

STORMWATER AND DETENTION-STORAGE CALCULATIONS

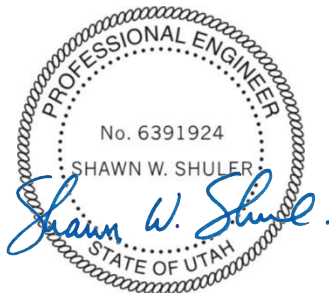
FOR THE

SNOWBASIN RESORT

**CANYON RIM PARKING LOT IMPROVEMENT
PROJECT**

AUGUST 2017

SNOWBASIN RESORT, HUNTSVILLE, UTAH



OWNER:



Snowbasin Resort Company
3925 E. Snowbasin Road
Huntsville, UT 84317
(801) 620-1100

ENGINEER:



Horrocks Engineers, Inc.
4905 South 1500 West, Suite 100
Riverdale, Utah 84405
(801) 621-1025

SNOWBASIN RESORT – CANYON RIM PARKING LOT IMPROVEMENT PROJECT
STORMWATER CALCULATIONS

Areas for Calculations

	Existing			Proposed		
	Sq. Ft.	Acres	%	Sq. Ft.	Acres	%
Total Drainage Area	295,830	6.79	100	295,830	6.79	100
Asphalt Pavement	52,825	1.21	17.9	126,725	2.91	42.8
Gravel Pavement	31,680	0.73	10.7	0	0	0
Undisturbed Vegetation	211,325	4.85	71.4	169,105	3.88	57.2

Hydrologic Groups (NRCS Web Soil Survey Application – See Appendix A)

Bertag silt loam, BAF: Soil Group C
 Crooked Creek silty clay loam, Ct: Soil Group D

Base SCS Runoff Curve Number for Soil Groups (Part 630, National Engineering Handbook, Figure 9-1)

BAF: CN = 75

Ct: CN = 85 (Figure 9-1)

USE THE MORE INTENSIVE CURVE NUMBER FOR THE WHOLE SITE ==> CN = 85

Composite Curve Numbers (Part 630, National Engineering Handbook, Equation 9-1)

Existing Composite Curve Number, CN_{CE} :

$$CN_{CE} = CN + \left(\frac{P_{imp}}{100}\right)(98 - CN) = 85 + \left(\frac{28.6}{100}\right)(98 - 85) = 88.7$$

Proposed Composite Curve Number, CN_{CP} :

$$CN_{CP} = 85 + \left(\frac{42.8}{100}\right)(98 - 85) = 90.6$$

Rainfall Depth (NOAA Atlas 14 – See Appendix B)

2-Year, 24-Hour Rainfall Depth, $P_2 = 2.65$ inches

Time of Concentration (NRCS TR-55)

The existing Time of Concentration, T_{CE} is composed of several segments and flow conditions (see Figure 1 for map):

Segment 1: $L = 300'$; $s = \pm 6.33\%$; Overland flow condition through heavy vegetation; $n = 0.80$ (TR-55 Table 3-1)

Using TR-55 Equation 3-3:

$$T_{CE1} = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5}s^{0.4}} = \frac{0.007(0.80 \times 300)^{0.8}}{(2.65)^{0.5}0.0633^{0.4}} = 1.04 \text{ hr.} = 62.40 \text{ min.}$$

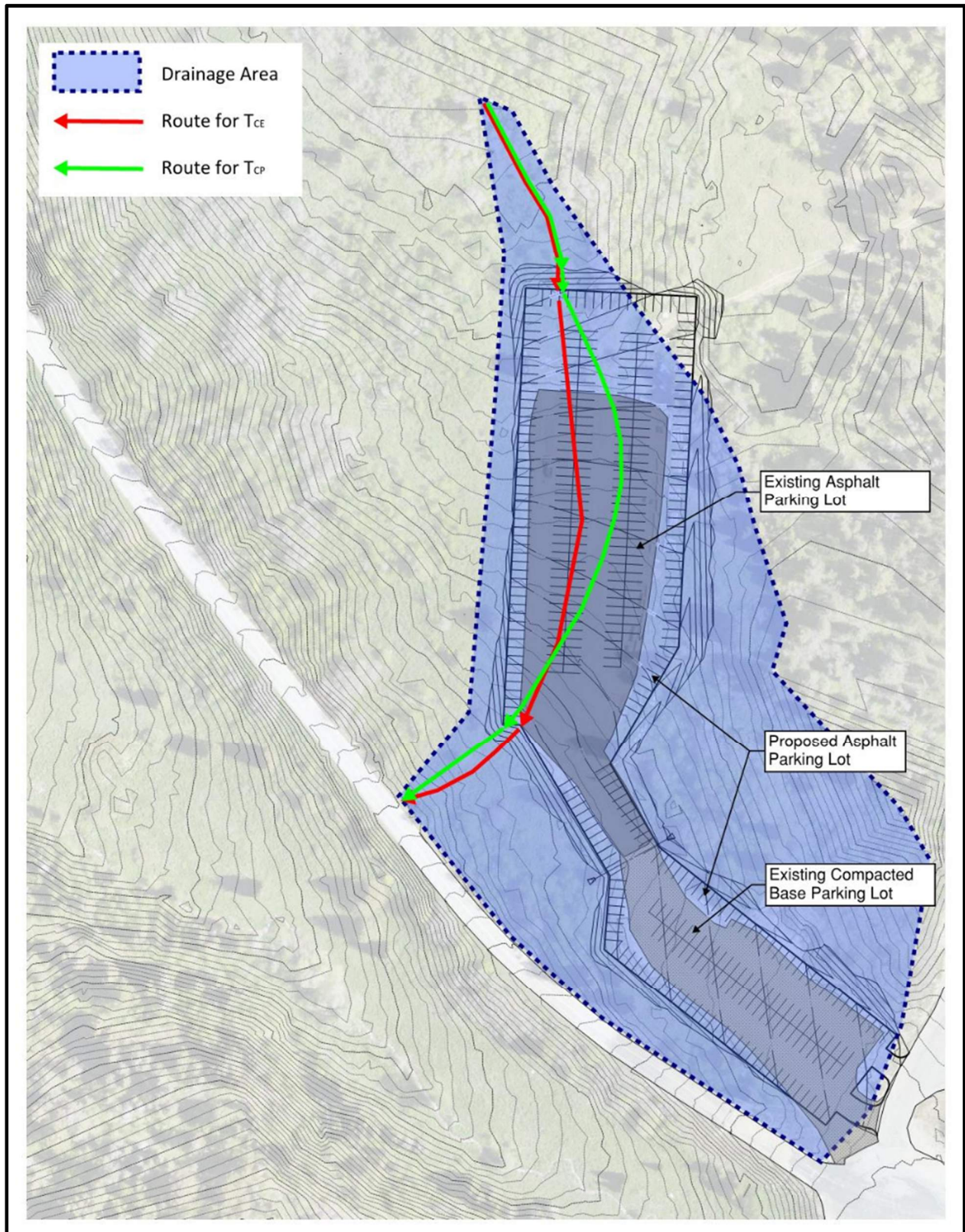


Figure 1 – Time of Concentration Map

Segment 2: L = 375'; s = ±5.9%; Shallow concentrated flow over pavement; V = 5 fps
(TR-55 Fig. 3-1)

Using TR-55 Equation 3-1:

$$T_{CE2} = \frac{L}{3600V} = \frac{375}{(3600 \times 5)} = 0.0208 \text{ hr.} = 1.25 \text{ min.}$$

Segment 3: L = 140'; s = ±14%; Shallow concentrated flow through dense vegetation; V = 6 fps
(TR-55 Fig. 3-1)

Using TR-55 Equation 3-1:

$$T_{CE3} = \frac{L}{3600V} = \frac{140}{(3600 \times 6)} = 0.0065 \text{ hr.} = 0.39 \text{ min.}$$

Total existing Time of Conc., $T_{CE} = T_{CE1} + T_{CE2} + T_{CE3} = 62.40 \text{ min.} + 1.25 \text{ min.} + 0.39 \text{ min.} = 64.04 \text{ min.}$
→ **USE $T_{CE} = 60 \text{ min.}$**

The proposed Time of Concentration, T_{CP} is composed of several segments and flow conditions:

Segment 1: L = 200'; s = ±8.00%; Overland flow condition through heavy vegetation; n = 0.80
(TR-55 Table 3-1)

Using TR-55 Equation 3-3:

$$T_{CP1} = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5} s^{0.4}} = \frac{0.007(0.80 \times 200)^{0.8}}{(2.65)^{0.5} 0.08^{0.4}} = 0.68 \text{ hr.} = 41.08 \text{ min.}$$

Segment 2: L = 490'; s = ±4.3%; Shallow concentrated flow over pavement; V = 4.2 fps
(TR-55 Fig. 3-1)

Using TR-55 Equation 3-1:

$$T_{CP2} = \frac{L}{3600V} = \frac{490}{(3600 \times 4.2)} = 0.0324 \text{ hr.} = 1.94 \text{ min.}$$

Segment 3: L = 140'; s = ±18%; Shallow concentrated flow through dense vegetation; V = 7 fps
(TR-55 Fig. 3-1)

Using TR-55 Equation 3-1:

$$T_{CP3} = \frac{L}{3600V} = \frac{140}{(3600 \times 7)} = 0.0056 \text{ hr.} = 0.33 \text{ min.}$$

Total proposed Time of Conc., $T_{CP} = 41.08 \text{ min.} + 1.94 \text{ min.} + 0.33 \text{ min.} = 43.35 \text{ min.}$
→ **USE $T_{CP} = 45 \text{ min}$**

Pre- and Post-Project Runoff Calculations

The Pre-Project and Post-Project peak flow rates (runoff) were calculated using PondPack software. These flows represent the unimpeded runoff and are required to estimate the required detention-storage and to validate the resulting pond design. The PondPack reports for both calculations are attached as Appendix C.

Pre-Project Peak Flow = 13.93 cfs

Post-Project Peak Flow = 18.37 cfs

Detention-Storage Estimate

The required detention-storage was calculated using PondPack software. Outfall was limited to the calculated Pre-Project Peak Flow. The estimate generated was used to layout the detention pond design. The PondPack report for the detention-storage estimate calculations is attached as Appendix D.

Estimated required Detention-Storage Volume = 0.410 ac-ft.

Detention-Storage Routing and Orifice Sizing Calculations

PondPack software was used to locate and size an orifice to limit Post-Project Peak Flows to the Pre-Project Peak Flow rate. The actual detention pond layout was then used, with the orifice design, to validate the detention-storage design (routing). The PondPack report for these calculations is included as Appendix E.

Post-Project Peak Flow In = 18.37 cfs

Post-Project Peak Flow Out = 13.78 cfs (<13.93 cfs)

Freeboard = 1.0' (Design)

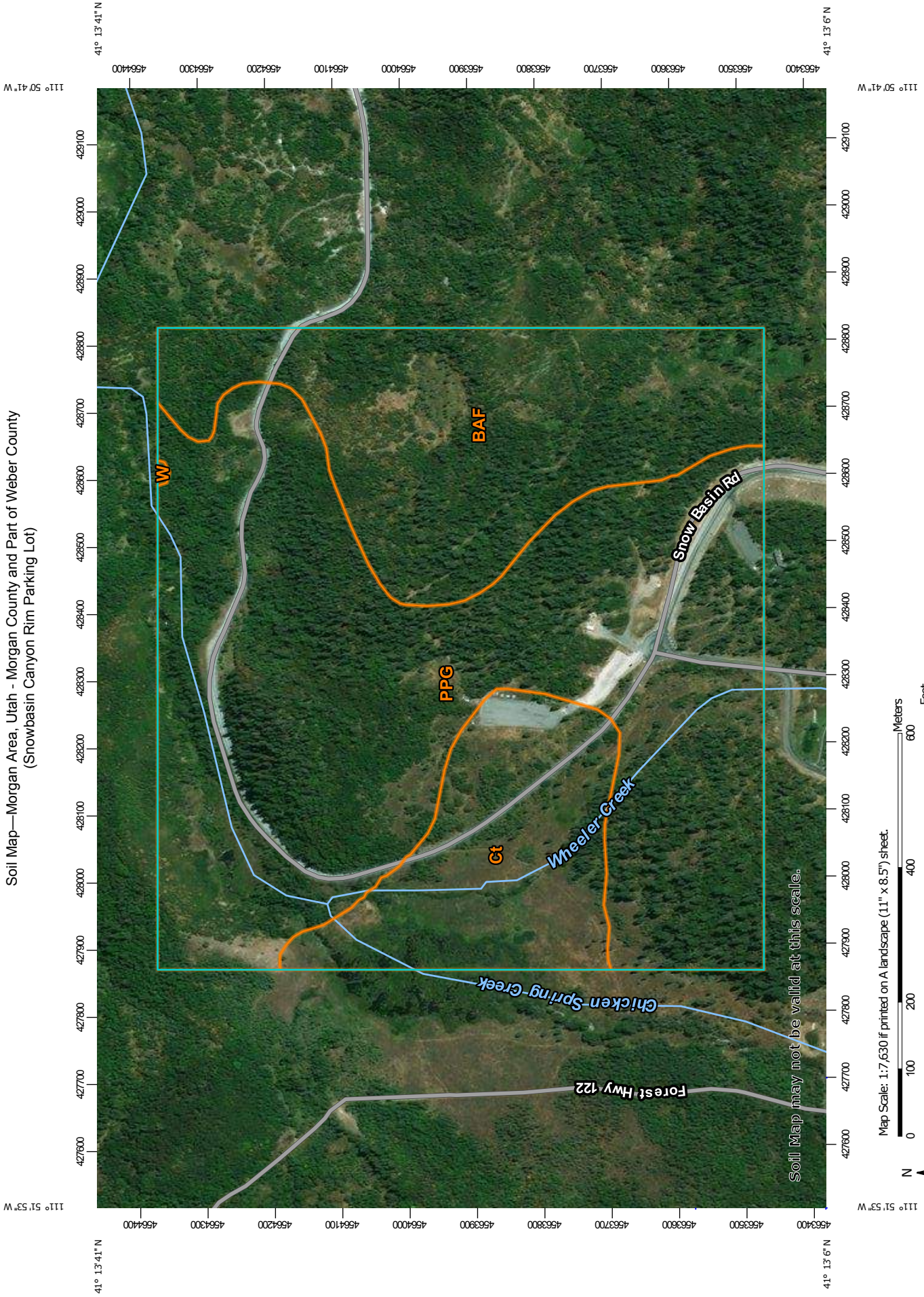
Freeboard = 1.43' (Actual at Peak)

Detention Pond Volume (Required at Peak) = 0.439 AC-ft

Detention Pond Volume (Actual with 1' Freeboard) = 0.521 AC-ft

Detention Pond Volume (Actual at Top of Berm) = 0.737 AC-ft

APPENDIX A - SOIL MAP AND HYDROLOGIC SOIL GROUPS



Soil Map—Morgan Area, Utah - Morgan County and Part of Weber County (Snowbasin Canyon Rim Parking Lot)

Soil Map may not be valid at this scale.

Map Scale: 1:7,630 if printed on A landscape (11" x 8.5") sheet.



MAP LEGEND

MAP INFORMATION

- Area of Interest (AOI)**
 - Area of Interest (AOI)
- Soils**
 - Soil Map Unit Polygons
 - Soil Map Unit Lines
 - Soil Map Unit Points
- Special Point Features**
 - Blowout
 - Borrow Pit
 - Clay Spot
 - Closed Depression
 - Gravel Pit
 - Gravelly Spot
 - Landfill
 - Lava Flow
 - Marsh or swamp
 - Mine or Quarry
 - Miscellaneous Water
 - Perennial Water
 - Rock Outcrop
 - Saline Spot
 - Sandy Spot
 - Severely Eroded Spot
 - Sinkhole
 - Slide or Slip
 - Sodic Spot

- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features
- Water Features**
 - Streams and Canals
- Transportation**
 - Rails
 - Interstate Highways
 - US Routes
 - Major Roads
 - Local Roads
- Background**
 - Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Morgan Area, Utah - Morgan County and Part of Weber County
Survey Area Data: Version 9, Sep 9, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 22, 2005—Nov 13, 2016

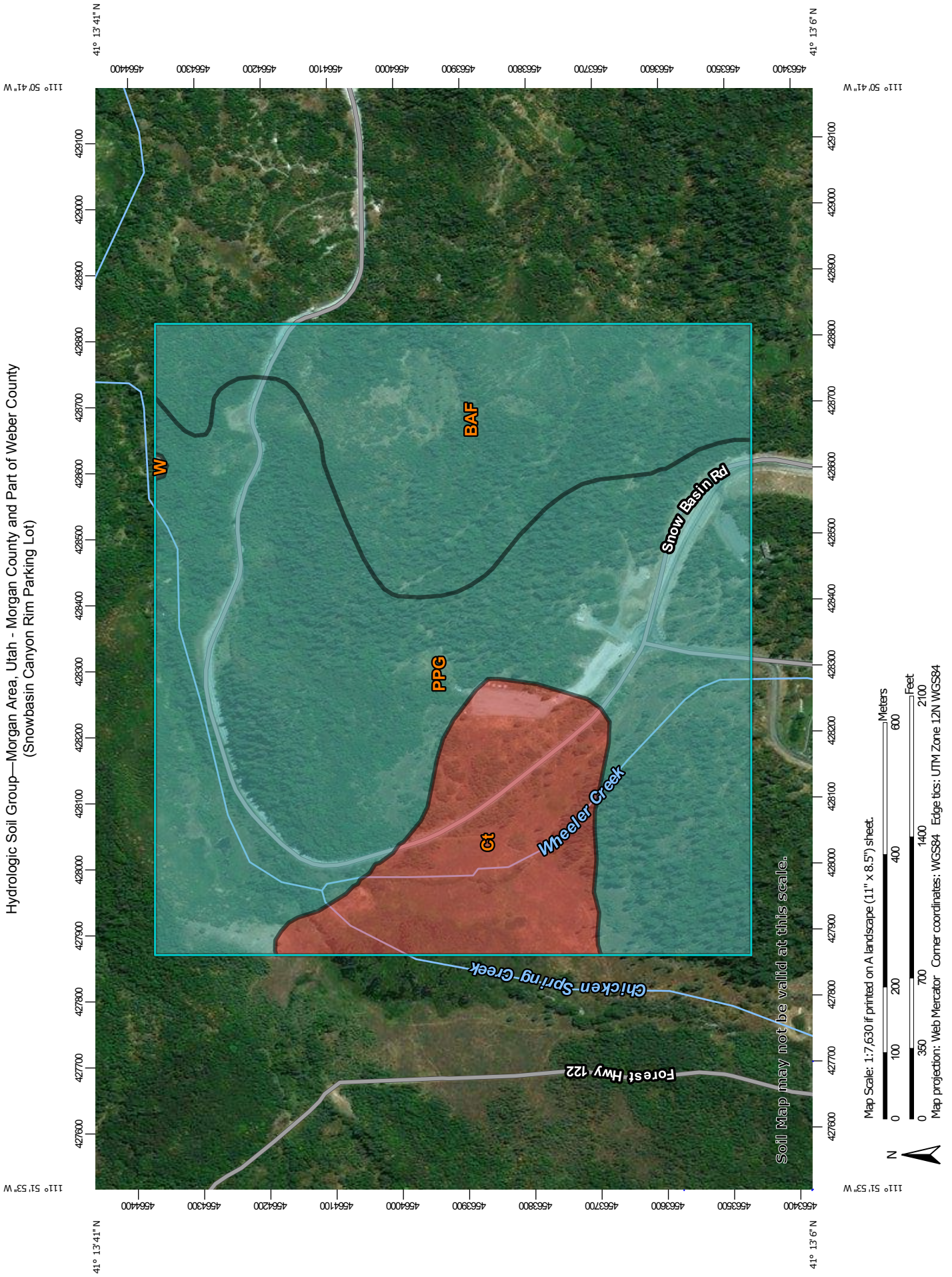
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

APPENDIX A - SOIL MAP AND HYDROLOGIC SOIL GROUPS

Map Unit Legend

Morgan Area, Utah - Morgan County and Part of Weber County (UT609)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BAF	Bertag silt loam, 10 to 30 percent slopes	54.5	25.5%
Ct	Crooked Creek silty clay loam	31.2	14.6%
PPG	Poleline-Patio association, very steep	127.9	59.8%
W	Water	0.1	0.1%
Totals for Area of Interest		213.6	100.0%

APPENDIX A - SOIL MAP AND HYDROLOGIC SOIL GROUPS



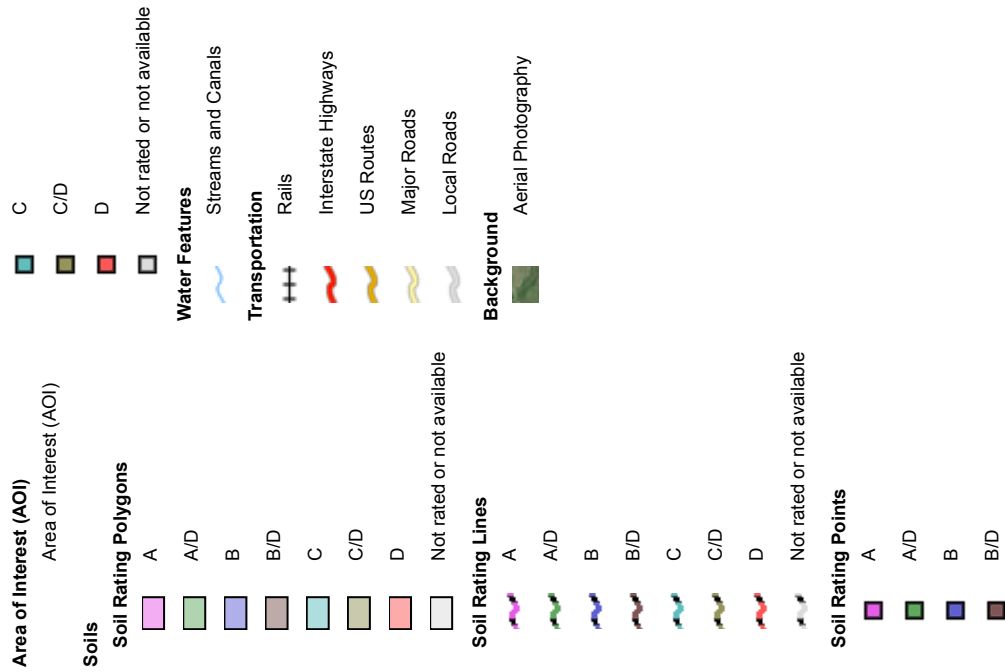
Hydrologic Soil Group—Morgan Area, Utah - Morgan County and Part of Weber County (Snowbasin Canyon Rim Parking Lot)

Soil Map may not be valid at this scale.

Map Scale: 1:7,630 if printed on A landscape (11" x 8.5") sheet.

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND



MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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Soil Survey Area: Morgan Area, Utah - Morgan County and Part of Weber County
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APPENDIX A - SOIL MAP AND HYDROLOGIC SOIL GROUPS

Hydrologic Soil Group—Morgan Area, Utah - Morgan County and Part of Weber County

Snowbasin Canyon Rim Parking Lot

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Morgan Area, Utah - Morgan County and Part of Weber County (UT609)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BAF	Bertag silt loam, 10 to 30 percent slopes	C	54.5	25.5%
Ct	Crooked Creek silty clay loam	D	31.2	14.6%
PPG	Poleline-Patio association, very steep	C	127.9	59.8%
W	Water		0.1	0.1%
Totals for Area of Interest			213.6	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX B - RAINFALL DATA

NOAA Atlas 14, Volume 1, Version 5
Location name: Huntsville, Utah, USA*
Latitude: 41.2229°, Longitude: -111.8548°
Elevation: 6321.88 ft**



* source: ESRI Maps
 ** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps_&_aerials](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.179 (0.156-0.206)	0.225 (0.200-0.260)	0.304 (0.266-0.349)	0.375 (0.326-0.431)	0.487 (0.414-0.564)	0.590 (0.487-0.691)	0.711 (0.570-0.845)	0.856 (0.660-1.04)	1.09 (0.794-1.37)	1.32 (0.910-1.71)
10-min	0.271 (0.238-0.313)	0.343 (0.304-0.396)	0.463 (0.406-0.532)	0.571 (0.496-0.656)	0.741 (0.630-0.859)	0.898 (0.742-1.05)	1.08 (0.867-1.29)	1.30 (1.00-1.58)	1.67 (1.21-2.09)	2.01 (1.39-2.60)
15-min	0.337 (0.295-0.388)	0.425 (0.376-0.491)	0.574 (0.503-0.659)	0.707 (0.615-0.814)	0.919 (0.781-1.07)	1.11 (0.919-1.31)	1.34 (1.07-1.59)	1.62 (1.25-1.96)	2.06 (1.50-2.59)	2.49 (1.72-3.22)
30-min	0.453 (0.397-0.523)	0.573 (0.507-0.661)	0.773 (0.677-0.888)	0.953 (0.827-1.10)	1.24 (1.05-1.43)	1.50 (1.24-1.76)	1.81 (1.45-2.15)	2.17 (1.68-2.64)	2.78 (2.02-3.49)	3.36 (2.31-4.33)
60-min	0.561 (0.492-0.647)	0.709 (0.627-0.818)	0.957 (0.838-1.10)	1.18 (1.02-1.36)	1.53 (1.30-1.78)	1.86 (1.53-2.17)	2.24 (1.79-2.66)	2.69 (2.08-3.27)	3.44 (2.50-4.32)	4.15 (2.86-5.36)
2-hr	0.745 (0.662-0.845)	0.932 (0.830-1.06)	1.20 (1.06-1.36)	1.44 (1.26-1.64)	1.85 (1.58-2.12)	2.21 (1.86-2.57)	2.65 (2.16-3.12)	3.16 (2.48-3.81)	4.00 (2.95-4.97)	4.78 (3.37-6.10)
3-hr	0.862 (0.777-0.962)	1.06 (0.961-1.19)	1.32 (1.18-1.47)	1.56 (1.38-1.75)	1.94 (1.69-2.20)	2.31 (1.97-2.63)	2.74 (2.29-3.18)	3.25 (2.63-3.84)	4.09 (3.15-4.98)	4.86 (3.60-6.16)
6-hr	1.22 (1.12-1.33)	1.48 (1.36-1.63)	1.77 (1.62-1.95)	2.04 (1.84-2.25)	2.44 (2.18-2.71)	2.78 (2.45-3.11)	3.16 (2.75-3.59)	3.58 (3.05-4.13)	4.44 (3.66-5.23)	5.22 (4.18-6.29)
12-hr	1.62 (1.48-1.78)	1.98 (1.81-2.18)	2.37 (2.16-2.62)	2.73 (2.46-3.02)	3.26 (2.91-3.64)	3.71 (3.26-4.17)	4.18 (3.62-4.76)	4.69 (3.98-5.41)	5.46 (4.51-6.45)	6.09 (4.89-7.33)
24-hr	2.16 (1.99-2.35)	2.65 (2.44-2.89)	3.18 (2.92-3.47)	3.62 (3.32-3.95)	4.23 (3.87-4.62)	4.71 (4.28-5.14)	5.20 (4.71-5.69)	5.71 (5.13-6.24)	6.39 (5.70-7.01)	6.93 (6.12-7.63)
2-day	2.65 (2.44-2.88)	3.26 (3.00-3.56)	3.92 (3.61-4.29)	4.48 (4.11-4.89)	5.25 (4.80-5.74)	5.86 (5.32-6.41)	6.49 (5.87-7.11)	7.13 (6.40-7.84)	8.01 (7.11-8.85)	8.70 (7.66-9.65)
3-day	2.99 (2.75-3.25)	3.68 (3.39-4.01)	4.46 (4.10-4.86)	5.11 (4.69-5.57)	6.02 (5.49-6.56)	6.74 (6.11-7.36)	7.48 (6.75-8.19)	8.26 (7.40-9.06)	9.32 (8.26-10.3)	10.2 (8.91-11.2)
4-day	3.32 (3.06-3.62)	4.10 (3.78-4.47)	4.99 (4.59-5.44)	5.74 (5.26-6.26)	6.78 (6.18-7.39)	7.61 (6.90-8.31)	8.48 (7.64-9.28)	9.39 (8.39-10.3)	10.6 (9.40-11.7)	11.6 (10.2-12.8)
7-day	4.21 (3.86-4.60)	5.20 (4.77-5.69)	6.32 (5.78-6.93)	7.26 (6.63-7.97)	8.56 (7.78-9.40)	9.59 (8.68-10.6)	10.7 (9.60-11.8)	11.8 (10.5-13.1)	13.3 (11.8-14.9)	14.6 (12.7-16.3)
10-day	4.89 (4.50-5.33)	6.04 (5.55-6.58)	7.27 (6.68-7.93)	8.28 (7.59-9.03)	9.63 (8.79-10.5)	10.7 (9.69-11.7)	11.7 (10.6-12.8)	12.8 (11.5-14.0)	14.2 (12.7-15.7)	15.3 (13.5-17.0)
20-day	6.64 (6.13-7.18)	8.19 (7.56-8.87)	9.75 (8.99-10.6)	11.0 (10.1-11.9)	12.6 (11.5-13.6)	13.7 (12.6-14.9)	14.9 (13.6-16.2)	16.0 (14.5-17.5)	17.5 (15.8-19.2)	18.6 (16.7-20.5)
30-day	8.25 (7.66-8.92)	10.2 (9.42-11.0)	12.0 (11.1-13.1)	13.5 (12.5-14.7)	15.4 (14.2-16.8)	16.9 (15.5-18.3)	18.3 (16.7-19.9)	19.6 (17.9-21.4)	21.4 (19.3-23.5)	22.7 (20.4-25.0)
45-day	10.4 (9.67-11.3)	12.8 (11.9-13.9)	15.2 (14.0-16.4)	17.1 (15.7-18.5)	19.5 (17.9-21.2)	21.4 (19.5-23.3)	23.2 (21.2-25.4)	25.1 (22.7-27.5)	27.6 (24.7-30.3)	29.5 (26.2-32.6)
60-day	12.4 (11.5-13.4)	15.3 (14.1-16.5)	18.0 (16.7-19.5)	20.2 (18.7-21.8)	23.0 (21.2-24.9)	25.0 (23.0-27.2)	27.1 (24.8-29.4)	29.1 (26.4-31.7)	31.6 (28.6-34.6)	33.6 (30.1-36.9)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

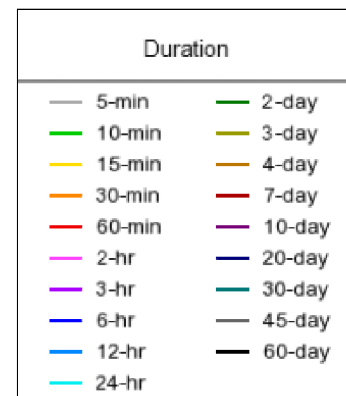
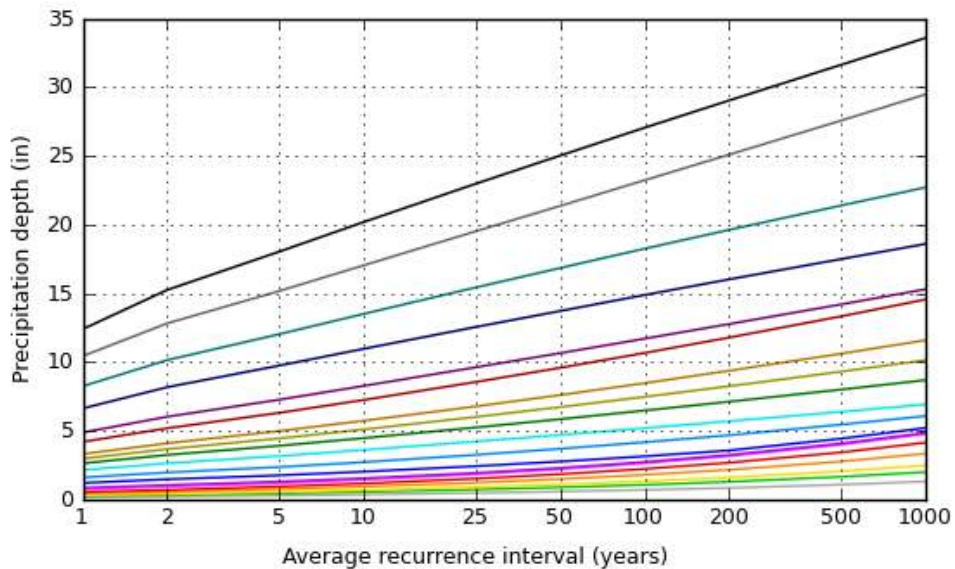
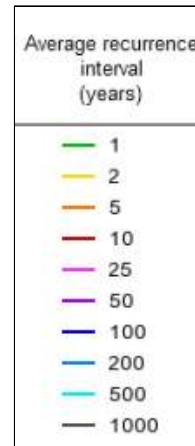
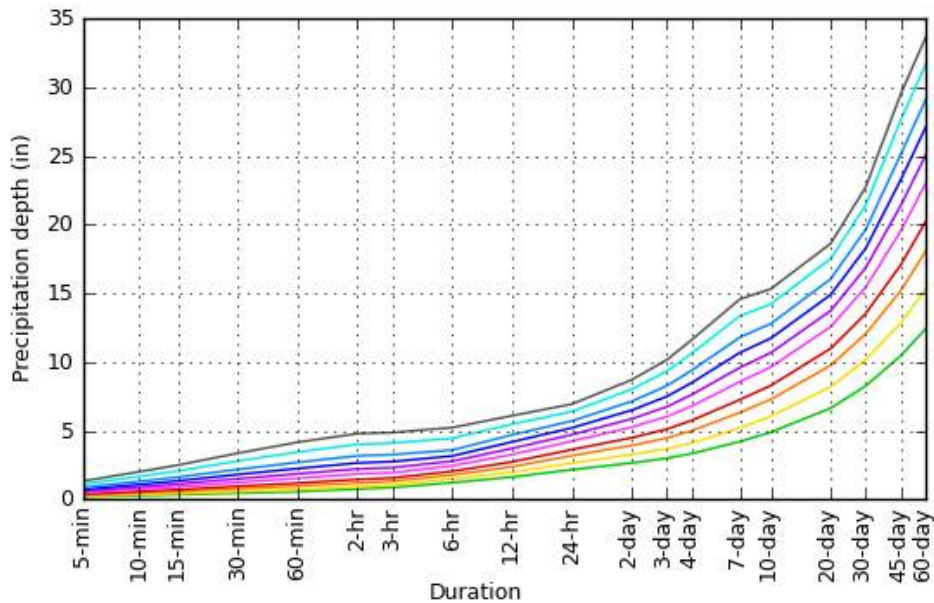
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PF graphical

APPENDIX B - RAINFALL DATA

PDS-based depth-duration-frequency (DDF) curves

Latitude: 41.2229°, Longitude: -111.8548°

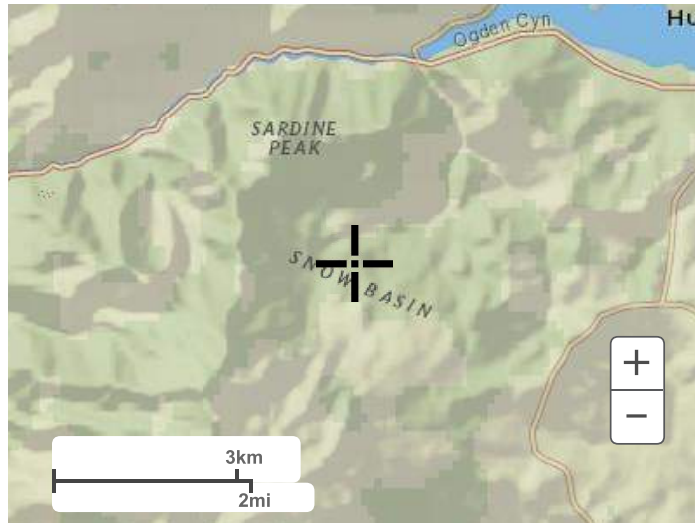


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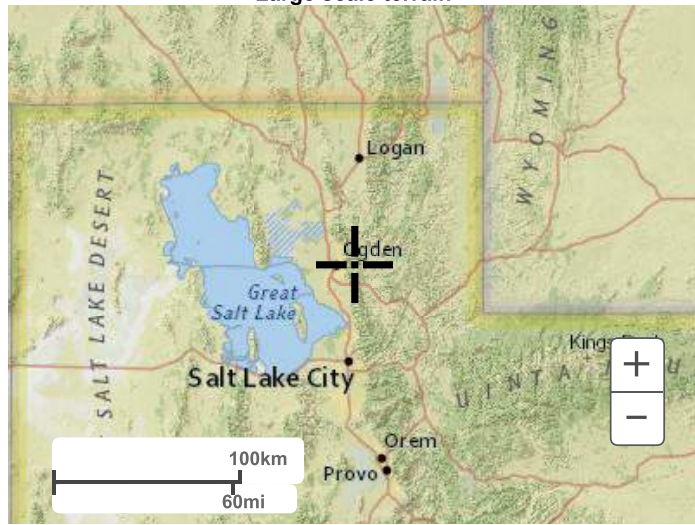
Maps & aerials

Small scale terrain

APPENDIX B - RAINFALL DATA



Large scale terrain

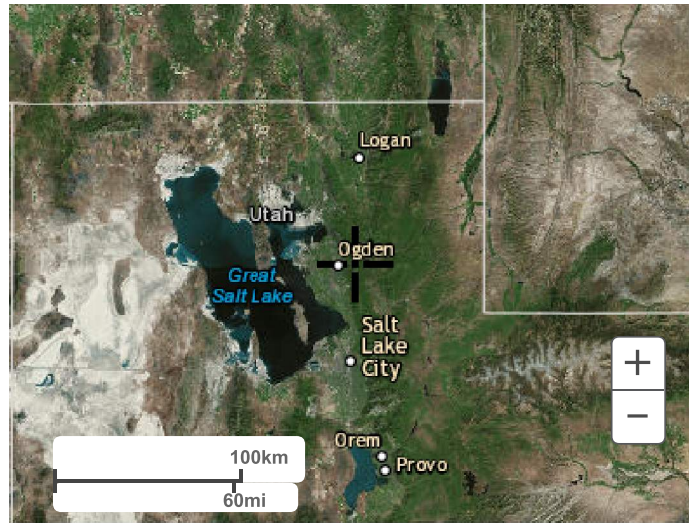


Large scale map



Large scale aerial

APPENDIX B - RAINFALL DATA



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Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

[Disclaimer](#)

APPENDIX C - PRE- AND POST-PROJECT PEAK FLOWS

Catchment Detailed Report: Pre

<General>			
ID	21	Notes	
Label	Pre	Hyperlinks	<Collection: 0 items>
GIS-IDs			
GIS-ID			
Geometry			
	X (ft)	Y (ft)	
	-182.14	57.86	
	-174.85	79.25	
	-192.93	92.79	
	-211.41	79.78	
	-204.74	58.19	
Active Topology			
Is Active?	True		
Catchment			
Outflow Node	O-1		
Rainfall			
Use Local Rainfall?	False		
Runoff			
Runoff Method	Unit Hydrograph	SCS CN	88.700
Loss Method	SCS CN	Unit Hydrograph Method	SCS Unit Hydrograph
Use Scaled Area?	False	Tc Input Type	User Defined Tc
Area (User Defined)	6.790 acres	Time of Concentration	1.000 hours
CN Input Type	Simple CN	Time of Concentration (Composite)	1.000 hours
Unit Hydrograph (Advanced)			
SCS Unit Hydrograph Method	Default Curvilinear	Use Directly Connected Impervious Area	False
Flow (Base)	0.00 ft ³ /s	Calculation Increment (Catchment)	0.000 hours
Results (Computed)			
Computational Time Increment	0.133 hours	Time to Peak (Computed)	12.400 hours

APPENDIX C - PRE- AND POST-PROJECT PEAK FLOWS

Catchment Detailed Report: Pre

Results (Computed)			
Flow (Peak, Computed)	13.93 ft ³ /s		
Results (Interpolated)			
Flow (Peak Interpolated Output)	13.93 ft ³ /s	Time to Flow (Peak Interpolated Output)	12.400 hours
Volume	2.200 ac-ft		
Results (Modified Rational Method)			
Frequency	(N/A) years	Area (Modified Rational, Composite)	(N/A) acres
C Adjustment Factor	(N/A)	C Coefficient (Modified Rational, Weighted)	(N/A)
Flow (Modified Rational, Allowable)	(N/A) ft ³ /s	C Coefficient (Modified Rational, Adjusted)	(N/A)
Storage (Modified Rational, Estimated)	(N/A) ac-ft	Second Outflow Breakpoint (Modified Rational)	(N/A) hours
Time of Duration (Modified Rational, Critical)	(N/A) hours	First Outflow Breakpoint (Modified Rational, Method T)	(N/A) hours
Time of Concentration (Modified Rational, Composite)	(N/A) hours	Intensity (Modified Rational, Critical)	(N/A) in/h
Intensity (Modified Rational, Peak)	(N/A) in/h	Flow (Modified Rational, Critical)	(N/A) ft ³ /s
Flow (Modified Rational, Peak)	(N/A) ft ³ /s		
Results (SCS Unit Hydrograph)			
Unit Hydrograph Shape Factor	483.432	Unit peak time, Tp	0.667 hours
K Factor	0.749	Unit receding limb, Tr	2.667 hours
Receding/Rising, Tr/Tp	1.670	Total unit time, Tb	3.333 hours
Unit peak, qp	7.69 ft ³ /s	Percent Volume under Rising Limb	37.5 %
Results			
Flow (Total)	0.00 ft ³ /s	Flow (Peak) + Flow (Base)	13.93 ft ³ /s
Cumulative Runoff Depth (Pervious)	3.9 in	Maximum Retention (Pervious)	1.3 in
Runoff Volume (Impervious)	0.000 ac-ft	Maximum Retention (Pervious, 20 percent)	0.3 in
Runoff Volume (Pervious)	2.225 ac-ft	Maximum Retention (Impervious)	(N/A) in
Cumulative Runoff Depth (Impervious)	0.0 in	Maximum Retention (Impervious, 20 percent)	(N/A) in

Calculation Messages

Time (hours)	Message
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APPENDIX C - PRE- AND POST-PROJECT PEAK FLOWS

Catchment Detailed Report: Post

<General>			
ID	26	Notes	
Label	Post	Hyperlinks	<Collection: 0 items>

GIS-IDs

GIS-ID

Geometry

X (ft)	Y (ft)
-76.16	-18.56
-67.87	3.28
-86.08	17.91
-105.62	5.12
-99.49	-17.42

Active Topology

Is Active?	True
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Catchment

Outflow Node	PO-1
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Rainfall

Use Local Rainfall?	False
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Runoff

Runoff Method	Unit Hydrograph	SCS CN	90.600
Loss Method	SCS CN	Unit Hydrograph Method	SCS Unit Hydrograph
Use Scaled Area?	False	Tc Input Type	User Defined Tc
Area (User Defined)	6.900 acres	Time of Concentration	0.750 hours
CN Input Type	Simple CN	Time of Concentration (Composite)	0.750 hours

Unit Hydrograph (Advanced)

SCS Unit Hydrograph Method	Default Curvilinear	Use Directly Connected Impervious Area	False
Flow (Base)	0.00 ft ³ /s	Calculation Increment (Catchment)	0.000 hours

Results (Computed)

Computational Time Increment	0.100 hours	Time to Peak (Computed)	12.300 hours
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APPENDIX C - PRE- AND POST-PROJECT PEAK FLOWS

Catchment Detailed Report: Post

Results (Computed)			
Flow (Peak, Computed)	18.37 ft ³ /s		
Results (Interpolated)			
Flow (Peak Interpolated Output)	18.37 ft ³ /s	Time to Flow (Peak Interpolated Output)	12.300 hours
Volume	2.357 ac-ft		
Results (Modified Rational Method)			
Frequency	(N/A) years	Area (Modified Rational, Composite)	(N/A) acres
C Adjustment Factor	(N/A)	C Coefficient (Modified Rational, Weighted)	(N/A)
Flow (Modified Rational, Allowable)	(N/A) ft ³ /s	C Coefficient (Modified Rational, Adjusted)	(N/A)
Storage (Modified Rational, Estimated)	(N/A) ac-ft	Second Outflow Breakpoint (Modified Rational)	(N/A) hours
Time of Duration (Modified Rational, Critical)	(N/A) hours	First Outflow Breakpoint (Modified Rational, Method T)	(N/A) hours
Time of Concentration (Modified Rational, Composite)	(N/A) hours	Intensity (Modified Rational, Critical)	(N/A) in/h
Intensity (Modified Rational, Peak)	(N/A) in/h	Flow (Modified Rational, Critical)	(N/A) ft ³ /s
Flow (Modified Rational, Peak)	(N/A) ft ³ /s		
Results (SCS Unit Hydrograph)			
Unit Hydrograph Shape Factor	483.432	Unit peak time, Tp	0.500 hours
K Factor	0.749	Unit receding limb, Tr	2.000 hours
Receding/Rising, Tr/Tp	1.670	Total unit time, Tb	2.500 hours
Unit peak, qp	10.42 ft ³ /s	Percent Volume under Rising Limb	37.5 %
Results			
Flow (Total)	0.00 ft ³ /s	Flow (Peak) + Flow (Base)	18.37 ft ³ /s
Cumulative Runoff Depth (Pervious)	4.1 in	Maximum Retention (Pervious)	1.0 in
Runoff Volume (Impervious)	0.000 ac-ft	Maximum Retention (Pervious, 20 percent)	0.2 in
Runoff Volume (Pervious)	2.377 ac-ft	Maximum Retention (Impervious)	(N/A) in
Cumulative Runoff Depth (Impervious)	0.0 in	Maximum Retention (Impervious, 20 percent)	(N/A) in

Calculation Messages

Time (hours)	Message
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APPENDIX D - DETENTION-STORAGE ESTIMATE

TR-55 Graphical Peak and Storage Detailed Report: Snow Basin
Parking Lot

Element Details		
ID	15	Notes
Label	Snow Basin Parking Lot	

>>>>> DETENTION STORAGE ESTIMATE <<<<<<

Frequency (years)	Rainfall, P, 24-hr (in)	Inflow Runoff, Q (in)	Peak Inflow, qi (ft ³ /s)	Peak Outflow, qo (ft ³ /s)	qo/qi Ratio	Vs/Vr Ratio	Inflow Volume, Vr (ac-ft)
100	5.2	4.1	18.60	14.91	0.802	0.175	2.339
Storage Volume, Vs (ac-ft)							0.410

>>>>> GRAPHICAL PEAK DISCHARGE METHOD (INFLOW) <<<<<<

Drainage Area	6.790 acres
Runoff Curve Number	90.600
Time of Concentration	0.750 hours
Pond and Swamp percent	0.0 %
Pond and Swamp Area	0.000 acres

Frequency (years)	Rainfall, P, 24-hr (in)	Initial Abstraction, Ia (in)	Ia/p Ratio	Runoff, Q (in)	Unit Discharge, * qu (csm/in)	Pond & Swamp Adjustment, Fp (%)	Peak Discharge, qp (ft ³ /s)
100	5.2	0.2	0.040	4.1	424.152	100.0	18.60

Summary of Computations for qu (Inflow)

Ia/p #1	0.100
C0 #1	2.553
C1 #1	-0.615
C2 #1	-0.164
qu #1 (csm/in)	424.152
Ia/p #2	0.100
C0 #2	2.553
C1 #2	-0.615
C2 #2	-0.164
qu #2 (csm/in)	424.152
qu (csm/in)	424.152

>>>>> GRAPHICAL PEAK DISCHARGE METHOD (OUTFLOW) <<<<<<

Drainage Area	6.790 acres
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APPENDIX D - DETENTION-STORAGE ESTIMATE

TR-55 Graphical Peak and Storage Detailed Report: Snow Basin
Parking Lot

>>>>> GRAPHICAL PEAK DISCHARGE METHOD
(OUTFLOW) <<<<<<

Runoff Curve Number	88.700
Time of Concentration	1.000 hours
Pond and Swamp percent	0.0 %
Pond and Swamp Area	0.000 acres

Frequency (years)	Rainfall, P, 24 -hr (in)	Initial Abstraction, Ia (in)	Ia/p Ratio	Runoff, Q (in)	Unit Discharge, * qu (csm/in)	Pond & Swamp Adjustment, Fp (%)	Peak Discharge, qp (ft ³ /s)
100	5.2	0.3	0.049	3.9	357.462	100.0	14.91

Summary of Computations for qu (Outflow)

Ia/p #1	0.100
C0 #1	2.553
C1 #1	-0.615
C2 #1	-0.164
qu #1 (csm/in)	357.462
Ia/p #2	0.100
C0 #2	2.553
C1 #2	-0.615
C2 #2	-0.164
qu #2 (csm/in)	357.462
qu (csm/in)	357.462

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

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APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
Post 2	Base	100	2.357	12.300	18.37

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
O-3	Base	100	2.250	12.550	13.78

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
PO-1 (IN)	Base	100	2.357	12.300	18.37	(N/A)	(N/A)
PO-1 (OUT)	Base	100	2.250	12.550	13.78	6,284.57	0.440

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Time-Depth Curve
 Label: Time-Depth - 1

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Time-Depth Curve: 100 Year 24 Hr

Label	100 Year 24 Hr
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	100 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.2	0.2	0.2	0.2
3.000	0.2	0.2	0.2	0.2	0.2
3.500	0.2	0.2	0.2	0.2	0.2
4.000	0.2	0.3	0.3	0.3	0.3
4.500	0.3	0.3	0.3	0.3	0.3
5.000	0.3	0.3	0.3	0.4	0.4
5.500	0.4	0.4	0.4	0.4	0.4
6.000	0.4	0.4	0.4	0.4	0.5
6.500	0.5	0.5	0.5	0.5	0.5
7.000	0.5	0.5	0.5	0.5	0.6
7.500	0.6	0.6	0.6	0.6	0.6
8.000	0.6	0.6	0.6	0.7	0.7
8.500	0.7	0.7	0.7	0.7	0.7
9.000	0.8	0.8	0.8	0.8	0.8
9.500	0.8	0.9	0.9	0.9	0.9
10.000	0.9	1.0	1.0	1.0	1.0
10.500	1.1	1.1	1.1	1.2	1.2
11.000	1.2	1.3	1.3	1.4	1.4
11.500	1.5	1.6	1.8	2.2	3.0
12.000	3.4	3.5	3.6	3.7	3.8
12.500	3.8	3.9	3.9	3.9	4.0
13.000	4.0	4.0	4.1	4.1	4.1
13.500	4.2	4.2	4.2	4.2	4.2
14.000	4.3	4.3	4.3	4.3	4.3
14.500	4.4	4.4	4.4	4.4	4.4
15.000	4.4	4.5	4.5	4.5	4.5
15.500	4.5	4.5	4.5	4.6	4.6
16.000	4.6	4.6	4.6	4.6	4.6
16.500	4.6	4.6	4.7	4.7	4.7
17.000	4.7	4.7	4.7	4.7	4.7
17.500	4.7	4.8	4.8	4.8	4.8

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Time-Depth Curve
 Label: Time-Depth - 1

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
18.000	4.8	4.8	4.8	4.8	4.8
18.500	4.8	4.8	4.9	4.9	4.9
19.000	4.9	4.9	4.9	4.9	4.9
19.500	4.9	4.9	4.9	4.9	4.9
20.000	5.0	5.0	5.0	5.0	5.0
20.500	5.0	5.0	5.0	5.0	5.0
21.000	5.0	5.0	5.0	5.0	5.0
21.500	5.0	5.1	5.1	5.1	5.1
22.000	5.1	5.1	5.1	5.1	5.1
22.500	5.1	5.1	5.1	5.1	5.1
23.000	5.1	5.1	5.2	5.2	5.2
23.500	5.2	5.2	5.2	5.2	5.2
24.000	5.2	(N/A)	(N/A)	(N/A)	(N/A)

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Unit Hydrograph Summary
 Label: Post 2

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Storm Event	100 Year 24 Hr
Return Event	100 years
Duration	24.000 hours
Depth	5.2 in
Time of Concentration (Composite)	0.750 hours
Area (User Defined)	6.900 acres
<hr/>	
Computational Time Increment	0.100 hours
Time to Peak (Computed)	12.300 hours
Flow (Peak, Computed)	18.37 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.300 hours
Flow (Peak Interpolated Output)	18.37 ft ³ /s
<hr/>	
Drainage Area	
SCS CN (Composite)	90.600
Area (User Defined)	6.900 acres
Maximum Retention (Pervious)	1.0 in
Maximum Retention (Pervious, 20 percent)	0.2 in
<hr/>	
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.1 in
Runoff Volume (Pervious)	2.377 ac-ft
<hr/>	
Hydrograph Volume (Area under Hydrograph curve)	
Volume	2.357 ac-ft
<hr/>	
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.750 hours
Computational Time Increment	0.100 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	10.42 ft ³ /s
Unit peak time, Tp	0.500 hours

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Unit Hydrograph Summary
Label: Post 2

Return Event: 100 years
Storm Event: 100 Year 24 Hr

SCS Unit Hydrograph Parameters

Unit receding limb, Tr	2.000 hours
Total unit time, Tb	2.500 hours

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Time vs. Elevation
 Label: PO-1 (OUT)

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Time vs. Elevation (ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
0.000	6,280.00	6,280.00	6,280.00	6,280.00	6,280.00
0.250	6,280.00	6,280.00	6,280.00	6,280.00	6,280.00
0.500	6,280.00	6,280.00	6,280.00	6,280.00	6,280.00
0.750	6,280.00	6,280.00	6,280.00	6,280.00	6,280.00
1.000	6,280.00	6,280.00	6,280.00	6,280.00	6,280.00
1.250	6,280.00	6,280.00	6,280.00	6,280.00	6,280.00
1.500	6,280.00	6,280.00	6,280.00	6,280.00	6,280.00
1.750	6,280.00	6,280.00	6,280.00	6,280.00	6,280.00
2.000	6,280.00	6,280.00	6,280.00	6,280.00	6,280.00
2.250	6,280.00	6,280.00	6,280.00	6,280.00	6,280.00
2.500	6,280.00	6,280.00	6,280.00	6,280.00	6,280.00
2.750	6,280.00	6,280.00	6,280.00	6,280.00	6,280.00
3.000	6,280.00	6,280.00	6,280.00	6,280.00	6,280.00
3.250	6,280.00	6,280.00	6,280.00	6,280.00	6,280.00
3.500	6,280.00	6,280.00	6,280.00	6,280.01	6,280.02
3.750	6,280.03	6,280.04	6,280.06	6,280.08	6,280.10
4.000	6,280.12	6,280.15	6,280.17	6,280.20	6,280.22
4.250	6,280.25	6,280.27	6,280.30	6,280.32	6,280.35
4.500	6,280.37	6,280.40	6,280.42	6,280.45	6,280.47
4.750	6,280.50	6,280.52	6,280.54	6,280.57	6,280.59
5.000	6,280.61	6,280.63	6,280.66	6,280.68	6,280.70
5.250	6,280.72	6,280.75	6,280.77	6,280.79	6,280.81
5.500	6,280.83	6,280.85	6,280.87	6,280.89	6,280.91
5.750	6,280.94	6,280.96	6,280.98	6,281.00	6,281.02
6.000	6,281.04	6,281.06	6,281.08	6,281.10	6,281.11
6.250	6,281.13	6,281.15	6,281.17	6,281.19	6,281.21
6.500	6,281.23	6,281.25	6,281.27	6,281.29	6,281.30
6.750	6,281.32	6,281.34	6,281.36	6,281.38	6,281.40
7.000	6,281.42	6,281.43	6,281.45	6,281.47	6,281.49
7.250	6,281.50	6,281.52	6,281.54	6,281.56	6,281.58
7.500	6,281.59	6,281.61	6,281.63	6,281.64	6,281.66
7.750	6,281.68	6,281.70	6,281.71	6,281.73	6,281.75
8.000	6,281.76	6,281.78	6,281.80	6,281.81	6,281.83
8.250	6,281.85	6,281.86	6,281.88	6,281.90	6,281.91
8.500	6,281.93	6,281.95	6,281.97	6,281.98	6,282.00
8.750	6,282.02	6,282.04	6,282.05	6,282.07	6,282.09
9.000	6,282.11	6,282.12	6,282.14	6,282.16	6,282.17
9.250	6,282.19	6,282.21	6,282.22	6,282.24	6,282.25
9.500	6,282.26	6,282.28	6,282.29	6,282.30	6,282.31
9.750	6,282.32	6,282.33	6,282.34	6,282.35	6,282.35
10.000	6,282.36	6,282.37	6,282.38	6,282.38	6,282.39
10.250	6,282.40	6,282.40	6,282.41	6,282.42	6,282.42
10.500	6,282.43	6,282.44	6,282.44	6,282.45	6,282.46

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Time vs. Elevation
 Label: PO-1 (OUT)

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Time vs. Elevation (ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
10.750	6,282.47	6,282.48	6,282.48	6,282.49	6,282.50
11.000	6,282.51	6,282.52	6,282.53	6,282.54	6,282.55
11.250	6,282.56	6,282.57	6,282.59	6,282.60	6,282.61
11.500	6,282.63	6,282.65	6,282.66	6,282.68	6,282.71
11.750	6,282.74	6,282.79	6,282.85	6,282.93	6,283.03
12.000	6,283.17	6,283.32	6,283.49	6,283.65	6,283.81
12.250	6,283.98	6,284.14	6,284.28	6,284.40	6,284.49
12.500	6,284.54	6,284.57	6,284.57	6,284.54	6,284.49
12.750	6,284.41	6,284.32	6,284.21	6,284.10	6,283.98
13.000	6,283.85	6,283.73	6,283.60	6,283.50	6,283.42
13.250	6,283.35	6,283.30	6,283.24	6,283.19	6,283.15
13.500	6,283.10	6,283.06	6,283.03	6,282.99	6,282.96
13.750	6,282.93	6,282.91	6,282.88	6,282.86	6,282.84
14.000	6,282.82	6,282.80	6,282.78	6,282.76	6,282.75
14.250	6,282.73	6,282.72	6,282.71	6,282.69	6,282.68
14.500	6,282.67	6,282.66	6,282.65	6,282.64	6,282.63
14.750	6,282.63	6,282.62	6,282.61	6,282.61	6,282.60
15.000	6,282.59	6,282.59	6,282.58	6,282.58	6,282.57
15.250	6,282.57	6,282.57	6,282.56	6,282.56	6,282.55
15.500	6,282.55	6,282.55	6,282.54	6,282.54	6,282.54
15.750	6,282.53	6,282.53	6,282.53	6,282.52	6,282.52
16.000	6,282.52	6,282.51	6,282.51	6,282.51	6,282.50
16.250	6,282.50	6,282.50	6,282.49	6,282.49	6,282.49
16.500	6,282.48	6,282.48	6,282.48	6,282.48	6,282.47
16.750	6,282.47	6,282.47	6,282.47	6,282.46	6,282.46
17.000	6,282.46	6,282.46	6,282.45	6,282.45	6,282.45
17.250	6,282.45	6,282.45	6,282.45	6,282.44	6,282.44
17.500	6,282.44	6,282.44	6,282.44	6,282.44	6,282.43
17.750	6,282.43	6,282.43	6,282.43	6,282.43	6,282.43
18.000	6,282.43	6,282.42	6,282.42	6,282.42	6,282.42
18.250	6,282.42	6,282.42	6,282.42	6,282.42	6,282.41
18.500	6,282.41	6,282.41	6,282.41	6,282.41	6,282.41
18.750	6,282.41	6,282.40	6,282.40	6,282.40	6,282.40
19.000	6,282.40	6,282.40	6,282.40	6,282.39	6,282.39
19.250	6,282.39	6,282.39	6,282.39	6,282.39	6,282.39
19.500	6,282.38	6,282.38	6,282.38	6,282.38	6,282.38
19.750	6,282.38	6,282.38	6,282.37	6,282.37	6,282.37
20.000	6,282.37	6,282.37	6,282.37	6,282.37	6,282.36
20.250	6,282.36	6,282.36	6,282.36	6,282.36	6,282.36
20.500	6,282.36	6,282.35	6,282.35	6,282.35	6,282.35
20.750	6,282.35	6,282.35	6,282.35	6,282.35	6,282.34
21.000	6,282.34	6,282.34	6,282.34	6,282.34	6,282.34
21.250	6,282.34	6,282.34	6,282.34	6,282.34	6,282.34

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Time vs. Elevation
 Label: PO-1 (OUT)

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Time vs. Elevation (ft)

**Output Time increment = 0.050 hours
 Time on left represents time for first value in each row.**

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
21.500	6,282.34	6,282.34	6,282.33	6,282.33	6,282.33
21.750	6,282.33	6,282.33	6,282.33	6,282.33	6,282.33
22.000	6,282.33	6,282.33	6,282.33	6,282.33	6,282.33
22.250	6,282.33	6,282.33	6,282.33	6,282.33	6,282.33
22.500	6,282.33	6,282.33	6,282.33	6,282.33	6,282.33
22.750	6,282.33	6,282.32	6,282.32	6,282.32	6,282.32
23.000	6,282.32	6,282.32	6,282.32	6,282.32	6,282.32
23.250	6,282.32	6,282.32	6,282.32	6,282.32	6,282.32
23.500	6,282.32	6,282.32	6,282.32	6,282.32	6,282.32
23.750	6,282.32	6,282.32	6,282.32	6,282.32	6,282.32
24.000	6,282.32	(N/A)	(N/A)	(N/A)	(N/A)

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Time vs. Volume
 Label: PO-1

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
0.000	0.000	0.000	0.000	0.000	0.000
0.250	0.000	0.000	0.000	0.000	0.000
0.500	0.000	0.000	0.000	0.000	0.000
0.750	0.000	0.000	0.000	0.000	0.000
1.000	0.000	0.000	0.000	0.000	0.000
1.250	0.000	0.000	0.000	0.000	0.000
1.500	0.000	0.000	0.000	0.000	0.000
1.750	0.000	0.000	0.000	0.000	0.000
2.000	0.000	0.000	0.000	0.000	0.000
2.250	0.000	0.000	0.000	0.000	0.000
2.500	0.000	0.000	0.000	0.000	0.000
2.750	0.000	0.000	0.000	0.000	0.000
3.000	0.000	0.000	0.000	0.000	0.000
3.250	0.000	0.000	0.000	0.000	0.000
3.500	0.000	0.000	0.000	0.000	0.000
3.750	0.000	0.000	0.000	0.000	0.000
4.000	0.000	0.000	0.000	0.000	0.000
4.250	0.000	0.000	0.001	0.001	0.001
4.500	0.001	0.001	0.001	0.001	0.002
4.750	0.002	0.002	0.002	0.003	0.003
5.000	0.003	0.003	0.004	0.004	0.004
5.250	0.005	0.005	0.005	0.006	0.006
5.500	0.007	0.007	0.008	0.008	0.009
5.750	0.009	0.010	0.010	0.011	0.011
6.000	0.012	0.013	0.013	0.014	0.015
6.250	0.015	0.016	0.017	0.017	0.018
6.500	0.019	0.020	0.021	0.021	0.022
6.750	0.023	0.024	0.025	0.026	0.027
7.000	0.028	0.029	0.030	0.031	0.032
7.250	0.033	0.034	0.035	0.036	0.037
7.500	0.039	0.040	0.041	0.042	0.043
7.750	0.045	0.046	0.047	0.049	0.050
8.000	0.051	0.053	0.054	0.055	0.057
8.250	0.058	0.060	0.061	0.063	0.065
8.500	0.066	0.068	0.069	0.071	0.073
8.750	0.075	0.077	0.078	0.080	0.082
9.000	0.084	0.086	0.088	0.090	0.091
9.250	0.093	0.095	0.096	0.098	0.100
9.500	0.101	0.102	0.104	0.105	0.106
9.750	0.107	0.108	0.109	0.110	0.111
10.000	0.112	0.113	0.114	0.114	0.115
10.250	0.116	0.117	0.118	0.118	0.119
10.500	0.120	0.121	0.122	0.122	0.123

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Time vs. Volume
 Label: PO-1

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
10.750	0.124	0.125	0.126	0.127	0.128
11.000	0.129	0.131	0.132	0.133	0.134
11.250	0.136	0.137	0.138	0.140	0.142
11.500	0.143	0.145	0.148	0.150	0.153
11.750	0.158	0.163	0.171	0.181	0.195
12.000	0.213	0.235	0.260	0.285	0.310
12.250	0.336	0.363	0.387	0.408	0.424
12.500	0.435	0.440	0.439	0.434	0.424
12.750	0.410	0.394	0.375	0.356	0.336
13.000	0.316	0.296	0.277	0.261	0.249
13.250	0.240	0.232	0.224	0.217	0.210
13.500	0.205	0.199	0.194	0.190	0.186
13.750	0.182	0.178	0.175	0.172	0.169
14.000	0.167	0.165	0.162	0.160	0.158
14.250	0.156	0.155	0.153	0.151	0.150
14.500	0.149	0.147	0.146	0.145	0.144
14.750	0.143	0.142	0.142	0.141	0.140
15.000	0.139	0.139	0.138	0.137	0.137
15.250	0.136	0.136	0.135	0.135	0.134
15.500	0.134	0.134	0.133	0.133	0.132
15.750	0.132	0.131	0.131	0.131	0.130
16.000	0.130	0.130	0.129	0.129	0.128
16.250	0.128	0.128	0.127	0.127	0.127
16.500	0.126	0.126	0.125	0.125	0.125
16.750	0.125	0.124	0.124	0.124	0.123
17.000	0.123	0.123	0.123	0.122	0.122
17.250	0.122	0.122	0.122	0.121	0.121
17.500	0.121	0.121	0.121	0.121	0.120
17.750	0.120	0.120	0.120	0.120	0.120
18.000	0.119	0.119	0.119	0.119	0.119
18.250	0.119	0.118	0.118	0.118	0.118
18.500	0.118	0.118	0.118	0.117	0.117
18.750	0.117	0.117	0.117	0.117	0.116
19.000	0.116	0.116	0.116	0.116	0.116
19.250	0.115	0.115	0.115	0.115	0.115
19.500	0.115	0.114	0.114	0.114	0.114
19.750	0.114	0.114	0.113	0.113	0.113
20.000	0.113	0.113	0.113	0.112	0.112
20.250	0.112	0.112	0.112	0.112	0.112
20.500	0.111	0.111	0.111	0.111	0.111
20.750	0.111	0.111	0.110	0.110	0.110
21.000	0.110	0.110	0.110	0.110	0.110
21.250	0.110	0.110	0.109	0.109	0.109

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Time vs. Volume
 Label: PO-1

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Time vs. Volume (ac-ft)

**Output Time increment = 0.050 hours
 Time on left represents time for first value in each row.**

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
21.500	0.109	0.109	0.109	0.109	0.109
21.750	0.109	0.109	0.109	0.109	0.109
22.000	0.109	0.109	0.109	0.108	0.108
22.250	0.108	0.108	0.108	0.108	0.108
22.500	0.108	0.108	0.108	0.108	0.108
22.750	0.108	0.108	0.108	0.108	0.108
23.000	0.108	0.108	0.108	0.108	0.108
23.250	0.108	0.108	0.107	0.107	0.107
23.500	0.107	0.107	0.107	0.107	0.107
23.750	0.107	0.107	0.107	0.107	0.107
24.000	0.107	(N/A)	(N/A)	(N/A)	(N/A)

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Outlet Input Data
 Label: Composite Outlet Structure - 1

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Requested Pond Water Surface Elevations	
Minimum (Headwater)	6,280.00 ft
Increment (Headwater)	0.01 ft
Maximum (Headwater)	6,286.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular Tailwater Settings	Orifice - 1 Tailwater	Forward	TW	6,282.00 (N/A)	6,286.00 (N/A)

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Outlet Input Data
 Label: Composite Outlet Structure - 1

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Structure ID: Orifice - 1	
Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	6,282.00 ft
Orifice Diameter	18.0 in
Orifice Coefficient	0.720
Structure ID: TW	
Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall
Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft ³ /s
Flow Tolerance (Maximum)	10.000 ft ³ /s

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Elevation-Volume-Flow Table (Pond)
 Label: PO-1

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Infiltration	
Infiltration Method (Computed)	No Infiltration
Initial Conditions	
Elevation (Water Surface, Initial)	6,280.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft ³ /s
Flow (Initial Infiltration)	0.00 ft ³ /s
Flow (Initial, Total)	0.00 ft ³ /s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft ³ /s)	Storage (ac-ft)	Area (acres)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
6,280.00	0.00	0.000	0.000	0.00	0.00	0.00
6,280.01	0.00	0.000	0.000	0.00	0.00	0.00
6,280.02	0.00	0.000	0.000	0.00	0.00	0.00
6,280.03	0.00	0.000	0.001	0.00	0.00	0.01
6,280.04	0.00	0.000	0.001	0.00	0.00	0.01
6,280.05	0.00	0.000	0.001	0.00	0.00	0.01
6,280.06	0.00	0.000	0.001	0.00	0.00	0.02
6,280.07	0.00	0.000	0.001	0.00	0.00	0.02
6,280.08	0.00	0.000	0.001	0.00	0.00	0.03
6,280.09	0.00	0.000	0.001	0.00	0.00	0.03
6,280.10	0.00	0.000	0.001	0.00	0.00	0.04
6,280.11	0.00	0.000	0.001	0.00	0.00	0.04
6,280.12	0.00	0.000	0.001	0.00	0.00	0.05
6,280.13	0.00	0.000	0.002	0.00	0.00	0.05
6,280.14	0.00	0.000	0.002	0.00	0.00	0.06
6,280.15	0.00	0.000	0.002	0.00	0.00	0.07
6,280.16	0.00	0.000	0.002	0.00	0.00	0.08
6,280.17	0.00	0.000	0.002	0.00	0.00	0.09
6,280.18	0.00	0.000	0.002	0.00	0.00	0.10
6,280.19	0.00	0.000	0.002	0.00	0.00	0.11
6,280.20	0.00	0.000	0.002	0.00	0.00	0.12
6,280.21	0.00	0.000	0.003	0.00	0.00	0.13
6,280.22	0.00	0.000	0.003	0.00	0.00	0.15
6,280.23	0.00	0.000	0.003	0.00	0.00	0.16
6,280.24	0.00	0.000	0.003	0.00	0.00	0.17
6,280.25	0.00	0.000	0.003	0.00	0.00	0.19
6,280.26	0.00	0.000	0.003	0.00	0.00	0.21
6,280.27	0.00	0.000	0.004	0.00	0.00	0.22
6,280.28	0.00	0.000	0.004	0.00	0.00	0.24
6,280.29	0.00	0.001	0.004	0.00	0.00	0.26
6,280.30	0.00	0.001	0.004	0.00	0.00	0.28

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Elevation-Volume-Flow Table (Pond)
 Label: PO-1

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Elevation (ft)	Outflow (ft ³ /s)	Storage (ac-ft)	Area (acres)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
6,280.31	0.00	0.001	0.004	0.00	0.00	0.30
6,280.32	0.00	0.001	0.005	0.00	0.00	0.32
6,280.33	0.00	0.001	0.005	0.00	0.00	0.34
6,280.34	0.00	0.001	0.005	0.00	0.00	0.37
6,280.35	0.00	0.001	0.005	0.00	0.00	0.39
6,280.36	0.00	0.001	0.005	0.00	0.00	0.42
6,280.37	0.00	0.001	0.006	0.00	0.00	0.44
6,280.38	0.00	0.001	0.006	0.00	0.00	0.47
6,280.39	0.00	0.001	0.006	0.00	0.00	0.50
6,280.40	0.00	0.001	0.006	0.00	0.00	0.53
6,280.41	0.00	0.001	0.007	0.00	0.00	0.56
6,280.42	0.00	0.001	0.007	0.00	0.00	0.59
6,280.43	0.00	0.001	0.007	0.00	0.00	0.63
6,280.44	0.00	0.001	0.007	0.00	0.00	0.66
6,280.45	0.00	0.001	0.008	0.00	0.00	0.70
6,280.46	0.00	0.002	0.008	0.00	0.00	0.74
6,280.47	0.00	0.002	0.008	0.00	0.00	0.77
6,280.48	0.00	0.002	0.008	0.00	0.00	0.81
6,280.49	0.00	0.002	0.009	0.00	0.00	0.85
6,280.50	0.00	0.002	0.009	0.00	0.00	0.90
6,280.51	0.00	0.002	0.009	0.00	0.00	0.94
6,280.52	0.00	0.002	0.010	0.00	0.00	0.99
6,280.53	0.00	0.002	0.010	0.00	0.00	1.03
6,280.54	0.00	0.002	0.010	0.00	0.00	1.08
6,280.55	0.00	0.002	0.010	0.00	0.00	1.13
6,280.56	0.00	0.002	0.011	0.00	0.00	1.18
6,280.57	0.00	0.003	0.011	0.00	0.00	1.24
6,280.58	0.00	0.003	0.011	0.00	0.00	1.29
6,280.59	0.00	0.003	0.012	0.00	0.00	1.35
6,280.60	0.00	0.003	0.012	0.00	0.00	1.40
6,280.61	0.00	0.003	0.012	0.00	0.00	1.46
6,280.62	0.00	0.003	0.013	0.00	0.00	1.52
6,280.63	0.00	0.003	0.013	0.00	0.00	1.58
6,280.64	0.00	0.003	0.013	0.00	0.00	1.65
6,280.65	0.00	0.004	0.014	0.00	0.00	1.71
6,280.66	0.00	0.004	0.014	0.00	0.00	1.78
6,280.67	0.00	0.004	0.014	0.00	0.00	1.85
6,280.68	0.00	0.004	0.015	0.00	0.00	1.92
6,280.69	0.00	0.004	0.015	0.00	0.00	1.99
6,280.70	0.00	0.004	0.016	0.00	0.00	2.07
6,280.71	0.00	0.004	0.016	0.00	0.00	2.14
6,280.72	0.00	0.005	0.016	0.00	0.00	2.22
6,280.73	0.00	0.005	0.017	0.00	0.00	2.30
6,280.74	0.00	0.005	0.017	0.00	0.00	2.38
6,280.75	0.00	0.005	0.017	0.00	0.00	2.47

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Elevation-Volume-Flow Table (Pond)
 Label: PO-1

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Elevation (ft)	Outflow (ft ³ /s)	Storage (ac-ft)	Area (acres)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
6,280.76	0.00	0.005	0.018	0.00	0.00	2.55
6,280.77	0.00	0.005	0.018	0.00	0.00	2.64
6,280.78	0.00	0.006	0.019	0.00	0.00	2.73
6,280.79	0.00	0.006	0.019	0.00	0.00	2.82
6,280.80	0.00	0.006	0.020	0.00	0.00	2.92
6,280.81	0.00	0.006	0.020	0.00	0.00	3.01
6,280.82	0.00	0.006	0.020	0.00	0.00	3.11
6,280.83	0.00	0.007	0.021	0.00	0.00	3.21
6,280.84	0.00	0.007	0.021	0.00	0.00	3.31
6,280.85	0.00	0.007	0.022	0.00	0.00	3.42
6,280.86	0.00	0.007	0.022	0.00	0.00	3.52
6,280.87	0.00	0.008	0.023	0.00	0.00	3.63
6,280.88	0.00	0.008	0.023	0.00	0.00	3.74
6,280.89	0.00	0.008	0.024	0.00	0.00	3.85
6,280.90	0.00	0.008	0.024	0.00	0.00	3.97
6,280.91	0.00	0.008	0.024	0.00	0.00	4.09
6,280.92	0.00	0.009	0.025	0.00	0.00	4.21
6,280.93	0.00	0.009	0.025	0.00	0.00	4.33
6,280.94	0.00	0.009	0.026	0.00	0.00	4.45
6,280.95	0.00	0.009	0.026	0.00	0.00	4.58
6,280.96	0.00	0.010	0.027	0.00	0.00	4.71
6,280.97	0.00	0.010	0.027	0.00	0.00	4.84
6,280.98	0.00	0.010	0.028	0.00	0.00	4.97
6,280.99	0.00	0.011	0.028	0.00	0.00	5.11
6,281.00	0.00	0.011	0.029	0.00	0.00	5.25
6,281.01	0.00	0.011	0.029	0.00	0.00	5.39
6,281.02	0.00	0.011	0.030	0.00	0.00	5.53
6,281.03	0.00	0.012	0.030	0.00	0.00	5.68
6,281.04	0.00	0.012	0.031	0.00	0.00	5.83
6,281.05	0.00	0.012	0.032	0.00	0.00	5.98
6,281.06	0.00	0.013	0.032	0.00	0.00	6.13
6,281.07	0.00	0.013	0.033	0.00	0.00	6.29
6,281.08	0.00	0.013	0.033	0.00	0.00	6.45
6,281.09	0.00	0.014	0.034	0.00	0.00	6.61
6,281.10	0.00	0.014	0.034	0.00	0.00	6.77
6,281.11	0.00	0.014	0.035	0.00	0.00	6.94
6,281.12	0.00	0.015	0.035	0.00	0.00	7.11
6,281.13	0.00	0.015	0.036	0.00	0.00	7.28
6,281.14	0.00	0.015	0.037	0.00	0.00	7.46
6,281.15	0.00	0.016	0.037	0.00	0.00	7.64
6,281.16	0.00	0.016	0.038	0.00	0.00	7.82
6,281.17	0.00	0.017	0.038	0.00	0.00	8.00
6,281.18	0.00	0.017	0.039	0.00	0.00	8.19
6,281.19	0.00	0.017	0.039	0.00	0.00	8.38
6,281.20	0.00	0.018	0.040	0.00	0.00	8.57

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Elevation-Volume-Flow Table (Pond)
 Label: PO-1

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Elevation (ft)	Outflow (ft ³ /s)	Storage (ac-ft)	Area (acres)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
6,281.21	0.00	0.018	0.041	0.00	0.00	8.76
6,281.22	0.00	0.019	0.041	0.00	0.00	8.96
6,281.23	0.00	0.019	0.042	0.00	0.00	9.16
6,281.24	0.00	0.019	0.043	0.00	0.00	9.37
6,281.25	0.00	0.020	0.043	0.00	0.00	9.58
6,281.26	0.00	0.020	0.044	0.00	0.00	9.79
6,281.27	0.00	0.021	0.044	0.00	0.00	10.00
6,281.28	0.00	0.021	0.045	0.00	0.00	10.22
6,281.29	0.00	0.022	0.046	0.00	0.00	10.44
6,281.30	0.00	0.022	0.046	0.00	0.00	10.66
6,281.31	0.00	0.022	0.047	0.00	0.00	10.88
6,281.32	0.00	0.023	0.048	0.00	0.00	11.11
6,281.33	0.00	0.023	0.048	0.00	0.00	11.34
6,281.34	0.00	0.024	0.049	0.00	0.00	11.58
6,281.35	0.00	0.024	0.050	0.00	0.00	11.82
6,281.36	0.00	0.025	0.050	0.00	0.00	12.06
6,281.37	0.00	0.025	0.051	0.00	0.00	12.31
6,281.38	0.00	0.026	0.052	0.00	0.00	12.55
6,281.39	0.00	0.026	0.052	0.00	0.00	12.81
6,281.40	0.00	0.027	0.053	0.00	0.00	13.06
6,281.41	0.00	0.028	0.054	0.00	0.00	13.32
6,281.42	0.00	0.028	0.054	0.00	0.00	13.58
6,281.43	0.00	0.029	0.055	0.00	0.00	13.85
6,281.44	0.00	0.029	0.056	0.00	0.00	14.11
6,281.45	0.00	0.030	0.057	0.00	0.00	14.39
6,281.46	0.00	0.030	0.057	0.00	0.00	14.66
6,281.47	0.00	0.031	0.058	0.00	0.00	14.94
6,281.48	0.00	0.031	0.059	0.00	0.00	15.22
6,281.49	0.00	0.032	0.059	0.00	0.00	15.51
6,281.50	0.00	0.033	0.060	0.00	0.00	15.80
6,281.51	0.00	0.033	0.061	0.00	0.00	16.09
6,281.52	0.00	0.034	0.062	0.00	0.00	16.39
6,281.53	0.00	0.034	0.062	0.00	0.00	16.69
6,281.54	0.00	0.035	0.063	0.00	0.00	16.99
6,281.55	0.00	0.036	0.064	0.00	0.00	17.30
6,281.56	0.00	0.036	0.065	0.00	0.00	17.61
6,281.57	0.00	0.037	0.066	0.00	0.00	17.93
6,281.58	0.00	0.038	0.066	0.00	0.00	18.25
6,281.59	0.00	0.038	0.067	0.00	0.00	18.57
6,281.60	0.00	0.039	0.068	0.00	0.00	18.90
6,281.61	0.00	0.040	0.069	0.00	0.00	19.23
6,281.62	0.00	0.040	0.069	0.00	0.00	19.56
6,281.63	0.00	0.041	0.070	0.00	0.00	19.90
6,281.64	0.00	0.042	0.071	0.00	0.00	20.24
6,281.65	0.00	0.043	0.072	0.00	0.00	20.59

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Elevation-Volume-Flow Table (Pond)
 Label: PO-1

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Elevation (ft)	Outflow (ft ³ /s)	Storage (ac-ft)	Area (acres)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
6,281.66	0.00	0.043	0.073	0.00	0.00	20.94
6,281.67	0.00	0.044	0.073	0.00	0.00	21.29
6,281.68	0.00	0.045	0.074	0.00	0.00	21.65
6,281.69	0.00	0.045	0.075	0.00	0.00	22.01
6,281.70	0.00	0.046	0.076	0.00	0.00	22.37
6,281.71	0.00	0.047	0.077	0.00	0.00	22.74
6,281.72	0.00	0.048	0.078	0.00	0.00	23.12
6,281.73	0.00	0.049	0.078	0.00	0.00	23.50
6,281.74	0.00	0.049	0.079	0.00	0.00	23.88
6,281.75	0.00	0.050	0.080	0.00	0.00	24.26
6,281.76	0.00	0.051	0.081	0.00	0.00	24.65
6,281.77	0.00	0.052	0.082	0.00	0.00	25.05
6,281.78	0.00	0.053	0.083	0.00	0.00	25.45
6,281.79	0.00	0.053	0.084	0.00	0.00	25.85
6,281.80	0.00	0.054	0.084	0.00	0.00	26.25
6,281.81	0.00	0.055	0.085	0.00	0.00	26.67
6,281.82	0.00	0.056	0.086	0.00	0.00	27.08
6,281.83	0.00	0.057	0.087	0.00	0.00	27.50
6,281.84	0.00	0.058	0.088	0.00	0.00	27.92
6,281.85	0.00	0.059	0.089	0.00	0.00	28.35
6,281.86	0.00	0.059	0.090	0.00	0.00	28.79
6,281.87	0.00	0.060	0.091	0.00	0.00	29.22
6,281.88	0.00	0.061	0.092	0.00	0.00	29.66
6,281.89	0.00	0.062	0.093	0.00	0.00	30.11
6,281.90	0.00	0.063	0.093	0.00	0.00	30.56
6,281.91	0.00	0.064	0.094	0.00	0.00	31.01
6,281.92	0.00	0.065	0.095	0.00	0.00	31.47
6,281.93	0.00	0.066	0.096	0.00	0.00	31.94
6,281.94	0.00	0.067	0.097	0.00	0.00	32.40
6,281.95	0.00	0.068	0.098	0.00	0.00	32.88
6,281.96	0.00	0.069	0.099	0.00	0.00	33.35
6,281.97	0.00	0.070	0.100	0.00	0.00	33.84
6,281.98	0.00	0.071	0.101	0.00	0.00	34.32
6,281.99	0.00	0.072	0.102	0.00	0.00	34.81
6,282.00	0.00	0.073	0.103	0.00	0.00	35.31
6,282.01	0.00	0.074	0.103	0.00	0.00	35.81
6,282.02	0.00	0.075	0.103	0.00	0.00	36.31
6,282.03	0.00	0.076	0.104	0.00	0.00	36.81
6,282.04	0.01	0.077	0.104	0.00	0.01	37.32
6,282.05	0.01	0.078	0.104	0.00	0.01	37.83
6,282.06	0.02	0.079	0.105	0.00	0.02	38.34
6,282.07	0.02	0.080	0.105	0.00	0.02	38.85
6,282.08	0.03	0.081	0.105	0.00	0.03	39.37
6,282.09	0.03	0.082	0.105	0.00	0.03	39.88
6,282.10	0.04	0.083	0.106	0.00	0.04	40.40

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Elevation-Volume-Flow Table (Pond)
 Label: PO-1

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Elevation (ft)	Outflow (ft ³ /s)	Storage (ac-ft)	Area (acres)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
6,282.11	0.05	0.084	0.106	0.00	0.05	40.92
6,282.12	0.06	0.086	0.106	0.00	0.06	41.45
6,282.13	0.07	0.087	0.107	0.00	0.07	41.97
6,282.14	0.08	0.088	0.107	0.00	0.08	42.50
6,282.15	0.09	0.089	0.107	0.00	0.09	43.03
6,282.16	0.11	0.090	0.108	0.00	0.11	43.56
6,282.17	0.12	0.091	0.108	0.00	0.12	44.10
6,282.18	0.13	0.092	0.108	0.00	0.13	44.64
6,282.19	0.15	0.093	0.108	0.00	0.15	45.17
6,282.20	0.16	0.094	0.109	0.00	0.16	45.71
6,282.21	0.18	0.095	0.109	0.00	0.18	46.26
6,282.22	0.20	0.096	0.109	0.00	0.20	46.80
6,282.23	0.22	0.097	0.110	0.00	0.22	47.35
6,282.24	0.24	0.098	0.110	0.00	0.24	47.90
6,282.25	0.25	0.100	0.110	0.00	0.25	48.45
6,282.26	0.28	0.101	0.110	0.00	0.28	49.01
6,282.27	0.30	0.102	0.111	0.00	0.30	49.57
6,282.28	0.32	0.103	0.111	0.00	0.32	50.12
6,282.29	0.34	0.104	0.111	0.00	0.34	50.68
6,282.30	0.37	0.105	0.112	0.00	0.37	51.25
6,282.31	0.39	0.106	0.112	0.00	0.39	51.81
6,282.32	0.41	0.107	0.112	0.00	0.41	52.38
6,282.33	0.44	0.108	0.113	0.00	0.44	52.95
6,282.34	0.47	0.110	0.113	0.00	0.47	53.52
6,282.35	0.49	0.111	0.113	0.00	0.49	54.10
6,282.36	0.52	0.112	0.113	0.00	0.52	54.67
6,282.37	0.55	0.113	0.114	0.00	0.55	55.25
6,282.38	0.58	0.114	0.114	0.00	0.58	55.83
6,282.39	0.61	0.115	0.114	0.00	0.61	56.41
6,282.40	0.64	0.116	0.115	0.00	0.64	57.00
6,282.41	0.67	0.118	0.115	0.00	0.67	57.58
6,282.42	0.70	0.119	0.115	0.00	0.70	58.17
6,282.43	0.73	0.120	0.116	0.00	0.73	58.76
6,282.44	0.77	0.121	0.116	0.00	0.77	59.36
6,282.45	0.80	0.122	0.116	0.00	0.80	59.95
6,282.46	0.84	0.123	0.116	0.00	0.84	60.55
6,282.47	0.87	0.125	0.117	0.00	0.87	61.15
6,282.48	0.91	0.126	0.117	0.00	0.91	61.75
6,282.49	0.94	0.127	0.117	0.00	0.94	62.35
6,282.50	0.98	0.128	0.118	0.00	0.98	62.97
6,282.51	1.02	0.129	0.118	0.00	1.02	63.57
6,282.52	1.05	0.130	0.118	0.00	1.05	64.18
6,282.53	1.10	0.132	0.119	0.00	1.10	64.79
6,282.54	1.14	0.133	0.119	0.00	1.14	65.41
6,282.55	1.17	0.134	0.119	0.00	1.17	66.02

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Elevation-Volume-Flow Table (Pond)
 Label: PO-1

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Elevation (ft)	Outflow (ft ³ /s)	Storage (ac-ft)	Area (acres)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
6,282.56	1.22	0.135	0.120	0.00	1.22	66.64
6,282.57	1.26	0.136	0.120	0.00	1.26	67.26
6,282.58	1.30	0.138	0.120	0.00	1.30	67.89
6,282.59	1.35	0.139	0.120	0.00	1.35	68.51
6,282.60	1.39	0.140	0.121	0.00	1.39	69.14
6,282.61	1.43	0.141	0.121	0.00	1.43	69.77
6,282.62	1.48	0.142	0.121	0.00	1.48	70.40
6,282.63	1.52	0.144	0.122	0.00	1.52	71.03
6,282.64	1.56	0.145	0.122	0.00	1.56	71.66
6,282.65	1.61	0.146	0.122	0.00	1.61	72.31
6,282.66	1.66	0.147	0.123	0.00	1.66	72.94
6,282.67	1.71	0.149	0.123	0.00	1.71	73.59
6,282.68	1.75	0.150	0.123	0.00	1.75	74.23
6,282.69	1.80	0.151	0.124	0.00	1.80	74.88
6,282.70	1.86	0.152	0.124	0.00	1.86	75.53
6,282.71	1.90	0.153	0.124	0.00	1.90	76.17
6,282.72	1.95	0.155	0.124	0.00	1.95	76.82
6,282.73	2.00	0.156	0.125	0.00	2.00	77.48
6,282.74	2.05	0.157	0.125	0.00	2.05	78.13
6,282.75	2.11	0.158	0.125	0.00	2.11	78.79
6,282.76	2.16	0.160	0.126	0.00	2.16	79.45
6,282.77	2.21	0.161	0.126	0.00	2.21	80.11
6,282.78	2.26	0.162	0.126	0.00	2.26	80.78
6,282.79	2.32	0.163	0.127	0.00	2.32	81.45
6,282.80	2.37	0.165	0.127	0.00	2.37	82.11
6,282.81	2.43	0.166	0.127	0.00	2.43	82.78
6,282.82	2.49	0.167	0.128	0.00	2.49	83.46
6,282.83	2.54	0.169	0.128	0.00	2.54	84.13
6,282.84	2.60	0.170	0.128	0.00	2.60	84.81
6,282.85	2.65	0.171	0.129	0.00	2.65	85.48
6,282.86	2.71	0.172	0.129	0.00	2.71	86.17
6,282.87	2.76	0.174	0.129	0.00	2.76	86.84
6,282.88	2.83	0.175	0.130	0.00	2.83	87.54
6,282.89	2.88	0.176	0.130	0.00	2.88	88.22
6,282.90	2.94	0.178	0.130	0.00	2.94	88.91
6,282.91	3.00	0.179	0.131	0.00	3.00	89.60
6,282.92	3.06	0.180	0.131	0.00	3.06	90.29
6,282.93	3.12	0.182	0.131	0.00	3.12	90.99
6,282.94	3.19	0.183	0.131	0.00	3.19	91.68
6,282.95	3.25	0.184	0.132	0.00	3.25	92.38
6,282.96	3.31	0.185	0.132	0.00	3.31	93.08
6,282.97	3.37	0.187	0.132	0.00	3.37	93.78
6,282.98	3.44	0.188	0.133	0.00	3.44	94.49
6,282.99	3.50	0.189	0.133	0.00	3.50	95.20
6,283.00	3.56	0.191	0.133	0.00	3.56	95.90

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Elevation-Volume-Flow Table (Pond)
 Label: PO-1

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Elevation (ft)	Outflow (ft ³ /s)	Storage (ac-ft)	Area (acres)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
6,283.01	3.63	0.192	0.134	0.00	3.63	96.62
6,283.02	3.69	0.193	0.134	0.00	3.69	97.32
6,283.03	3.75	0.195	0.134	0.00	3.75	98.03
6,283.04	3.82	0.196	0.135	0.00	3.82	98.75
6,283.05	3.88	0.198	0.135	0.00	3.88	99.48
6,283.06	3.95	0.199	0.135	0.00	3.95	100.20
6,283.07	4.01	0.200	0.136	0.00	4.01	100.91
6,283.08	4.07	0.202	0.136	0.00	4.07	101.63
6,283.09	4.14	0.203	0.136	0.00	4.14	102.36
6,283.10	4.21	0.204	0.136	0.00	4.21	103.09
6,283.11	4.28	0.206	0.137	0.00	4.28	103.82
6,283.12	4.35	0.207	0.137	0.00	4.35	104.55
6,283.13	4.42	0.208	0.137	0.00	4.42	105.28
6,283.14	4.49	0.210	0.138	0.00	4.49	106.02
6,283.15	4.56	0.211	0.138	0.00	4.56	106.75
6,283.16	4.63	0.213	0.138	0.00	4.63	107.49
6,283.17	4.70	0.214	0.139	0.00	4.70	108.23
6,283.18	4.76	0.215	0.139	0.00	4.76	108.97
6,283.19	4.83	0.217	0.139	0.00	4.83	109.71
6,283.20	4.90	0.218	0.139	0.00	4.90	110.46
6,283.21	4.97	0.219	0.140	0.00	4.97	111.20
6,283.22	5.04	0.221	0.140	0.00	5.04	111.95
6,283.23	5.11	0.222	0.140	0.00	5.11	112.70
6,283.24	5.19	0.224	0.141	0.00	5.19	113.45
6,283.25	5.26	0.225	0.141	0.00	5.26	114.20
6,283.26	5.33	0.227	0.141	0.00	5.33	114.97
6,283.27	5.40	0.228	0.142	0.00	5.40	115.72
6,283.28	5.47	0.229	0.142	0.00	5.47	116.47
6,283.29	5.54	0.231	0.142	0.00	5.54	117.23
6,283.30	5.62	0.232	0.143	0.00	5.62	118.00
6,283.31	5.70	0.234	0.143	0.00	5.70	118.77
6,283.32	5.77	0.235	0.143	0.00	5.77	119.53
6,283.33	5.84	0.236	0.144	0.00	5.84	120.29
6,283.34	5.91	0.238	0.144	0.00	5.91	121.06
6,283.35	5.99	0.239	0.144	0.00	5.99	121.84
6,283.36	6.06	0.241	0.144	0.00	6.06	122.61
6,283.37	6.13	0.242	0.145	0.00	6.13	123.38
6,283.38	6.21	0.244	0.145	0.00	6.21	124.16
6,283.39	6.28	0.245	0.145	0.00	6.28	124.94
6,283.40	6.35	0.247	0.146	0.00	6.35	125.71
6,283.41	6.44	0.248	0.146	0.00	6.44	126.50
6,283.42	6.51	0.250	0.146	0.00	6.51	127.28
6,283.43	6.58	0.251	0.147	0.00	6.58	128.06
6,283.44	6.66	0.252	0.147	0.00	6.66	128.85
6,283.45	6.73	0.254	0.147	0.00	6.73	129.63

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Elevation-Volume-Flow Table (Pond)
 Label: PO-1

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Elevation (ft)	Outflow (ft ³ /s)	Storage (ac-ft)	Area (acres)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
6,283.46	6.81	0.255	0.148	0.00	6.81	130.43
6,283.47	6.89	0.257	0.148	0.00	6.89	131.22
6,283.48	6.96	0.258	0.148	0.00	6.96	132.00
6,283.49	7.04	0.260	0.149	0.00	7.04	132.81
6,283.50	8.84	0.261	0.149	0.00	8.84	135.32
6,283.51	8.90	0.263	0.149	0.00	8.90	136.10
6,283.52	8.96	0.264	0.150	0.00	8.96	136.89
6,283.53	9.01	0.266	0.150	0.00	9.01	137.67
6,283.54	9.07	0.267	0.150	0.00	9.07	138.45
6,283.55	9.13	0.269	0.150	0.00	9.13	139.24
6,283.56	9.19	0.270	0.151	0.00	9.19	140.02
6,283.57	9.24	0.272	0.151	0.00	9.24	140.81
6,283.58	9.30	0.273	0.151	0.00	9.30	141.60
6,283.59	9.35	0.275	0.152	0.00	9.35	142.39
6,283.60	9.41	0.276	0.152	0.00	9.41	143.18
6,283.61	9.47	0.278	0.152	0.00	9.47	143.97
6,283.62	9.52	0.279	0.153	0.00	9.52	144.76
6,283.63	9.57	0.281	0.153	0.00	9.57	145.56
6,283.64	9.63	0.282	0.153	0.00	9.63	146.35
6,283.65	9.68	0.284	0.154	0.00	9.68	147.15
6,283.66	9.74	0.286	0.154	0.00	9.74	147.95
6,283.67	9.79	0.287	0.154	0.00	9.79	148.75
6,283.68	9.84	0.289	0.155	0.00	9.84	149.55
6,283.69	9.90	0.290	0.155	0.00	9.90	150.35
6,283.70	9.95	0.292	0.155	0.00	9.95	151.15
6,283.71	10.00	0.293	0.156	0.00	10.00	151.96
6,283.72	10.05	0.295	0.156	0.00	10.05	152.76
6,283.73	10.10	0.296	0.156	0.00	10.10	153.57
6,283.74	10.16	0.298	0.157	0.00	10.16	154.38
6,283.75	10.21	0.300	0.157	0.00	10.21	155.19
6,283.76	10.26	0.301	0.157	0.00	10.26	156.00
6,283.77	10.31	0.303	0.158	0.00	10.31	156.81
6,283.78	10.36	0.304	0.158	0.00	10.36	157.63
6,283.79	10.41	0.306	0.158	0.00	10.41	158.44
6,283.80	10.46	0.307	0.159	0.00	10.46	159.26
6,283.81	10.51	0.309	0.159	0.00	10.51	160.07
6,283.82	10.56	0.311	0.159	0.00	10.56	160.89
6,283.83	10.61	0.312	0.160	0.00	10.61	161.71
6,283.84	10.66	0.314	0.160	0.00	10.66	162.54
6,283.85	10.70	0.315	0.160	0.00	10.70	163.36
6,283.86	10.75	0.317	0.161	0.00	10.75	164.18
6,283.87	10.80	0.319	0.161	0.00	10.80	165.01
6,283.88	10.85	0.320	0.161	0.00	10.85	165.84
6,283.89	10.90	0.322	0.161	0.00	10.90	166.67
6,283.90	10.95	0.323	0.162	0.00	10.95	167.50

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Elevation-Volume-Flow Table (Pond)
 Label: PO-1

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Elevation (ft)	Outflow (ft ³ /s)	Storage (ac-ft)	Area (acres)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
6,283.91	10.99	0.325	0.162	0.00	10.99	168.33
6,283.92	11.04	0.327	0.162	0.00	11.04	169.16
6,283.93	11.09	0.328	0.163	0.00	11.09	170.00
6,283.94	11.13	0.330	0.163	0.00	11.13	170.83
6,283.95	11.18	0.332	0.163	0.00	11.18	171.67
6,283.96	11.23	0.333	0.164	0.00	11.23	172.51
6,283.97	11.27	0.335	0.164	0.00	11.27	173.35
6,283.98	11.32	0.337	0.164	0.00	11.32	174.19
6,283.99	11.37	0.338	0.165	0.00	11.37	175.03
6,284.00	11.41	0.340	0.165	0.00	11.41	175.88
6,284.01	11.46	0.341	0.165	0.00	11.46	176.72
6,284.02	11.50	0.343	0.166	0.00	11.50	177.57
6,284.03	11.55	0.345	0.166	0.00	11.55	178.42
6,284.04	11.59	0.346	0.166	0.00	11.59	179.27
6,284.05	11.64	0.348	0.167	0.00	11.64	180.12
6,284.06	11.68	0.350	0.167	0.00	11.68	180.97
6,284.07	11.73	0.351	0.167	0.00	11.73	181.82
6,284.08	11.77	0.353	0.168	0.00	11.77	182.68
6,284.09	11.81	0.355	0.168	0.00	11.81	183.53
6,284.10	11.86	0.356	0.168	0.00	11.86	184.39
6,284.11	11.90	0.358	0.169	0.00	11.90	185.25
6,284.12	11.95	0.360	0.169	0.00	11.95	186.11
6,284.13	11.99	0.362	0.169	0.00	11.99	186.98
6,284.14	12.03	0.363	0.170	0.00	12.03	187.84
6,284.15	12.08	0.365	0.170	0.00	12.08	188.70
6,284.16	12.12	0.367	0.170	0.00	12.12	189.57
6,284.17	12.16	0.368	0.171	0.00	12.16	190.44
6,284.18	12.21	0.370	0.171	0.00	12.21	191.31
6,284.19	12.25	0.372	0.171	0.00	12.25	192.18
6,284.20	12.29	0.373	0.172	0.00	12.29	193.05
6,284.21	12.33	0.375	0.172	0.00	12.33	193.92
6,284.22	12.37	0.377	0.172	0.00	12.37	194.80
6,284.23	12.42	0.379	0.173	0.00	12.42	195.67
6,284.24	12.46	0.380	0.173	0.00	12.46	196.55
6,284.25	12.50	0.382	0.173	0.00	12.50	197.43
6,284.26	12.54	0.384	0.173	0.00	12.54	198.31
6,284.27	12.58	0.386	0.174	0.00	12.58	199.19
6,284.28	12.62	0.387	0.174	0.00	12.62	200.08
6,284.29	12.67	0.389	0.174	0.00	12.67	200.96
6,284.30	12.71	0.391	0.175	0.00	12.71	201.85
6,284.31	12.75	0.393	0.175	0.00	12.75	202.74
6,284.32	12.79	0.394	0.175	0.00	12.79	203.62
6,284.33	12.83	0.396	0.176	0.00	12.83	204.51
6,284.34	12.87	0.398	0.176	0.00	12.87	205.41
6,284.35	12.91	0.400	0.176	0.00	12.91	206.30

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Elevation-Volume-Flow Table (Pond)
 Label: PO-1

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Elevation (ft)	Outflow (ft ³ /s)	Storage (ac-ft)	Area (acres)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
6,284.36	12.95	0.401	0.177	0.00	12.95	207.20
6,284.37	12.99	0.403	0.177	0.00	12.99	208.09
6,284.38	13.03	0.405	0.177	0.00	13.03	208.99
6,284.39	13.07	0.407	0.178	0.00	13.07	209.89
6,284.40	13.11	0.408	0.178	0.00	13.11	210.79
6,284.41	13.15	0.410	0.178	0.00	13.15	211.69
6,284.42	13.19	0.412	0.179	0.00	13.19	212.60
6,284.43	13.23	0.414	0.179	0.00	13.23	213.50
6,284.44	13.27	0.416	0.179	0.00	13.27	214.41
6,284.45	13.31	0.417	0.180	0.00	13.31	215.32
6,284.46	13.35	0.419	0.180	0.00	13.35	216.23
6,284.47	13.39	0.421	0.180	0.00	13.39	217.14
6,284.48	13.42	0.423	0.181	0.00	13.42	218.05
6,284.49	13.46	0.425	0.181	0.00	13.46	218.96
6,284.50	13.50	0.426	0.181	0.00	13.50	219.88
6,284.51	13.54	0.428	0.182	0.00	13.54	220.80
6,284.52	13.58	0.430	0.182	0.00	13.58	221.72
6,284.53	13.62	0.432	0.182	0.00	13.62	222.64
6,284.54	13.66	0.434	0.183	0.00	13.66	223.56
6,284.55	13.69	0.436	0.183	0.00	13.69	224.48
6,284.56	13.73	0.437	0.183	0.00	13.73	225.40
6,284.57	13.77	0.439	0.184	0.00	13.77	226.33
6,284.58	13.81	0.441	0.184	0.00	13.81	227.26
6,284.59	13.84	0.443	0.184	0.00	13.84	228.19
6,284.60	13.88	0.445	0.185	0.00	13.88	229.12
6,284.61	13.92	0.447	0.185	0.00	13.92	230.05
6,284.62	13.96	0.448	0.185	0.00	13.96	230.98
6,284.63	13.99	0.450	0.186	0.00	13.99	231.92
6,284.64	14.03	0.452	0.186	0.00	14.03	232.86
6,284.65	14.07	0.454	0.186	0.00	14.07	233.80
6,284.66	14.11	0.456	0.187	0.00	14.11	234.74
6,284.67	14.14	0.458	0.187	0.00	14.14	235.68
6,284.68	14.18	0.460	0.187	0.00	14.18	236.62
6,284.69	14.22	0.461	0.188	0.00	14.22	237.56
6,284.70	14.25	0.463	0.188	0.00	14.25	238.51
6,284.71	14.29	0.465	0.188	0.00	14.29	239.46
6,284.72	14.33	0.467	0.189	0.00	14.33	240.41
6,284.73	14.36	0.469	0.189	0.00	14.36	241.36
6,284.74	14.40	0.471	0.189	0.00	14.40	242.31
6,284.75	14.43	0.473	0.190	0.00	14.43	243.26
6,284.76	14.47	0.475	0.190	0.00	14.47	244.22
6,284.77	14.51	0.477	0.190	0.00	14.51	245.18
6,284.78	14.54	0.478	0.191	0.00	14.54	246.13
6,284.79	14.58	0.480	0.191	0.00	14.58	247.09
6,284.80	14.61	0.482	0.191	0.00	14.61	248.06

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Elevation-Volume-Flow Table (Pond)
 Label: PO-1

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Elevation (ft)	Outflow (ft ³ /s)	Storage (ac-ft)	Area (acres)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
6,284.81	14.65	0.484	0.192	0.00	14.65	249.02
6,284.82	14.68	0.486	0.192	0.00	14.68	249.98
6,284.83	14.72	0.488	0.192	0.00	14.72	250.95
6,284.84	14.76	0.490	0.193	0.00	14.76	251.92
6,284.85	14.79	0.492	0.193	0.00	14.79	252.89
6,284.86	14.83	0.494	0.194	0.00	14.83	253.86
6,284.87	14.86	0.496	0.194	0.00	14.86	254.83
6,284.88	14.90	0.498	0.194	0.00	14.90	255.80
6,284.89	14.93	0.500	0.195	0.00	14.93	256.78
6,284.90	14.97	0.502	0.195	0.00	14.97	257.76
6,284.91	15.00	0.504	0.195	0.00	15.00	258.74
6,284.92	15.03	0.506	0.196	0.00	15.03	259.72
6,284.93	15.07	0.507	0.196	0.00	15.07	260.70
6,284.94	15.10	0.509	0.196	0.00	15.10	261.68
6,284.95	15.14	0.511	0.197	0.00	15.14	262.67
6,284.96	15.17	0.513	0.197	0.00	15.17	263.65
6,284.97	15.21	0.515	0.197	0.00	15.21	264.64
6,284.98	15.24	0.517	0.198	0.00	15.24	265.63
6,284.99	15.28	0.519	0.198	0.00	15.28	266.62
6,285.00	15.31	0.521	0.198	0.00	15.31	267.62
6,285.01	15.34	0.523	0.199	0.00	15.34	268.61
6,285.02	15.38	0.525	0.199	0.00	15.38	269.61
6,285.03	15.41	0.527	0.199	0.00	15.41	270.61
6,285.04	15.45	0.529	0.200	0.00	15.45	271.61
6,285.05	15.48	0.531	0.200	0.00	15.48	272.61
6,285.06	15.51	0.533	0.200	0.00	15.51	273.61
6,285.07	15.55	0.535	0.201	0.00	15.55	274.61
6,285.08	15.58	0.537	0.201	0.00	15.58	275.62
6,285.09	15.61	0.539	0.201	0.00	15.61	276.63
6,285.10	15.65	0.541	0.202	0.00	15.65	277.64
6,285.11	15.68	0.543	0.202	0.00	15.68	278.65
6,285.12	15.71	0.545	0.202	0.00	15.71	279.66
6,285.13	15.75	0.547	0.203	0.00	15.75	280.67
6,285.14	15.78	0.549	0.203	0.00	15.78	281.69
6,285.15	15.81	0.551	0.204	0.00	15.81	282.71
6,285.16	15.84	0.553	0.204	0.00	15.84	283.73
6,285.17	15.88	0.556	0.204	0.00	15.88	284.75
6,285.18	15.91	0.558	0.205	0.00	15.91	285.77
6,285.19	15.94	0.560	0.205	0.00	15.94	286.79
6,285.20	15.98	0.562	0.205	0.00	15.98	287.82
6,285.21	16.01	0.564	0.206	0.00	16.01	288.84
6,285.22	16.04	0.566	0.206	0.00	16.04	289.87
6,285.23	16.07	0.568	0.206	0.00	16.07	290.90
6,285.24	16.11	0.570	0.207	0.00	16.11	291.93
6,285.25	16.14	0.572	0.207	0.00	16.14	292.97

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Elevation-Volume-Flow Table (Pond)
 Label: PO-1

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Elevation (ft)	Outflow (ft ³ /s)	Storage (ac-ft)	Area (acres)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
6,285.26	16.17	0.574	0.207	0.00	16.17	294.00
6,285.27	16.20	0.576	0.208	0.00	16.20	295.04
6,285.28	16.23	0.578	0.208	0.00	16.23	296.08
6,285.29	16.27	0.580	0.208	0.00	16.27	297.12
6,285.30	16.30	0.582	0.209	0.00	16.30	298.16
6,285.31	16.33	0.584	0.209	0.00	16.33	299.20
6,285.32	16.36	0.587	0.209	0.00	16.36	300.24
6,285.33	16.39	0.589	0.210	0.00	16.39	301.29
6,285.34	16.43	0.591	0.210	0.00	16.43	302.34
6,285.35	16.46	0.593	0.210	0.00	16.46	303.39
6,285.36	16.49	0.595	0.211	0.00	16.49	304.44
6,285.37	16.52	0.597	0.211	0.00	16.52	305.49
6,285.38	16.55	0.599	0.212	0.00	16.55	306.55
6,285.39	16.58	0.601	0.212	0.00	16.58	307.60
6,285.40	16.61	0.603	0.212	0.00	16.61	308.66
6,285.41	16.65	0.606	0.213	0.00	16.65	309.72
6,285.42	16.68	0.608	0.213	0.00	16.68	310.78
6,285.43	16.71	0.610	0.213	0.00	16.71	311.84
6,285.44	16.74	0.612	0.214	0.00	16.74	312.91
6,285.45	16.77	0.614	0.214	0.00	16.77	313.98
6,285.46	16.80	0.616	0.214	0.00	16.80	315.04
6,285.47	16.83	0.618	0.215	0.00	16.83	316.11
6,285.48	16.86	0.620	0.215	0.00	16.86	317.18
6,285.49	16.89	0.623	0.215	0.00	16.89	318.26
6,285.50	16.93	0.625	0.216	0.00	16.93	319.33
6,285.51	16.96	0.627	0.216	0.00	16.96	320.41
6,285.52	16.99	0.629	0.217	0.00	16.99	321.48
6,285.53	17.02	0.631	0.217	0.00	17.02	322.56
6,285.54	17.05	0.633	0.217	0.00	17.05	323.65
6,285.55	17.08	0.636	0.218	0.00	17.08	324.73
6,285.56	17.11	0.638	0.218	0.00	17.11	325.81
6,285.57	17.14	0.640	0.218	0.00	17.14	326.90
6,285.58	17.17	0.642	0.219	0.00	17.17	327.99
6,285.59	17.20	0.644	0.219	0.00	17.20	329.08
6,285.60	17.23	0.647	0.219	0.00	17.23	330.17
6,285.61	17.26	0.649	0.220	0.00	17.26	331.26
6,285.62	17.29	0.651	0.220	0.00	17.29	332.35
6,285.63	17.32	0.653	0.220	0.00	17.32	333.45
6,285.64	17.35	0.655	0.221	0.00	17.35	334.55
6,285.65	17.38	0.658	0.221	0.00	17.38	335.65
6,285.66	17.41	0.660	0.222	0.00	17.41	336.75
6,285.67	17.44	0.662	0.222	0.00	17.44	337.85
6,285.68	17.47	0.664	0.222	0.00	17.47	338.96
6,285.69	17.50	0.666	0.223	0.00	17.50	340.06
6,285.70	17.53	0.669	0.223	0.00	17.53	341.17

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Elevation-Volume-Flow Table (Pond)
 Label: PO-1

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Elevation (ft)	Outflow (ft ³ /s)	Storage (ac-ft)	Area (acres)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
6,285.71	17.56	0.671	0.223	0.00	17.56	342.28
6,285.72	17.59	0.673	0.224	0.00	17.59	343.39
6,285.73	17.62	0.675	0.224	0.00	17.62	344.51
6,285.74	17.65	0.678	0.224	0.00	17.65	345.62
6,285.75	17.68	0.680	0.225	0.00	17.68	346.74
6,285.76	17.71	0.682	0.225	0.00	17.71	347.86
6,285.77	17.74	0.684	0.226	0.00	17.74	348.98
6,285.78	17.77	0.687	0.226	0.00	17.77	350.10
6,285.79	17.80	0.689	0.226	0.00	17.80	351.22
6,285.80	17.82	0.691	0.227	0.00	17.82	352.35
6,285.81	17.85	0.693	0.227	0.00	17.85	353.48
6,285.82	17.88	0.696	0.227	0.00	17.88	354.60
6,285.83	17.91	0.698	0.228	0.00	17.91	355.73
6,285.84	17.94	0.700	0.228	0.00	17.94	356.87
6,285.85	17.97	0.703	0.228	0.00	17.97	358.00
6,285.86	18.00	0.705	0.229	0.00	18.00	359.14
6,285.87	18.03	0.707	0.229	0.00	18.03	360.27
6,285.88	18.06	0.709	0.230	0.00	18.06	361.41
6,285.89	18.09	0.712	0.230	0.00	18.09	362.55
6,285.90	18.11	0.714	0.230	0.00	18.11	363.70
6,285.91	18.14	0.716	0.231	0.00	18.14	364.84
6,285.92	18.17	0.719	0.231	0.00	18.17	365.99
6,285.93	18.20	0.721	0.231	0.00	18.20	367.13
6,285.94	18.23	0.723	0.232	0.00	18.23	368.28
6,285.95	18.26	0.726	0.232	0.00	18.26	369.43
6,285.96	18.29	0.728	0.233	0.00	18.29	370.59
6,285.97	18.31	0.730	0.233	0.00	18.31	371.74
6,285.98	18.34	0.733	0.233	0.00	18.34	372.90
6,285.99	18.37	0.735	0.234	0.00	18.37	374.06
6,286.00	18.40	0.737	0.234	0.00	18.40	375.22

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Detention Time
 Label: PO-1 (IN)

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Infiltration	
Infiltration Method (Computed)	No Infiltration
Approximate Detention Times	
Time to Peak (Outflow + Infiltration, Peak to Peak Detention Time)	12.550 hours
Time to Peak (Inflow, Peak to Peak Detention Time)	12.300 hours
Detention Time (Peak to Peak)	0.250 hours
Time to Centroid (Outflow)	13.993 hours
Time to Centroid (Inflow)	13.478 hours
Detention Time (Centroid to Centroid)	0.515 hours
Weighted Average Plug Time	0.972 hours
Maximum Plug Volume Plug Time	0.347 hours
Maximum Inflow Plug Volume	0.075 ac-ft
Time (Maximum Plug Volume, Start)	12.300 hours
Time (Maximum Plug Volume, End)	12.350 hours

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Level Pool Pond Routing Summary
 Label: PO-1 (IN)

Return Event: 100 years
 Storm Event: 100 Year 24 Hr

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	6,280.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft ³ /s
Flow (Initial Infiltration)	0.00 ft ³ /s
Flow (Initial, Total)	0.00 ft ³ /s
Time Increment	0.050 hours

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	18.37 ft ³ /s	Time to Peak (Flow, In)	12.300 hours
Flow (Peak Outlet)	13.78 ft ³ /s	Time to Peak (Flow, Outlet)	12.550 hours

Elevation (Water Surface, Peak)	6,284.57 ft
Volume (Peak)	0.440 ac-ft

Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	2.357 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	2.250 ac-ft
Volume (Retained)	0.105 ac-ft
Volume (Unrouted)	-0.002 ac-ft
Error (Mass Balance)	0.1 %

APPENDIX E - DETENTION-STORAGE ROUTING AND ORIFICE SIZING

Subsection: Pond Inflow Summary
Label: PO-1 (IN)

Return Event: 100 years
Storm Event: 100 Year 24 Hr

Summary for Hydrograph Addition at 'PO-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Post 2

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft ³ /s)
Flow (From)	Post 2	2.357	12.300	18.37
Flow (In)	PO-1	2.357	12.300	18.37

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