

Sly Gulch Watershed

37

Tucker Weiss

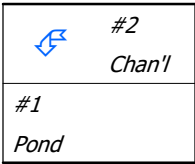
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	25 yr - 24 hr
Rainfall Depth:	2.160 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Pond	#1	==>	End	0.000	0.000	
Channel	#2	==>	#1	0.000	0.000	



Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#2		14.600	14.600	17.64	1.41
#1	In	0.000	14.600	17.64	1.41
	Out			0.33	0.81

Structure Detail:

Structure #2 (Riprap Channel)

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	1.0:1	1.0:1	12.0	1.00		

Riprap Channel Results:

PADER Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	17.64 cfs	
Depth:	0.50 ft	1.50 ft
Top Width:	5.99 ft	7.99 ft
Velocity:	6.48 fps	
X-Section Area:	2.72 sq ft	
Hydraulic Radius:	0.425 ft	
Froude Number:	1.70	
Manning's n:	0.0450	
Dmin:	2.00 in	
D50:	3.00 in	
Dmax:	4.50 in	

Structure #1 (Pond)

Pond Inputs:

Initial Pool Elev:	100.50 ft
Initial Pool:	0.18 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
105.00	14.00	2.00:1	2.00:1	12.00

Perforated Riser

Riser Diameter (in)	Riser Height (ft)	Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Number of Holes per Elev
18.00	4.00	12.00	90.00	2.00	0.0120	104.00	4

Pond Results:

Peak Elevation:	102.89 ft
Dewater Time:	5.23 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)
100.00	0.342	0.000	0.000	
100.50	0.375	0.179	0.000	Low hole SPW #2
101.00	0.409	0.375	0.042	56.78*
101.50	0.445	0.589	0.101	25.63*
102.00	0.483	0.821	0.173	16.20*
102.50	0.522	1.072	0.257	14.30
102.89	0.553	1.282	0.329	12.55 Peak Stage
103.00	0.562	1.343	0.350	
103.50	0.604	1.635	0.453	
104.00	0.648	1.948	0.563	Spillway #2
104.50	0.693	2.283	5.165	
105.00	0.739	2.641	7.425	Spillway #1
105.50	0.788	3.022	10.062	
106.00	0.837	3.428	40.138	

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

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Perf. Riser (cfs)	Combined Total Discharge (cfs)
100.00	0.000	0.000	0.000
100.50	0.000	0.75>0.000	0.000
101.00	0.000	0.75>0.042	0.042
101.50	0.000	0.75>0.101	0.101
102.00	0.000	0.75>0.173	0.173
102.50	0.000	0.75>0.257	0.257
103.00	0.000	0.75>0.350	0.350

Elevation (ft)	Emergency Spillway (cfs)	Perf. Riser (cfs)	Combined Total Discharge (cfs)
103.50	0.000	0.75>0.453	0.453
104.00	0.000	0.563	0.563
104.50	0.000	5.165	5.165
105.00	0.000	7.425	7.425
105.50	2.369	7.693	10.062
106.00	32.186	7.952	40.138

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)
#2	1	14.600	0.087	0.000	0.000	89.000	17.64	1.412	
	Σ	14.600						17.64	1.412
#1	Σ	14.600						17.64	1.412

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#2	1	7. Paved area and small upland gullies	12.00	264.00	2,200.00	6.970	0.087
#2	1	Time of Concentration:					0.087

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37

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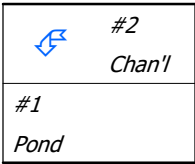
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	100 yr - 24 hr
Rainfall Depth:	2.730 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Pond	#1	==>	End	0.000	0.000	
Channel	#2	==>	#1	0.000	0.000	



Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#2		14.600	14.600	24.35	2.01
#1	In	0.000	14.600	24.35	2.01
	Out			0.68	1.46

Structure Detail:

Structure #2 (Riprap Channel)

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	1.0:1	1.0:1	12.0	1.00		

Riprap Channel Results:

PADER Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	24.35 cfs	
Depth:	0.65 ft	1.65 ft
Top Width:	6.31 ft	8.31 ft
Velocity:	6.58 fps	
X-Section Area:	3.70 sq ft	
Hydraulic Radius:	0.540 ft	
Froude Number:	1.51	
Manning's n:	0.0520	
Dmin:	3.00 in	
D50:	6.00 in	
Dmax:	9.00 in	

Structure #1 (Pond)

Pond Inputs:

Initial Pool Elev:	101.50 ft
Initial Pool:	0.59 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
105.00	14.00	2.00:1	2.00:1	12.00

Perforated Riser

Riser Diameter (in)	Riser Height (ft)	Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Number of Holes per Elev
18.00	4.00	12.00	90.00	2.00	0.0120	105.00	4

Pond Results:

Peak Elevation:	104.15 ft
Dewater Time:	3.68 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)
100.00	0.342	0.000	0.000	
100.50	0.375	0.179	0.000	
101.00	0.409	0.375	0.000	
101.50	0.445	0.589	0.000	Low hole SPW #2
102.00	0.483	0.821	0.074	37.79*
102.50	0.522	1.072	0.179	16.94*
103.00	0.562	1.343	0.308	10.65*
103.50	0.604	1.635	0.457	9.35
104.00	0.648	1.948	0.623	7.05
104.15	0.662	2.047	0.677	6.55 Peak Stage
104.50	0.693	2.283	0.805	
105.00	0.739	2.641	1.001	Spillway #1 Spillway #2
105.50	0.788	3.022	7.534	
106.00	0.837	3.428	39.611	

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

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Perf. Riser (cfs)	Combined Total Discharge (cfs)
100.00	0.000	0.000	0.000
100.50	0.000	0.000	0.000
101.00	0.000	0.000	0.000
101.50	0.000	1.00>0.000	0.000
102.00	0.000	1.00>0.074	0.074
102.50	0.000	1.00>0.179	0.179

Elevation (ft)	Emergency Spillway (cfs)	Perf. Riser (cfs)	Combined Total Discharge (cfs)
103.00	0.000	1.00>0.308	0.308
103.50	0.000	1.00>0.457	0.457
104.00	0.000	1.00>0.623	0.623
104.50	0.000	1.00>0.805	0.805
105.00	0.000	1.001	1.001
105.50	2.369	5.165	7.534
106.00	32.186	7.425	39.611

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)
#2	1	14.600	0.087	0.000	0.000	89.000	24.35	2.015	
	Σ	14.600						24.35	2.015
#1	Σ	14.600						24.35	2.015

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#2	1	7. Paved area and small upland gullies	12.00	264.00	2,200.00	6.970	0.087
#2	1	Time of Concentration:					0.087

Sly Gulch Watershed Improvements

3.0 [43F & 43E]

Tucker Weiss

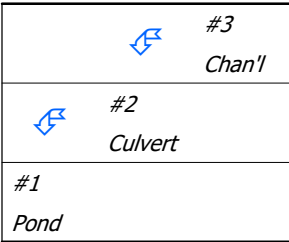
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	25 yr - 24 hr
Rainfall Depth:	2.160 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Pond	#1	==>	End	0.000	0.000	
Culvert	#2	==>	#1	0.000	0.000	
Channel	#3	==>	#2	0.003	0.468	



Structure Routing Details:

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#3	8. Large gullies, diversions, and low flowing streams	71.00	229.32	323.00	25.27	0.003
#3	Muskingum K:					0.003

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#3	3.000	3.000	3.31	0.26
#2	0.000	3.000	3.31	0.26
#1 In	0.000	3.000	3.31	0.26
Out			0.16	0.24

Structure Detail:

Structure #3 (Erodible Channel)

Trapezoidal Erodible Channel Inputs:

Material: Coarse gravel 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)
3.00	1.0:1	1.0:1	5.0	0.0250	1.00			6.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	3.31 cfs	
Depth:	0.23 ft	1.23 ft
Top Width:	3.45 ft	5.45 ft
Velocity:	4.55 fps	
X-Section Area:	0.73 sq ft	
Hydraulic Radius:	0.200 ft	
Froude Number:	1.75	

Structure #2 (Culvert)

Culvert Inputs:

Length (ft)	Slope (%)	Manning's n	Max. Headwater (ft)	Tailwater (ft)	Entrance Loss Coef. (Ke)
80.00	3.00	0.0150	3.00	2.00	0.70

Culvert Results:

Design Discharge = 3.31 cfs

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

Structure #1 (Pond)

Pond Inputs:

Initial Pool Elev:	100.50 ft
Initial Pool:	0.03 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
105.00	10.00	1.00:1	1.00:1	12.00

Perforated Riser

Riser Diameter (in)	Riser Height (ft)	Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Number of Holes per Elev
18.00	4.00	12.00	30.00	2.00	0.0120	104.00	4

Pond Results:

Peak Elevation:	103.00 ft
Dewater Time:	2.05 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)
100.00	0.050	0.000	0.000	
100.50	0.054	0.026	0.000	Low hole SPW #2
101.00	0.057	0.054	0.019	18.02*
101.50	0.061	0.083	0.045	11.95
102.00	0.065	0.114	0.077	6.40
102.50	0.069	0.148	0.114	4.75
103.00	0.073	0.183	0.156	8.15 Peak Stage
103.00	0.073	0.183	0.156	
103.50	0.077	0.221	0.201	
104.00	0.081	0.260	0.250	Spillway #2
104.50	0.086	0.302	5.165	
105.00	0.090	0.346	8.210	Spillway #1
105.50	0.095	0.393	11.038	
106.00	0.100	0.441	41.019	

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

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Perf. Riser (cfs)	Combined Total Discharge (cfs)
100.00	0.000	0.000	0.000
100.50	0.000	0.50>0.000	0.000
101.00	0.000	0.50>0.019	0.019
101.50	0.000	0.50>0.045	0.045
102.00	0.000	0.50>0.077	0.077
102.50	0.000	0.50>0.114	0.114

Elevation (ft)	Emergency Spillway (cfs)	Perf. Riser (cfs)	Combined Total Discharge (cfs)
103.00	0.000	0.50>0.156	0.156
103.50	0.000	0.50>0.201	0.201
104.00	0.000	0.250	0.250
104.50	0.000	5.165	5.165
105.00	0.000	8.210	8.210
105.50	2.469	8.569	11.038
106.00	32.105	8.913	41.019

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)
#3	1	3.000	0.003	0.000	0.000	87.000	3.31	0.258	
	Σ	3.000						3.31	0.258
#2	Σ	3.000						3.31	0.258
#1	Σ	3.000						3.31	0.258

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#3	1	8. Large gullies, diversions, and low flowing streams	71.00	229.32	323.00	25.270	0.003
#3	1	Time of Concentration:					0.003

Sly Gulch Watershed Improvements

3.0 [43F & 43E]

Tucker Weiss

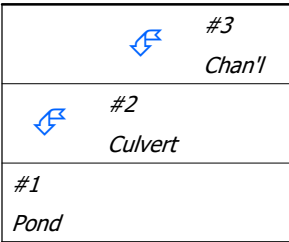
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	100 yr - 24 hr
Rainfall Depth:	2.730 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Pond	#1	==>	End	0.000	0.000	
Culvert	#2	==>	#1	0.000	0.000	
Channel	#3	==>	#2	0.003	0.468	



Structure Routing Details:

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#3	8. Large gullies, diversions, and low flowing streams	71.00	229.32	323.00	25.27	0.003
#3	Muskingum K:					0.003

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#3	3.000	3.000	4.67	0.38
#2	0.000	3.000	4.67	0.38
#1 In	0.000	3.000	4.67	0.38
Out			0.25	0.35

Structure Detail:

Structure #3 (Erodible Channel)

Trapezoidal Erodible Channel Inputs:

Material: Coarse gravel 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)
3.00	1.0:1	1.0:1	5.0	0.0250	1.00			6.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	4.67 cfs	
Depth:	0.28 ft	1.28 ft
Top Width:	3.55 ft	5.55 ft
Velocity:	5.15 fps	
X-Section Area:	0.91 sq ft	
Hydraulic Radius:	0.240 ft	
Froude Number:	1.79	

Structure #2 (Culvert)

Culvert Inputs:

Length (ft)	Slope (%)	Manning's n	Max. Headwater (ft)	Tailwater (ft)	Entrance Loss Coef. (Ke)
80.00	3.00	0.0150	3.00	2.00	0.70

Culvert Results:

Design Discharge = 4.67 cfs

Minimum pipe diameter: 1 - 12 inch pipe(s) required

Structure #1 (Pond)

Pond Inputs:

Initial Pool Elev:	100.50 ft
Initial Pool:	0.03 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
105.00	10.00	1.00:1	1.00:1	12.00

Perforated Riser

Riser Diameter (in)	Riser Height (ft)	Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Number of Holes per Elev
18.00	4.00	12.00	30.00	2.00	0.0120	104.00	4

Pond Results:

Peak Elevation:	103.95 ft
Dewater Time:	2.09 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)
100.00	0.050	0.000	0.000	
100.50	0.054	0.026	0.000	Low hole SPW #2
101.00	0.057	0.054	0.019	18.02*
101.50	0.061	0.083	0.045	7.96*
102.00	0.065	0.114	0.077	6.40
102.50	0.069	0.148	0.114	4.25
103.00	0.073	0.183	0.156	3.20
103.50	0.077	0.221	0.201	4.60
103.95	0.081	0.256	0.245	5.65 Peak Stage
104.00	0.081	0.260	0.250	Spillway #2
104.50	0.086	0.302	5.165	
105.00	0.090	0.346	8.210	Spillway #1
105.50	0.095	0.393	11.038	
106.00	0.100	0.441	41.019	

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

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Perf. Riser (cfs)	Combined Total Discharge (cfs)
100.00	0.000	0.000	0.000
100.50	0.000	0.50>0.000	0.000
101.00	0.000	0.50>0.019	0.019
101.50	0.000	0.50>0.045	0.045
102.00	0.000	0.50>0.077	0.077
102.50	0.000	0.50>0.114	0.114

Elevation (ft)	Emergency Spillway (cfs)	Perf. Riser (cfs)	Combined Total Discharge (cfs)
103.00	0.000	0.50>0.156	0.156
103.50	0.000	0.50>0.201	0.201
104.00	0.000	0.250	0.250
104.50	0.000	5.165	5.165
105.00	0.000	8.210	8.210
105.50	2.469	8.569	11.038
106.00	32.105	8.913	41.019

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)
#3	1	3.000	0.003	0.000	0.000	87.000	4.67	0.376	
	Σ	3.000						4.67	0.376
#2	Σ	3.000						4.67	0.376
#1	Σ	3.000						4.67	0.376

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#3	1	8. Large gullies, diversions, and low flowing streams	71.00	229.32	323.00	25.270	0.003
#3	1	Time of Concentration:					0.003

Sly Gulch Watershed

46

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General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	25 yr - 24 hr
Rainfall Depth:	2.160 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Pond	#1	==>	End	0.000	0.000	SG-3 Sediment Pond

#1 Pond

Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	In	4.500	4.500	5.44	0.44
	Out			0.26	0.39

Structure Detail:***Structure #1 (Pond)******SG-3 Sediment Pond*****Pond Inputs:**

Initial Pool Elev:	100.50 ft
Initial Pool:	0.06 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
105.00	11.00	3.00:1	2.00:1	12.00

Perforated Riser

Riser Diameter (in)	Riser Height (ft)	Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Number of Holes per Elev
18.00	4.00	12.00	30.00	2.00	0.0120	104.00	4

Pond Results:

Peak Elevation:	102.50 ft
Dewater Time:	1.94 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)
100.00	0.120	0.000	0.000	
100.50	0.125	0.061	0.000	Low hole SPW #2
101.00	0.131	0.125	0.042	18.52*
101.50	0.136	0.192	0.101	12.00
102.00	0.142	0.261	0.173	6.30
102.50	0.147	0.333	0.257	9.65
102.50	0.147	0.334	0.257	0.15 Peak Stage
103.00	0.153	0.409	0.350	
103.50	0.159	0.486	0.453	
104.00	0.165	0.567	0.563	Spillway #2
104.50	0.171	0.651	5.165	

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)
105.00	0.177	0.738	8.210	Spillway #1
105.50	0.184	0.829	11.041	
106.00	0.190	0.922	42.940	

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

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Perf. Riser (cfs)	Combined Total Discharge (cfs)
100.00	0.000	0.000	0.000
100.50	0.000	0.75>0.000	0.000
101.00	0.000	0.75>0.042	0.042
101.50	0.000	0.75>0.101	0.101
102.00	0.000	0.75>0.173	0.173
102.50	0.000	0.75>0.257	0.257
103.00	0.000	0.75>0.350	0.350
103.50	0.000	0.75>0.453	0.453
104.00	0.000	0.563	0.563
104.50	0.000	5.165	5.165
105.00	0.000	8.210	8.210
105.50	2.471	8.569	11.041
106.00	34.026	8.913	42.940

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)
#1	1	4.500	0.009	0.000	0.000	89.000	5.44	0.435	
	Σ	4.500						5.44	0.435

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	7. Paved area and small upland gullies	36.51	157.00	430.00	12.160	0.009
#1	1	Time of Concentration:					0.009

Sly Gulch Watershed

46

Tucker Weiss

General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	100 yr - 24 hr
Rainfall Depth:	2.730 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Pond	#1	==>	End	0.000	0.000	

#1
Pond

Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	In	4.500	4.500	7.50	0.62
	Out			0.40	0.57

Structure Detail:***Structure #1 (Pond)***

Pond Inputs:

Initial Pool Elev:	100.50 ft
Initial Pool:	0.06 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
105.00	11.00	3.00:1	2.00:1	12.00

Perforated Riser

Riser Diameter (in)	Riser Height (ft)	Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Number of Holes per Elev
18.00	4.00	12.00	30.00	2.00	0.0120	104.00	4

Pond Results:

Peak Elevation:	103.26 ft
Dewater Time:	2.12 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)
100.00	0.120	0.000	0.000	
100.50	0.125	0.061	0.000	Low hole SPW #2
101.00	0.131	0.125	0.042	18.52*
101.50	0.136	0.192	0.101	12.00
102.00	0.142	0.261	0.173	6.30
102.50	0.147	0.333	0.257	4.10
103.00	0.153	0.409	0.350	5.70
103.26	0.156	0.449	0.403	4.20 Peak Stage
103.50	0.159	0.486	0.453	
104.00	0.165	0.567	0.563	Spillway #2
104.50	0.171	0.651	5.165	
105.00	0.177	0.738	8.210	Spillway #1
105.50	0.184	0.829	11.041	
106.00	0.190	0.922	42.940	

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

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Perf. Riser (cfs)	Combined Total Discharge (cfs)
100.00	0.000	0.000	0.000
100.50	0.000	0.75>0.000	0.000
101.00	0.000	0.75>0.042	0.042
101.50	0.000	0.75>0.101	0.101
102.00	0.000	0.75>0.173	0.173
102.50	0.000	0.75>0.257	0.257
103.00	0.000	0.75>0.350	0.350
103.50	0.000	0.75>0.453	0.453
104.00	0.000	0.563	0.563
104.50	0.000	5.165	5.165
105.00	0.000	8.210	8.210
105.50	2.471	8.569	11.041
106.00	34.026	8.913	42.940

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)
#1	1	4.500	0.009	0.000	0.000	89.000	7.50	0.621	
	Σ	4.500						7.50	0.621

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	7. Paved area and small upland gullies	36.51	157.00	430.00	12.160	0.009
#1	1	Time of Concentration:					0.009

Sly Gulch Watershed

49

Tucker Weiss

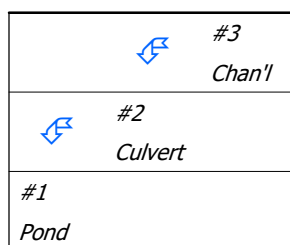
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	25 yr - 24 hr
Rainfall Depth:	2.160 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Pond	#1	==>	End	0.000	0.000	
Culvert	#2	==>	#1	0.000	0.000	
Channel	#3	==>	#2	0.000	0.000	

***Structure Routing Details:***

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#3	8. Large gullies, diversions, and low flowing streams	0.00	0.00	0.00	0.00	0.000
#3	Muskingum K:					0.000

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#3	14.800	14.800	17.88	1.43
#2	0.000	14.800	17.88	1.43
#1 In	0.000	14.800	17.88	1.43
Out			5.11	1.38

Structure Detail:

Structure #3 (Riprap Channel)

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)
3.00	1.0:1	1.0:1	5.0	1.00		

Riprap Channel Results:

PADER Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	17.88 cfs	
Depth:	0.81 ft	1.81 ft
Top Width:	4.62 ft	6.62 ft
Velocity:	5.81 fps	
X-Section Area:	3.08 sq ft	
Hydraulic Radius:	0.582 ft	
Froude Number:	1.25	
Manning's n:	0.0400	
Dmin:	2.00 in	
D50:	3.00 in	
Dmax:	4.50 in	

Structure #2 (Culvert)

Culvert Inputs:

Length (ft)	Slope (%)	Manning's n	Max. Headwater (ft)	Tailwater (ft)	Entrance Loss Coef. (Ke)
95.00	5.00	0.0120	4.00	3.00	0.70

Culvert Results:

Design Discharge = 17.88 cfs

Minimum pipe diameter: 1 - 21 inch pipe(s) required

Structure #1 (Pond)

Pond Inputs:

Initial Pool Elev:	100.75 ft
Initial Pool:	0.06 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
109.00	13.00	1.00:1	1.00:1	8.00

Perforated Riser

Riser Diameter (in)	Riser Height (ft)	Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Number of Holes per Elev
48.00	8.00	32.00	45.00	2.00	0.0120	108.00	4

Pond Results:

Peak Elevation:	106.50 ft
Dewater Time:	2.12 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)
100.00	0.076	0.000	0.000	
100.75	0.083	0.060	0.000	Low hole SPW #2
101.50	0.091	0.125	0.051	15.44*
102.25	0.099	0.196	0.124	10.45
103.00	0.107	0.273	0.212	5.70
103.75	0.116	0.357	0.315	3.90
104.50	0.125	0.447	0.429	2.95
105.25	0.134	0.544	0.554	6.95
106.00	0.144	0.648	2.913	4.75
106.50	0.150	0.722	5.106	0.75 Peak Stage
106.75	0.154	0.760	6.202	
107.50	0.164	0.879	10.206	
108.00	0.171	0.962	13.678	Spillway #2
108.25	0.174	1.005	14.814	
109.00	0.185	1.140	38.956	Spillway #1
109.75	0.196	1.283	91.246	
110.00	0.200	1.333	106.782	

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

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Perf. Riser (cfs)	Combined Total Discharge (cfs)
100.00	0.000	0.000	0.000
100.75	0.000	0.75>0.000	0.000
101.50	0.000	0.75>0.051	0.051
102.25	0.000	0.75>0.124	0.124
103.00	0.000	0.75>0.212	0.212
103.75	0.000	0.75>0.315	0.315
104.50	0.000	0.75>0.429	0.429
105.25	0.000	5.00>0.554	0.554
106.00	0.000	5.00>2.913	2.913
106.75	0.000	5.00>6.202	6.202
107.50	0.000	5.00>10.206	10.206
108.00	0.000	13.678	13.678
108.25	0.000	14.814	14.814
109.00	0.000	38.956	38.956
109.75	11.203	80.043	91.246
110.00	21.212	85.570	106.782

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)
#3	1	14.800	0.028	0.000	0.000	89.000	17.88	1.432	
	Σ	14.800						17.88	1.432
#2	Σ	14.800						17.88	1.432
#1	Σ	14.800						17.88	1.432

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#3	1	5. Nearly bare and untilled, and alluvial valley fans	30.18	169.00	560.00	5.490	0.028
#3	1	Time of Concentration:					0.028

Sly Gulch Watershed

49

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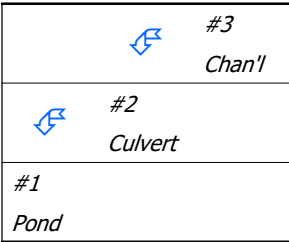
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	100 yr - 24 hr
Rainfall Depth:	2.730 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Pond	#1	==>	End	0.000	0.000	
Culvert	#2	==>	#1	0.000	0.000	
Channel	#3	==>	#2	0.000	0.000	



Structure Routing Details:

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#3	8. Large gullies, diversions, and low flowing streams	0.00	0.00	0.00	0.00	0.000
#3	Muskingum K:					0.000

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#3	14.800	14.800	24.68	2.04
#2	0.000	14.800	24.68	2.04
#1 In	0.000	14.800	24.68	2.04
Out			13.29	1.97

Structure Detail:

Structure #3 (Riprap Channel)

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)
3.00	1.0:1	1.0:1	5.0	1.00		

Riprap Channel Results:

PADER Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	24.68 cfs	
Depth:	0.96 ft	1.96 ft
Top Width:	4.92 ft	6.92 ft
Velocity:	6.50 fps	
X-Section Area:	3.79 sq ft	
Hydraulic Radius:	0.664 ft	
Froude Number:	1.30	
Manning's n:	0.0390	
Dmin:	3.00 in	
D50:	6.00 in	
Dmax:	9.00 in	

Structure #2 (Culvert)

Culvert Inputs:

Length (ft)	Slope (%)	Manning's n	Max. Headwater (ft)	Tailwater (ft)	Entrance Loss Coef. (Ke)
95.00	5.00	0.0120	4.00	3.00	0.70

Culvert Results:

Design Discharge = 24.68 cfs

Minimum pipe diameter: 1 - 24 inch pipe(s) required

Structure #1 (Pond)

Pond Inputs:

Initial Pool Elev:	100.75 ft
Initial Pool:	0.06 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
109.00	13.00	1.00:1	1.00:1	8.00

Perforated Riser

Riser Diameter (in)	Riser Height (ft)	Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Number of Holes per Elev
48.00	8.00	32.00	45.00	2.00	0.0120	108.00	4

Pond Results:

Peak Elevation:	108.44 ft
Dewater Time:	2.17 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)
100.00	0.076	0.000	0.000	
100.75	0.083	0.060	0.000	Low hole SPW #2
101.50	0.091	0.125	0.051	15.44*
102.25	0.099	0.196	0.124	6.97*
103.00	0.107	0.273	0.212	5.70
103.75	0.116	0.357	0.315	3.90
104.50	0.125	0.447	0.429	2.95
105.25	0.134	0.544	0.554	2.40
106.00	0.144	0.648	0.690	2.05
106.75	0.154	0.760	0.834	2.95
107.50	0.164	0.879	0.988	3.30
108.00	0.171	0.962	1.105	3.50 Spillway #2
108.25	0.174	1.005	4.869	2.80
108.44	0.177	1.039	13.290	0.15 Peak Stage
109.00	0.185	1.140	38.956	Spillway #1
109.75	0.196	1.283	91.246	
110.00	0.200	1.333	106.782	

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

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Perf. Riser (cfs)	Combined Total Discharge (cfs)
100.00	0.000	0.000	0.000
100.75	0.000	0.75>0.000	0.000
101.50	0.000	0.75>0.051	0.051
102.25	0.000	0.75>0.124	0.124
103.00	0.000	0.75>0.212	0.212
103.75	0.000	0.75>0.315	0.315
104.50	0.000	0.75>0.429	0.429
105.25	0.000	0.75>0.554	0.554
106.00	0.000	0.75>0.690	0.690
106.75	0.000	0.75>0.834	0.834
107.50	0.000	0.75>0.988	0.988
108.00	0.000	1.105	1.105
108.25	0.000	4.869	4.869
109.00	0.000	38.956	38.956
109.75	11.203	80.043	91.246
110.00	21.212	85.570	106.782

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)
#3	1	14.800	0.028	0.000	0.000	89.000	24.68	2.043	
	Σ	14.800						24.68	2.043
#2	Σ	14.800						24.68	2.043
#1	Σ	14.800						24.68	2.043

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#3	1	5. Nearly bare and untilled, and alluvial valley fans	30.18	169.00	560.00	5.490	0.028
#3	1	Time of Concentration:					0.028