Shephard Wesnitzer, Inc.

110 West Dale Avenue
Flagstaff, AZ 86001

928.773.0354
928.774.8934 fax

www.swiaz.com

Engineering an environment of excellence.

PRELIMINARY
NOT FOR CONSTRUCTION, BIDDING OR RECORDING

Attention: Doug Slover
City of Flagstaff
211 W. Aspen Ave.
Flagstaff, AZ 86001

February 24, 2022
SWI # 21214

RE: RESTORATION SOILS YARD (Preliminary Drainage Letter)
COF Project No. PZ-21-00117

Dear Mr. Slover:

This drainage letter is being provided to support the Site Plan submittal for the proposed Restoration Soils Yard development located on ASLD land at the intersection of N. El Paso Flagstaff Rd and W. Historic Route 66. The site is currently zoned Highway Commercial but will be rezoned to Heavy Industrial - Open with the proposed project. Access to the site will be provided by two driveways to N. El Paso Flagstaff Rd. The overall state land is approximately 51.41 acres. The proposed site will be constructed on approximately 7.29 acres with the development located on the eastern 4.01 acres of the site. The proposed development consists a new gravel road and a concrete pad with 4 parking spots.

The objective of this letter is to determine the impact the proposed development will have on the runoff characteristics of the site. Mitigation measures will be provided for the adverse impacts to the runoff conditions per the City of Flagstaff Stormwater Management Design Manual (COFSMDM).

Hydrology

The SCS TR-55 Method was used to determine peak runoff rates for the pre-development and post-development conditions. Rainfall data was taken from the COFSMDM.

The property is currently undeveloped with vegetation consisting of native grasses. The site is currently stockpiled with non-native material. Soils on the site were determined to consist of stony loam material per the NRCS Web Soil Survey. The property is relatively flat with the exception of some steeper slopes to the West. The site currently drains west and north/west at a 2-3% slope towards Rio De Flag. The high point of the site is located in the northeast and southeast of the property. A small portion on the southeast corner

drains south towards W. Historic Route 66. A narrow strip of land by the easterly property line drains to the east to an existing road dich along N. El Paso Flagstaff Rd.

The proposed grading and drainage plan was used to delineate Post-development Drainage Basins (A and B), which generally match the existing drainage patterns. Since this project is located on a portion of the overall site the drainage analysis is only for the eastern portion of the site draining west towards the Rio De Flag.

DETENTION/LID

Bentley's *PondPack* computer program was used to calculate the pre- and post-developed hydrographs for the Type II, 2-year, 10-year, and 100-year, 24-hour storm events for each basin. PondPack calculations utilized the SCS TR-55 Method. Curve Numbers (CNs) were determined based on existing soil conditions, proposed improvements, and weighted based on coverage area. The modeling report from PondPack and a drainage exhibit showing Pre- and Post-development basins are included as attachments to this letter. The table below summarizes the pre vs. post preliminary required storage volumes for the project.

Table 1: Peak Discharge Rates

Peak Discharge Rates						
Pre-Development Condition Peak Discharge Rates						
Basin ID	Area (acres)	Tc (hr)	CN	Runoff Flows (cfs)		
				Q_2	Q_{10}	Q_{100}
A	5.07	1.21	80	-	2.59	5.83
B	2.07	1.35	80	-	0.98	2.21
Post-Development Condition Peak Discharge Rates						
Basin ID	Area (acres)	Tc (min)	CN	Runoff Flows (cfs)		
				Q_2	Q_{10}	Q_{100}
A	6.75	1.21	81	1.13	3.83	5.97
B	0.39	1.35	80	0.09	0.21	0.46

Table 2: Detention Volume

Pre-Development Conditions Runoff Volumes				
Basin ID	Area (acres)	Tc (min)	Curve Number	Runoff Volume (cf)
A	5.07	1.21	80	45,458
B	2.07	1.35	80	18,509
Post-Development Conditions Runoff Volumes				
Area (acres)	Area (acres)	Tc (min)	Curve Number	Runoff Volume (cf)
A	6.75	1.21	81	64,990
B	0.39	1.35	80	3,832
			Required Retention Volume (cf)	4,855

Due to the decrease of basin area in the post-development condition for basin B, the runoff volume of the basin (B2) will decrease in the post-development condition; therefore, no detention of stormwater runoff for B is required. The required storage volume for basin A in the post-development condition resulted in 4,855 cubic feet. Storage is required for Basin A, which will be provided by the Retention basin. The site will continue to slope to the northeast and surface drain into the basin that will provide approximately 5,000 cubic feet. The outlet structure will consist of a berm, weir and discharge pipe with an orifice to drain the basin within 24 to 36 hours.

This project is required to account for the first flush of 1 inch over all new impervious areas per the COFSMDM. There is no impervious cover for the pre-development conditions. The increase in proposed impervious cover is 15,117 square feet, which results in 1,260 cubic feet of required LID volume. The retention basin will provide the LID volume required for the project. The treatment of this volume is achieved through the use of vegetated swales, see attached Hydraflow design report. The table below summaries the impervious area coverage and required LID Volume for the project.

Table 3 – Impervious Area/LID Summary

Impervious Area & LID Analysis					
				LID Required Depth (ft)	0.0833
Basin ID	Basin Area (sf)	Existing Impervious Area (sf)	Proposed Impervious Area (sf)	Net Impervious Area (sf)	Required LID Volume (CF)
A	693,835	0	15,117	15,117	1,260
1. Gross required 1" LID volume is for all post-development impervious area including streets, parking, sidewalks and buildings.					

Safe overflow of the pond is provided with a riprap lined weir. The overflow weir will be further designed during constructions plans.

CONCLUSION

Peak discharge rates for the 2-, 10- and 100-year storm events were determined for the project site for both the pre- and post-development conditions. Runoff volumes for the 100-year storm event were calculated to determine the detention volumes required at each drainage basin. The drainage design for the Restoration Soils Yard Project will be designed to retain the difference between the pre- and post-development runoff volumes for the Project basins. All drainage conveyance structures and retention facilities will be designed per the requirements outlined in the COFSMDM and LIDM. Refer to the Drainage Exhibits and Concept Plan prepared by SWI for locations and notes.

The design concepts in this report will ensure that the drainage integrity of the site is sustained with proper maintenance activity. Activities include frequent clearing of debris and sediment from the retention facilities and swales, disturbed slope treatment and

erosion control at the outlet pipe. Frequent monitoring will ensure expedient remedies to common problems such as erosion, sedimentation, and flow obstructions.

REFERENCES

Publications
City of Flagstaff Stormwater Management Design Manual, March 2009
Ordinance 2012-03, April 2012
City of Flagstaff Low Impact Development Manual, January 2009
TR-55, Urban Hydrology for Small Watersheds, NRCS, June 1986

Software
PondPack, Bentley Systems, Inc., Version *8i*

Refer to the Grading & Drainage Plan for the location of the proposed stormwater discharge point and the proposed site design.

Please let us know if you have any questions, comments, or need any additional information.

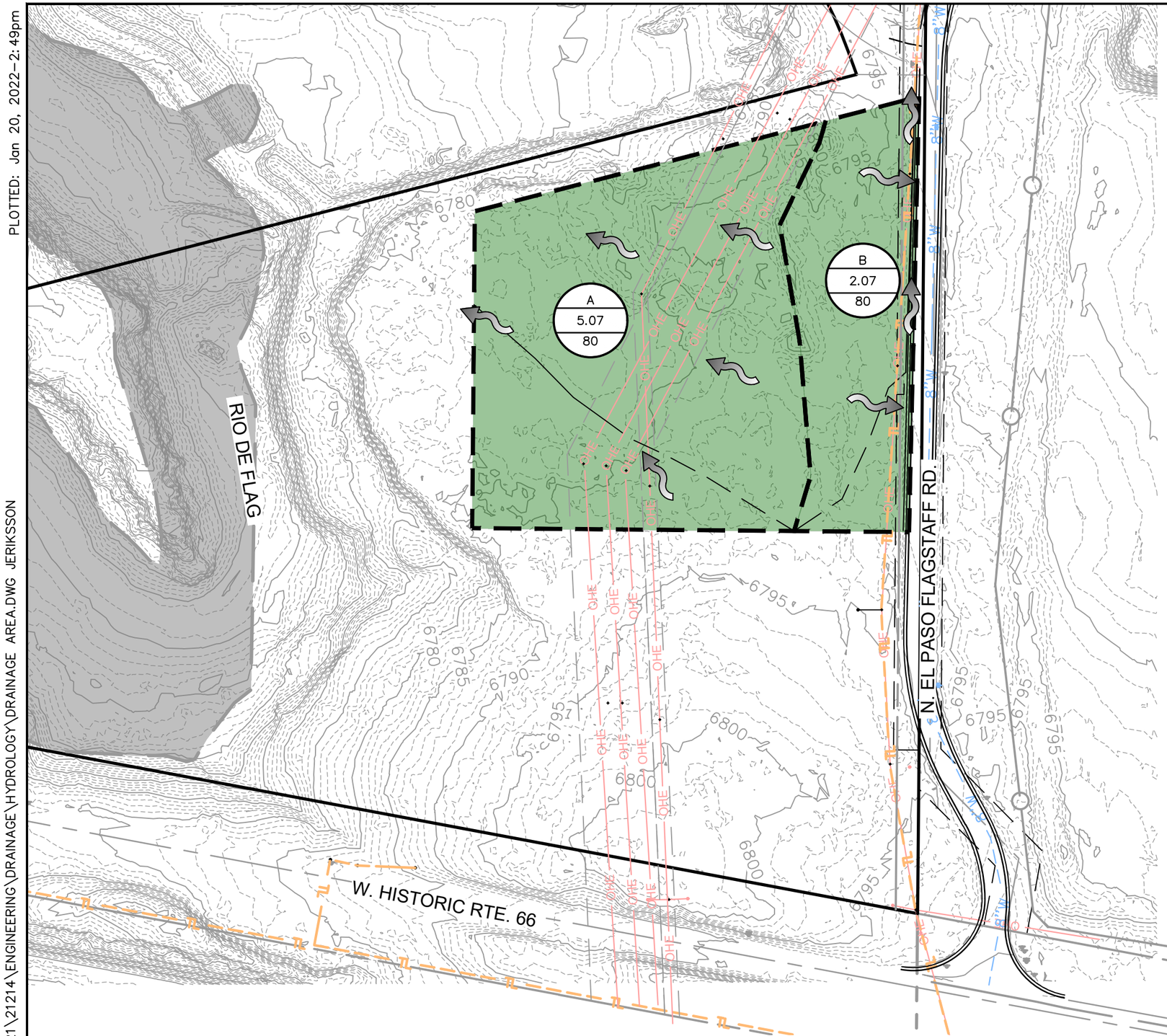
Sincerely,
Shephard – Wesnitzer, Inc.

Stephen C. Irwin, P.E.
Project Engineer

Attachments:
- Drainage Exhibit
- NRCS Web Soil Survey
- Hydraflow Report
- PondPack Report

PLOTTED: Jan 20, 2022 – 2:49pm

FILE: P:\2021\21214\ENGINEERING\DRAINAGE\HYDROLOGY\DRAINAGE AREA.DWG JERIKSSON



LEGEND

- PRE DEVELOPMENT BASIN DELINEATION
- SHEET FLOW
- SHALLOW CONCENTRATED FLOW
- 80 — HERBACEOUS AREA
- DRAINAGE ARROW
- ID / A / CN — ID = BASIN IDENTIFICATION, A = AREA IN ACRES, CN = SCS CURVE NUMBER

NORTH

SCALE 1" : 150'
0 75 150

PRELIMINARY

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C.O.F. Project # PZ 21-00117

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811 BLUE STAKE, INC.
Call 811 or click Arizona811.com

REVISIONS			
NO.	DESCRIPTION	DATE	BY

SWI Shephard Wesnitzer, Inc.
110 W. Dale Avenue
Flagstaff, AZ 86001
928.773.0354
928.774.8934 fax
www.swiaz.com

JOB NO:	21214
DATE:	JAN 22
SCALE:	AS SHOWN
DRAWN:	JEE
DESIGN:	JEE, CNP
CHECKED:	SCI

RESTORATION SOILS YARD — FLAGSTAFF ARIZONA

PRE-DEVELOPMENT DRAINAGE MAP

SHEET D01 OF 2

PLOTTED: Jan 20, 2022 – 2:49pm

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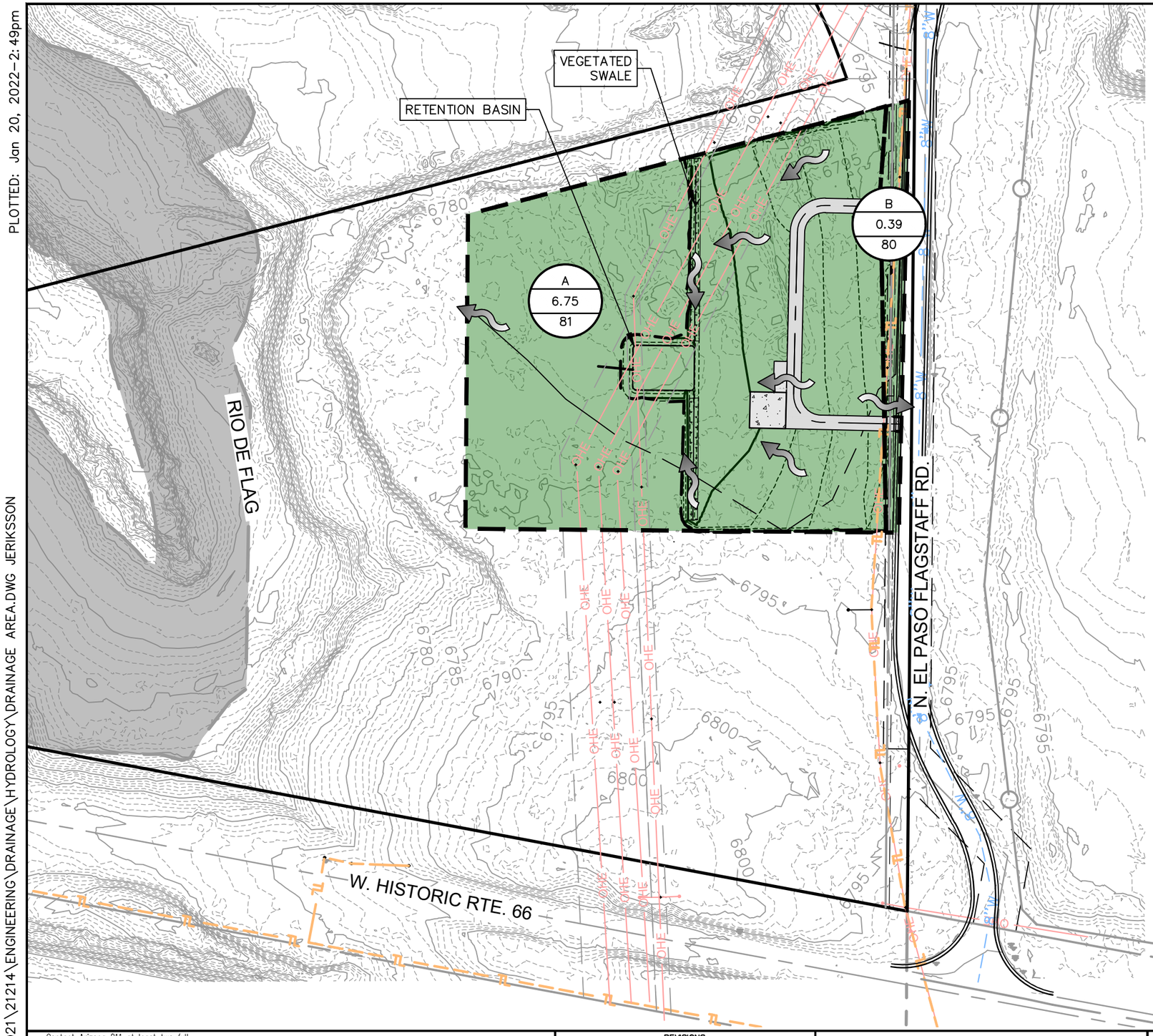

LEGEND

- POST DEVELOPMENT BASIN DELINEATION
- SHEET FLOW
- SHALLOW CONCENTRATED FLOW
- 98 — ROW/ IMPERVIOUS AREA
- 77 — HERBACEOUS AREA
- DRAINAGE ARROW
- ID / A / CN — ID = BASIN IDENTIFICATION, A = AREA IN ACRES, CN = SCS CURVE NUMBER

NORTH

SCALE 1" : 150'
0 75 150

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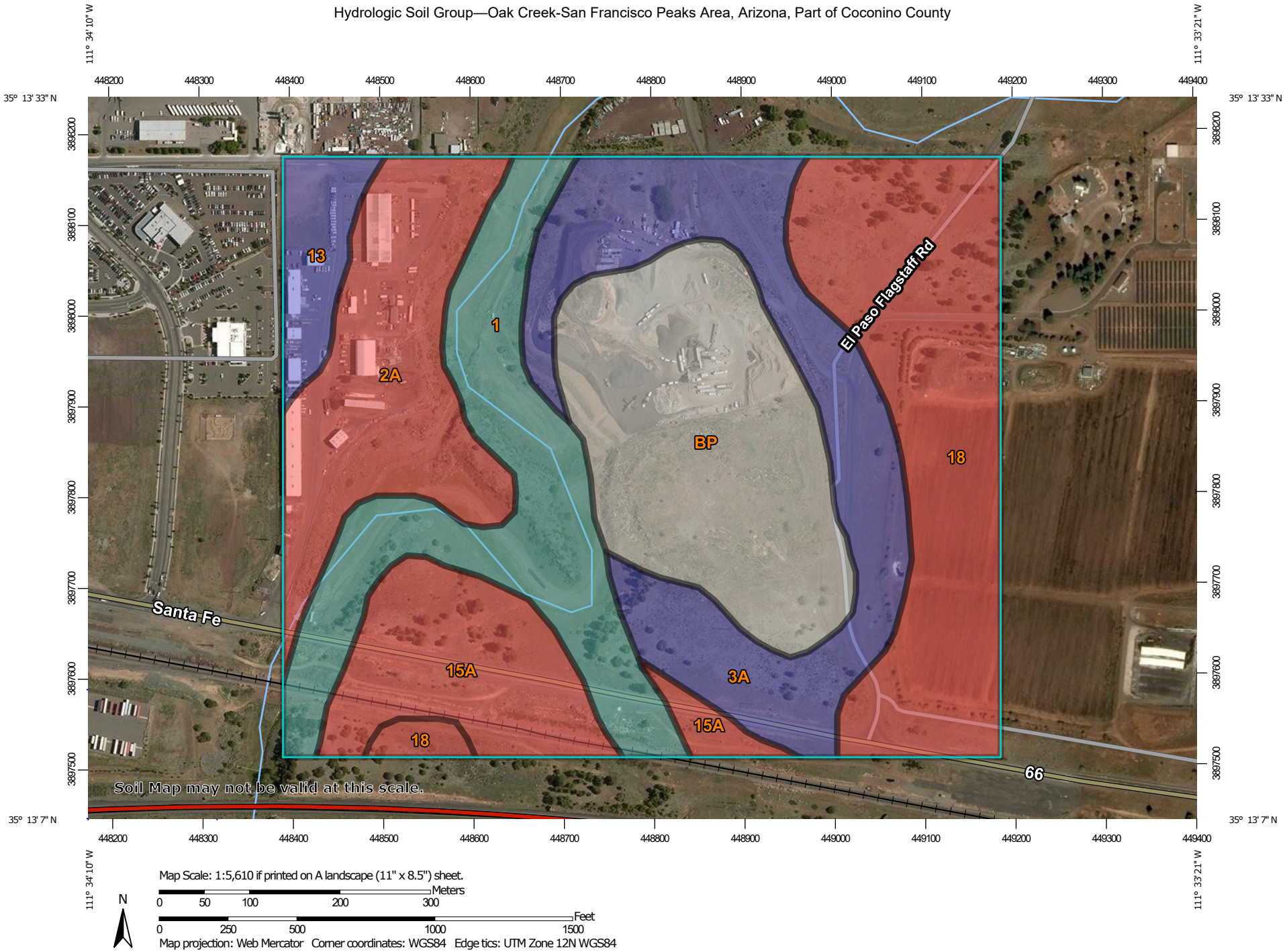
DATE:	JAN 22
SCALE:	AS SHOWN
DRAWN:	JEE
DESIGN:	JEE, CNP
CHECKED:	SCI

RESTRORATION SOILS YARD — FLAGSTAFF ARIZONA

POST-DEVELOPMENT DRAINAGE MAP

SHEET D02 OF 2


111° 34' 10" W
111° 33' 21" W
35° 13' 33" N
35° 13' 7" N
448200
448300
448400
448500
448600
448700
448800
448900
449000
449100
449200
449300
449400
3898200
3898100
3898000
3897900
3897800
3897700
3897600
3897500
13
1
2A
BP
18
3A
15A
18
15A
El Paso Flagstaff Rd
Santa Fe
66
Soil Map may not be valid at this scale.
Map Scale: 1:5,610 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 50 100 200 300
Feet
0 250 500 1000 1500
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

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: Oak Creek-San Francisco Peaks Area, Arizona, Part of Coconino County
Survey Area Data: Version 11, Sep 16, 2021

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

Date(s) aerial images were photographed: Aug 13, 2010—Jun 25, 2015

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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Jacques clay loam, 0 to 2 percent slopes	C	20.4	15.6%
2A	Brolliar stony clay loam, 2 to 8 percent slopes	D	17.5	13.4%
3A	Baldy stony loam, 8 to 15 percent slopes	B	23.4	17.9%
13	Lynx loam, 0 to 2 percent slopes	B	4.4	3.4%
15A	Tortugas-Daze complex, 0 to 15 percent slopes	D	13.0	10.0%
18	Boysag gravelly loam, 0 to 8 percent slopes	D	26.8	20.5%
BP	Pits-Dumps complex		25.0	19.1%
Totals for Area of Interest			**130.5**	**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

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Monday, Dec 20 2021

VEGITATED SWALE - 21214

Trapezoidal

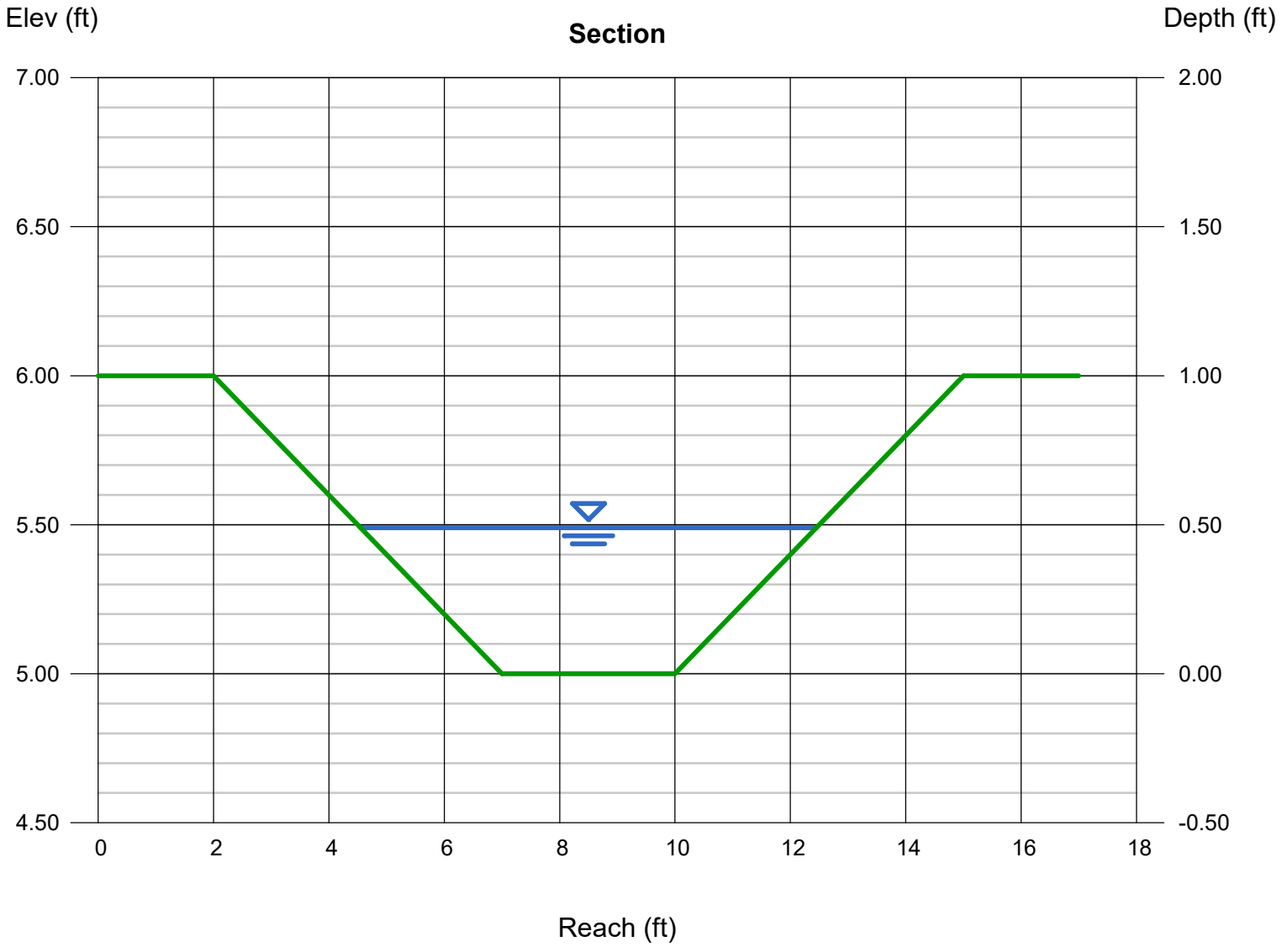
Bottom Width (ft)	= 3.00
Side Slopes (z:1)	= 5.00, 5.00
Total Depth (ft)	= 1.00
Invert Elev (ft)	= 5.00
Slope (%)	= 0.60
N-Value	= 0.055

Calculations

Compute by:	Known Q
Known Q (cfs)	= 2.66

Highlighted

Depth (ft)	= 0.49
Q (cfs)	= 2.660
Area (sqft)	= 2.67
Velocity (ft/s)	= 1.00
Wetted Perim (ft)	= 8.00
Crit Depth, Yc (ft)	= 0.26
Top Width (ft)	= 7.90
EGL (ft)	= 0.51



Pond pack 21214

Project Summary	
Title	21214 RESTORATION SOILS YARD
Engineer	JEE
Company	SWI
Date	1/18/2022

Notes

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Pond pack 21214

Subsection: User Notifications

User Notifications?	No user notifications generated.

Pond pack 21214

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (hours)	Peak Flow (ft³/s)
BASIN B EXISTING	Pre-Development 10 YEAR	10	8,521.000	12.750	0.98
BASIN B EXISTING	Pre-Development 100 YEAR	100	18,509.000	12.750	2.21
BASIN A EXISTING	Pre-Development 10 YEAR	10	20,934.000	12.650	2.59
BASIN A EXISTING	Pre-Development 100 YEAR	100	45,458.000	12.650	5.83
BASIN A PROPOSED	Post-Development 2 YEAR	2	13,709.000	13.200	1.13
BASIN A PROPOSED	Post-Development 10 YEAR	10	30,771.000	12.650	3.84
BASIN A PROPOSED	Post-Development 100 YEAR	100	64,990.000	13.150	5.97
BASIN B PROPOSED	Post-Development 2 YEAR	2	811.000	12.750	0.09
BASIN B PROPOSED	Post-Development 10 YEAR	10	1,794.000	12.750	0.21
BASIN B PROPOSED	Post-Development 100 YEAR	100	3,832.000	12.750	0.46

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (hours)	Peak Flow (ft³/s)
OUTLET B	Post-Development 2 YEAR	2	811.000	12.750	0.09
OUTLET B	Post-Development 10 YEAR	10	1,794.000	12.750	0.21
OUTLET B	Pre-Development 10 YEAR	10	8,521.000	12.750	0.98
OUTLET B	Post-Development 100 YEAR	100	3,832.000	12.750	0.46
OUTLET B	Pre-Development 100 YEAR	100	18,509.000	12.750	2.21
OUTLET A	Post-Development 2 YEAR	2	13,709.000	13.200	1.13
OUTLET A	Post-Development 10 YEAR	10	30,771.000	12.650	3.84
OUTLET A	Pre-Development 10 YEAR	10	20,934.000	12.650	2.59
OUTLET A	Post-Development 100 YEAR	100	64,990.000	13.150	5.97
OUTLET A	Pre-Development 100 YEAR	100	45,458.000	12.650	5.83

Pond pack 21214

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

Return Event: 10 years
Storm Event: 10 YEAR 24 HR

Time-Depth Curve: 10 YEAR 24 HR	
Label	10 YEAR 24 HR
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	10 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	0.0	0.0	0.0	0.0	0.0
1.500	0.0	0.0	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.000	0.1	0.1	0.1	0.1	0.1
3.500	0.1	0.1	0.1	0.1	0.1
4.000	0.1	0.1	0.1	0.2	0.2
4.500	0.2	0.2	0.2	0.2	0.2
5.000	0.2	0.2	0.2	0.2	0.2
5.500	0.2	0.2	0.2	0.2	0.2
6.000	0.2	0.2	0.2	0.2	0.3
6.500	0.3	0.3	0.3	0.3	0.3
7.000	0.3	0.3	0.3	0.3	0.3
7.500	0.3	0.3	0.3	0.3	0.3
8.000	0.3	0.4	0.4	0.4	0.4
8.500	0.4	0.4	0.4	0.4	0.4
9.000	0.4	0.4	0.4	0.5	0.5
9.500	0.5	0.5	0.5	0.5	0.5
10.000	0.5	0.5	0.5	0.6	0.6
10.500	0.6	0.6	0.6	0.6	0.7
11.000	0.7	0.7	0.7	0.8	0.8
11.500	0.8	0.9	1.0	1.2	1.6
12.000	1.9	2.0	2.0	2.1	2.1
12.500	2.1	2.1	2.2	2.2	2.2
13.000	2.2	2.2	2.3	2.3	2.3
13.500	2.3	2.3	2.3	2.3	2.4
14.000	2.4	2.4	2.4	2.4	2.4
14.500	2.4	2.4	2.4	2.4	2.4
15.000	2.5	2.5	2.5	2.5	2.5
15.500	2.5	2.5	2.5	2.5	2.5
16.000	2.5	2.5	2.5	2.6	2.6
16.500	2.6	2.6	2.6	2.6	2.6

Pond pack 21214

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

Return Event: 10 years
Storm Event: 10 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)
17.000	2.6	2.6	2.6	2.6	2.6
17.500	2.6	2.6	2.6	2.6	2.6
18.000	2.7	2.7	2.7	2.7	2.7
18.500	2.7	2.7	2.7	2.7	2.7
19.000	2.7	2.7	2.7	2.7	2.7
19.500	2.7	2.7	2.7	2.7	2.7
20.000	2.7	2.7	2.7	2.8	2.8
20.500	2.8	2.8	2.8	2.8	2.8
21.000	2.8	2.8	2.8	2.8	2.8
21.500	2.8	2.8	2.8	2.8	2.8
22.000	2.8	2.8	2.8	2.8	2.8
22.500	2.8	2.8	2.8	2.8	2.8
23.000	2.8	2.9	2.9	2.9	2.9
23.500	2.9	2.9	2.9	2.9	2.9
24.000	2.9	(N/A)	(N/A)	(N/A)	(N/A)

Pond pack 21214

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

Return Event: 10 years
Storm Event: 10 YEAR 24 HR

Time-Depth Curve: 10 YEAR 24 HR	
Label	10 YEAR 24 HR
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	10 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	0.0	0.0	0.0	0.0	0.0
1.500	0.0	0.0	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.000	0.1	0.1	0.1	0.1	0.1
3.500	0.1	0.1	0.1	0.1	0.1
4.000	0.1	0.1	0.1	0.2	0.2
4.500	0.2	0.2	0.2	0.2	0.2
5.000	0.2	0.2	0.2	0.2	0.2
5.500	0.2	0.2	0.2	0.2	0.2
6.000	0.2	0.2	0.2	0.2	0.3
6.500	0.3	0.3	0.3	0.3	0.3
7.000	0.3	0.3	0.3	0.3	0.3
7.500	0.3	0.3	0.3	0.3	0.3
8.000	0.3	0.4	0.4	0.4	0.4
8.500	0.4	0.4	0.4	0.4	0.4
9.000	0.4	0.4	0.4	0.5	0.5
9.500	0.5	0.5	0.5	0.5	0.5
10.000	0.5	0.5	0.5	0.6	0.6
10.500	0.6	0.6	0.6	0.6	0.7
11.000	0.7	0.7	0.7	0.8	0.8
11.500	0.8	0.9	1.0	1.2	1.6
12.000	1.9	2.0	2.0	2.1	2.1
12.500	2.1	2.1	2.2	2.2	2.2
13.000	2.2	2.2	2.3	2.3	2.3
13.500	2.3	2.3	2.3	2.3	2.4
14.000	2.4	2.4	2.4	2.4	2.4
14.500	2.4	2.4	2.4	2.4	2.4
15.000	2.5	2.5	2.5	2.5	2.5
15.500	2.5	2.5	2.5	2.5	2.5
16.000	2.5	2.5	2.5	2.6	2.6
16.500	2.6	2.6	2.6	2.6	2.6

Pond pack 21214

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

Return Event: 10 years
Storm Event: 10 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)
17.000	2.6	2.6	2.6	2.6	2.6
17.500	2.6	2.6	2.6	2.6	2.6
18.000	2.7	2.7	2.7	2.7	2.7
18.500	2.7	2.7	2.7	2.7	2.7
19.000	2.7	2.7	2.7	2.7	2.7
19.500	2.7	2.7	2.7	2.7	2.7
20.000	2.7	2.7	2.7	2.8	2.8
20.500	2.8	2.8	2.8	2.8	2.8
21.000	2.8	2.8	2.8	2.8	2.8
21.500	2.8	2.8	2.8	2.8	2.8
22.000	2.8	2.8	2.8	2.8	2.8
22.500	2.8	2.8	2.8	2.8	2.8
23.000	2.8	2.9	2.9	2.9	2.9
23.500	2.9	2.9	2.9	2.9	2.9
24.000	2.9	(N/A)	(N/A)	(N/A)	(N/A)

Pond pack 21214

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	0.0	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	0.1	0.1	0.1	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	0.2	0.2	0.2	0.2
4.500	0.3	0.3	0.3	0.3	0.3
5.000	0.3	0.3	0.3	0.3	0.3
5.500	0.3	0.3	0.3	0.3	0.4
6.000	0.4	0.4	0.4	0.4	0.4
6.500	0.4	0.4	0.4	0.4	0.4
7.000	0.5	0.5	0.5	0.5	0.5
7.500	0.5	0.5	0.5	0.5	0.5
8.000	0.5	0.6	0.6	0.6	0.6
8.500	0.6	0.6	0.6	0.6	0.7
9.000	0.7	0.7	0.7	0.7	0.7
9.500	0.7	0.8	0.8	0.8	0.8
10.000	0.8	0.8	0.9	0.9	0.9
10.500	0.9	1.0	1.0	1.0	1.0
11.000	1.1	1.1	1.1	1.2	1.2
11.500	1.3	1.4	1.6	2.0	2.6
12.000	3.0	3.1	3.2	3.3	3.3
12.500	3.4	3.4	3.4	3.5	3.5
13.000	3.5	3.5	3.6	3.6	3.6
13.500	3.6	3.7	3.7	3.7	3.7
14.000	3.7	3.8	3.8	3.8	3.8
14.500	3.8	3.8	3.8	3.9	3.9
15.000	3.9	3.9	3.9	3.9	3.9
15.500	4.0	4.0	4.0	4.0	4.0
16.000	4.0	4.0	4.0	4.0	4.1
16.500	4.1	4.1	4.1	4.1	4.1

Pond pack 21214

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)
17.000	4.1	4.1	4.1	4.1	4.1
17.500	4.2	4.2	4.2	4.2	4.2
18.000	4.2	4.2	4.2	4.2	4.2
18.500	4.2	4.2	4.3	4.3	4.3
19.000	4.3	4.3	4.3	4.3	4.3
19.500	4.3	4.3	4.3	4.3	4.3
20.000	4.3	4.3	4.4	4.4	4.4
20.500	4.4	4.4	4.4	4.4	4.4
21.000	4.4	4.4	4.4	4.4	4.4
21.500	4.4	4.4	4.4	4.4	4.4
22.000	4.5	4.5	4.5	4.5	4.5
22.500	4.5	4.5	4.5	4.5	4.5
23.000	4.5	4.5	4.5	4.5	4.5
23.500	4.5	4.5	4.5	4.5	4.6
24.000	4.6	(N/A)	(N/A)	(N/A)	(N/A)

Pond pack 21214

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	0.0	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	0.1	0.1	0.1	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	0.2	0.2	0.2	0.2
4.500	0.3	0.3	0.3	0.3	0.3
5.000	0.3	0.3	0.3	0.3	0.3
5.500	0.3	0.3	0.3	0.3	0.4
6.000	0.4	0.4	0.4	0.4	0.4
6.500	0.4	0.4	0.4	0.4	0.4
7.000	0.5	0.5	0.5	0.5	0.5
7.500	0.5	0.5	0.5	0.5	0.5
8.000	0.5	0.6	0.6	0.6	0.6
8.500	0.6	0.6	0.6	0.6	0.7
9.000	0.7	0.7	0.7	0.7	0.7
9.500	0.7	0.8	0.8	0.8	0.8
10.000	0.8	0.8	0.9	0.9	0.9
10.500	0.9	1.0	1.0	1.0	1.0
11.000	1.1	1.1	1.1	1.2	1.2
11.500	1.3	1.4	1.6	2.0	2.6
12.000	3.0	3.1	3.2	3.3	3.3
12.500	3.4	3.4	3.4	3.5	3.5
13.000	3.5	3.5	3.6	3.6	3.6
13.500	3.6	3.7	3.7	3.7	3.7
14.000	3.7	3.8	3.8	3.8	3.8
14.500	3.8	3.8	3.8	3.9	3.9
15.000	3.9	3.9	3.9	3.9	3.9
15.500	4.0	4.0	4.0	4.0	4.0
16.000	4.0	4.0	4.0	4.0	4.1
16.500	4.1	4.1	4.1	4.1	4.1

Pond pack 21214

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)
17.000	4.1	4.1	4.1	4.1	4.1
17.500	4.2	4.2	4.2	4.2	4.2
18.000	4.2	4.2	4.2	4.2	4.2
18.500	4.2	4.2	4.3	4.3	4.3
19.000	4.3	4.3	4.3	4.3	4.3
19.500	4.3	4.3	4.3	4.3	4.3
20.000	4.3	4.3	4.4	4.4	4.4
20.500	4.4	4.4	4.4	4.4	4.4
21.000	4.4	4.4	4.4	4.4	4.4
21.500	4.4	4.4	4.4	4.4	4.4
22.000	4.5	4.5	4.5	4.5	4.5
22.500	4.5	4.5	4.5	4.5	4.5
23.000	4.5	4.5	4.5	4.5	4.5
23.500	4.5	4.5	4.5	4.5	4.6
24.000	4.6	(N/A)	(N/A)	(N/A)	(N/A)

Pond pack 21214

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

Return Event: 2 years
Storm Event: 2 YEAR 24 HR

Time-Depth Curve: 2 YEAR 24 HR	
Label	2 YEAR 24 HR
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	2 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	0.0	0.0	0.0	0.0	0.0
1.500	0.0	0.0	0.0	0.0	0.0
2.000	0.0	0.0	0.0	0.0	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.000	0.1	0.1	0.1	0.1	0.1
3.500	0.1	0.1	0.1	0.1	0.1
4.000	0.1	0.1	0.1	0.1	0.1
4.500	0.1	0.1	0.1	0.1	0.1
5.000	0.1	0.1	0.1	0.1	0.1
5.500	0.1	0.1	0.1	0.1	0.2
6.000	0.2	0.2	0.2	0.2	0.2
6.500	0.2	0.2	0.2	0.2	0.2
7.000	0.2	0.2	0.2	0.2	0.2
7.500	0.2	0.2	0.2	0.2	0.2
8.000	0.2	0.2	0.2	0.2	0.2
8.500	0.3	0.3	0.3	0.3	0.3
9.000	0.3	0.3	0.3	0.3	0.3
9.500	0.3	0.3	0.3	0.3	0.3
10.000	0.3	0.4	0.4	0.4	0.4
10.500	0.4	0.4	0.4	0.4	0.4
11.000	0.5	0.5	0.5	0.5	0.5
11.500	0.5	0.6	0.7	0.8	1.1
12.000	1.3	1.3	1.3	1.4	1.4
12.500	1.4	1.4	1.4	1.5	1.5
13.000	1.5	1.5	1.5	1.5	1.5
13.500	1.5	1.5	1.6	1.6	1.6
14.000	1.6	1.6	1.6	1.6	1.6
14.500	1.6	1.6	1.6	1.6	1.6
15.000	1.6	1.6	1.6	1.7	1.7
15.500	1.7	1.7	1.7	1.7	1.7
16.000	1.7	1.7	1.7	1.7	1.7
16.500	1.7	1.7	1.7	1.7	1.7

Pond pack 21214

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

Return Event: 2 years
Storm Event: 2 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)
17.000	1.7	1.7	1.7	1.7	1.7
17.500	1.8	1.8	1.8	1.8	1.8
18.000	1.8	1.8	1.8	1.8	1.8
18.500	1.8	1.8	1.8	1.8	1.8
19.000	1.8	1.8	1.8	1.8	1.8
19.500	1.8	1.8	1.8	1.8	1.8
20.000	1.8	1.8	1.8	1.8	1.8
20.500	1.8	1.8	1.8	1.8	1.8
21.000	1.9	1.9	1.9	1.9	1.9
21.500	1.9	1.9	1.9	1.9	1.9
22.000	1.9	1.9	1.9	1.9	1.9
22.500	1.9	1.9	1.9	1.9	1.9
23.000	1.9	1.9	1.9	1.9	1.9
23.500	1.9	1.9	1.9	1.9	1.9
24.000	1.9	(N/A)	(N/A)	(N/A)	(N/A)

Pond pack 21214

Subsection: Time of Concentration Calculations
Label: BASIN A EXISTING

Return Event: 10 years
Storm Event: 10 YEAR 24 HR

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	300.00 ft
Manning's n	0.400
Slope	0.018 ft/ft
2 Year 24 Hour Depth	1.9 in
Average Velocity	0.07 ft/s
Segment Time of Concentration	1.161 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	242.00 ft
Is Paved?	False
Slope	0.006 ft/ft
Average Velocity	1.25 ft/s
Segment Time of Concentration	0.054 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	1.214 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:

V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

Pond pack 21214

Subsection: Time of Concentration Calculations
Label: BASIN A EXISTING

Return Event: 100 years
Storm Event: 100 YEAR 24 HR

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	300.00 ft
Manning's n	0.400
Slope	0.018 ft/ft
2 Year 24 Hour Depth	1.9 in
Average Velocity	0.07 ft/s
Segment Time of Concentration	1.161 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	242.00 ft
Is Paved?	False
Slope	0.006 ft/ft
Average Velocity	1.25 ft/s
Segment Time of Concentration	0.054 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	1.214 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:

V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

Pond pack 21214

Subsection: Time of Concentration Calculations
Label: BASIN B EXISTING

Return Event: 10 years
Storm Event: 10 YEAR 24 HR

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	276.00 ft
Manning's n	0.400
Slope	0.013 ft/ft
2 Year 24 Hour Depth	1.9 in
Average Velocity	0.06 ft/s
Segment Time of Concentration	1.243 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	377.00 ft
Is Paved?	False
Slope	0.004 ft/ft
Average Velocity	1.02 ft/s
Segment Time of Concentration	0.103 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	1.346 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:

V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

Pond pack 21214

Subsection: Time of Concentration Calculations
Label: BASIN B EXISTING

Return Event: 100 years
Storm Event: 100 YEAR 24 HR

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	276.00 ft
Manning's n	0.400
Slope	0.013 ft/ft
2 Year 24 Hour Depth	1.9 in
Average Velocity	0.06 ft/s
Segment Time of Concentration	1.243 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	377.00 ft
Is Paved?	False
Slope	0.004 ft/ft
Average Velocity	1.02 ft/s
Segment Time of Concentration	0.103 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	1.346 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:

V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

Pond pack 21214

Subsection: Runoff CN-Area
Label: BASIN A PROPOSED

Return Event: 2 years
Storm Event: 2 YEAR 24 HR

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Herbaceous - poor - Soil B	80.000	294,204.000	0.0	0.0	80.000
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil B	98.000	13,879.000	0.0	0.0	98.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	308,083.000	(N/A)	(N/A)	80.811

Pond pack 21214

Subsection: Runoff CN-Area
Label: BASIN A EXISTING

Return Event: 10 years
Storm Event: 10 YEAR 24 HR

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Herbaceous - poor - Soil B	80.000	220,818.000	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	220,818.000	(N/A)	(N/A)	80.000

Pond pack 21214

Subsection: Runoff CN-Area
Label: BASIN A PROPOSED

Return Event: 100 years
Storm Event: 100 YEAR 24 HR

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Herbaceous - poor - Soil B	80.000	294,204.000	0.0	0.0	80.000
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil B	98.000	13,879.000	0.0	0.0	98.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	308,083.000	(N/A)	(N/A)	80.811

Pond pack 21214

Subsection: Runoff CN-Area
Label: BASIN A EXISTING

Return Event: 100 years
Storm Event: 100 YEAR 24 HR

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Herbaceous - poor - Soil B	80.000	220,818.000	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	220,818.000	(N/A)	(N/A)	80.000

Pond pack 21214

Subsection: Runoff CN-Area
Label: BASIN A PROPOSED

Return Event: 10 years
Storm Event: 10 YEAR 24 HR

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Herbaceous - poor - Soil B	80.000	294,204.000	0.0	0.0	80.000
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil B	98.000	13,943.000	0.0	0.0	98.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	308,147.000	(N/A)	(N/A)	80.814

Pond pack 21214

Subsection: Runoff CN-Area
Label: BASIN B PROPOSED

Return Event: 2 years
Storm Event: 2 YEAR 24 HR

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Herbaceous - poor - Soil B	80.000	16,836.000	0.0	0.0	80.000
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil B	98.000	1,181.000	0.0	0.0	98.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	18,017.000	(N/A)	(N/A)	81.180

Pond pack 21214

Subsection: Runoff CN-Area
Label: BASIN B EXISTING

Return Event: 10 years
Storm Event: 10 YEAR 24 HR

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Herbaceous - poor - Soil B	80.000	90,085.000	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	90,085.000	(N/A)	(N/A)	80.000

Pond pack 21214

Subsection: Runoff CN-Area
Label: BASIN B PROPOSED

Return Event: 100 years
Storm Event: 100 YEAR 24 HR

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Herbaceous - poor - Soil B	80.000	16,836.000	0.0	0.0	80.000
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil B	98.000	1,181.000	0.0	0.0	98.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	18,017.000	(N/A)	(N/A)	81.180

Pond pack 21214

Subsection: Runoff CN-Area
Label: BASIN B EXISTING

Return Event: 100 years
Storm Event: 100 YEAR 24 HR

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Herbaceous - poor - Soil B	80.000	90,085.000	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	90,085.000	(N/A)	(N/A)	80.000

Pond pack 21214

Subsection: Runoff CN-Area
Label: BASIN B PROPOSED

Return Event: 10 years
Storm Event: 10 YEAR 24 HR

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Herbaceous - poor - Soil B	80.000	16,836.000	0.0	0.0	80.000
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil B	98.000	1,174.000	0.0	0.0	98.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	18,010.000	(N/A)	(N/A)	81.173

Pond pack 21214

Subsection: Unit Hydrograph Equations

Unit Hydrograph Method (Computational Notes)

Definition of Terms

At	Total area (acres): At = Ai+Ap
Ai	Impervious area (acres)
Ap	Pervious area (acres)
CNi	Runoff curve number for impervious area
CNp	Runoff curve number for pervious area
fLoss	f loss constant infiltration (depth/time)
gKs	Saturated Hydraulic Conductivity (depth/time)
Md	Volumetric Moisture Deficit
Psi	Capillary Suction (length)
hK	Horton Infiltration Decay Rate (time^-1)
fo	Initial Infiltration Rate (depth/time)
fc	Ultimate(capacity)Infiltration Rate (depth/time)
Ia	Initial Abstraction (length)
dt	Computational increment (duration of unit excess rainfall) Default dt is smallest value of 0.1333Tc, rtm, and th (Smallest dt is then adjusted to match up with Tp)
UDdt	User specified override computational main time increment (only used if UDdt is => .1333Tc)
D(t)	Point on distribution curve (fraction of P) for time step t
K	2 / (1 + (Tr/Tp)): default K = 0.75: (for Tr/Tp = 1.67)
Ks	Hydrograph shape factor = Unit Conversions * K: = ((1hr/3600sec) * (1ft/12in) * ((5280ft)**2/sq.mi)) * K Default Ks = 645.333 * 0.75 = 484
Lag	Lag time from center of excess runoff (dt) to Tp: Lag = 0.6Tc
P	Total precipitation depth, inches
Pa(t)	Accumulated rainfall at time step t
Pi(t)	Incremental rainfall at time step t
qp	Peak discharge (cfs) for 1in. runoff, for 1hr, for 1 sq.mi. = (Ks * A * Q) / Tp (where Q = 1in. runoff, A=sq.mi.)
Qu(t)	Unit hydrograph ordinate (cfs) at time step t
Q(t)	Final hydrograph ordinate (cfs) at time step t
Rai(t)	Accumulated runoff (inches) at time step t for impervious area
Rap(t)	Accumulated runoff (inches) at time step t for pervious area
Rii(t)	Incremental runoff (inches) at time step t for impervious area
Rip(t)	Incremental runoff (inches) at time step t for pervious area
R(t)	Incremental weighted total runoff (inches)
Rtm	Time increment for rainfall table
Si	S for impervious area: Si = (1000/CNi) - 10
Sp	S for pervious area: Sp = (1000/CNp) - 10
t	Time step (row) number
Tc	Time of concentration
Tb	Time (hrs) of entire unit hydrograph: Tb = Tp + Tr
Tp	Time (hrs) to peak of a unit hydrograph: Tp = (dt/2) + Lag
Tr	Time (hrs) of receding limb of unit hydrograph: Tr = ratio of Tp

Pond pack 21214

Subsection: Unit Hydrograph Equations

Unit Hydrograph Method
Computational Notes
Precipitation

Column (1)	Time for time step t
Column (2)	D(t) = Point on distribution curve for time step t
Column (3)	Pi(t) = Pa(t) - Pa(t-1): Col.(4) - Preceding Col.(4)
Column (4)	Pa(t) = D(t) x P: Col.(2) x P

Pervious Area Runoff (using SCS Runoff CN Method)

Column (5)	Rap(t) = Accumulated pervious runoff for time step t
	If (Pa(t) is <= 0.2Sp) then use: Rap(t) = 0.0
	If (Pa(t) is > 0.2Sp) then use:
	
	Rap(t) = (Col.(4)-0.2Sp)**2 / (Col.(4)+0.8Sp)

Column (6)	Rip(t) = Incremental pervious runoff for time step t Rip(t) = Rap(t) - Rap(t-1) Rip(t) = Col.(5) for current row - Col.(5) for preceding row.

Impervious Area Runoff

Column (7 & 8)...	Did not specify to use impervious areas.

Incremental Weighted Runoff

Column (9)	R(t) = (Ap/At) x Rip(t) + (Ai/At) x Rii(t) R(t) = (Ap/At) x Col.(6) + (Ai/At) x Col.(8)

SCS Unit Hydrograph Method

Column (10)	Q(t) is computed with the SCS unit hydrograph method using R(t) and Qu(t).

Pond pack 21214

Subsection: Unit Hydrograph Summary
Label: BASIN A PROPOSED

Return Event: 2 years
Storm Event: 2 YEAR 24 HR

Storm Event	2 YEAR 24 HR
Return Event	2 years
Duration	24.000 hours
Depth	1.9 in
Time of Concentration (Composite)	1.214 hours
Area (User Defined)	308,147.000 ft²

Computational Time Increment	0.253 hours
Time to Peak (Computed)	13.173 hours
Flow (Peak, Computed)	1.14 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	13.200 hours
Flow (Peak Interpolated Output)	1.13 ft³/s

Drainage Area	
SCS CN (Composite)	81.000
Area (User Defined)	308,147.000 ft²
Maximum Retention (Pervious)	2.3 in
Maximum Retention (Pervious, 20 percent)	0.5 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	0.6 in
Runoff Volume (Pervious)	14,235.115 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	13,709.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	1.214 hours
Computational Time Increment	0.253 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Pond pack 21214

Subsection: Unit Hydrograph Summary
Label: BASIN A PROPOSED

Return Event: 2 years
Storm Event: 2 YEAR 24 HR

SCS Unit Hydrograph Parameters	
Unit peak, qp	4.22 ft³/s
Unit peak time, Tp	1.267 hours
Unit receding limb, Tr	5.067 hours
Total unit time, Tb	6.333 hours

Pond pack 21214

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 2 years
Label: BASIN A PROPOSED Storm Event: 2 YEAR 24 HR

Storm Event	2 YEAR 24 HR
Return Event	2 years
Duration	24.000 hours
Depth	1.9 in
Time of Concentration (Composite)	1.214 hours
Area (User Defined)	308,147.000 ft²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
11.400	0.00	0.00	0.00	0.00	0.00
11.650	0.01	0.02	0.03	0.04	0.05
11.900	0.07	0.10	0.13	0.16	0.20
12.150	0.23	0.28	0.34	0.40	0.45
12.400	0.51	0.57	0.64	0.70	0.76
12.650	0.83	0.88	0.92	0.96	1.00
12.900	1.05	1.07	1.09	1.10	1.12
13.150	1.13	1.13	1.12	1.12	1.11
13.400	1.10	1.09	1.06	1.04	1.01
13.650	0.99	0.96	0.93	0.90	0.87
13.900	0.84	0.81	0.79	0.76	0.74
14.150	0.71	0.69	0.67	0.65	0.63
14.400	0.61	0.59	0.58	0.56	0.54
14.650	0.53	0.51	0.50	0.49	0.47
14.900	0.46	0.45	0.44	0.43	0.42
15.150	0.41	0.40	0.39	0.38	0.37
15.400	0.36	0.36	0.35	0.34	0.34
15.650	0.33	0.32	0.32	0.31	0.31
15.900	0.30	0.30	0.29	0.29	0.28
16.150	0.28	0.27	0.27	0.26	0.26
16.400	0.26	0.25	0.25	0.25	0.24
16.650	0.24	0.24	0.23	0.23	0.23
16.900	0.22	0.22	0.22	0.22	0.21
17.150	0.21	0.21	0.21	0.20	0.20
17.400	0.20	0.20	0.20	0.19	0.19
17.650	0.19	0.19	0.19	0.18	0.18
17.900	0.18	0.18	0.18	0.18	0.17
18.150	0.17	0.17	0.17	0.17	0.17
18.400	0.17	0.17	0.17	0.16	0.16
18.650	0.16	0.16	0.16	0.16	0.16
18.900	0.16	0.16	0.15	0.15	0.15
19.150	0.15	0.15	0.15	0.15	0.15
19.400	0.15	0.15	0.14	0.14	0.14

Pond pack 21214

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 2 years
Label: BASIN A PROPOSED Storm Event: 2 YEAR 24 HR

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
19.650	0.14	0.14	0.14	0.14	0.14
19.900	0.14	0.14	0.14	0.13	0.13
20.150	0.13	0.13	0.13	0.13	0.13
20.400	0.13	0.13	0.13	0.13	0.12
20.650	0.12	0.12	0.12	0.12	0.12
20.900	0.12	0.12	0.12	0.12	0.12
21.150	0.12	0.12	0.11	0.11	0.11
21.400	0.11	0.11	0.11	0.11	0.11
21.650	0.11	0.11	0.11	0.11	0.11
21.900	0.11	0.11	0.11	0.11	0.11
22.150	0.11	0.11	0.11	0.11	0.11
22.400	0.11	0.11	0.10	0.10	0.10
22.650	0.10	0.10	0.10	0.10	0.10
22.900	0.10	0.10	0.10	0.10	0.10
23.150	0.10	0.10	0.10	0.10	0.10
23.400	0.10	0.10	0.10	0.10	0.10
23.650	0.10	0.10	0.10	0.10	0.10
23.900	0.10	0.10	0.10	(N/A)	(N/A)

Pond pack 21214

Subsection: Unit Hydrograph Summary
Label: BASIN A EXISTING

Return Event: 10 years
Storm Event: 10 YEAR 24 HR

Storm Event	10 YEAR 24 HR
Return Event	10 years
Duration	24.000 hours
Depth	2.9 in
Time of Concentration (Composite)	1.214 hours
Area (User Defined)	220,818.000 ft²

Computational Time Increment	0.162 hours
Time to Peak (Computed)	12.630 hours
Flow (Peak, Computed)	2.60 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.650 hours
Flow (Peak Interpolated Output)	2.59 ft³/s

Drainage Area	
SCS CN (Composite)	80.000
Area (User Defined)	220,818.000 ft²
Maximum Retention (Pervious)	2.5 in
Maximum Retention (Pervious, 20 percent)	0.5 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.2 in
Runoff Volume (Pervious)	21,359.706 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	20,934.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	1.214 hours
Computational Time Increment	0.162 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Pond pack 21214

Subsection: Unit Hydrograph Summary
Label: BASIN A EXISTING

Return Event: 10 years
Storm Event: 10 YEAR 24 HR

SCS Unit Hydrograph Parameters	
Unit peak, qp	4.73 ft³/s
Unit peak time, Tp	0.810 hours
Unit receding limb, Tr	3.238 hours
Total unit time, Tb	4.048 hours

Pond pack 21214

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 10 years
Label: BASIN A EXISTING Storm Event: 10 YEAR 24 HR

Storm Event	10 YEAR 24 HR
Return Event	10 years
Duration	24.000 hours
Depth	2.9 in
Time of Concentration (Composite)	1.214 hours
Area (User Defined)	220,818.000 ft²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
10.200	0.00	0.00	0.00	0.00	0.00
10.450	0.00	0.00	0.01	0.01	0.01
10.700	0.01	0.01	0.01	0.02	0.02
10.950	0.02	0.03	0.03	0.03	0.04
11.200	0.04	0.05	0.05	0.06	0.07
11.450	0.07	0.08	0.10	0.11	0.12
11.700	0.16	0.19	0.23	0.30	0.41
11.950	0.51	0.63	0.81	0.98	1.16
12.200	1.38	1.60	1.82	1.99	2.16
12.450	2.33	2.43	2.49	2.56	2.59
12.700	2.57	2.55	2.51	2.43	2.35
12.950	2.27	2.15	2.04	1.92	1.81
13.200	1.71	1.61	1.52	1.44	1.36
13.450	1.29	1.23	1.17	1.11	1.06
13.700	1.01	0.96	0.92	0.88	0.84
13.950	0.81	0.77	0.74	0.71	0.69
14.200	0.66	0.64	0.62	0.60	0.58
14.450	0.56	0.54	0.52	0.51	0.50
14.700	0.48	0.47	0.46	0.45	0.44
14.950	0.43	0.42	0.41	0.40	0.40
15.200	0.39	0.38	0.38	0.37	0.36
15.450	0.36	0.35	0.35	0.34	0.34
15.700	0.33	0.33	0.32	0.32	0.31
15.950	0.31	0.30	0.30	0.30	0.29
16.200	0.29	0.29	0.28	0.28	0.28
16.450	0.27	0.27	0.27	0.26	0.26
16.700	0.26	0.26	0.25	0.25	0.25
16.950	0.25	0.24	0.24	0.24	0.24
17.200	0.24	0.23	0.23	0.23	0.23
17.450	0.23	0.23	0.22	0.22	0.22
17.700	0.22	0.22	0.22	0.22	0.22
17.950	0.21	0.21	0.21	0.21	0.21
18.200	0.21	0.21	0.20	0.20	0.20

Pond pack 21214

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 10 years
Label: BASIN A EXISTING Storm Event: 10 YEAR 24 HR

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
18.450	0.20	0.20	0.20	0.20	0.20
18.700	0.19	0.19	0.19	0.19	0.19
18.950	0.19	0.19	0.19	0.19	0.18
19.200	0.18	0.18	0.18	0.18	0.18
19.450	0.18	0.18	0.17	0.17	0.17
19.700	0.17	0.17	0.17	0.17	0.17
19.950	0.16	0.16	0.16	0.16	0.16
20.200	0.16	0.16	0.16	0.15	0.15
20.450	0.15	0.15	0.15	0.15	0.15
20.700	0.15	0.15	0.14	0.14	0.14
20.950	0.14	0.14	0.14	0.14	0.14
21.200	0.14	0.14	0.14	0.14	0.14
21.450	0.14	0.14	0.14	0.14	0.14
21.700	0.14	0.14	0.14	0.13	0.13
21.950	0.13	0.13	0.13	0.13	0.13
22.200	0.13	0.13	0.13	0.13	0.13
22.450	0.13	0.13	0.13	0.13	0.13
22.700	0.13	0.13	0.13	0.13	0.13
22.950	0.13	0.13	0.13	0.13	0.13
23.200	0.13	0.13	0.13	0.13	0.13
23.450	0.13	0.13	0.13	0.13	0.13
23.700	0.13	0.13	0.13	0.12	0.12
23.950	0.12	0.12	(N/A)	(N/A)	(N/A)

Pond pack 21214

Subsection: Unit Hydrograph Summary
Label: BASIN A PROPOSED

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	4.6 in
Time of Concentration (Composite)	1.214 hours
Area (User Defined)	308,147.000 ft²

Computational Time Increment	0.253 hours
Time to Peak (Computed)	13.173 hours
Flow (Peak, Computed)	5.98 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	13.150 hours
Flow (Peak Interpolated Output)	5.97 ft³/s

Drainage Area	
SCS CN (Composite)	81.000
Area (User Defined)	308,147.000 ft²
Maximum Retention (Pervious)	2.3 in
Maximum Retention (Pervious, 20 percent)	0.5 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.6 in
Runoff Volume (Pervious)	66,752.962 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	64,990.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	1.214 hours
Computational Time Increment	0.253 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Pond pack 21214

Subsection: Unit Hydrograph Summary
Label: BASIN A PROPOSED

Return Event: 100 years
Storm Event: 100 YEAR 24 HR

SCS Unit Hydrograph Parameters	
Unit peak, qp	4.22 ft³/s
Unit peak time, Tp	1.267 hours
Unit receding limb, Tr	5.067 hours
Total unit time, Tb	6.333 hours

Pond pack 21214

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 100 years
Label: BASIN A PROPOSED Storm Event: 100 YEAR 24 HR

Storm Event	100 YEAR 24 HR
Return Event	100 years
Duration	24.000 hours
Depth	4.6 in
Time of Concentration (Composite)	1.214 hours
Area (User Defined)	308,147.000 ft²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
7.750	0.00	0.00	0.00	0.00	0.00
8.000	0.00	0.00	0.00	0.00	0.01
8.250	0.01	0.01	0.01	0.01	0.01
8.500	0.01	0.01	0.02	0.02	0.02
8.750	0.02	0.02	0.02	0.03	0.03
9.000	0.03	0.04	0.04	0.04	0.04
9.250	0.05	0.05	0.05	0.06	0.06
9.500	0.07	0.07	0.07	0.08	0.08
9.750	0.09	0.09	0.10	0.10	0.11
10.000	0.11	0.12	0.12	0.13	0.13
10.250	0.14	0.14	0.15	0.16	0.16
10.500	0.17	0.18	0.19	0.19	0.20
10.750	0.21	0.22	0.23	0.24	0.25
11.000	0.26	0.28	0.29	0.30	0.32
11.250	0.33	0.35	0.37	0.38	0.41
11.500	0.44	0.47	0.50	0.53	0.62
11.750	0.71	0.81	0.91	1.00	1.19
12.000	1.39	1.58	1.78	1.98	2.27
12.250	2.57	2.88	3.19	3.49	3.79
12.500	4.09	4.38	4.68	4.98	5.18
12.750	5.35	5.51	5.67	5.83	5.90
13.000	5.92	5.94	5.95	5.97	5.93
13.250	5.84	5.75	5.66	5.57	5.44
13.500	5.27	5.11	4.94	4.77	4.61
13.750	4.43	4.26	4.09	3.92	3.76
14.000	3.63	3.49	3.36	3.22	3.10
14.250	2.99	2.89	2.79	2.69	2.59
14.500	2.51	2.43	2.35	2.27	2.19
14.750	2.12	2.06	1.99	1.93	1.86
15.000	1.81	1.76	1.71	1.66	1.61
15.250	1.57	1.53	1.49	1.45	1.41
15.500	1.38	1.35	1.32	1.29	1.26
15.750	1.23	1.21	1.18	1.16	1.13

Pond pack 21214

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 100 years
Label: BASIN A PROPOSED Storm Event: 100 YEAR 24 HR

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
16.000	1.11	1.09	1.07	1.05	1.03
16.250	1.01	0.99	0.97	0.96	0.94
16.500	0.92	0.91	0.89	0.88	0.87
16.750	0.85	0.84	0.83	0.82	0.80
17.000	0.79	0.78	0.77	0.76	0.75
17.250	0.74	0.73	0.72	0.72	0.71
17.500	0.70	0.69	0.68	0.67	0.67
17.750	0.66	0.65	0.65	0.64	0.63
18.000	0.63	0.62	0.61	0.61	0.60
18.250	0.60	0.59	0.59	0.59	0.58
18.500	0.58	0.57	0.57	0.56	0.56
18.750	0.56	0.55	0.55	0.54	0.54
19.000	0.54	0.53	0.53	0.53	0.52
19.250	0.52	0.52	0.51	0.51	0.50
19.500	0.50	0.50	0.49	0.49	0.49
19.750	0.48	0.48	0.48	0.47	0.47
20.000	0.47	0.46	0.46	0.46	0.45
20.250	0.45	0.45	0.44	0.44	0.44
20.500	0.43	0.43	0.43	0.42	0.42
20.750	0.42	0.41	0.41	0.41	0.41
21.000	0.40	0.40	0.40	0.40	0.39
21.250	0.39	0.39	0.39	0.38	0.38
21.500	0.38	0.38	0.38	0.38	0.37
21.750	0.37	0.37	0.37	0.37	0.37
22.000	0.37	0.36	0.36	0.36	0.36
22.250	0.36	0.36	0.36	0.36	0.36
22.500	0.35	0.35	0.35	0.35	0.35
22.750	0.35	0.35	0.35	0.35	0.35
23.000	0.35	0.34	0.34	0.34	0.34
23.250	0.34	0.34	0.34	0.34	0.34
23.500	0.34	0.34	0.34	0.34	0.33
23.750	0.33	0.33	0.33	0.33	0.33
24.000	0.33	(N/A)	(N/A)	(N/A)	(N/A)

Pond pack 21214

Subsection: Unit Hydrograph Summary
Label: BASIN A EXISTING

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	4.6 in
Time of Concentration (Composite)	1.214 hours
Area (User Defined)	220,818.000 ft²

Computational Time Increment	0.162 hours
Time to Peak (Computed)	12.630 hours
Flow (Peak, Computed)	5.86 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.650 hours
Flow (Peak Interpolated Output)	5.83 ft³/s

Drainage Area	
SCS CN (Composite)	80.000
Area (User Defined)	220,818.000 ft²
Maximum Retention (Pervious)	2.5 in
Maximum Retention (Pervious, 20 percent)	0.5 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.5 in
Runoff Volume (Pervious)	46,238.975 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	45,458.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	1.214 hours
Computational Time Increment	0.162 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Pond pack 21214

Subsection: Unit Hydrograph Summary
Label: BASIN A EXISTING

Return Event: 100 years
Storm Event: 100 YEAR 24 HR

SCS Unit Hydrograph Parameters	
Unit peak, qp	4.73 ft³/s
Unit peak time, Tp	0.810 hours
Unit receding limb, Tr	3.238 hours
Total unit time, Tb	4.048 hours

Pond pack 21214

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 100 years
Label: BASIN A EXISTING Storm Event: 100 YEAR 24 HR

Storm Event	100 YEAR 24 HR
Return Event	100 years
Duration	24.000 hours
Depth	4.6 in
Time of Concentration (Composite)	1.214 hours
Area (User Defined)	220,818.000 ft²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
8.000	0.00	0.00	0.00	0.00	0.00
8.250	0.00	0.00	0.01	0.01	0.01
8.500	0.01	0.01	0.01	0.01	0.01
8.750	0.02	0.02	0.02	0.02	0.03
9.000	0.03	0.03	0.03	0.04	0.04
9.250	0.04	0.04	0.05	0.05	0.05
9.500	0.06	0.06	0.07	0.07	0.07
9.750	0.08	0.08	0.08	0.09	0.09
10.000	0.10	0.10	0.10	0.11	0.11
10.250	0.12	0.12	0.13	0.14	0.14
10.500	0.15	0.16	0.16	0.17	0.18
10.750	0.19	0.20	0.21	0.22	0.23
11.000	0.24	0.25	0.27	0.28	0.29
11.250	0.31	0.33	0.35	0.37	0.39
11.500	0.41	0.45	0.49	0.52	0.61
11.750	0.71	0.80	0.98	1.22	1.46
12.000	1.76	2.15	2.54	2.94	3.41
12.250	3.89	4.36	4.71	5.05	5.39
12.500	5.58	5.69	5.80	5.83	5.75
12.750	5.67	5.56	5.36	5.15	4.94
13.000	4.67	4.40	4.13	3.88	3.65
13.250	3.42	3.22	3.04	2.87	2.70
13.500	2.57	2.43	2.30	2.19	2.08
13.750	1.97	1.88	1.79	1.71	1.63
14.000	1.57	1.50	1.43	1.38	1.32
14.250	1.27	1.23	1.18	1.14	1.10
14.500	1.07	1.03	1.00	0.97	0.94
14.750	0.92	0.89	0.87	0.85	0.83
15.000	0.81	0.79	0.78	0.76	0.75
15.250	0.73	0.72	0.71	0.70	0.68
15.500	0.67	0.66	0.65	0.64	0.63
15.750	0.62	0.61	0.60	0.59	0.58
16.000	0.58	0.57	0.56	0.55	0.55

Pond pack 21214

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 100 years
Label: BASIN A EXISTING Storm Event: 100 YEAR 24 HR

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
16.250	0.54	0.53	0.53	0.52	0.51
16.500	0.51	0.50	0.50	0.49	0.49
16.750	0.48	0.48	0.47	0.47	0.46
17.000	0.46	0.45	0.45	0.45	0.44
17.250	0.44	0.44	0.43	0.43	0.43
17.500	0.42	0.42	0.42	0.42	0.41
17.750	0.41	0.41	0.41	0.40	0.40
18.000	0.40	0.40	0.39	0.39	0.39
18.250	0.39	0.38	0.38	0.38	0.38
18.500	0.37	0.37	0.37	0.37	0.36
18.750	0.36	0.36	0.36	0.35	0.35
19.000	0.35	0.35	0.34	0.34	0.34
19.250	0.34	0.34	0.33	0.33	0.33
19.500	0.33	0.32	0.32	0.32	0.32
19.750	0.31	0.31	0.31	0.31	0.30
20.000	0.30	0.30	0.30	0.30	0.29
20.250	0.29	0.29	0.29	0.28	0.28
20.500	0.28	0.28	0.28	0.27	0.27
20.750	0.27	0.27	0.27	0.27	0.26
21.000	0.26	0.26	0.26	0.26	0.26
21.250	0.26	0.26	0.26	0.26	0.25
21.500	0.25	0.25	0.25	0.25	0.25
21.750	0.25	0.25	0.25	0.25	0.25
22.000	0.25	0.25	0.25	0.25	0.25
22.250	0.24	0.24	0.24	0.24	0.24
22.500	0.24	0.24	0.24	0.24	0.24
22.750	0.24	0.24	0.24	0.24	0.24
23.000	0.24	0.24	0.24	0.24	0.24
23.250	0.24	0.23	0.23	0.23	0.23
23.500	0.23	0.23	0.23	0.23	0.23
23.750	0.23	0.23	0.23	0.23	0.23
24.000	0.23	(N/A)	(N/A)	(N/A)	(N/A)

Pond pack 21214

Subsection: Unit Hydrograph Summary
Label: BASIN A PROPOSED

Return Event: 10 years
Storm Event: 10 YEAR 24 HR

Storm Event	10 YEAR 24 HR
Return Event	10 years
Duration	24.000 hours
Depth	2.9 in
Time of Concentration (Composite)	1.214 hours
Area (User Defined)	308,147.000 ft²

Computational Time Increment	0.162 hours
Time to Peak (Computed)	12.626 hours
Flow (Peak, Computed)	3.85 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.650 hours
Flow (Peak Interpolated Output)	3.84 ft³/s

Drainage Area	
SCS CN (Composite)	81.000
Area (User Defined)	308,147.000 ft²
Maximum Retention (Pervious)	2.3 in
Maximum Retention (Pervious, 20 percent)	0.5 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.2 in
Runoff Volume (Pervious)	31,378.957 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	30,771.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	1.214 hours
Computational Time Increment	0.162 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Pond pack 21214

Subsection: Unit Hydrograph Summary
Label: BASIN A PROPOSED

Return Event: 10 years
Storm Event: 10 YEAR 24 HR

SCS Unit Hydrograph Parameters	
Unit peak, qp	6.60 ft³/s
Unit peak time, Tp	0.809 hours
Unit receding limb, Tr	3.237 hours
Total unit time, Tb	4.047 hours

Pond pack 21214

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 10 years
Label: BASIN A PROPOSED Storm Event: 10 YEAR 24 HR

Storm Event	10 YEAR 24 HR
Return Event	10 years
Duration	24.000 hours
Depth	2.9 in
Time of Concentration (Composite)	1.214 hours
Area (User Defined)	308,147.000 ft²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
9.900	0.00	0.00	0.00	0.00	0.00
10.150	0.00	0.01	0.01	0.01	0.01
10.400	0.01	0.01	0.02	0.02	0.02
10.650	0.03	0.03	0.03	0.04	0.04
10.900	0.05	0.05	0.06	0.06	0.07
11.150	0.08	0.08	0.09	0.10	0.11
11.400	0.12	0.13	0.15	0.17	0.19
11.650	0.21	0.26	0.32	0.37	0.49
11.900	0.64	0.78	0.98	1.23	1.49
12.150	1.76	2.08	2.40	2.72	2.98
12.400	3.22	3.47	3.61	3.71	3.80
12.650	3.84	3.80	3.77	3.72	3.59
12.900	3.47	3.35	3.17	3.00	2.83
13.150	2.67	2.52	2.36	2.23	2.11
13.400	2.00	1.89	1.80	1.71	1.62
13.650	1.55	1.47	1.40	1.34	1.28
13.900	1.22	1.17	1.13	1.08	1.04
14.150	1.00	0.96	0.92	0.89	0.86
14.400	0.83	0.81	0.78	0.76	0.74
14.650	0.72	0.70	0.68	0.66	0.65
14.900	0.63	0.62	0.61	0.59	0.58
15.150	0.57	0.56	0.55	0.54	0.53
15.400	0.52	0.52	0.51	0.50	0.49
15.650	0.48	0.48	0.47	0.46	0.45
15.900	0.45	0.44	0.44	0.43	0.43
16.150	0.42	0.42	0.41	0.41	0.40
16.400	0.40	0.39	0.39	0.38	0.38
16.650	0.37	0.37	0.37	0.36	0.36
16.900	0.36	0.35	0.35	0.35	0.34
17.150	0.34	0.34	0.34	0.33	0.33
17.400	0.33	0.33	0.33	0.32	0.32
17.650	0.32	0.32	0.32	0.31	0.31
17.900	0.31	0.31	0.31	0.30	0.30

Pond pack 21214

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 10 years
Label: BASIN A PROPOSED Storm Event: 10 YEAR 24 HR

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
18.150	0.30	0.30	0.30	0.29	0.29
18.400	0.29	0.29	0.29	0.29	0.28
18.650	0.28	0.28	0.28	0.28	0.27
18.900	0.27	0.27	0.27	0.27	0.27
19.150	0.26	0.26	0.26	0.26	0.26
19.400	0.25	0.25	0.25	0.25	0.25
19.650	0.25	0.24	0.24	0.24	0.24
19.900	0.24	0.24	0.23	0.23	0.23
20.150	0.23	0.23	0.22	0.22	0.22
20.400	0.22	0.22	0.22	0.21	0.21
20.650	0.21	0.21	0.21	0.21	0.21
20.900	0.21	0.20	0.20	0.20	0.20
21.150	0.20	0.20	0.20	0.20	0.20
21.400	0.20	0.20	0.20	0.20	0.20
21.650	0.20	0.19	0.19	0.19	0.19
21.900	0.19	0.19	0.19	0.19	0.19
22.150	0.19	0.19	0.19	0.19	0.19
22.400	0.19	0.19	0.19	0.19	0.19
22.650	0.19	0.19	0.19	0.19	0.19
22.900	0.19	0.19	0.18	0.18	0.18
23.150	0.18	0.18	0.18	0.18	0.18
23.400	0.18	0.18	0.18	0.18	0.18
23.650	0.18	0.18	0.18	0.18	0.18
23.900	0.18	0.18	0.18	(N/A)	(N/A)

Storm Event	2 YEAR 24 HR
Return Event	2 years
Duration	24.000 hours
Depth	1.9 in
Time of Concentration (Composite)	1.346 hours
Area (User Defined)	18,010.000 ft²

Computational Time Increment	0.179 hours
Time to Peak (Computed)	12.742 hours
Flow (Peak, Computed)	0.09 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.750 hours
Flow (Peak Interpolated Output)	0.09 ft³/s

Drainage Area	
SCS CN (Composite)	81.000
Area (User Defined)	18,010.000 ft²
Maximum Retention (Pervious)	2.3 in
Maximum Retention (Pervious, 20 percent)	0.5 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	0.6 in
Runoff Volume (Pervious)	832.483 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	811.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	1.346 hours
Computational Time Increment	0.179 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Pond pack 21214

Subsection: Unit Hydrograph Summary
Label: BASIN B PROPOSED

Return Event: 2 years
Storm Event: 2 YEAR 24 HR

SCS Unit Hydrograph Parameters	
Unit peak, qp	0.35 ft³/s
Unit peak time, Tp	0.897 hours
Unit receding limb, Tr	3.589 hours
Total unit time, Tb	4.487 hours

Storm Event	2 YEAR 24 HR
Return Event	2 years
Duration	24.000 hours
Depth	1.9 in
Time of Concentration (Composite)	1.346 hours
Area (User Defined)	18,010.000 ft²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
11.650	0.00	0.00	0.00	0.00	0.00
11.900	0.01	0.01	0.01	0.02	0.02
12.150	0.03	0.03	0.04	0.05	0.06
12.400	0.06	0.07	0.07	0.08	0.08
12.650	0.08	0.08	0.09	0.09	0.09
12.900	0.09	0.08	0.08	0.08	0.08
13.150	0.07	0.07	0.07	0.06	0.06
13.400	0.06	0.05	0.05	0.05	0.05
13.650	0.05	0.04	0.04	0.04	0.04
13.900	0.04	0.04	0.03	0.03	0.03
14.150	0.03	0.03	0.03	0.03	0.03
14.400	0.03	0.03	0.02	0.02	0.02
14.650	0.02	0.02	0.02	0.02	0.02
14.900	0.02	0.02	0.02	0.02	0.02
15.150	0.02	0.02	0.02	0.02	0.02
15.400	0.02	0.02	0.02	0.02	0.02
15.650	0.02	0.02	0.01	0.01	0.01
15.900	0.01	0.01	0.01	0.01	0.01
16.150	0.01	0.01	0.01	0.01	0.01
16.400	0.01	0.01	0.01	0.01	0.01
16.650	0.01	0.01	0.01	0.01	0.01
16.900	0.01	0.01	0.01	0.01	0.01
17.150	0.01	0.01	0.01	0.01	0.01
17.400	0.01	0.01	0.01	0.01	0.01
17.650	0.01	0.01	0.01	0.01	0.01
17.900	0.01	0.01	0.01	0.01	0.01
18.150	0.01	0.01	0.01	0.01	0.01
18.400	0.01	0.01	0.01	0.01	0.01
18.650	0.01	0.01	0.01	0.01	0.01
18.900	0.01	0.01	0.01	0.01	0.01
19.150	0.01	0.01	0.01	0.01	0.01
19.400	0.01	0.01	0.01	0.01	0.01
19.650	0.01	0.01	0.01	0.01	0.01

Pond pack 21214

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 2 years
Label: BASIN B PROPOSED Storm Event: 2 YEAR 24 HR

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
19.900	0.01	0.01	0.01	0.01	0.01
20.150	0.01	0.01	0.01	0.01	0.01
20.400	0.01	0.01	0.01	0.01	0.01
20.650	0.01	0.01	0.01	0.01	0.01
20.900	0.01	0.01	0.01	0.01	0.01
21.150	0.01	0.01	0.01	0.01	0.01
21.400	0.01	0.01	0.01	0.01	0.01
21.650	0.01	0.01	0.01	0.01	0.01
21.900	0.01	0.01	0.01	0.01	0.01
22.150	0.01	0.01	0.01	0.01	0.01
22.400	0.01	0.01	0.01	0.01	0.01
22.650	0.01	0.01	0.01	0.01	0.01
22.900	0.01	0.01	0.01	0.01	0.01
23.150	0.01	0.01	0.01	0.01	0.01
23.400	0.01	0.01	0.01	0.01	0.01
23.650	0.01	0.01	0.01	0.01	0.01
23.900	0.01	0.01	0.01	(N/A)	(N/A)

Pond pack 21214

Subsection: Unit Hydrograph Summary
Label: BASIN B EXISTING

Return Event: 10 years
Storm Event: 10 YEAR 24 HR

Storm Event	10 YEAR 24 HR
Return Event	10 years
Duration	24.000 hours
Depth	2.9 in
Time of Concentration (Composite)	1.346 hours
Area (User Defined)	90,085.000 ft²

Computational Time Increment	0.179 hours
Time to Peak (Computed)	12.740 hours
Flow (Peak, Computed)	0.98 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.750 hours
Flow (Peak Interpolated Output)	0.98 ft³/s

Drainage Area	
SCS CN (Composite)	80.000
Area (User Defined)	90,085.000 ft²
Maximum Retention (Pervious)	2.5 in
Maximum Retention (Pervious, 20 percent)	0.5 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.2 in
Runoff Volume (Pervious)	8,713.914 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	8,521.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	1.346 hours
Computational Time Increment	0.179 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Pond pack 21214

Subsection: Unit Hydrograph Summary
Label: BASIN B EXISTING

Return Event: 10 years
Storm Event: 10 YEAR 24 HR

SCS Unit Hydrograph Parameters	
Unit peak, qp	1.74 ft³/s
Unit peak time, Tp	0.897 hours
Unit receding limb, Tr	3.589 hours
Total unit time, Tb	4.486 hours

Pond pack 21214

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 10 years
Label: BASIN B EXISTING Storm Event: 10 YEAR 24 HR

Storm Event	10 YEAR 24 HR
Return Event	10 years
Duration	24.000 hours
Depth	2.9 in
Time of Concentration (Composite)	1.346 hours
Area (User Defined)	90,085.000 ft²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
10.400	0.00	0.00	0.00	0.00	0.00
10.650	0.00	0.00	0.00	0.00	0.01
10.900	0.01	0.01	0.01	0.01	0.01
11.150	0.01	0.02	0.02	0.02	0.02
11.400	0.02	0.03	0.03	0.03	0.04
11.650	0.04	0.06	0.07	0.09	0.10
11.900	0.14	0.18	0.22	0.27	0.33
12.150	0.40	0.46	0.53	0.61	0.68
12.400	0.75	0.80	0.86	0.91	0.94
12.650	0.95	0.97	0.98	0.97	0.96
12.900	0.95	0.93	0.89	0.86	0.83
13.150	0.79	0.75	0.71	0.68	0.64
13.400	0.61	0.58	0.55	0.52	0.50
13.650	0.47	0.45	0.44	0.42	0.40
13.900	0.38	0.37	0.35	0.34	0.32
14.150	0.31	0.30	0.29	0.28	0.27
14.400	0.26	0.25	0.24	0.23	0.23
14.650	0.22	0.21	0.21	0.20	0.20
14.900	0.19	0.19	0.18	0.18	0.18
15.150	0.17	0.17	0.17	0.16	0.16
15.400	0.16	0.15	0.15	0.15	0.15
15.650	0.14	0.14	0.14	0.14	0.14
15.900	0.13	0.13	0.13	0.13	0.13
16.150	0.12	0.12	0.12	0.12	0.12
16.400	0.12	0.11	0.11	0.11	0.11
16.650	0.11	0.11	0.11	0.11	0.10
16.900	0.10	0.10	0.10	0.10	0.10
17.150	0.10	0.10	0.10	0.10	0.10
17.400	0.10	0.09	0.09	0.09	0.09
17.650	0.09	0.09	0.09	0.09	0.09
17.900	0.09	0.09	0.09	0.09	0.09
18.150	0.09	0.09	0.09	0.08	0.08
18.400	0.08	0.08	0.08	0.08	0.08

Pond pack 21214

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 10 years
Label: BASIN B EXISTING Storm Event: 10 YEAR 24 HR

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
18.650	0.08	0.08	0.08	0.08	0.08
18.900	0.08	0.08	0.08	0.08	0.08
19.150	0.08	0.08	0.08	0.07	0.07
19.400	0.07	0.07	0.07	0.07	0.07
19.650	0.07	0.07	0.07	0.07	0.07
19.900	0.07	0.07	0.07	0.07	0.07
20.150	0.07	0.07	0.06	0.06	0.06
20.400	0.06	0.06	0.06	0.06	0.06
20.650	0.06	0.06	0.06	0.06	0.06
20.900	0.06	0.06	0.06	0.06	0.06
21.150	0.06	0.06	0.06	0.06	0.06
21.400	0.06	0.06	0.06	0.06	0.06
21.650	0.06	0.06	0.06	0.06	0.06
21.900	0.06	0.06	0.05	0.05	0.05
22.150	0.05	0.05	0.05	0.05	0.05
22.400	0.05	0.05	0.05	0.05	0.05
22.650	0.05	0.05	0.05	0.05	0.05
22.900	0.05	0.05	0.05	0.05	0.05
23.150	0.05	0.05	0.05	0.05	0.05
23.400	0.05	0.05	0.05	0.05	0.05
23.650	0.05	0.05	0.05	0.05	0.05
23.900	0.05	0.05	0.05	(N/A)	(N/A)

Storm Event	100 YEAR 24 HR
Return Event	100 years
Duration	24.000 hours
Depth	4.6 in
Time of Concentration (Composite)	1.346 hours
Area (User Defined)	18,010.000 ft²

Computational Time Increment	0.179 hours
Time to Peak (Computed)	12.742 hours
Flow (Peak, Computed)	0.46 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.750 hours
Flow (Peak Interpolated Output)	0.46 ft³/s

Drainage Area	
SCS CN (Composite)	81.000
Area (User Defined)	18,010.000 ft²
Maximum Retention (Pervious)	2.3 in
Maximum Retention (Pervious, 20 percent)	0.5 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.6 in
Runoff Volume (Pervious)	3,903.780 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	3,832.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	1.346 hours
Computational Time Increment	0.179 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Pond pack 21214

Subsection: Unit Hydrograph Summary
Label: BASIN B PROPOSED

Return Event: 100 years
Storm Event: 100 YEAR 24 HR

SCS Unit Hydrograph Parameters	
Unit peak, qp	0.35 ft³/s
Unit peak time, Tp	0.897 hours
Unit receding limb, Tr	3.589 hours
Total unit time, Tb	4.487 hours

Pond pack 21214

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 100 years
Label: BASIN B PROPOSED Storm Event: 100 YEAR 24 HR

Storm Event	100 YEAR 24 HR
Return Event	100 years
Duration	24.000 hours
Depth	4.6 in
Time of Concentration (Composite)	1.346 hours
Area (User Defined)	18,010.000 ft²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
8.400	0.00	0.00	0.00	0.00	0.00
8.650	0.00	0.00	0.00	0.00	0.00
8.900	0.00	0.00	0.00	0.00	0.00
9.150	0.00	0.00	0.00	0.00	0.00
9.400	0.01	0.01	0.01	0.01	0.01
9.650	0.01	0.01	0.01	0.01	0.01
9.900	0.01	0.01	0.01	0.01	0.01
10.150	0.01	0.01	0.01	0.01	0.01
10.400	0.01	0.01	0.01	0.01	0.01
10.650	0.01	0.02	0.02	0.02	0.02
10.900	0.02	0.02	0.02	0.02	0.02
11.150	0.02	0.02	0.03	0.03	0.03
11.400	0.03	0.03	0.03	0.04	0.04
11.650	0.04	0.05	0.06	0.07	0.07
11.900	0.09	0.11	0.13	0.15	0.18
12.150	0.21	0.24	0.28	0.31	0.34
12.400	0.37	0.39	0.41	0.44	0.44
12.650	0.45	0.45	0.46	0.45	0.44
12.900	0.43	0.42	0.41	0.39	0.37
13.150	0.35	0.34	0.32	0.30	0.28
13.400	0.27	0.25	0.24	0.23	0.22
13.650	0.20	0.20	0.19	0.18	0.17
13.900	0.16	0.15	0.15	0.14	0.14
14.150	0.13	0.12	0.12	0.11	0.11
14.400	0.11	0.10	0.10	0.10	0.09
14.650	0.09	0.09	0.08	0.08	0.08
14.900	0.08	0.08	0.07	0.07	0.07
15.150	0.07	0.07	0.07	0.06	0.06
15.400	0.06	0.06	0.06	0.06	0.06
15.650	0.06	0.06	0.05	0.05	0.05
15.900	0.05	0.05	0.05	0.05	0.05
16.150	0.05	0.05	0.05	0.05	0.05
16.400	0.04	0.04	0.04	0.04	0.04

Pond pack 21214

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 100 years
Label: BASIN B PROPOSED Storm Event: 100 YEAR 24 HR

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
16.650	0.04	0.04	0.04	0.04	0.04
16.900	0.04	0.04	0.04	0.04	0.04
17.150	0.04	0.04	0.04	0.04	0.04
17.400	0.04	0.04	0.04	0.04	0.04
17.650	0.04	0.03	0.03	0.03	0.03
17.900	0.03	0.03	0.03	0.03	0.03
18.150	0.03	0.03	0.03	0.03	0.03
18.400	0.03	0.03	0.03	0.03	0.03
18.650	0.03	0.03	0.03	0.03	0.03
18.900	0.03	0.03	0.03	0.03	0.03
19.150	0.03	0.03	0.03	0.03	0.03
19.400	0.03	0.03	0.03	0.03	0.03
19.650	0.03	0.03	0.03	0.03	0.03
19.900	0.03	0.03	0.03	0.03	0.03
20.150	0.02	0.02	0.02	0.02	0.02
20.400	0.02	0.02	0.02	0.02	0.02
20.650	0.02	0.02	0.02	0.02	0.02
20.900	0.02	0.02	0.02	0.02	0.02
21.150	0.02	0.02	0.02	0.02	0.02
21.400	0.02	0.02	0.02	0.02	0.02
21.650	0.02	0.02	0.02	0.02	0.02
21.900	0.02	0.02	0.02	0.02	0.02
22.150	0.02	0.02	0.02	0.02	0.02
22.400	0.02	0.02	0.02	0.02	0.02
22.650	0.02	0.02	0.02	0.02	0.02
22.900	0.02	0.02	0.02	0.02	0.02
23.150	0.02	0.02	0.02	0.02	0.02
23.400	0.02	0.02	0.02	0.02	0.02
23.650	0.02	0.02	0.02	0.02	0.02
23.900	0.02	0.02	0.02	(N/A)	(N/A)

Pond pack 21214

Subsection: Unit Hydrograph Summary
Label: BASIN B EXISTING

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	4.6 in
Time of Concentration (Composite)	1.346 hours
Area (User Defined)	90,085.000 ft²

Computational Time Increment	0.179 hours
Time to Peak (Computed)	12.740 hours
Flow (Peak, Computed)	2.21 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.750 hours
Flow (Peak Interpolated Output)	2.21 ft³/s

Drainage Area	
SCS CN (Composite)	80.000
Area (User Defined)	90,085.000 ft²
Maximum Retention (Pervious)	2.5 in
Maximum Retention (Pervious, 20 percent)	0.5 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.5 in
Runoff Volume (Pervious)	18,863.671 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	18,509.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	1.346 hours
Computational Time Increment	0.179 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Pond pack 21214

Subsection: Unit Hydrograph Summary
Label: BASIN B EXISTING

Return Event: 100 years
Storm Event: 100 YEAR 24 HR

SCS Unit Hydrograph Parameters	
Unit peak, qp	1.74 ft³/s
Unit peak time, Tp	0.897 hours
Unit receding limb, Tr	3.589 hours
Total unit time, Tb	4.486 hours

Storm Event	100 YEAR 24 HR
Return Event	100 years
Duration	24.000 hours
Depth	4.6 in
Time of Concentration (Composite)	1.346 hours
Area (User Defined)	90,085.000 ft²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
8.200	0.00	0.00	0.00	0.00	0.00
8.450	0.00	0.00	0.00	0.00	0.00
8.700	0.01	0.01	0.01	0.01	0.01
8.950	0.01	0.01	0.01	0.01	0.01
9.200	0.01	0.02	0.02	0.02	0.02
9.450	0.02	0.02	0.02	0.02	0.03
9.700	0.03	0.03	0.03	0.03	0.03
9.950	0.03	0.04	0.04	0.04	0.04
10.200	0.04	0.05	0.05	0.05	0.05
10.450	0.05	0.06	0.06	0.06	0.06
10.700	0.07	0.07	0.07	0.08	0.08
10.950	0.09	0.09	0.10	0.10	0.11
11.200	0.11	0.12	0.12	0.13	0.14
11.450	0.15	0.16	0.17	0.18	0.20
11.700	0.23	0.26	0.30	0.35	0.44
11.950	0.53	0.61	0.73	0.87	1.02
12.200	1.16	1.32	1.48	1.64	1.78
12.450	1.89	1.99	2.10	2.14	2.17
12.700	2.19	2.21	2.17	2.13	2.10
12.950	2.04	1.96	1.89	1.81	1.72
13.200	1.62	1.53	1.44	1.37	1.29
13.450	1.22	1.16	1.10	1.05	0.99
13.700	0.95	0.90	0.86	0.82	0.79
13.950	0.75	0.71	0.69	0.66	0.63
14.200	0.61	0.58	0.56	0.54	0.52
14.450	0.50	0.48	0.47	0.45	0.44
14.700	0.42	0.41	0.40	0.39	0.38
14.950	0.37	0.36	0.35	0.34	0.34
15.200	0.33	0.32	0.31	0.31	0.30
15.450	0.30	0.29	0.29	0.28	0.28
15.700	0.27	0.27	0.26	0.26	0.26
15.950	0.25	0.25	0.24	0.24	0.24
16.200	0.23	0.23	0.23	0.22	0.22

Pond pack 21214

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 100 years
Label: BASIN B EXISTING Storm Event: 100 YEAR 24 HR

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
16.450	0.22	0.21	0.21	0.21	0.21
16.700	0.20	0.20	0.20	0.20	0.20
16.950	0.19	0.19	0.19	0.19	0.19
17.200	0.18	0.18	0.18	0.18	0.18
17.450	0.18	0.18	0.18	0.17	0.17
17.700	0.17	0.17	0.17	0.17	0.17
17.950	0.17	0.16	0.16	0.16	0.16
18.200	0.16	0.16	0.16	0.16	0.16
18.450	0.16	0.15	0.15	0.15	0.15
18.700	0.15	0.15	0.15	0.15	0.15
18.950	0.15	0.14	0.14	0.14	0.14
19.200	0.14	0.14	0.14	0.14	0.14
19.450	0.14	0.14	0.13	0.13	0.13
19.700	0.13	0.13	0.13	0.13	0.13
19.950	0.13	0.13	0.12	0.12	0.12
20.200	0.12	0.12	0.12	0.12	0.12
20.450	0.12	0.12	0.12	0.11	0.11
20.700	0.11	0.11	0.11	0.11	0.11
20.950	0.11	0.11	0.11	0.11	0.11
21.200	0.11	0.11	0.11	0.11	0.11
21.450	0.10	0.10	0.10	0.10	0.10
21.700	0.10	0.10	0.10	0.10	0.10
21.950	0.10	0.10	0.10	0.10	0.10
22.200	0.10	0.10	0.10	0.10	0.10
22.450	0.10	0.10	0.10	0.10	0.10
22.700	0.10	0.10	0.10	0.10	0.10
22.950	0.10	0.10	0.10	0.10	0.10
23.200	0.10	0.10	0.10	0.10	0.10
23.450	0.10	0.10	0.10	0.09	0.09
23.700	0.09	0.09	0.09	0.09	0.09
23.950	0.09	0.09	(N/A)	(N/A)	(N/A)

Pond pack 21214

Subsection: Unit Hydrograph Summary
Label: BASIN B PROPOSED

Return Event: 10 years
Storm Event: 10 YEAR 24 HR

Storm Event	10 YEAR 24 HR
Return Event	10 years
Duration	24.000 hours
Depth	2.9 in
Time of Concentration (Composite)	1.346 hours
Area (User Defined)	18,010.000 ft²

Computational Time Increment	0.179 hours
Time to Peak (Computed)	12.742 hours
Flow (Peak, Computed)	0.21 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.750 hours
Flow (Peak Interpolated Output)	0.21 ft³/s

Drainage Area	
SCS CN (Composite)	81.000
Area (User Defined)	18,010.000 ft²
Maximum Retention (Pervious)	2.3 in
Maximum Retention (Pervious, 20 percent)	0.5 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.2 in
Runoff Volume (Pervious)	1,833.977 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,794.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	1.346 hours
Computational Time Increment	0.179 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Pond pack 21214

Subsection: Unit Hydrograph Summary
Label: BASIN B PROPOSED

Return Event: 10 years
Storm Event: 10 YEAR 24 HR

SCS Unit Hydrograph Parameters	
Unit peak, qp	0.35 ft³/s
Unit peak time, Tp	0.897 hours
Unit receding limb, Tr	3.589 hours
Total unit time, Tb	4.487 hours

Pond pack 21214

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 10 years
Label: BASIN B PROPOSED Storm Event: 10 YEAR 24 HR

Storm Event	10 YEAR 24 HR
Return Event	10 years
Duration	24.000 hours
Depth	2.9 in
Time of Concentration (Composite)	1.346 hours
Area (User Defined)	18,010.000 ft²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
10.550	0.00	0.00	0.00	0.00	0.00
10.800	0.00	0.00	0.00	0.00	0.00
11.050	0.00	0.00	0.00	0.00	0.00
11.300	0.01	0.01	0.01	0.01	0.01
11.550	0.01	0.01	0.01	0.01	0.02
11.800	0.02	0.02	0.03	0.04	0.05
12.050	0.06	0.07	0.09	0.10	0.12
12.300	0.13	0.15	0.16	0.17	0.18
12.550	0.19	0.20	0.20	0.21	0.21
12.800	0.21	0.20	0.20	0.20	0.19
13.050	0.18	0.18	0.17	0.16	0.15
13.300	0.14	0.14	0.13	0.12	0.12
13.550	0.11	0.10	0.10	0.10	0.09
13.800	0.09	0.08	0.08	0.08	0.07
14.050	0.07	0.07	0.06	0.06	0.06
14.300	0.06	0.06	0.05	0.05	0.05
14.550	0.05	0.05	0.05	0.04	0.04
14.800	0.04	0.04	0.04	0.04	0.04
15.050	0.04	0.04	0.04	0.04	0.03
15.300	0.03	0.03	0.03	0.03	0.03
15.550	0.03	0.03	0.03	0.03	0.03
15.800	0.03	0.03	0.03	0.03	0.03
16.050	0.03	0.03	0.03	0.03	0.02
16.300	0.02	0.02	0.02	0.02	0.02
16.550	0.02	0.02	0.02	0.02	0.02
16.800	0.02	0.02	0.02	0.02	0.02
17.050	0.02	0.02	0.02	0.02	0.02
17.300	0.02	0.02	0.02	0.02	0.02
17.550	0.02	0.02	0.02	0.02	0.02
17.800	0.02	0.02	0.02	0.02	0.02
18.050	0.02	0.02	0.02	0.02	0.02
18.300	0.02	0.02	0.02	0.02	0.02
18.550	0.02	0.02	0.02	0.02	0.02

Pond pack 21214

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 10 years
Label: BASIN B PROPOSED Storm Event: 10 YEAR 24 HR

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
18.800	0.02	0.02	0.02	0.02	0.02
19.050	0.02	0.02	0.02	0.02	0.02
19.300	0.02	0.02	0.02	0.02	0.01
19.550	0.01	0.01	0.01	0.01	0.01
19.800	0.01	0.01	0.01	0.01	0.01
20.050	0.01	0.01	0.01	0.01	0.01
20.300	0.01	0.01	0.01	0.01	0.01
20.550	0.01	0.01	0.01	0.01	0.01
20.800	0.01	0.01	0.01	0.01	0.01
21.050	0.01	0.01	0.01	0.01	0.01
21.300	0.01	0.01	0.01	0.01	0.01
21.550	0.01	0.01	0.01	0.01	0.01
21.800	0.01	0.01	0.01	0.01	0.01
22.050	0.01	0.01	0.01	0.01	0.01
22.300	0.01	0.01	0.01	0.01	0.01
22.550	0.01	0.01	0.01	0.01	0.01
22.800	0.01	0.01	0.01	0.01	0.01
23.050	0.01	0.01	0.01	0.01	0.01
23.300	0.01	0.01	0.01	0.01	0.01
23.550	0.01	0.01	0.01	0.01	0.01
23.800	0.01	0.01	0.01	0.01	0.01

Pond pack 21214

Subsection: Addition Summary
Label: OUTLET A

Return Event: 2 years
Storm Event: 2 YEAR 24 HR

Summary for Hydrograph Addition at 'OUTLET A'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	BASIN A PROPOSED

Node Inflows

Inflow Type	Element	Volume (ft³)	Time to Peak (hours)	Flow (Peak) (ft³/s)
Flow (From)	BASIN A PROPOSED	13,709.018	13.200	1.13
Flow (In)	OUTLET A	13,709.018	13.200	1.13

Pond pack 21214

Subsection: Addition Summary
Label: OUTLET A

Return Event: 10 years
Storm Event: 10 YEAR 24 HR

Summary for Hydrograph Addition at 'OUTLET A'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	BASIN A PROPOSED

Node Inflows

Inflow Type	Element	Volume (ft³)	Time to Peak (hours)	Flow (Peak) (ft³/s)
Flow (From)	BASIN A PROPOSED	30,770.848	12.650	3.84
Flow (In)	OUTLET A	30,770.848	12.650	3.84

Pond pack 21214

Subsection: Addition Summary
Label: OUTLET A

Return Event: 10 years
Storm Event: 10 YEAR 24 HR

Summary for Hydrograph Addition at 'OUTLET A'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	BASIN A EXISTING

Node Inflows

Inflow Type	Element	Volume (ft^3)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	BASIN A EXISTING	20,934.408	12.650	2.59
Flow (In)	OUTLET A	20,934.408	12.650	2.59

Pond pack 21214

Subsection: Addition Summary
Label: OUTLET A

Return Event: 100 years
Storm Event: 100 YEAR 24 HR

Summary for Hydrograph Addition at 'OUTLET A'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	BASIN A PROPOSED

Node Inflows

Inflow Type	Element	Volume (ft³)	Time to Peak (hours)	Flow (Peak) (ft³/s)
Flow (From)	BASIN A PROPOSED	64,990.212	13.150	5.97
Flow (In)	OUTLET A	64,990.212	13.150	5.97

Pond pack 21214

Subsection: Addition Summary
Label: OUTLET A

Return Event: 100 years
Storm Event: 100 YEAR 24 HR

Summary for Hydrograph Addition at 'OUTLET A'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	BASIN A EXISTING

Node Inflows

Inflow Type	Element	Volume (ft^3)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	BASIN A EXISTING	45,457.665	12.650	5.83
Flow (In)	OUTLET A	45,457.665	12.650	5.83

Pond pack 21214

Subsection: Addition Summary
Label: OUTLET B

Return Event: 2 years
Storm Event: 2 YEAR 24 HR

Summary for Hydrograph Addition at 'OUTLET B'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	BASIN B PROPOSED

Node Inflows

Inflow Type	Element	Volume (ft^3)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	BASIN B PROPOSED	810.945	12.750	0.09
Flow (In)	OUTLET B	810.945	12.750	0.09

Pond pack 21214

Subsection: Addition Summary
Label: OUTLET B

Return Event: 10 years
Storm Event: 10 YEAR 24 HR

Summary for Hydrograph Addition at 'OUTLET B'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	BASIN B PROPOSED

Node Inflows

Inflow Type	Element	Volume (ft^3)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	BASIN B PROPOSED	1,794.364	12.750	0.21
Flow (In)	OUTLET B	1,794.364	12.750	0.21

Pond pack 21214

Subsection: Addition Summary
Label: OUTLET B

Return Event: 10 years
Storm Event: 10 YEAR 24 HR

Summary for Hydrograph Addition at 'OUTLET B'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	BASIN B EXISTING

Node Inflows

Inflow Type	Element	Volume (ft^3)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	BASIN B EXISTING	8,520.889	12.750	0.98
Flow (In)	OUTLET B	8,520.889	12.750	0.98

Pond pack 21214

Subsection: Addition Summary
Label: OUTLET B

Return Event: 100 years
Storm Event: 100 YEAR 24 HR

Summary for Hydrograph Addition at 'OUTLET B'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	BASIN B PROPOSED

Node Inflows

Inflow Type	Element	Volume (ft³)	Time to Peak (hours)	Flow (Peak) (ft³/s)
Flow (From)	BASIN B PROPOSED	3,831.771	12.750	0.46
Flow (In)	OUTLET B	3,831.771	12.750	0.46

Pond pack 21214

Subsection: Addition Summary
Label: OUTLET B

Return Event: 100 years
Storm Event: 100 YEAR 24 HR

Summary for Hydrograph Addition at 'OUTLET B'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	BASIN B EXISTING

Node Inflows

Inflow Type	Element	Volume (ft^3)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	BASIN B EXISTING	18,508.923	12.750	2.21
Flow (In)	OUTLET B	18,508.923	12.750	2.21

Pond pack 21214

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