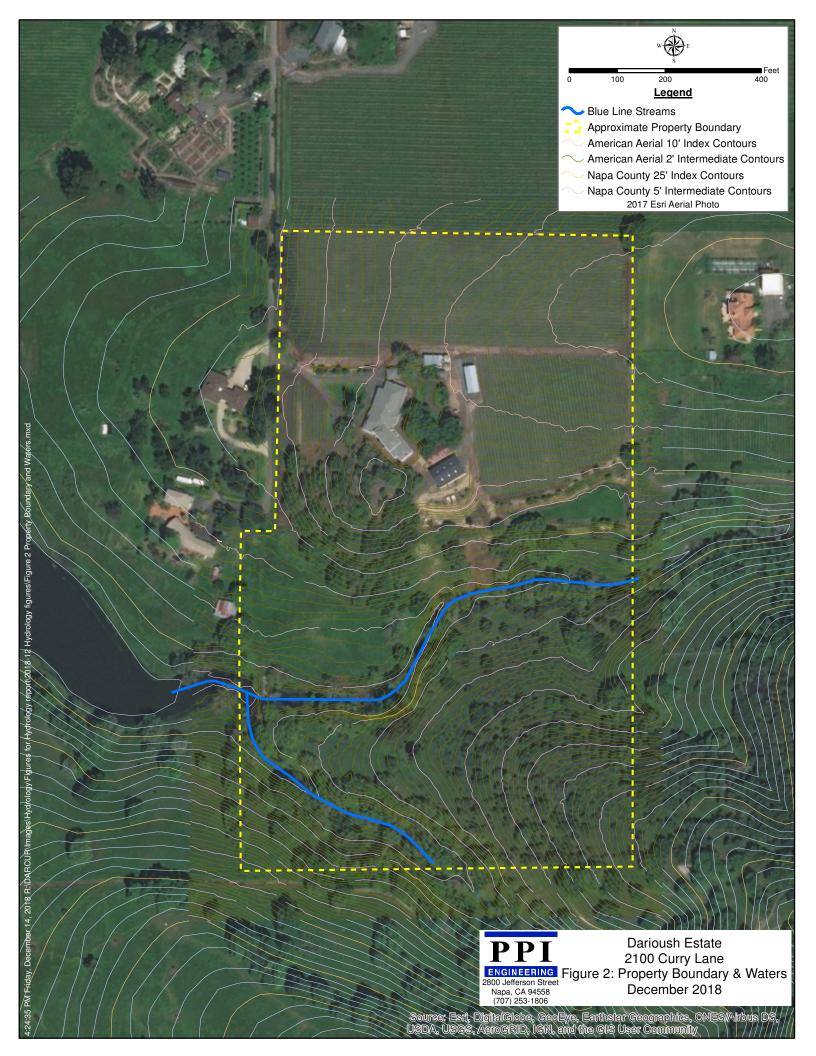


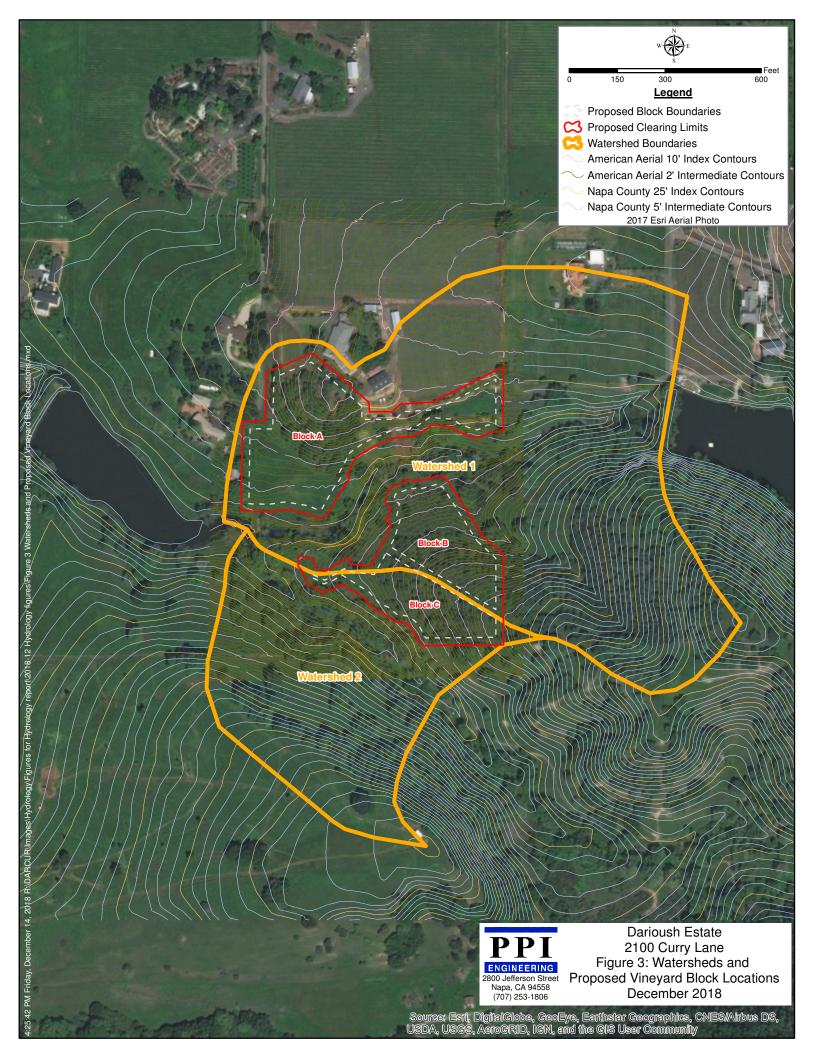
11713401 2 of 2

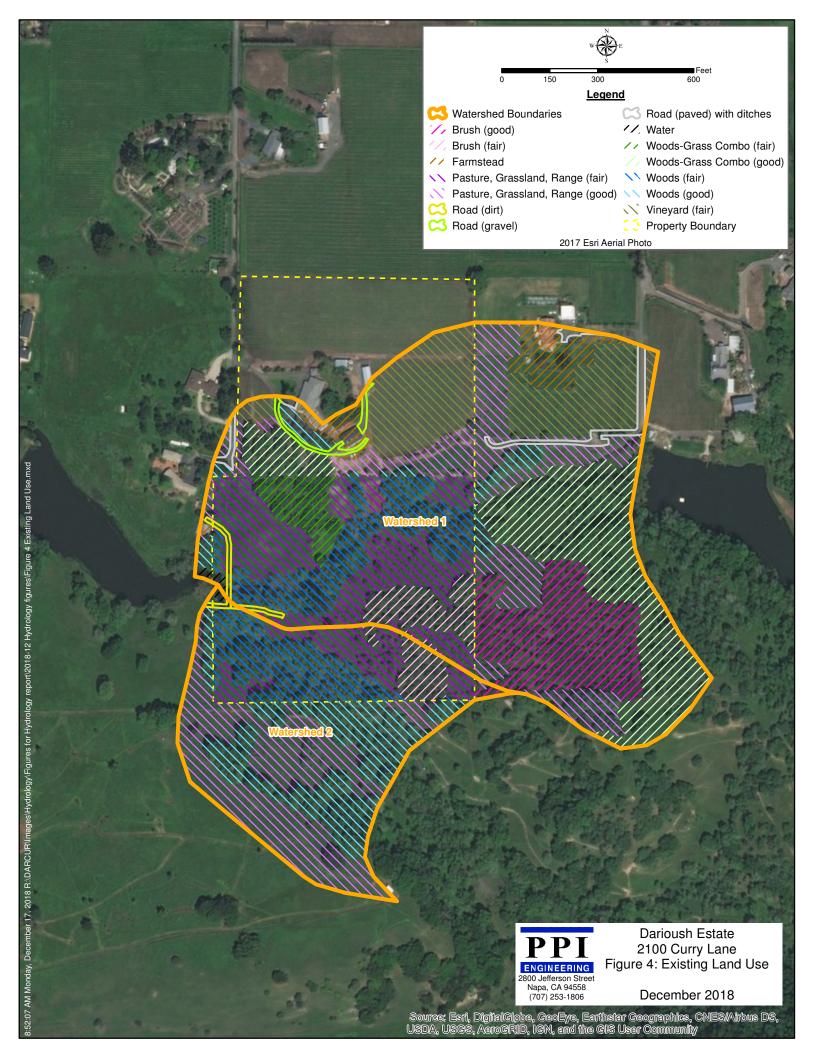
# ATTACHMENT A

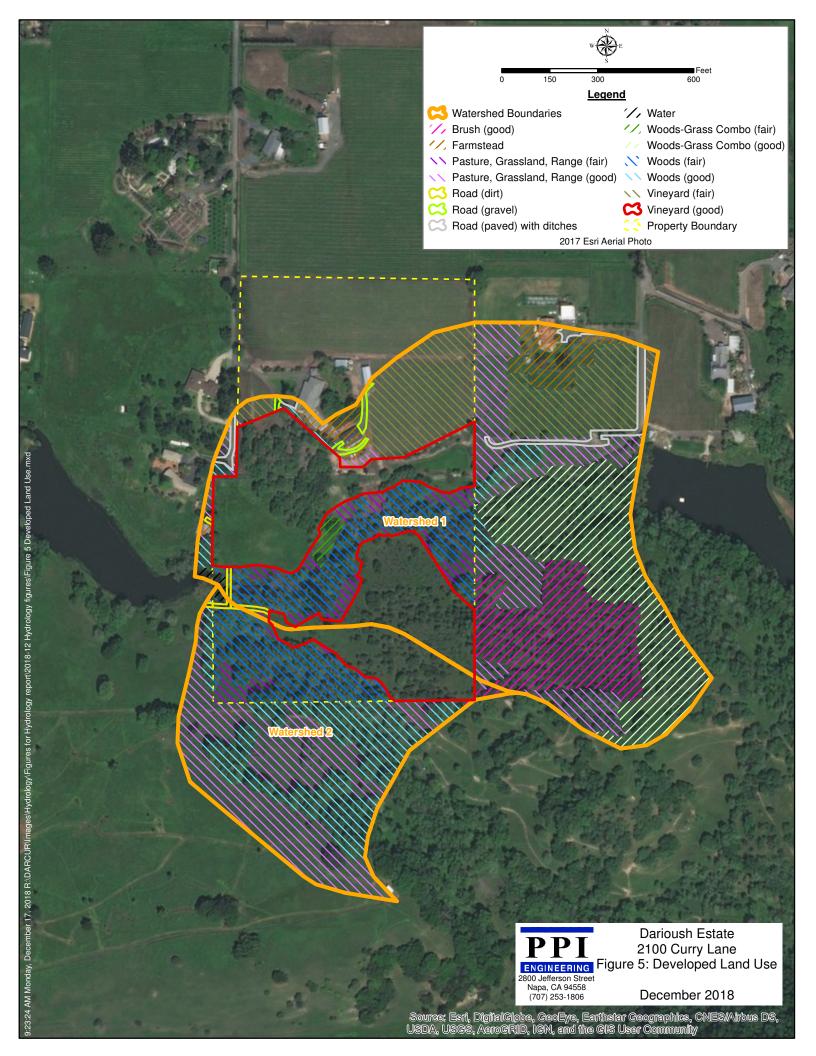
SUPPORTING FIGURES

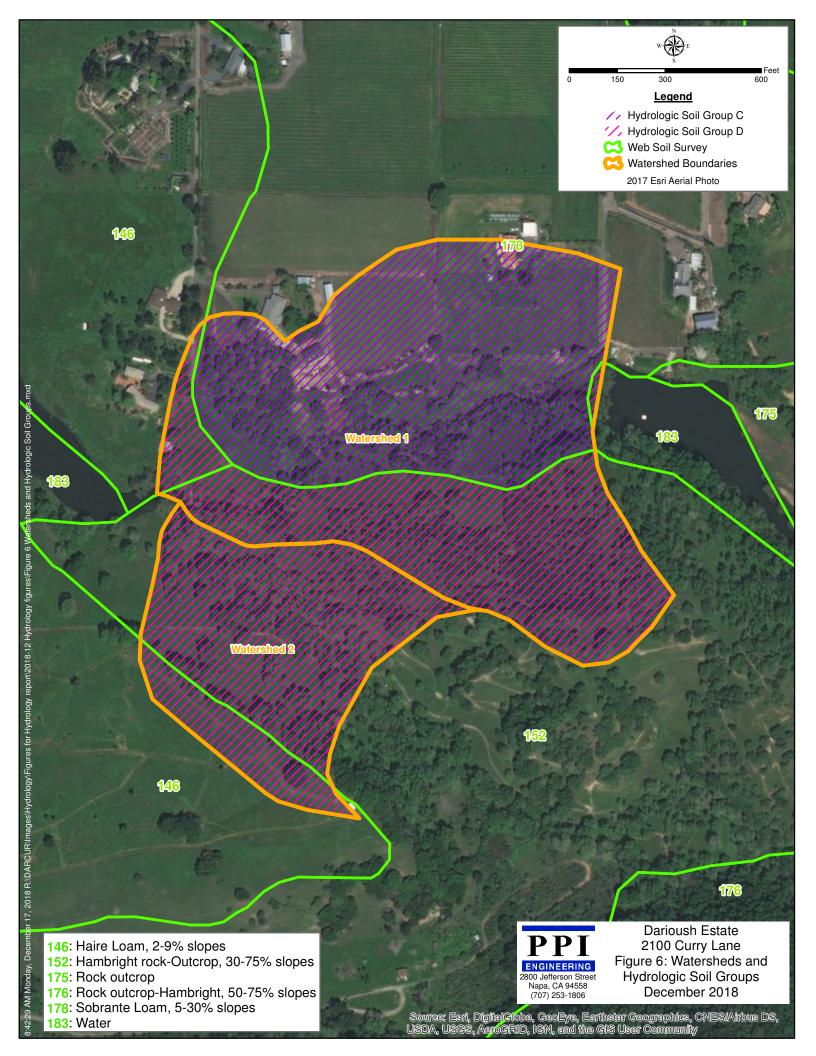


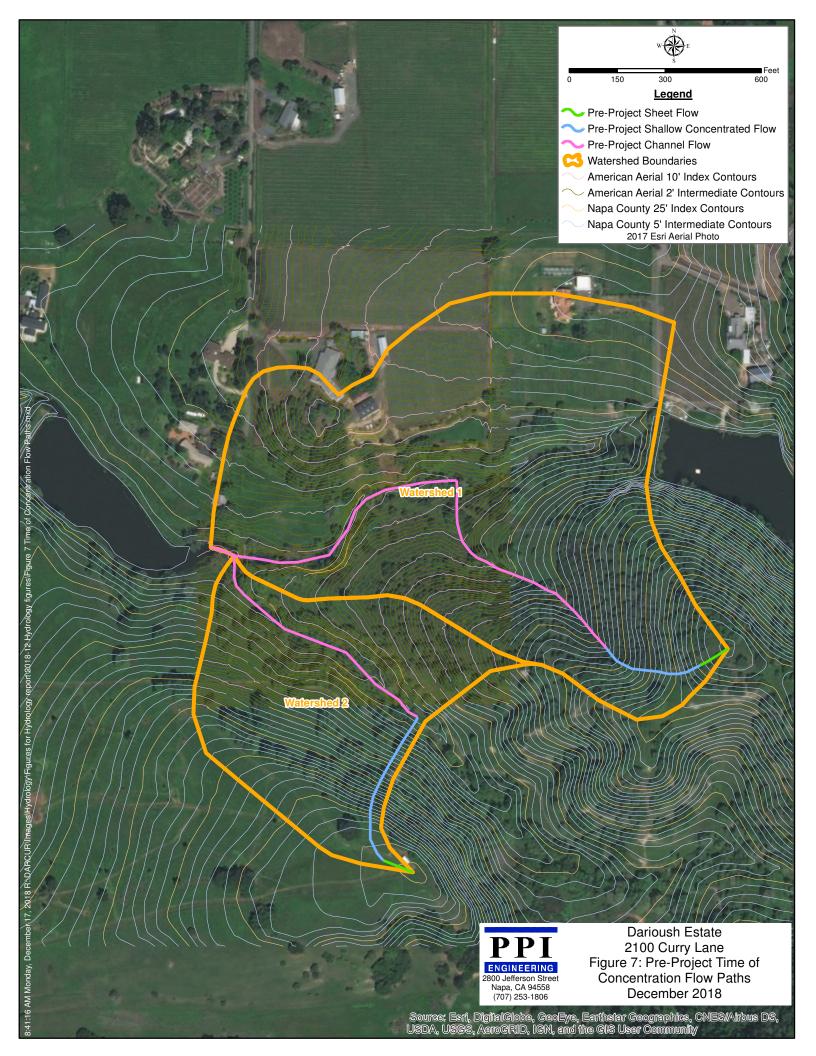


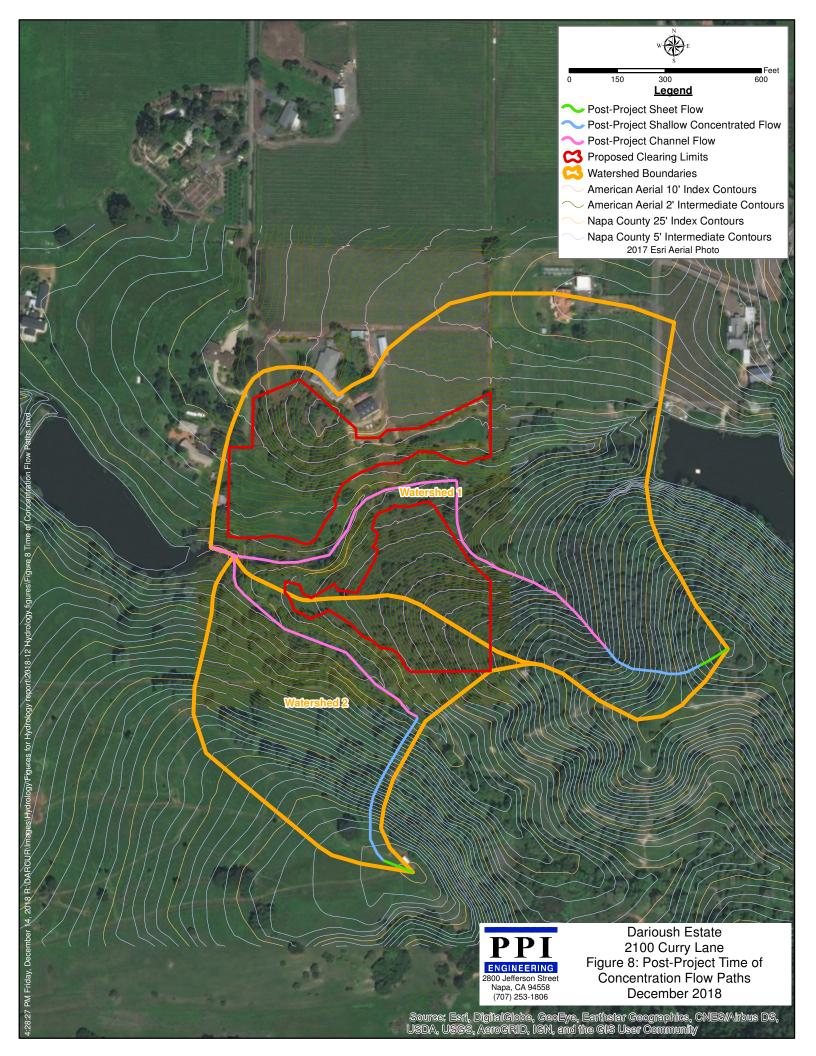












# ATTACHMENT B

**HYDROCAD ANALYSES** 

Page 1

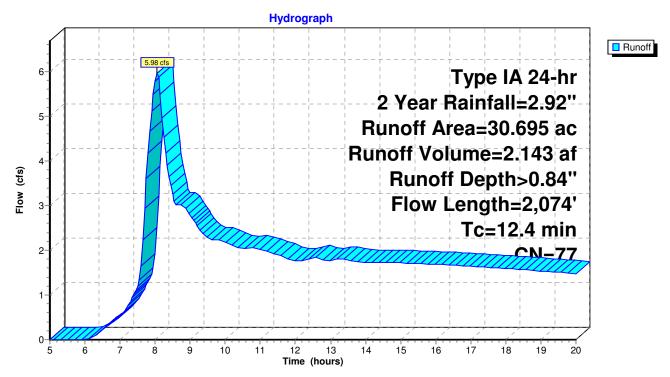
### Summary for Subcatchment WS 1: Subcat WS 1

Runoff = 5.98 cfs @ 8.06 hrs, Volume= 2.143 af, Depth> 0.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type IA 24-hr 2 Year Rainfall=2.92"

Area	(ac)	CI	N Desc	cription							
* 0.	.000	(	0 , HS	G C							
1.	.045	7	7 Brus	h, Fair, HS	SG D						
0.	.050	6	5 Brus	Brush, Good, HSG C							
3.	.580	7		Brush, Good, HSG D							
0.	.119	8	9 Dirt r	Dirt roads, HSG D							
1.	.418	8	2 Farm	Farmsteads, HSG C							
0.	.030	8	6 Farm	nsteads, H	SG D						
0.	.163	8	9 Grav	el roads, l	HSG C						
1.	.668	7	9 Past	ure/grassl	and/range,	Fair, HSG C					
2	.441	8	4 Past	ure/grassl	and/range,	Fair, HSG D					
	.089	7				Good, HSG C					
1.	.397	8				Good, HSG D					
	.418	9				nes, 50% imp, HSG C					
	.068	9				nes, 50% imp, HSG D					
	.613	7		yard, Fair,							
	.012	8		yard, Fair,							
	.090	9		er Surface							
	.661	7		ds, Fair, F							
	1.083 79 Woods, Fair, HSG D										
	.765	7		ds, Good,							
	.155	7		ds, Good,		1100.0					
	.952	70			comb., Fair,						
	.001	8		•	comb., Fair,						
	.222	7			comb., Goo						
	.656	7		_	comb., Goo	d, HSG D					
	.695	7		hted Aver							
	.362			1% Pervio							
0	.333		1.09	% Impervi	ous Area						
<b>-</b> .	1	ıı.	01	Malaali	0 ''	Describer.					
Tc	Lengt		Slope	Velocity	Capacity	Description					
(min)	(fee		(ft/ft)	(ft/sec)	(cfs)						
6.7	10	00	0.1500	0.25		Sheet Flow, Sheet					
		_				Grass: Dense n= 0.240 P2= 2.92"					
0.6	32	25	0.3000	8.82		Shallow Concentrated Flow, Shallow					
			0.4000		05.07	Unpaved Kv= 16.1 fps					
1.4	76	66	0.1200	9.38	65.67	Trap/Vee/Rect Channel Flow, Swale					
						Bot.W=3.00' D=1.00' Z= 4.0 '/' Top.W=11.00'					
a <b>-</b>	^^		0.0000	4.00	00.40	n= 0.040 Mountain streams					
3.7	88	33	0.0200	4.02	20.10	Trap/Vee/Rect Channel Flow, Stream					
						Bot.W=3.00' D=1.00' Z= 2.0 '/' Top.W=7.00'					
			<del>-</del>			n= 0.040 Mountain streams					

Page 2



Page 3

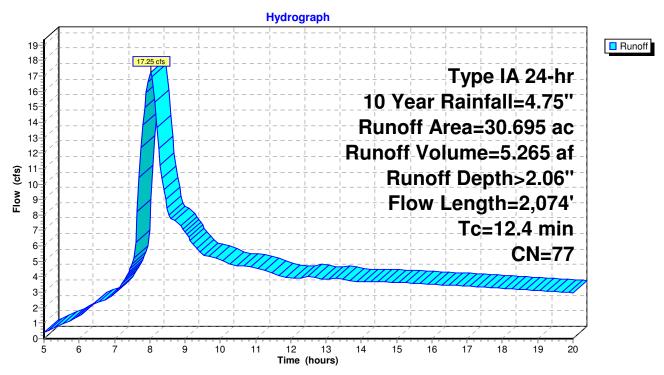
## Summary for Subcatchment WS 1: Subcat WS 1

Runoff = 17.25 cfs @ 8.04 hrs, Volume= 5.265 af, Depth> 2.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type IA 24-hr 10 Year Rainfall=4.75"

Area	(ac)	CN	Desc	ription								
	.000	0		_								
	.045	77		h, Fair, HS	SG D							
0.	.050	65		Brush, Good, HSG C								
3.	.580	73	Brus	Brush, Good, HSG D								
0.	.119	89	Dirt r	Dirt roads, HSG D								
1.	.418	82	Farm	nsteads, H	SG C							
0.	.030	86	Farm	nsteads, H	SG D							
0.	.163	89		el roads, l								
	.668	79				Fair, HSG C						
2.	.441	84				Fair, HSG D						
	.089	74				Good, HSG C						
	.397	80				Good, HSG D						
	.418	92				ies, 50% imp, HSG C						
	.068	93				ies, 50% imp, HSG D						
	.613	79		yard, Fair,								
	.012	84		yard, Fair,								
	.090	98		er Surface								
	.661	73		ds, Fair, F								
	.083	79		ds, Fair, F								
	.765	70		ds, Good,								
	.155	77		ds, Good,		1100.0						
	.952	76			omb., Fair,							
	.001	82			omb., Fair,							
	.222	72		•	comb., Goo							
	.656	79			omb., Goo	0, HSG D						
	.695	77	- 0	hted Aver								
	.362			1% Pervio								
0	.333		1.09°	% Impervi	ous Area							
<b>-</b> .		L.	01	Mala 21	0 ''	Describer						
Tc	Lengt		Slope	Velocity	Capacity	Description						
<u>(min)</u>	(feet		(ft/ft)	(ft/sec)	(cfs)							
6.7	10	0 (	0.1500	0.25		Sheet Flow, Sheet						
						Grass: Dense n= 0.240 P2= 2.92"						
0.6	32	5 (	0.3000	8.82		Shallow Concentrated Flow, Shallow						
					05.05	Unpaved Kv= 16.1 fps						
1.4	76	6 (	0.1200	9.38	65.67	Trap/Vee/Rect Channel Flow, Swale						
						Bot.W=3.00' D=1.00' Z= 4.0 '/' Top.W=11.00'						
o <del>-</del>	00		0000	4.00	00.40	n= 0.040 Mountain streams						
3.7	88	<b>3</b> (	0.0200	4.02	20.10	Trap/Vee/Rect Channel Flow, Stream						
						Bot.W=3.00' D=1.00' Z= 2.0 '/' Top.W=7.00'						
						n= 0.040 Mountain streams						

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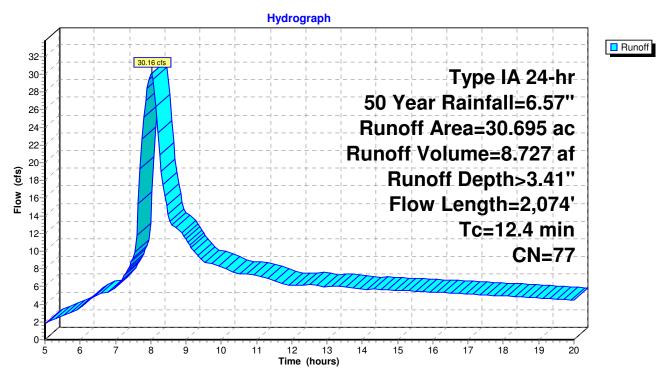
## Summary for Subcatchment WS 1: Subcat WS 1

Runoff = 30.16 cfs @ 8.03 hrs, Volume= 8.727 af, Depth> 3.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type IA 24-hr 50 Year Rainfall=6.57"

Area	(ac)	CI	N Desc	ription							
* 0	.000		0 , HS	G C							
1	.045	7	7 Brus	h, Fair, HS	SG D						
0	.050	6	5 Brus	Brush, Good, HSG C							
3	.580	7		Brush, Good, HSG D							
0	.119	8	9 Dirt r	Dirt roads, HSG D							
1	.418	8	2 Farm	Farmsteads, HSG C							
0	.030	8	6 Farm	nsteads, H	SG D						
0	.163	8	9 Grav	el roads, I	HSG C						
1	.668	7	9 Past	ure/grassl	and/range,	Fair, HSG C					
	.441	8				Fair, HSG D					
	.089	7				Good, HSG C					
1	.397	8				Good, HSG D					
	.418	9				nes, 50% imp, HSG C					
	.068	9				nes, 50% imp, HSG D					
	.613	7		yard, Fair,							
	.012	8		yard, Fair,							
	.090	9		er Surface							
	.661	7		ds, Fair, F							
	1.083 79 Woods, Fair, HSG D										
	.765	7		ds, Good,							
	.155	7		ds, Good,		1100.0					
	.952	7			comb., Fair						
	.001	8		•	comb., Fair						
	.222	7			comb., Goo						
	.656	7			comb., Goo	0, HSG D					
	.695	7	- 0	hted Aver							
	.362			1% Pervio							
0	.333		1.09	% Impervi	ous Area						
т.	1	.11.	Olama	Malaalt.	0	December					
Tc	Leng		Slope	Velocity	Capacity	Description					
(min)	(fee		(ft/ft)	(ft/sec)	(cfs)						
6.7	10	00	0.1500	0.25		Sheet Flow, Sheet					
0.0	0.4	~-	0.0000	0.00		Grass: Dense n= 0.240 P2= 2.92"					
0.6	32	25	0.3000	8.82		Shallow Concentrated Flow, Shallow					
	7	^^	0.4000	0.00	05.07	Unpaved Kv= 16.1 fps					
1.4	76	66	0.1200	9.38	65.67	Trap/Vee/Rect Channel Flow, Swale					
						Bot.W=3.00' D=1.00' Z= 4.0 '/' Top.W=11.00'					
0.7	0.4	00	0.0000	4.00	00.40	n= 0.040 Mountain streams					
3.7	86	83	0.0200	4.02	20.10	Trap/Vee/Rect Channel Flow, Stream					
						Bot.W=3.00' D=1.00' Z= 2.0 '/' Top.W=7.00'					
			<del>-</del>			n= 0.040 Mountain streams					

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#### **Darioush Curry Lane Pre-Project**

Prepared by Microsoft

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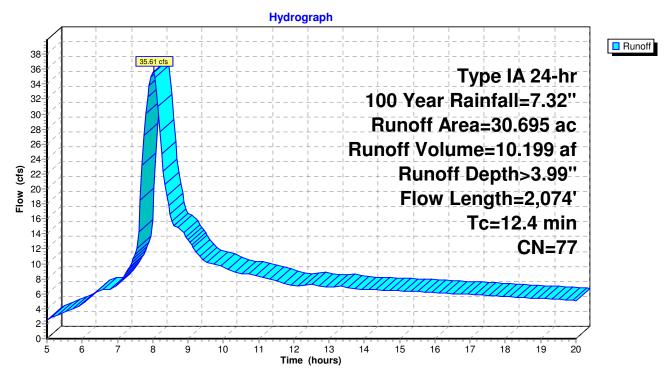
## Summary for Subcatchment WS 1: Subcat WS 1

Runoff = 35.61 cfs @ 8.02 hrs, Volume= 10.199 af, Depth> 3.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type IA 24-hr 100 Year Rainfall=7.32"

Area	(ac)	CN	N Desc	cription								
* (	0.000	(	O, HS	G C								
1	.045	7		h, Fair, HS	SG D							
	0.050	6		h, Good, F								
	3.580	73		Brush, Good, HSG D								
	).119	89		Dirt roads, HSG D								
	.418	82		Farmsteads, HSG C								
	0.030	86		Farmsteads, HSG D								
C	).163	89	9 Grav	el roads, l	HSG C							
1	.668	79	9 Past	ure/grassla	and/range,	Fair, HSG C						
2	2.441	84	4 Past	ure/grassla	and/range,	Fair, HSG D						
3	3.089	74	4 Past	ure/grassla	and/range,	Good, HSG C						
1	.397	80	D Past	ure/grassla	and/range,	Good, HSG D						
C	).418	92	2 Pave	ed roads w	/open ditch	nes, 50% imp, HSG C						
C	0.068	93		ed roads w	/open ditch	nes, 50% imp, HSG D						
4	l.613	79		yard, Fair,	HSG C							
	0.012	84		yard, Fair,								
	0.090	98		er Surface								
	.661	73		ds, Fair, F								
	1.083 79 Woods, Fair, HSG D											
	0.765 70 Woods, Good, HSG C											
	).155	7		ds, Good,								
	).952	76			comb., Fair							
	0.001	82		•	comb., Fair							
	3.222	72			comb., Goo							
	2.656	79		_	comb., Goo	0, HSG D						
	).695	7	- 0	hted Aver								
	).362			1% Pervio								
C	).333		1.09	% Impervi	ous Area							
т.		<b>.</b>	01	Malaali.	0	December						
Tc	_		Slope	Velocity	Capacity	Description						
(min)	(fee		(ft/ft)	(ft/sec)	(cfs)							
6.7	10	00	0.1500	0.25		Sheet Flow, Sheet						
	0.0	~=	0.0000	0.00		Grass: Dense n= 0.240 P2= 2.92"						
0.6	32	25	0.3000	8.82		Shallow Concentrated Flow, Shallow						
	7.	20	0.4000	0.00	05.07	Unpaved Kv= 16.1 fps						
1.4	76	66	0.1200	9.38	65.67	Trap/Vee/Rect Channel Flow, Swale						
						Bot.W=3.00' D=1.00' Z= 4.0 '/' Top.W=11.00'						
0.7	0.0	20	0.0000	4.00	00.40	n= 0.040 Mountain streams						
3.7	88	33	0.0200	4.02	20.10	Trap/Vee/Rect Channel Flow, Stream						
						Bot.W=3.00' D=1.00' Z= 2.0 '/' Top.W=7.00'						
			<b>-</b>			n= 0.040 Mountain streams						

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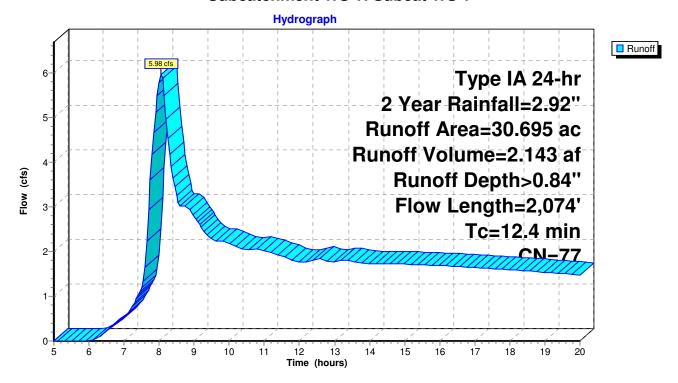
## Summary for Subcatchment WS 1: Subcat WS 1

Runoff = 5.98 cfs @ 8.06 hrs, Volume= 2.143 af, Depth> 0.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type IA 24-hr 2 Year Rainfall=2.92"

	_	G C	0 , HS	000							
				000	* 0.						
		HSG D									
	Brush, Good, HSG C										
	Brush, Good, HSG D										
	Dirt roads, HSG D										
	Farmsteads, HSG C										
	Farmsteads, HSG D										
		/el roads, l									
	and/range, F	-									
	and/range, I and/range, I										
	and/range, i and/range, (	-									
	and/range, ( and/range, (										
	/open ditch										
	open ditche										
	•										
	·										
			•								
	ous Area	% impervi	1.09	333	0.						
	Consoity	Volocity	Clono	Longth	To						
	(018)										
D		0.25	0.1500	100	6.7						
low, Shallow		8.82	0.3000	325	0.6						
	65.67	9.38	0.1200	766	1.4						
	20.10	4.02	0.0200	883	3.7						
ns											
P2= 2.92" low, Shallow Flow, Swale 4.0 '/' Top.W=11.00' ms Flow, Stream 2.0 '/' Top.W=7.00' ms	HSG D d, HSG C d, HSG D , HSG D ISG C HSG D HSG C HSG D comb., Fair, comb., Good cage us Area ous Area Capacity (cfs)	er Surface ods, Fair, F ods, Fair, F ods, Good, ods, Good, ods/grass o ods/grass o	34 Vine 75 Vine 81 Vine 88 Wate 73 Woo 79 Woo 70 Woo 77 Woo 76 Woo 72 Woo 77 Weig 98.9 1.09 Slope (ft/ft) 0.1500 0.3000	012 8 163 7 969 8 090 9 439 7 121 7 524 7 155 7 196 7 001 8 456 7 656 7 656 7 362 333  Length (feet) 100 325 766	0. 4. 2. 0. 1. 0. 0. 0. 2. 2. 30. 30.						

12.4 2,074 Total



### **Darioush Curry Lane Post-Project**

Prepared by Microsoft

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## Summary for Subcatchment WS 1: Subcat WS 1

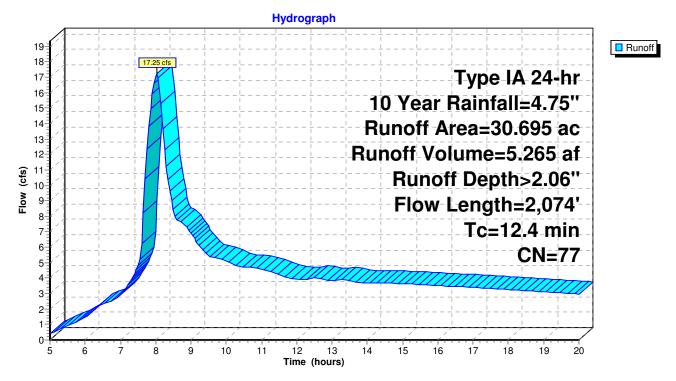
Runoff = 17.25 cfs @ 8.04 hrs, Volume= 5.265 af, Depth> 2.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type IA 24-hr 10 Year Rainfall=4.75"

	Area	(ac)	CN	Desc	ription								
*	0.	000	0	, HS	G C								
*		000	0	, HS									
	0.	050	65	Brus	Brush, Good, HSG C								
	3.	580	73	Brus	Brush, Good, HSG D								
	0.	062	89	Dirt r	Dirt roads, HSG D								
	1.	415	82	Farm	Farmsteads, HSG C								
	0.	030	86	Farm	isteads, H	SG D							
		106	89	Grav	el roads, l	HSG C							
		431	79				Fair, HSG C						
		536	84		•	•	Fair, HSG D						
		228	74		•	•	Good, HSG C						
		397	80				Good, HSG D						
		418	92				nes, 50% imp, HSG C						
		068	93				nes, 50% imp, HSG D						
		592	79		yard, Fair,								
		012	84 75		yard, Fair,								
		163	75 01		yard, Good								
		969 000	81		yard, Good								
	0.090 98 Water Surface, HSG D 1.439 73 Woods, Fair, HSG C												
		439 121	79		ds, Fair, F								
		524	70		ds, ran, r ds, Good,								
		155	77		ds, Good,								
		196	76			comb., Fair	HSG C						
		001	82			comb., Fair							
		456	72			omb., Goo							
		656	79			omb., Goo							
		695	77		hted Aver								
		362			, 1% Pervio								
		333			% Impervi								
					•								
	Тс	Length	n S	Slope	Velocity	Capacity	Description						
(	(min)	(feet)	) (	(ft/ft)	(ft/sec)	(cfs)							
	6.7	100	0.	1500	0.25		Sheet Flow, Sheet						
							Grass: Dense n= 0.240 P2= 2.92"						
	0.6	325	0.0	3000	8.82		Shallow Concentrated Flow, Shallow						
							Unpaved Kv= 16.1 fps						
	1.4	766	0.	1200	9.38	65.67	Trap/Vee/Rect Channel Flow, Swale						
							Bot.W=3.00' D=1.00' Z= 4.0 '/' Top.W=11.00'						
							n= 0.040 Mountain streams						
	3.7	883	0.0	0200	4.02	20.10	Trap/Vee/Rect Channel Flow, Stream						
							Bot.W=3.00' D=1.00' Z= 2.0 '/' Top.W=7.00'						
							n= 0.040 Mountain streams						

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12.4 2,074 Total



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# Summary for Subcatchment WS 1: Subcat WS 1

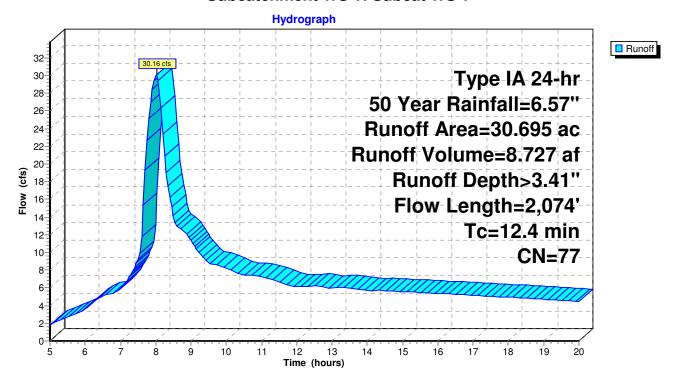
Runoff = 30.16 cfs @ 8.03 hrs, Volume= 8.727 af, Depth> 3.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type IA 24-hr 50 Year Rainfall=6.57"

	Area	(ac) C	N Des	cription								
*		000	0 , HS									
*		000	0 , HS									
			,	Brush, Good, HSG C								
				Brush, Good, HSG D								
				Dirt roads, HSG D								
				nsteads, H								
				nsteads, H								
				∕el roads, l								
						Fair, HSG C						
	0.	536				Fair, HSG D						
	2.	228				Good, HSG C						
	1.3	397				Good, HSG D						
	0.	418	92 Pave	ed roads w	ı/open ditch	nes, 50% imp, HSG C						
	0.	068	93 Pave	ed roads w	/open ditch	nes, 50% imp, HSG D						
				yard, Fair,								
				yard, Fair,								
				yard, Goo	•							
				yard, Goo								
				er Surface	,							
				ds, Fair, F								
				ds, Fair, F								
				ds, Good,								
				ds, Good,		1100.0						
				•	comb., Fair							
					comb., Fair							
					comb., Goo comb., Goo							
				•		ш, нэс р						
				ghted Ave								
		362 333		1% Pervio								
	0.	<i>ააა</i>	1.09	% Impervi	ous Area							
	Тс	Length	Slope	Velocity	Capacity	Description						
	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	Description						
	6.7	100	0.1500	0.25	(010)	Sheet Flow, Sheet						
	0.7	100	0.1500	0.23		Grass: Dense n= 0.240 P2= 2.92"						
	0.6	325	0.3000	8.82		Shallow Concentrated Flow, Shallow						
	0.0	020	0.0000	0.02		Unpaved Kv= 16.1 fps						
	1.4	766	0.1200	9.38	65.67	Trap/Vee/Rect Channel Flow, Swale						
		700	0.1200	0.00	00.07	Bot.W=3.00' D=1.00' Z= 4.0 '/' Top.W=11.00'						
						n= 0.040 Mountain streams						
	3.7	883	0.0200	4.02	20.10	Trap/Vee/Rect Channel Flow, Stream						
					_00	Bot.W=3.00' D=1.00' Z= 2.0 '/' Top.W=7.00'						
						n= 0.040 Mountain streams						
						C.C.O Modificanto						

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12.4 2,074 Total



### **Darioush Curry Lane Post-Project**

Prepared by Microsoft

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### Summary for Subcatchment WS 1: Subcat WS 1

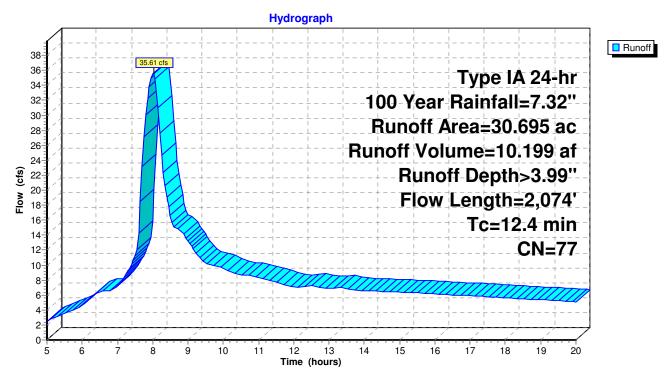
Runoff = 35.61 cfs @ 8.02 hrs, Volume= 10.199 af, Depth> 3.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type IA 24-hr 100 Year Rainfall=7.32"

	Area	(ac)	CN	Desc	ription								
*		000	0	, HS									
*		000	0	, HS									
		050	65	,	Brush, Good, HSG C								
		580	73		Brush, Good, HSG D								
		062	89		Dirt roads, HSG D								
		415	82		nsteads, H								
	0.	030	86		nsteads, H								
	0.	106	89	Grav	el roads, l	HSG C							
	0.	431	79	Past	ure/grassl	and/range,	Fair, HSG C						
	0.	536	84	Past	ure/grassl	and/range,	Fair, HSG D						
	2.	228	74	Past	ure/grassl	and/range,	Good, HSG C						
	1.	397	80	Past	ure/grassl	and/range,	Good, HSG D						
		418	92				nes, 50% imp, HSG C						
		068	93				nes, 50% imp, HSG D						
		592	79		yard, Fair,								
		012	84		yard, Fair,								
		163	75		yard, Goo	•							
		969	81		yard, Goo								
		090	98		er Surface	•							
		439	73		ds, Fair, F								
		121	79 70		ds, Fair, F								
		524 155	70 77		ds, Good,								
		155 196	77 76		ds, Good,		HSC C						
		001	82			comb., Fair, comb., Fair,							
		456	72			comb., Goo							
		656	79			comb., Goo							
_		695	77		hted Aver		u, 110a b						
		362	11	_	1% Pervio	•							
		333			% Impervi								
	0.	000		1.00	76 IIIIpei Vi	ous Alea							
	Tc	Length	า :	Slope	Velocity	Capacity	Description						
	(min)	(feet		(ft/ft)	(ft/sec)	(cfs)	2000.191.011						
_	6.7	100		.1500	0.25	(0.0)	Sheet Flow, Sheet						
	0.7	100	, ,	.1000	0.20		Grass: Dense n= 0.240 P2= 2.92"						
	0.6	325	5 0	.3000	8.82		Shallow Concentrated Flow, Shallow						
	0.0	0_\	, ,	.0000	0.02		Unpaved Kv= 16.1 fps						
	1.4	766	3 0	.1200	9.38	65.67	Trap/Vee/Rect Channel Flow, Swale						
		. 3		• •	2.00	20.07	Bot.W=3.00' D=1.00' Z= 4.0 '/' Top.W=11.00'						
							n= 0.040 Mountain streams						
	3.7	883	3 0	.0200	4.02	20.10	Trap/Vee/Rect Channel Flow, Stream						
							Bot.W=3.00' D=1.00' Z= 2.0 '/' Top.W=7.00'						
_							n= 0.040 Mountain streams						

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12.4 2,074 Total



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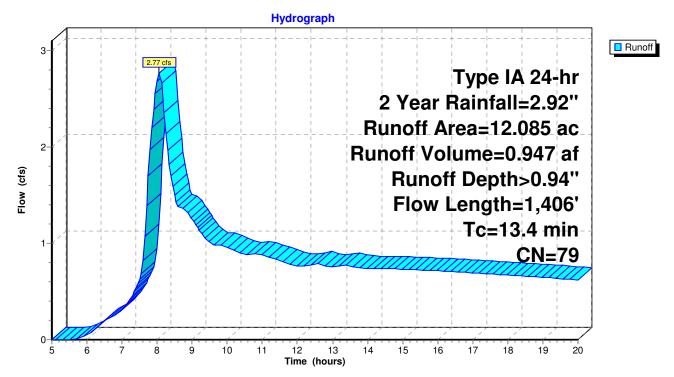
### Summary for Subcatchment WS 2: Subcat WS 2

Runoff = 2.77 cfs @ 8.06 hrs, Volume= 0.947 af, Depth> 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type IA 24-hr 2 Year Rainfall=2.92"

Area (a	ac) C	N Des	cription						
0.6	18 7	7 Brus	Brush, Fair, HSG D						
0.0	72 7	'3 Brus	sh, Good, F	HSG D					
0.0	33 8	9 Dirt	roads, HS0	G D					
1.3	68 8	4 Past	ure/grassl	and/range,	Fair, HSG D				
4.5	04 8				Good, HSG D				
0.0	33 9		Water Surface, HSG D						
2.1	49 7	'9 Woo	Woods, Fair, HSG D						
3.3	08 7	7 Woo	ds, Good,	HSG D					
12.0	85 7	'9 Wei	ghted Aver	age					
12.0			2% Pervio	•					
0.0		0.28	% Impervi	ous Area					
			•						
Tc I	Length	Slope	Velocity	Capacity	Description				
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)					
9.8	93	0.0500	0.16	, ,	Sheet Flow, Sheet				
0.0	00	0.0000	0.10		Grass: Dense n= 0.240 P2= 2.92"				
0.9	505	0.3100	8.96		Shallow Concentrated Flow, Shallow				
0.0	000	0.0100	0.00		Unpaved Kv= 16.1 fps				
2.7	808	0.0300	4.92	24.61	Trap/Vee/Rect Channel Flow, Stream				
,	000	3.0000			Bot.W=3.00' D=1.00' Z= 2.0 '/' Top.W=7.00'				
					n= 0.040				
13.4	1 406	Total			0.0.0				

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### Summary for Subcatchment WS 2: Subcat WS 2

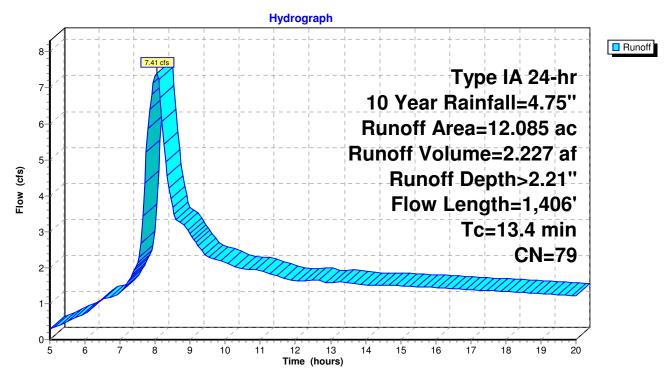
Runoff = 7.41 cfs @ 8.04 hrs, Volume= 2.227 af, Depth> 2.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type IA 24-hr 10 Year Rainfall=4.75"

_	Area	(ac) (	ON Des	cription						
_	0.	618	77 Brus	Brush, Fair, HSG D						
	0.	072		Brush, Good, HSG D						
				roads, HS						
						Fair, HSG D				
						Good, HSG D				
				Water Surface, HSG D Woods, Fair, HSG D						
	2.									
_				ods, Good,						
				ghted Aver	_					
		052		2% Pervio						
	0.	033	0.20	% Impervi	ous Area					
	Tc	Length	Slope	Velocity	Capacity	Description				
	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	2000 paon				
_	9.8	93		0.16		Sheet Flow, Sheet				
						Grass: Dense n= 0.240 P2= 2.92"				
	0.9	505	0.3100	8.96		Shallow Concentrated Flow, Shallow				
						Unpaved Kv= 16.1 fps				
	2.7	808	0.0300	4.92	24.61	Trap/Vee/Rect Channel Flow, Stream				
						Bot.W=3.00' D=1.00' Z= 2.0 '/' Top.W=7.00'				
_						n= 0.040				
	13 /	1 406	Total							

13.4 1,406 Total

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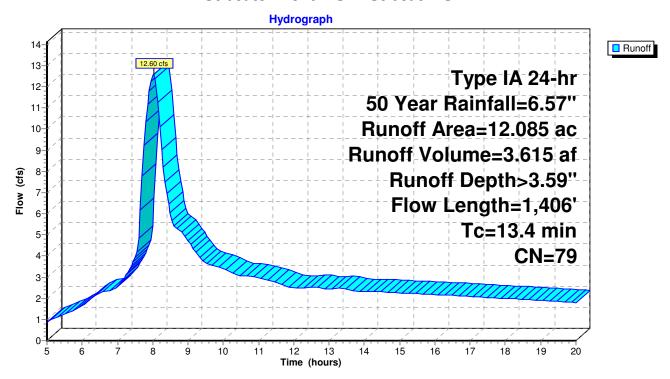
## Summary for Subcatchment WS 2: Subcat WS 2

Runoff = 12.60 cfs @ 8.03 hrs, Volume= 3.615 af, Depth> 3.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type IA 24-hr 50 Year Rainfall=6.57"

Area	(ac)	CN	Desc	cription					
0.	618	77	Brush, Fair, HSG D						
0.	072	73	Brus	Brush, Good, HSG D					
0.	033	89	Dirt r	oads, HS0	G D				
1.	368	84	Past	ure/grassla	and/range,	Fair, HSG D			
4.	504	80	Past	ure/grassla	and/range,	Good, HSG D			
0.	033	98	Wate	er Surface	, HSG D				
2.	149	79	Woo	ds, Fair, F	ISG D				
3.	308	77	Woo	ds, Good,	HSG D				
12.	085	79	Weig	hted Aver	age				
12.052 99.72% Pervious Area									
0.	033		$0.28^{\circ}$	% Impervi	ous Area				
Tc	Length	n S	Slope	Velocity	Capacity	Description			
(min)	(feet	()	(ft/ft)	(ft/sec)	(cfs)				
9.8	93	3 0.0	0500	0.16		Sheet Flow, Sheet			
						Grass: Dense n= 0.240 P2= 2.92"			
0.9	50	5 0.3	3100	8.96		Shallow Concentrated Flow, Shallow			
						Unpaved Kv= 16.1 fps			
2.7	808	3 0.0	0300	4.92	24.61	Trap/Vee/Rect Channel Flow, Stream			
						Bot.W=3.00' D=1.00' Z= 2.0 '/' Top.W=7.00'			
						n= 0.040			
13.4	1,406	6 To	tal						

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### Summary for Subcatchment WS 2: Subcat WS 2

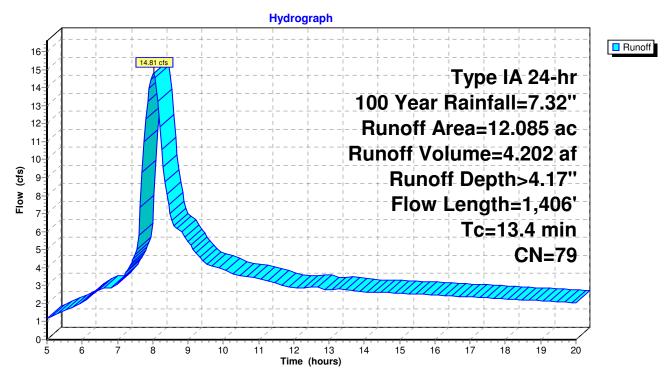
Runoff = 14.81 cfs @ 8.03 hrs, Volume= 4.202 af, Depth> 4.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type IA 24-hr 100 Year Rainfall=7.32"

_	Area	(ac) (	ON Des	cription					
	0.	618	77 Brus	sh, Fair, HS	SG D				
	0.	072		sh, Good, F					
				Dirt roads, HSG D					
						Fair, HSG D			
						Good, HSG D			
				Water Surface, HSG D					
				ods, Fair, F					
3.308 77 Woods, Good, HSG D									
				ghted Aver	_				
	12.052 0.033			99.72% Pervious Area 0.28% Impervious Area					
	U.	033	0.28	% impervi	ous Area				
	Tc	Length	Slope	Velocity	Capacity	Description			
	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	Decomplian			
_	9.8	93		0.16		Sheet Flow, Sheet			
						Grass: Dense n= 0.240 P2= 2.92"			
	0.9	505	0.3100	8.96		Shallow Concentrated Flow, Shallow			
						Unpaved Kv= 16.1 fps			
	2.7	808	0.0300	4.92	24.61	Trap/Vee/Rect Channel Flow, Stream			
						Bot.W=3.00' D=1.00' Z= 2.0 '/' Top.W=7.00'			
_						n= 0.040			
	13 /	1 406	Total						

13.4 1,406 Total

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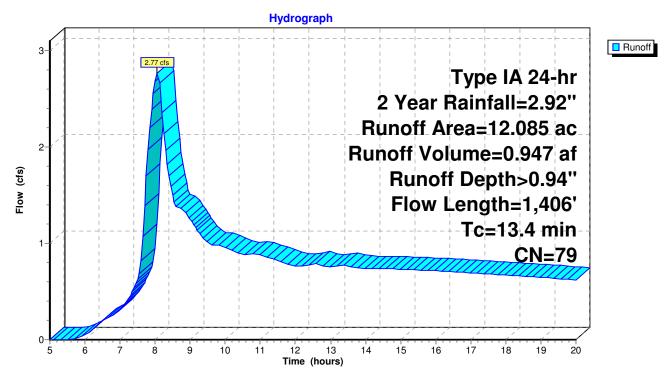
### Summary for Subcatchment WS 2: Subcat WS 2

Runoff = 2.77 cfs @ 8.06 hrs, Volume= 0.947 af, Depth> 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type IA 24-hr 2 Year Rainfall=2.92"

Area	(ac) C	N Des	cription				
0.	084						
0.	033 8	39 Dirt	roads, HS0	G D			
0.	331 8	34 Past	ure/grassl	and/range,	Fair, HSG D		
4.	504 8	30 Past	ure/grassl	and/range,	Good, HSG D		
1.	746 8	31 Vine	Vineyard, Good, HSG D				
0.	033	98 Wat	Water Surface, HSG D				
2.	047	79 Woo	ds, Fair, F	ISG D			
3.	306	77 Woo	ds, Good,	HSG D			
12.	085	79 Wei	Weighted Average				
12.	052	99.7	2% Pervio	us Area			
0.	033	0.28	% Impervi	ous Area			
·							
Tc	Length	Slope	Velocity	Capacity	Description		
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)			
9.8	93	0.0500	0.16		Sheet Flow, Sheet		
					Grass: Dense n= 0.240 P2= 2.92"		
0.9	505	0.3100	8.96		Shallow Concentrated Flow, Shallow		
					Unpaved Kv= 16.1 fps		
2.7	808	0.0300	4.92	24.61	Trap/Vee/Rect Channel Flow, Stream		
					Bot.W=3.00' D=1.00' Z= 2.0 '/' Top.W=7.00'		
					n= 0.040		
13.4	1,406	Total					

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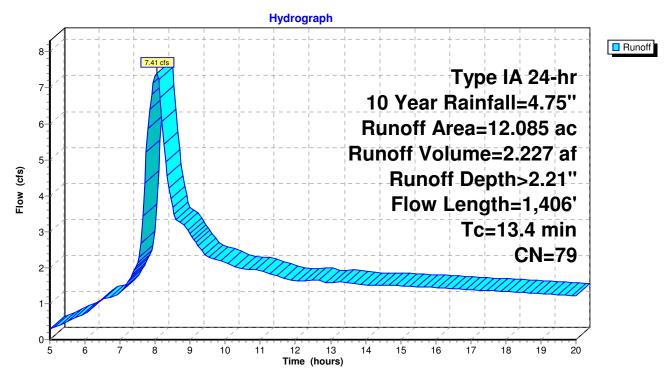
### Summary for Subcatchment WS 2: Subcat WS 2

Runoff = 7.41 cfs @ 8.04 hrs, Volume= 2.227 af, Depth> 2.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type IA 24-hr 10 Year Rainfall=4.75"

Are	a (ac)	С	N Desc	cription					
	0.084	7	3 Brus	h, Good, F	HSG D				
	0.033	8	9 Dirt ı	roads, HS0	G D				
	0.331	8	4 Past	Pasture/grassland/range, Fair, HSG D					
4.504			0 Past	Pasture/grassland/range, Good, HSG D					
	1.746	8	1 Vine	Vineyard, Good, HSG D					
	0.033	9	8 Wate	er Surface	, HSG D				
	2.047	7	9 Woo	ds, Fair, H	ISG D				
	3.306	7	7 Woo	ds, Good,	HSG D				
12.085 79 Weighted Average									
1	12.052		99.7	99.72% Pervious Area					
0.033			0.28	0.28% Impervious Area					
To	c Len	gth	Slope	Velocity	Capacity	Description			
(min	) (fe	et)	(ft/ft)	(ft/sec)	(cfs)				
9.8	3	93	0.0500	0.16		Sheet Flow, Sheet			
						Grass: Dense n= 0.240 P2= 2.92"			
0.9	9 5	505	0.3100	8.96		Shallow Concentrated Flow, Shallow			
						Unpaved Kv= 16.1 fps			
2.7	7 8	808	0.0300	4.92	24.61	Trap/Vee/Rect Channel Flow, Stream			
						Bot.W=3.00' D=1.00' Z= 2.0 '/' Top.W=7.00'			
						n= 0.040			
13.4	1 1,4	106	Total						

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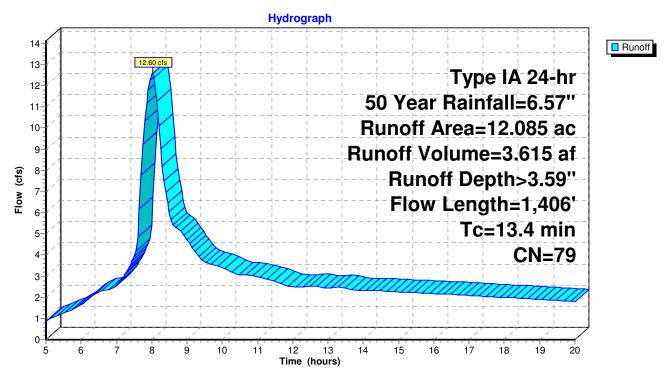
## Summary for Subcatchment WS 2: Subcat WS 2

Runoff = 12.60 cfs @ 8.03 hrs, Volume= 3.615 af, Depth> 3.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type IA 24-hr 50 Year Rainfall=6.57"

Area	(ac) (	ON Des	cription				
0.	084	73 Brus	sh, Good, F	HSG D			
0.	033	89 Dirt	roads, HS0	G D			
0.	331	84 Past	ture/grassl	and/range,	Fair, HSG D		
4.	504	80 Past	Pasture/grassland/range, Good, HSG D				
1.	746	81 Vine	Vineyard, Good, HSG D				
0.	033	98 Wat	er Surface	, HSG D			
2.	047	79 Woo	ds, Fair, F	ISG D			
3.	306	77 Woo	ds, Good,	HSG D			
12.	085	79 Wei	ghted Aver	age			
12.	052	99.7	2% Pervio	us Area			
0.	033	0.28	% Impervi	ous Area			
			•				
Tc	Length	Slope	Velocity	Capacity	Description		
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)			
9.8	93	0.0500	0.16		Sheet Flow, Sheet		
					Grass: Dense n= 0.240 P2= 2.92"		
0.9	505	0.3100	8.96		Shallow Concentrated Flow, Shallow		
					Unpaved Kv= 16.1 fps		
2.7	808	0.0300	4.92	24.61	Trap/Vee/Rect Channel Flow, Stream		
					Bot.W=3.00' D=1.00' Z= 2.0 '/' Top.W=7.00'		
					n= 0.040		
13.4	1,406	Total					

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### Summary for Subcatchment WS 2: Subcat WS 2

Runoff = 14.81 cfs @ 8.03 hrs, Volume= 4.202 af, Depth> 4.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type IA 24-hr 100 Year Rainfall=7.32"

Area	(ac) C	ON Des	cription				
0.	.084	73 Brus	h, Good, F				
0.	.033	89 Dirt	roads, HS0	G D			
0.	.331				Fair, HSG D		
4.	.504		asture/grassland/range, Good, HSG D				
			Vineyard, Good, HSG D				
0.	.033		Water Surface, HSG D				
2.	.047		ods, Fair, F				
3.	.306	77 Woo	ods, Good,	HSG D			
12.	.085	79 Wei	Weighted Average				
	.052		2% Pervio				
0.	.033	0.28	% Impervi	ous Area			
_							
Tc	Length	•	Velocity	Capacity	Description		
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)			
9.8	93	0.0500	0.16		Sheet Flow, Sheet		
					Grass: Dense n= 0.240 P2= 2.92"		
0.9	505	0.3100	8.96		Shallow Concentrated Flow, Shallow		
					Unpaved Kv= 16.1 fps		
2.7	808	0.0300	4.92	24.61	Trap/Vee/Rect Channel Flow, Stream		
					Bot.W=3.00' D=1.00' Z= 2.0 '/' Top.W=7.00'		
					n= 0.040		
13.4	1,406	Total					

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