Stormwater Management Report Addendum

ROCKY MAPLE SOLAR

18 North Carver Road
Wareham and Carver, Massachusetts

Prepared for:
BE RE, LLC
PO Box 974
Edwards, Colorado, 81632

Presented by:

B E A L S + T H O M A S
BEALS AND THOMAS, INC.
Reservoir Corporate Center
144 Turnpike Road
Southborough, MA 01772-2104

Addendum Issued: April 7, 2021

Calculated by: **Nathaniel Bautz, EIT**

Checked by: **Nick Santangelo, EIT**

Approved by:

Eric J. Las, PE

Table 1: Pre- & Post-development Peak Runoff Rate Comparison, units are in cubic feet per second (cfs).

Design Point 1	1-Year	2-Year	10-Year	25-Year	50-Year	100-Year
Pre	*10.92*	*26.67*	*86.83*	*143.12*	*199.56*	*270.44*
Post	10.84	26.46	86.14	141.99	197.98	268.29

Table 2: Pre- & Post-development Stormwater Volume Comparison, units are in acre-feet (af).

Design Point 1	1-Year	2-Year	10-Year	25-Year	50-Year	100-Year
Pre	*1.55*	*2.66*	*6.81*	*10.71*	*14.66*	*19.67*
Post	1.54	2.64	6.75	10.62	14.54	19.51

JOB NO./LOCATION:

3203.00
Carver & Wareham, MA

CLIENT/PROJECT:

BE RE, LLC
Rocky Maple Solar

SUBJECT/TITLE:

Pre-Development Conditions Hydrology

OBJECTIVE OF CALCULATION:

- To determine the pre-development peak rates of runoff and stormwater volumes from the site for the 1, 2, 10, 25, 50, & 100-year storm events at the design points.

CALCULATION METHOD(S):

- Runoff curve numbers (CN), time-of-concentration (Tc), and runoff rates were calculated based on TR-55 methodology.
- AutoCAD 2019 computer program was utilized for digitizing ground cover areas.
- Peak runoff rates and volumes were computed using HydroCAD version 10.00.

ASSUMPTIONS:

- The ground cover types were determined using aerial imagery. Hydrologic soil groups based on United States Department of Agriculture, NRCS Soil Survey map information.
- Stormwater runoff from offsite tributary areas was not included in the calculations.
- Wetlands were excluded from this calculation.

SOURCES OF DATA/EQUATIONS:

- Pre-Development Conditions Hydrologic Areas Map prepared by Beals and Thomas, Inc. File No. 320300P004C-001.
- NRCS Soil Survey for Plymouth County, downloaded from Web Soil Survey on 06/03/2020.
- TR-55 urban Hydrology for Small Watersheds, SCS, 1986.
- Massachusetts DEP Stormwater Management Handbook, February 2008.

REV	CALC. BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
0	N. Bautz	12/15/2020	N. Santangelo	12/15/2020	E. Las	12/16/2020
1	N. Bautz	02/26/2021	N. Santangelo	03/05/2021	E. Las	03/11/2021
2	N. Bautz	04/01/2021	N. Santangelo	04/02/2021	E. Las	04/07/2021

CONCLUSIONS:

Peak Runoff Rates (CFS):

Storm Event	DP-1
1-Year	10.92
2-Year	26.67
10-Year	86.83
25-Year	143.12
50-Year	199.56
100-Year	270.44

Total Runoff Volumes (AF):

Storm Event	DP-1
1-Year	1.55
2-Year	2.66
10-Year	6.81
25-Year	10.71
50-Year	14.66
100-Year	19.67

REV	CALC. BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
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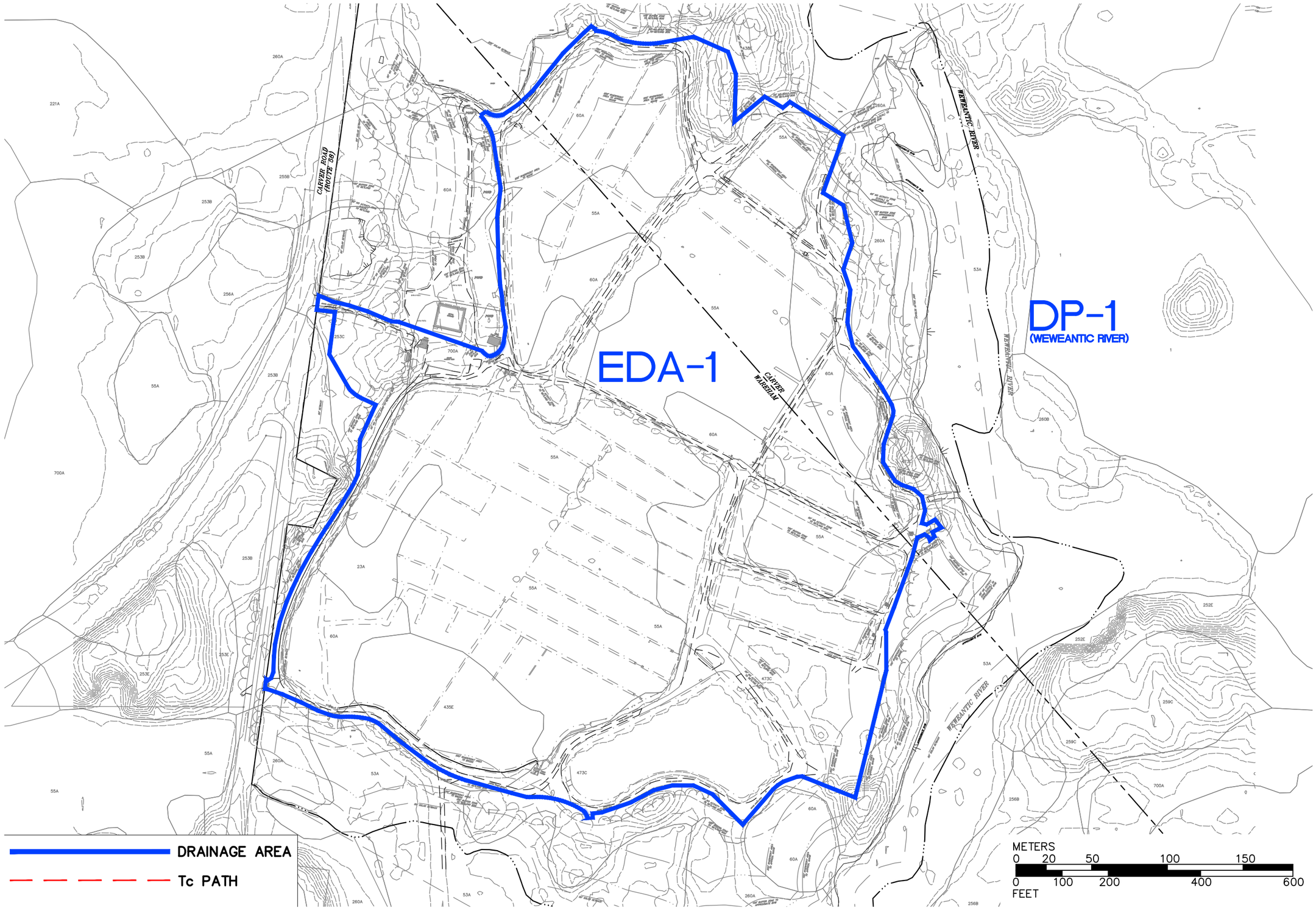
1	N. Bautz	02/26/2021	N. Santangelo	03/05/2021	E. Las	03/11/2021
2	N. Bautz	04/01/2021	N. Santangelo	04/02/2021	E. Las	04/07/2021



Pre-Development Conditions
Hydrologic Areas Map
Figure Number 001

Scale: 1" = 250' Date: 04/01/2021

Plan No. 320300P004C-001

B+T Project No. 3203.00

Rocky Maple Solar
Wareham and Carver, Massachusetts

BE RE, LLC
PO Box 974
Edwards, Colorado

North Arrow
NORTH

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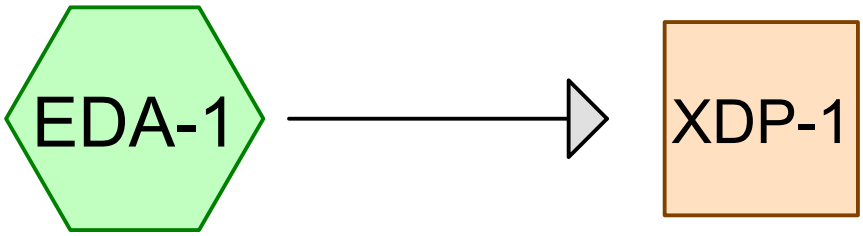
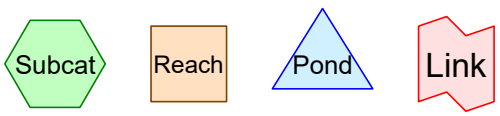
Pre-Development Conditions Hydrology



Weweantic River



Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
15.447	30	Brush, Good, HSG A (EDA-1)
38.212	73	Brush, Good, HSG D (EDA-1)
1.809	96	Existing Gravel Road, HSG A (EDA-1)
1.601	96	Existing Gravel Road, HSG D (EDA-1)
0.200	98	Existing Pavement, HSG A (EDA-1)
0.018	98	Existing Pavement, HSG D (EDA-1)
0.007	98	Existing Roofs, HSG A (EDA-1)
0.010	98	Existing Roofs, HSG D (EDA-1)
0.755	30	Woods, Good, HSG A (EDA-1)
0.025	77	Woods, Good, HSG D (EDA-1)
58.084	**62**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
18.218	HSG A	EDA-1
0.000	HSG B	
0.000	HSG C	
39.866	HSG D	EDA-1
0.000	Other	
58.084		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA-1: Runoff Area=58.084 ac 0.40% Impervious Runoff Depth>0.32"
Tc=6.0 min CN=62 Runoff=10.92 cfs 1.554 af

Reach XDP-1: Weweantic River Inflow=10.92 cfs 1.554 af
Outflow=10.92 cfs 1.554 af

Total Runoff Area = 58.084 ac Runoff Volume = 1.554 af Average Runoff Depth = 0.32"
99.60% Pervious = 57.849 ac 0.40% Impervious = 0.235 ac

Summary for Subcatchment EDA-1:

Runoff = 10.92 cfs @ 12.16 hrs, Volume= 1.554 af, Depth> 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-001yr Rainfall=2.80"

	Area (ac)	CN	Description
	0.755	30	Woods, Good, HSG A
	0.025	77	Woods, Good, HSG D
	15.447	30	Brush, Good, HSG A
	38.212	73	Brush, Good, HSG D
*	1.809	96	Existing Gravel Road, HSG A
*	1.601	96	Existing Gravel Road, HSG D
*	0.200	98	Existing Pavement, HSG A
*	0.018	98	Existing Pavement, HSG D
*	0.007	98	Existing Roofs, HSG A
*	0.010	98	Existing Roofs, HSG D
	58.084	62	Weighted Average
	57.849		99.60% Pervious Area
	0.235		0.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc.**

Summary for Reach XDP-1: Weweantic River

Inflow Area = 58.084 ac, 0.40% Impervious, Inflow Depth > 0.32" for Plymouth-001yr event
Inflow = 10.92 cfs @ 12.16 hrs, Volume= 1.554 af
Outflow = 10.92 cfs @ 12.16 hrs, Volume= 1.554 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA-1: Runoff Area=58.084 ac 0.40% Impervious Runoff Depth>0.55"
Tc=6.0 min CN=62 Runoff=26.67 cfs 2.664 af

Reach XDP-1: Weweantic River Inflow=26.67 cfs 2.664 af
Outflow=26.67 cfs 2.664 af

Total Runoff Area = 58.084 ac Runoff Volume = 2.664 af Average Runoff Depth = 0.55"
99.60% Pervious = 57.849 ac 0.40% Impervious = 0.235 ac

Summary for Subcatchment EDA-1:

Runoff = 26.67 cfs @ 12.12 hrs, Volume= 2.664 af, Depth> 0.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-002yr Rainfall=3.36"

	Area (ac)	CN	Description
	0.755	30	Woods, Good, HSG A
	0.025	77	Woods, Good, HSG D
	15.447	30	Brush, Good, HSG A
	38.212	73	Brush, Good, HSG D
*	1.809	96	Existing Gravel Road, HSG A
*	1.601	96	Existing Gravel Road, HSG D
*	0.200	98	Existing Pavement, HSG A
*	0.018	98	Existing Pavement, HSG D
*	0.007	98	Existing Roofs, HSG A
*	0.010	98	Existing Roofs, HSG D
	58.084	62	Weighted Average
	57.849		99.60% Pervious Area
	0.235		0.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc.**

Summary for Reach XDP-1: Weweantic River

Inflow Area = 58.084 ac, 0.40% Impervious, Inflow Depth > 0.55" for Plymouth-002yr event
Inflow = 26.67 cfs @ 12.12 hrs, Volume= 2.664 af
Outflow = 26.67 cfs @ 12.12 hrs, Volume= 2.664 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA-1: Runoff Area=58.084 ac 0.40% Impervious Runoff Depth>1.41"
Tc=6.0 min CN=62 Runoff=86.83 cfs 6.805 af

Reach XDP-1: Weweantic River Inflow=86.83 cfs 6.805 af
Outflow=86.83 cfs 6.805 af

Total Runoff Area = 58.084 ac Runoff Volume = 6.805 af Average Runoff Depth = 1.41"
99.60% Pervious = 57.849 ac 0.40% Impervious = 0.235 ac

Summary for Subcatchment EDA-1:

Runoff = 86.83 cfs @ 12.10 hrs, Volume= 6.805 af, Depth> 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-010yr Rainfall=4.95"

	Area (ac)	CN	Description
	0.755	30	Woods, Good, HSG A
	0.025	77	Woods, Good, HSG D
	15.447	30	Brush, Good, HSG A
	38.212	73	Brush, Good, HSG D
*	1.809	96	Existing Gravel Road, HSG A
*	1.601	96	Existing Gravel Road, HSG D
*	0.200	98	Existing Pavement, HSG A
*	0.018	98	Existing Pavement, HSG D
*	0.007	98	Existing Roofs, HSG A
*	0.010	98	Existing Roofs, HSG D
	58.084	62	Weighted Average
	57.849		99.60% Pervious Area
	0.235		0.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc.**

Summary for Reach XDP-1: Weweantic River

Inflow Area = 58.084 ac, 0.40% Impervious, Inflow Depth > 1.41" for Plymouth-010yr event
Inflow = 86.83 cfs @ 12.10 hrs, Volume= 6.805 af
Outflow = 86.83 cfs @ 12.10 hrs, Volume= 6.805 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA-1: Runoff Area=58.084 ac 0.40% Impervious Runoff Depth>2.21"
Tc=6.0 min CN=62 Runoff=143.12 cfs 10.707 af

Reach XDP-1: Weweantic River Inflow=143.12 cfs 10.707 af
Outflow=143.12 cfs 10.707 af

Total Runoff Area = 58.084 ac Runoff Volume = 10.707 af Average Runoff Depth = 2.21"
99.60% Pervious = 57.849 ac 0.40% Impervious = 0.235 ac

Summary for Subcatchment EDA-1:

Runoff = 143.12 cfs @ 12.10 hrs, Volume= 10.707 af, Depth> 2.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-025yr Rainfall=6.18"

	Area (ac)	CN	Description
	0.755	30	Woods, Good, HSG A
	0.025	77	Woods, Good, HSG D
	15.447	30	Brush, Good, HSG A
	38.212	73	Brush, Good, HSG D
*	1.809	96	Existing Gravel Road, HSG A
*	1.601	96	Existing Gravel Road, HSG D
*	0.200	98	Existing Pavement, HSG A
*	0.018	98	Existing Pavement, HSG D
*	0.007	98	Existing Roofs, HSG A
*	0.010	98	Existing Roofs, HSG D
	58.084	62	Weighted Average
	57.849		99.60% Pervious Area
	0.235		0.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc.**

Summary for Reach XDP-1: Weweantic River

Inflow Area = 58.084 ac, 0.40% Impervious, Inflow Depth > 2.21" for Plymouth-025yr event
Inflow = 143.12 cfs @ 12.10 hrs, Volume= 10.707 af
Outflow = 143.12 cfs @ 12.10 hrs, Volume= 10.707 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA-1: Runoff Area=58.084 ac 0.40% Impervious Runoff Depth>3.03"
Tc=6.0 min CN=62 Runoff=199.56 cfs 14.655 af

Reach XDP-1: Weweantic River Inflow=199.56 cfs 14.655 af
Outflow=199.56 cfs 14.655 af

Total Runoff Area = 58.084 ac Runoff Volume = 14.655 af Average Runoff Depth = 3.03"
99.60% Pervious = 57.849 ac 0.40% Impervious = 0.235 ac

Summary for Subcatchment EDA-1:

Runoff = 199.56 cfs @ 12.10 hrs, Volume= 14.655 af, Depth> 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-050yr Rainfall=7.31"

	Area (ac)	CN	Description
	0.755	30	Woods, Good, HSG A
	0.025	77	Woods, Good, HSG D
	15.447	30	Brush, Good, HSG A
	38.212	73	Brush, Good, HSG D
*	1.809	96	Existing Gravel Road, HSG A
*	1.601	96	Existing Gravel Road, HSG D
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	58.084	62	Weighted Average
	57.849		99.60% Pervious Area
	0.235		0.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc.**

Summary for Reach XDP-1: Weweantic River

Inflow Area = 58.084 ac, 0.40% Impervious, Inflow Depth > 3.03" for Plymouth-050yr event
Inflow = 199.56 cfs @ 12.10 hrs, Volume= 14.655 af
Outflow = 199.56 cfs @ 12.10 hrs, Volume= 14.655 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA-1: Runoff Area=58.084 ac 0.40% Impervious Runoff Depth>4.06"
Tc=6.0 min CN=62 Runoff=270.44 cfs 19.665 af

Reach XDP-1: Weweantic River Inflow=270.44 cfs 19.665 af
Outflow=270.44 cfs 19.665 af

Total Runoff Area = 58.084 ac Runoff Volume = 19.665 af Average Runoff Depth = 4.06"
99.60% Pervious = 57.849 ac 0.40% Impervious = 0.235 ac

Summary for Subcatchment EDA-1:

Runoff = 270.44 cfs @ 12.09 hrs, Volume= 19.665 af, Depth> 4.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-100yr Rainfall=8.65"

	Area (ac)	CN	Description
	0.755	30	Woods, Good, HSG A
	0.025	77	Woods, Good, HSG D
	15.447	30	Brush, Good, HSG A
	38.212	73	Brush, Good, HSG D
*	1.809	96	Existing Gravel Road, HSG A
*	1.601	96	Existing Gravel Road, HSG D
*	0.200	98	Existing Pavement, HSG A
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*	0.010	98	Existing Roofs, HSG D
	58.084	62	Weighted Average
	57.849		99.60% Pervious Area
	0.235		0.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc.**

Summary for Reach XDP-1: Weweantic River

Inflow Area = 58.084 ac, 0.40% Impervious, Inflow Depth > 4.06" for Plymouth-100yr event
Inflow = 270.44 cfs @ 12.09 hrs, Volume= 19.665 af
Outflow = 270.44 cfs @ 12.09 hrs, Volume= 19.665 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

JOB NO./LOCATION:

3203.00
Carver & Wareham, MA

CLIENT/PROJECT:

BE RE, LLC
Rocky Maple Solar

SUBJECT/TITLE:

Post-Development Conditions Hydrology

OBJECTIVE OF CALCULATION:

- To determine the post-development peak rates of runoff and stormwater volumes from the site for the 1, 2, 10, 25, 50, & 100-year storm events at the design points.

CALCULATION METHOD(S):

- Runoff curve numbers (CN), time-of-concentration (Tc), and runoff rates were calculated based on TR-55 methodology.
- AutoCAD 2019 computer program was utilized for digitizing ground cover areas.
- Peak runoff rates were computed using HydroCAD version 10.00.

ASSUMPTIONS:

- The ground cover types were determined using aerial imagery. Hydrologic soil groups based on United States Department of Agriculture, NRCS Soil Survey map information.
- Stormwater runoff from offsite tributary areas was included in the calculations.
- Wetlands were excluded from this calculation.

SOURCES OF DATA/EQUATIONS:

- Post-Development Conditions Hydrologic Areas Map prepared by Beals and Thomas, Inc. File No. 320300P004C-002.
- NRCS Soil Survey for Plymouth County, downloaded from Web Soil Survey on 06/03/2020.
- TR-55 urban Hydrology for Small Watersheds, SCS, 1986.
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REV	CALC. BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
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1	N. Bautz	02/26/2021	N. Santangelo	03/05/2021	E. Las	03/11/2021
2	N. Bautz	04/01/2021	N. Santangelo	04/02/2021	E. Las	04/07/2021

CONCLUSIONS:

Peak Runoff Rates (CFS):

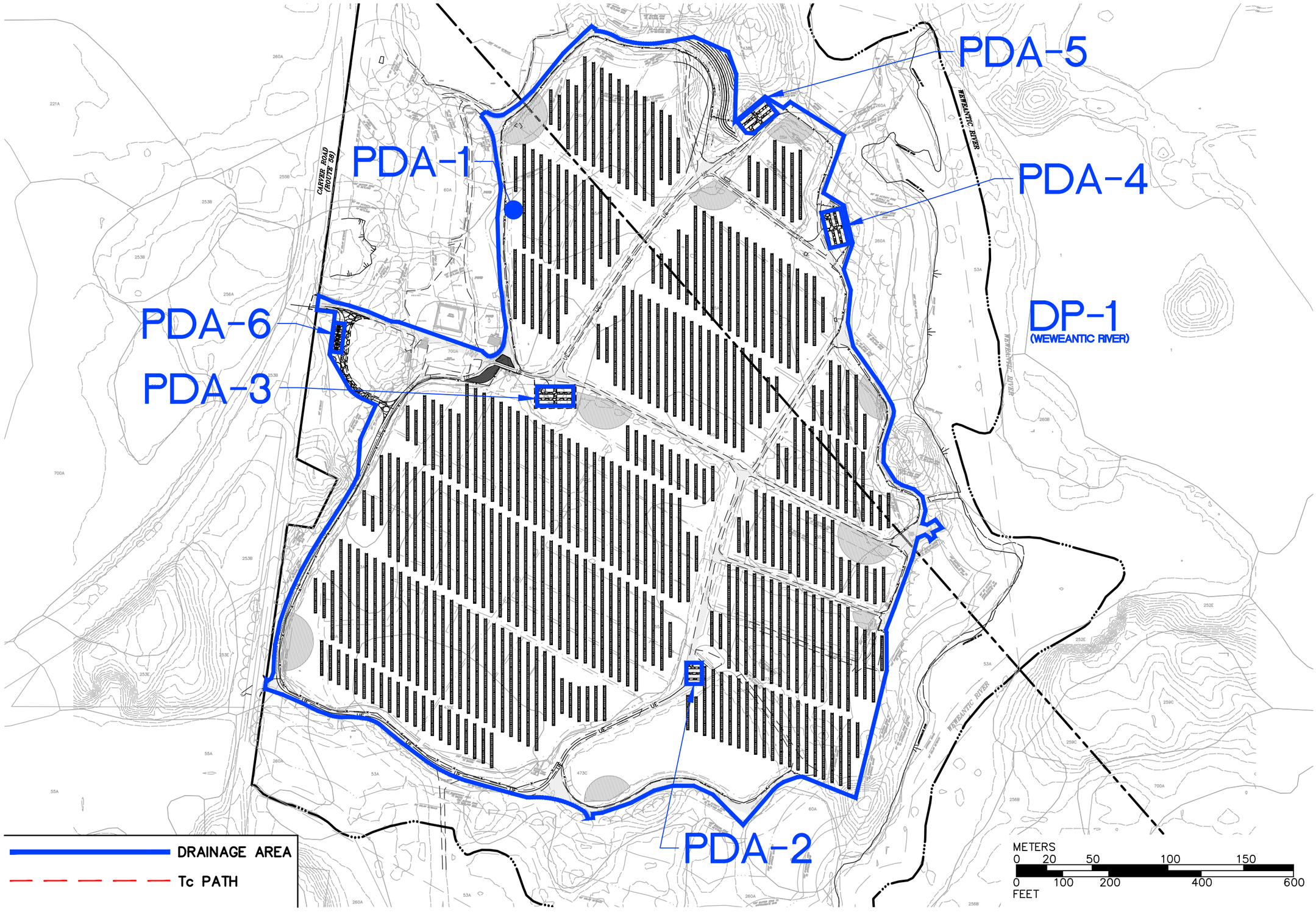
Storm Event	DP-1
1-Year	10.84
2-Year	26.46
10-Year	86.14
25-Year	141.99
50-Year	197.98
100-Year	268.29

Total Runoff Volumes (AF):

Storm Event	DP-1
1-Year	1.54
2-Year	2.64
10-Year	6.75
25-Year	10.62
50-Year	14.54
100-Year	19.51

Conclusion: Overall runoff rates and volumes from the project area will be less than existing conditions in accordance with Standard 2 of the MassDEP Stormwater Management Regulations and local bylaws.

REV	CALC. BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
0	N. Bautz	12/15/2020	N. Santangelo	12/15/2020	E. Las	12/16/2020
1	N. Bautz	02/26/2021	N. Santangelo	03/05/2021	E. Las	03/11/2021
2	N. Bautz	04/01/2021	N. Santangelo	04/02/2021	E. Las	04/07/2021



Post-Development Conditions Hydrologic Areas Map
Figure Number 002

Scale: 1" = 250'
Date: 04/01/2021
Plan No. 320300P004C-002
B+T Project No. 3203.00

Rocky Maple Solar
Wareham and Carver, Massachusetts

BE RE, LLC
PO Box 974
Edwards, Colorado

North Arrow
NORTH

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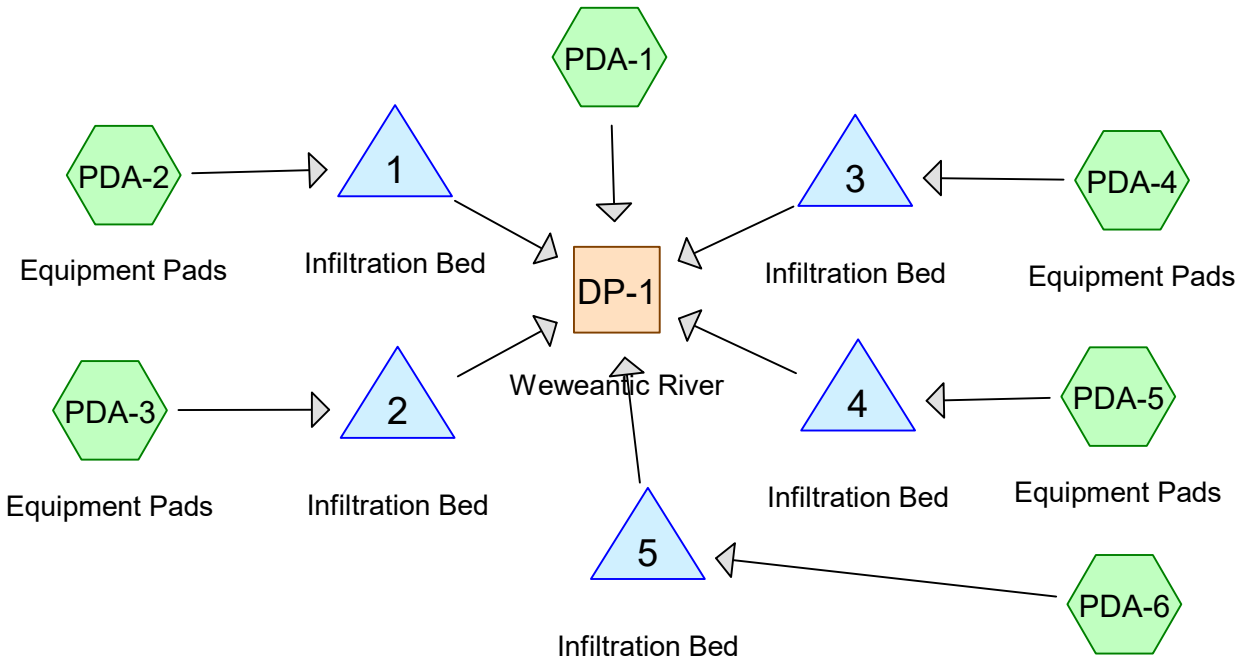
Post-Development
Conditions Hydrology



Subcat Reach Pond Link

Routing Diagram for 320300HC001C
Prepared by Beals and Thomas, Inc., Printed 4/1/2021
HydroCAD® 10.10-5a s/n 04493 © 2020 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
15.561	30	Brush, Good, HSG A (PDA-1)
37.968	73	Brush, Good, HSG D (PDA-1)
0.092	98	Equipment Pads, HSG A (PDA-2, PDA-5, PDA-6)
0.102	98	Equipment Pads, HSG D (PDA-3, PDA-4)
0.010	98	Exising Roofs, HSG D (PDA-1)
1.412	96	Existing Gravel Road, HSG A (PDA-1)
1.601	96	Existing Gravel Road, HSG D (PDA-1)
0.200	98	Existing Pavement, HSG A (PDA-1)
0.018	98	Existing Pavement, HSG D (PDA-1)
0.007	98	Existing Roofs, HSG A (PDA-1)
0.273	96	Proposed Gravel Road, HSG A (PDA-1)
0.006	96	Proposed Gravel Road, HSG D (PDA-1)
0.131	96	Proposed Gravel, HSG A (PDA-2, PDA-5, PDA-6)
0.136	96	Proposed Gravel, HSG D (PDA-3, PDA-4)
0.542	30	Woods, Good, HSG A (PDA-1)
0.025	77	Woods, Good, HSG D (PDA-1)
58.084	**63**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
18.218	HSG A	PDA-1, PDA-2, PDA-5, PDA-6
0.000	HSG B	
0.000	HSG C	
39.866	HSG D	PDA-1, PDA-3, PDA-4
0.000	Other	
58.084		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-1: Runoff Area=57.623 ac 0.41% Impervious Runoff Depth>0.32"
Tc=6.0 min CN=62 Runoff=10.84 cfs 1.542 af

Subcatchment PDA-2: Equipment Pads Runoff Area=0.055 ac 60.00% Impervious Runoff Depth>2.46"
Tc=6.0 min CN=97 Runoff=0.14 cfs 0.011 af

Subcatchment PDA-3: Equipment Pads Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>2.46"
Tc=6.0 min CN=97 Runoff=0.31 cfs 0.024 af

Subcatchment PDA-4: Equipment Pads Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>2.46"
Tc=6.0 min CN=97 Runoff=0.31 cfs 0.024 af

Subcatchment PDA-5: Equipment Pads Runoff Area=0.116 ac 43.97% Impervious Runoff Depth>2.46"
Tc=6.0 min CN=97 Runoff=0.30 cfs 0.024 af

Subcatchment PDA-6: Equipment Pads Runoff Area=0.052 ac 15.38% Impervious Runoff Depth>2.35"
Tc=6.0 min CN=96 Runoff=0.13 cfs 0.010 af

Reach DP-1: Weweantic River Inflow=10.84 cfs 1.542 af
Outflow=10.84 cfs 1.542 af

Pond 1: Infiltration Bed Peak Elev=63.01' Storage=0.000 af Inflow=0.14 cfs 0.011 af
Outflow=0.14 cfs 0.011 af

Pond 2: Infiltration Bed Peak Elev=63.51' Storage=0.001 af Inflow=0.31 cfs 0.024 af
Outflow=0.29 cfs 0.024 af

Pond 3: Infiltration Bed Peak Elev=65.01' Storage=0.001 af Inflow=0.31 cfs 0.024 af
Outflow=0.29 cfs 0.024 af

Pond 4: Infiltration Bed Peak Elev=65.01' Storage=0.001 af Inflow=0.30 cfs 0.024 af
Outflow=0.28 cfs 0.024 af

Pond 5: Infiltration Bed Peak Elev=69.01' Storage=0.000 af Inflow=0.13 cfs 0.010 af
Outflow=0.13 cfs 0.010 af

Total Runoff Area = 58.084 ac Runoff Volume = 1.636 af Average Runoff Depth = 0.34"
99.26% Pervious = 57.655 ac 0.74% Impervious = 0.429 ac

Summary for Subcatchment PDA-1:

Runoff = 10.84 cfs @ 12.16 hrs, Volume= 1.542 af, Depth> 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-001yr Rainfall=2.80"

	Area (ac)	CN	Description
	0.542	30	Woods, Good, HSG A
	0.025	77	Woods, Good, HSG D
	15.561	30	Brush, Good, HSG A
	37.968	73	Brush, Good, HSG D
*	0.273	96	Proposed Gravel Road, HSG A
*	1.412	96	Existing Gravel Road, HSG A
*	0.006	96	Proposed Gravel Road, HSG D
*	1.601	96	Existing Gravel Road, HSG D
*	0.200	98	Existing Pavement, HSG A
*	0.018	98	Existing Pavement, HSG D
*	0.007	98	Existing Roofs, HSG A
*	0.010	98	Exising Roofs, HSG D
	57.623	62	Weighted Average
	57.388		99.59% Pervious Area
	0.235		0.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc.**

Summary for Subcatchment PDA-2: Equipment Pads

Runoff = 0.14 cfs @ 12.09 hrs, Volume= 0.011 af, Depth> 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-001yr Rainfall=2.80"

	Area (ac)	CN	Description
*	0.033	98	Equipment Pads, HSG A
*	0.022	96	Proposed Gravel, HSG A
	0.055	97	Weighted Average
	0.022		40.00% Pervious Area
	0.033		60.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-3: Equipment Pads

Runoff = 0.31 cfs @ 12.09 hrs, Volume= 0.024 af, Depth> 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-001yr Rainfall=2.80"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG D
*	0.068	96	Proposed Gravel, HSG D
	0.119	97	Weighted Average
	0.068		57.14% Pervious Area
	0.051		42.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-4: Equipment Pads

Runoff = 0.31 cfs @ 12.09 hrs, Volume= 0.024 af, Depth> 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-001yr Rainfall=2.80"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG D
*	0.068	96	Proposed Gravel, HSG D
	0.119	97	Weighted Average
	0.068		57.14% Pervious Area
	0.051		42.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-5: Equipment Pads

Runoff = 0.30 cfs @ 12.09 hrs, Volume= 0.024 af, Depth> 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-001yr Rainfall=2.80"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG A
*	0.065	96	Proposed Gravel, HSG A
	0.116	97	Weighted Average
	0.065		56.03% Pervious Area
	0.051		43.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-6: Equipment Pads

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.010 af, Depth> 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-001yr Rainfall=2.80"

	Area (ac)	CN	Description
*	0.008	98	Equipment Pads, HSG A
*	0.044	96	Proposed Gravel, HSG A
	0.052	96	Weighted Average
	0.044		84.62% Pervious Area
	0.008		15.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Reach DP-1: Weweantic River

Inflow Area = 58.084 ac, 0.74% Impervious, Inflow Depth > 0.32" for Plymouth-001yr event
Inflow = 10.84 cfs @ 12.16 hrs, Volume= 1.542 af
Outflow = 10.84 cfs @ 12.16 hrs, Volume= 1.542 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 1: Infiltration Bed

Inflow Area = 0.055 ac, 60.00% Impervious, Inflow Depth > 2.46" for Plymouth-001yr event
Inflow = 0.14 cfs @ 12.09 hrs, Volume= 0.011 af
Outflow = 0.14 cfs @ 12.11 hrs, Volume= 0.011 af, Atten= 4%, Lag= 1.5 min
Discarded = 0.14 cfs @ 12.11 hrs, Volume= 0.011 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 63.01' @ 12.11 hrs Surf.Area= 0.056 ac Storage= 0.000 af

Plug-Flow detention time= 1.2 min calculated for 0.011 af (100% of inflow)
Center-of-Mass det. time= 1.1 min (770.1 - 769.1)

Volume	Invert	Avail.Storage	Storage Description
#1	63.00'	0.022 af	**42.00'W x 58.00'L x 1.00'H Prismatoid** 0.056 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.14 cfs @ 12.11 hrs HW=63.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.14 cfs)

Summary for Pond 2: Infiltration Bed

Inflow Area = 0.119 ac, 42.86% Impervious, Inflow Depth > 2.46" for Plymouth-001yr event
Inflow = 0.31 cfs @ 12.09 hrs, Volume= 0.024 af
Outflow = 0.29 cfs @ 12.12 hrs, Volume= 0.024 af, Atten= 6%, Lag= 2.2 min
Discarded = 0.29 cfs @ 12.12 hrs, Volume= 0.024 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 63.51' @ 12.11 hrs Surf.Area= 0.118 ac Storage= 0.001 af

Plug-Flow detention time= 1.2 min calculated for 0.024 af (100% of inflow)
Center-of-Mass det. time= 1.1 min (770.1 - 769.1)

Volume	Invert	Avail.Storage	Storage Description
#1	63.50'	0.047 af	**52.00'W x 99.00'L x 1.00'H Prismatoid** 0.118 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.50'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.29 cfs @ 12.12 hrs HW=63.51' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.29 cfs)

Summary for Pond 3: Infiltration Bed

Inflow Area = 0.119 ac, 42.86% Impervious, Inflow Depth > 2.46" for Plymouth-001yr event
Inflow = 0.31 cfs @ 12.09 hrs, Volume= 0.024 af
Outflow = 0.29 cfs @ 12.12 hrs, Volume= 0.024 af, Atten= 6%, Lag= 2.2 min
Discarded = 0.29 cfs @ 12.12 hrs, Volume= 0.024 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 65.01' @ 12.11 hrs Surf.Area= 0.118 ac Storage= 0.001 af

Plug-Flow detention time= 1.2 min calculated for 0.024 af (100% of inflow)
Center-of-Mass det. time= 1.1 min (770.1 - 769.1)

Volume	Invert	Avail.Storage	Storage Description
#1	65.00'	0.047 af	**52.00'W x 99.00'L x 1.00'H Prismatoid** 0.118 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	65.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.29 cfs @ 12.12 hrs HW=65.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.29 cfs)

Summary for Pond 4: Infiltration Bed

Inflow Area = 0.116 ac, 43.97% Impervious, Inflow Depth > 2.46" for Plymouth-001yr event
Inflow = 0.30 cfs @ 12.09 hrs, Volume= 0.024 af
Outflow = 0.28 cfs @ 12.12 hrs, Volume= 0.024 af, Atten= 5%, Lag= 1.9 min
Discarded = 0.28 cfs @ 12.12 hrs, Volume= 0.024 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 65.01' @ 12.11 hrs Surf.Area= 0.116 ac Storage= 0.001 af

Plug-Flow detention time= 1.2 min calculated for 0.024 af (100% of inflow)
Center-of-Mass det. time= 1.1 min (770.1 - 769.1)

Volume	Invert	Avail.Storage	Storage Description
#1	65.00'	0.046 af	**51.00'W x 99.00'L x 1.00'H Prismatoid** 0.116 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	65.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.28 cfs @ 12.12 hrs HW=65.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.28 cfs)

Summary for Pond 5: Infiltration Bed

Inflow Area = 0.052 ac, 15.38% Impervious, Inflow Depth > 2.35" for Plymouth-001yr event
Inflow = 0.13 cfs @ 12.09 hrs, Volume= 0.010 af
Outflow = 0.13 cfs @ 12.11 hrs, Volume= 0.010 af, Atten= 3%, Lag= 1.2 min
Discarded = 0.13 cfs @ 12.11 hrs, Volume= 0.010 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 69.01' @ 12.11 hrs Surf.Area= 0.053 ac Storage= 0.000 af

Plug-Flow detention time= 1.2 min calculated for 0.010 af (100% of inflow)
Center-of-Mass det. time= 1.1 min (778.5 - 777.5)

Volume	Invert	Avail.Storage	Storage Description
#1	69.00'	0.021 af	**29.00'W x 79.00'L x 1.00'H Prismatoid** 0.053 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	69.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.13 cfs @ 12.11 hrs HW=69.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.13 cfs)

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-1: Runoff Area=57.623 ac 0.41% Impervious Runoff Depth>0.55"
Tc=6.0 min CN=62 Runoff=26.46 cfs 2.643 af

Subcatchment PDA-2: Equipment Pads Runoff Area=0.055 ac 60.00% Impervious Runoff Depth>3.01"
Tc=6.0 min CN=97 Runoff=0.17 cfs 0.014 af

Subcatchment PDA-3: Equipment Pads Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>3.01"
Tc=6.0 min CN=97 Runoff=0.37 cfs 0.030 af

Subcatchment PDA-4: Equipment Pads Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>3.01"
Tc=6.0 min CN=97 Runoff=0.37 cfs 0.030 af

Subcatchment PDA-5: Equipment Pads Runoff Area=0.116 ac 43.97% Impervious Runoff Depth>3.01"
Tc=6.0 min CN=97 Runoff=0.36 cfs 0.029 af

Subcatchment PDA-6: Equipment Pads Runoff Area=0.052 ac 15.38% Impervious Runoff Depth>2.91"
Tc=6.0 min CN=96 Runoff=0.16 cfs 0.013 af

Reach DP-1: Weweantic River Inflow=26.46 cfs 2.643 af
Outflow=26.46 cfs 2.643 af

Pond 1: Infiltration Bed Peak Elev=63.02' Storage=0.000 af Inflow=0.17 cfs 0.014 af
Outflow=0.14 cfs 0.014 af

Pond 2: Infiltration Bed Peak Elev=63.52' Storage=0.001 af Inflow=0.37 cfs 0.030 af
Outflow=0.29 cfs 0.030 af

Pond 3: Infiltration Bed Peak Elev=65.02' Storage=0.001 af Inflow=0.37 cfs 0.030 af
Outflow=0.29 cfs 0.030 af

Pond 4: Infiltration Bed Peak Elev=65.02' Storage=0.001 af Inflow=0.36 cfs 0.029 af
Outflow=0.28 cfs 0.029 af

Pond 5: Infiltration Bed Peak Elev=69.02' Storage=0.000 af Inflow=0.16 cfs 0.013 af
Outflow=0.13 cfs 0.013 af

Total Runoff Area = 58.084 ac Runoff Volume = 2.758 af Average Runoff Depth = 0.57"
99.26% Pervious = 57.655 ac 0.74% Impervious = 0.429 ac

Summary for Subcatchment PDA-1:

Runoff = 26.46 cfs @ 12.12 hrs, Volume= 2.643 af, Depth> 0.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-002yr Rainfall=3.36"

	Area (ac)	CN	Description
	0.542	30	Woods, Good, HSG A
	0.025	77	Woods, Good, HSG D
	15.561	30	Brush, Good, HSG A
	37.968	73	Brush, Good, HSG D
*	0.273	96	Proposed Gravel Road, HSG A
*	1.412	96	Existing Gravel Road, HSG A
*	0.006	96	Proposed Gravel Road, HSG D
*	1.601	96	Existing Gravel Road, HSG D
*	0.200	98	Existing Pavement, HSG A
*	0.018	98	Existing Pavement, HSG D
*	0.007	98	Existing Roofs, HSG A
*	0.010	98	Exising Roofs, HSG D
	57.623	62	Weighted Average
	57.388		99.59% Pervious Area
	0.235		0.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc.**

Summary for Subcatchment PDA-2: Equipment Pads

Runoff = 0.17 cfs @ 12.09 hrs, Volume= 0.014 af, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-002yr Rainfall=3.36"

	Area (ac)	CN	Description
*	0.033	98	Equipment Pads, HSG A
*	0.022	96	Proposed Gravel, HSG A
	0.055	97	Weighted Average
	0.022		40.00% Pervious Area
	0.033		60.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-3: Equipment Pads

Runoff = 0.37 cfs @ 12.09 hrs, Volume= 0.030 af, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-002yr Rainfall=3.36"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG D
*	0.068	96	Proposed Gravel, HSG D
	0.119	97	Weighted Average
	0.068		57.14% Pervious Area
	0.051		42.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-4: Equipment Pads

Runoff = 0.37 cfs @ 12.09 hrs, Volume= 0.030 af, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-002yr Rainfall=3.36"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG D
*	0.068	96	Proposed Gravel, HSG D
	0.119	97	Weighted Average
	0.068		57.14% Pervious Area
	0.051		42.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-5: Equipment Pads

Runoff = 0.36 cfs @ 12.09 hrs, Volume= 0.029 af, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-002yr Rainfall=3.36"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG A
*	0.065	96	Proposed Gravel, HSG A
	0.116	97	Weighted Average
	0.065		56.03% Pervious Area
	0.051		43.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-6: Equipment Pads

Runoff = 0.16 cfs @ 12.09 hrs, Volume= 0.013 af, Depth> 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-002yr Rainfall=3.36"

	Area (ac)	CN	Description
*	0.008	98	Equipment Pads, HSG A
*	0.044	96	Proposed Gravel, HSG A
	0.052	96	Weighted Average
	0.044		84.62% Pervious Area
	0.008		15.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Reach DP-1: Weweantic River

Inflow Area = 58.084 ac, 0.74% Impervious, Inflow Depth > 0.55" for Plymouth-002yr event
Inflow = 26.46 cfs @ 12.12 hrs, Volume= 2.643 af
Outflow = 26.46 cfs @ 12.12 hrs, Volume= 2.643 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 1: Infiltration Bed

Inflow Area = 0.055 ac, 60.00% Impervious, Inflow Depth > 3.01" for Plymouth-002yr event
Inflow = 0.17 cfs @ 12.09 hrs, Volume= 0.014 af
Outflow = 0.14 cfs @ 12.05 hrs, Volume= 0.014 af, Atten= 21%, Lag= 0.0 min
Discarded = 0.14 cfs @ 12.05 hrs, Volume= 0.014 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 63.02' @ 12.15 hrs Surf.Area= 0.056 ac Storage= 0.000 af

Plug-Flow detention time= 1.3 min calculated for 0.014 af (100% of inflow)
Center-of-Mass det. time= 1.2 min (765.5 - 764.4)

Volume	Invert	Avail.Storage	Storage Description
#1	63.00'	0.022 af	**42.00'W x 58.00'L x 1.00'H Prismatoid** 0.056 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.14 cfs @ 12.05 hrs HW=63.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.14 cfs)

Summary for Pond 2: Infiltration Bed

Inflow Area = 0.119 ac, 42.86% Impervious, Inflow Depth > 3.01" for Plymouth-002yr event
Inflow = 0.37 cfs @ 12.09 hrs, Volume= 0.030 af
Outflow = 0.29 cfs @ 12.05 hrs, Volume= 0.030 af, Atten= 23%, Lag= 0.0 min
Discarded = 0.29 cfs @ 12.05 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 63.52' @ 12.15 hrs Surf.Area= 0.118 ac Storage= 0.001 af

Plug-Flow detention time= 1.3 min calculated for 0.030 af (100% of inflow)
Center-of-Mass det. time= 1.2 min (765.6 - 764.4)

Volume	Invert	Avail.Storage	Storage Description
#1	63.50'	0.047 af	**52.00'W x 99.00'L x 1.00'H Prismatoid** 0.118 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.50'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.29 cfs @ 12.05 hrs HW=63.51' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.29 cfs)

Summary for Pond 3: Infiltration Bed

Inflow Area = 0.119 ac, 42.86% Impervious, Inflow Depth > 3.01" for Plymouth-002yr event
Inflow = 0.37 cfs @ 12.09 hrs, Volume= 0.030 af
Outflow = 0.29 cfs @ 12.05 hrs, Volume= 0.030 af, Atten= 23%, Lag= 0.0 min
Discarded = 0.29 cfs @ 12.05 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 65.02' @ 12.15 hrs Surf.Area= 0.118 ac Storage= 0.001 af

Plug-Flow detention time= 1.3 min calculated for 0.030 af (100% of inflow)
Center-of-Mass det. time= 1.2 min (765.6 - 764.4)

Volume	Invert	Avail.Storage	Storage Description
#1	65.00'	0.047 af	**52.00'W x 99.00'L x 1.00'H Prismatoid** 0.118 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	65.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.29 cfs @ 12.05 hrs HW=65.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.29 cfs)

Summary for Pond 4: Infiltration Bed

Inflow Area = 0.116 ac, 43.97% Impervious, Inflow Depth > 3.01" for Plymouth-002yr event
Inflow = 0.36 cfs @ 12.09 hrs, Volume= 0.029 af
Outflow = 0.28 cfs @ 12.05 hrs, Volume= 0.029 af, Atten= 23%, Lag= 0.0 min
Discarded = 0.28 cfs @ 12.05 hrs, Volume= 0.029 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 65.02' @ 12.15 hrs Surf.Area= 0.116 ac Storage= 0.001 af

Plug-Flow detention time= 1.3 min calculated for 0.029 af (100% of inflow)
Center-of-Mass det. time= 1.2 min (765.6 - 764.4)

Volume	Invert	Avail.Storage	Storage Description
#1	65.00'	0.046 af	**51.00'W x 99.00'L x 1.00'H Prismatoid** 0.116 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	65.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.28 cfs @ 12.05 hrs HW=65.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.28 cfs)

Summary for Pond 5: Infiltration Bed

Inflow Area = 0.052 ac, 15.38% Impervious, Inflow Depth > 2.91" for Plymouth-002yr event
Inflow = 0.16 cfs @ 12.09 hrs, Volume= 0.013 af
Outflow = 0.13 cfs @ 12.05 hrs, Volume= 0.013 af, Atten= 20%, Lag= 0.0 min
Discarded = 0.13 cfs @ 12.05 hrs, Volume= 0.013 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 69.02' @ 12.15 hrs Surf.Area= 0.053 ac Storage= 0.000 af

Plug-Flow detention time= 1.3 min calculated for 0.013 af (100% of inflow)
Center-of-Mass det. time= 1.2 min (773.4 - 772.2)

Volume	Invert	Avail.Storage	Storage Description
#1	69.00'	0.021 af	**29.00'W x 79.00'L x 1.00'H Prismatoid** 0.053 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	69.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.13 cfs @ 12.05 hrs HW=69.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.13 cfs)

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-1: Runoff Area=57.623 ac 0.41% Impervious Runoff Depth>1.41"
Tc=6.0 min CN=62 Runoff=86.14 cfs 6.751 af

Subcatchment PDA-2: Equipment Pads Runoff Area=0.055 ac 60.00% Impervious Runoff Depth>4.59"
Tc=6.0 min CN=97 Runoff=0.26 cfs 0.021 af

Subcatchment PDA-3: Equipment Pads Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>4.59"
Tc=6.0 min CN=97 Runoff=0.56 cfs 0.046 af

Subcatchment PDA-4: Equipment Pads Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>4.59"
Tc=6.0 min CN=97 Runoff=0.56 cfs 0.046 af

Subcatchment PDA-5: Equipment Pads Runoff Area=0.116 ac 43.97% Impervious Runoff Depth>4.59"
Tc=6.0 min CN=97 Runoff=0.54 cfs 0.044 af

Subcatchment PDA-6: Equipment Pads Runoff Area=0.052 ac 15.38% Impervious Runoff Depth>4.48"
Tc=6.0 min CN=96 Runoff=0.24 cfs 0.019 af

Reach DP-1: Weweantic River Inflow=86.14 cfs 6.751 af
Outflow=86.14 cfs 6.751 af

Pond 1: Infiltration Bed Peak Elev=63.07' Storage=0.002 af Inflow=0.26 cfs 0.021 af
Outflow=0.14 cfs 0.021 af

Pond 2: Infiltration Bed Peak Elev=63.57' Storage=0.004 af Inflow=0.56 cfs 0.046 af
Outflow=0.29 cfs 0.046 af

Pond 3: Infiltration Bed Peak Elev=65.07' Storage=0.004 af Inflow=0.56 cfs 0.046 af
Outflow=0.29 cfs 0.046 af

Pond 4: Infiltration Bed Peak Elev=65.07' Storage=0.003 af Inflow=0.54 cfs 0.044 af
Outflow=0.28 cfs 0.044 af

Pond 5: Infiltration Bed Peak Elev=69.07' Storage=0.001 af Inflow=0.24 cfs 0.019 af
Outflow=0.13 cfs 0.019 af

Total Runoff Area = 58.084 ac Runoff Volume = 6.927 af Average Runoff Depth = 1.43"
99.26% Pervious = 57.655 ac 0.74% Impervious = 0.429 ac

Summary for Subcatchment PDA-1:

Runoff = 86.14 cfs @ 12.10 hrs, Volume= 6.751 af, Depth> 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-010yr Rainfall=4.95"

	Area (ac)	CN	Description
	0.542	30	Woods, Good, HSG A
	0.025	77	Woods, Good, HSG D
	15.561	30	Brush, Good, HSG A
	37.968	73	Brush, Good, HSG D
*	0.273	96	Proposed Gravel Road, HSG A
*	1.412	96	Existing Gravel Road, HSG A
*	0.006	96	Proposed Gravel Road, HSG D
*	1.601	96	Existing Gravel Road, HSG D
*	0.200	98	Existing Pavement, HSG A
*	0.018	98	Existing Pavement, HSG D
*	0.007	98	Existing Roofs, HSG A
*	0.010	98	Exising Roofs, HSG D
	57.623	62	Weighted Average
	57.388		99.59% Pervious Area
	0.235		0.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc.**

Summary for Subcatchment PDA-2: Equipment Pads

Runoff = 0.26 cfs @ 12.09 hrs, Volume= 0.021 af, Depth> 4.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-010yr Rainfall=4.95"

	Area (ac)	CN	Description
*	0.033	98	Equipment Pads, HSG A
*	0.022	96	Proposed Gravel, HSG A
	0.055	97	Weighted Average
	0.022		40.00% Pervious Area
	0.033		60.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-3: Equipment Pads

Runoff = 0.56 cfs @ 12.09 hrs, Volume= 0.046 af, Depth> 4.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-010yr Rainfall=4.95"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG D
*	0.068	96	Proposed Gravel, HSG D
	0.119	97	Weighted Average
	0.068		57.14% Pervious Area
	0.051		42.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-4: Equipment Pads

Runoff = 0.56 cfs @ 12.09 hrs, Volume= 0.046 af, Depth> 4.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-010yr Rainfall=4.95"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG D
*	0.068	96	Proposed Gravel, HSG D
	0.119	97	Weighted Average
	0.068		57.14% Pervious Area
	0.051		42.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-5: Equipment Pads

Runoff = 0.54 cfs @ 12.09 hrs, Volume= 0.044 af, Depth> 4.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-010yr Rainfall=4.95"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG A
*	0.065	96	Proposed Gravel, HSG A
	0.116	97	Weighted Average
	0.065		56.03% Pervious Area
	0.051		43.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-6: Equipment Pads

Runoff = 0.24 cfs @ 12.09 hrs, Volume= 0.019 af, Depth> 4.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-010yr Rainfall=4.95"

	Area (ac)	CN	Description
*	0.008	98	Equipment Pads, HSG A
*	0.044	96	Proposed Gravel, HSG A
	0.052	96	Weighted Average
	0.044		84.62% Pervious Area
	0.008		15.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Reach DP-1: Weweantic River

Inflow Area = 58.084 ac, 0.74% Impervious, Inflow Depth > 1.39" for Plymouth-010yr event
Inflow = 86.14 cfs @ 12.10 hrs, Volume= 6.751 af
Outflow = 86.14 cfs @ 12.10 hrs, Volume= 6.751 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 1: Infiltration Bed

Inflow Area = 0.055 ac, 60.00% Impervious, Inflow Depth > 4.59" for Plymouth-010yr event
Inflow = 0.26 cfs @ 12.09 hrs, Volume= 0.021 af
Outflow = 0.14 cfs @ 12.00 hrs, Volume= 0.021 af, Atten= 47%, Lag= 0.0 min
Discarded = 0.14 cfs @ 12.00 hrs, Volume= 0.021 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 63.07' @ 12.22 hrs Surf.Area= 0.056 ac Storage= 0.002 af

Plug-Flow detention time= 2.5 min calculated for 0.021 af (100% of inflow)
Center-of-Mass det. time= 2.4 min (757.9 - 755.5)

Volume	Invert	Avail.Storage	Storage Description
#1	63.00'	0.022 af	**42.00'W x 58.00'L x 1.00'H Prismatoid** 0.056 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.14 cfs @ 12.00 hrs HW=63.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.14 cfs)

Summary for Pond 2: Infiltration Bed

Inflow Area = 0.119 ac, 42.86% Impervious, Inflow Depth > 4.59" for Plymouth-010yr event
Inflow = 0.56 cfs @ 12.09 hrs, Volume= 0.046 af
Outflow = 0.29 cfs @ 12.00 hrs, Volume= 0.046 af, Atten= 49%, Lag= 0.0 min
Discarded = 0.29 cfs @ 12.00 hrs, Volume= 0.046 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 63.57' @ 12.23 hrs Surf.Area= 0.118 ac Storage= 0.004 af

Plug-Flow detention time= 2.6 min calculated for 0.046 af (100% of inflow)
Center-of-Mass det. time= 2.5 min (758.0 - 755.5)

Volume	Invert	Avail.Storage	Storage Description
#1	63.50'	0.047 af	**52.00'W x 99.00'L x 1.00'H Prismatoid** 0.118 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.50'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.29 cfs @ 12.00 hrs HW=63.51' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.29 cfs)

Summary for Pond 3: Infiltration Bed

Inflow Area = 0.119 ac, 42.86% Impervious, Inflow Depth > 4.59" for Plymouth-010yr event
Inflow = 0.56 cfs @ 12.09 hrs, Volume= 0.046 af
Outflow = 0.29 cfs @ 12.00 hrs, Volume= 0.046 af, Atten= 49%, Lag= 0.0 min
Discarded = 0.29 cfs @ 12.00 hrs, Volume= 0.046 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 65.07' @ 12.23 hrs Surf.Area= 0.118 ac Storage= 0.004 af

Plug-Flow detention time= 2.6 min calculated for 0.046 af (100% of inflow)
Center-of-Mass det. time= 2.5 min (758.0 - 755.5)

Volume	Invert	Avail.Storage	Storage Description
#1	65.00'	0.047 af	**52.00'W x 99.00'L x 1.00'H Prismatoid** 0.118 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	65.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.29 cfs @ 12.00 hrs HW=65.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.29 cfs)

Summary for Pond 4: Infiltration Bed

Inflow Area = 0.116 ac, 43.97% Impervious, Inflow Depth > 4.59" for Plymouth-010yr event
Inflow = 0.54 cfs @ 12.09 hrs, Volume= 0.044 af
Outflow = 0.28 cfs @ 12.00 hrs, Volume= 0.044 af, Atten= 48%, Lag= 0.0 min
Discarded = 0.28 cfs @ 12.00 hrs, Volume= 0.044 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 65.07' @ 12.23 hrs Surf.Area= 0.116 ac Storage= 0.003 af

Plug-Flow detention time= 2.6 min calculated for 0.044 af (100% of inflow)
Center-of-Mass det. time= 2.4 min (758.0 - 755.5)

Volume	Invert	Avail.Storage	Storage Description
#1	65.00'	0.046 af	**51.00'W x 99.00'L x 1.00'H Prismatoid** 0.116 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	65.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.28 cfs @ 12.00 hrs HW=65.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.28 cfs)

Summary for Pond 5: Infiltration Bed

Inflow Area = 0.052 ac, 15.38% Impervious, Inflow Depth > 4.48" for Plymouth-010yr event
Inflow = 0.24 cfs @ 12.09 hrs, Volume= 0.019 af
Outflow = 0.13 cfs @ 12.00 hrs, Volume= 0.019 af, Atten= 47%, Lag= 0.0 min
Discarded = 0.13 cfs @ 12.00 hrs, Volume= 0.019 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 69.07' @ 12.22 hrs Surf.Area= 0.053 ac Storage= 0.001 af

Plug-Flow detention time= 2.5 min calculated for 0.019 af (100% of inflow)
Center-of-Mass det. time= 2.3 min (764.5 - 762.2)

Volume	Invert	Avail.Storage	Storage Description
#1	69.00'	0.021 af	**29.00'W x 79.00'L x 1.00'H Prismatoid** 0.053 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	69.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.13 cfs @ 12.00 hrs HW=69.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.13 cfs)

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-1: Runoff Area=57.623 ac 0.41% Impervious Runoff Depth>2.21"
Tc=6.0 min CN=62 Runoff=141.99 cfs 10.622 af

Subcatchment PDA-2: Equipment Pads Runoff Area=0.055 ac 60.00% Impervious Runoff Depth>5.82"
Tc=6.0 min CN=97 Runoff=0.32 cfs 0.027 af

Subcatchment PDA-3: Equipment Pads Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>5.82"
Tc=6.0 min CN=97 Runoff=0.70 cfs 0.058 af

Subcatchment PDA-4: Equipment Pads Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>5.82"
Tc=6.0 min CN=97 Runoff=0.70 cfs 0.058 af

Subcatchment PDA-5: Equipment Pads Runoff Area=0.116 ac 43.97% Impervious Runoff Depth>5.82"
Tc=6.0 min CN=97 Runoff=0.68 cfs 0.056 af

Subcatchment PDA-6: Equipment Pads Runoff Area=0.052 ac 15.38% Impervious Runoff Depth>5.70"
Tc=6.0 min CN=96 Runoff=0.30 cfs 0.025 af

Reach DP-1: Weweantic River Inflow=141.99 cfs 10.622 af
Outflow=141.99 cfs 10.622 af

Pond 1: Infiltration Bed Peak Elev=63.12' Storage=0.003 af Inflow=0.32 cfs 0.027 af
Outflow=0.14 cfs 0.027 af

Pond 2: Infiltration Bed Peak Elev=63.63' Storage=0.006 af Inflow=0.70 cfs 0.058 af
Outflow=0.29 cfs 0.058 af

Pond 3: Infiltration Bed Peak Elev=65.13' Storage=0.006 af Inflow=0.70 cfs 0.058 af
Outflow=0.29 cfs 0.058 af

Pond 4: Infiltration Bed Peak Elev=65.13' Storage=0.006 af Inflow=0.68 cfs 0.056 af
Outflow=0.28 cfs 0.056 af

Pond 5: Infiltration Bed Peak Elev=69.12' Storage=0.003 af Inflow=0.30 cfs 0.025 af
Outflow=0.13 cfs 0.025 af

Total Runoff Area = 58.084 ac Runoff Volume = 10.845 af Average Runoff Depth = 2.24"
99.26% Pervious = 57.655 ac 0.74% Impervious = 0.429 ac

Summary for Subcatchment PDA-1:

Runoff = 141.99 cfs @ 12.10 hrs, Volume= 10.622 af, Depth> 2.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-025yr Rainfall=6.18"

	Area (ac)	CN	Description
	0.542	30	Woods, Good, HSG A
	0.025	77	Woods, Good, HSG D
	15.561	30	Brush, Good, HSG A
	37.968	73	Brush, Good, HSG D
*	0.273	96	Proposed Gravel Road, HSG A
*	1.412	96	Existing Gravel Road, HSG A
*	0.006	96	Proposed Gravel Road, HSG D
*	1.601	96	Existing Gravel Road, HSG D
*	0.200	98	Existing Pavement, HSG A
*	0.018	98	Existing Pavement, HSG D
*	0.007	98	Existing Roofs, HSG A
*	0.010	98	Exising Roofs, HSG D
	57.623	62	Weighted Average
	57.388		99.59% Pervious Area
	0.235		0.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc.**

Summary for Subcatchment PDA-2: Equipment Pads

Runoff = 0.32 cfs @ 12.09 hrs, Volume= 0.027 af, Depth> 5.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-025yr Rainfall=6.18"

	Area (ac)	CN	Description
*	0.033	98	Equipment Pads, HSG A
*	0.022	96	Proposed Gravel, HSG A
	0.055	97	Weighted Average
	0.022		40.00% Pervious Area
	0.033		60.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-3: Equipment Pads

Runoff = 0.70 cfs @ 12.09 hrs, Volume= 0.058 af, Depth> 5.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-025yr Rainfall=6.18"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG D
*	0.068	96	Proposed Gravel, HSG D
	0.119	97	Weighted Average
	0.068		57.14% Pervious Area
	0.051		42.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-4: Equipment Pads

Runoff = 0.70 cfs @ 12.09 hrs, Volume= 0.058 af, Depth> 5.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-025yr Rainfall=6.18"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG D
*	0.068	96	Proposed Gravel, HSG D
	0.119	97	Weighted Average
	0.068		57.14% Pervious Area
	0.051		42.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-5: Equipment Pads

Runoff = 0.68 cfs @ 12.09 hrs, Volume= 0.056 af, Depth> 5.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-025yr Rainfall=6.18"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG A
*	0.065	96	Proposed Gravel, HSG A
	0.116	97	Weighted Average
	0.065		56.03% Pervious Area
	0.051		43.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-6: Equipment Pads

Runoff = 0.30 cfs @ 12.09 hrs, Volume= 0.025 af, Depth> 5.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-025yr Rainfall=6.18"

	Area (ac)	CN	Description
*	0.008	98	Equipment Pads, HSG A
*	0.044	96	Proposed Gravel, HSG A
	0.052	96	Weighted Average
	0.044		84.62% Pervious Area
	0.008		15.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Reach DP-1: Weweantic River

Inflow Area = 58.084 ac, 0.74% Impervious, Inflow Depth > 2.19" for Plymouth-025yr event
Inflow = 141.99 cfs @ 12.10 hrs, Volume= 10.622 af
Outflow = 141.99 cfs @ 12.10 hrs, Volume= 10.622 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 1: Infiltration Bed

Inflow Area = 0.055 ac, 60.00% Impervious, Inflow Depth > 5.82" for Plymouth-025yr event
Inflow = 0.32 cfs @ 12.09 hrs, Volume= 0.027 af
Outflow = 0.14 cfs @ 11.95 hrs, Volume= 0.027 af, Atten= 58%, Lag= 0.0 min
Discarded = 0.14 cfs @ 11.95 hrs, Volume= 0.027 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 63.12' @ 12.29 hrs Surf.Area= 0.056 ac Storage= 0.003 af

Plug-Flow detention time= 4.0 min calculated for 0.027 af (100% of inflow)
Center-of-Mass det. time= 3.9 min (755.1 - 751.2)

Volume	Invert	Avail.Storage	Storage Description
#1	63.00'	0.022 af	**42.00'W x 58.00'L x 1.00'H Prismatoid** 0.056 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.14 cfs @ 11.95 hrs HW=63.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.14 cfs)

Summary for Pond 2: Infiltration Bed

Inflow Area = 0.119 ac, 42.86% Impervious, Inflow Depth > 5.82" for Plymouth-025yr event
Inflow = 0.70 cfs @ 12.09 hrs, Volume= 0.058 af
Outflow = 0.29 cfs @ 11.95 hrs, Volume= 0.058 af, Atten= 59%, Lag= 0.0 min
Discarded = 0.29 cfs @ 11.95 hrs, Volume= 0.058 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 63.63' @ 12.30 hrs Surf.Area= 0.118 ac Storage= 0.006 af

Plug-Flow detention time= 4.3 min calculated for 0.058 af (100% of inflow)
Center-of-Mass det. time= 4.1 min (755.3 - 751.2)

Volume	Invert	Avail.Storage	Storage Description
#1	63.50'	0.047 af	**52.00'W x 99.00'L x 1.00'H Prismatoid** 0.118 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.50'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.29 cfs @ 11.95 hrs HW=63.51' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.29 cfs)

Summary for Pond 3: Infiltration Bed

Inflow Area = 0.119 ac, 42.86% Impervious, Inflow Depth > 5.82" for Plymouth-025yr event
Inflow = 0.70 cfs @ 12.09 hrs, Volume= 0.058 af
Outflow = 0.29 cfs @ 11.95 hrs, Volume= 0.058 af, Atten= 59%, Lag= 0.0 min
Discarded = 0.29 cfs @ 11.95 hrs, Volume= 0.058 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 65.13' @ 12.30 hrs Surf.Area= 0.118 ac Storage= 0.006 af

Plug-Flow detention time= 4.3 min calculated for 0.058 af (100% of inflow)
Center-of-Mass det. time= 4.1 min (755.3 - 751.2)

Volume	Invert	Avail.Storage	Storage Description
#1	65.00'	0.047 af	**52.00'W x 99.00'L x 1.00'H Prismatoid** 0.118 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	65.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.29 cfs @ 11.95 hrs HW=65.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.29 cfs)

Summary for Pond 4: Infiltration Bed

Inflow Area = 0.116 ac, 43.97% Impervious, Inflow Depth > 5.82" for Plymouth-025yr event
Inflow = 0.68 cfs @ 12.09 hrs, Volume= 0.056 af
Outflow = 0.28 cfs @ 11.95 hrs, Volume= 0.056 af, Atten= 59%, Lag= 0.0 min
Discarded = 0.28 cfs @ 11.95 hrs, Volume= 0.056 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 65.13' @ 12.29 hrs Surf.Area= 0.116 ac Storage= 0.006 af

Plug-Flow detention time= 4.2 min calculated for 0.056 af (100% of inflow)
Center-of-Mass det. time= 4.1 min (755.3 - 751.2)

Volume	Invert	Avail.Storage	Storage Description
#1	65.00'	0.046 af	**51.00'W x 99.00'L x 1.00'H Prismatoid** 0.116 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	65.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.28 cfs @ 11.95 hrs HW=65.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.28 cfs)

Summary for Pond 5: Infiltration Bed

Inflow Area = 0.052 ac, 15.38% Impervious, Inflow Depth > 5.70" for Plymouth-025yr event
Inflow = 0.30 cfs @ 12.09 hrs, Volume= 0.025 af
Outflow = 0.13 cfs @ 11.95 hrs, Volume= 0.025 af, Atten= 58%, Lag= 0.0 min
Discarded = 0.13 cfs @ 11.95 hrs, Volume= 0.025 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 69.12' @ 12.29 hrs Surf.Area= 0.053 ac Storage= 0.003 af

Plug-Flow detention time= 4.1 min calculated for 0.025 af (100% of inflow)
Center-of-Mass det. time= 3.9 min (761.1 - 757.2)

Volume	Invert	Avail.Storage	Storage Description
#1	69.00'	0.021 af	**29.00'W x 79.00'L x 1.00'H Prismatoid** 0.053 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	69.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.13 cfs @ 11.95 hrs HW=69.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.13 cfs)

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-1: Runoff Area=57.623 ac 0.41% Impervious Runoff Depth>3.03"
Tc=6.0 min CN=62 Runoff=197.98 cfs 14.539 af

Subcatchment PDA-2: Equipment Pads Runoff Area=0.055 ac 60.00% Impervious Runoff Depth>6.95"
Tc=6.0 min CN=97 Runoff=0.38 cfs 0.032 af

Subcatchment PDA-3: Equipment Pads Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>6.95"
Tc=6.0 min CN=97 Runoff=0.83 cfs 0.069 af

Subcatchment PDA-4: Equipment Pads Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>6.95"
Tc=6.0 min CN=97 Runoff=0.83 cfs 0.069 af

Subcatchment PDA-5: Equipment Pads Runoff Area=0.116 ac 43.97% Impervious Runoff Depth>6.95"
Tc=6.0 min CN=97 Runoff=0.81 cfs 0.067 af

Subcatchment PDA-6: Equipment Pads Runoff Area=0.052 ac 15.38% Impervious Runoff Depth>6.83"
Tc=6.0 min CN=96 Runoff=0.36 cfs 0.030 af

Reach DP-1: Weweantic River Inflow=197.98 cfs 14.539 af
Outflow=197.98 cfs 14.539 af

Pond 1: Infiltration Bed Peak Elev=63.19' Storage=0.004 af Inflow=0.38 cfs 0.032 af
Outflow=0.14 cfs 0.032 af

Pond 2: Infiltration Bed Peak Elev=63.70' Storage=0.009 af Inflow=0.83 cfs 0.069 af
Outflow=0.29 cfs 0.069 af

Pond 3: Infiltration Bed Peak Elev=65.20' Storage=0.009 af Inflow=0.83 cfs 0.069 af
Outflow=0.29 cfs 0.069 af

Pond 4: Infiltration Bed Peak Elev=65.19' Storage=0.009 af Inflow=0.81 cfs 0.067 af
Outflow=0.28 cfs 0.067 af

Pond 5: Infiltration Bed Peak Elev=69.19' Storage=0.004 af Inflow=0.36 cfs 0.030 af
Outflow=0.13 cfs 0.030 af

Total Runoff Area = 58.084 ac Runoff Volume = 14.805 af Average Runoff Depth = 3.06"
99.26% Pervious = 57.655 ac 0.74% Impervious = 0.429 ac

Summary for Subcatchment PDA-1:

Runoff = 197.98 cfs @ 12.10 hrs, Volume= 14.539 af, Depth> 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-050yr Rainfall=7.31"

	Area (ac)	CN	Description
	0.542	30	Woods, Good, HSG A
	0.025	77	Woods, Good, HSG D
	15.561	30	Brush, Good, HSG A
	37.968	73	Brush, Good, HSG D
*	0.273	96	Proposed Gravel Road, HSG A
*	1.412	96	Existing Gravel Road, HSG A
*	0.006	96	Proposed Gravel Road, HSG D
*	1.601	96	Existing Gravel Road, HSG D
*	0.200	98	Existing Pavement, HSG A
*	0.018	98	Existing Pavement, HSG D
*	0.007	98	Existing Roofs, HSG A
*	0.010	98	Exising Roofs, HSG D
	57.623	62	Weighted Average
	57.388		99.59% Pervious Area
	0.235		0.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc.**

Summary for Subcatchment PDA-2: Equipment Pads

Runoff = 0.38 cfs @ 12.09 hrs, Volume= 0.032 af, Depth> 6.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-050yr Rainfall=7.31"

	Area (ac)	CN	Description
*	0.033	98	Equipment Pads, HSG A
*	0.022	96	Proposed Gravel, HSG A
	0.055	97	Weighted Average
	0.022		40.00% Pervious Area
	0.033		60.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-3: Equipment Pads

Runoff = 0.83 cfs @ 12.09 hrs, Volume= 0.069 af, Depth> 6.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-050yr Rainfall=7.31"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG D
*	0.068	96	Proposed Gravel, HSG D
	0.119	97	Weighted Average
	0.068		57.14% Pervious Area
	0.051		42.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-4: Equipment Pads

Runoff = 0.83 cfs @ 12.09 hrs, Volume= 0.069 af, Depth> 6.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-050yr Rainfall=7.31"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG D
*	0.068	96	Proposed Gravel, HSG D
	0.119	97	Weighted Average
	0.068		57.14% Pervious Area
	0.051		42.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-5: Equipment Pads

Runoff = 0.81 cfs @ 12.09 hrs, Volume= 0.067 af, Depth> 6.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-050yr Rainfall=7.31"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG A
*	0.065	96	Proposed Gravel, HSG A
	0.116	97	Weighted Average
	0.065		56.03% Pervious Area
	0.051		43.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-6: Equipment Pads

Runoff = 0.36 cfs @ 12.09 hrs, Volume= 0.030 af, Depth> 6.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-050yr Rainfall=7.31"

	Area (ac)	CN	Description
*	0.008	98	Equipment Pads, HSG A
*	0.044	96	Proposed Gravel, HSG A
	0.052	96	Weighted Average
	0.044		84.62% Pervious Area
	0.008		15.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Reach DP-1: Weweantic River

Inflow Area = 58.084 ac, 0.74% Impervious, Inflow Depth > 3.00" for Plymouth-050yr event
Inflow = 197.98 cfs @ 12.10 hrs, Volume= 14.539 af
Outflow = 197.98 cfs @ 12.10 hrs, Volume= 14.539 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 1: Infiltration Bed

Inflow Area = 0.055 ac, 60.00% Impervious, Inflow Depth > 6.95" for Plymouth-050yr event
Inflow = 0.38 cfs @ 12.09 hrs, Volume= 0.032 af
Outflow = 0.14 cfs @ 11.90 hrs, Volume= 0.032 af, Atten= 65%, Lag= 0.0 min
Discarded = 0.14 cfs @ 11.90 hrs, Volume= 0.032 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 63.19' @ 12.35 hrs Surf.Area= 0.056 ac Storage= 0.004 af

Plug-Flow detention time= 5.9 min calculated for 0.032 af (100% of inflow)
Center-of-Mass det. time= 5.8 min (754.0 - 748.2)

Volume	Invert	Avail.Storage	Storage Description
#1	63.00'	0.022 af	**42.00'W x 58.00'L x 1.00'H Prismatoid** 0.056 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.14 cfs @ 11.90 hrs HW=63.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.14 cfs)

Summary for Pond 2: Infiltration Bed

Inflow Area = 0.119 ac, 42.86% Impervious, Inflow Depth > 6.95" for Plymouth-050yr event
Inflow = 0.83 cfs @ 12.09 hrs, Volume= 0.069 af
Outflow = 0.29 cfs @ 11.90 hrs, Volume= 0.069 af, Atten= 65%, Lag= 0.0 min
Discarded = 0.29 cfs @ 11.90 hrs, Volume= 0.069 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 63.70' @ 12.36 hrs Surf.Area= 0.118 ac Storage= 0.009 af

Plug-Flow detention time= 6.3 min calculated for 0.069 af (100% of inflow)
Center-of-Mass det. time= 6.1 min (754.3 - 748.2)

Volume	Invert	Avail.Storage	Storage Description
#1	63.50'	0.047 af	**52.00'W x 99.00'L x 1.00'H Prismatoid** 0.118 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.50'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.29 cfs @ 11.90 hrs HW=63.51' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.29 cfs)

Summary for Pond 3: Infiltration Bed

Inflow Area = 0.119 ac, 42.86% Impervious, Inflow Depth > 6.95" for Plymouth-050yr event
Inflow = 0.83 cfs @ 12.09 hrs, Volume= 0.069 af
Outflow = 0.29 cfs @ 11.90 hrs, Volume= 0.069 af, Atten= 65%, Lag= 0.0 min
Discarded = 0.29 cfs @ 11.90 hrs, Volume= 0.069 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 65.20' @ 12.36 hrs Surf.Area= 0.118 ac Storage= 0.009 af

Plug-Flow detention time= 6.3 min calculated for 0.069 af (100% of inflow)
Center-of-Mass det. time= 6.1 min (754.3 - 748.2)

Volume	Invert	Avail.Storage	Storage Description
#1	65.00'	0.047 af	**52.00'W x 99.00'L x 1.00'H Prismatoid** 0.118 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	65.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.29 cfs @ 11.90 hrs HW=65.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.29 cfs)

Summary for Pond 4: Infiltration Bed

Inflow Area = 0.116 ac, 43.97% Impervious, Inflow Depth > 6.95" for Plymouth-050yr event
Inflow = 0.81 cfs @ 12.09 hrs, Volume= 0.067 af
Outflow = 0.28 cfs @ 11.90 hrs, Volume= 0.067 af, Atten= 65%, Lag= 0.0 min
Discarded = 0.28 cfs @ 11.90 hrs, Volume= 0.067 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 65.19' @ 12.35 hrs Surf.Area= 0.116 ac Storage= 0.009 af

Plug-Flow detention time= 6.2 min calculated for 0.067 af (100% of inflow)
Center-of-Mass det. time= 6.0 min (754.2 - 748.2)

Volume	Invert	Avail.Storage	Storage Description
#1	65.00'	0.046 af	**51.00'W x 99.00'L x 1.00'H Prismatoid** 0.116 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	65.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.28 cfs @ 11.90 hrs HW=65.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.28 cfs)

Summary for Pond 5: Infiltration Bed

Inflow Area = 0.052 ac, 15.38% Impervious, Inflow Depth > 6.83" for Plymouth-050yr event
Inflow = 0.36 cfs @ 12.09 hrs, Volume= 0.030 af
Outflow = 0.13 cfs @ 11.90 hrs, Volume= 0.030 af, Atten= 65%, Lag= 0.0 min
Discarded = 0.13 cfs @ 11.90 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 69.19' @ 12.35 hrs Surf.Area= 0.053 ac Storage= 0.004 af

Plug-Flow detention time= 6.0 min calculated for 0.030 af (100% of inflow)
Center-of-Mass det. time= 5.9 min (759.6 - 753.7)

Volume	Invert	Avail.Storage	Storage Description
#1	69.00'	0.021 af	**29.00'W x 79.00'L x 1.00'H Prismatoid** 0.053 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	69.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.13 cfs @ 11.90 hrs HW=69.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.13 cfs)

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-1: Runoff Area=57.623 ac 0.41% Impervious Runoff Depth>4.06"
Tc=6.0 min CN=62 Runoff=268.29 cfs 19.509 af

Subcatchment PDA-2: Equipment Pads Runoff Area=0.055 ac 60.00% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=97 Runoff=0.46 cfs 0.038 af

Subcatchment PDA-3: Equipment Pads Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=97 Runoff=0.98 cfs 0.082 af

Subcatchment PDA-4: Equipment Pads Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=97 Runoff=0.98 cfs 0.082 af

Subcatchment PDA-5: Equipment Pads Runoff Area=0.116 ac 43.97% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=97 Runoff=0.96 cfs 0.080 af

Subcatchment PDA-6: Equipment Pads Runoff Area=0.052 ac 15.38% Impervious Runoff Depth>8.16"
Tc=6.0 min CN=96 Runoff=0.43 cfs 0.035 af

Reach DP-1: Weweantic River Inflow=268.29 cfs 19.509 af
Outflow=268.29 cfs 19.509 af

Pond 1: Infiltration Bed Peak Elev=63.27' Storage=0.006 af Inflow=0.46 cfs 0.038 af
Outflow=0.14 cfs 0.038 af

Pond 2: Infiltration Bed Peak Elev=63.78' Storage=0.013 af Inflow=0.98 cfs 0.082 af
Outflow=0.29 cfs 0.082 af

Pond 3: Infiltration Bed Peak Elev=65.28' Storage=0.013 af Inflow=0.98 cfs 0.082 af
Outflow=0.29 cfs 0.082 af

Pond 4: Infiltration Bed Peak Elev=65.28' Storage=0.013 af Inflow=0.96 cfs 0.080 af
Outflow=0.28 cfs 0.080 af

Pond 5: Infiltration Bed Peak Elev=69.27' Storage=0.006 af Inflow=0.43 cfs 0.035 af
Outflow=0.13 cfs 0.035 af

Total Runoff Area = 58.084 ac Runoff Volume = 19.827 af Average Runoff Depth = 4.10"
99.26% Pervious = 57.655 ac 0.74% Impervious = 0.429 ac

Summary for Subcatchment PDA-1:

Runoff = 268.29 cfs @ 12.09 hrs, Volume= 19.509 af, Depth> 4.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-100yr Rainfall=8.65"

	Area (ac)	CN	Description
	0.542	30	Woods, Good, HSG A
	0.025	77	Woods, Good, HSG D
	15.561	30	Brush, Good, HSG A
	37.968	73	Brush, Good, HSG D
*	0.273	96	Proposed Gravel Road, HSG A
*	1.412	96	Existing Gravel Road, HSG A
*	0.006	96	Proposed Gravel Road, HSG D
*	1.601	96	Existing Gravel Road, HSG D
*	0.200	98	Existing Pavement, HSG A
*	0.018	98	Existing Pavement, HSG D
*	0.007	98	Existing Roofs, HSG A
*	0.010	98	Exising Roofs, HSG D
	57.623	62	Weighted Average
	57.388		99.59% Pervious Area
	0.235		0.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc.**

Summary for Subcatchment PDA-2: Equipment Pads

Runoff = 0.46 cfs @ 12.09 hrs, Volume= 0.038 af, Depth> 8.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-100yr Rainfall=8.65"

	Area (ac)	CN	Description
*	0.033	98	Equipment Pads, HSG A
*	0.022	96	Proposed Gravel, HSG A
	0.055	97	Weighted Average
	0.022		40.00% Pervious Area
	0.033		60.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-3: Equipment Pads

Runoff = 0.98 cfs @ 12.09 hrs, Volume= 0.082 af, Depth> 8.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-100yr Rainfall=8.65"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG D
*	0.068	96	Proposed Gravel, HSG D
	0.119	97	Weighted Average
	0.068		57.14% Pervious Area
	0.051		42.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-4: Equipment Pads

Runoff = 0.98 cfs @ 12.09 hrs, Volume= 0.082 af, Depth> 8.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-100yr Rainfall=8.65"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG D
*	0.068	96	Proposed Gravel, HSG D
	0.119	97	Weighted Average
	0.068		57.14% Pervious Area
	0.051		42.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-5: Equipment Pads

Runoff = 0.96 cfs @ 12.09 hrs, Volume= 0.080 af, Depth> 8.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-100yr Rainfall=8.65"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG A
*	0.065	96	Proposed Gravel, HSG A
	0.116	97	Weighted Average
	0.065		56.03% Pervious Area
	0.051		43.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment PDA-6: Equipment Pads

Runoff = 0.43 cfs @ 12.09 hrs, Volume= 0.035 af, Depth> 8.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr Plymouth-100yr Rainfall=8.65"

	Area (ac)	CN	Description
*	0.008	98	Equipment Pads, HSG A
*	0.044	96	Proposed Gravel, HSG A
	0.052	96	Weighted Average
	0.044		84.62% Pervious Area
	0.008		15.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Reach DP-1: Weweantic River

Inflow Area = 58.084 ac, 0.74% Impervious, Inflow Depth > 4.03" for Plymouth-100yr event
Inflow = 268.29 cfs @ 12.09 hrs, Volume= 19.509 af
Outflow = 268.29 cfs @ 12.09 hrs, Volume= 19.509 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 1: Infiltration Bed

Inflow Area = 0.055 ac, 60.00% Impervious, Inflow Depth > 8.28" for Plymouth-100yr event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 0.038 af
Outflow = 0.14 cfs @ 11.85 hrs, Volume= 0.038 af, Atten= 70%, Lag= 0.0 min
Discarded = 0.14 cfs @ 11.85 hrs, Volume= 0.038 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 63.27' @ 12.41 hrs Surf.Area= 0.056 ac Storage= 0.006 af

Plug-Flow detention time= 8.7 min calculated for 0.038 af (100% of inflow)
Center-of-Mass det. time= 8.6 min (754.1 - 745.5)

Volume	Invert	Avail.Storage	Storage Description
#1	63.00'	0.022 af	**42.00'W x 58.00'L x 1.00'H Prismatoid** 0.056 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.14 cfs @ 11.85 hrs HW=63.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.14 cfs)

Summary for Pond 2: Infiltration Bed

Inflow Area = 0.119 ac, 42.86% Impervious, Inflow Depth > 8.28" for Plymouth-100yr event
Inflow = 0.98 cfs @ 12.09 hrs, Volume= 0.082 af
Outflow = 0.29 cfs @ 11.80 hrs, Volume= 0.082 af, Atten= 71%, Lag= 0.0 min
Discarded = 0.29 cfs @ 11.80 hrs, Volume= 0.082 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 63.78' @ 12.41 hrs Surf.Area= 0.118 ac Storage= 0.013 af

Plug-Flow detention time= 9.2 min calculated for 0.082 af (100% of inflow)
Center-of-Mass det. time= 9.1 min (754.6 - 745.5)

Volume	Invert	Avail.Storage	Storage Description
#1	63.50'	0.047 af	**52.00'W x 99.00'L x 1.00'H Prismatoid** 0.118 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.50'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.29 cfs @ 11.80 hrs HW=63.51' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.29 cfs)

Summary for Pond 3: Infiltration Bed

Inflow Area = 0.119 ac, 42.86% Impervious, Inflow Depth > 8.28" for Plymouth-100yr event
Inflow = 0.98 cfs @ 12.09 hrs, Volume= 0.082 af
Outflow = 0.29 cfs @ 11.80 hrs, Volume= 0.082 af, Atten= 71%, Lag= 0.0 min
Discarded = 0.29 cfs @ 11.80 hrs, Volume= 0.082 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 65.28' @ 12.41 hrs Surf.Area= 0.118 ac Storage= 0.013 af

Plug-Flow detention time= 9.2 min calculated for 0.082 af (100% of inflow)
Center-of-Mass det. time= 9.1 min (754.6 - 745.5)

Volume	Invert	Avail.Storage	Storage Description
#1	65.00'	0.047 af	**52.00'W x 99.00'L x 1.00'H Prismatoid** 0.118 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	65.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.29 cfs @ 11.80 hrs HW=65.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.29 cfs)

Summary for Pond 4: Infiltration Bed

Inflow Area = 0.116 ac, 43.97% Impervious, Inflow Depth > 8.28" for Plymouth-100yr event
Inflow = 0.96 cfs @ 12.09 hrs, Volume= 0.080 af
Outflow = 0.28 cfs @ 11.80 hrs, Volume= 0.080 af, Atten= 71%, Lag= 0.0 min
Discarded = 0.28 cfs @ 11.80 hrs, Volume= 0.080 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 65.28' @ 12.41 hrs Surf.Area= 0.116 ac Storage= 0.013 af

Plug-Flow detention time= 9.1 min calculated for 0.080 af (100% of inflow)
Center-of-Mass det. time= 9.0 min (754.4 - 745.5)

Volume	Invert	Avail.Storage	Storage Description
#1	65.00'	0.046 af	**51.00'W x 99.00'L x 1.00'H Prismatoid** 0.116 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	65.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.28 cfs @ 11.80 hrs HW=65.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.28 cfs)

Summary for Pond 5: Infiltration Bed

Inflow Area = 0.052 ac, 15.38% Impervious, Inflow Depth > 8.16" for Plymouth-100yr event
Inflow = 0.43 cfs @ 12.09 hrs, Volume= 0.035 af
Outflow = 0.13 cfs @ 11.85 hrs, Volume= 0.035 af, Atten= 70%, Lag= 0.0 min
Discarded = 0.13 cfs @ 11.85 hrs, Volume= 0.035 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 69.27' @ 12.41 hrs Surf.Area= 0.053 ac Storage= 0.006 af

Plug-Flow detention time= 8.8 min calculated for 0.035 af (100% of inflow)
Center-of-Mass det. time= 8.7 min (759.2 - 750.5)

Volume	Invert	Avail.Storage	Storage Description
#1	69.00'	0.021 af	**29.00'W x 79.00'L x 1.00'H Prismatoid** 0.053 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	69.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.13 cfs @ 11.85 hrs HW=69.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.13 cfs)

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CLIENT/PROJECT:

BE RE, LLC
Rocky Maple Solar

SUBJECT/TITLE:

Groundwater Mounding Calculations for Infiltration Bed 1

OBJECTIVE OF CALCULATION:

- To determine the maximum groundwater mounding height beneath Infiltration Bed 1.

CALCULATION METHOD(S):

- Estimated maximum groundwater mounding height calculated using Hantush equation.

ASSUMPTIONS:

- Vertical hydraulic conductivity [R] (unsaturated zone) is equal to the infiltration rate of the proposed basin = 2.41 in/hr = 4.82 ft/day.
- Horizontal hydraulic conductivity [K] (saturated zone) is 200 ft/day based on data provided in USGS Report 86-4053A for mixed sand and gravel.
- Specific yield [Sy] is 0.26 based on data provided in GSWS Paper 1662-D for Medium Sand
- Estimated saturated thickness [hi(0)] is 10.00 ft based upon observed seasonal high groundwater and additional field observations during subsurface explorations.
- ½ the length of basin (in x direction) [x] = 29 ft
- ½ the width of basin (in y direction) [y] = 21 ft
- Infiltration Basin-1 takes approximately 1.956 hours (t=0.082 days) to dewater.

SOURCES OF DATA/EQUATIONS:

- Hantush equation spreadsheet published by the USGS.
- Page 2 of USGS Report 86-4053A, *Yield and Quality of Ground Water from Stratified-Drift Aquifers, Taunton River Basin, Massachusetts: Executive Summary,* 1989.
- Page D1 of GWSWS Paper 1662-D, *Specific Yield – Compilation of Specific Yields for Various Materials,* 1967.
- *Massachusetts Stormwater Handbook,* 2008

CONCLUSIONS:

The mounding analysis indicates that the groundwater elevation would rise approximately 0.784-feet to infiltrate the required volume. Therefore, it can be concluded that the rise in groundwater elevation will not prohibit the basin from dewatering within 72 hours.

REV	CALC. BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
0	NBB	02/26/2021	NPS	03/05/2021	EJL	03/11/2021
1	NBB	04/01/2021	NPS	04/02/2021	EJL	04/07/2021

This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

The user must specify infiltration rate (R), specific yield (Sy), horizontal hydraulic conductivity (Kh), basin dimensions (x, y), duration of infiltration period (t), and the initial thickness of the saturated zone (hi(0), height of the water table if the bottom of the aquifer is the datum). For a square basin the half width equals the half length (x = y). For a rectangular basin, if the user wants the water-table changes perpendicular to the long side, specify x as the short dimension and y as the long dimension. Conversely, if the user wants the values perpendicular to the short side, specify y as the short dimension, x as the long dimension. All distances are from the center of the basin. Users can change the distances from the center of the basin at which water-table aquifer thickness are calculated.
Cells highlighted in yellow are values that can be changed by the user. Cells highlighted in red are output values based on user-specified inputs. The user MUST click the blue "Re-Calculate Now" button each time ANY of the user-specified inputs are changed otherwise necessary iterations to converge on the correct solution will not be done and values shown will be incorrect. Use consistent units for all input values (for example, feet and days)

use consistent units (e.g. feet & days **or** inches & hours)

Input Values		
4.8200	***R***	**Recharge (infiltration) rate (feet/day)**
0.260	**Sy**	**Specific yield, Sy (dimensionless, between 0 and 1)**
200.00	**K**	**Horizontal hydraulic conductivity, Kh (feet/day)***
29.000	**x**	**1/2 length of basin (x direction, in feet)**
21.000	**y**	**1/2 width of basin (y direction, in feet)**
0.082	**t**	**duration of infiltration period (days)**
10.000	**hi(0)**	**initial thickness of saturated zone (feet)**

Conversion Table

inch/hour	**feet/day**
0.67	1.33
2.00	4.00

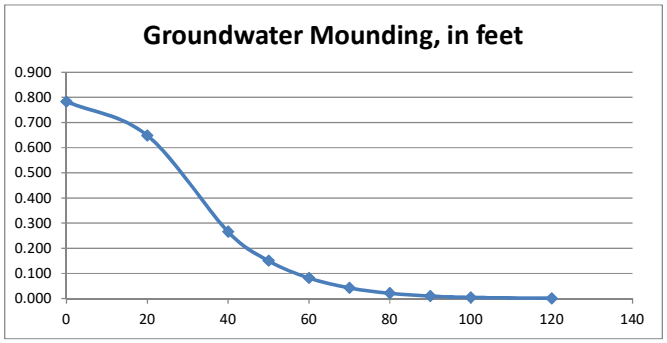
hours	**days**
36	1.50

In the report accompanying this spreadsheet (USGS SIR 2010-5102), vertical soil permeability (ft/d) is assumed to be one-tenth horizontal hydraulic conductivity (ft/d).

10.784	**h(max)**	**maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
0.784	**Δh(max)**	**maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	**Distance from center of basin in x direction, in feet**
0.784	**0**
0.649	**20**
0.266	**40**
0.150	**50**
0.082	**60**
0.043	**70**
0.021	**80**
0.010	**90**
0.005	**100**
0.001	**120**

Re-Calculate Now



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

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Regional Office: Plymouth, MA

JOB NO./LOCATION:

3203.00
Carver & Wareham, MA

CLIENT/PROJECT:

BE RE, LLC
Rocky Maple Solar

SUBJECT/TITLE:

Groundwater Mounding Calculations for Infiltration Bed 5

OBJECTIVE OF CALCULATION:

- To determine the maximum groundwater mounding height beneath Infiltration Bed 5.

CALCULATION METHOD(S):

- Estimated maximum groundwater mounding height calculated using Hantush equation.

ASSUMPTIONS:

- Vertical hydraulic conductivity [R] (unsaturated zone) is equal to the infiltration rate of the proposed basin = 2.41 in/hr = 4.82 ft/day.
- Horizontal hydraulic conductivity [K] (saturated zone) is 200 ft/day based on data provided in USGS Report 86-4053A for mixed sand and gravel.
- Specific yield [Sy] is 0.26 based on data provided in GSWS Paper 1662-D for Medium Sand
- Estimated saturated thickness [hi(0)] is 10.00 ft based upon observed seasonal high groundwater and additional field observations during subsurface explorations.
- ½ the length of basin (in x direction) [x] = 39.5 ft
- ½ the width of basin (in y direction) [y] = 14.5 ft
- Infiltration Basin-5 takes approximately 1.973 hours (t=0.082 days) to dewater.

SOURCES OF DATA/EQUATIONS:

- Hantush equation spreadsheet published by the USGS.
- Page 2 of USGS Report 86-4053A, *Yield and Quality of Ground Water from Stratified-Drift Aquifers, Taunton River Basin, Massachusetts: Executive Summary,* 1989.
- Page D1 of GWSWS Paper 1662-D, *Specific Yield – Compilation of Specific Yields for Various Materials,* 1967.
- *Massachusetts Stormwater Handbook,* 2008

CONCLUSIONS:

The mounding analysis indicates that the groundwater elevation would rise approximately 0.685-feet to infiltrate the required volume. Therefore, it can be concluded that the rise in groundwater elevation will not prohibit the basin from dewatering within 72 hours.

REV	CALC. BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
1	NBB	04/01/2021	NPS	04/02/2021	EJL	04/07/2021

This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

The user must specify infiltration rate (R), specific yield (Sy), horizontal hydraulic conductivity (Kh), basin dimensions (x, y), duration of infiltration period (t), and the initial thickness of the saturated zone (hi(0), height of the water table if the bottom of the aquifer is the datum). For a square basin the half width equals the half length (x = y). For a rectangular basin, if the user wants the water-table changes perpendicular to the long side, specify x as the short dimension and y as the long dimension. Conversely, if the user wants the values perpendicular to the short side, specify y as the short dimension, x as the long dimension. All distances are from the center of the basin. Users can change the distances from the center of the basin at which water-table aquifer thickness are calculated.
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use consistent units (e.g. feet & days **or** inches & hours)

Input Values		
4.8200	***R***	**Recharge (infiltration) rate (feet/day)**
0.260	**Sy**	**Specific yield, Sy (dimensionless, between 0 and 1)**
200.00	**K**	**Horizontal hydraulic conductivity, Kh (feet/day)***
39.500	**x**	**1/2 length of basin (x direction, in feet)**
14.500	**y**	**1/2 width of basin (y direction, in feet)**
0.082	**t**	**duration of infiltration period (days)**
10.000	**hi(0)**	**initial thickness of saturated zone (feet)**

Conversion Table

inch/hour	feet/day
0.67	1.33
2.00	4.00

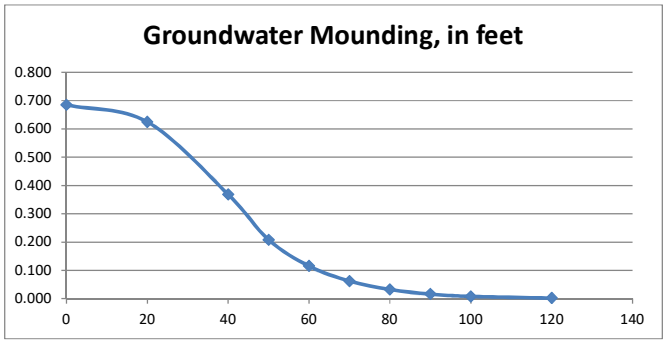
hours	days
36	1.50

In the report accompanying this spreadsheet (USGS SIR 2010-5102), vertical soil permeability (ft/d) is assumed to be one-tenth horizontal hydraulic conductivity (ft/d).

10.685	**h(max)**	**maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
0.685	**Δh(max)**	**maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
0.685	**0**
0.625	**20**
0.368	**40**
0.208	**50**
0.115	**60**
0.062	**70**
0.032	**80**
0.016	**90**
0.008	**100**
0.002	**120**

Re-Calculate Now



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YIELD AND QUALITY OF GROUND WATER FROM STRATIFIED-DRIFT AQUIFERS, TAUNTON RIVER BASIN, MASSACHUSETTS: EXECUTIVE SUMMARY

By Wayne W. Lapham and Julio C. Olimpio

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations Report 86-4053A

Prepared in cooperation with

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
DIVISION OF WATER RESOURCES

Boston, Massachusetts
1989

PHYSICAL SETTING AND HYDROGEOLOGY OF THE BASIN

The Taunton River basin covers 530 mi^2 (square miles) of Bristol, Norfolk, and Plymouth Counties in southeastern Massachusetts. All or parts of the cities of Attleboro, Brockton, Fall River, New Bedford, and Taunton, and 36 towns are in the basin (fig. 1). The basin is drained by the Matfield, Town, and Taunton Rivers.

Tributary streams include the Canoe, Nemasket, Wading, Threemile, and Winnetuxet Rivers. Surface-water drainage is generally southward toward Mount Hope Bay, a part of Narragansett Bay at Fall River.

Stratified-drift deposits cover about 62 percent of the basin. These deposits are primarily ice-contact, outwash, and lake-bottom sediments, which were deposited in preglacial bedrock valleys and in water-filled depressions in the till and bedrock surface during retreat of the last glacier. The sediments are composed of sand, gravel, cobbles, silt, and clay. The drift ranges in thickness from zero to about 200 ft (feet) in some of the deep preglacial bedrock valleys. The thickest deposits are lake-bottom deposits composed of fine sand interbedded with silt and clay. Stratified-drift deposits are more abundant in the central and southern parts of the basin than in the northern part of the basin. In the northern one-third of the basin, stratified drift fills narrow, north-south trending valleys, which are bordered by till and bedrock uplands.

Yields of wells in the fine-grained stratified-drift deposits are usually no more than a few gallons per minute (gal/min) whereas yields of wells in the coarse-grained stratified drift may exceed 300 gal/min. The coarse-grained parts of the stratified-drift deposits form the major aquifers in the basin. In the northern part of the basin, these aquifers are long, narrow, and thin, and have saturated thicknesses that range from about 20 ft to somewhat more than 100 ft. The widths of the stratified-drift aquifers generally range from 0.1 to 1.5 mi (miles), and their lengths generally range from 1 to 5 mi.

Twenty-six stratified-drift aquifers in the northern half of the basin were studied in detail (fig. 2). These aquifers were selected because current and projected 1990 water-supply deficits are greatest in the northern half of the basin, affecting 14 of 19 municipalities. In contrast, only one of nine municipalities in the southern half of the basin is projected to have a deficit (Richard Thibedeau, Massachusetts Division of Water Resources, written commun.,1984). The 26 aquifers also were selected because the use of ground water as the sole source of supply is greatest in the northern half of the basin. Fifteen of 19 municipalities in the northern half of the basin use ground water as compared to 4 of 9 municipalities in the southern half of the basin.

The 26 stratified-drift aquifers were identified as areas of stratified drift that have a transmissivity equal to or greater than 1,337 ft^2/d (square feet per day), which is equivalent to 10,000 gallons per day per foot. The aquifers underlie or are near major rivers or tributaries. The aquifers are composed mostly of layers of sand and gravel but include some interbedded layers of silt and clay. John R. Williams (U.S. Geological Survey, written commun., 1982) determined that the hydraulic conductivity of fine-to-coarse gravel ranges from about 150 to 500 ft/d (feet per day), mixed sand and gravel averages about 200 ft/d, and fine-to-coarse sand ranges from about 25 to 150 ft/d. The transmissivity of the stratified drift is equal to the product of its hydraulic conductivity and saturated thickness. Therefore, equal transmissivities at different locations in an aquifer may be the result of thin deposits of high-conductivity drift or thick deposits of low-conductivity drift. Transmissivity exceeds 4,000 ft^2/d in small areas in nearly all 26 aquifers. In a few areas, where the stratified drift is thick or has a high hydraulic conductivity, transmissivity exceeds 10,000 ft^2/d.

AQUIFER YIELDS

Estimates from Model Simulations

During severe drought, ground-water discharge from aquifers to streams is reduced or ceases, streamflow is at a minimum, and only small amounts of surface water are stored in wetlands and ponds. Consequently, water pumped from most aquifers in New England during severe drought is derived largely from storage in the aquifers. During normal climatic conditions, water pumped from an aquifer is derived from storage, intercepted ground-water discharge, and induced infiltration of surface water. To account for drought and normal conditions, two sets of aquifer-yield estimates were made for each of the 26 stratified-drift aquifers using simple ground-water flow models. "Short-term" aquifer yields during drought conditions were determined by considering only water from storage and are expressed as single values for several selected pumping periods. "Long-term" aquifer yields during normal

Specific Yield--

Compilation of Specific Yields for Various Materials

GEOLOGICAL SURVEY WATER SUPPLY PAPER 1662-D

Prepared in cooperation with the California Department of Water Resources

SPECIFIC YIELD—COMPILATION OF SPECIFIC YIELDS FOR VARIOUS MATERIALS

By A. I. JOHNSON

ABSTRACT

Specific yield is defined as the ratio of (1) the volume of water that a saturated rock or soil will yield by gravity to (2) the total volume of the rock or soil. Specific yield is usually expressed as a percentage. The value is not definitive, because the quantity of water that will drain by gravity depends on variables such as duration of drainage, temperature, mineral composition of the water, and various physical characteristics of the rock or soil under consideration. Values of specific yield, nevertheless, offer a convenient means by which hydrologists can estimate the water-yielding capacities of earth materials and, as such, are very useful in hydrologic studies.

The present report consists mostly of direct or modified quotations from many selected reports that present and evaluate methods for determining specific yield, limitations of those methods, and results of the determinations made on a wide variety of rock and soil materials. Although no particular values are recommended in this report, a table summarizes values of specific yield, and their averages, determined for 10 rock textures. The following is an abstract of the table:

Specific yields, in percent, of various materials

[Rounded to nearest whole percent]

Material	Number of determinations	Specific yield		
		Maximum	Minimum	Average
Clay	15	5	0	2
Silt	16	19	3	8
Sandy clay	12	12	3	7
Fine sand	17	28	10	21
Medium sand	17	32	15	26
Coarse sand	17	35	20	27
Gravelly sand	15	35	20	25
Fine gravel	17	35	21	25
Medium gravel	14	26	13	23
Coarse gravel	14	26	12	22

INTRODUCTION

PURPOSE AND SCOPE

The purpose of this report is to assist hydrologists in estimating the quantity of water in storage in ground-water reservoirs by providing

B E A L S + T H O M A S

Standard 3: Drawdown

$$\text{Drawdown Time} = \frac{\text{Rv}}{\text{(K) (Bottom Area)}}$$

where:

Rv = Storage Volume Below Outlet [Ac-ft]
K= Infiltration Rate [in/hr]
Bottom Area= Bottom Area of Recharge System [Ac]

Infiltration Bed 1

Rv =	0.022	Ac-ft	
K =	2.410	in/hr	
Bottom Area =	0.056	Acres	
Drawdown Time =	**1.956**	**Hours**	*< 72 Hours, Design is in compliance with the standard.*

Infiltration Bed 5

Rv =	0.021	Ac-ft	
K =	2.410	in/hr	
Bottom Area =	0.053	Acres	
Drawdown Time =	**1.973**	**Hours**	*< 72 Hours, Design is in compliance with the standard.*

Note:

1. The infiltration BMPs have been designed to fully drain within 72 hours, therefore the proposed stormwater management design is in compliance with Standard 3 .

2. Infiltration Rate based on Volume 3, Chapter 1, Table 2.3.3 *Rawls Rates* from the 2008 MA DEP Stormwater Management Handbook.

JOB NO.	3203.00	COMPUTED BY:	NBB	CHECKED BY:	NPS
JOB:	Rocky Maple Solar	DATE:	04/01/21	DATE:	4/2/2021

Stage-Area-Storage for Pond 1: Infiltration Bed

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
63.00	**0.056**	0.000	63.52	0.056	0.012
63.01	0.056	0.000	63.53	0.056	0.012
63.02	0.056	0.000	63.54	0.056	0.012
63.03	0.056	0.001	63.55	0.056	0.012
63.04	0.056	0.001	63.56	0.056	0.013
63.05	0.056	0.001	63.57	0.056	0.013
63.06	0.056	0.001	63.58	0.056	0.013
63.07	0.056	0.002	63.59	0.056	0.013
63.08	0.056	0.002	63.60	0.056	0.013
63.09	0.056	0.002	63.61	0.056	0.014
63.10	0.056	0.002	63.62	0.056	0.014
63.11	0.056	0.002	63.63	0.056	0.014
63.12	0.056	0.003	63.64	0.056	0.014
63.13	0.056	0.003	63.65	0.056	0.015
63.14	0.056	0.003	63.66	0.056	0.015
63.15	0.056	0.003	63.67	0.056	0.015
63.16	0.056	0.004	63.68	0.056	0.015
63.17	0.056	0.004	63.69	0.056	0.015
63.18	0.056	0.004	63.70	0.056	0.016
63.19	0.056	0.004	63.71	0.056	0.016
63.20	0.056	0.004	63.72	0.056	0.016
63.21	0.056	0.005	63.73	0.056	0.016
63.22	0.056	0.005	63.74	0.056	0.017
63.23	0.056	0.005	63.75	0.056	0.017
63.24	0.056	0.005	63.76	0.056	0.017
63.25	0.056	0.006	63.77	0.056	0.017
63.26	0.056	0.006	63.78	0.056	0.017
63.27	0.056	0.006	63.79	0.056	0.018
63.28	0.056	0.006	63.80	0.056	0.018
63.29	0.056	0.006	63.81	0.056	0.018
63.30	0.056	0.007	63.82	0.056	0.018
63.31	0.056	0.007	63.83	0.056	0.019
63.32	0.056	0.007	63.84	0.056	0.019
63.33	0.056	0.007	63.85	0.056	0.019
63.34	0.056	0.008	63.86	0.056	0.019
63.35	0.056	0.008	63.87	0.056	0.019
63.36	0.056	0.008	63.88	0.056	0.020
63.37	0.056	0.008	63.89	0.056	0.020
63.38	0.056	0.009	63.90	0.056	0.020
63.39	0.056	0.009	63.91	0.056	0.020
63.40	0.056	0.009	63.92	0.056	0.021
63.41	0.056	0.009	63.93	0.056	0.021
63.42	0.056	0.009	63.94	0.056	0.021
63.43	0.056	0.010	63.95	0.056	0.021
63.44	0.056	0.010	63.96	0.056	0.021
63.45	0.056	0.010	63.97	0.056	0.022
63.46	0.056	0.010	63.98	0.056	0.022
63.47	0.056	0.011	63.99	0.056	0.022
63.48	0.056	0.011	64.00	0.056	**0.022**
63.49	0.056	0.011			
63.50	0.056	0.011			
63.51	0.056	0.011			

Stage-Area-Storage for Pond 5: Infiltration Bed

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
69.00	**0.053**	0.000	69.52	0.053	0.011
69.01	0.053	0.000	69.53	0.053	0.011
69.02	0.053	0.000	69.54	0.053	0.011
69.03	0.053	0.001	69.55	0.053	0.012
69.04	0.053	0.001	69.56	0.053	0.012
69.05	0.053	0.001	69.57	0.053	0.012
69.06	0.053	0.001	69.58	0.053	0.012
69.07	0.053	0.001	69.59	0.053	0.012
69.08	0.053	0.002	69.60	0.053	0.013
69.09	0.053	0.002	69.61	0.053	0.013
69.10	0.053	0.002	69.62	0.053	0.013
69.11	0.053	0.002	69.63	0.053	0.013
69.12	0.053	0.003	69.64	0.053	0.013
69.13	0.053	0.003	69.65	0.053	0.014
69.14	0.053	0.003	69.66	0.053	0.014
69.15	0.053	0.003	69.67	0.053	0.014
69.16	0.053	0.003	69.68	0.053	0.014
69.17	0.053	0.004	69.69	0.053	0.015
69.18	0.053	0.004	69.70	0.053	0.015
69.19	0.053	0.004	69.71	0.053	0.015
69.20	0.053	0.004	69.72	0.053	0.015
69.21	0.053	0.004	69.73	0.053	0.015
69.22	0.053	0.005	69.74	0.053	0.016
69.23	0.053	0.005	69.75	0.053	0.016
69.24	0.053	0.005	69.76	0.053	0.016
69.25	0.053	0.005	69.77	0.053	0.016
69.26	0.053	0.005	69.78	0.053	0.016
69.27	0.053	0.006	69.79	0.053	0.017
69.28	0.053	0.006	69.80	0.053	0.017
69.29	0.053	0.006	69.81	0.053	0.017
69.30	0.053	0.006	69.82	0.053	0.017
69.31	0.053	0.007	69.83	0.053	0.017
69.32	0.053	0.007	69.84	0.053	0.018
69.33	0.053	0.007	69.85	0.053	0.018
69.34	0.053	0.007	69.86	0.053	0.018
69.35	0.053	0.007	69.87	0.053	0.018
69.36	0.053	0.008	69.88	0.053	0.019
69.37	0.053	0.008	69.89	0.053	0.019
69.38	0.053	0.008	69.90	0.053	0.019
69.39	0.053	0.008	69.91	0.053	0.019
69.40	0.053	0.008	69.92	0.053	0.019
69.41	0.053	0.009	69.93	0.053	0.020
69.42	0.053	0.009	69.94	0.053	0.020
69.43	0.053	0.009	69.95	0.053	0.020
69.44	0.053	0.009	69.96	0.053	0.020
69.45	0.053	0.009	69.97	0.053	0.020
69.46	0.053	0.010	69.98	0.053	0.021
69.47	0.053	0.010	69.99	0.053	0.021
69.48	0.053	0.010	70.00	0.053	**0.021**
69.49	0.053	0.010			
69.50	0.053	0.011			
69.51	0.053	0.011			

Site Owner's Manual Addendum

ROCKY MAPLE SOLAR

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Addendum Issued: April 7, 2021

320300RP002B-Addendum

Stormwater Management System Components

The following table outlines the type and quantity of the BMPs and their general location. Please reference the site plan(s) provided in the Figures section for exact location.

BMP Type	Quantity	Location
Infiltration Bed	5	Throughout the site at equipment pads.

Estimated Operation and Maintenance Budget

An operations and maintenance budget was prepared to approximate the annual cost of the inspections required in compliance with the DEP Stormwater Management Policy. The table below estimates the annual cost to inspect and maintain each proposed BMP, based on the requirements in Section 4.2.

BMP Type	# of BMPS	Annual O&M Cost (per BMP)[1]	Total Cost
Infiltration Bed	5	$200-$400	$1000-$2000
		Total	**$1000-$2000**

[1] Annual maintenance cost is based on estimate of the cost to complete all inspection and maintenance measures outlined in Section 4.2. For BMPs that require sediment removal at regular intervals (i.e. every 5 or 10 years), the annual cost includes the annual percentage of that cost.