Illustration 60
Addendum 1
Analysis of Existing BLM Red Wash Reservoir #2 as Point of Compliance for RP-A

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September 29, 2020

DESERADO MINE
BLUE MOUNTAIN ENERGY

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Introduction

RP-A was originally permitted as Technical Revision 72 in the fall of 2019. Blue Mountain Energy would like to change the location of the subsoil and topsoil stockpiles. Some topsoil and subsoil has been placed in the originally permitted locations, but as stockpiling progresses, it would be advantageous to shorten the haul distance and eliminate conflicts with the ongoing operation of haul trucks. The proposed configuration is shown on the revised Map 162.

Hydrology

The new stockpile areas drain to the Red Wash Reservoir #2 that is designated as our point of compliance. In the SedCAD calculations, the sub watersheds upstream from Structure 32 were revised to reflect the disturbance of 12.16 acres for the new stockpile locations. The revised results for the 10, 25, and 100- Year analyses are found in the respective following sections.

Table 1 shows a comparison of the flow rates into and out of the BLM Red Wash Reservoir #2 for the previously permitted conditions (Pre MR-178) and the proposed conditions contained herein (Post MR-178).

Table 1. Pre and Post MR 178 Flow rates

	Pre MR-178		Post MR-178	
Storm	Flow Into Pond (cfs)	Flow Out (cfs)	Flow Into Pond (cfs)	Flow Out (cfs)
10-Year	24	3	28	4
25-Year	41	12	44	13
100-Year	77	45	81	49

The increase in flow rates is relatively insignificant and does not warrant changes to the structure design.

Sedimentology

The reservoir reduces the peak settleable solids concentration to 0.01 ml/l during the 10-year storm. This is well below the permitted limit of 0.5 ml/l.

RP-A 10-Year Hydrology and Sedimentology

Watshed contributing to Red Wash Reservoir #2

Jason Tuttle

General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	10 yr - 24 hr
Rainfall Depth:	1.570 inches

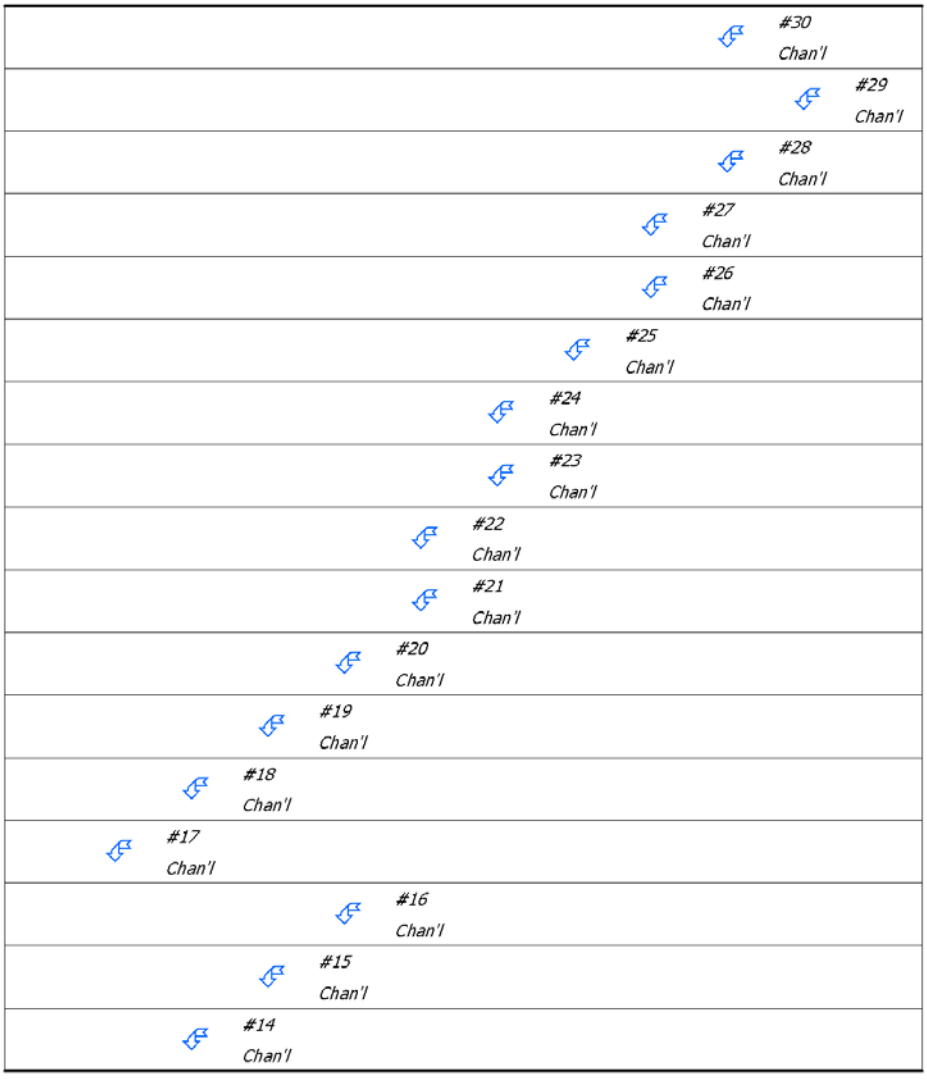
Particle Size Distribution:

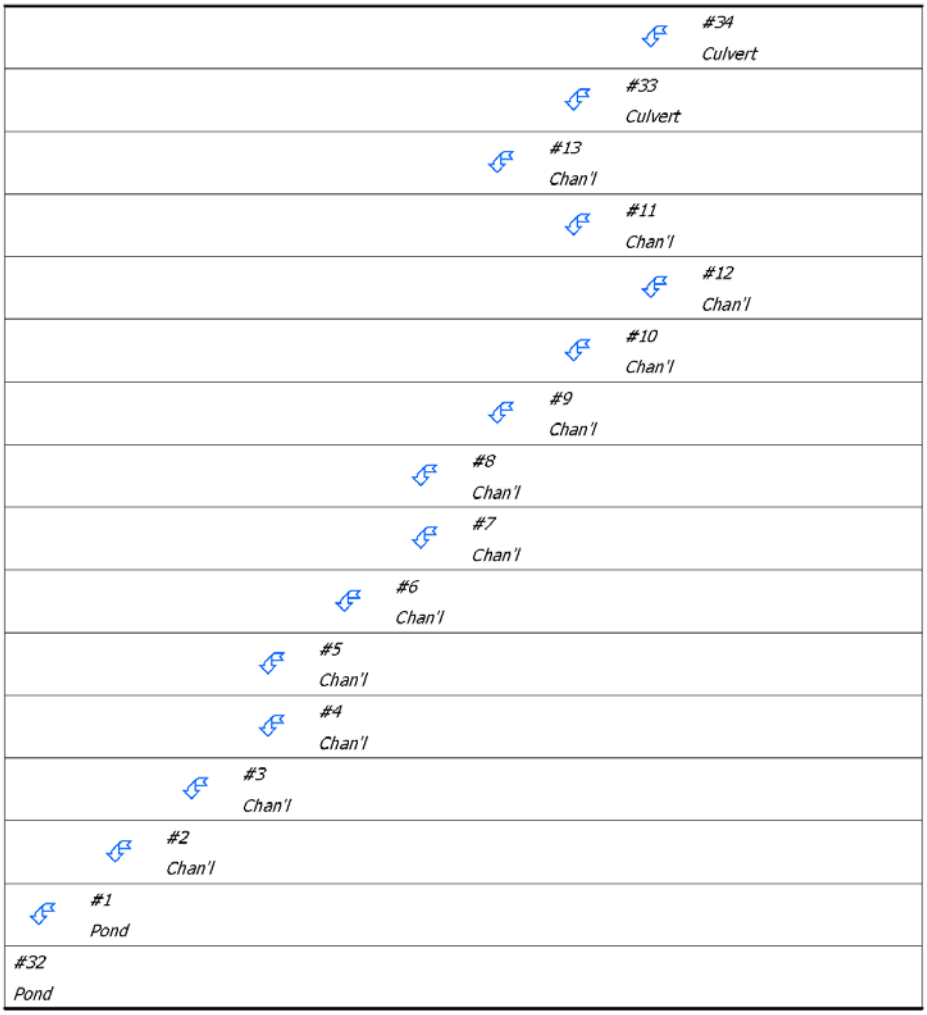
Size (mm)	Standard
1.0000	100.000%
0.5600	95.000%
0.3500	90.000%
0.1500	80.000%
0.0500	60.000%
0.0250	40.000%
0.0095	20.000%
0.0001	0.000%

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Pond	#1	==>	#32	0.013	0.368	Main Sediment Pond
Channel	#2	==>	#1	0.002	0.319	Channel into pond - west end
Channel	#3	==>	#2	0.015	0.421	Perimeter channel - lowest south
Channel	#4	==>	#3	0.058	0.368	Lowest contour channel - south
Channel	#5	==>	#3	0.034	0.398	Steep perimeter channel - 2nd lowest south
Channel	#6	==>	#5	0.011	0.416	Perimeter channel - 3rd lowest south
Channel	#7	==>	#6	0.065	0.345	Contour channel - 2nd lowest south
Channel	#8	==>	#6	0.065	0.345	Perimeter channel - 4th lowest south
Channel	#9	==>	#8	0.068	0.376	Contour channel - lowest segment of 3rd lowest south
Channel	#10	==>	#9	0.066	0.373	Contour channel - 2nd lowest of 3rd lowest south
Channel	#11	==>	#9	0.066	0.373	Contour channel - west arm of 3rd lowest south
Channel	#12	==>	#10	0.081	0.372	Contour channel - upper arm of 3rd lowest south
Channel	#13	==>	#8	0.068	0.376	Perimeter channel - top segment south
Channel	#14	==>	#2	0.002	0.430	Perimeter channel - lowest segment north
Channel	#15	==>	#14	0.007	0.431	Perimeter channel - 2nd lowest segment north
Channel	#16	==>	#15	0.001	0.449	Contour channel - lowest segment north
Channel	#17	==>	#1	0.000	0.000	Diversion channel into pond from north
Channel	#18	==>	#17	0.015	0.419	Diversion channel middle segment
Channel	#19	==>	#18	0.010	0.430	Diversion channel west segment
Channel	#20	==>	#19	0.019	0.316	Perimeter channel northern most segment
Channel	#21	==>	#20	0.124	0.334	Contour channel - 2nd lowest north
Channel	#22	==>	#20	0.124	0.334	Perimeter channel north of HR
Channel	#23	==>	#22	0.055	0.325	Lower segment of HR
Channel	#24	==>	#22	0.055	0.325	Perimeter channel south of HR
Channel	#25	==>	#24	0.126	0.307	Contour channel lowest segment of west
Channel	#26	==>	#25	0.058	0.368	Contour channel south extension of west
Channel	#27	==>	#25	0.058	0.368	Contour channel 2nd lowest segment of west
Channel	#28	==>	#27	0.066	0.375	Contour channel upper extension of west - north segment

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#29	==>	#28	0.056	0.377	Contour channel upper extension of west - south segment
Channel	#30	==>	#27	0.066	0.375	Upper HR segment
Pond	#32	==>	End	0.000	0.000	RWR#2
Culvert	#33	==>	#13	0.041	0.421	Culvert under conveyor/road
Culvert	#34	==>	#33	0.051	0.400	Culvert under Haul Road Culver under haul road





Structure Routing Details:

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	8. Large gullies, diversions, and low flowing streams	2.50	5.90	236.00	4.74	0.013
#1	**Muskingum K:**					**0.013**
#2	8. Large gullies, diversions, and low flowing streams	1.00	0.25	25.00	3.00	0.002
#2	**Muskingum K:**					**0.002**

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#3	8. Large gullies, diversions, and low flowing streams	9.11	45.00	493.96	9.05	0.015
#3	**Muskingum K:**					**0.015**
#4	8. Large gullies, diversions, and low flowing streams	2.50	25.00	1,000.00	4.74	0.058
#4	**Muskingum K:**					**0.058**
#5	8. Large gullies, diversions, and low flowing streams	4.88	40.00	820.00	6.62	0.034
#5	**Muskingum K:**					**0.034**
#6	8. Large gullies, diversions, and low flowing streams	7.78	28.00	360.00	8.36	0.011
#6	**Muskingum K:**					**0.011**
#7	8. Large gullies, diversions, and low flowing streams	1.58	14.00	885.00	3.77	0.065
#7	**Muskingum K:**					**0.065**
#8	8. Large gullies, diversions, and low flowing streams	1.58	14.00	885.00	3.77	0.065
#8	**Muskingum K:**					**0.065**
#9	8. Large gullies, diversions, and low flowing streams	2.97	38.00	1,280.00	5.16	0.068
#9	**Muskingum K:**					**0.068**
#10	8. Large gullies, diversions, and low flowing streams	2.77	33.00	1,190.00	4.99	0.066
#10	**Muskingum K:**					**0.066**
#11	8. Large gullies, diversions, and low flowing streams	2.77	33.00	1,190.00	4.99	0.066
#11	**Muskingum K:**					**0.066**
#12	8. Large gullies, diversions, and low flowing streams	2.74	40.00	1,460.00	4.96	0.081
#12	**Muskingum K:**					**0.081**
#13	8. Large gullies, diversions, and low flowing streams	2.97	38.00	1,280.00	5.16	0.068
#13	**Muskingum K:**					**0.068**
#14	8. Large gullies, diversions, and low flowing streams	12.20	10.00	82.00	10.47	0.002
#14	**Muskingum K:**					**0.002**
#15	8. Large gullies, diversions, and low flowing streams	12.67	38.00	300.00	10.67	0.007
#15	**Muskingum K:**					**0.007**
#16	8. Large gullies, diversions, and low flowing streams	25.00	20.00	80.00	15.00	0.001
#16	**Muskingum K:**					**0.001**
#18	8. Large gullies, diversions, and low flowing streams	8.60	43.00	500.00	8.79	0.015
#18	**Muskingum K:**					**0.015**
#19	8. Large gullies, diversions, and low flowing streams	12.00	45.00	375.00	10.39	0.010
#19	**Muskingum K:**					**0.010**

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#20	8. Large gullies, diversions, and low flowing streams	0.95	2.00	210.00	2.92	0.019
#20	**Muskingum K:**					**0.019**
#21	8. Large gullies, diversions, and low flowing streams	1.31	20.00	1,530.00	3.42	0.124
#21	**Muskingum K:**					**0.124**
#22	8. Large gullies, diversions, and low flowing streams	1.31	20.00	1,530.00	3.42	0.124
#22	**Muskingum K:**					**0.124**
#23	8. Large gullies, diversions, and low flowing streams	1.11	7.00	630.00	3.16	0.055
#23	**Muskingum K:**					**0.055**
#24	8. Large gullies, diversions, and low flowing streams	1.11	7.00	630.00	3.16	0.055
#24	**Muskingum K:**					**0.055**
#25	8. Large gullies, diversions, and low flowing streams	0.81	10.00	1,234.00	2.70	0.126
#25	**Muskingum K:**					**0.126**
#26	8. Large gullies, diversions, and low flowing streams	2.50	25.00	1,000.00	4.74	0.058
#26	**Muskingum K:**					**0.058**
#27	8. Large gullies, diversions, and low flowing streams	2.50	25.00	1,000.00	4.74	0.058
#27	**Muskingum K:**					**0.058**
#28	8. Large gullies, diversions, and low flowing streams	2.87	35.00	1,220.00	5.08	0.066
#28	**Muskingum K:**					**0.066**
#29	8. Large gullies, diversions, and low flowing streams	3.00	32.00	1,065.00	5.20	0.056
#29	**Muskingum K:**					**0.056**
#30	8. Large gullies, diversions, and low flowing streams	2.87	35.00	1,220.00	5.08	0.066
#30	**Muskingum K:**					**0.066**
#33	9. Small streams flowing bankfull	1.00	13.54	1,354.00	9.00	0.041
#33	**Muskingum K:**					**0.041**
#34	8. Large gullies, diversions, and low flowing streams	5.18	64.95	1,254.00	6.82	0.051
#34	**Muskingum K:**					**0.051**

Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)	Sediment (tons)	Peak Sediment Conc. (mg/l)	Peak Settleable Conc. (ml/l)	24VW (ml/l)
#30		6.310	6.310	4.04	0.35	44.1	209,513	128.41	53.90
#29		4.610	4.610	3.43	0.26	68.6	322,915	201.31	108.32
#28		4.850	9.460	6.88	0.54	149.5	337,750	210.56	114.44
#27		3.710	19.480	12.95	1.10	236.6	294,917	183.65	90.63
#26		7.910	7.910	5.88	0.45	146.1	388,769	242.37	131.43
#25		2.700	30.090	19.72	1.70	406.3	312,443	194.64	99.64
#24		18.960	49.050	22.83	2.10	424.9	315,072	196.23	85.41
#23		3.940	3.940	3.11	0.24	22.4	125,973	78.54	41.03
#22		1.850	54.840	23.51	2.45	456.1	319,599	199.06	79.12
#21		7.100	7.100	5.28	0.40	106.1	324,000	201.99	108.66
#20		6.480	68.420	26.85	3.04	582.2	374,204	233.11	80.96
#19		0.000	68.420	26.85	3.04	582.2	535,840	333.81	87.43
#18		1.220	69.640	26.95	3.07	581.3	793,829	494.46	83.79
#17		0.000	69.640	26.95	3.07	581.3	793,829	494.46	83.94
#16		1.510	1.510	1.12	0.09	21.9	315,882	196.93	106.16
#15		0.930	2.440	1.20	0.09	22.0	304,427	189.79	103.73
#14		0.690	3.130	1.71	0.13	28.5	382,188	238.27	95.65
#34		5.850	5.850	0.02	0.01	0.0	390	0.24	0.22
#33		31.310	37.160	0.92	0.10	1.0	21,401	13.34	4.72
#13		21.700	58.860	5.79	0.47	68.4	201,191	125.43	62.26
#11		6.140	6.140	4.56	0.35	110.0	378,898	236.22	127.95
#12		7.720	7.720	5.74	0.44	106.6	302,473	188.57	101.18
#10		4.450	12.170	8.67	0.69	162.0	357,374	222.80	97.80
#9		3.510	21.820	15.07	1.24	314.3	363,279	226.48	105.12
#8		3.400	84.080	22.03	1.91	421.6	385,464	240.31	92.66
#7		10.670	10.670	7.93	0.61	195.7	386,319	240.84	130.55
#6		1.550	96.300	29.36	2.60	629.7	423,410	263.96	100.76
#5		1.640	97.940	30.27	2.70	652.2	419,642	261.61	100.79
#4		3.600	3.600	2.68	0.20	57.9	345,659	215.49	116.33
#3		1.930	103.470	32.83	2.90	710.1	412,146	256.94	101.97
#2		0.000	106.600	34.54	3.03	738.6	407,012	253.74	101.90
#1	In	10.450	186.690	62.70	6.45	1,340.3	628,268	391.52	89.99
	Out			22.29	6.45	238.5	36,754	0.28	0.21
#32	In	229.310	416.000	27.97	8.41	157.6	20,474	0.21	0.14
	Out			3.63	3.27	4.6	1,402	0.01	0.01

Particle Size Distribution(s) at Each Structure

Structure #30 (Upper HR segment):

Size (mm)	In/Out
1.0000	100.000%
0.5600	99.778%
0.3500	98.377%
0.1500	87.447%
0.0500	65.585%
0.0250	43.723%
0.0095	21.862%
0.0001	0.000%

Structure #29 (Contour channel upper extension of west - south segment):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.000%
0.3500	90.000%
0.1500	80.000%
0.0500	60.000%
0.0250	40.000%
0.0095	20.000%
0.0001	0.000%

Structure #28 (Contour channel upper extension of west - north segment):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.005%
0.3500	90.004%
0.1500	80.004%
0.0500	60.003%

Size (mm)	In/Out
0.0250	40.002%
0.0095	20.001%
0.0001	0.000%

Structure #27 (Contour channel 2nd lowest segment of west):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.903%
0.3500	91.574%
0.1500	81.399%
0.0500	61.049%
0.0250	40.700%
0.0095	20.350%
0.0001	0.000%

Structure #26 (Contour channel south extension of west):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.000%
0.3500	90.000%
0.1500	80.000%
0.0500	60.000%
0.0250	40.000%
0.0095	20.000%
0.0001	0.000%

Structure #25 (Contour channel lowest segment of west):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.536%
0.3500	90.926%
0.1500	80.823%
0.0500	60.617%
0.0250	40.412%
0.0095	20.206%
0.0001	0.000%

Structure #24 (Perimeter channel south of HR):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.753%
0.3500	91.290%
0.1500	81.147%
0.0500	60.860%
0.0250	40.573%
0.0095	20.287%
0.0001	0.000%

Structure #23 (Lower segment of HR):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.000%
0.3500	90.000%
0.1500	80.000%
0.0500	60.000%
0.0250	40.000%
0.0095	20.000%
0.0001	0.000%

Structure #22 (Perimeter channel north of HR):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.710%
0.3500	91.210%
0.1500	81.076%
0.0500	60.807%
0.0250	40.538%
0.0095	20.269%
0.0001	0.000%

Structure #21 (Contour channel - 2nd lowest north):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.000%
0.3500	90.000%
0.1500	80.000%

Size (mm)	In/Out
0.0500	60.000%
0.0250	40.000%
0.0095	20.000%
0.0001	0.000%

Structure #20 (Perimeter channel northern most segment):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.578%
0.3500	90.968%
0.1500	80.861%
0.0500	60.646%
0.0250	40.430%
0.0095	20.215%
0.0001	0.000%

Structure #19 (Diversion channel west segment):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.578%
0.3500	90.968%
0.1500	80.861%
0.0500	60.646%
0.0250	40.430%
0.0095	20.215%
0.0001	0.000%

Structure #18 (Diversion channel middle segment):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.756%
0.3500	91.137%
0.1500	81.011%
0.0500	60.758%
0.0250	40.506%
0.0095	20.253%
0.0001	0.000%

Structure #17 (Diversion channel into pond from north):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.756%
0.3500	91.137%
0.1500	81.011%
0.0500	60.758%
0.0250	40.506%
0.0095	20.253%
0.0001	0.000%

Structure #16 (Contour channel - lowest segment north):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.000%
0.3500	90.000%
0.1500	80.000%
0.0500	60.000%
0.0250	40.000%
0.0095	20.000%
0.0001	0.000%

Structure #15 (Perimeter channel - 2nd lowest segment north):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.018%
0.3500	90.017%
0.1500	80.015%
0.0500	60.011%
0.0250	40.007%
0.0095	20.004%
0.0001	0.000%

Structure #14 (Perimeter channel - lowest segment north):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.015%
0.3500	90.014%
0.1500	80.012%

Size (mm)	In/Out
0.0500	60.009%
0.0250	40.006%
0.0095	20.003%
0.0001	0.000%

Structure #34 (Culvert under Haul Road Culver under haul road):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.000%
0.3500	90.000%
0.1500	80.000%
0.0500	60.000%
0.0250	40.000%
0.0095	20.000%
0.0001	0.000%

Structure #33 (Culvert under conveyor/road):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.006%
0.3500	90.006%
0.1500	80.005%
0.0500	60.004%
0.0250	40.003%
0.0095	20.001%
0.0001	0.000%

Structure #13 (Perimeter channel - top segment south):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.000%
0.3500	90.000%
0.1500	80.000%
0.0500	60.000%
0.0250	40.000%
0.0095	20.000%

Size (mm)	In/Out
0.0001	0.000%

Structure #11 (Contour channel - west arm of 3rd lowest south):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.000%
0.3500	90.000%
0.1500	80.000%
0.0500	60.000%
0.0250	40.000%
0.0095	20.000%
0.0001	0.000%

Structure #12 (Contour channel - upper arm of 3rd lowest south):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.000%
0.3500	90.000%
0.1500	80.000%
0.0500	60.000%
0.0250	40.000%
0.0095	20.000%
0.0001	0.000%

Structure #10 (Contour channel - 2nd lowest of 3rd lowest south):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.010%
0.3500	90.009%
0.1500	80.008%
0.0500	60.006%
0.0250	40.004%
0.0095	20.002%
0.0001	0.000%

Structure #9 (Contour channel - lowest segment of 3rd lowest south):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.015%
0.3500	90.014%
0.1500	80.013%
0.0500	60.010%
0.0250	40.006%
0.0095	20.003%
0.0001	0.000%

Structure #8 (Perimeter channel - 4th lowest south):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.022%
0.3500	90.021%
0.1500	80.019%
0.0500	60.014%
0.0250	40.009%
0.0095	20.005%
0.0001	0.000%

Structure #7 (Contour channel - 2nd lowest south):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.000%
0.3500	90.000%
0.1500	80.000%
0.0500	60.000%
0.0250	40.000%
0.0095	20.000%
0.0001	0.000%

Structure #6 (Perimeter channel - 3rd lowest south):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.026%

Size (mm)	In/Out
0.3500	90.025%
0.1500	80.022%
0.0500	60.017%
0.0250	40.011%
0.0095	20.006%
0.0001	0.000%

Structure #5 (Steep perimeter channel - 2nd lowest south):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.027%
0.3500	90.026%
0.1500	80.023%
0.0500	60.017%
0.0250	40.012%
0.0095	20.006%
0.0001	0.000%

Structure #4 (Lowest contour channel - south):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.000%
0.3500	90.000%
0.1500	80.000%
0.0500	60.000%
0.0250	40.000%
0.0095	20.000%
0.0001	0.000%

Structure #3 (Perimeter channel - lowest south):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.031%
0.3500	90.030%
0.1500	80.027%
0.0500	60.020%
0.0250	40.013%
0.0095	20.007%

Size (mm)	In/Out
0.0001	0.000%

Structure #2 (Channel into pond - west end):

Size (mm)	In/Out
1.0000	100.000%
0.5600	95.031%
0.3500	90.029%
0.1500	80.026%
0.0500	60.019%
0.0250	40.013%
0.0095	20.006%
0.0001	0.000%

Structure #1 (Main Sediment Pond):

Size (mm)	In	Out
1.0000	100.000%	100.000%
0.5600	95.345%	100.000%
0.3500	90.510%	100.000%
0.1500	80.453%	100.000%
0.0500	60.340%	100.000%
0.0250	40.227%	100.000%
0.0095	20.113%	100.000%
0.0001	0.000%	0.000%

Structure #32:

Size (mm)	In	Out
1.0000	100.000%	100.000%
0.5600	100.000%	100.000%
0.3500	100.000%	100.000%
0.1500	100.000%	100.000%
0.0500	100.000%	100.000%
0.0250	100.000%	100.000%
0.0095	99.608%	100.000%
0.0001	0.000%	0.000%

Structure Detail:

Structure #30 (Erodible Channel)

Upper HR segment

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	6.0:1	7.1	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	4.04 cfs	
Depth:	0.44 ft	1.44 ft
Top Width:	3.93 ft	12.93 ft
Velocity:	4.71 fps	
X-Section Area:	0.86 sq ft	
Hydraulic Radius:	0.213 ft	
Froude Number:	1.78	

Structure #29 (Erodible Channel)

Contour channel upper extension of west - south segment

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	3.0:1	2.3	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	3.43 cfs	
Depth:	0.51 ft	1.51 ft
Top Width:	4.58 ft	13.58 ft
Velocity:	2.94 fps	
X-Section Area:	1.16 sq ft	
Hydraulic Radius:	0.248 ft	

	w/o Freeboard	w/ Freeboard
Froude Number:	1.03	

Structure #28 (Erodible Channel)

Contour channel upper extension of west - north segment

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	3.0:1	3.0	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	6.88 cfs	
Depth:	0.63 ft	1.63 ft
Top Width:	5.63 ft	14.63 ft
Velocity:	3.90 fps	
X-Section Area:	1.76 sq ft	
Hydraulic Radius:	0.306 ft	
Froude Number:	1.23	

Structure #27 (Erodible Channel)

Contour channel 2nd lowest segment of west

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	6.0:1	2.9	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	12.95 cfs	
Depth:	0.80 ft	1.80 ft
Top Width:	7.20 ft	16.20 ft
Velocity:	4.50 fps	
X-Section Area:	2.88 sq ft	

	w/o Freeboard	w/ Freeboard
Hydraulic Radius:	0.390 ft	
Froude Number:	1.25	

Structure #26 (Erodible Channel)

Contour channel south extension of west

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	3.0:1	2.7	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	5.88 cfs	
Depth:	0.60 ft	1.60 ft
Top Width:	5.42 ft	14.42 ft
Velocity:	3.60 fps	
X-Section Area:	1.63 sq ft	
Hydraulic Radius:	0.294 ft	
Froude Number:	1.16	

Structure #25 (Erodible Channel)

Contour channel lowest segment of west

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	6.0:1	2.5	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	19.72 cfs	
Depth:	0.96 ft	1.96 ft
Top Width:	8.65 ft	17.65 ft
Velocity:	4.74 fps	

	w/o Freeboard	w/ Freeboard
X-Section Area:	4.16 sq ft	
Hydraulic Radius:	0.469 ft	
Froude Number:	1.21	

Structure #24 (Erodible Channel)

Perimeter channel south of HR

Trapezoidal Erodible Channel Inputs:

Material: Graded loam to cobbles when noncolloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.00	4.0:1	4.0:1	1.0	0.0300	1.00			5.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	22.83 cfs	
Depth:	0.75 ft	1.75 ft
Top Width:	12.03 ft	20.03 ft
Velocity:	3.36 fps	
X-Section Area:	6.80 sq ft	
Hydraulic Radius:	0.556 ft	
Froude Number:	0.79	

Structure #23 (Erodible Channel)

Lower segment of HR

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	6.0:1	7.1	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	3.11 cfs	
Depth:	0.40 ft	1.40 ft
Top Width:	3.56 ft	12.56 ft

	w/o Freeboard	w/ Freeboard
Velocity:	4.42 fps	
X-Section Area:	0.70 sq ft	
Hydraulic Radius:	0.193 ft	
Froude Number:	1.75	

Structure #22 (Erodible Channel)

Perimeter channel north of HR

Trapezoidal Erodible Channel Inputs:

Material: Graded loam to cobbles when noncolloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.00	4.0:1	4.0:1	1.1	0.0300	1.00			5.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	23.51 cfs	
Depth:	0.74 ft	1.74 ft
Top Width:	11.92 ft	19.92 ft
Velocity:	3.55 fps	
X-Section Area:	6.62 sq ft	
Hydraulic Radius:	0.548 ft	
Froude Number:	0.84	

Structure #21 (Erodible Channel)

Contour channel - 2nd lowest north

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	6.0:1	4.2	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	5.28 cfs	
Depth:	0.53 ft	1.53 ft

	w/o Freeboard	w/ Freeboard
Top Width:	4.80 ft	13.80 ft
Velocity:	4.12 fps	
X-Section Area:	1.28 sq ft	
Hydraulic Radius:	0.260 ft	
Froude Number:	1.41	

Structure #20 (Erodible Channel)

Perimeter channel northern most segment

Trapezoidal Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
5.00	4.0:1	4.0:1	1.3	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	26.85 cfs	
Depth:	0.83 ft	1.83 ft
Top Width:	11.65 ft	19.65 ft
Velocity:	3.88 fps	
X-Section Area:	6.92 sq ft	
Hydraulic Radius:	0.584 ft	
Froude Number:	0.89	

Structure #19 (Erodible Channel)

Diversion channel west segment

Trapezoidal Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.00	4.0:1	4.0:1	1.0	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	26.85 cfs	

	w/o Freeboard	w/ Freeboard
Depth:	0.82 ft	1.82 ft
Top Width:	12.57 ft	20.57 ft
Velocity:	3.52 fps	
X-Section Area:	7.63 sq ft	
Hydraulic Radius:	0.597 ft	
Froude Number:	0.80	

Structure #18 (Riprap Channel)

Diversion channel middle segment

Trapezoidal Riprap Channel Inputs:

Material: Riprap

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
8.00	4.0:1	4.0:1	13.0	1.00		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	26.95 cfs	
Depth:	0.29 ft	1.29 ft
Top Width:	10.31 ft	18.31 ft
Velocity*:		
X-Section Area:	2.64 sq ft	
Hydraulic Radius:	0.254 ft	
Froude Number*:		
Manning's n*:		
Dmin:	3.00 in	
D50:	9.00 in	
Dmax:	11.25 in	

Velocity and Manning's n calculations may not apply for this method.

Structure #17 (Riprap Channel)

Diversion channel into pond from north

Trapezoidal Riprap Channel Inputs:

Material: Riprap

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
8.00	4.0:1	4.0:1	10.0	1.00		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	26.95 cfs	
Depth:	0.31 ft	1.31 ft
Top Width:	10.52 ft	18.52 ft
Velocity*:		
X-Section Area:	2.91 sq ft	
Hydraulic Radius:	0.275 ft	
Froude Number*:		
Manning's n*:		
Dmin:	2.00 in	
D50:	6.00 in	
Dmax:	7.50 in	

Velocity and Manning's n calculations may not apply for this method.

Structure #16 (Erodible Channel)

Contour channel - lowest segment north

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	6.0:1	1.2	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	1.12 cfs	
Depth:	0.38 ft	1.38 ft
Top Width:	3.38 ft	12.38 ft
Velocity:	1.76 fps	
X-Section Area:	0.64 sq ft	
Hydraulic Radius:	0.184 ft	
Froude Number:	0.71	

Structure #15 (Erodible Channel)

Perimeter channel - 2nd lowest segment north

Trapezoidal Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
4.00	3.0:1	3.0:1	33.0	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	1.20 cfs	
Depth:	0.06 ft	1.06 ft
Top Width:	4.38 ft	10.38 ft
Velocity:	4.42 fps	
X-Section Area:	0.27 sq ft	
Hydraulic Radius:	0.061 ft	
Froude Number:	3.15	

Structure #14 (Erodible Channel)

Perimeter channel - lowest segment north

Trapezoidal Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
2.50	3.0:1	3.0:1	14.3	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	1.71 cfs	
Depth:	0.13 ft	1.13 ft
Top Width:	3.30 ft	9.30 ft
Velocity:	4.45 fps	
X-Section Area:	0.38 sq ft	
Hydraulic Radius:	0.115 ft	
Froude Number:	2.29	

Structure #34 (Culvert)

Culvert under Haul Road

Culver under haul road

Culvert Inputs:

Length (ft)	Slope (%)	Manning's n	Max. Headwater (ft)	Tailwater (ft)	Entrance Loss Coef. (Ke)
160.00	4.40	0.0150	0.67	0.00	0.90

Culvert Results:

Design Discharge = 0.02 cfs

Minimum pipe diameter: 1 - 2 inch pipe(s) required

Structure #33 (Culvert)

Culvert under conveyor/road

Culvert Inputs:

Length (ft)	Slope (%)	Manning's n	Max. Headwater (ft)	Tailwater (ft)	Entrance Loss Coef. (Ke)
100.00	4.50	0.0150	1.00	0.00	0.90

Culvert Results:

Design Discharge = 0.92 cfs

Minimum pipe diameter: 1 - 8 inch pipe(s) required

Structure #13 (Erodible Channel)

Perimeter channel - top segment south

Trapezoidal Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
4.00	3.0:1	3.0:1	1.2	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	5.79 cfs	
Depth:	0.42 ft	1.42 ft
Top Width:	6.54 ft	12.54 ft
Velocity:	2.60 fps	

	w/o Freeboard	w/ Freeboard
X-Section Area:	2.23 sq ft	
Hydraulic Radius:	0.334 ft	
Froude Number:	0.78	

Structure #11 (Erodible Channel)

Contour channel - west arm of 3rd lowest south

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	6.0:1	2.8	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	4.56 cfs	
Depth:	0.55 ft	1.55 ft
Top Width:	4.91 ft	13.91 ft
Velocity:	3.41 fps	
X-Section Area:	1.34 sq ft	
Hydraulic Radius:	0.266 ft	
Froude Number:	1.15	

Structure #12 (Erodible Channel)

Contour channel - upper arm of 3rd lowest south

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	6.0:1	2.7	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	5.74 cfs	
Depth:	0.60 ft	1.60 ft
Top Width:	5.38 ft	14.38 ft

	w/o Freeboard	w/ Freeboard
Velocity:	3.57 fps	
X-Section Area:	1.61 sq ft	
Hydraulic Radius:	0.292 ft	
Froude Number:	1.15	

Structure #10 (Erodible Channel)

Contour channel - 2nd lowest of 3rd lowest south

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	3.0:1	2.7	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	8.67 cfs	
Depth:	0.69 ft	1.69 ft
Top Width:	6.25 ft	15.25 ft
Velocity:	4.00 fps	
X-Section Area:	2.17 sq ft	
Hydraulic Radius:	0.339 ft	
Froude Number:	1.20	

Structure #9 (Erodible Channel)

Contour channel - lowest segment of 3rd lowest south

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	3.0:1	2.8	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	15.07 cfs	
Depth:	0.85 ft	1.85 ft

	w/o Freeboard	w/ Freeboard
Top Width:	7.67 ft	16.67 ft
Velocity:	4.61 fps	
X-Section Area:	3.27 sq ft	
Hydraulic Radius:	0.416 ft	
Froude Number:	1.24	

Structure #8 (Erodible Channel)

Perimeter channel - 4th lowest south

Trapezoidal Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
8.00	3.0:1	3.0:1	3.0	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	22.03 cfs	
Depth:	0.49 ft	1.49 ft
Top Width:	10.93 ft	16.93 ft
Velocity:	4.77 fps	
X-Section Area:	4.62 sq ft	
Hydraulic Radius:	0.416 ft	
Froude Number:	1.29	

Structure #7 (Erodible Channel)

Contour channel - 2nd lowest south

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	3.0:1	2.6	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	7.93 cfs	

	w/o Freeboard	w/ Freeboard
Depth:	0.68 ft	1.68 ft
Top Width:	6.11 ft	15.11 ft
Velocity:	3.83 fps	
X-Section Area:	2.07 sq ft	
Hydraulic Radius:	0.331 ft	
Froude Number:	1.16	

Structure #6 (Erodible Channel)

Perimeter channel - 3rd lowest south

Trapezoidal Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.00	3.0:1	3.0:1	1.6	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	29.36 cfs	
Depth:	0.79 ft	1.79 ft
Top Width:	10.74 ft	16.74 ft
Velocity:	4.45 fps	
X-Section Area:	6.60 sq ft	
Hydraulic Radius:	0.601 ft	
Froude Number:	1.00	

Structure #5 (Riprap Channel)

Steep perimeter channel - 2nd lowest south

Trapezoidal Riprap Channel Inputs:

Material: Riprap

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
6.00	3.0:1	3.0:1	7.8	1.00		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	30.27 cfs	
Depth:	0.42 ft	1.42 ft
Top Width:	8.51 ft	14.51 ft
Velocity*:		
X-Section Area:	3.04 sq ft	
Hydraulic Radius:	0.352 ft	
Froude Number*:		
Manning's n*:		
Dmin:	3.00 in	
D50:	9.00 in	
Dmax:	11.25 in	

Velocity and Manning's n calculations may not apply for this method.

Structure #4 (Erodible Channel)

Lowest contour channel - south

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	3.0:1	2.5	0.0300				5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	2.68 cfs	
Depth:	0.46 ft	
Top Width:	4.10 ft	
Velocity:	2.86 fps	
X-Section Area:	0.93 sq ft	
Hydraulic Radius:	0.222 ft	
Froude Number:	1.06	

Structure #3 (Riprap Channel)

Perimeter channel - lowest south

Trapezoidal Riprap Channel Inputs:

Material: Riprap

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
5.00	3.0:1	3.0:1	4.9	1.00		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	32.83 cfs	
Depth:	0.53 ft	1.53 ft
Top Width:	8.15 ft	14.15 ft
Velocity*:		
X-Section Area:	3.45 sq ft	
Hydraulic Radius:	0.415 ft	
Froude Number*:		
Manning's n*:		
Dmin:	3.00 in	
D50:	9.00 in	
Dmax:	11.25 in	

Velocity and Manning's n calculations may not apply for this method.

Structure #2 (Riprap Channel)

Channel into pond - west end

Trapezoidal Riprap Channel Inputs:

Material: Riprap

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
6.00	3.0:1	3.0:1	10.0			

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	34.54 cfs	
Depth:	0.43 ft	
Top Width:	8.60 ft	
Velocity*:		
X-Section Area:	3.16 sq ft	
Hydraulic Radius:	0.361 ft	

	w/o Freeboard	w/ Freeboard
Froude Number*:		
Manning's n*:		
Dmin:	3.00 in	
D50:	9.00 in	
Dmax:	11.25 in	

Velocity and Manning's n calculations may not apply for this method.

Structure #1 (Pond)

Main Sediment Pond

Pond Inputs:

Initial Pool Elev:	5,626.00 ft
Initial Pool:	1.44 ac-ft
*Sediment Storage:	3.57 ac-ft
Dead Space:	20.00 %

**Sediment capacity based on Average Annual R of 16.6 for 3 year(s)*

Straight Pipe

Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Entrance Loss Coefficient	Tailwater Depth (ft)
30.00	35.00	5.71	0.0240	5,626.00	0.70	1.35

Straight Pipe

Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Entrance Loss Coefficient	Tailwater Depth (ft)
30.00	35.00	5.71	0.0240	5,626.00	0.70	1.35

Pond Results:

Peak Elevation:	5,627.65 ft
H'graph Detention Time:	1.74 hrs
Pond Model:	CSTRS
Dewater Time:	1.17 days
Trap Efficiency:	82.20 %

Dewatering time is calculated from peak stage to lowest spillway

Elevation-Capacity-Discharge Table

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
5,624.72	1.030	0.000	0.000		Top of Sed. Storage
5,624.75	1.034	0.028	0.000		
5,625.00	1.078	0.292	0.000		
5,625.25	1.114	0.566	0.000		
5,625.50	1.150	0.849	0.000		
5,625.75	1.187	1.141	0.000		
5,626.00	1.225	1.443	0.000		Spillway #1 Spillway #2
5,626.25	1.263	1.754	1.319	15.90	
5,626.50	1.301	2.074	3.713	7.20	
5,626.75	1.341	2.404	6.806	2.30	
5,627.00	1.380	2.744	10.484	1.05	
5,627.25	1.421	3.095	14.640	0.65	
5,627.50	1.462	3.455	19.233	0.50	
5,627.65	1.487	3.681	22.286	0.40	Peak Stage
5,627.75	1.503	3.826	24.243		
5,628.00	1.546	4.207	29.619		
5,628.25	1.588	4.598	35.352		
5,628.50	1.632	5.001	41.385		
5,628.75	1.676	5.414	47.756		
5,629.00	1.720	5.839	54.021		
5,629.25	1.765	6.274	58.787		
5,629.50	1.811	6.721	63.658		
5,629.75	1.857	7.180	68.188		
5,630.00	1.904	7.650	72.434		

Detailed Discharge Table

Elevation (ft)	Straight Pipe (cfs)	Straight Pipe (cfs)	Combined Total Discharge (cfs)
5,624.72	0.000	0.000	0.000
5,624.75	0.000	0.000	0.000
5,625.00	0.000	0.000	0.000
5,625.25	0.000	0.000	0.000
5,625.50	0.000	0.000	0.000
5,625.75	0.000	0.000	0.000
5,626.00	0.000	0.000	0.000
5,626.25	(3)>0.660	(3)>0.660	1.319
5,626.50	(3)>1.856	(3)>1.856	3.713

Elevation (ft)	Straight Pipe (cfs)	Straight Pipe (cfs)	Combined Total Discharge (cfs)
5,626.75	(3)>3.403	(3)>3.403	6.806
5,627.00	(3)>5.242	(3)>5.242	10.484
5,627.25	(3)>7.320	(3)>7.320	14.640
5,627.50	(3)>9.617	(3)>9.617	19.233
5,627.75	(3)>12.122	(3)>12.122	24.243
5,628.00	(3)>14.810	(3)>14.810	29.619
5,628.25	(3)>17.676	(3)>17.676	35.352
5,628.50	(3)>20.693	(3)>20.693	41.385
5,628.75	(3)>23.878	(3)>23.878	47.756
5,629.00	(3)>27.011	(3)>27.011	54.021
5,629.25	(5)>29.393	(5)>29.393	58.787
5,629.50	(5)>31.829	(5)>31.829	63.658
5,629.75	(5)>34.094	(5)>34.094	68.188
5,630.00	(5)>36.217	(5)>36.217	72.434

Structure #32 (Pond)

RWR#2

Pond Inputs:

Initial Pool Elev:	5,563.15 ft
Initial Pool:	0.00 ac-ft
*Sediment Storage:	0.00 ac-ft
Dead Space:	20.00 %

**Sediment capacity was entered by user*

Broad-crested Weir

Weir Width (ft)	Spillway Elev (ft)
20.50	5,578.82

V-notch Weir

Notch Angle (deg)	Spillway Elev (ft)
75.00	5,577.32

Pond Results:

Peak Elevation:	5,578.60 ft
H'graph Detention Time:	8.42 hrs
Pond Model:	CSTRS

Dewater Time:	4.53 days
Trap Efficiency:	97.09 %

Dewatering time is calculated from peak stage to lowest spillway

Elevation-Capacity-Discharge Table

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
5,563.07	0.001	0.000	0.000		Top of Sed. Storage
5,563.15	0.002	0.000	0.000		
5,563.25	0.003	0.000	0.000		
5,563.50	0.007	0.002	0.000		
5,563.75	0.013	0.004	0.000		
5,564.00	0.020	0.008	0.000		
5,564.10	0.022	0.010	0.000		
5,564.25	0.024	0.014	0.000		
5,564.50	0.028	0.020	0.000		
5,564.75	0.033	0.028	0.000		
5,565.00	0.038	0.037	0.000		
5,565.25	0.044	0.047	0.000		
5,565.50	0.050	0.059	0.000		
5,565.75	0.057	0.072	0.000		
5,566.00	0.064	0.087	0.000		
5,566.25	0.072	0.104	0.000		
5,566.50	0.080	0.123	0.000		
5,566.75	0.089	0.144	0.000		
5,567.00	0.098	0.168	0.000		
5,567.25	0.108	0.193	0.000		
5,567.50	0.118	0.221	0.000		
5,567.75	0.129	0.252	0.000		
5,568.00	0.140	0.286	0.000		
5,568.25	0.152	0.322	0.000		
5,568.50	0.164	0.362	0.000		
5,568.75	0.177	0.404	0.000		
5,569.00	0.190	0.450	0.000		
5,569.25	0.202	0.499	0.000		
5,569.50	0.214	0.551	0.000		
5,569.75	0.227	0.606	0.000		
5,570.00	0.240	0.665	0.000		
5,570.25	0.259	0.727	0.000		
5,570.50	0.279	0.794	0.000		
5,570.75	0.300	0.867	0.000		
5,571.00	0.321	0.944	0.000		

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
5,571.25	0.345	1.027	0.000		
5,571.50	0.369	1.117	0.000		
5,571.75	0.394	1.212	0.000		
5,572.00	0.420	1.314	0.000		
5,572.25	0.442	1.421	0.000		
5,572.50	0.464	1.535	0.000		
5,572.75	0.487	1.653	0.000		
5,573.00	0.510	1.778	0.000		
5,573.25	0.533	1.908	0.000		
5,573.50	0.556	2.044	0.000		
5,573.75	0.580	2.186	0.000		
5,574.00	0.604	2.334	0.000		
5,574.25	0.627	2.488	0.000		
5,574.50	0.651	2.648	0.000		
5,574.75	0.675	2.814	0.000		
5,575.00	0.700	2.986	0.000		
5,575.25	0.724	3.164	0.000		
5,575.50	0.748	3.348	0.000		
5,575.75	0.772	3.538	0.000		
5,576.00	0.797	3.734	0.000		
5,576.25	0.823	3.936	0.000		
5,576.50	0.849	4.145	0.000		
5,576.75	0.875	4.361	0.000		
5,577.00	0.902	4.583	0.000		
5,577.25	0.926	4.811	0.000		
5,577.32	0.933	4.876	0.000		Spillway #2
5,577.50	0.950	5.046	0.026	77.66*	
5,577.75	0.975	5.286	0.233	12.51*	
5,578.00	1.000	5.533	0.732	7.65	
5,578.25	1.008	5.784	1.601	3.75	
5,578.50	1.016	6.037	2.903	2.70	
5,578.60	1.020	6.142	3.633	4.35	Peak Stage
5,578.75	1.025	6.292	4.692		
5,578.82	1.027	6.364	5.286		Spillway #1
5,579.00	1.033	6.550	11.859		
5,579.25	1.050	6.810	27.784		
5,579.50	1.067	7.075	48.963		
5,579.75	1.084	7.343	74.433		
5,580.00	1.101	7.617	103.695		
5,580.25	1.125	7.895	136.431		
5,580.50	1.150	8.179	172.421		

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)
5,580.75	1.175	8.470	211.505	
5,581.00	1.200	8.767	253.559	

**Designates time(s) to dewater have been extrapolated beyond the 50 hour hydrograph limit.*

Detailed Discharge Table

Elevation (ft)	Broad-crested Weir (cfs)	V-notch Weir (cfs)	Combined Total Discharge (cfs)
5,563.07	0.000	0.000	0.000
5,563.15	0.000	0.000	0.000
5,563.25	0.000	0.000	0.000
5,563.50	0.000	0.000	0.000
5,563.75	0.000	0.000	0.000
5,564.00	0.000	0.000	0.000
5,564.10	0.000	0.000	0.000
5,564.25	0.000	0.000	0.000
5,564.50	0.000	0.000	0.000
5,564.75	0.000	0.000	0.000
5,565.00	0.000	0.000	0.000
5,565.25	0.000	0.000	0.000
5,565.50	0.000	0.000	0.000
5,565.75	0.000	0.000	0.000
5,566.00	0.000	0.000	0.000
5,566.25	0.000	0.000	0.000
5,566.50	0.000	0.000	0.000
5,566.75	0.000	0.000	0.000
5,567.00	0.000	0.000	0.000
5,567.25	0.000	0.000	0.000
5,567.50	0.000	0.000	0.000
5,567.75	0.000	0.000	0.000
5,568.00	0.000	0.000	0.000
5,568.25	0.000	0.000	0.000
5,568.50	0.000	0.000	0.000
5,568.75	0.000	0.000	0.000
5,569.00	0.000	0.000	0.000
5,569.25	0.000	0.000	0.000
5,569.50	0.000	0.000	0.000
5,569.75	0.000	0.000	0.000
5,570.00	0.000	0.000	0.000

Elevation (ft)	Broad-crested Weir (cfs)	V-notch Weir (cfs)	Combined Total Discharge (cfs)
5,570.25	0.000	0.000	0.000
5,570.50	0.000	0.000	0.000
5,570.75	0.000	0.000	0.000
5,571.00	0.000	0.000	0.000
5,571.25	0.000	0.000	0.000
5,571.50	0.000	0.000	0.000
5,571.75	0.000	0.000	0.000
5,572.00	0.000	0.000	0.000
5,572.25	0.000	0.000	0.000
5,572.50	0.000	0.000	0.000
5,572.75	0.000	0.000	0.000
5,573.00	0.000	0.000	0.000
5,573.25	0.000	0.000	0.000
5,573.50	0.000	0.000	0.000
5,573.75	0.000	0.000	0.000
5,574.00	0.000	0.000	0.000
5,574.25	0.000	0.000	0.000
5,574.50	0.000	0.000	0.000
5,574.75	0.000	0.000	0.000
5,575.00	0.000	0.000	0.000
5,575.25	0.000	0.000	0.000
5,575.50	0.000	0.000	0.000
5,575.75	0.000	0.000	0.000
5,576.00	0.000	0.000	0.000
5,576.25	0.000	0.000	0.000
5,576.50	0.000	0.000	0.000
5,576.75	0.000	0.000	0.000
5,577.00	0.000	0.000	0.000
5,577.25	0.000	0.000	0.000
5,577.32	0.000	0.000	0.000
5,577.50	0.000	0.026	0.026
5,577.75	0.000	0.233	0.233
5,578.00	0.000	0.732	0.732
5,578.25	0.000	1.601	1.601
5,578.50	0.000	2.903	2.903
5,578.75	0.000	4.692	4.692
5,578.82	0.000	5.286	5.286
5,579.00	4.840	7.020	11.859
5,579.25	17.855	9.929	27.784
5,579.50	35.500	13.463	48.963

Elevation (ft)	Broad-crested Weir (cfs)	V-notch Weir (cfs)	Combined Total Discharge (cfs)
5,579.75	56.773	17.661	74.433
5,580.00	81.135	22.559	103.695
5,580.25	108.237	28.194	136.431
5,580.50	137.823	34.598	172.421
5,580.75	169.702	41.803	211.505
5,581.00	203.717	49.842	253.559

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#30	1	4.280	0.125	0.000	0.000	89.000	F	2.69	0.235
	2	2.030	0.039	0.000	0.000	89.000	F	1.51	0.115
	Σ	**6.310**						**4.04**	**0.350**
#29	1	4.610	0.085	0.000	0.000	89.000	F	3.43	0.262
	Σ	**4.610**						**3.43**	**0.262**
#28	1	4.850	0.059	0.000	0.000	89.000	F	3.60	0.276
	Σ	**9.460**						**6.88**	**0.538**
#27	1	3.710	0.022	0.000	0.000	89.000	F	2.76	0.211
	Σ	**19.480**						**12.95**	**1.099**
#26	1	7.910	0.077	0.000	0.000	89.000	F	5.88	0.450
	Σ	**7.910**						**5.88**	**0.450**
#25	1	2.700	0.058	0.000	0.000	89.000	F	2.01	0.153
	Σ	**30.090**						**19.72**	**1.703**
#24	1	2.090	0.126	0.000	0.000	89.000	F	1.32	0.114
	2	1.990	0.135	0.000	0.000	87.000	F	1.07	0.093
	3	1.900	0.163	0.000	0.000	89.000	F	1.20	0.104
	4	0.400	0.064	0.000	0.000	91.000	F	0.34	0.022
	5	11.340	0.189	0.000	0.000	63.000	F	0.03	0.022
	6	0.340	0.058	0.000	0.000	63.000	F	0.00	0.000
	7	0.270	0.077	0.000	0.000	89.000	F	0.20	0.011
	8	0.630	0.180	0.000	0.000	89.000	F	0.39	0.031
	Σ	**49.050**						**22.83**	**2.101**
#23	1	2.110	0.040	0.000	0.000	89.000	F	1.57	0.120
	2	1.830	0.040	0.000	0.000	91.000	F	1.54	0.121
	Σ	**3.940**						**3.11**	**0.241**
#22	1	1.140	0.042	0.000	0.000	89.000	F	0.85	0.065
	2	0.710	0.112	0.000	0.000	89.000	F	0.53	0.040
	Σ	**54.840**						**23.51**	**2.446**
#21	1	7.100	0.054	0.000	0.000	89.000	F	5.28	0.404
	Σ	**7.100**						**5.28**	**0.404**
#20	1	0.500	0.051	0.000	0.000	89.000	F	0.37	0.024
	2	2.350	0.124	0.000	0.000	89.000	F	1.75	0.134
	3	3.630	0.104	0.000	0.000	70.000	F	0.30	0.031

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
	Σ	**68.420**						**26.85**	**3.039**
#19	Σ	**68.420**						**26.85**	**3.039**
#18	1	0.750	0.010	0.010	0.000	70.000	F	0.06	0.002
	2	0.470	0.026	0.000	0.000	91.000	F	0.39	0.027
	Σ	**69.640**						**26.95**	**3.067**
#17	Σ	**69.640**						**26.95**	**3.067**
#16	1	1.510	0.022	0.000	0.000	89.000	F	1.12	0.086
	Σ	**1.510**						**1.12**	**0.086**
#15	1	0.930	0.007	0.000	0.000	70.000	F	0.08	0.003
	Σ	**2.440**						**1.20**	**0.089**
#14	1	0.690	0.007	0.000	0.000	89.000	F	0.51	0.036
	Σ	**3.130**						**1.71**	**0.125**
#34	1	5.850	0.022	0.000	0.000	63.000	F	0.02	0.012
	Σ	**5.850**						**0.02**	**0.012**
#33	1	0.650	0.021	0.041	0.412	89.000	F	0.48	0.033
	2	14.820	0.042	0.000	0.000	51.000	F	0.00	0.000
	3	15.250	0.065	0.000	0.000	63.000	F	0.04	0.032
	4	0.330	0.011	0.037	0.410	89.000	F	0.25	0.014
	5	0.260	0.006	0.025	0.416	89.000	F	0.19	0.010
	Σ	**37.160**						**0.92**	**0.101**
#13	1	4.950	0.102	0.000	0.000	89.000	F	3.68	0.282
	2	15.150	0.060	0.000	0.000	51.000	F	0.00	0.000
	3	1.600	0.117	0.000	0.000	89.000	F	1.19	0.091
	Σ	**58.860**						**5.79**	**0.473**
#11	1	6.140	0.068	0.000	0.000	89.000	F	4.56	0.349
	Σ	**6.140**						**4.56**	**0.349**
#12	1	7.720	0.091	0.000	0.000	89.000	F	5.74	0.439
	Σ	**7.720**						**5.74**	**0.439**
#10	1	4.450	0.081	0.000	0.000	89.000	F	3.31	0.253
	Σ	**12.170**						**8.67**	**0.693**
#9	1	3.510	0.066	0.000	0.000	89.000	F	2.61	0.200
	Σ	**21.820**						**15.07**	**1.242**
#8	1	3.400	0.068	0.000	0.000	89.000	F	2.53	0.193
	Σ	**84.080**						**22.03**	**1.908**

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#7	1	10.670	0.099	0.000	0.000	89.000	F	7.93	0.607
	Σ	**10.670**						**7.93**	**0.607**
#6	1	1.550	0.065	0.000	0.000	89.000	F	1.15	0.088
	Σ	**96.300**						**29.36**	**2.604**
#5	1	1.640	0.012	0.000	0.000	89.000	F	1.22	0.093
	Σ	**97.940**						**30.27**	**2.697**
#4	1	3.600	0.046	0.000	0.000	89.000	F	2.68	0.205
	Σ	**3.600**						**2.68**	**0.205**
#3	1	1.930	0.034	0.000	0.000	1.000	F	0.00	0.000
	Σ	**103.470**						**32.83**	**2.901**
#2	Σ	**106.600**						**34.54**	**3.026**
#1	1	1.900	0.000	0.000	0.000	98.000	F	2.22	0.213
	2	1.690	0.000	0.000	0.000	87.000	F	1.10	0.082
	3	3.650	0.021	0.000	0.000	70.000	F	0.30	0.031
	4	3.210	0.009	0.000	0.000	70.000	F	0.26	0.027
	Σ	**186.690**						**62.70**	**6.447**
#32	1	217.150	1.147	0.000	0.000	69.000	F	3.03	1.483
	2	12.160	0.169	0.345	0.326	85.000	F	5.52	0.484
	Σ	**416.000**						**27.97**	**8.414**

Subwatershed Sedimentology Detail:

Stru #	SWS #	Soil K	L (ft)	S (%)	C	P	PS #	Sediment (tons)	Peak Sediment Conc. (mg/l)	Peak Settleable Conc (ml/l)	24VW (ml/l)
#30	1	0.320	117.00	30.00	0.3000	1.0000	1	42.2	229,190	140.31	75.41
	2	0.320	45.00	7.00	0.3000	1.0000	1	2.0	23,830	14.86	7.73
	Σ							**44.1**	**209,513**	**128.41**	**53.90**
#29	1	0.320	167.00	33.00	0.3000	1.0000	1	68.6	322,915	201.31	108.32
	Σ							**68.6**	**322,915**	**201.31**	**108.32**
#28	1	0.320	200.00	33.00	0.3000	1.0000	1	80.9	356,432	222.21	120.05
	Σ							**149.5**	**337,750**	**210.56**	**114.44**
#27	1	0.320	115.00	33.00	0.3000	1.0000	1	43.0	258,926	161.42	86.23
	Σ							**236.6**	**294,917**	**183.65**	**90.63**

Stru #	SWS #	Soil K	L (ft)	S (%)	C	P	PS #	Sediment (tons)	Peak Sediment Conc. (mg/l)	Peak Settleable Conc (ml/l)	24VW (ml/l)
#26	1	0.320	215.00	33.00	0.3000	1.0000	1	146.1	388,769	242.37	131.43
	Σ							**146.1**	**388,769**	**242.37**	**131.43**
#25	1	0.320	90.00	30.00	0.3000	1.0000	1	23.6	200,365	124.91	66.29
	Σ							**406.3**	**312,443**	**194.64**	**99.64**
#24	1	0.320	90.00	33.00	0.3000	1.0000	1	17.8	200,529	122.76	65.84
	2	0.320	40.00	3.00	0.1500	1.0000	1	0.4	5,341	3.26	1.68
	3	0.280	30.00	2.00	0.1800	1.0000	1	0.3	3,573	2.19	1.15
	4	0.320	40.00	1.00	0.1800	1.0000	1	0.0	2,256	1.41	0.86
	5	0.320	310.00	8.00	0.0900	1.0000	1	0.1	2,825	1.76	1.61
	6	0.320	67.00	5.00	0.0900	1.0000	1	0.0	1	0.00	0.00
	7	0.320	45.00	3.00	0.1800	1.0000	1	0.1	6,236	3.89	2.62
	8	0.320	45.00	2.50	0.1800	1.0000	1	0.1	5,050	3.09	1.74
	Σ							**424.9**	**315,072**	**196.23**	**85.41**
#23	1	0.320	90.00	33.00	0.3000	1.0000	1	19.7	213,167	132.89	70.65
	2	0.280	100.00	7.00	0.3000	1.0000	1	2.7	29,937	18.66	9.97
	Σ							**22.4**	**125,973**	**78.54**	**41.03**
#22	1	0.320	120.00	25.00	0.3000	1.0000	1	8.8	178,830	111.49	59.23
	2	0.280	45.00	2.00	0.1800	1.0000	1	0.1	3,835	2.39	1.25
	Σ							**456.1**	**319,599**	**199.06**	**79.12**
#21	1	0.320	250.00	25.00	0.3000	1.0000	1	106.1	324,000	201.99	108.66
	Σ							**106.1**	**324,000**	**201.99**	**108.66**
#20	1	0.320	45.00	3.00	0.1800	1.0000	1	0.1	6,293	3.92	2.30
	2	0.320	91.00	28.60	0.3000	1.0000	1	19.3	189,636	118.23	62.67
	3	0.280	110.00	20.00	0.0900	1.0000	1	0.6	38,681	24.11	9.28
	Σ							**582.2**	**374,204**	**233.11**	**80.96**
#19	Σ							**582.2**	**535,840**	**333.81**	**87.43**
#18	1	0.280	85.00	26.00	0.0900	1.0000	1	0.1	80,169	49.98	30.38
	2	0.320	45.00	3.00	0.1800	1.0000	1	0.1	6,079	3.79	2.26
	Σ							**581.3**	**793,829**	**494.46**	**83.79**
#17	Σ							**581.3**	**793,829**	**494.46**	**83.94**
#16	1	0.320	200.00	33.00	0.3000	1.0000	1	21.9	315,882	196.93	106.16
	Σ							**21.9**	**315,882**	**196.93**	**106.16**
#15	1	0.280	171.00	16.00	0.0900	1.0000	1	0.1	60,021	37.42	20.22
	Σ							**22.0**	**304,427**	**189.79**	**103.73**

Stru #	SWS #	Soil K	L (ft)	S (%)	C	P	PS #	Sediment (tons)	Peak Sediment Conc. (mg/l)	Peak Settleable Conc (ml/l)	24VW (ml/l)
#14	1	0.320	132.00	30.00	0.3000	1.0000	1	6.4	216,536	135.00	77.08
	Σ							**28.5**	**382,188**	**238.27**	**95.65**
#34	1	0.320	280.00	9.30	0.0110	1.0000	1	0.0	390	0.24	0.22
	Σ							**0.0**	**390**	**0.24**	**0.22**
#33	1	0.320	30.00	2.00	1.0000	1.0000	1	0.6	21,684	13.52	7.57
	2	0.320	500.00	10.00	0.0110	1.0000	1	0.0	1	0.00	0.00
	3	0.320	500.00	10.00	0.0110	1.0000	1	0.0	641	0.40	0.36
	4	0.320	30.00	2.00	1.0000	1.0000	1	0.3	21,092	13.15	8.38
	5	0.320	30.00	2.00	1.0000	1.0000	1	0.2	21,105	13.16	8.91
	Σ							**1.0**	**21,401**	**13.34**	**4.72**
#13	1	0.320	200.00	26.00	0.3000	1.0000	1	64.6	287,840	179.45	96.14
	2	0.320	750.00	9.80	0.0030	1.0000	1	0.0	1	0.00	0.00
	3	0.320	60.00	3.00	1.0000	1.0000	1	2.7	41,444	25.84	13.49
	Σ							**68.4**	**201,191**	**125.43**	**62.26**
#11	1	0.320	215.00	33.00	0.3000	1.0000	1	110.0	378,898	236.22	127.95
	Σ							**110.0**	**378,898**	**236.22**	**127.95**
#12	1	0.320	133.00	33.00	0.3000	1.0000	1	106.6	302,473	188.57	101.18
	Σ							**106.6**	**302,473**	**188.57**	**101.18**
#10	1	0.320	125.00	33.00	0.3000	1.0000	1	55.4	276,073	172.11	92.10
	Σ							**162.0**	**357,374**	**222.80**	**97.80**
#9	1	0.320	124.00	33.00	0.3000	1.0000	1	42.3	268,012	167.09	89.35
	Σ							**314.3**	**363,279**	**226.48**	**105.12**
#8	1	0.320	115.00	33.00	0.3000	1.0000	1	39.0	256,511	159.92	85.41
	Σ							**421.6**	**385,464**	**240.31**	**92.66**
#7	1	0.320	200.00	33.00	0.3000	1.0000	1	195.7	386,319	240.84	130.55
	Σ							**195.7**	**386,319**	**240.84**	**130.55**
#6	1	0.320	75.00	33.00	0.3000	1.0000	1	12.5	186,358	116.18	61.68
	Σ							**629.7**	**423,410**	**263.96**	**100.76**
#5	1	0.320	180.00	33.00	0.3000	1.0000	1	22.5	301,442	187.93	101.09
	Σ							**652.2**	**419,642**	**261.61**	**100.79**
#4	1	0.320	200.00	33.00	0.3000	1.0000	1	57.9	345,659	215.49	116.33
	Σ							**57.9**	**345,659**	**215.49**	**116.33**
#3	1	0.320	105.00	33.00	0.3000	1.0000	1	0.0	1	0.00	0.00

Stru #	SWS #	Soil K	L (ft)	S (%)	C	P	PS #	Sediment (tons)	Peak Sediment Conc. (mg/l)	Peak Settleable Conc (ml/l)	24VW (ml/l)
	Σ							**710.1**	**412,146**	**256.94**	**101.97**
#2	Σ							**738.6**	**407,012**	**253.74**	**101.90**
#1	1	0.280	30.00	14.00	1.0000	1.0000	1	18.9	112,642	70.22	39.19
	2	0.280	80.00	5.00	0.0900	1.0000	1	0.3	6,103	3.80	1.92
	3	0.280	330.00	8.00	0.0900	1.0000	1	0.3	18,932	11.80	4.52
	4	0.280	200.00	21.50	0.0900	1.0000	1	0.8	58,756	36.63	14.16
	Σ							**1,340.3**	**628,268**	**391.52**	**89.99**
#32	1	0.320	500.00	5.00	0.0110	1.0000	1	1.1	765	0.32	0.23
	2	0.320	100.00	33.00	0.8500	1.0000	1	268.6	598,374	363.16	204.16
	Σ							**157.6**	**20,474**	**0.21**	**0.14**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	3	8. Large gullies, diversions, and low flowing streams	22.22	40.00	180.00	14.140	0.003
		8. Large gullies, diversions, and low flowing streams	7.27	40.00	550.00	8.090	0.018
#1	**3**	**Time of Concentration:**					**0.021**
#1	4	8. Large gullies, diversions, and low flowing streams	17.53	78.00	445.00	12.550	0.009
#1	**4**	**Time of Concentration:**					**0.009**
#3	1	8. Large gullies, diversions, and low flowing streams	4.88	40.00	820.00	6.620	0.034
#3	**1**	**Time of Concentration:**					**0.034**
#4	1	8. Large gullies, diversions, and low flowing streams	32.73	72.00	220.00	17.160	0.003
		8. Large gullies, diversions, and low flowing streams	2.47	18.00	730.00	4.710	0.043
#4	**1**	**Time of Concentration:**					**0.046**
#5	1	8. Large gullies, diversions, and low flowing streams	30.48	32.00	105.00	16.560	0.001
		8. Large gullies, diversions, and low flowing streams	7.78	28.00	360.00	8.360	0.011
#5	**1**	**Time of Concentration:**					**0.012**
#6	1	8. Large gullies, diversions, and low flowing streams	1.58	14.00	885.00	3.770	0.065
#6	**1**	**Time of Concentration:**					**0.065**
#7	1	8. Large gullies, diversions, and low flowing streams	25.93	70.00	270.00	15.270	0.004

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
		8. Large gullies, diversions, and low flowing streams	2.59	43.00	1,660.00	4.820	0.095
#7	**1**	**Time of Concentration:**					**0.099**
#8	1	8. Large gullies, diversions, and low flowing streams	2.97	38.00	1,280.00	5.160	0.068
#8	**1**	**Time of Concentration:**					**0.068**
#9	1	8. Large gullies, diversions, and low flowing streams	2.77	33.00	1,190.00	4.990	0.066
#9	**1**	**Time of Concentration:**					**0.066**
#10	1	8. Large gullies, diversions, and low flowing streams	2.74	40.00	1,460.00	4.960	0.081
#10	**1**	**Time of Concentration:**					**0.081**
#11	1	8. Large gullies, diversions, and low flowing streams	17.14	66.00	385.00	12.420	0.008
		8. Large gullies, diversions, and low flowing streams	2.76	30.00	1,085.00	4.980	0.060
#11	**1**	**Time of Concentration:**					**0.068**
#12	1	8. Large gullies, diversions, and low flowing streams	2.00	1.00	50.00	4.240	0.003
		8. Large gullies, diversions, and low flowing streams	30.56	55.00	180.00	16.580	0.003
		8. Large gullies, diversions, and low flowing streams	2.67	40.00	1,500.00	4.890	0.085
#12	**1**	**Time of Concentration:**					**0.091**
#13	1	8. Large gullies, diversions, and low flowing streams	31.72	46.00	145.00	16.890	0.002
		8. Large gullies, diversions, and low flowing streams	1.18	14.00	1,183.00	3.260	0.100
#13	**1**	**Time of Concentration:**					**0.102**
#13	2	3. Short grass pasture	22.06	15.00	68.00	3.750	0.005
		8. Large gullies, diversions, and low flowing streams	7.54	17.49	232.00	8.230	0.007
		6. Grassed waterway	7.14	49.98	700.00	4.000	0.048
#13	**2**	**Time of Concentration:**					**0.060**
#13	3	9. Small streams flowing bankfull	4.57	21.02	460.00	19.230	0.006
		3. Short grass pasture	5.56	41.97	755.00	1.880	0.111
#13	**3**	**Time of Concentration:**					**0.117**
#14	1	8. Large gullies, diversions, and low flowing streams	23.77	29.00	122.00	14.620	0.002
		8. Large gullies, diversions, and low flowing streams	14.29	30.00	210.00	11.330	0.005
#14	**1**	**Time of Concentration:**					**0.007**
#15	1	8. Large gullies, diversions, and low flowing streams	14.47	46.00	318.00	11.410	0.007
#15	**1**	**Time of Concentration:**					**0.007**
#16	1	9. Small streams flowing bankfull	29.33	66.00	225.00	48.740	0.001
		8. Large gullies, diversions, and low flowing streams	1.19	3.00	253.00	3.260	0.021

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#16	**1**	**Time of Concentration:**					**0.022**
#18	1	8. Large gullies, diversions, and low flowing streams	12.93	53.00	410.00	10.780	0.010
#18	**1**	**Time of Concentration:**					**0.010**
#18	2	9. Small streams flowing bankfull	2.38	19.00	800.00	13.860	0.016
		8. Large gullies, diversions, and low flowing streams	12.93	53.00	410.00	10.780	0.010
#18	**2**	**Time of Concentration:**					**0.026**
#20	1	8. Large gullies, diversions, and low flowing streams	1.17	7.00	600.00	3.240	0.051
#20	**1**	**Time of Concentration:**					**0.051**
#20	2	8. Large gullies, diversions, and low flowing streams	1.31	20.00	1,530.00	3.420	0.124
#20	**2**	**Time of Concentration:**					**0.124**
#20	3	8. Large gullies, diversions, and low flowing streams	1.26	16.00	1,266.02	3.370	0.104
#20	**3**	**Time of Concentration:**					**0.104**
#21	1	8. Large gullies, diversions, and low flowing streams	25.00	70.00	280.00	15.000	0.005
		8. Large gullies, diversions, and low flowing streams	4.15	45.00	1,085.00	6.100	0.049
#21	**1**	**Time of Concentration:**					**0.054**
#22	1	8. Large gullies, diversions, and low flowing streams	1.32	7.00	530.00	3.440	0.042
#22	**1**	**Time of Concentration:**					**0.042**
#22	2	8. Large gullies, diversions, and low flowing streams	0.56	5.00	900.00	2.230	0.112
#22	**2**	**Time of Concentration:**					**0.112**
#23	1	8. Large gullies, diversions, and low flowing streams	7.09	83.00	1,170.00	7.990	0.040
#23	**1**	**Time of Concentration:**					**0.040**
#23	2	8. Large gullies, diversions, and low flowing streams	7.09	83.00	1,170.00	7.990	0.040
#23	**2**	**Time of Concentration:**					**0.040**
#24	1	8. Large gullies, diversions, and low flowing streams	0.81	10.00	1,234.00	2.700	0.126
#24	**1**	**Time of Concentration:**					**0.126**
#24	2	8. Large gullies, diversions, and low flowing streams	1.00	7.00	700.00	3.000	0.064
		8. Large gullies, diversions, and low flowing streams	1.70	17.00	1,000.00	3.910	0.071
#24	**2**	**Time of Concentration:**					**0.135**
#24	3	8. Large gullies, diversions, and low flowing streams	1.00	10.00	1,000.00	3.000	0.092
		8. Large gullies, diversions, and low flowing streams	1.70	17.00	1,000.00	3.910	0.071
#24	**3**	**Time of Concentration:**					**0.163**

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#24	4	8. Large gullies, diversions, and low flowing streams	2.00	3.00	150.00	4.240	0.009
		8. Large gullies, diversions, and low flowing streams	1.00	6.00	600.00	3.000	0.055
#24	**4**	**Time of Concentration:**					**0.064**
#24	5	8. Large gullies, diversions, and low flowing streams	1.35	13.00	960.00	3.490	0.076
		8. Large gullies, diversions, and low flowing streams	0.75	8.00	1,060.00	2.600	0.113
#24	**5**	**Time of Concentration:**					**0.189**
#24	6	8. Large gullies, diversions, and low flowing streams	4.67	14.00	300.00	6.480	0.012
		8. Large gullies, diversions, and low flowing streams	1.00	5.00	500.00	3.000	0.046
#24	**6**	**Time of Concentration:**					**0.058**
#24	7	8. Large gullies, diversions, and low flowing streams	3.50	14.00	400.00	5.610	0.019
		8. Large gullies, diversions, and low flowing streams	5.00	15.00	300.00	6.700	0.012
		8. Large gullies, diversions, and low flowing streams	1.00	5.00	500.00	3.000	0.046
#24	**7**	**Time of Concentration:**					**0.077**
#24	8	8. Large gullies, diversions, and low flowing streams	3.64	40.00	1,100.00	5.720	0.053
		8. Large gullies, diversions, and low flowing streams	6.67	30.00	450.00	7.740	0.016
		8. Large gullies, diversions, and low flowing streams	0.70	7.00	1,000.00	2.500	0.111
#24	**8**	**Time of Concentration:**					**0.180**
#25	1	8. Large gullies, diversions, and low flowing streams	2.50	25.00	1,000.00	4.740	0.058
#25	**1**	**Time of Concentration:**					**0.058**
#26	1	8. Large gullies, diversions, and low flowing streams	28.00	70.00	250.00	15.870	0.004
		8. Large gullies, diversions, and low flowing streams	2.69	35.00	1,300.00	4.920	0.073
#26	**1**	**Time of Concentration:**					**0.077**
#27	1	9. Small streams flowing bankfull	2.87	35.00	1,220.00	15.240	0.022
#27	**1**	**Time of Concentration:**					**0.022**
#28	1	8. Large gullies, diversions, and low flowing streams	30.43	70.00	230.00	16.550	0.003
		8. Large gullies, diversions, and low flowing streams	2.20	20.00	910.00	4.440	0.056
#28	**1**	**Time of Concentration:**					**0.059**
#29	1	8. Large gullies, diversions, and low flowing streams	7.65	90.00	1,176.00	8.290	0.039
		8. Large gullies, diversions, and low flowing streams	2.25	17.00	754.00	4.500	0.046
#29	**1**	**Time of Concentration:**					**0.085**

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#30	1	4. Cultivated, straight row	1.50	5.06	337.33	1.090	0.085
		8. Large gullies, diversions, and low flowing streams	7.09	83.00	1,170.00	7.990	0.040
#30	**1**	**Time of Concentration:**					**0.125**
#30	2	8. Large gullies, diversions, and low flowing streams	7.65	90.00	1,176.00	8.290	0.039
#30	**2**	**Time of Concentration:**					**0.039**
#32	1	1. Forest with heavy ground litter	8.61	56.48	655.98	0.740	0.246
		2. Minimum tillage cultivation	5.09	72.00	1,414.53	1.120	0.350
		7. Paved area and small upland gullies	2.93	200.17	6,831.74	3.440	0.551
#32	**1**	**Time of Concentration:**					**1.147**
#32	2	5. Nearly bare and untilled, and alluvial valley fans	10.00	16.50	165.00	3.160	0.014
		6. Grassed waterway	4.50	80.00	1,777.77	3.180	0.155
#32	**2**	**Time of Concentration:**					**0.169**
#33	1	9. Small streams flowing bankfull	1.44	12.02	835.00	10.800	0.021
#33	**1**	**Time of Concentration:**					**0.021**
#33	2	8. Large gullies, diversions, and low flowing streams	8.69	43.01	495.00	8.840	0.015
		8. Large gullies, diversions, and low flowing streams	5.79	40.99	708.00	7.210	0.027
#33	**2**	**Time of Concentration:**					**0.042**
#33	3	8. Large gullies, diversions, and low flowing streams	9.52	45.98	483.00	9.250	0.014
		8. Large gullies, diversions, and low flowing streams	4.65	55.98	1,204.00	6.460	0.051
#33	**3**	**Time of Concentration:**					**0.065**
#33	4	7. Paved area and small upland gullies	3.00	1.04	35.00	3.480	0.002
		9. Small streams flowing bankfull	1.94	8.01	413.00	12.530	0.009
#33	**4**	**Time of Concentration:**					**0.011**
#33	5	7. Paved area and small upland gullies	5.71	1.49	26.25	4.810	0.001
		9. Small streams flowing bankfull	3.13	9.98	319.00	15.920	0.005
#33	**5**	**Time of Concentration:**					**0.006**
#34	1	8. Large gullies, diversions, and low flowing streams	6.33	37.98	600.00	7.540	0.022
#34	**1**	**Time of Concentration:**					**0.022**

Subwatershed Muskingum Routing Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#32	2	7. Paved area and small upland gullies	2.52	100.00	3,968.25	3.190	0.345

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#32	**2**	**Muskingum K:**					**0.345**
#33	1	8. Large gullies, diversions, and low flowing streams	9.62	37.99	395.00	9.300	0.011
		8. Large gullies, diversions, and low flowing streams	5.84	46.01	788.00	7.240	0.030
#33	**1**	**Muskingum K:**					**0.041**
#33	4	8. Large gullies, diversions, and low flowing streams	6.74	69.96	1,038.00	7.780	0.037
#33	**4**	**Muskingum K:**					**0.037**
#33	5	8. Large gullies, diversions, and low flowing streams	7.88	59.96	761.00	8.420	0.025
#33	**5**	**Muskingum K:**					**0.025**

25-Year Hydrology

RP-A 25-Year Hydrology

Watshed contributing to Red Wash Reservoir #2

Jason Tuttle

General Information

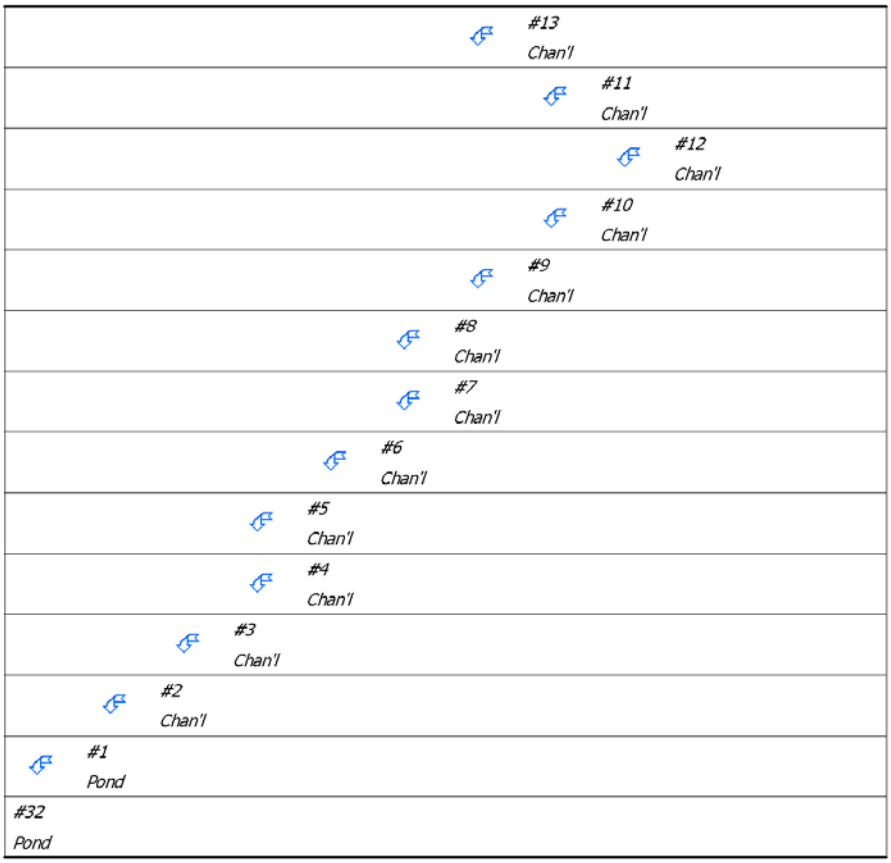
Storm Information:

Storm Type:	NRCS Type II
Design Storm:	25 yr - 24 hr
Rainfall Depth:	1.870 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Pond	#1	==>	#32	0.117	0.368	Main Sediment Pond
Channel	#2	==>	#1	0.002	0.319	Channel into pond - west end
Channel	#3	==>	#2	0.015	0.421	Perimeter channel - lowest south
Channel	#4	==>	#3	0.058	0.368	Lowest contour channel - south
Channel	#5	==>	#3	0.034	0.398	Steep perimeter channel - 2nd lowest south
Channel	#6	==>	#5	0.011	0.416	Perimeter channel - 3rd lowest south
Channel	#7	==>	#6	0.065	0.345	Contour channel - 2nd lowest south
Channel	#8	==>	#6	0.065	0.345	Perimeter channel - 4th lowest south
Channel	#9	==>	#8	0.068	0.376	Contour channel - lowest segment of 3rd lowest south
Channel	#10	==>	#9	0.066	0.373	Contour channel - 2nd lowest of 3rd lowest south
Channel	#11	==>	#9	0.066	0.373	Contour channel - west arm of 3rd lowest south
Channel	#12	==>	#10	0.081	0.372	Contour channel - upper arm of 3rd lowest south
Channel	#13	==>	#8	0.068	0.376	Perimeter channel - top segment south
Channel	#14	==>	#2	0.002	0.430	Perimeter channel - lowest segment north
Channel	#15	==>	#14	0.007	0.431	Perimeter channel - 2nd lowest segment north
Channel	#16	==>	#15	0.001	0.449	Contour channel - lowest segment north
Channel	#17	==>	#1	0.000	0.000	Diversion channel into pond from north
Channel	#18	==>	#17	0.015	0.419	Diversion channel middle segment
Channel	#19	==>	#18	0.010	0.430	Diversion channel west segment
Channel	#20	==>	#19	0.019	0.316	Perimeter channel northern most segment
Channel	#21	==>	#20	0.124	0.334	Contour channel - 2nd lowest north
Channel	#22	==>	#20	0.124	0.334	Perimeter channel north of HR
Channel	#23	==>	#22	0.055	0.325	Lower segment of HR
Channel	#24	==>	#22	0.055	0.325	Perimeter channel south of HR
Channel	#25	==>	#24	0.126	0.307	Contour channel lowest segment of west
Channel	#26	==>	#25	0.058	0.368	Contour channel south extension of west
Channel	#27	==>	#25	0.058	0.368	Contour channel 2nd lowest segment of west
Channel	#28	==>	#27	0.066	0.375	Contour channel upper extension of west - north segment
Channel	#29	==>	#28	0.056	0.377	Contour channel upper extension of west - south segment
Channel	#30	==>	#27	0.066	0.375	Upper HR segment
Pond	#32	==>	End	0.000	0.000	RWR#2

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Culvert	#33	==>	#13	0.041	0.421	Culvert under conveyor/road
Culvert	#34	==>	#33	0.051	0.400	Culvert under Haul Road Culver under haul road



Structure Routing Details:

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	8. Large gullies, diversions, and low flowing streams	2.50	50.00	2,000.00	4.74	0.117
#1	**Muskingum K:**					**0.117**
#2	8. Large gullies, diversions, and low flowing streams	1.00	0.25	25.00	3.00	0.002
#2	**Muskingum K:**					**0.002**
#3	8. Large gullies, diversions, and low flowing streams	9.11	45.00	493.96	9.05	0.015
#3	**Muskingum K:**					**0.015**
#4	8. Large gullies, diversions, and low flowing streams	2.50	25.00	1,000.00	4.74	0.058
#4	**Muskingum K:**					**0.058**

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#5	8. Large gullies, diversions, and low flowing streams	4.88	40.00	820.00	6.62	0.034
#5	**Muskingum K:**					**0.034**
#6	8. Large gullies, diversions, and low flowing streams	7.78	28.00	360.00	8.36	0.011
#6	**Muskingum K:**					**0.011**
#7	8. Large gullies, diversions, and low flowing streams	1.58	14.00	885.00	3.77	0.065
#7	**Muskingum K:**					**0.065**
#8	8. Large gullies, diversions, and low flowing streams	1.58	14.00	885.00	3.77	0.065
#8	**Muskingum K:**					**0.065**
#9	8. Large gullies, diversions, and low flowing streams	2.97	38.00	1,280.00	5.16	0.068
#9	**Muskingum K:**					**0.068**
#10	8. Large gullies, diversions, and low flowing streams	2.77	33.00	1,190.00	4.99	0.066
#10	**Muskingum K:**					**0.066**
#11	8. Large gullies, diversions, and low flowing streams	2.77	33.00	1,190.00	4.99	0.066
#11	**Muskingum K:**					**0.066**
#12	8. Large gullies, diversions, and low flowing streams	2.74	40.00	1,460.00	4.96	0.081
#12	**Muskingum K:**					**0.081**
#13	8. Large gullies, diversions, and low flowing streams	2.97	38.00	1,280.00	5.16	0.068
#13	**Muskingum K:**					**0.068**
#14	8. Large gullies, diversions, and low flowing streams	12.20	10.00	82.00	10.47	0.002
#14	**Muskingum K:**					**0.002**
#15	8. Large gullies, diversions, and low flowing streams	12.67	38.00	300.00	10.67	0.007
#15	**Muskingum K:**					**0.007**
#16	8. Large gullies, diversions, and low flowing streams	25.00	20.00	80.00	15.00	0.001
#16	**Muskingum K:**					**0.001**
#18	8. Large gullies, diversions, and low flowing streams	8.60	43.00	500.00	8.79	0.015
#18	**Muskingum K:**					**0.015**
#19	8. Large gullies, diversions, and low flowing streams	12.00	45.00	375.00	10.39	0.010
#19	**Muskingum K:**					**0.010**
#20	8. Large gullies, diversions, and low flowing streams	0.95	2.00	210.00	2.92	0.019
#20	**Muskingum K:**					**0.019**
#21	8. Large gullies, diversions, and low flowing streams	1.31	20.00	1,530.00	3.42	0.124
#21	**Muskingum K:**					**0.124**
#22	8. Large gullies, diversions, and low flowing streams	1.31	20.00	1,530.00	3.42	0.124

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#22	**Muskingum K:**					**0.124**
#23	8. Large gullies, diversions, and low flowing streams	1.11	7.00	630.00	3.16	0.055
#23	**Muskingum K:**					**0.055**
#24	8. Large gullies, diversions, and low flowing streams	1.11	7.00	630.00	3.16	0.055
#24	**Muskingum K:**					**0.055**
#25	8. Large gullies, diversions, and low flowing streams	0.81	10.00	1,234.00	2.70	0.126
#25	**Muskingum K:**					**0.126**
#26	8. Large gullies, diversions, and low flowing streams	2.50	25.00	1,000.00	4.74	0.058
#26	**Muskingum K:**					**0.058**
#27	8. Large gullies, diversions, and low flowing streams	2.50	25.00	1,000.00	4.74	0.058
#27	**Muskingum K:**					**0.058**
#28	8. Large gullies, diversions, and low flowing streams	2.87	35.00	1,220.00	5.08	0.066
#28	**Muskingum K:**					**0.066**
#29	8. Large gullies, diversions, and low flowing streams	3.00	32.00	1,065.00	5.20	0.056
#29	**Muskingum K:**					**0.056**
#30	8. Large gullies, diversions, and low flowing streams	2.87	35.00	1,220.00	5.08	0.066
#30	**Muskingum K:**					**0.066**
#33	9. Small streams flowing bankfull	1.00	13.54	1,354.00	9.00	0.041
#33	**Muskingum K:**					**0.041**
#34	8. Large gullies, diversions, and low flowing streams	5.18	64.95	1,254.00	6.82	0.051
#34	**Muskingum K:**					**0.051**

Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#30		6.310	6.310	5.42	0.47
#29		4.610	4.610	4.51	0.35
#28		4.850	9.460	9.08	0.73
#27		3.710	19.480	17.32	1.48
#26		7.910	7.910	7.73	0.61
#25		2.700	30.090	26.44	2.29
#24		18.960	49.050	30.78	2.88
#23		3.940	3.940	4.04	0.32
#22		1.850	54.840	32.10	3.34
#21		7.100	7.100	6.94	0.54
#20		6.480	68.420	36.88	4.16
#19		0.000	68.420	36.88	4.16
#18		1.220	69.640	37.01	4.20
#17		0.000	69.640	37.01	4.20
#16		1.510	1.510	1.48	0.12
#15		0.930	2.440	1.67	0.13
#14		0.690	3.130	2.34	0.18
#34		5.850	5.850	0.10	0.04
#33		31.310	37.160	1.44	0.21
#13		21.700	58.860	7.84	0.72
#11		6.140	6.140	6.00	0.47
#12		7.720	7.720	7.55	0.59
#10		4.450	12.170	11.49	0.93
#9		3.510	21.820	20.08	1.67
#8		3.400	84.080	29.52	2.65
#7		10.670	10.670	10.43	0.82
#6		1.550	96.300	39.27	3.59
#5		1.640	97.940	40.78	3.71
#4		3.600	3.600	3.52	0.28
#3		1.930	103.470	44.17	3.99
#2		0.000	106.600	46.51	4.17
#1	In	10.450	186.690	86.22	8.85
	Out			33.06	8.85
#32	In	229.310	416.000	43.87	12.47
	Out			13.34	7.18

Structure Detail:

Structure #30 (Erodible Channel)

Upper HR segment

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	6.0:1	7.1	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	5.42 cfs	
Depth:	0.49 ft	1.49 ft
Top Width:	4.38 ft	13.38 ft
Velocity:	5.07 fps	
X-Section Area:	1.07 sq ft	
Hydraulic Radius:	0.238 ft	
Froude Number:	1.81	

Structure #29 (Erodible Channel)

Contour channel upper extension of west - south segment

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	3.0:1	2.3	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	4.51 cfs	
Depth:	0.56 ft	1.56 ft
Top Width:	5.07 ft	14.07 ft
Velocity:	3.15 fps	
X-Section Area:	1.43 sq ft	
Hydraulic Radius:	0.275 ft	

	w/o Freeboard	w/ Freeboard
Froude Number:	1.05	

Structure #28 (Erodible Channel)

Contour channel upper extension of west - north segment

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	3.0:1	3.0	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	9.08 cfs	
Depth:	0.69 ft	1.69 ft
Top Width:	6.25 ft	15.25 ft
Velocity:	4.18 fps	
X-Section Area:	2.17 sq ft	
Hydraulic Radius:	0.339 ft	
Froude Number:	1.25	

Structure #27 (Erodible Channel)

Contour channel 2nd lowest segment of west

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	6.0:1	2.9	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	17.32 cfs	
Depth:	0.89 ft	1.89 ft
Top Width:	8.03 ft	17.03 ft
Velocity:	4.83 fps	
X-Section Area:	3.58 sq ft	
Hydraulic Radius:	0.435 ft	

	w/o Freeboard	w/ Freeboard
Froude Number:	1.28	

Structure #26 (Erodible Channel)

Contour channel south extension of west

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	3.0:1	2.7	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	7.73 cfs	
Depth:	0.67 ft	1.67 ft
Top Width:	6.00 ft	15.00 ft
Velocity:	3.86 fps	
X-Section Area:	2.00 sq ft	
Hydraulic Radius:	0.326 ft	
Froude Number:	1.18	

Structure #25 (Erodible Channel)

Contour channel lowest segment of west

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	6.0:1	2.5	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	26.44 cfs	
Depth:	1.07 ft	2.07 ft
Top Width:	9.66 ft	18.66 ft
Velocity:	5.10 fps	
X-Section Area:	5.18 sq ft	
Hydraulic Radius:	0.524 ft	

	w/o Freeboard	w/ Freeboard
Froude Number:	1.23	

Structure #24 (Erodible Channel)

Perimeter channel south of HR

Trapezoidal Erodible Channel Inputs:

Material: Graded loam to cobbles when noncolloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.00	4.0:1	4.0:1	1.0	0.0300	1.00			5.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	30.78 cfs	
Depth:	0.88 ft	1.88 ft
Top Width:	13.06 ft	21.06 ft
Velocity:	3.66 fps	
X-Section Area:	8.41 sq ft	
Hydraulic Radius:	0.633 ft	
Froude Number:	0.80	

Structure #23 (Erodible Channel)

Lower segment of HR

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	6.0:1	7.1	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	4.04 cfs	
Depth:	0.44 ft	1.44 ft
Top Width:	3.93 ft	12.93 ft
Velocity:	4.72 fps	
X-Section Area:	0.86 sq ft	
Hydraulic Radius:	0.213 ft	

	w/o Freeboard	w/ Freeboard
Froude Number:	1.78	

Structure #22 (Erodible Channel)

Perimeter channel north of HR

Trapezoidal Erodible Channel Inputs:

Material: Graded loam to cobbles when noncolloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.00	4.0:1	4.0:1	1.1	0.0300	1.00			5.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	32.10 cfs	
Depth:	0.87 ft	1.87 ft
Top Width:	12.97 ft	20.97 ft
Velocity:	3.88 fps	
X-Section Area:	8.26 sq ft	
Hydraulic Radius:	0.627 ft	
Froude Number:	0.86	

Structure #21 (Erodible Channel)

Contour channel - 2nd lowest north

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	6.0:1	4.2	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	6.94 cfs	
Depth:	0.59 ft	1.59 ft
Top Width:	5.32 ft	14.32 ft
Velocity:	4.42 fps	
X-Section Area:	1.57 sq ft	
Hydraulic Radius:	0.288 ft	

	w/o Freeboard	w/ Freeboard
Froude Number:	1.43	

Structure #20 (Erodible Channel)

Perimeter channel northern most segment

Trapezoidal Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
5.00	4.0:1	4.0:1	1.3	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	36.88 cfs	
Depth:	0.98 ft	1.98 ft
Top Width:	12.82 ft	20.82 ft
Velocity:	4.24 fps	
X-Section Area:	8.70 sq ft	
Hydraulic Radius:	0.667 ft	
Froude Number:	0.91	

Structure #19 (Erodible Channel)

Diversion channel west segment

Trapezoidal Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.00	4.0:1	4.0:1	1.0	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	36.88 cfs	
Depth:	0.97 ft	1.97 ft
Top Width:	13.75 ft	21.75 ft
Velocity:	3.86 fps	
X-Section Area:	9.57 sq ft	
Hydraulic Radius:	0.684 ft	

	w/o Freeboard	w/ Freeboard
Froude Number:	0.81	

Structure #18 (Riprap Channel)

Diversion channel middle segment

Trapezoidal Riprap Channel Inputs:

Material: Riprap

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
8.00	4.0:1	4.0:1	13.0	1.00		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	37.01 cfs	
Depth:	0.37 ft	1.37 ft
Top Width:	10.94 ft	18.94 ft
Velocity*:		
X-Section Area:	3.47 sq ft	
Hydraulic Radius:	0.315 ft	
Froude Number*:		
Manning's n*:		
Dmin:	3.00 in	
D50:	9.00 in	
Dmax:	11.25 in	

Velocity and Manning's n calculations may not apply for this method.

Structure #17 (Riprap Channel)

Diversion channel into pond from north

Trapezoidal Riprap Channel Inputs:

Material: Riprap

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
8.00	4.0:1	4.0:1	10.0	1.00		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	37.01 cfs	
Depth:	0.40 ft	1.40 ft
Top Width:	11.20 ft	19.20 ft
Velocity*:		
X-Section Area:	3.83 sq ft	
Hydraulic Radius:	0.339 ft	
Froude Number*:		
Manning's n*:		
Dmin:	3.00 in	
D50:	9.00 in	
Dmax:	11.25 in	

Velocity and Manning's n calculations may not apply for this method.

Structure #16 (Erodible Channel)

Contour channel - lowest segment north

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	6.0:1	1.2	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	1.48 cfs	
Depth:	0.42 ft	1.42 ft
Top Width:	3.76 ft	12.76 ft
Velocity:	1.88 fps	
X-Section Area:	0.78 sq ft	
Hydraulic Radius:	0.204 ft	
Froude Number:	0.73	

Structure #15 (Erodible Channel)

Perimeter channel - 2nd lowest segment north

Trapezoidal Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
4.00	3.0:1	3.0:1	33.0	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	1.67 cfs	
Depth:	0.08 ft	1.08 ft
Top Width:	4.47 ft	10.47 ft
Velocity:	4.99 fps	
X-Section Area:	0.33 sq ft	
Hydraulic Radius:	0.073 ft	
Froude Number:	3.24	

Structure #14 (Erodible Channel)

Perimeter channel - lowest segment north

Trapezoidal Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
2.50	3.0:1	3.0:1	14.3	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	2.34 cfs	
Depth:	0.16 ft	1.16 ft
Top Width:	3.46 ft	9.46 ft
Velocity:	4.95 fps	
X-Section Area:	0.47 sq ft	
Hydraulic Radius:	0.135 ft	
Froude Number:	2.35	

Structure #34 (Culvert)

Culvert under Haul Road

Culver under haul road

Culvert Inputs:

Length (ft)	Slope (%)	Manning's n	Max. Headwater (ft)	Tailwater (ft)	Entrance Loss Coef. (Ke)
160.00	4.40	0.0150	0.67	0.00	0.90

Culvert Results:

Design Discharge = 0.10 cfs

Minimum pipe diameter: 1 - 4 inch pipe(s) required

Structure #33 (Culvert)

Culvert under conveyor/road

Culvert Inputs:

Length (ft)	Slope (%)	Manning's n	Max. Headwater (ft)	Tailwater (ft)	Entrance Loss Coef. (Ke)
100.00	4.50	0.0150	1.00	0.00	0.90

Culvert Results:

Design Discharge = 1.44 cfs

Minimum pipe diameter: 1 - 10 inch pipe(s) required

Structure #13 (Erodible Channel)

Perimeter channel - top segment south

Trapezoidal Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
4.00	3.0:1	3.0:1	1.2	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	7.84 cfs	
Depth:	0.50 ft	1.50 ft
Top Width:	7.00 ft	13.00 ft
Velocity:	2.85 fps	
X-Section Area:	2.75 sq ft	
Hydraulic Radius:	0.384 ft	
Froude Number:	0.80	

Structure #11 (Erodible Channel)

Contour channel - west arm of 3rd lowest south

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	6.0:1	2.8	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	6.00 cfs	
Depth:	0.60 ft	1.60 ft
Top Width:	5.44 ft	14.44 ft
Velocity:	3.65 fps	
X-Section Area:	1.64 sq ft	
Hydraulic Radius:	0.295 ft	
Froude Number:	1.17	

Structure #12 (Erodible Channel)

Contour channel - upper arm of 3rd lowest south

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	6.0:1	2.7	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	7.55 cfs	
Depth:	0.66 ft	1.66 ft
Top Width:	5.96 ft	14.96 ft
Velocity:	3.82 fps	
X-Section Area:	1.98 sq ft	
Hydraulic Radius:	0.323 ft	
Froude Number:	1.17	

Structure #10 (Erodible Channel)

Contour channel - 2nd lowest of 3rd lowest south

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	3.0:1	2.7	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	11.49 cfs	
Depth:	0.77 ft	1.77 ft
Top Width:	6.94 ft	15.94 ft
Velocity:	4.29 fps	
X-Section Area:	2.68 sq ft	
Hydraulic Radius:	0.377 ft	
Froude Number:	1.22	

Structure #9 (Erodible Channel)

Contour channel - lowest segment of 3rd lowest south

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	3.0:1	2.8	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	20.08 cfs	
Depth:	0.95 ft	1.95 ft
Top Width:	8.55 ft	17.55 ft
Velocity:	4.95 fps	
X-Section Area:	4.06 sq ft	
Hydraulic Radius:	0.463 ft	
Froude Number:	1.27	

Structure #8 (Erodible Channel)

Perimeter channel - 4th lowest south

Trapezoidal Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
8.00	3.0:1	3.0:1	3.0	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	29.52 cfs	
Depth:	0.58 ft	1.58 ft
Top Width:	11.46 ft	17.46 ft
Velocity:	5.26 fps	
X-Section Area:	5.61 sq ft	
Hydraulic Radius:	0.482 ft	
Froude Number:	1.32	

Structure #7 (Erodible Channel)

Contour channel - 2nd lowest south

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	3.0:1	2.6	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	10.43 cfs	
Depth:	0.75 ft	1.75 ft
Top Width:	6.77 ft	15.77 ft
Velocity:	4.10 fps	
X-Section Area:	2.54 sq ft	
Hydraulic Radius:	0.367 ft	
Froude Number:	1.18	

Structure #6 (Erodible Channel)

Perimeter channel - 3rd lowest south

Trapezoidal Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.00	3.0:1	3.0:1	1.6	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	39.27 cfs	
Depth:	0.92 ft	1.92 ft
Top Width:	11.54 ft	17.54 ft
Velocity:	4.85 fps	
X-Section Area:	8.10 sq ft	
Hydraulic Radius:	0.684 ft	
Froude Number:	1.02	

Structure #5 (Riprap Channel)

Steep perimeter channel - 2nd lowest south

Trapezoidal Riprap Channel Inputs:

Material: Riprap

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
6.00	3.0:1	3.0:1	7.8	1.00		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	40.78 cfs	
Depth:	0.52 ft	1.52 ft
Top Width:	9.13 ft	15.13 ft
Velocity*:		
X-Section Area:	3.95 sq ft	
Hydraulic Radius:	0.425 ft	
Froude Number*:		
Manning's n*:		
Dmin:	3.00 in	
D50:	9.00 in	
Dmax:	11.25 in	

Velocity and Manning's n calculations may not apply for this method.

Structure #4 (Erodible Channel)

Lowest contour channel - south

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	3.0:1	2.5	0.0300				5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	3.52 cfs	
Depth:	0.50 ft	
Top Width:	4.54 ft	
Velocity:	3.07 fps	
X-Section Area:	1.15 sq ft	
Hydraulic Radius:	0.246 ft	
Froude Number:	1.08	

Structure #3 (Riprap Channel)

Perimeter channel - lowest south

Trapezoidal Riprap Channel Inputs:

Material: Riprap

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
5.00	3.0:1	3.0:1	4.9	1.00		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	44.17 cfs	
Depth:	0.64 ft	1.64 ft
Top Width:	8.85 ft	14.85 ft
Velocity*:		
X-Section Area:	4.44 sq ft	
Hydraulic Radius:	0.491 ft	
Froude Number*:		
Manning's n*:		
Dmin:	3.00 in	
D50:	9.00 in	

	w/o Freeboard	w/ Freeboard
Dmax:	11.25 in	

Velocity and Manning's n calculations may not apply for this method.

Structure #2 (Riprap Channel)

Channel into pond - west end

Trapezoidal Riprap Channel Inputs:

Material: Riprap

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
6.00	3.0:1	3.0:1	10.0			

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	46.51 cfs	
Depth:	0.53 ft	
Top Width:	9.20 ft	
Velocity*:		
X-Section Area:	4.06 sq ft	
Hydraulic Radius:	0.433 ft	
Froude Number*:		
Manning's n*:		
Dmin:	4.00 in	
D50:	12.00 in	
Dmax:	15.00 in	

Velocity and Manning's n calculations may not apply for this method.

Structure #1 (Pond)

Main Sediment Pond

Pond Inputs:

Initial Pool Elev:	5,626.00 ft
Initial Pool:	5.02 ac-ft

Straight Pipe

Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Entrance Loss Coefficient	Tailwater Depth (ft)
30.00	35.00	5.71	0.0240	5,626.00	0.70	1.35

Straight Pipe

Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Entrance Loss Coefficient	Tailwater Depth (ft)
30.00	35.00	5.71	0.0240	5,626.00	0.70	1.35

Pond Results:

Peak Elevation:	5,628.15 ft
Dewater Time:	1.19 days

Dewatering time is calculated from peak stage to lowest spillway

Elevation-Capacity-Discharge Table

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)
5,617.00	0.000	0.000	0.000	
5,617.01	0.000	0.000	0.000	
5,617.25	0.004	0.000	0.000	
5,617.50	0.012	0.002	0.000	
5,617.75	0.025	0.007	0.000	
5,618.00	0.044	0.015	0.000	
5,618.25	0.068	0.029	0.000	
5,618.50	0.097	0.050	0.000	
5,618.75	0.131	0.078	0.000	
5,619.00	0.169	0.115	0.000	
5,619.25	0.213	0.163	0.000	
5,619.50	0.263	0.223	0.000	
5,619.75	0.317	0.295	0.000	
5,620.00	0.376	0.381	0.000	
5,620.25	0.403	0.479	0.000	
5,620.50	0.430	0.583	0.000	
5,620.75	0.458	0.694	0.000	
5,621.00	0.488	0.812	0.000	
5,621.25	0.518	0.938	0.000	
5,621.50	0.549	1.071	0.000	
5,621.75	0.581	1.212	0.000	
5,622.00	0.613	1.361	0.000	

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
5,622.25	0.647	1.519	0.000		
5,622.50	0.682	1.685	0.000		
5,622.75	0.717	1.860	0.000		
5,623.00	0.754	2.044	0.000		
5,623.25	0.791	2.237	0.000		
5,623.50	0.829	2.439	0.000		
5,623.75	0.869	2.652	0.000		
5,624.00	0.909	2.874	0.000		
5,624.25	0.950	3.106	0.000		
5,624.50	0.992	3.349	0.000		
5,624.75	1.034	3.602	0.000		
5,625.00	1.078	3.866	0.000		
5,625.25	1.114	4.140	0.000		
5,625.50	1.150	4.423	0.000		
5,625.75	1.187	4.715	0.000		
5,626.00	1.225	5.016	0.000		Spillway #1 Spillway #2
5,626.25	1.263	5.327	1.319	15.90	
5,626.50	1.301	5.648	3.713	6.30	
5,626.75	1.341	5.978	6.806	2.85	
5,627.00	1.380	6.318	10.484	1.20	
5,627.25	1.421	6.668	14.640	0.70	
5,627.50	1.462	7.029	19.233	0.50	
5,627.75	1.503	7.399	24.243	0.40	
5,628.00	1.546	7.780	29.619	0.35	
5,628.15	1.571	8.015	33.058	0.30	Peak Stage
5,628.25	1.588	8.172	35.352		
5,628.50	1.632	8.575	41.385		
5,628.75	1.676	8.988	47.756		
5,629.00	1.720	9.413	54.021		
5,629.25	1.765	9.848	58.787		
5,629.50	1.811	10.295	63.658		
5,629.75	1.857	10.754	68.188		
5,630.00	1.904	11.224	72.434		

Detailed Discharge Table

Elevation (ft)	Straight Pipe (cfs)	Straight Pipe (cfs)	Combined Total Discharge (cfs)
5,617.00	0.000	0.000	0.000
5,617.01	0.000	0.000	0.000
5,617.25	0.000	0.000	0.000
5,617.50	0.000	0.000	0.000
5,617.75	0.000	0.000	0.000
5,618.00	0.000	0.000	0.000
5,618.25	0.000	0.000	0.000
5,618.50	0.000	0.000	0.000
5,618.75	0.000	0.000	0.000
5,619.00	0.000	0.000	0.000
5,619.25	0.000	0.000	0.000
5,619.50	0.000	0.000	0.000
5,619.75	0.000	0.000	0.000
5,620.00	0.000	0.000	0.000
5,620.25	0.000	0.000	0.000
5,620.50	0.000	0.000	0.000
5,620.75	0.000	0.000	0.000
5,621.00	0.000	0.000	0.000
5,621.25	0.000	0.000	0.000
5,621.50	0.000	0.000	0.000
5,621.75	0.000	0.000	0.000
5,622.00	0.000	0.000	0.000
5,622.25	0.000	0.000	0.000
5,622.50	0.000	0.000	0.000
5,622.75	0.000	0.000	0.000
5,623.00	0.000	0.000	0.000
5,623.25	0.000	0.000	0.000
5,623.50	0.000	0.000	0.000
5,623.75	0.000	0.000	0.000
5,624.00	0.000	0.000	0.000
5,624.25	0.000	0.000	0.000
5,624.50	0.000	0.000	0.000
5,624.75	0.000	0.000	0.000
5,625.00	0.000	0.000	0.000
5,625.25	0.000	0.000	0.000
5,625.50	0.000	0.000	0.000
5,625.75	0.000	0.000	0.000
5,626.00	0.000	0.000	0.000
5,626.25	(3)>0.660	(3)>0.660	1.319
5,626.50	(3)>1.856	(3)>1.856	3.713
5,626.75	(3)>3.403	(3)>3.403	6.806

Elevation (ft)	Straight Pipe (cfs)	Straight Pipe (cfs)	Combined Total Discharge (cfs)
5,627.00	(3)>5.242	(3)>5.242	10.484
5,627.25	(3)>7.320	(3)>7.320	14.640
5,627.50	(3)>9.617	(3)>9.617	19.233
5,627.75	(3)>12.122	(3)>12.122	24.243
5,628.00	(3)>14.810	(3)>14.810	29.619
5,628.25	(3)>17.676	(3)>17.676	35.352
5,628.50	(3)>20.693	(3)>20.693	41.385
5,628.75	(3)>23.878	(3)>23.878	47.756
5,629.00	(3)>27.011	(3)>27.011	54.021
5,629.25	(5)>29.393	(5)>29.393	58.787
5,629.50	(5)>31.829	(5)>31.829	63.658
5,629.75	(5)>34.094	(5)>34.094	68.188
5,630.00	(5)>36.217	(5)>36.217	72.434

Structure #32 (Pond)

RWR#2

Pond Inputs:

Initial Pool Elev:	5,563.00 ft
Initial Pool:	0.00 ac-ft

Broad-crested Weir

Weir Width (ft)	Spillway Elev (ft)
20.50	5,578.82

V-notch Weir

Notch Angle (deg)	Spillway Elev (ft)
45.00	5,577.32

Pond Results:

Peak Elevation:	5,579.08 ft
Dewater Time:	8.19 days

Dewatering time is calculated from peak stage to lowest spillway

Elevation-Capacity-Discharge Table

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)
5,560.00	0.000	0.000	0.000	
5,560.01	0.000	0.000	0.000	
5,560.25	0.000	0.000	0.000	
5,560.50	0.000	0.000	0.000	
5,560.75	0.000	0.000	0.000	
5,561.00	0.000	0.000	0.000	
5,561.25	0.000	0.000	0.000	
5,561.50	0.000	0.000	0.000	
5,561.75	0.000	0.000	0.000	
5,562.00	0.000	0.000	0.000	
5,562.25	0.000	0.001	0.000	
5,562.50	0.000	0.001	0.000	
5,562.75	0.001	0.001	0.000	
5,563.00	0.001	0.001	0.000	
5,563.25	0.003	0.001	0.000	
5,563.50	0.007	0.002	0.000	
5,563.75	0.013	0.005	0.000	
5,564.00	0.020	0.009	0.000	
5,564.25	0.024	0.014	0.000	
5,564.50	0.028	0.021	0.000	
5,564.75	0.033	0.029	0.000	
5,565.00	0.038	0.037	0.000	
5,565.25	0.044	0.048	0.000	
5,565.50	0.050	0.059	0.000	
5,565.75	0.057	0.073	0.000	
5,566.00	0.064	0.088	0.000	
5,566.25	0.072	0.105	0.000	
5,566.50	0.080	0.124	0.000	
5,566.75	0.089	0.145	0.000	
5,567.00	0.098	0.168	0.000	
5,567.25	0.108	0.194	0.000	
5,567.50	0.118	0.222	0.000	
5,567.75	0.129	0.253	0.000	
5,568.00	0.140	0.287	0.000	
5,568.25	0.152	0.323	0.000	
5,568.50	0.164	0.363	0.000	
5,568.75	0.177	0.405	0.000	
5,569.00	0.190	0.451	0.000	
5,569.25	0.202	0.500	0.000	
5,569.50	0.214	0.552	0.000	
5,569.75	0.227	0.607	0.000	
5,570.00	0.240	0.666	0.000	
5,570.25	0.259	0.728	0.000	

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
5,570.50	0.279	0.795	0.000		
5,570.75	0.300	0.867	0.000		
5,571.00	0.321	0.945	0.000		
5,571.25	0.345	1.028	0.000		
5,571.50	0.369	1.117	0.000		
5,571.75	0.394	1.213	0.000		
5,572.00	0.420	1.314	0.000		
5,572.25	0.442	1.422	0.000		
5,572.50	0.464	1.535	0.000		
5,572.75	0.487	1.654	0.000		
5,573.00	0.510	1.779	0.000		
5,573.25	0.533	1.909	0.000		
5,573.50	0.556	2.045	0.000		
5,573.75	0.580	2.187	0.000		
5,574.00	0.604	2.335	0.000		
5,574.25	0.627	2.489	0.000		
5,574.50	0.651	2.649	0.000		
5,574.75	0.675	2.815	0.000		
5,575.00	0.700	2.986	0.000		
5,575.25	0.724	3.164	0.000		
5,575.50	0.748	3.348	0.000		
5,575.75	0.772	3.538	0.000		
5,576.00	0.797	3.734	0.000		
5,576.25	0.823	3.937	0.000		
5,576.50	0.849	4.146	0.000		
5,576.75	0.875	4.361	0.000		
5,577.00	0.902	4.583	0.000		
5,577.25	0.926	4.812	0.000		
5,577.32	0.933	4.877	0.000		Spillway #2
5,577.50	0.950	5.046	0.014	143.86*	
5,577.75	0.975	5.287	0.126	23.17*	
5,578.00	1.000	5.534	0.395	7.56*	
5,578.25	1.008	5.785	0.864	5.60	
5,578.50	1.016	6.038	1.567	3.35	
5,578.75	1.025	6.293	2.533	2.40	
5,578.82	1.027	6.365	2.854	0.75	Spillway #1
5,579.00	1.033	6.550	8.629	8.05	
5,579.08	1.041	6.635	13.337	1.80	Peak Stage
5,579.25	1.050	6.811	23.215		
5,579.50	1.067	7.075	42.767		
5,579.75	1.084	7.344	66.306		
5,580.00	1.101	7.617	93.313		
5,580.25	1.125	7.896	123.456		

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)
5,580.50	1.150	8.180	156.500	
5,580.75	1.175	8.471	192.268	
5,581.00	1.200	8.767	230.622	

**Designates time(s) to dewater have been extrapolated beyond the 50 hour hydrograph limit.*

Detailed Discharge Table

Elevation (ft)	Broad-crested Weir (cfs)	V-notch Weir (cfs)	Combined Total Discharge (cfs)
5,560.00	0.000	0.000	0.000
5,560.01	0.000	0.000	0.000
5,560.25	0.000	0.000	0.000
5,560.50	0.000	0.000	0.000
5,560.75	0.000	0.000	0.000
5,561.00	0.000	0.000	0.000
5,561.25	0.000	0.000	0.000
5,561.50	0.000	0.000	0.000
5,561.75	0.000	0.000	0.000
5,562.00	0.000	0.000	0.000
5,562.25	0.000	0.000	0.000
5,562.50	0.000	0.000	0.000
5,562.75	0.000	0.000	0.000
5,563.00	0.000	0.000	0.000
5,563.25	0.000	0.000	0.000
5,563.50	0.000	0.000	0.000
5,563.75	0.000	0.000	0.000
5,564.00	0.000	0.000	0.000
5,564.25	0.000	0.000	0.000
5,564.50	0.000	0.000	0.000
5,564.75	0.000	0.000	0.000
5,565.00	0.000	0.000	0.000
5,565.25	0.000	0.000	0.000
5,565.50	0.000	0.000	0.000
5,565.75	0.000	0.000	0.000
5,566.00	0.000	0.000	0.000
5,566.25	0.000	0.000	0.000
5,566.50	0.000	0.000	0.000
5,566.75	0.000	0.000	0.000
5,567.00	0.000	0.000	0.000
5,567.25	0.000	0.000	0.000

Elevation (ft)	Broad-crested Weir (cfs)	V-notch Weir (cfs)	Combined Total Discharge (cfs)
5,567.50	0.000	0.000	0.000
5,567.75	0.000	0.000	0.000
5,568.00	0.000	0.000	0.000
5,568.25	0.000	0.000	0.000
5,568.50	0.000	0.000	0.000
5,568.75	0.000	0.000	0.000
5,569.00	0.000	0.000	0.000
5,569.25	0.000	0.000	0.000
5,569.50	0.000	0.000	0.000
5,569.75	0.000	0.000	0.000
5,570.00	0.000	0.000	0.000
5,570.25	0.000	0.000	0.000
5,570.50	0.000	0.000	0.000
5,570.75	0.000	0.000	0.000
5,571.00	0.000	0.000	0.000
5,571.25	0.000	0.000	0.000
5,571.50	0.000	0.000	0.000
5,571.75	0.000	0.000	0.000
5,572.00	0.000	0.000	0.000
5,572.25	0.000	0.000	0.000
5,572.50	0.000	0.000	0.000
5,572.75	0.000	0.000	0.000
5,573.00	0.000	0.000	0.000
5,573.25	0.000	0.000	0.000
5,573.50	0.000	0.000	0.000
5,573.75	0.000	0.000	0.000
5,574.00	0.000	0.000	0.000
5,574.25	0.000	0.000	0.000
5,574.50	0.000	0.000	0.000
5,574.75	0.000	0.000	0.000
5,575.00	0.000	0.000	0.000
5,575.25	0.000	0.000	0.000
5,575.50	0.000	0.000	0.000
5,575.75	0.000	0.000	0.000
5,576.00	0.000	0.000	0.000
5,576.25	0.000	0.000	0.000
5,576.50	0.000	0.000	0.000
5,576.75	0.000	0.000	0.000
5,577.00	0.000	0.000	0.000
5,577.25	0.000	0.000	0.000
5,577.32	0.000	0.000	0.000

Elevation (ft)	Broad-crested Weir (cfs)	V-notch Weir (cfs)	Combined Total Discharge (cfs)
5,577.50	0.000	0.014	0.014
5,577.75	0.000	0.126	0.126
5,578.00	0.000	0.395	0.395
5,578.25	0.000	0.864	0.864
5,578.50	0.000	1.567	1.567
5,578.75	0.000	2.533	2.533
5,578.82	0.000	2.854	2.854
5,579.00	4.840	3.789	8.629
5,579.25	17.855	5.360	23.215
5,579.50	35.500	7.268	42.767
5,579.75	56.773	9.534	66.306
5,580.00	81.135	12.178	93.313
5,580.25	108.237	15.219	123.456
5,580.50	137.823	18.676	156.500
5,580.75	169.702	22.566	192.268
5,581.00	203.717	26.905	230.622

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#30	1	4.280	0.125	0.000	0.000	89.000	F	3.62	0.316
	2	2.030	0.039	0.000	0.000	89.000	F	1.98	0.155
	Σ	**6.310**						**5.42**	**0.472**
#29	1	4.610	0.085	0.000	0.000	89.000	F	4.51	0.353
	Σ	**4.610**						**4.51**	**0.353**
#28	1	4.850	0.059	0.000	0.000	89.000	F	4.74	0.372
	Σ	**9.460**						**9.08**	**0.725**
#27	1	3.710	0.022	0.000	0.000	89.000	F	3.63	0.284
	Σ	**19.480**						**17.32**	**1.481**
#26	1	7.910	0.077	0.000	0.000	89.000	F	7.73	0.607
	Σ	**7.910**						**7.73**	**0.607**
#25	1	2.700	0.058	0.000	0.000	89.000	F	2.64	0.207
	Σ	**30.090**						**26.44**	**2.294**
#24	1	2.090	0.126	0.000	0.000	89.000	F	1.77	0.154
	2	1.990	0.135	0.000	0.000	87.000	F	1.47	0.128
	3	1.900	0.163	0.000	0.000	89.000	F	1.61	0.140
	4	0.400	0.064	0.000	0.000	91.000	F	0.43	0.031
	5	11.340	0.189	0.000	0.000	63.000	F	0.15	0.066
	6	0.340	0.058	0.000	0.000	63.000	F	0.00	0.000
	7	0.270	0.077	0.000	0.000	89.000	F	0.26	0.016
	8	0.630	0.180	0.000	0.000	89.000	F	0.53	0.046
	Σ	**49.050**						**30.78**	**2.876**
#23	1	2.110	0.040	0.000	0.000	89.000	F	2.06	0.161
	2	1.830	0.040	0.000	0.000	91.000	F	1.98	0.160
	Σ	**3.940**						**4.04**	**0.321**
#22	1	1.140	0.042	0.000	0.000	89.000	F	1.11	0.087
	2	0.710	0.112	0.000	0.000	89.000	F	0.69	0.054
	Σ	**54.840**						**32.10**	**3.338**
#21	1	7.100	0.054	0.000	0.000	89.000	F	6.94	0.544
	Σ	**7.100**						**6.94**	**0.544**
#20	1	0.500	0.051	0.000	0.000	89.000	F	0.49	0.035
	2	2.350	0.124	0.000	0.000	89.000	F	2.30	0.180
	3	3.630	0.104	0.000	0.000	70.000	F	0.75	0.058
	Σ	**68.420**						**36.88**	**4.155**

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#19	Σ	**68.420**						**36.88**	**4.155**
#18	1	0.750	0.010	0.010	0.000	70.000	F	0.15	0.007
	2	0.470	0.026	0.000	0.000	91.000	F	0.51	0.037
	Σ	**69.640**						**37.01**	**4.200**
#17	Σ	**69.640**						**37.01**	**4.200**
#16	1	1.510	0.022	0.000	0.000	89.000	F	1.48	0.115
	Σ	**1.510**						**1.48**	**0.115**
#15	1	0.930	0.007	0.000	0.000	70.000	F	0.19	0.011
	Σ	**2.440**						**1.67**	**0.126**
#14	1	0.690	0.007	0.000	0.000	89.000	F	0.67	0.052
	Σ	**3.130**						**2.34**	**0.179**
#34	1	5.850	0.022	0.000	0.000	63.000	F	0.10	0.036
	Σ	**5.850**						**0.10**	**0.036**
#33	1	0.650	0.021	0.041	0.412	89.000	F	0.64	0.049
	2	14.820	0.042	0.000	0.000	51.000	F	0.00	0.000
	3	15.250	0.065	0.000	0.000	63.000	F	0.26	0.093
	4	0.330	0.011	0.037	0.410	89.000	F	0.32	0.021
	5	0.260	0.006	0.025	0.416	89.000	F	0.25	0.015
	Σ	**37.160**						**1.44**	**0.214**
#13	1	4.950	0.102	0.000	0.000	89.000	F	4.84	0.379
	2	15.150	0.060	0.000	0.000	51.000	F	0.00	0.000
	3	1.600	0.117	0.000	0.000	89.000	F	1.56	0.122
	Σ	**58.860**						**7.84**	**0.716**
#11	1	6.140	0.068	0.000	0.000	89.000	F	6.00	0.471
	Σ	**6.140**						**6.00**	**0.471**
#12	1	7.720	0.091	0.000	0.000	89.000	F	7.55	0.592
	Σ	**7.720**						**7.55**	**0.592**
#10	1	4.450	0.081	0.000	0.000	89.000	F	4.35	0.341
	Σ	**12.170**						**11.49**	**0.933**
#9	1	3.510	0.066	0.000	0.000	89.000	F	3.43	0.269
	Σ	**21.820**						**20.08**	**1.673**
#8	1	3.400	0.068	0.000	0.000	89.000	F	3.32	0.261
	Σ	**84.080**						**29.52**	**2.649**
#7	1	10.670	0.099	0.000	0.000	89.000	F	10.43	0.818
	Σ	**10.670**						**10.43**	**0.818**

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#6	1	1.550	0.065	0.000	0.000	89.000	F	1.51	0.118
	Σ	**96.300**						**39.27**	**3.586**
#5	1	1.640	0.012	0.000	0.000	89.000	F	1.60	0.125
	Σ	**97.940**						**40.78**	**3.711**
#4	1	3.600	0.046	0.000	0.000	89.000	F	3.52	0.276
	Σ	**3.600**						**3.52**	**0.276**
#3	1	1.930	0.034	0.000	0.000	1.000	F	0.00	0.000
	Σ	**103.470**						**44.17**	**3.987**
#2	Σ	**106.600**						**46.51**	**4.166**
#1	1	1.900	0.000	0.000	0.000	98.000	F	2.66	0.260
	2	1.690	0.000	0.000	0.000	87.000	F	1.48	0.113
	3	3.650	0.021	0.000	0.000	70.000	F	0.75	0.059
	4	3.210	0.009	0.000	0.000	70.000	F	0.66	0.052
	Σ	**186.690**						**86.22**	**8.849**
#32	1	217.150	1.147	0.000	0.000	69.000	F	8.48	2.935
	2	12.160	0.169	0.345	0.326	85.000	F	7.81	0.684
	Σ	**416.000**						**43.87**	**12.467**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	3	8. Large gullies, diversions, and low flowing streams	22.22	40.00	180.00	14.140	0.003
		8. Large gullies, diversions, and low flowing streams	7.27	40.00	550.00	8.090	0.018
#1	**3**	**Time of Concentration:**					**0.021**
#1	4	8. Large gullies, diversions, and low flowing streams	17.53	78.00	445.00	12.550	0.009
#1	**4**	**Time of Concentration:**					**0.009**
#3	1	8. Large gullies, diversions, and low flowing streams	4.88	40.00	820.00	6.620	0.034
#3	**1**	**Time of Concentration:**					**0.034**
#4	1	8. Large gullies, diversions, and low flowing streams	32.73	72.00	220.00	17.160	0.003
		8. Large gullies, diversions, and low flowing streams	2.47	18.00	730.00	4.710	0.043
#4	**1**	**Time of Concentration:**					**0.046**
#5	1	8. Large gullies, diversions, and low flowing streams	30.48	32.00	105.00	16.560	0.001
		8. Large gullies, diversions, and low flowing streams	7.78	28.00	360.00	8.360	0.011

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#5	**1**	**Time of Concentration:**					**0.012**
#6	1	8. Large gullies, diversions, and low flowing streams	1.58	14.00	885.00	3.770	0.065
#6	**1**	**Time of Concentration:**					**0.065**
#7	1	8. Large gullies, diversions, and low flowing streams	25.93	70.00	270.00	15.270	0.004
		8. Large gullies, diversions, and low flowing streams	2.59	43.00	1,660.00	4.820	0.095
#7	**1**	**Time of Concentration:**					**0.099**
#8	1	8. Large gullies, diversions, and low flowing streams	2.97	38.00	1,280.00	5.160	0.068
#8	**1**	**Time of Concentration:**					**0.068**
#9	1	8. Large gullies, diversions, and low flowing streams	2.77	33.00	1,190.00	4.990	0.066
#9	**1**	**Time of Concentration:**					**0.066**
#10	1	8. Large gullies, diversions, and low flowing streams	2.74	40.00	1,460.00	4.960	0.081
#10	**1**	**Time of Concentration:**					**0.081**
#11	1	8. Large gullies, diversions, and low flowing streams	17.14	66.00	385.00	12.420	0.008
		8. Large gullies, diversions, and low flowing streams	2.76	30.00	1,085.00	4.980	0.060
#11	**1**	**Time of Concentration:**					**0.068**
#12	1	8. Large gullies, diversions, and low flowing streams	2.00	1.00	50.00	4.240	0.003
		8. Large gullies, diversions, and low flowing streams	30.56	55.00	180.00	16.580	0.003
		8. Large gullies, diversions, and low flowing streams	2.67	40.00	1,500.00	4.890	0.085
#12	**1**	**Time of Concentration:**					**0.091**
#13	1	8. Large gullies, diversions, and low flowing streams	31.72	46.00	145.00	16.890	0.002
		8. Large gullies, diversions, and low flowing streams	1.18	14.00	1,183.00	3.260	0.100
#13	**1**	**Time of Concentration:**					**0.102**
#13	2	3. Short grass pasture	22.06	15.00	68.00	3.750	0.005
		8. Large gullies, diversions, and low flowing streams	7.54	17.49	232.00	8.230	0.007
		6. Grassed waterway	7.14	49.98	700.00	4.000	0.048
#13	**2**	**Time of Concentration:**					**0.060**
#13	3	9. Small streams flowing bankfull	4.57	21.02	460.00	19.230	0.006
		3. Short grass pasture	5.56	41.97	755.00	1.880	0.111
#13	**3**	**Time of Concentration:**					**0.117**
#14	1	8. Large gullies, diversions, and low flowing streams	23.77	29.00	122.00	14.620	0.002
		8. Large gullies, diversions, and low flowing streams	14.29	30.00	210.00	11.330	0.005
#14	**1**	**Time of Concentration:**					**0.007**
#15	1	8. Large gullies, diversions, and low flowing streams	14.47	46.00	318.00	11.410	0.007

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#15	**1**	**Time of Concentration:**					**0.007**
#16	1	9. Small streams flowing bankfull	29.33	66.00	225.00	48.740	0.001
		8. Large gullies, diversions, and low flowing streams	1.19	3.00	253.00	3.260	0.021
#16	**1**	**Time of Concentration:**					**0.022**
#18	1	8. Large gullies, diversions, and low flowing streams	12.93	53.00	410.00	10.780	0.010
#18	**1**	**Time of Concentration:**					**0.010**
#18	2	9. Small streams flowing bankfull	2.38	19.00	800.00	13.860	0.016
		8. Large gullies, diversions, and low flowing streams	12.93	53.00	410.00	10.780	0.010
#18	**2**	**Time of Concentration:**					**0.026**
#20	1	8. Large gullies, diversions, and low flowing streams	1.17	7.00	600.00	3.240	0.051
#20	**1**	**Time of Concentration:**					**0.051**
#20	2	8. Large gullies, diversions, and low flowing streams	1.31	20.00	1,530.00	3.420	0.124
#20	**2**	**Time of Concentration:**					**0.124**
#20	3	8. Large gullies, diversions, and low flowing streams	1.26	16.00	1,266.02	3.370	0.104
#20	**3**	**Time of Concentration:**					**0.104**
#21	1	8. Large gullies, diversions, and low flowing streams	25.00	70.00	280.00	15.000	0.005
		8. Large gullies, diversions, and low flowing streams	4.15	45.00	1,085.00	6.100	0.049
#21	**1**	**Time of Concentration:**					**0.054**
#22	1	8. Large gullies, diversions, and low flowing streams	1.32	7.00	530.00	3.440	0.042
#22	**1**	**Time of Concentration:**					**0.042**
#22	2	8. Large gullies, diversions, and low flowing streams	0.56	5.00	900.00	2.230	0.112
#22	**2**	**Time of Concentration:**					**0.112**
#23	1	8. Large gullies, diversions, and low flowing streams	7.09	83.00	1,170.00	7.990	0.040
#23	**1**	**Time of Concentration:**					**0.040**
#23	2	8. Large gullies, diversions, and low flowing streams	7.09	83.00	1,170.00	7.990	0.040
#23	**2**	**Time of Concentration:**					**0.040**
#24	1	8. Large gullies, diversions, and low flowing streams	0.81	10.00	1,234.00	2.700	0.126
#24	**1**	**Time of Concentration:**					**0.126**
#24	2	8. Large gullies, diversions, and low flowing streams	1.00	7.00	700.00	3.000	0.064
		8. Large gullies, diversions, and low flowing streams	1.70	17.00	1,000.00	3.910	0.071
#24	**2**	**Time of Concentration:**					**0.135**
#24	3	8. Large gullies, diversions, and low flowing streams	1.00	10.00	1,000.00	3.000	0.092
		8. Large gullies, diversions, and low flowing streams	1.70	17.00	1,000.00	3.910	0.071

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#24	**3**	**Time of Concentration:**					**0.163**
#24	4	8. Large gullies, diversions, and low flowing streams	2.00	3.00	150.00	4.240	0.009
		8. Large gullies, diversions, and low flowing streams	1.00	6.00	600.00	3.000	0.055
#24	**4**	**Time of Concentration:**					**0.064**
#24	5	8. Large gullies, diversions, and low flowing streams	1.35	13.00	960.00	3.490	0.076
		8. Large gullies, diversions, and low flowing streams	0.75	8.00	1,060.00	2.600	0.113
#24	**5**	**Time of Concentration:**					**0.189**
#24	6	8. Large gullies, diversions, and low flowing streams	4.67	14.00	300.00	6.480	0.012
		8. Large gullies, diversions, and low flowing streams	1.00	5.00	500.00	3.000	0.046
#24	**6**	**Time of Concentration:**					**0.058**
#24	7	8. Large gullies, diversions, and low flowing streams	3.50	14.00	400.00	5.610	0.019
		8. Large gullies, diversions, and low flowing streams	5.00	15.00	300.00	6.700	0.012
		8. Large gullies, diversions, and low flowing streams	1.00	5.00	500.00	3.000	0.046
#24	**7**	**Time of Concentration:**					**0.077**
#24	8	8. Large gullies, diversions, and low flowing streams	3.64	40.00	1,100.00	5.720	0.053
		8. Large gullies, diversions, and low flowing streams	6.67	30.00	450.00	7.740	0.016
		8. Large gullies, diversions, and low flowing streams	0.70	7.00	1,000.00	2.500	0.111
#24	**8**	**Time of Concentration:**					**0.180**
#25	1	8. Large gullies, diversions, and low flowing streams	2.50	25.00	1,000.00	4.740	0.058
#25	**1**	**Time of Concentration:**					**0.058**
#26	1	8. Large gullies, diversions, and low flowing streams	28.00	70.00	250.00	15.870	0.004
		8. Large gullies, diversions, and low flowing streams	2.69	35.00	1,300.00	4.920	0.073
#26	**1**	**Time of Concentration:**					**0.077**
#27	1	9. Small streams flowing bankfull	2.87	35.00	1,220.00	15.240	0.022
#27	**1**	**Time of Concentration:**					**0.022**
#28	1	8. Large gullies, diversions, and low flowing streams	30.43	70.00	230.00	16.550	0.003
		8. Large gullies, diversions, and low flowing streams	2.20	20.00	910.00	4.440	0.056
#28	**1**	**Time of Concentration:**					**0.059**
#29	1	8. Large gullies, diversions, and low flowing streams	7.65	90.00	1,176.00	8.290	0.039
		8. Large gullies, diversions, and low flowing streams	2.25	17.00	754.00	4.500	0.046
#29	**1**	**Time of Concentration:**					**0.085**

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#30	1	4. Cultivated, straight row	1.50	5.06	337.33	1.090	0.085
		8. Large gullies, diversions, and low flowing streams	7.09	83.00	1,170.00	7.990	0.040
#30	**1**	**Time of Concentration:**					**0.125**
#30	2	8. Large gullies, diversions, and low flowing streams	7.65	90.00	1,176.00	8.290	0.039
#30	**2**	**Time of Concentration:**					**0.039**
#32	1	1. Forest with heavy ground litter	8.61	56.48	656.00	0.740	0.246
		2. Minimum tillage cultivation	5.09	72.00	1,414.73	1.120	0.350
		7. Paved area and small upland gullies	2.93	200.17	6,831.74	3.440	0.551
#32	**1**	**Time of Concentration:**					**1.147**
#32	2	5. Nearly bare and untilled, and alluvial valley fans	10.00	16.50	165.00	3.160	0.014
		6. Grassed waterway	4.50	80.00	1,777.77	3.180	0.155
#32	**2**	**Time of Concentration:**					**0.169**
#33	1	9. Small streams flowing bankfull	1.44	12.02	835.00	10.800	0.021
#33	**1**	**Time of Concentration:**					**0.021**
#33	2	8. Large gullies, diversions, and low flowing streams	8.69	43.01	495.00	8.840	0.015
		8. Large gullies, diversions, and low flowing streams	5.79	40.99	708.00	7.210	0.027
#33	**2**	**Time of Concentration:**					**0.042**
#33	3	8. Large gullies, diversions, and low flowing streams	9.52	45.98	483.00	9.250	0.014
		8. Large gullies, diversions, and low flowing streams	4.65	55.98	1,204.00	6.460	0.051
#33	**3**	**Time of Concentration:**					**0.065**
#33	4	7. Paved area and small upland gullies	3.00	1.04	35.00	3.480	0.002
		9. Small streams flowing bankfull	1.94	8.01	413.00	12.530	0.009
#33	**4**	**Time of Concentration:**					**0.011**
#33	5	7. Paved area and small upland gullies	5.71	1.49	26.25	4.810	0.001
		9. Small streams flowing bankfull	3.13	9.98	319.00	15.920	0.005
#33	**5**	**Time of Concentration:**					**0.006**
#34	1	8. Large gullies, diversions, and low flowing streams	6.33	37.98	600.00	7.540	0.022
#34	**1**	**Time of Concentration:**					**0.022**

Subwatershed Muskingum Routing Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#32	2	7. Paved area and small upland gullies	2.52	100.00	3,968.25	3.190	0.345
#32	**2**	**Muskingum K:**					**0.345**

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#33	1	8. Large gullies, diversions, and low flowing streams	9.62	37.99	395.00	9.300	0.011
		8. Large gullies, diversions, and low flowing streams	5.84	46.01	788.00	7.240	0.030
#33	**1**	**Muskingum K:**					**0.041**
#33	4	8. Large gullies, diversions, and low flowing streams	6.74	69.96	1,038.00	7.780	0.037
#33	**4**	**Muskingum K:**					**0.037**
#33	5	8. Large gullies, diversions, and low flowing streams	7.88	59.96	761.00	8.420	0.025
#33	**5**	**Muskingum K:**					**0.025**

RP-A 100-Year Hydrology

Watshed contributing to Red Wash Reservoir #2

Jason Tuttle

General Information

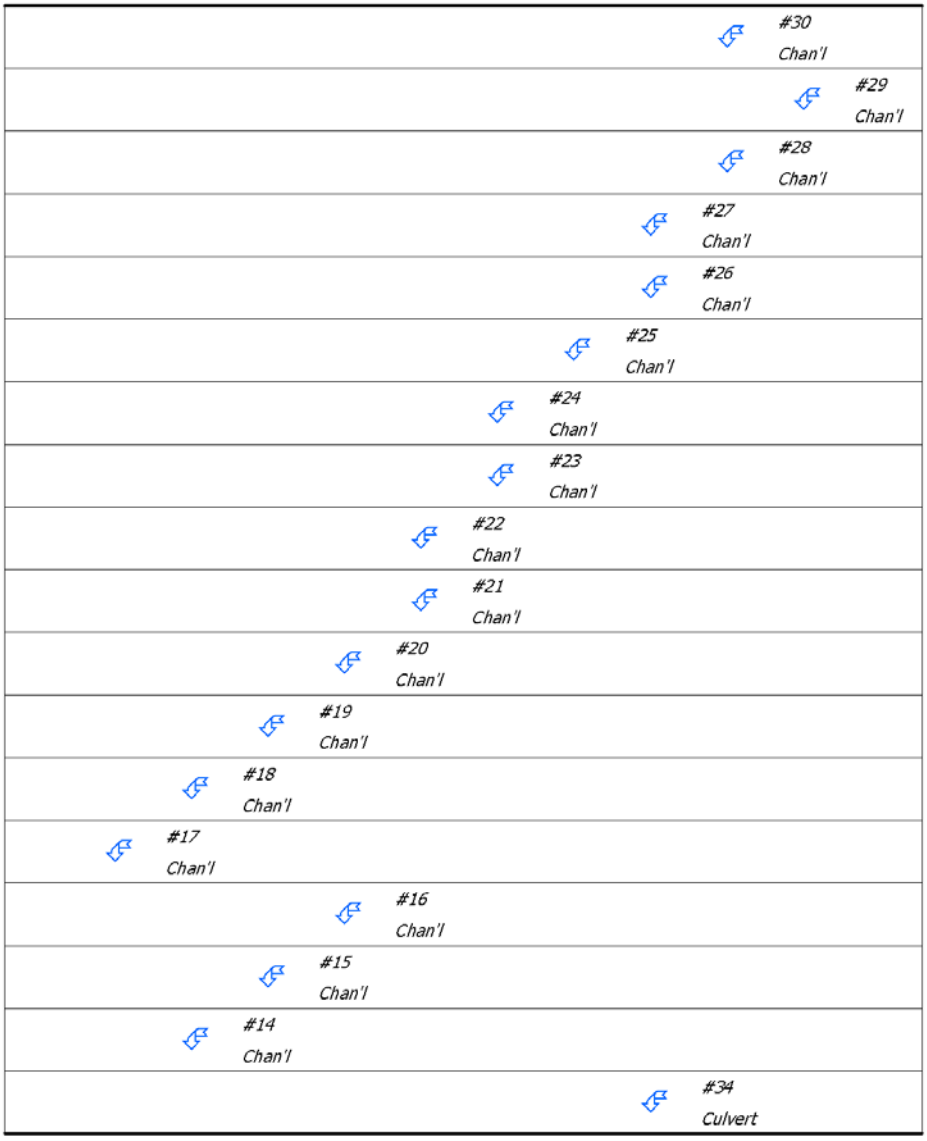
Storm Information:

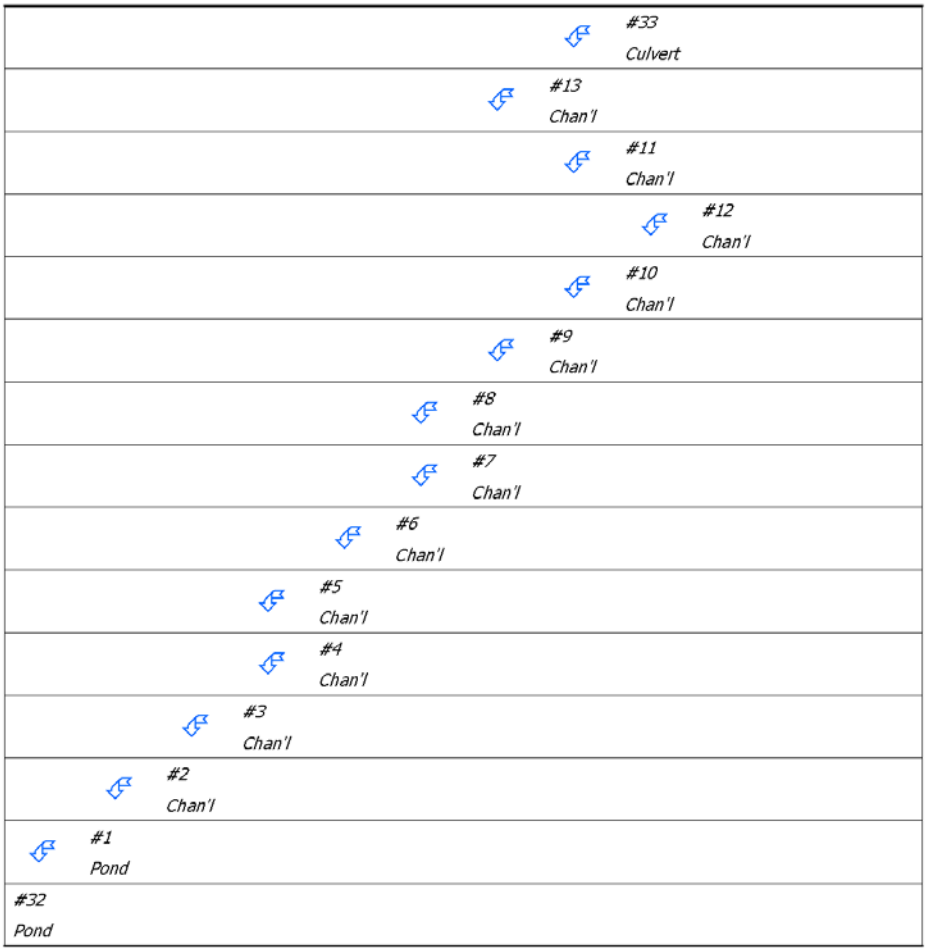
Storm Type:	NRCS Type II
Design Storm:	100 yr - 24 hr
Rainfall Depth:	2.370 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Pond	#1	==>	#32	0.117	0.368	Main Sediment Pond
Channel	#2	==>	#1	0.002	0.319	Channel into pond - west end
Channel	#3	==>	#2	0.015	0.421	Perimeter channel - lowest south
Channel	#4	==>	#3	0.058	0.368	Lowest contour channel - south
Channel	#5	==>	#3	0.034	0.398	Steep perimeter channel - 2nd lowest south
Channel	#6	==>	#5	0.011	0.416	Perimeter channel - 3rd lowest south
Channel	#7	==>	#6	0.065	0.345	Contour channel - 2nd lowest south
Channel	#8	==>	#6	0.065	0.345	Perimeter channel - 4th lowest south
Channel	#9	==>	#8	0.068	0.376	Contour channel - lowest segment of 3rd lowest south
Channel	#10	==>	#9	0.066	0.373	Contour channel - 2nd lowest of 3rd lowest south
Channel	#11	==>	#9	0.066	0.373	Contour channel - west arm of 3rd lowest south
Channel	#12	==>	#10	0.081	0.372	Contour channel - upper arm of 3rd lowest south
Channel	#13	==>	#8	0.068	0.376	Perimeter channel - top segment south
Channel	#14	==>	#2	0.002	0.430	Perimeter channel - lowest segment north
Channel	#15	==>	#14	0.007	0.431	Perimeter channel - 2nd lowest segment north
Channel	#16	==>	#15	0.001	0.449	Contour channel - lowest segment north
Channel	#17	==>	#1	0.000	0.000	Diversion channel into pond from north
Channel	#18	==>	#17	0.015	0.419	Diversion channel middle segment
Channel	#19	==>	#18	0.010	0.430	Diversion channel west segment
Channel	#20	==>	#19	0.019	0.316	Perimeter channel northern most segment
Channel	#21	==>	#20	0.124	0.334	Contour channel - 2nd lowest north
Channel	#22	==>	#20	0.124	0.334	Perimeter channel north of HR
Channel	#23	==>	#22	0.055	0.325	Lower segment of HR
Channel	#24	==>	#22	0.055	0.325	Perimeter channel south of HR
Channel	#25	==>	#24	0.126	0.307	Contour channel lowest segment of west
Channel	#26	==>	#25	0.058	0.368	Contour channel south extension of west
Channel	#27	==>	#25	0.058	0.368	Contour channel 2nd lowest segment of west
Channel	#28	==>	#27	0.066	0.375	Contour channel upper extension of west - north segment
Channel	#29	==>	#28	0.056	0.377	Contour channel upper extension of west - south segment

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#30	==>	#27	0.066	0.375	Upper HR segment
Pond	#32	==>	End	0.000	0.000	RWR#2
Culvert	#33	==>	#13	0.041	0.421	Culvert under conveyor/road
Culvert	#34	==>	#33	0.051	0.400	Culvert under Haul Road Culver under haul road





Structure Routing Details:

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	8. Large gullies, diversions, and low flowing streams	2.50	50.00	2,000.00	4.74	0.117
#1	**Muskingum K:**					**0.117**
#2	8. Large gullies, diversions, and low flowing streams	1.00	0.25	25.00	3.00	0.002
#2	**Muskingum K:**					**0.002**
#3	8. Large gullies, diversions, and low flowing streams	9.11	45.00	494.00	9.05	0.015

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#3	**Muskingum K:**					**0.015**
#4	8. Large gullies, diversions, and low flowing streams	2.50	25.00	1,000.00	4.74	0.058
#4	**Muskingum K:**					**0.058**
#5	8. Large gullies, diversions, and low flowing streams	4.88	40.00	820.00	6.62	0.034
#5	**Muskingum K:**					**0.034**
#6	8. Large gullies, diversions, and low flowing streams	7.78	28.00	360.00	8.36	0.011
#6	**Muskingum K:**					**0.011**
#7	8. Large gullies, diversions, and low flowing streams	1.58	14.00	885.00	3.77	0.065
#7	**Muskingum K:**					**0.065**
#8	8. Large gullies, diversions, and low flowing streams	1.58	14.00	885.00	3.77	0.065
#8	**Muskingum K:**					**0.065**
#9	8. Large gullies, diversions, and low flowing streams	2.97	38.00	1,280.00	5.16	0.068
#9	**Muskingum K:**					**0.068**
#10	8. Large gullies, diversions, and low flowing streams	2.77	33.00	1,190.00	4.99	0.066
#10	**Muskingum K:**					**0.066**
#11	8. Large gullies, diversions, and low flowing streams	2.77	33.00	1,190.00	4.99	0.066
#11	**Muskingum K:**					**0.066**
#12	8. Large gullies, diversions, and low flowing streams	2.74	40.00	1,460.00	4.96	0.081
#12	**Muskingum K:**					**0.081**
#13	8. Large gullies, diversions, and low flowing streams	2.97	38.00	1,280.00	5.16	0.068
#13	**Muskingum K:**					**0.068**
#14	8. Large gullies, diversions, and low flowing streams	12.20	10.00	82.00	10.47	0.002
#14	**Muskingum K:**					**0.002**
#15	8. Large gullies, diversions, and low flowing streams	12.67	38.00	300.00	10.67	0.007
#15	**Muskingum K:**					**0.007**
#16	8. Large gullies, diversions, and low flowing streams	25.00	20.00	80.00	15.00	0.001
#16	**Muskingum K:**					**0.001**
#18	8. Large gullies, diversions, and low flowing streams	8.60	43.00	500.00	8.79	0.015
#18	**Muskingum K:**					**0.015**
#19	8. Large gullies, diversions, and low flowing streams	12.00	45.00	375.00	10.39	0.010
#19	**Muskingum K:**					**0.010**
#20	8. Large gullies, diversions, and low flowing streams	0.95	2.00	210.00	2.92	0.019

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#20	**Muskingum K:**					**0.019**
#21	8. Large gullies, diversions, and low flowing streams	1.31	20.00	1,530.00	3.42	0.124
#21	**Muskingum K:**					**0.124**
#22	8. Large gullies, diversions, and low flowing streams	1.31	20.00	1,530.00	3.42	0.124
#22	**Muskingum K:**					**0.124**
#23	8. Large gullies, diversions, and low flowing streams	1.11	7.00	630.00	3.16	0.055
#23	**Muskingum K:**					**0.055**
#24	8. Large gullies, diversions, and low flowing streams	1.11	7.00	630.00	3.16	0.055
#24	**Muskingum K:**					**0.055**
#25	8. Large gullies, diversions, and low flowing streams	0.81	10.00	1,234.00	2.70	0.126
#25	**Muskingum K:**					**0.126**
#26	8. Large gullies, diversions, and low flowing streams	2.50	25.00	1,000.00	4.74	0.058
#26	**Muskingum K:**					**0.058**
#27	8. Large gullies, diversions, and low flowing streams	2.50	25.00	1,000.00	4.74	0.058
#27	**Muskingum K:**					**0.058**
#28	8. Large gullies, diversions, and low flowing streams	2.87	35.00	1,220.00	5.08	0.066
#28	**Muskingum K:**					**0.066**
#29	8. Large gullies, diversions, and low flowing streams	3.00	32.00	1,065.00	5.20	0.056
#29	**Muskingum K:**					**0.056**
#30	8. Large gullies, diversions, and low flowing streams	2.87	35.00	1,220.00	5.08	0.066
#30	**Muskingum K:**					**0.066**
#33	9. Small streams flowing bankfull	1.00	13.54	1,354.00	9.00	0.041
#33	**Muskingum K:**					**0.041**
#34	8. Large gullies, diversions, and low flowing streams	5.18	64.95	1,254.00	6.82	0.051
#34	**Muskingum K:**					**0.051**

Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#30		6.310	6.310	7.81	0.69
#29		4.610	4.610	6.35	0.51
#28		4.850	9.460	12.85	1.06
#27		3.710	19.480	24.85	2.16
#26		7.910	7.910	10.89	0.88
#25		2.700	30.090	38.05	3.34
#24		18.960	49.050	45.66	4.29
#23		3.940	3.940	5.62	0.46
#22		1.850	54.840	47.65	4.96
#21		7.100	7.100	9.78	0.79
#20		6.480	68.420	54.69	6.19
#19		0.000	68.420	54.69	6.19
#18		1.220	69.640	54.90	6.26
#17		0.000	69.640	54.90	6.26
#16		1.510	1.510	2.08	0.17
#15		0.930	2.440	2.50	0.20
#14		0.690	3.130	3.45	0.28
#34		5.850	5.850	1.17	0.10
#33		31.310	37.160	5.63	0.51
#13		21.700	58.860	14.64	1.26
#11		6.140	6.140	8.45	0.69
#12		7.720	7.720	10.63	0.86
#10		4.450	12.170	16.32	1.36
#9		3.510	21.820	28.70	2.44
#8		3.400	84.080	44.99	4.08
#7		10.670	10.670	14.69	1.19
#6		1.550	96.300	58.59	5.44
#5		1.640	97.940	60.27	5.63
#4		3.600	3.600	4.96	0.40
#3		1.930	103.470	65.09	6.03
#2		0.000	106.600	68.54	6.30
#1	In	10.450	186.690	128.99	13.30
	Out			53.55	13.30
#32	In	229.310	416.000	81.04	20.52
	Out			48.83	15.37

Structure Detail:

Structure #30 (Erodible Channel)

Upper HR segment

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	6.0:1	7.1	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	7.81 cfs	
Depth:	0.56 ft	1.56 ft
Top Width:	5.03 ft	14.03 ft
Velocity:	5.56 fps	
X-Section Area:	1.40 sq ft	
Hydraulic Radius:	0.273 ft	
Froude Number:	1.85	

Structure #29 (Erodible Channel)

Contour channel upper extension of west - south segment

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	3.0:1	2.3	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	6.35 cfs	
Depth:	0.64 ft	1.64 ft
Top Width:	5.77 ft	14.77 ft
Velocity:	3.43 fps	
X-Section Area:	1.85 sq ft	

	w/o Freeboard	w/ Freeboard
Hydraulic Radius:	0.313 ft	
Froude Number:	1.07	

Structure #28 (Erodible Channel)

Contour channel upper extension of west - north segment

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	3.0:1	3.0	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	12.85 cfs	
Depth:	0.79 ft	1.79 ft
Top Width:	7.12 ft	16.12 ft
Velocity:	4.56 fps	
X-Section Area:	2.82 sq ft	
Hydraulic Radius:	0.386 ft	
Froude Number:	1.28	

Structure #27 (Erodible Channel)

Contour channel 2nd lowest segment of west

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	6.0:1	2.9	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	24.85 cfs	
Depth:	1.02 ft	2.02 ft
Top Width:	9.20 ft	18.20 ft
Velocity:	5.29 fps	

	w/o Freeboard	w/ Freeboard
X-Section Area:	4.70 sq ft	
Hydraulic Radius:	0.499 ft	
Froude Number:	1.30	

Structure #26 (Erodible Channel)

Contour channel south extension of west

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	3.0:1	2.7	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	10.89 cfs	
Depth:	0.76 ft	1.76 ft
Top Width:	6.83 ft	15.83 ft
Velocity:	4.20 fps	
X-Section Area:	2.59 sq ft	
Hydraulic Radius:	0.370 ft	
Froude Number:	1.20	

Structure #25 (Erodible Channel)

Contour channel lowest segment of west

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	11.4:1	2.5	0.0300	0.30			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	38.05 cfs	
Depth:	1.03 ft	1.33 ft
Top Width:	14.82 ft	19.15 ft

	w/o Freeboard	w/ Freeboard
Velocity:	5.00 fps	
X-Section Area:	7.61 sq ft	
Hydraulic Radius:	0.508 ft	
Froude Number:	1.23	

Structure #24 (Erodible Channel)

Perimeter channel south of HR

Trapezoidal Erodible Channel Inputs:

Material: Graded loam to cobbles when noncolloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.00	4.0:1	4.0:1	1.0	0.0300	1.00			5.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	45.66 cfs	
Depth:	1.08 ft	2.08 ft
Top Width:	14.65 ft	22.65 ft
Velocity:	4.09 fps	
X-Section Area:	11.16 sq ft	
Hydraulic Radius:	0.748 ft	
Froude Number:	0.83	

Structure #23 (Erodible Channel)

Lower segment of HR

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	6.0:1	7.1	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	5.62 cfs	
Depth:	0.49 ft	1.49 ft

	w/o Freeboard	w/ Freeboard
Top Width:	4.45 ft	13.45 ft
Velocity:	5.12 fps	
X-Section Area:	1.10 sq ft	
Hydraulic Radius:	0.241 ft	
Froude Number:	1.82	

Structure #22 (Erodible Channel)

Perimeter channel north of HR

Trapezoidal Erodible Channel Inputs:

Material: Graded loam to cobbles when noncolloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.00	4.0:1	4.0:1	1.1	0.0300	1.00			5.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	47.65 cfs	
Depth:	1.07 ft	2.07 ft
Top Width:	14.55 ft	22.55 ft
Velocity:	4.34 fps	
X-Section Area:	10.97 sq ft	
Hydraulic Radius:	0.741 ft	
Froude Number:	0.88	

Structure #21 (Erodible Channel)

Contour channel - 2nd lowest north

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	6.0:1	4.2	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	9.78 cfs	

	w/o Freeboard	w/ Freeboard
Depth:	0.67 ft	1.67 ft
Top Width:	6.05 ft	15.05 ft
Velocity:	4.81 fps	
X-Section Area:	2.03 sq ft	
Hydraulic Radius:	0.328 ft	
Froude Number:	1.46	

Structure #20 (Erodible Channel)

Perimeter channel northern most segment

Trapezoidal Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
5.00	4.0:1	4.0:1	1.3	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	54.69 cfs	
Depth:	1.19 ft	2.19 ft
Top Width:	14.51 ft	22.51 ft
Velocity:	4.72 fps	
X-Section Area:	11.59 sq ft	
Hydraulic Radius:	0.783 ft	
Froude Number:	0.93	

Structure #19 (Erodible Channel)

Diversion channel west segment

Trapezoidal Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.00	4.0:1	4.0:1	1.0	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	54.69 cfs	
Depth:	1.18 ft	2.18 ft
Top Width:	15.47 ft	23.47 ft
Velocity:	4.30 fps	
X-Section Area:	12.71 sq ft	
Hydraulic Radius:	0.806 ft	
Froude Number:	0.84	

Structure #18 (Riprap Channel)

Diversion channel middle segment

Trapezoidal Riprap Channel Inputs:

Material: Riprap

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
8.00	4.0:1	4.0:1	13.0	1.00		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	54.90 cfs	
Depth:	0.49 ft	1.49 ft
Top Width:	11.90 ft	19.90 ft
Velocity*:		
X-Section Area:	4.85 sq ft	
Hydraulic Radius:	0.404 ft	
Froude Number*:		
Manning's n*:		
Dmin:	4.00 in	
D50:	12.00 in	
Dmax:	15.00 in	

Velocity and Manning's n calculations may not apply for this method.

Structure #17 (Riprap Channel)

Diversion channel into pond from north

Trapezoidal Riprap Channel Inputs:

Material: Riprap

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
8.00	4.0:1	4.0:1	10.0	1.00		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	54.90 cfs	
Depth:	0.53 ft	1.53 ft
Top Width:	12.24 ft	20.24 ft
Velocity*:		
X-Section Area:	5.37 sq ft	
Hydraulic Radius:	0.434 ft	
Froude Number*:		
Manning's n*:		
Dmin:	3.00 in	
D50:	9.00 in	
Dmax:	11.25 in	

Velocity and Manning's n calculations may not apply for this method.

Structure #16 (Erodible Channel)

Contour channel - lowest segment north

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	6.0:1	1.2	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	2.08 cfs	
Depth:	0.47 ft	1.47 ft
Top Width:	4.27 ft	13.27 ft
Velocity:	2.05 fps	
X-Section Area:	1.01 sq ft	
Hydraulic Radius:	0.232 ft	
Froude Number:	0.74	

Structure #15 (Erodible Channel)

Perimeter channel - 2nd lowest segment north

Trapezoidal Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
4.00	3.0:1	3.0:1	33.0	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	2.50 cfs	
Depth:	0.10 ft	1.10 ft
Top Width:	4.60 ft	10.60 ft
Velocity:	5.84 fps	
X-Section Area:	0.43 sq ft	
Hydraulic Radius:	0.093 ft	
Froude Number:	3.37	

Structure #14 (Erodible Channel)

Perimeter channel - lowest segment north

Trapezoidal Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
2.50	3.0:1	3.0:1	14.3	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	3.45 cfs	
Depth:	0.20 ft	1.20 ft
Top Width:	3.69 ft	9.69 ft
Velocity:	5.62 fps	
X-Section Area:	0.61 sq ft	
Hydraulic Radius:	0.164 ft	
Froude Number:	2.43	

Structure #34 (Culvert)

Culvert under Haul Road

Culver under haul road

Culvert Inputs:

Length (ft)	Slope (%)	Manning's n	Max. Headwater (ft)	Tailwater (ft)	Entrance Loss Coef. (Ke)
160.00	4.40	0.0150	0.67	0.00	0.90

Culvert Results:

Design Discharge = 1.17 cfs

Minimum pipe diameter: 1 - 15 inch pipe(s) required

Structure #33 (Culvert)

Culvert under conveyor/road

Culvert Inputs:

Length (ft)	Slope (%)	Manning's n	Max. Headwater (ft)	Tailwater (ft)	Entrance Loss Coef. (Ke)
100.00	4.50	0.0150	1.00	0.00	0.90

Culvert Results:

Design Discharge = 5.63 cfs

Minimum pipe diameter: 1 - 36 inch pipe(s) required

Structure #13 (Erodible Channel)

Perimeter channel - top segment south

Trapezoidal Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
4.00	3.0:1	3.0:1	1.2	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	14.64 cfs	
Depth:	0.70 ft	1.70 ft
Top Width:	8.20 ft	14.20 ft
Velocity:	3.43 fps	

	w/o Freeboard	w/ Freeboard
X-Section Area:	4.27 sq ft	
Hydraulic Radius:	0.507 ft	
Froude Number:	0.84	

Structure #11 (Erodible Channel)

Contour channel - west arm of 3rd lowest south

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	6.0:1	2.8	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	8.45 cfs	
Depth:	0.69 ft	1.69 ft
Top Width:	6.18 ft	15.18 ft
Velocity:	3.98 fps	
X-Section Area:	2.12 sq ft	
Hydraulic Radius:	0.335 ft	
Froude Number:	1.20	

Structure #12 (Erodible Channel)

Contour channel - upper arm of 3rd lowest south

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	6.0:1	2.7	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	10.63 cfs	
Depth:	0.75 ft	1.75 ft
Top Width:	6.78 ft	15.78 ft

	w/o Freeboard	w/ Freeboard
Velocity:	4.16 fps	
X-Section Area:	2.55 sq ft	
Hydraulic Radius:	0.368 ft	
Froude Number:	1.20	

Structure #10 (Erodible Channel)

Contour channel - 2nd lowest of 3rd lowest south

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	3.0:1	2.7	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	16.32 cfs	
Depth:	0.88 ft	1.88 ft
Top Width:	7.92 ft	16.92 ft
Velocity:	4.68 fps	
X-Section Area:	3.49 sq ft	
Hydraulic Radius:	0.430 ft	
Froude Number:	1.24	

Structure #9 (Erodible Channel)

Contour channel - lowest segment of 3rd lowest south

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	3.0:1	2.8	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	28.70 cfs	
Depth:	1.09 ft	2.09 ft

	w/o Freeboard	w/ Freeboard
Top Width:	9.77 ft	18.77 ft
Velocity:	5.41 fps	
X-Section Area:	5.30 sq ft	
Hydraulic Radius:	0.530 ft	
Froude Number:	1.29	

Structure #8 (Erodible Channel)

Perimeter channel - 4th lowest south

Trapezoidal Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
8.00	3.0:1	3.0:1	3.0	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	44.99 cfs	
Depth:	0.73 ft	1.73 ft
Top Width:	12.39 ft	18.39 ft
Velocity:	6.03 fps	
X-Section Area:	7.46 sq ft	
Hydraulic Radius:	0.591 ft	
Froude Number:	1.37	

Structure #7 (Erodible Channel)

Contour channel - 2nd lowest south

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	3.0:1	2.6	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	14.69 cfs	

	w/o Freeboard	w/ Freeboard
Depth:	0.86 ft	1.86 ft
Top Width:	7.70 ft	16.70 ft
Velocity:	4.46 fps	
X-Section Area:	3.29 sq ft	
Hydraulic Radius:	0.417 ft	
Froude Number:	1.20	

Structure #6 (Erodible Channel)

Perimeter channel - 3rd lowest south

Trapezoidal Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.00	3.0:1	3.0:1	1.6	0.0300	1.00			5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	58.59 cfs	
Depth:	1.14 ft	2.14 ft
Top Width:	12.85 ft	18.85 ft
Velocity:	5.44 fps	
X-Section Area:	10.76 sq ft	
Hydraulic Radius:	0.814 ft	
Froude Number:	1.05	

Structure #5 (Riprap Channel)

Steep perimeter channel - 2nd lowest south

Trapezoidal Riprap Channel Inputs:

Material: Riprap

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
6.00	3.0:1	3.0:1	7.8	1.00		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	60.27 cfs	
Depth:	0.68 ft	1.68 ft
Top Width:	10.10 ft	16.10 ft
Velocity*:		
X-Section Area:	5.50 sq ft	
Hydraulic Radius:	0.533 ft	
Froude Number*:		
Manning's n*:		
Dmin:	4.00 in	
D50:	12.00 in	
Dmax:	15.00 in	

Velocity and Manning's n calculations may not apply for this method.

Structure #4 (Erodible Channel)

Lowest contour channel - south

Triangular Erodible Channel Inputs:

Material: Graded silts to cobbles when colloidal

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	3.0:1	2.5	0.0300				5.5

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	4.96 cfs	
Depth:	0.57 ft	
Top Width:	5.17 ft	
Velocity:	3.34 fps	
X-Section Area:	1.48 sq ft	
Hydraulic Radius:	0.280 ft	
Froude Number:	1.10	

Structure #3 (Riprap Channel)

Perimeter channel - lowest south

Trapezoidal Riprap Channel Inputs:

Material: Riprap

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
5.00	3.0:1	3.0:1	4.9	1.00		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	65.09 cfs	
Depth:	0.82 ft	1.82 ft
Top Width:	9.95 ft	15.95 ft
Velocity*:		
X-Section Area:	6.17 sq ft	
Hydraulic Radius:	0.603 ft	
Froude Number*:		
Manning's n*:		
Dmin:	4.00 in	
D50:	12.00 in	
Dmax:	15.00 in	

Velocity and Manning's n calculations may not apply for this method.

Structure #2 (Riprap Channel)

Channel into pond - west end

Trapezoidal Riprap Channel Inputs:

Material: Riprap

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
6.00	3.0:1	3.0:1	10.0			

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	68.54 cfs	
Depth:	0.68 ft	
Top Width:	10.10 ft	
Velocity*:		
X-Section Area:	5.49 sq ft	
Hydraulic Radius:	0.532 ft	

	w/o Freeboard	w/ Freeboard
Froude Number*:		
Manning's n*:		
Dmin:	4.00 in	
D50:	12.00 in	
Dmax:	15.00 in	

Velocity and Manning's n calculations may not apply for this method.

Structure #1 (Pond)

Main Sediment Pond

Pond Inputs:

Initial Pool Elev:	5,626.00 ft
Initial Pool:	5.02 ac-ft

Straight Pipe

Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Entrance Loss Coefficient	Tailwater Depth (ft)
30.00	35.00	5.71	0.0240	5,626.00	0.70	1.35

Straight Pipe

Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Entrance Loss Coefficient	Tailwater Depth (ft)
30.00	35.00	5.71	0.0240	5,626.00	0.70	1.35

Pond Results:

Peak Elevation:	5,628.98 ft
Dewater Time:	1.21 days

Dewatering time is calculated from peak stage to lowest spillway

Elevation-Capacity-Discharge Table

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)
5,617.00	0.000	0.000	0.000	
5,617.01	0.000	0.000	0.000	
5,617.25	0.004	0.000	0.000	
5,617.50	0.012	0.002	0.000	

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
5,617.75	0.025	0.007	0.000		
5,618.00	0.044	0.015	0.000		
5,618.25	0.068	0.029	0.000		
5,618.50	0.097	0.050	0.000		
5,618.75	0.131	0.078	0.000		
5,619.00	0.169	0.115	0.000		
5,619.25	0.213	0.163	0.000		
5,619.50	0.263	0.223	0.000		
5,619.75	0.317	0.295	0.000		
5,620.00	0.376	0.381	0.000		
5,620.25	0.403	0.479	0.000		
5,620.50	0.430	0.583	0.000		
5,620.75	0.458	0.694	0.000		
5,621.00	0.488	0.812	0.000		
5,621.25	0.518	0.938	0.000		
5,621.50	0.549	1.071	0.000		
5,621.75	0.581	1.212	0.000		
5,622.00	0.613	1.361	0.000		
5,622.25	0.647	1.519	0.000		
5,622.50	0.682	1.685	0.000		
5,622.75	0.717	1.860	0.000		
5,623.00	0.754	2.044	0.000		
5,623.25	0.791	2.237	0.000		
5,623.50	0.829	2.439	0.000		
5,623.75	0.869	2.652	0.000		
5,624.00	0.909	2.874	0.000		
5,624.25	0.950	3.106	0.000		
5,624.50	0.992	3.349	0.000		
5,624.75	1.034	3.602	0.000		
5,625.00	1.078	3.866	0.000		
5,625.25	1.114	4.140	0.000		
5,625.50	1.150	4.423	0.000		
5,625.75	1.187	4.715	0.000		
5,626.00	1.225	5.016	0.000		Spillway #1 Spillway #2
5,626.25	1.263	5.327	1.319	15.90	
5,626.50	1.301	5.648	3.713	4.60	
5,626.75	1.341	5.978	6.806	3.75	
5,627.00	1.380	6.318	10.484	1.70	
5,627.25	1.421	6.668	14.640	0.90	
5,627.50	1.462	7.029	19.233	0.55	

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
5,627.75	1.503	7.399	24.243	0.40	
5,628.00	1.546	7.780	29.619	0.35	
5,628.25	1.588	8.172	35.352	0.25	
5,628.50	1.632	8.575	41.385	0.20	
5,628.75	1.676	8.988	47.756	0.25	
5,628.98	1.717	9.381	53.550	0.30	Peak Stage
5,629.00	1.720	9.413	54.021		
5,629.25	1.765	9.848	58.787		
5,629.50	1.811	10.295	63.658		
5,629.75	1.857	10.754	68.188		
5,630.00	1.904	11.224	72.434		

Detailed Discharge Table

Elevation (ft)	Straight Pipe (cfs)	Straight Pipe (cfs)	Combined Total Discharge (cfs)
5,617.00	0.000	0.000	0.000
5,617.01	0.000	0.000	0.000
5,617.25	0.000	0.000	0.000
5,617.50	0.000	0.000	0.000
5,617.75	0.000	0.000	0.000
5,618.00	0.000	0.000	0.000
5,618.25	0.000	0.000	0.000
5,618.50	0.000	0.000	0.000
5,618.75	0.000	0.000	0.000
5,619.00	0.000	0.000	0.000
5,619.25	0.000	0.000	0.000
5,619.50	0.000	0.000	0.000
5,619.75	0.000	0.000	0.000
5,620.00	0.000	0.000	0.000
5,620.25	0.000	0.000	0.000
5,620.50	0.000	0.000	0.000
5,620.75	0.000	0.000	0.000
5,621.00	0.000	0.000	0.000
5,621.25	0.000	0.000	0.000
5,621.50	0.000	0.000	0.000
5,621.75	0.000	0.000	0.000
5,622.00	0.000	0.000	0.000
5,622.25	0.000	0.000	0.000

Elevation (ft)	Straight Pipe (cfs)	Straight Pipe (cfs)	Combined Total Discharge (cfs)
5,622.50	0.000	0.000	0.000
5,622.75	0.000	0.000	0.000
5,623.00	0.000	0.000	0.000
5,623.25	0.000	0.000	0.000
5,623.50	0.000	0.000	0.000
5,623.75	0.000	0.000	0.000
5,624.00	0.000	0.000	0.000
5,624.25	0.000	0.000	0.000
5,624.50	0.000	0.000	0.000
5,624.75	0.000	0.000	0.000
5,625.00	0.000	0.000	0.000
5,625.25	0.000	0.000	0.000
5,625.50	0.000	0.000	0.000
5,625.75	0.000	0.000	0.000
5,626.00	0.000	0.000	0.000
5,626.25	(3)>0.660	(3)>0.660	1.319
5,626.50	(3)>1.856	(3)>1.856	3.713
5,626.75	(3)>3.403	(3)>3.403	6.806
5,627.00	(3)>5.242	(3)>5.242	10.484
5,627.25	(3)>7.320	(3)>7.320	14.640
5,627.50	(3)>9.617	(3)>9.617	19.233
5,627.75	(3)>12.122	(3)>12.122	24.243
5,628.00	(3)>14.810	(3)>14.810	29.619
5,628.25	(3)>17.676	(3)>17.676	35.352
5,628.50	(3)>20.693	(3)>20.693	41.385
5,628.75	(3)>23.878	(3)>23.878	47.756
5,629.00	(3)>27.011	(3)>27.011	54.021
5,629.25	(5)>29.393	(5)>29.393	58.787
5,629.50	(5)>31.829	(5)>31.829	63.658
5,629.75	(5)>34.094	(5)>34.094	68.188
5,630.00	(5)>36.217	(5)>36.217	72.434

Structure #32 (Pond)

RWR#2

Pond Inputs:

Initial Pool Elev:	5,563.00 ft
Initial Pool:	0.00 ac-ft

Broad-crested Weir

Weir Width (ft)	Spillway Elev (ft)
20.50	5,578.82

V-notch Weir

Notch Angle (deg)	Spillway Elev (ft)
75.00	5,577.32

Pond Results:

Peak Elevation:	5,579.50 ft
Dewater Time:	4.86 days

Dewatering time is calculated from peak stage to lowest spillway

Elevation-Capacity-Discharge Table

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)
5,560.00	0.000	0.000	0.000	
5,560.01	0.000	0.000	0.000	
5,560.25	0.000	0.000	0.000	
5,560.50	0.000	0.000	0.000	
5,560.75	0.000	0.000	0.000	
5,561.00	0.000	0.000	0.000	
5,561.25	0.000	0.000	0.000	
5,561.50	0.000	0.000	0.000	
5,561.75	0.000	0.000	0.000	
5,562.00	0.000	0.000	0.000	
5,562.25	0.000	0.001	0.000	
5,562.50	0.000	0.001	0.000	
5,562.75	0.001	0.001	0.000	
5,563.00	0.001	0.001	0.000	
5,563.25	0.003	0.001	0.000	
5,563.50	0.007	0.002	0.000	
5,563.75	0.013	0.005	0.000	
5,564.00	0.020	0.009	0.000	
5,564.25	0.024	0.014	0.000	
5,564.50	0.028	0.021	0.000	
5,564.75	0.033	0.029	0.000	
5,565.00	0.038	0.037	0.000	
5,565.25	0.044	0.048	0.000	

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)
5,565.50	0.050	0.059	0.000	
5,565.75	0.057	0.073	0.000	
5,566.00	0.064	0.088	0.000	
5,566.25	0.072	0.105	0.000	
5,566.50	0.080	0.124	0.000	
5,566.75	0.089	0.145	0.000	
5,567.00	0.098	0.168	0.000	
5,567.25	0.108	0.194	0.000	
5,567.50	0.118	0.222	0.000	
5,567.75	0.129	0.253	0.000	
5,568.00	0.140	0.287	0.000	
5,568.25	0.152	0.323	0.000	
5,568.50	0.164	0.363	0.000	
5,568.75	0.177	0.405	0.000	
5,569.00	0.190	0.451	0.000	
5,569.25	0.202	0.500	0.000	
5,569.50	0.214	0.552	0.000	
5,569.75	0.227	0.607	0.000	
5,570.00	0.240	0.666	0.000	
5,570.25	0.259	0.728	0.000	
5,570.50	0.279	0.795	0.000	
5,570.75	0.300	0.867	0.000	
5,571.00	0.321	0.945	0.000	
5,571.25	0.345	1.028	0.000	
5,571.50	0.369	1.117	0.000	
5,571.75	0.394	1.213	0.000	
5,572.00	0.420	1.314	0.000	
5,572.25	0.442	1.422	0.000	
5,572.50	0.464	1.535	0.000	
5,572.75	0.487	1.654	0.000	
5,573.00	0.510	1.779	0.000	
5,573.25	0.533	1.909	0.000	
5,573.50	0.556	2.045	0.000	
5,573.75	0.580	2.187	0.000	
5,574.00	0.604	2.335	0.000	
5,574.25	0.627	2.489	0.000	
5,574.50	0.651	2.649	0.000	
5,574.75	0.675	2.815	0.000	
5,575.00	0.700	2.986	0.000	
5,575.25	0.724	3.164	0.000	
5,575.50	0.748	3.348	0.000	

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
5,575.75	0.772	3.538	0.000		
5,576.00	0.797	3.734	0.000		
5,576.25	0.823	3.937	0.000		
5,576.50	0.849	4.146	0.000		
5,576.75	0.875	4.361	0.000		
5,577.00	0.902	4.583	0.000		
5,577.25	0.926	4.812	0.000		
5,577.32	0.933	4.877	0.000		Spillway #2
5,577.50	0.950	5.046	0.026	77.66*	
5,577.75	0.975	5.287	0.233	12.51*	
5,578.00	1.000	5.534	0.732	7.60	
5,578.25	1.008	5.785	1.601	3.55	
5,578.50	1.016	6.038	2.903	2.05	
5,578.75	1.025	6.293	4.692	1.40	
5,578.82	1.027	6.365	5.286	0.55	Spillway #1
5,579.00	1.033	6.550	11.859	7.20	
5,579.25	1.050	6.811	27.784	2.90	
5,579.50	1.067	7.074	48.834	1.15	Peak Stage
5,579.50	1.067	7.075	48.963		
5,579.75	1.084	7.344	74.433		
5,580.00	1.101	7.617	103.695		
5,580.25	1.125	7.896	136.431		
5,580.50	1.150	8.180	172.421		
5,580.75	1.175	8.471	211.505		
5,581.00	1.200	8.767	253.559		

**Designates time(s) to dewater have been extrapolated beyond the 50 hour hydrograph limit.*

Detailed Discharge Table

Elevation (ft)	Broad-crested Weir (cfs)	V-notch Weir (cfs)	Combined Total Discharge (cfs)
5,560.00	0.000	0.000	0.000
5,560.01	0.000	0.000	0.000
5,560.25	0.000	0.000	0.000
5,560.50	0.000	0.000	0.000
5,560.75	0.000	0.000	0.000
5,561.00	0.000	0.000	0.000
5,561.25	0.000	0.000	0.000
5,561.50	0.000	0.000	0.000

Elevation (ft)	Broad-crested Weir (cfs)	V-notch Weir (cfs)	Combined Total Discharge (cfs)
5,561.75	0.000	0.000	0.000
5,562.00	0.000	0.000	0.000
5,562.25	0.000	0.000	0.000
5,562.50	0.000	0.000	0.000
5,562.75	0.000	0.000	0.000
5,563.00	0.000	0.000	0.000
5,563.25	0.000	0.000	0.000
5,563.50	0.000	0.000	0.000
5,563.75	0.000	0.000	0.000
5,564.00	0.000	0.000	0.000
5,564.25	0.000	0.000	0.000
5,564.50	0.000	0.000	0.000
5,564.75	0.000	0.000	0.000
5,565.00	0.000	0.000	0.000
5,565.25	0.000	0.000	0.000
5,565.50	0.000	0.000	0.000
5,565.75	0.000	0.000	0.000
5,566.00	0.000	0.000	0.000
5,566.25	0.000	0.000	0.000
5,566.50	0.000	0.000	0.000
5,566.75	0.000	0.000	0.000
5,567.00	0.000	0.000	0.000
5,567.25	0.000	0.000	0.000
5,567.50	0.000	0.000	0.000
5,567.75	0.000	0.000	0.000
5,568.00	0.000	0.000	0.000
5,568.25	0.000	0.000	0.000
5,568.50	0.000	0.000	0.000
5,568.75	0.000	0.000	0.000
5,569.00	0.000	0.000	0.000
5,569.25	0.000	0.000	0.000
5,569.50	0.000	0.000	0.000
5,569.75	0.000	0.000	0.000
5,570.00	0.000	0.000	0.000
5,570.25	0.000	0.000	0.000
5,570.50	0.000	0.000	0.000
5,570.75	0.000	0.000	0.000
5,571.00	0.000	0.000	0.000
5,571.25	0.000	0.000	0.000
5,571.50	0.000	0.000	0.000

Elevation (ft)	Broad-crested Weir (cfs)	V-notch Weir (cfs)	Combined Total Discharge (cfs)
5,571.75	0.000	0.000	0.000
5,572.00	0.000	0.000	0.000
5,572.25	0.000	0.000	0.000
5,572.50	0.000	0.000	0.000
5,572.75	0.000	0.000	0.000
5,573.00	0.000	0.000	0.000
5,573.25	0.000	0.000	0.000
5,573.50	0.000	0.000	0.000
5,573.75	0.000	0.000	0.000
5,574.00	0.000	0.000	0.000
5,574.25	0.000	0.000	0.000
5,574.50	0.000	0.000	0.000
5,574.75	0.000	0.000	0.000
5,575.00	0.000	0.000	0.000
5,575.25	0.000	0.000	0.000
5,575.50	0.000	0.000	0.000
5,575.75	0.000	0.000	0.000
5,576.00	0.000	0.000	0.000
5,576.25	0.000	0.000	0.000
5,576.50	0.000	0.000	0.000
5,576.75	0.000	0.000	0.000
5,577.00	0.000	0.000	0.000
5,577.25	0.000	0.000	0.000
5,577.32	0.000	0.000	0.000
5,577.50	0.000	0.026	0.026
5,577.75	0.000	0.233	0.233
5,578.00	0.000	0.732	0.732
5,578.25	0.000	1.601	1.601
5,578.50	0.000	2.903	2.903
5,578.75	0.000	4.692	4.692
5,578.82	0.000	5.286	5.286
5,579.00	4.840	7.020	11.859
5,579.25	17.855	9.929	27.784
5,579.50	35.500	13.463	48.963
5,579.75	56.773	17.661	74.433
5,580.00	81.135	22.559	103.695
5,580.25	108.237	28.194	136.431
5,580.50	137.823	34.598	172.421
5,580.75	169.702	41.803	211.505
5,581.00	203.717	49.842	253.559

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#30	1	4.280	0.125	0.000	0.000	89.000	F	5.23	0.461
	2	2.030	0.039	0.000	0.000	89.000	F	2.80	0.226
	Σ	**6.310**						**7.81**	**0.687**
#29	1	4.610	0.085	0.000	0.000	89.000	F	6.35	0.515
	Σ	**4.610**						**6.35**	**0.515**
#28	1	4.850	0.059	0.000	0.000	89.000	F	6.68	0.542
	Σ	**9.460**						**12.85**	**1.056**
#27	1	3.710	0.022	0.000	0.000	89.000	F	5.11	0.414
	Σ	**19.480**						**24.85**	**2.158**
#26	1	7.910	0.077	0.000	0.000	89.000	F	10.89	0.883
	Σ	**7.910**						**10.89**	**0.883**
#25	1	2.700	0.058	0.000	0.000	89.000	F	3.72	0.301
	Σ	**30.090**						**38.05**	**3.342**
#24	1	2.090	0.126	0.000	0.000	89.000	F	2.56	0.225
	2	1.990	0.135	0.000	0.000	87.000	F	2.20	0.192
	3	1.900	0.163	0.000	0.000	89.000	F	2.32	0.204
	4	0.400	0.064	0.000	0.000	91.000	F	0.59	0.049
	5	11.340	0.189	0.000	0.000	63.000	F	1.20	0.182
	6	0.340	0.058	0.000	0.000	63.000	F	0.07	0.002
	7	0.270	0.077	0.000	0.000	89.000	F	0.37	0.025
	8	0.630	0.180	0.000	0.000	89.000	F	0.76	0.067
	Σ	**49.050**						**45.66**	**4.288**
#23	1	2.110	0.040	0.000	0.000	89.000	F	2.91	0.235
	2	1.830	0.040	0.000	0.000	91.000	F	2.72	0.227
	Σ	**3.940**						**5.62**	**0.462**
#22	1	1.140	0.042	0.000	0.000	89.000	F	1.57	0.127
	2	0.710	0.112	0.000	0.000	89.000	F	0.98	0.079
	Σ	**54.840**						**47.65**	**4.956**
#21	1	7.100	0.054	0.000	0.000	89.000	F	9.78	0.793
	Σ	**7.100**						**9.78**	**0.793**
#20	1	0.500	0.051	0.000	0.000	89.000	F	0.69	0.055
	2	2.350	0.124	0.000	0.000	89.000	F	3.24	0.262
	3	3.630	0.104	0.000	0.000	70.000	F	1.66	0.119

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
	Σ	**68.420**						**54.69**	**6.185**
#19	Σ	**68.420**						**54.69**	**6.185**
#18	1	0.750	0.010	0.010	0.000	70.000	F	0.34	0.022
	2	0.470	0.026	0.000	0.000	91.000	F	0.70	0.057
	Σ	**69.640**						**54.90**	**6.264**
#17	Σ	**69.640**						**54.90**	**6.264**
#16	1	1.510	0.022	0.000	0.000	89.000	F	2.08	0.168
	Σ	**1.510**						**2.08**	**0.168**
#15	1	0.930	0.007	0.000	0.000	70.000	F	0.43	0.031
	Σ	**2.440**						**2.50**	**0.199**
#14	1	0.690	0.007	0.000	0.000	89.000	F	0.95	0.076
	Σ	**3.130**						**3.45**	**0.275**
#34	1	5.850	0.022	0.000	0.000	63.000	F	1.17	0.098
	Σ	**5.850**						**1.17**	**0.098**
#33	1	0.650	0.021	0.041	0.412	89.000	F	0.89	0.072
	2	14.820	0.042	0.000	0.000	51.000	F	0.04	0.024
	3	15.250	0.065	0.000	0.000	63.000	F	3.04	0.256
	4	0.330	0.011	0.037	0.410	89.000	F	0.45	0.033
	5	0.260	0.006	0.025	0.416	89.000	F	0.36	0.024
	Σ	**37.160**						**5.63**	**0.508**
#13	1	4.950	0.102	0.000	0.000	89.000	F	6.82	0.553
	2	15.150	0.060	0.000	0.000	51.000	F	0.04	0.025
	3	1.600	0.117	0.000	0.000	89.000	F	2.20	0.178
	Σ	**58.860**						**14.64**	**1.264**
#11	1	6.140	0.068	0.000	0.000	89.000	F	8.45	0.686
	Σ	**6.140**						**8.45**	**0.686**
#12	1	7.720	0.091	0.000	0.000	89.000	F	10.63	0.862
	Σ	**7.720**						**10.63**	**0.862**
#10	1	4.450	0.081	0.000	0.000	89.000	F	6.13	0.497
	Σ	**12.170**						**16.32**	**1.359**
#9	1	3.510	0.066	0.000	0.000	89.000	F	4.83	0.392
	Σ	**21.820**						**28.70**	**2.437**
#8	1	3.400	0.068	0.000	0.000	89.000	F	4.68	0.379
	Σ	**84.080**						**44.99**	**4.080**

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#7	1	10.670	0.099	0.000	0.000	89.000	F	14.69	1.192
	Σ	**10.670**						**14.69**	**1.192**
#6	1	1.550	0.065	0.000	0.000	89.000	F	2.13	0.173
	Σ	**96.300**						**58.59**	**5.444**
#5	1	1.640	0.012	0.000	0.000	89.000	F	2.26	0.183
	Σ	**97.940**						**60.27**	**5.627**
#4	1	3.600	0.046	0.000	0.000	89.000	F	4.96	0.402
	Σ	**3.600**						**4.96**	**0.402**
#3	1	1.930	0.034	0.000	0.000	1.000	F	0.00	0.000
	Σ	**103.470**						**65.09**	**6.029**
#2	Σ	**106.600**						**68.54**	**6.304**
#1	1	1.900	0.000	0.000	0.000	98.000	F	3.40	0.339
	2	1.690	0.000	0.000	0.000	87.000	F	2.14	0.169
	3	3.650	0.021	0.000	0.000	70.000	F	1.67	0.120
	4	3.210	0.009	0.000	0.000	70.000	F	1.47	0.105
	Σ	**186.690**						**128.99**	**13.301**
#32	1	217.150	1.147	0.000	0.000	69.000	F	24.30	6.168
	2	12.160	0.169	0.345	0.326	85.000	F	12.02	1.049
	Σ	**416.000**						**81.04**	**20.518**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	3	8. Large gullies, diversions, and low flowing streams	22.22	40.00	180.00	14.140	0.003
		8. Large gullies, diversions, and low flowing streams	7.27	40.00	550.00	8.090	0.018
#1	**3**	**Time of Concentration:**					**0.021**
#1	4	8. Large gullies, diversions, and low flowing streams	17.53	78.00	445.00	12.550	0.009
#1	**4**	**Time of Concentration:**					**0.009**
#3	1	8. Large gullies, diversions, and low flowing streams	4.88	40.00	820.00	6.620	0.034
#3	**1**	**Time of Concentration:**					**0.034**
#4	1	8. Large gullies, diversions, and low flowing streams	32.73	72.00	220.00	17.160	0.003
		8. Large gullies, diversions, and low flowing streams	2.47	18.00	730.00	4.710	0.043

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#4	**1**	**Time of Concentration:**					**0.046**
#5	1	8. Large gullies, diversions, and low flowing streams	30.48	32.00	105.00	16.560	0.001
		8. Large gullies, diversions, and low flowing streams	7.78	28.00	360.00	8.360	0.011
#5	**1**	**Time of Concentration:**					**0.012**
#6	1	8. Large gullies, diversions, and low flowing streams	1.58	14.00	885.00	3.770	0.065
#6	**1**	**Time of Concentration:**					**0.065**
#7	1	8. Large gullies, diversions, and low flowing streams	25.93	70.00	270.00	15.270	0.004
		8. Large gullies, diversions, and low flowing streams	2.59	43.00	1,660.00	4.820	0.095
#7	**1**	**Time of Concentration:**					**0.099**
#8	1	8. Large gullies, diversions, and low flowing streams	2.97	38.00	1,280.00	5.160	0.068
#8	**1**	**Time of Concentration:**					**0.068**
#9	1	8. Large gullies, diversions, and low flowing streams	2.77	33.00	1,190.00	4.990	0.066
#9	**1**	**Time of Concentration:**					**0.066**
#10	1	8. Large gullies, diversions, and low flowing streams	2.74	40.00	1,460.00	4.960	0.081
#10	**1**	**Time of Concentration:**					**0.081**
#11	1	8. Large gullies, diversions, and low flowing streams	17.14	66.00	385.00	12.420	0.008
		8. Large gullies, diversions, and low flowing streams	2.76	30.00	1,085.00	4.980	0.060
#11	**1**	**Time of Concentration:**					**0.068**
#12	1	8. Large gullies, diversions, and low flowing streams	2.00	1.00	50.00	4.240	0.003
		8. Large gullies, diversions, and low flowing streams	30.56	55.00	180.00	16.580	0.003
		8. Large gullies, diversions, and low flowing streams	2.67	40.00	1,500.00	4.890	0.085
#12	**1**	**Time of Concentration:**					**0.091**
#13	1	8. Large gullies, diversions, and low flowing streams	31.72	46.00	145.00	16.890	0.002
		8. Large gullies, diversions, and low flowing streams	1.18	14.00	1,183.00	3.260	0.100
#13	**1**	**Time of Concentration:**					**0.102**
#13	2	3. Short grass pasture	22.06	15.00	68.00	3.750	0.005
		8. Large gullies, diversions, and low flowing streams	7.54	17.49	232.00	8.230	0.007
		6. Grassed waterway	7.14	49.98	700.00	4.000	0.048
#13	**2**	**Time of Concentration:**					**0.060**
#13	3	9. Small streams flowing bankfull	4.57	21.02	460.00	19.230	0.006
		3. Short grass pasture	5.56	41.97	755.00	1.880	0.111
#13	**3**	**Time of Concentration:**					**0.117**

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#14	1	8. Large gullies, diversions, and low flowing streams	23.77	29.00	122.00	14.620	0.002
		8. Large gullies, diversions, and low flowing streams	14.29	30.00	210.00	11.330	0.005
#14	**1**	**Time of Concentration:**					**0.007**
#15	1	8. Large gullies, diversions, and low flowing streams	14.47	46.00	318.00	11.410	0.007
#15	**1**	**Time of Concentration:**					**0.007**
#16	1	9. Small streams flowing bankfull	29.33	66.00	225.00	48.740	0.001
		8. Large gullies, diversions, and low flowing streams	1.19	3.00	253.00	3.260	0.021
#16	**1**	**Time of Concentration:**					**0.022**
#18	1	8. Large gullies, diversions, and low flowing streams	12.93	53.00	410.00	10.780	0.010
#18	**1**	**Time of Concentration:**					**0.010**
#18	2	9. Small streams flowing bankfull	2.38	19.00	800.00	13.860	0.016
		8. Large gullies, diversions, and low flowing streams	12.93	53.00	410.00	10.780	0.010
#18	**2**	**Time of Concentration:**					**0.026**
#20	1	8. Large gullies, diversions, and low flowing streams	1.17	7.00	600.00	3.240	0.051
#20	**1**	**Time of Concentration:**					**0.051**
#20	2	8. Large gullies, diversions, and low flowing streams	1.31	20.00	1,530.00	3.420	0.124
#20	**2**	**Time of Concentration:**					**0.124**
#20	3	8. Large gullies, diversions, and low flowing streams	1.26	16.00	1,266.02	3.370	0.104
#20	**3**	**Time of Concentration:**					**0.104**
#21	1	8. Large gullies, diversions, and low flowing streams	25.00	70.00	280.00	15.000	0.005
		8. Large gullies, diversions, and low flowing streams	4.15	45.00	1,085.00	6.100	0.049
#21	**1**	**Time of Concentration:**					**0.054**
#22	1	8. Large gullies, diversions, and low flowing streams	1.32	7.00	530.00	3.440	0.042
#22	**1**	**Time of Concentration:**					**0.042**
#22	2	8. Large gullies, diversions, and low flowing streams	0.56	5.00	900.00	2.230	0.112
#22	**2**	**Time of Concentration:**					**0.112**
#23	1	8. Large gullies, diversions, and low flowing streams	7.09	83.00	1,170.00	7.990	0.040
#23	**1**	**Time of Concentration:**					**0.040**
#23	2	8. Large gullies, diversions, and low flowing streams	7.09	83.00	1,170.00	7.990	0.040
#23	**2**	**Time of Concentration:**					**0.040**
#24	1	8. Large gullies, diversions, and low flowing streams	0.81	10.00	1,234.00	2.700	0.126
#24	**1**	**Time of Concentration:**					**0.126**

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#24	2	8. Large gullies, diversions, and low flowing streams	1.00	7.00	700.00	3.000	0.064
		8. Large gullies, diversions, and low flowing streams	1.70	17.00	1,000.00	3.910	0.071
#24	**2**	**Time of Concentration:**					**0.135**
#24	3	8. Large gullies, diversions, and low flowing streams	1.00	10.00	1,000.00	3.000	0.092
		8. Large gullies, diversions, and low flowing streams	1.70	17.00	1,000.00	3.910	0.071
#24	**3**	**Time of Concentration:**					**0.163**
#24	4	8. Large gullies, diversions, and low flowing streams	2.00	3.00	150.00	4.240	0.009
		8. Large gullies, diversions, and low flowing streams	1.00	6.00	600.00	3.000	0.055
#24	**4**	**Time of Concentration:**					**0.064**
#24	5	8. Large gullies, diversions, and low flowing streams	1.35	13.00	960.00	3.490	0.076
		8. Large gullies, diversions, and low flowing streams	0.75	8.00	1,060.00	2.600	0.113
#24	**5**	**Time of Concentration:**					**0.189**
#24	6	8. Large gullies, diversions, and low flowing streams	4.67	14.00	300.00	6.480	0.012
		8. Large gullies, diversions, and low flowing streams	1.00	5.00	500.00	3.000	0.046
#24	**6**	**Time of Concentration:**					**0.058**
#24	7	8. Large gullies, diversions, and low flowing streams	3.50	14.00	400.00	5.610	0.019
		8. Large gullies, diversions, and low flowing streams	5.00	15.00	300.00	6.700	0.012
		8. Large gullies, diversions, and low flowing streams	1.00	5.00	500.00	3.000	0.046
#24	**7**	**Time of Concentration:**					**0.077**
#24	8	8. Large gullies, diversions, and low flowing streams	3.64	40.00	1,100.00	5.720	0.053
		8. Large gullies, diversions, and low flowing streams	6.67	30.00	450.00	7.740	0.016
		8. Large gullies, diversions, and low flowing streams	0.70	7.00	1,000.00	2.500	0.111
#24	**8**	**Time of Concentration:**					**0.180**
#25	1	8. Large gullies, diversions, and low flowing streams	2.50	25.00	1,000.00	4.740	0.058
#25	**1**	**Time of Concentration:**					**0.058**
#26	1	8. Large gullies, diversions, and low flowing streams	28.00	70.00	250.00	15.870	0.004
		8. Large gullies, diversions, and low flowing streams	2.69	35.00	1,300.00	4.920	0.073
#26	**1**	**Time of Concentration:**					**0.077**
#27	1	9. Small streams flowing bankfull	2.87	35.00	1,220.00	15.240	0.022
#27	**1**	**Time of Concentration:**					**0.022**

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#28	1	8. Large gullies, diversions, and low flowing streams	30.43	70.00	230.00	16.550	0.003
		8. Large gullies, diversions, and low flowing streams	2.20	20.00	910.00	4.440	0.056
#28	**1**	**Time of Concentration:**					**0.059**
#29	1	8. Large gullies, diversions, and low flowing streams	7.65	90.00	1,176.00	8.290	0.039
		8. Large gullies, diversions, and low flowing streams	2.25	17.00	754.00	4.500	0.046
#29	**1**	**Time of Concentration:**					**0.085**
#30	1	4. Cultivated, straight row	1.50	5.06	337.33	1.090	0.085
		8. Large gullies, diversions, and low flowing streams	7.09	83.00	1,170.00	7.990	0.040
#30	**1**	**Time of Concentration:**					**0.125**
#30	2	8. Large gullies, diversions, and low flowing streams	7.65	90.00	1,176.00	8.290	0.039
#30	**2**	**Time of Concentration:**					**0.039**
#32	1	1. Forest with heavy ground litter	8.61	56.48	656.00	0.740	0.246
		2. Minimum tillage cultivation	5.09	72.00	1,414.73	1.120	0.350
		7. Paved area and small upland gullies	2.93	200.17	6,831.74	3.440	0.551
#32	**1**	**Time of Concentration:**					**1.147**
#32	2	5. Nearly bare and untilled, and alluvial valley fans	10.00	16.50	165.00	3.160	0.014
		6. Grassed waterway	4.50	80.00	1,777.77	3.180	0.155
#32	**2**	**Time of Concentration:**					**0.169**
#33	1	9. Small streams flowing bankfull	1.44	12.02	835.00	10.800	0.021
#33	**1**	**Time of Concentration:**					**0.021**
#33	2	8. Large gullies, diversions, and low flowing streams	8.69	43.01	495.00	8.840	0.015
		8. Large gullies, diversions, and low flowing streams	5.79	40.99	708.00	7.210	0.027
#33	**2**	**Time of Concentration:**					**0.042**
#33	3	8. Large gullies, diversions, and low flowing streams	9.52	45.98	483.00	9.250	0.014
		8. Large gullies, diversions, and low flowing streams	4.65	55.98	1,204.00	6.460	0.051
#33	**3**	**Time of Concentration:**					**0.065**
#33	4	7. Paved area and small upland gullies	3.00	1.04	35.00	3.480	0.002
		9. Small streams flowing bankfull	1.94	8.01	413.00	12.530	0.009
#33	**4**	**Time of Concentration:**					**0.011**
#33	5	7. Paved area and small upland gullies	5.71	1.49	26.25	4.810	0.001
		9. Small streams flowing bankfull	3.13	9.98	319.00	15.920	0.005
#33	**5**	**Time of Concentration:**					**0.006**

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#34	1	8. Large gullies, diversions, and low flowing streams	6.33	37.98	600.00	7.540	0.022
#34	**1**	**Time of Concentration:**					**0.022**

Subwatershed Muskingum Routing Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#32	2	7. Paved area and small upland gullies	2.52	100.00	3,970.14	3.190	0.345
#32	**2**	**Muskingum K:**					**0.345**
#33	1	8. Large gullies, diversions, and low flowing streams	9.62	37.99	395.00	9.300	0.011
		8. Large gullies, diversions, and low flowing streams	5.84	46.01	788.00	7.240	0.030
#33	**1**	**Muskingum K:**					**0.041**
#33	4	8. Large gullies, diversions, and low flowing streams	6.74	69.96	1,038.00	7.780	0.037
#33	**4**	**Muskingum K:**					**0.037**
#33	5	8. Large gullies, diversions, and low flowing streams	7.88	59.96	761.00	8.420	0.025
#33	**5**	**Muskingum K:**					**0.025**