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:

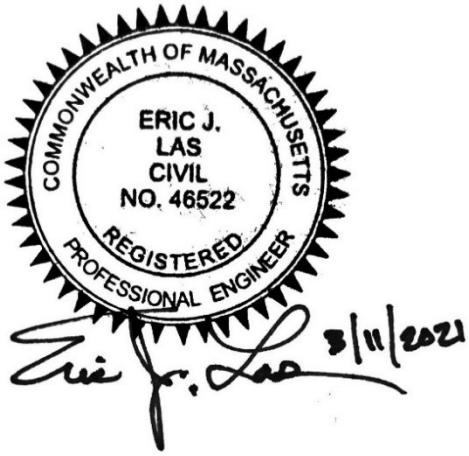
B E A L S + T H O M A S
BEALS AND THOMAS, INC.
Reservoir Corporate Center
144 Turnpike Road
Southborough, MA 01772-2104

Addendum Issued: March 11, 2021

Calculated by: **Nathaniel Bautz, EIT**

Checked by: **Nick Santangelo, EIT**

Approved by:



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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	*13.07*	*29.88*	*91.59*	*148.71*	*205.68*	*276.94*
Post	12.97	29.64	90.87	147.54	204.06	274.76

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	*1.69*	*2.85*	*7.10*	*11.06*	*15.06*	*20.11*
Post	1.68	2.82	7.04	10.97	14.94	19.95

STANDARD 3: **Loss of annual recharge to groundwater shall be eliminated or minimized through the use of environmentally sensitive site design, low impact development techniques, stormwater management practices and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil types. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.**

The Project proposes equipment pads with infiltration beds beneath such that runoff from these minor impervious areas will have the opportunity to infiltrate. The surrounding grassed and wooded areas provide for further infiltration. The proposed solar panels, while covering a large footprint, will allow water to sheet flow to the ground below where it can infiltrate similarly to existing conditions. Therefore, recharge of the groundwater will be maintained under the post-development conditions.

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. 320300P004B-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

CONCLUSIONS:

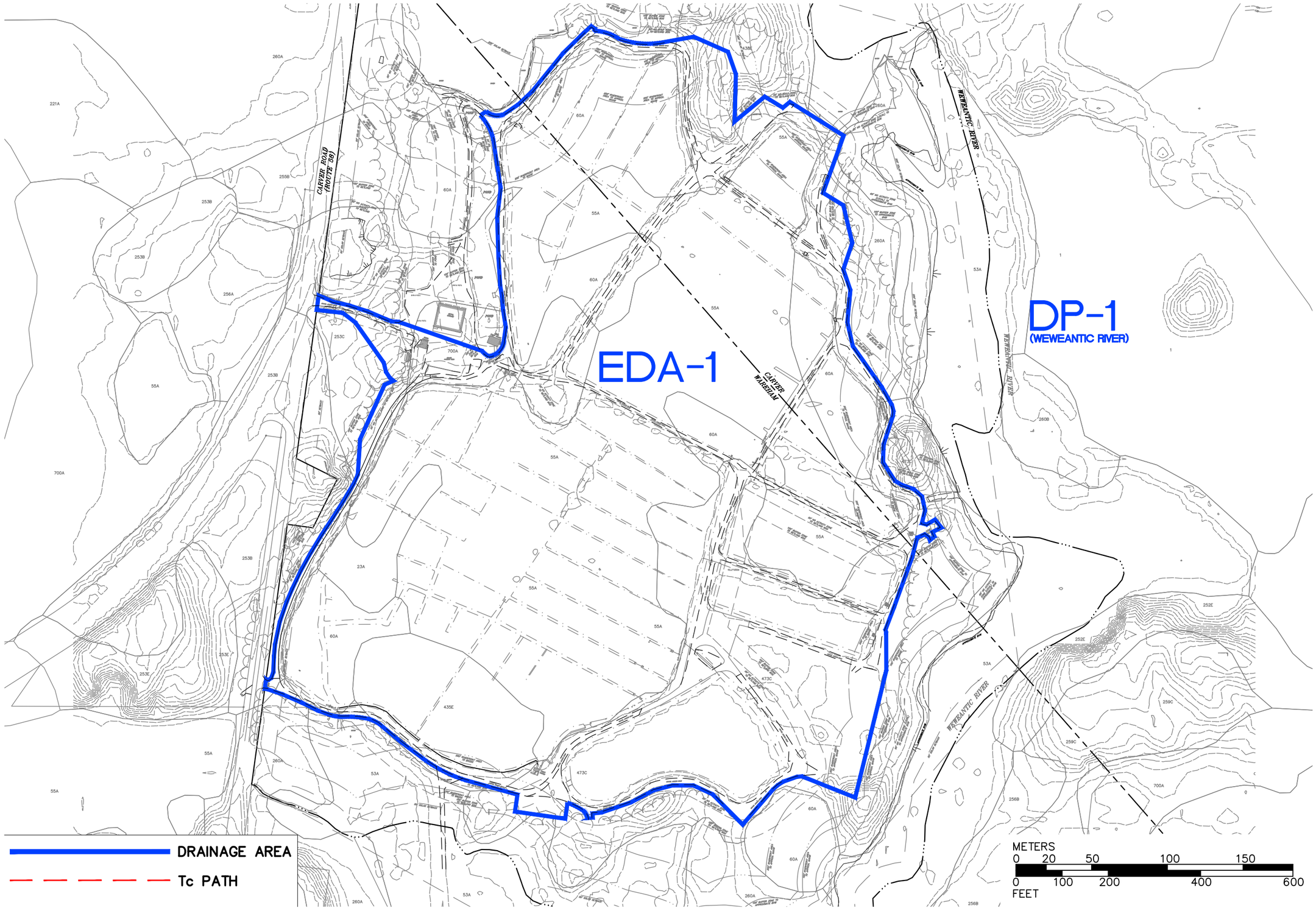
Peak Runoff Rates (CFS):

Storm Event	DP-1
1-Year	13.07
2-Year	29.88
10-Year	91.59
25-Year	148.71
50-Year	205.68
100-Year	276.94

Total Runoff Volumes (AF):

Storm Event	DP-1
1-Year	1.69
2-Year	2.85
10-Year	7.10
25-Year	11.06
50-Year	15.06
100-Year	20.11

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



Pre-Development Conditions
Hydrologic Areas Map
Figure Number 001

Scale: 1" = 250' Date: 02/26/2021

Plan No. 320300P004B-001

B+T Project No. 3203.00

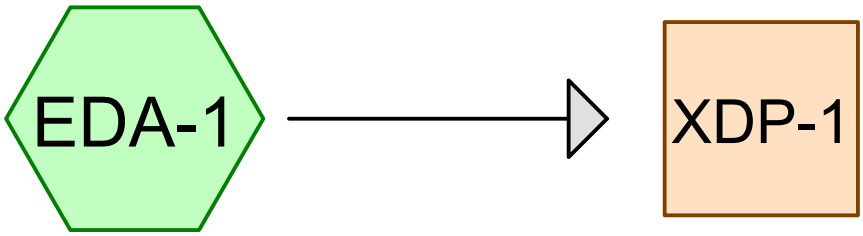
Rocky Maple Solar
Wareham and Carver, Massachusetts

BE RE, LLC
PO Box 974
Edwards, Colorado

North Arrow
NORTH

BEALS AND THOMAS, INC.

Pre-Development Conditions Hydrology



Weweantic River

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
15.539	30	Brush, Good, HSG A (EDA-1)
38.227	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)
0.262	30	Woods, Good, HSG A (EDA-1)
0.025	77	Woods, Good, HSG D (EDA-1)
57.698	**63**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
17.817	HSG A	EDA-1
0.000	HSG B	
0.000	HSG C	
39.881	HSG D	EDA-1
0.000	Other	
57.698		**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=57.698 ac 0.41% Impervious Runoff Depth>0.35"
Tc=6.0 min CN=63 Runoff=13.07 cfs 1.691 af

Reach XDP-1: Weweantic River Inflow=13.07 cfs 1.691 af
Outflow=13.07 cfs 1.691 af

Total Runoff Area = 57.698 ac Runoff Volume = 1.691 af Average Runoff Depth = 0.35"
99.59% Pervious = 57.463 ac 0.41% Impervious = 0.235 ac

Summary for Subcatchment EDA-1:

Runoff = 13.07 cfs @ 12.14 hrs, Volume= 1.691 af, Depth> 0.35"

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
	0.262	30	Woods, Good, HSG A
	0.025	77	Woods, Good, HSG D
	15.539	30	Brush, Good, HSG A
	38.227	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
	57.698	63	Weighted Average
	57.463		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 Reach XDP-1: Weweantic River

Inflow Area = 57.698 ac, 0.41% Impervious, Inflow Depth > 0.35" for Plymouth-001yr event
Inflow = 13.07 cfs @ 12.14 hrs, Volume= 1.691 af
Outflow = 13.07 cfs @ 12.14 hrs, Volume= 1.691 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=57.698 ac 0.41% Impervious Runoff Depth>0.59"
Tc=6.0 min CN=63 Runoff=29.88 cfs 2.845 af

Reach XDP-1: Weweantic River Inflow=29.88 cfs 2.845 af
Outflow=29.88 cfs 2.845 af

Total Runoff Area = 57.698 ac Runoff Volume = 2.845 af Average Runoff Depth = 0.59"
99.59% Pervious = 57.463 ac 0.41% Impervious = 0.235 ac

Summary for Subcatchment EDA-1:

Runoff = 29.88 cfs @ 12.11 hrs, Volume= 2.845 af, Depth> 0.59"

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-002yr Rainfall=3.36"

	Area (ac)	CN	Description
	0.262	30	Woods, Good, HSG A
	0.025	77	Woods, Good, HSG D
	15.539	30	Brush, Good, HSG A
	38.227	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
	57.698	63	Weighted Average
	57.463		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 Reach XDP-1: Weweantic River

Inflow Area = 57.698 ac, 0.41% Impervious, Inflow Depth > 0.59" for Plymouth-002yr event
Inflow = 29.88 cfs @ 12.11 hrs, Volume= 2.845 af
Outflow = 29.88 cfs @ 12.11 hrs, Volume= 2.845 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=57.698 ac 0.41% Impervious Runoff Depth>1.48"
Tc=6.0 min CN=63 Runoff=91.59 cfs 7.094 af

Reach XDP-1: Weweantic River Inflow=91.59 cfs 7.094 af
Outflow=91.59 cfs 7.094 af

Total Runoff Area = 57.698 ac Runoff Volume = 7.094 af Average Runoff Depth = 1.48"
99.59% Pervious = 57.463 ac 0.41% Impervious = 0.235 ac

Summary for Subcatchment EDA-1:

Runoff = 91.59 cfs @ 12.10 hrs, Volume= 7.094 af, Depth> 1.48"

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
	0.262	30	Woods, Good, HSG A
	0.025	77	Woods, Good, HSG D
	15.539	30	Brush, Good, HSG A
	38.227	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
	57.698	63	Weighted Average
	57.463		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 Reach XDP-1: Weweantic River

Inflow Area = 57.698 ac, 0.41% Impervious, Inflow Depth > 1.48" for Plymouth-010yr event
Inflow = 91.59 cfs @ 12.10 hrs, Volume= 7.094 af
Outflow = 91.59 cfs @ 12.10 hrs, Volume= 7.094 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=57.698 ac 0.41% Impervious Runoff Depth>2.30"
Tc=6.0 min CN=63 Runoff=148.71 cfs 11.061 af

Reach XDP-1: Weweantic River Inflow=148.71 cfs 11.061 af
Outflow=148.71 cfs 11.061 af

Total Runoff Area = 57.698 ac Runoff Volume = 11.061 af Average Runoff Depth = 2.30"
99.59% Pervious = 57.463 ac 0.41% Impervious = 0.235 ac

Summary for Subcatchment EDA-1:

Runoff = 148.71 cfs @ 12.10 hrs, Volume= 11.061 af, Depth> 2.30"

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
	0.262	30	Woods, Good, HSG A
	0.025	77	Woods, Good, HSG D
	15.539	30	Brush, Good, HSG A
	38.227	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
	57.698	63	Weighted Average
	57.463		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 Reach XDP-1: Weweantic River

Inflow Area = 57.698 ac, 0.41% Impervious, Inflow Depth > 2.30" for Plymouth-025yr event
Inflow = 148.71 cfs @ 12.10 hrs, Volume= 11.061 af
Outflow = 148.71 cfs @ 12.10 hrs, Volume= 11.061 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=57.698 ac 0.41% Impervious Runoff Depth>3.13"
Tc=6.0 min CN=63 Runoff=205.68 cfs 15.057 af

Reach XDP-1: Weweantic River Inflow=205.68 cfs 15.057 af
Outflow=205.68 cfs 15.057 af

Total Runoff Area = 57.698 ac Runoff Volume = 15.057 af Average Runoff Depth = 3.13"
99.59% Pervious = 57.463 ac 0.41% Impervious = 0.235 ac

Summary for Subcatchment EDA-1:

Runoff = 205.68 cfs @ 12.10 hrs, Volume= 15.057 af, Depth> 3.13"

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
	0.262	30	Woods, Good, HSG A
	0.025	77	Woods, Good, HSG D
	15.539	30	Brush, Good, HSG A
	38.227	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
	57.698	63	Weighted Average
	57.463		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 Reach XDP-1: Weweantic River

Inflow Area = 57.698 ac, 0.41% Impervious, Inflow Depth > 3.13" for Plymouth-050yr event
Inflow = 205.68 cfs @ 12.10 hrs, Volume= 15.057 af
Outflow = 205.68 cfs @ 12.10 hrs, Volume= 15.057 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=57.698 ac 0.41% Impervious Runoff Depth>4.18"
Tc=6.0 min CN=63 Runoff=276.94 cfs 20.109 af

Reach XDP-1: Weweantic River Inflow=276.94 cfs 20.109 af
Outflow=276.94 cfs 20.109 af

Total Runoff Area = 57.698 ac Runoff Volume = 20.109 af Average Runoff Depth = 4.18"
99.59% Pervious = 57.463 ac 0.41% Impervious = 0.235 ac

Summary for Subcatchment EDA-1:

Runoff = 276.94 cfs @ 12.09 hrs, Volume= 20.109 af, Depth> 4.18"

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
	0.262	30	Woods, Good, HSG A
	0.025	77	Woods, Good, HSG D
	15.539	30	Brush, Good, HSG A
	38.227	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
	57.698	63	Weighted Average
	57.463		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 Reach XDP-1: Weweantic River

Inflow Area = 57.698 ac, 0.41% Impervious, Inflow Depth > 4.18" for Plymouth-100yr event
Inflow = 276.94 cfs @ 12.09 hrs, Volume= 20.109 af
Outflow = 276.94 cfs @ 12.09 hrs, Volume= 20.109 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. 320300P004B-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

CONCLUSIONS:

Peak Runoff Rates (CFS):

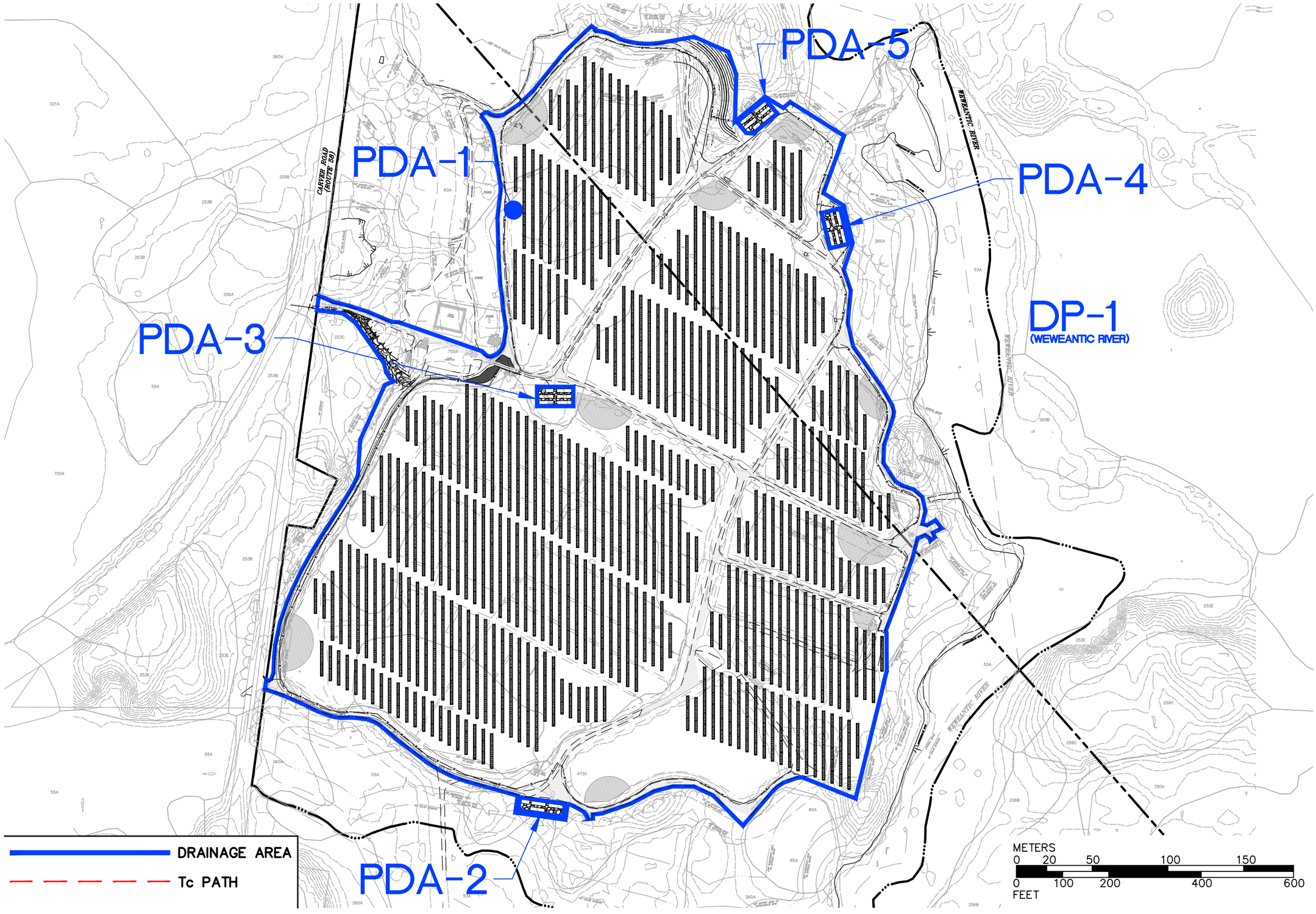
Storm Event	DP-1
1-Year	12.97
2-Year	29.64
10-Year	90.87
25-Year	147.54
50-Year	204.06
100-Year	274.76

Total Runoff Volumes (AF):

Storm Event	DP-1
1-Year	1.68
2-Year	2.82
10-Year	7.04
25-Year	10.97
50-Year	14.94
100-Year	19.95

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



Post-Development Conditions Hydrologic Areas Map
Figure Number 002

Scale: 1" = 250'
Date: 02/26/2021
Plan No. 320300P004B-002
B+T Project No. 3203.00

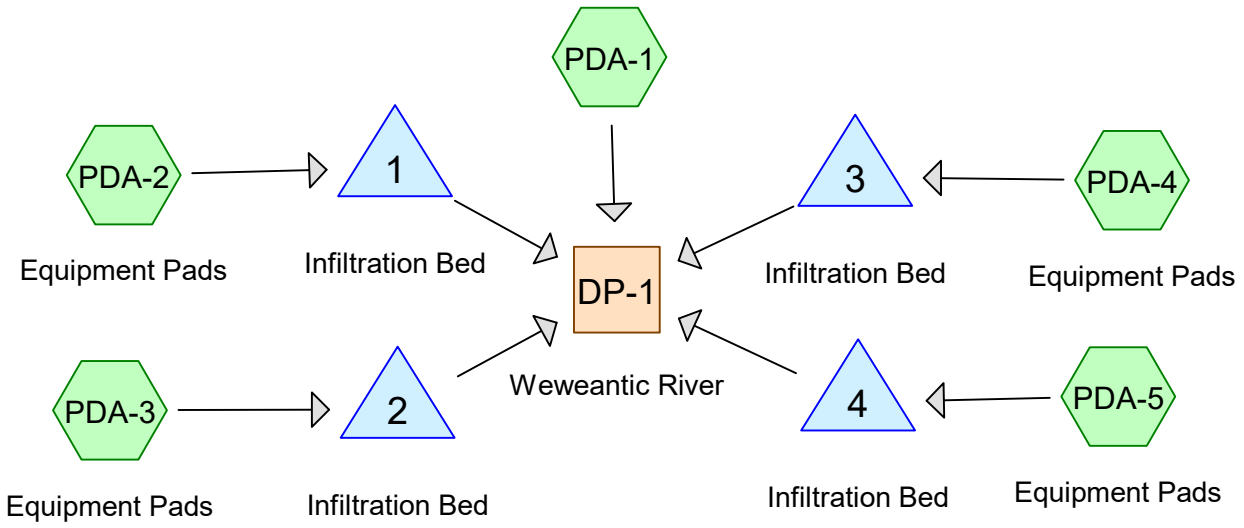
Rocky Maple Solar
Wareham and Carver, Massachusetts

BE RE, LLC
PO Box 974
Edwards, Colorado

North Arrow
NORTH

BEALS AND THOMAS, INC.

Post-Development
Conditions Hydrology



Subcat Reach Pond Link

Routing Diagram for 320300HC001B
Prepared by Beals and Thomas, Inc., Printed 3/1/2021

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
15.674	30	Brush, Good, HSG A (PDA-1)
37.989	73	Brush, Good, HSG D (PDA-1)
0.084	98	Equipment Pads, HSG A (PDA-2, PDA-5)
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)
0.218	96	Proposed Gravel Road, HSG A (PDA-1)
0.006	96	Proposed Gravel Road, HSG D (PDA-1)
0.130	96	Proposed Gravel, HSG A (PDA-2, PDA-5)
0.140	96	Proposed Gravel, HSG D (PDA-2, PDA-3, PDA-4)
0.092	30	Woods, Good, HSG A (PDA-1)
0.015	77	Woods, Good, HSG D (PDA-1)
57.698	**63**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
17.817	HSG A	PDA-1, PDA-2, PDA-5
0.000	HSG B	
0.000	HSG C	
39.881	HSG D	PDA-1, PDA-2, PDA-3, PDA-4
0.000	Other	
57.698		**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=57.242 ac 0.41% Impervious Runoff Depth>0.35"
Tc=6.0 min CN=63 Runoff=12.97 cfs 1.678 af

Subcatchment PDA-2: Equipment Pads Runoff Area=0.102 ac 32.35% Impervious Runoff Depth>2.46"
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>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

Reach DP-1: Weweantic River Inflow=12.97 cfs 1.678 af
Outflow=12.97 cfs 1.678 af

Pond 1: Infiltration Bed Peak Elev=62.01' Storage=0.000 af Inflow=0.26 cfs 0.021 af
Outflow=0.25 cfs 0.021 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

Total Runoff Area = 57.698 ac Runoff Volume = 1.771 af Average Runoff Depth = 0.37"
99.27% Pervious = 57.277 ac 0.73% Impervious = 0.421 ac

Summary for Subcatchment PDA-1:

Runoff = 12.97 cfs @ 12.14 hrs, Volume= 1.678 af, Depth> 0.35"

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
	0.092	30	Woods, Good, HSG A
	0.015	77	Woods, Good, HSG D
	15.674	30	Brush, Good, HSG A
	37.989	73	Brush, Good, HSG D
*	0.218	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
	57.242	63	Weighted Average
	57.007		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> 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
*	0.065	96	Proposed Gravel, HSG A
*	0.004	96	Proposed Gravel, HSG D
	0.102	97	Weighted Average
	0.069		67.65% Pervious Area
	0.033		32.35% 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 Reach DP-1: Weweantic River

Inflow Area = 57.698 ac, 0.73% Impervious, Inflow Depth > 0.35" for Plymouth-001yr event
Inflow = 12.97 cfs @ 12.14 hrs, Volume= 1.678 af
Outflow = 12.97 cfs @ 12.14 hrs, Volume= 1.678 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 = 0.102 ac, 32.35% Impervious, Inflow Depth > 2.46" for Plymouth-001yr event
Inflow = 0.26 cfs @ 12.09 hrs, Volume= 0.021 af
Outflow = 0.25 cfs @ 12.12 hrs, Volume= 0.021 af, Atten= 5%, Lag= 2.0 min
Discarded = 0.25 cfs @ 12.12 hrs, Volume= 0.021 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 62.01' @ 12.11 hrs Surf.Area= 0.102 ac Storage= 0.000 af

Plug-Flow detention time= 1.2 min calculated for 0.021 af (100% of inflow)
Center-of-Mass det. time= 1.1 min (770.1 - 769.1)

Volume	Invert	Avail.Storage	Storage Description
#1	62.00'	0.041 af	**36.00'W x 123.00'L x 1.00'H Prismatoid** 0.102 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	62.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.25 cfs @ 12.12 hrs HW=62.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.25 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)

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=57.242 ac 0.41% Impervious Runoff Depth>0.59"
Tc=6.0 min CN=63 Runoff=29.64 cfs 2.823 af

Subcatchment PDA-2: Equipment Pads Runoff Area=0.102 ac 32.35% Impervious Runoff Depth>3.01"
Tc=6.0 min CN=97 Runoff=0.32 cfs 0.026 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

Reach DP-1: Weweantic River Inflow=29.64 cfs 2.823 af
Outflow=29.64 cfs 2.823 af

Pond 1: Infiltration Bed Peak Elev=62.02' Storage=0.001 af Inflow=0.32 cfs 0.026 af
Outflow=0.25 cfs 0.026 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

Total Runoff Area = 57.698 ac Runoff Volume = 2.937 af Average Runoff Depth = 0.61"
99.27% Pervious = 57.277 ac 0.73% Impervious = 0.421 ac

Summary for Subcatchment PDA-1:

Runoff = 29.64 cfs @ 12.11 hrs, Volume= 2.823 af, Depth> 0.59"

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-002yr Rainfall=3.36"

	Area (ac)	CN	Description
	0.092	30	Woods, Good, HSG A
	0.015	77	Woods, Good, HSG D
	15.674	30	Brush, Good, HSG A
	37.989	73	Brush, Good, HSG D
*	0.218	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
	57.242	63	Weighted Average
	57.007		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= 0.026 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
*	0.065	96	Proposed Gravel, HSG A
*	0.004	96	Proposed Gravel, HSG D
	0.102	97	Weighted Average
	0.069		67.65% Pervious Area
	0.033		32.35% 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 Reach DP-1: Weweantic River

Inflow Area = 57.698 ac, 0.73% Impervious, Inflow Depth > 0.59" for Plymouth-002yr event
Inflow = 29.64 cfs @ 12.11 hrs, Volume= 2.823 af
Outflow = 29.64 cfs @ 12.11 hrs, Volume= 2.823 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 = 0.102 ac, 32.35% Impervious, Inflow Depth > 3.01" for Plymouth-002yr event
Inflow = 0.32 cfs @ 12.09 hrs, Volume= 0.026 af
Outflow = 0.25 cfs @ 12.05 hrs, Volume= 0.026 af, Atten= 23%, Lag= 0.0 min
Discarded = 0.25 cfs @ 12.05 hrs, Volume= 0.026 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 62.02' @ 12.15 hrs Surf.Area= 0.102 ac Storage= 0.001 af

Plug-Flow detention time= 1.3 min calculated for 0.026 af (100% of inflow)
Center-of-Mass det. time= 1.2 min (765.6 - 764.4)

Volume	Invert	Avail.Storage	Storage Description
#1	62.00'	0.041 af	**36.00'W x 123.00'L x 1.00'H Prismatoid** 0.102 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	62.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.25 cfs @ 12.05 hrs HW=62.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.25 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)

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=57.242 ac 0.41% Impervious Runoff Depth>1.48"
Tc=6.0 min CN=63 Runoff=90.87 cfs 7.038 af

Subcatchment PDA-2: Equipment Pads Runoff Area=0.102 ac 32.35% Impervious Runoff Depth>4.59"
Tc=6.0 min CN=97 Runoff=0.48 cfs 0.039 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

Reach DP-1: Weweantic River Inflow=90.87 cfs 7.038 af
Outflow=90.87 cfs 7.038 af

Pond 1: Infiltration Bed Peak Elev=62.07' Storage=0.003 af Inflow=0.48 cfs 0.039 af
Outflow=0.25 cfs 0.039 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

Total Runoff Area = 57.698 ac Runoff Volume = 7.213 af Average Runoff Depth = 1.50"
99.27% Pervious = 57.277 ac 0.73% Impervious = 0.421 ac

Summary for Subcatchment PDA-1:

Runoff = 90.87 cfs @ 12.10 hrs, Volume= 7.038 af, Depth> 1.48"

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
	0.092	30	Woods, Good, HSG A
	0.015	77	Woods, Good, HSG D
	15.674	30	Brush, Good, HSG A
	37.989	73	Brush, Good, HSG D
*	0.218	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
	57.242	63	Weighted Average
	57.007		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 = 0.48 cfs @ 12.09 hrs, Volume= 0.039 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
*	0.065	96	Proposed Gravel, HSG A
*	0.004	96	Proposed Gravel, HSG D
	0.102	97	Weighted Average
	0.069		67.65% Pervious Area
	0.033		32.35% 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 Reach DP-1: Weweantic River

Inflow Area = 57.698 ac, 0.73% Impervious, Inflow Depth > 1.46" for Plymouth-010yr event
Inflow = 90.87 cfs @ 12.10 hrs, Volume= 7.038 af
Outflow = 90.87 cfs @ 12.10 hrs, Volume= 7.038 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 = 0.102 ac, 32.35% Impervious, Inflow Depth > 4.59" for Plymouth-010yr event
Inflow = 0.48 cfs @ 12.09 hrs, Volume= 0.039 af
Outflow = 0.25 cfs @ 12.00 hrs, Volume= 0.039 af, Atten= 48%, Lag= 0.0 min
Discarded = 0.25 cfs @ 12.00 hrs, Volume= 0.039 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 62.07' @ 12.23 hrs Surf.Area= 0.102 ac Storage= 0.003 af

Plug-Flow detention time= 2.6 min calculated for 0.039 af (100% of inflow)
Center-of-Mass det. time= 2.5 min (758.0 - 755.5)

Volume	Invert	Avail.Storage	Storage Description
#1	62.00'	0.041 af	**36.00'W x 123.00'L x 1.00'H Prismatoid** 0.102 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	62.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.25 cfs @ 12.00 hrs HW=62.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.25 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)

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=57.242 ac 0.41% Impervious Runoff Depth>2.30"
Tc=6.0 min CN=63 Runoff=147.54 cfs 10.974 af

Subcatchment PDA-2: Equipment Pads Runoff Area=0.102 ac 32.35% Impervious Runoff Depth>5.82"
Tc=6.0 min CN=97 Runoff=0.60 cfs 0.049 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

Reach DP-1: Weweantic River Inflow=147.54 cfs 10.974 af
Outflow=147.54 cfs 10.974 af

Pond 1: Infiltration Bed Peak Elev=62.13' Storage=0.005 af Inflow=0.60 cfs 0.049 af
Outflow=0.25 cfs 0.049 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

Total Runoff Area = 57.698 ac Runoff Volume = 11.195 af Average Runoff Depth = 2.33"
99.27% Pervious = 57.277 ac 0.73% Impervious = 0.421 ac

Summary for Subcatchment PDA-1:

Runoff = 147.54 cfs @ 12.10 hrs, Volume= 10.974 af, Depth> 2.30"

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
	0.092	30	Woods, Good, HSG A
	0.015	77	Woods, Good, HSG D
	15.674	30	Brush, Good, HSG A
	37.989	73	Brush, Good, HSG D
*	0.218	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
	57.242	63	Weighted Average
	57.007		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 = 0.60 cfs @ 12.09 hrs, Volume= 0.049 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
*	0.065	96	Proposed Gravel, HSG A
*	0.004	96	Proposed Gravel, HSG D
	0.102	97	Weighted Average
	0.069		67.65% Pervious Area
	0.033		32.35% 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 Reach DP-1: Weweantic River

Inflow Area = 57.698 ac, 0.73% Impervious, Inflow Depth > 2.28" for Plymouth-025yr event
Inflow = 147.54 cfs @ 12.10 hrs, Volume= 10.974 af
Outflow = 147.54 cfs @ 12.10 hrs, Volume= 10.974 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 = 0.102 ac, 32.35% Impervious, Inflow Depth > 5.82" for Plymouth-025yr event
Inflow = 0.60 cfs @ 12.09 hrs, Volume= 0.049 af
Outflow = 0.25 cfs @ 11.95 hrs, Volume= 0.049 af, Atten= 59%, Lag= 0.0 min
Discarded = 0.25 cfs @ 11.95 hrs, Volume= 0.049 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 62.13' @ 12.30 hrs Surf.Area= 0.102 ac Storage= 0.005 af

Plug-Flow detention time= 4.2 min calculated for 0.049 af (100% of inflow)
Center-of-Mass det. time= 4.1 min (755.3 - 751.2)

Volume	Invert	Avail.Storage	Storage Description
#1	62.00'	0.041 af	**36.00'W x 123.00'L x 1.00'H Prismatoid** 0.102 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	62.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.25 cfs @ 11.95 hrs HW=62.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.25 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)

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=57.242 ac 0.41% Impervious Runoff Depth>3.13"
Tc=6.0 min CN=63 Runoff=204.06 cfs 14.938 af

Subcatchment PDA-2: Equipment Pads Runoff Area=0.102 ac 32.35% Impervious Runoff Depth>6.95"
Tc=6.0 min CN=97 Runoff=0.71 cfs 0.059 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

Reach DP-1: Weweantic River Inflow=204.06 cfs 14.938 af
Outflow=204.06 cfs 14.938 af

Pond 1: Infiltration Bed Peak Elev=62.19' Storage=0.008 af Inflow=0.71 cfs 0.059 af
Outflow=0.25 cfs 0.059 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

Total Runoff Area = 57.698 ac Runoff Volume = 15.202 af Average Runoff Depth = 3.16"
99.27% Pervious = 57.277 ac 0.73% Impervious = 0.421 ac

Summary for Subcatchment PDA-1:

Runoff = 204.06 cfs @ 12.10 hrs, Volume= 14.938 af, Depth> 3.13"

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
	0.092	30	Woods, Good, HSG A
	0.015	77	Woods, Good, HSG D
	15.674	30	Brush, Good, HSG A
	37.989	73	Brush, Good, HSG D
*	0.218	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
	57.242	63	Weighted Average
	57.007		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 = 0.71 cfs @ 12.09 hrs, Volume= 0.059 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
*	0.065	96	Proposed Gravel, HSG A
*	0.004	96	Proposed Gravel, HSG D
	0.102	97	Weighted Average
	0.069		67.65% Pervious Area
	0.033		32.35% 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 Reach DP-1: Weweantic River

Inflow Area = 57.698 ac, 0.73% Impervious, Inflow Depth > 3.11" for Plymouth-050yr event
Inflow = 204.06 cfs @ 12.10 hrs, Volume= 14.938 af
Outflow = 204.06 cfs @ 12.10 hrs, Volume= 14.938 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 = 0.102 ac, 32.35% Impervious, Inflow Depth > 6.95" for Plymouth-050yr event
Inflow = 0.71 cfs @ 12.09 hrs, Volume= 0.059 af
Outflow = 0.25 cfs @ 11.90 hrs, Volume= 0.059 af, Atten= 65%, Lag= 0.0 min
Discarded = 0.25 cfs @ 11.90 hrs, Volume= 0.059 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 62.19' @ 12.36 hrs Surf.Area= 0.102 ac Storage= 0.008 af

Plug-Flow detention time= 6.2 min calculated for 0.059 af (100% of inflow)
Center-of-Mass det. time= 6.1 min (754.3 - 748.2)

Volume	Invert	Avail.Storage	Storage Description
#1	62.00'	0.041 af	**36.00'W x 123.00'L x 1.00'H Prismatoid** 0.102 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	62.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.25 cfs @ 11.90 hrs HW=62.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.25 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)

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=57.242 ac 0.41% Impervious Runoff Depth>4.18"
Tc=6.0 min CN=63 Runoff=274.76 cfs 19.950 af

Subcatchment PDA-2: Equipment Pads Runoff Area=0.102 ac 32.35% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=97 Runoff=0.84 cfs 0.070 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

Reach DP-1: Weweantic River Inflow=274.76 cfs 19.950 af
Outflow=274.76 cfs 19.950 af

Pond 1: Infiltration Bed Peak Elev=62.28' Storage=0.012 af Inflow=0.84 cfs 0.070 af
Outflow=0.25 cfs 0.070 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

Total Runoff Area = 57.698 ac Runoff Volume = 20.265 af Average Runoff Depth = 4.21"
99.27% Pervious = 57.277 ac 0.73% Impervious = 0.421 ac

Summary for Subcatchment PDA-1:

Runoff = 274.76 cfs @ 12.09 hrs, Volume= 19.950 af, Depth> 4.18"

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
	0.092	30	Woods, Good, HSG A
	0.015	77	Woods, Good, HSG D
	15.674	30	Brush, Good, HSG A
	37.989	73	Brush, Good, HSG D
*	0.218	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
	57.242	63	Weighted Average
	57.007		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 = 0.84 cfs @ 12.09 hrs, Volume= 0.070 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
*	0.065	96	Proposed Gravel, HSG A
*	0.004	96	Proposed Gravel, HSG D
	0.102	97	Weighted Average
	0.069		67.65% Pervious Area
	0.033		32.35% 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 Reach DP-1: Weweantic River

Inflow Area = 57.698 ac, 0.73% Impervious, Inflow Depth > 4.15" for Plymouth-100yr event
Inflow = 274.76 cfs @ 12.09 hrs, Volume= 19.950 af
Outflow = 274.76 cfs @ 12.09 hrs, Volume= 19.950 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 = 0.102 ac, 32.35% Impervious, Inflow Depth > 8.28" for Plymouth-100yr event
Inflow = 0.84 cfs @ 12.09 hrs, Volume= 0.070 af
Outflow = 0.25 cfs @ 11.80 hrs, Volume= 0.070 af, Atten= 71%, Lag= 0.0 min
Discarded = 0.25 cfs @ 11.80 hrs, Volume= 0.070 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 62.28' @ 12.41 hrs Surf.Area= 0.102 ac Storage= 0.012 af

Plug-Flow detention time= 9.1 min calculated for 0.070 af (100% of inflow)
Center-of-Mass det. time= 9.0 min (754.5 - 745.5)

Volume	Invert	Avail.Storage	Storage Description
#1	62.00'	0.041 af	**36.00'W x 123.00'L x 1.00'H Prismatoid** 0.102 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	62.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.25 cfs @ 11.80 hrs HW=62.01' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.25 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)

B E A L S + T H O M A S
BEALS AND THOMAS, INC.
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CALCULATION SUMMARY

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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 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] = 61.5 ft
- ½ the width of basin (in y direction) [y] = 18 ft
- Infiltration Basin-1 takes approximately 2.001 hours (t=0.083 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 0.867-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

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)***
61.500	**x**	**1/2 length of basin (x direction, in feet)**
18.000	**y**	**1/2 width of basin (y direction, in feet)**
0.083	**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

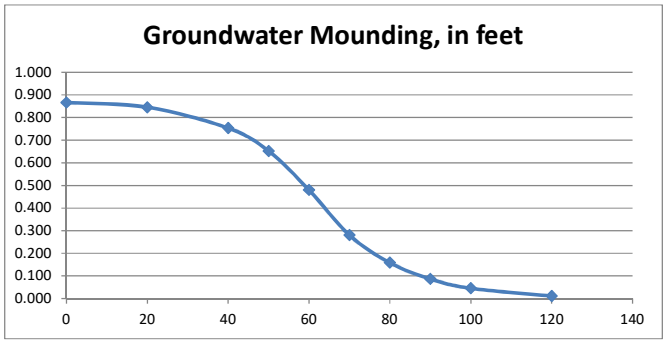
hours	days
36	1.50

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).

10.867	**h(max)**	**maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
0.867	**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**
0.867	**0**
0.845	**20**
0.753	**40**
0.652	**50**
0.480	**60**
0.281	**70**
0.158	**80**
0.087	**90**
0.046	**100**
0.011	**120**

Re-Calculate Now



Disclaimer

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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 2

OBJECTIVE OF CALCULATION:

- To determine the maximum groundwater mounding height beneath Infiltration Bed 2.

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] = 49.5 ft
- ½ the width of basin (in y direction) [y] = 26 ft
- Infiltration Basin-1 takes approximately 1.983 hours (t=0.083 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 1.049-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

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)***
49.500	**x**	**1/2 length of basin (x direction, in feet)**
26.000	**y**	**1/2 width of basin (y direction, in feet)**
0.083	**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

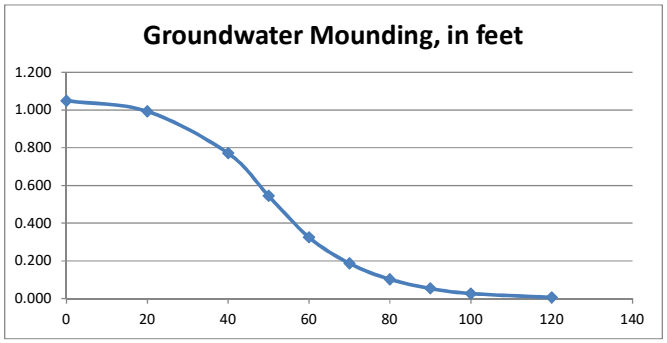
hours	days
36	1.50

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).

11.049	**h(max)**	**maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
1.049	**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
1.049	**0**
0.993	**20**
0.770	**40**
0.545	**50**
0.325	**60**
0.186	**70**
0.102	**80**
0.054	**90**
0.027	**100**
0.006	**120**

Re-Calculate Now



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3203.00
Carver & Wareham, MA

CLIENT/PROJECT:

BE RE, LLC
Rocky Maple Solar

SUBJECT/TITLE:

Groundwater Mounding Calculations for Infiltration Bed 3

OBJECTIVE OF CALCULATION:

- To determine the maximum groundwater mounding height beneath Infiltration Bed 3.

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] = 49.5 ft
- ½ the width of basin (in y direction) [y] = 26 ft
- Infiltration Basin-1 takes approximately 1.983 hours (t=0.083 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 1.049-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

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)***
49.500	**x**	**1/2 length of basin (x direction, in feet)**
26.000	**y**	**1/2 width of basin (y direction, in feet)**
0.083	**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

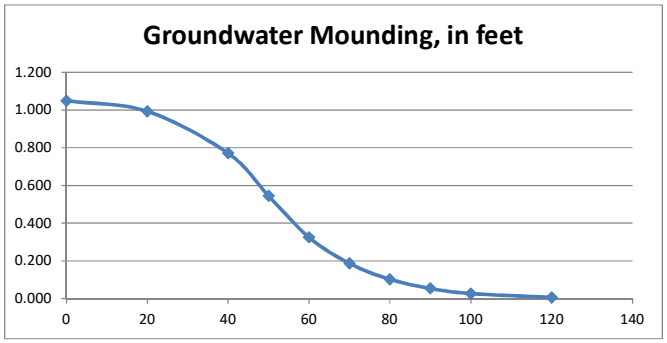
hours	days
36	1.50

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).

11.049	**h(max)**	**maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
1.049	**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
1.049	**0**
0.993	**20**
0.770	**40**
0.545	**50**
0.325	**60**
0.186	**70**
0.102	**80**
0.054	**90**
0.027	**100**
0.006	**120**

Re-Calculate Now



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Carver & Wareham, MA

CLIENT/PROJECT:

BE RE, LLC
Rocky Maple Solar

SUBJECT/TITLE:

Groundwater Mounding Calculations for Infiltration Bed 4

OBJECTIVE OF CALCULATION:

- To determine the maximum groundwater mounding height beneath Infiltration Bed 4.

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] = 49.5 ft
- ½ the width of basin (in y direction) [y] = 25.5 ft
- Infiltration Basin-1 takes approximately 1.975 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 1.030-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

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)***
49.500	**x**	**1/2 length of basin (x direction, in feet)**
25.500	**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

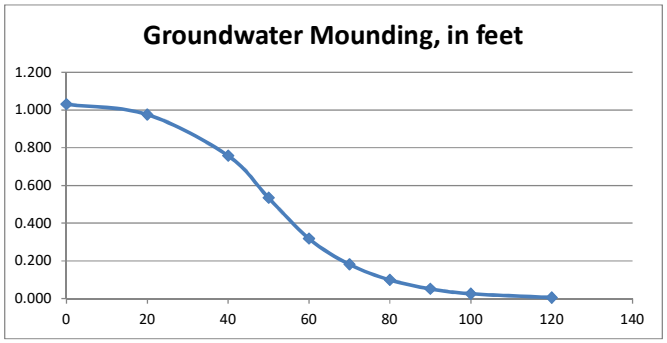
hours	**days**
36	1.50

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).

11.030	**h(max)**	**maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
1.030	**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**
1.030	**0**
0.976	**20**
0.757	**40**
0.534	**50**
0.318	**60**
0.181	**70**
0.099	**80**
0.052	**90**
0.026	**100**
0.006	**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

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

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 =	0.041	Ac-ft	
K =	2.410	in/hr	
Bottom Area =	0.102	Acres	
Drawdown Time =	**2.001**	**Hours**	*< 72 Hours, Design is in compliance with the standard.*

Infiltration Bed 2

Rv =	0.047	Ac-ft	
K =	2.410	in/hr	
Bottom Area =	0.118	Acres	
Drawdown Time =	**1.983**	**Hours**	*< 72 Hours, Design is in compliance with the standard.*

Infiltration Bed 3

Rv =	0.047	Ac-ft	
K =	2.410	in/hr	
Bottom Area =	0.118	Acres	
Drawdown Time =	**1.983**	**Hours**	*< 72 Hours, Design is in compliance with the standard.*

Infiltration Bed 4

Rv =	0.046	Ac-ft	
K =	2.410	in/hr	
Bottom Area =	0.116	Acres	
Drawdown Time =	**1.975**	**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:	02/26/21	DATE:	3/5/2021

Stage-Area-Storage for Pond 1: Infiltration Bed

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
62.00	**0.102**	0.000	62.52	0.102	0.021
62.01	0.102	0.000	62.53	0.102	0.022
62.02	0.102	0.001	62.54	0.102	0.022
62.03	0.102	0.001	62.55	0.102	0.022
62.04	0.102	0.002	62.56	0.102	0.023
62.05	0.102	0.002	62.57	0.102	0.023
62.06	0.102	0.002	62.58	0.102	0.024
62.07	0.102	0.003	62.59	0.102	0.024
62.08	0.102	0.003	62.60	0.102	0.024
62.09	0.102	0.004	62.61	0.102	0.025
62.10	0.102	0.004	62.62	0.102	0.025
62.11	0.102	0.004	62.63	0.102	0.026
62.12	0.102	0.005	62.64	0.102	0.026
62.13	0.102	0.005	62.65	0.102	0.026
62.14	0.102	0.006	62.66	0.102	0.027
62.15	0.102	0.006	62.67	0.102	0.027
62.16	0.102	0.007	62.68	0.102	0.028
62.17	0.102	0.007	62.69	0.102	0.028
62.18	0.102	0.007	62.70	0.102	0.028
62.19	0.102	0.008	62.71	0.102	0.029
62.20	0.102	0.008	62.72	0.102	0.029
62.21	0.102	0.009	62.73	0.102	0.030
62.22	0.102	0.009	62.74	0.102	0.030
62.23	0.102	0.009	62.75	0.102	0.030
62.24	0.102	0.010	62.76	0.102	0.031
62.25	0.102	0.010	62.77	0.102	0.031
62.26	0.102	0.011	62.78	0.102	0.032
62.27	0.102	0.011	62.79	0.102	0.032
62.28	0.102	0.011	62.80	0.102	0.033
62.29	0.102	0.012	62.81	0.102	0.033
62.30	0.102	0.012	62.82	0.102	0.033
62.31	0.102	0.013	62.83	0.102	0.034
62.32	0.102	0.013	62.84	0.102	0.034
62.33	0.102	0.013	62.85	0.102	0.035
62.34	0.102	0.014	62.86	0.102	0.035
62.35	0.102	0.014	62.87	0.102	0.035
62.36	0.102	0.015	62.88	0.102	0.036
62.37	0.102	0.015	62.89	0.102	0.036
62.38	0.102	0.015	62.90	0.102	0.037
62.39	0.102	0.016	62.91	0.102	0.037
62.40	0.102	0.016	62.92	0.102	0.037
62.41	0.102	0.017	62.93	0.102	0.038
62.42	0.102	0.017	62.94	0.102	0.038
62.43	0.102	0.017	62.95	0.102	0.039
62.44	0.102	0.018	62.96	0.102	0.039
62.45	0.102	0.018	62.97	0.102	0.039
62.46	0.102	0.019	62.98	0.102	0.040
62.47	0.102	0.019	62.99	0.102	0.040
62.48	0.102	0.020	63.00	0.102	**0.041**
62.49	0.102	0.020			
62.50	0.102	0.020			
62.51	0.102	0.021			

Stage-Area-Storage for Pond 2: Infiltration Bed

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
63.50	**0.118**	0.000	64.02	0.118	0.025
63.51	0.118	0.000	64.03	0.118	0.025
63.52	0.118	0.001	64.04	0.118	0.026
63.53	0.118	0.001	64.05	0.118	0.026
63.54	0.118	0.002	64.06	0.118	0.026
63.55	0.118	0.002	64.07	0.118	0.027
63.56	0.118	0.003	64.08	0.118	0.027
63.57	0.118	0.003	64.09	0.118	0.028
63.58	0.118	0.004	64.10	0.118	0.028
63.59	0.118	0.004	64.11	0.118	0.029
63.60	0.118	0.005	64.12	0.118	0.029
63.61	0.118	0.005	64.13	0.118	0.030
63.62	0.118	0.006	64.14	0.118	0.030
63.63	0.118	0.006	64.15	0.118	0.031
63.64	0.118	0.007	64.16	0.118	0.031
63.65	0.118	0.007	64.17	0.118	0.032
63.66	0.118	0.008	64.18	0.118	0.032
63.67	0.118	0.008	64.19	0.118	0.033
63.68	0.118	0.009	64.20	0.118	0.033
63.69	0.118	0.009	64.21	0.118	0.034
63.70	0.118	0.009	64.22	0.118	0.034
63.71	0.118	0.010	64.23	0.118	0.035
63.72	0.118	0.010	64.24	0.118	0.035
63.73	0.118	0.011	64.25	0.118	0.035
63.74	0.118	0.011	64.26	0.118	0.036
63.75	0.118	0.012	64.27	0.118	0.036
63.76	0.118	0.012	64.28	0.118	0.037
63.77	0.118	0.013	64.29	0.118	0.037
63.78	0.118	0.013	64.30	0.118	0.038
63.79	0.118	0.014	64.31	0.118	0.038
63.80	0.118	0.014	64.32	0.118	0.039
63.81	0.118	0.015	64.33	0.118	0.039
63.82	0.118	0.015	64.34	0.118	0.040
63.83	0.118	0.016	64.35	0.118	0.040
63.84	0.118	0.016	64.36	0.118	0.041
63.85	0.118	0.017	64.37	0.118	0.041
63.86	0.118	0.017	64.38	0.118	0.042
63.87	0.118	0.017	64.39	0.118	0.042
63.88	0.118	0.018	64.40	0.118	0.043
63.89	0.118	0.018	64.41	0.118	0.043
63.90	0.118	0.019	64.42	0.118	0.043
63.91	0.118	0.019	64.43	0.118	0.044
63.92	0.118	0.020	64.44	0.118	0.044
63.93	0.118	0.020	64.45	0.118	0.045
63.94	0.118	0.021	64.46	0.118	0.045
63.95	0.118	0.021	64.47	0.118	0.046
63.96	0.118	0.022	64.48	0.118	0.046
63.97	0.118	0.022	64.49	0.118	0.047
63.98	0.118	0.023	64.50	0.118	**0.047**
63.99	0.118	0.023			
64.00	0.118	0.024			
64.01	0.118	0.024			

Stage-Area-Storage for Pond 3: Infiltration Bed

Elevation (feet)	Surface (acres)	Storage (acre-feet)
65.00	**0.118**	0.000
65.01	0.118	0.000
65.02	0.118	0.001
65.03	0.118	0.001
65.04	0.118	0.002
65.05	0.118	0.002
65.06	0.118	0.003
65.07	0.118	0.003
65.08	0.118	0.004
65.09	0.118	0.004
65.10	0.118	0.005
65.11	0.118	0.005
65.12	0.118	0.006
65.13	0.118	0.006
65.14	0.118	0.007
65.15	0.118	0.007
65.16	0.118	0.008
65.17	0.118	0.008
65.18	0.118	0.009
65.19	0.118	0.009
65.20	0.118	0.009
65.21	0.118	0.010
65.22	0.118	0.010
65.23	0.118	0.011
65.24	0.118	0.011
65.25	0.118	0.012
65.26	0.118	0.012
65.27	0.118	0.013
65.28	0.118	0.013
65.29	0.118	0.014
65.30	0.118	0.014
65.31	0.118	0.015
65.32	0.118	0.015
65.33	0.118	0.016
65.34	0.118	0.016
65.35	0.118	0.017
65.36	0.118	0.017
65.37	0.118	0.017
65.38	0.118	0.018
65.39	0.118	0.018
65.40	0.118	0.019
65.41	0.118	0.019
65.42	0.118	0.020
65.43	0.118	0.020
65.44	0.118	0.021
65.45	0.118	0.021
65.46	0.118	0.022
65.47	0.118	0.022
65.48	0.118	0.023
65.49	0.118	0.023
65.50	0.118	0.024
65.51	0.118	0.024
65.52	0.118	0.025
65.53	0.118	0.025
65.54	0.118	0.026
65.55	0.118	0.026
65.56	0.118	0.026
65.57	0.118	0.027
65.58	0.118	0.027
65.59	0.118	0.028
65.60	0.118	0.028
65.61	0.118	0.029
65.62	0.118	0.029
65.63	0.118	0.030
65.64	0.118	0.030
65.65	0.118	0.031
65.66	0.118	0.031
65.67	0.118	0.032
65.68	0.118	0.032
65.69	0.118	0.033
65.70	0.118	0.033
65.71	0.118	0.034
65.72	0.118	0.034
65.73	0.118	0.035
65.74	0.118	0.035
65.75	0.118	0.035
65.76	0.118	0.036
65.77	0.118	0.036
65.78	0.118	0.037
65.79	0.118	0.037
65.80	0.118	0.038
65.81	0.118	0.038
65.82	0.118	0.039
65.83	0.118	0.039
65.84	0.118	0.040
65.85	0.118	0.040
65.86	0.118	0.041
65.87	0.118	0.041
65.88	0.118	0.042
65.89	0.118	0.042
65.90	0.118	0.043
65.91	0.118	0.043
65.92	0.118	0.043
65.93	0.118	0.044
65.94	0.118	0.044
65.95	0.118	0.045
65.96	0.118	0.045
65.97	0.118	0.046
65.98	0.118	0.046
65.99	0.118	0.047
66.00	0.118	**0.047**

Stage-Area-Storage for Pond 4: Infiltration Bed

Elevation (feet)	Surface (acres)	Storage (acre-feet)
65.00	**0.116**	0.000
65.01	0.116	0.000
65.02	0.116	0.001
65.03	0.116	0.001
65.04	0.116	0.002
65.05	0.116	0.002
65.06	0.116	0.003
65.07	0.116	0.003
65.08	0.116	0.004
65.09	0.116	0.004
65.10	0.116	0.005
65.11	0.116	0.005
65.12	0.116	0.006
65.13	0.116	0.006
65.14	0.116	0.006
65.15	0.116	0.007
65.16	0.116	0.007
65.17	0.116	0.008
65.18	0.116	0.008
65.19	0.116	0.009
65.20	0.116	0.009
65.21	0.116	0.010
65.22	0.116	0.010
65.23	0.116	0.011
65.24	0.116	0.011
65.25	0.116	0.012
65.26	0.116	0.012
65.27	0.116	0.013
65.28	0.116	0.013
65.29	0.116	0.013
65.30	0.116	0.014
65.31	0.116	0.014
65.32	0.116	0.015
65.33	0.116	0.015
65.34	0.116	0.016
65.35	0.116	0.016
65.36	0.116	0.017
65.37	0.116	0.017
65.38	0.116	0.018
65.39	0.116	0.018
65.40	0.116	0.019
65.41	0.116	0.019
65.42	0.116	0.019
65.43	0.116	0.020
65.44	0.116	0.020
65.45	0.116	0.021
65.46	0.116	0.021
65.47	0.116	0.022
65.48	0.116	0.022
65.49	0.116	0.023
65.50	0.116	0.023
65.51	0.116	0.024
65.52	0.116	0.024
65.53	0.116	0.025
65.54	0.116	0.025
65.55	0.116	0.025
65.56	0.116	0.026
65.57	0.116	0.026
65.58	0.116	0.027
65.59	0.116	0.027
65.60	0.116	0.028
65.61	0.116	0.028
65.62	0.116	0.029
65.63	0.116	0.029
65.64	0.116	0.030
65.65	0.116	0.030
65.66	0.116	0.031
65.67	0.116	0.031
65.68	0.116	0.032
65.69	0.116	0.032
65.70	0.116	0.032
65.71	0.116	0.033
65.72	0.116	0.033
65.73	0.116	0.034
65.74	0.116	0.034
65.75	0.116	0.035
65.76	0.116	0.035
65.77	0.116	0.036
65.78	0.116	0.036
65.79	0.116	0.037
65.80	0.116	0.037
65.81	0.116	0.038
65.82	0.116	0.038
65.83	0.116	0.038
65.84	0.116	0.039
65.85	0.116	0.039
65.86	0.116	0.040
65.87	0.116	0.040
65.88	0.116	0.041
65.89	0.116	0.041
65.90	0.116	0.042
65.91	0.116	0.042
65.92	0.116	0.043
65.93	0.116	0.043
65.94	0.116	0.044
65.95	0.116	0.044
65.96	0.116	0.045
65.97	0.116	0.045
65.98	0.116	0.045
65.99	0.116	0.046
66.00	0.116	**0.046**