

Drainage Report:

**Earth Removal Operation
Teel Road
Winchendon, MA**

Submitted to:

**Town of Winchendon
Planning Board & Conservation Commission**

February 19, 2024

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Earth Removal Operation
Teel Road
Winchendon, Massachusetts
STORM WATER MANAGEMENT DESIGN
February 19, 2024

INTRODUCTION

The proposed project site is located off Teel Road located in Winchendon, Massachusetts and is situated in the Industrial (I) zoning district. An active earth removal operation was previously conducted on this property, however the earth removal permit is no longer transferable upon the sale of the land, therefore a new permit application is being sought by the land owner. The site is bound by Teel Road to the North, Bemis Road to the West, and undeveloped land to the South and East. Refer to **Figure 1** for the Locus Plan.

The proposed project includes the development of this property to support a gravel manufacturing and processing operation for Powell Stone & Gravel. Though portions of the property were previously an active earth removal operation and has remained open since the 1990s, the existing conditions for the site were molded as if it was entirely comprised of woods. Under the proposed condition the site will be modeled as stabilized with loam & seed.

The hydrologic study area is comprised of approximately 23.4 acres. Based on the USDA Natural Resources Conservation Service soil survey the site is comprised of Becket-Skerry Association which is a Hydrologic Soil Group (HSG) “C” Soil, unclassified Gravel Pits, Colton gravelly loamy sand, which is a HSG “A” Soil, and Naumburg fine sandy loam, which is a HSG “A”. Soil borings were conducted in July of 2023 by Geosearch, Inc. and their findings determined that the site contained sand with gravel. Individual test pits have not yet been conducted within the proposed infiltration basin locations, however once the earth removal operations are completed in their vicinity they will be conducted, and the information will be provided for their review to validate the drainage design. Based on the findings of Geosearch, Inc., the Rawls Rate for an “A” sand soil (8.27 in/hr) has been used in this analysis for the at grade infiltration basins as detailed within the MA Stormwater Handbook. Refer to **Appendix A** for the NRCS soil survey and boring information.

EXISTING CONDITIONS

As described above, the existing site is a former earth removal operation on an undeveloped site and has been modeled entirely as woods with the exception of the gravel access road to the property. As such, the existing hydrologic study area is

Teel Road
Winchendon, Massachusetts
Stormwater Management Design

comprised of approximately 23.06 acres of woods and 0.34 acres of gravel. The existing site is made up of seven watershed areas.

Area 1 includes the western most cleared area as you enter the site from Teel Road and is located between the A-series and P-series wetlands. This area sheet flows to A-series wetland system, which is considered Point of Analysis 1 (POA-1).

Area 2 includes the northern area of the cleared land adjacent to the F-series wetlands. This area sheet flows to POA-1.

Area 3 includes the southern area immediately adjacent to Area 2. This area sheet flows to the E-series wetland system, which is considered Point of Analysis 2 (POA-2).

Area 4 includes the southern most area immediately adjacent to Area 3 and surrounded by the D-series wetland system. This area sheet flows directly to the D-series wetland system which is considered Point of Analysis 3 (POA-3).

Area 5 includes the eastern most side of the parcel. This area sheet flows directly to POA-2.

Area 6 includes the area immediately adjacent to Area 5. This area sheet flows directly to POA-3.

Area 7 includes the gravel access roadway leading into the property. This area sheet flows directly to POA-1. Refer to **Figure 2** – Existing Watershed Plan.

PROPOSED CONDITIONS

Under proposed conditions, the site is comprised of approximately 22.92 acres of grass and 0.48 acres of gravel road. The post-development run-off rates will be mitigated to less than the pre-development run-off rates for all design storm events. The proposed site is comprised of 6 watershed areas.

Area 1 includes the majority of western most cleared area as you enter the site from Teel Road. This area sheet flows to infiltration basin 1. This basin is then conveyed to infiltration basin 2, and ultimately to the A-series wetland system, which is considered Point of Analysis 1 (POA-1).

Area 2 includes the area north of Area 1. This area sheet flows to infiltration basin 2. Ultimately, this basin discharges to POA-1

Area 3 includes the majority of the developed area between the P-series and F-series. This area sheet flows to infiltration basin 3. Ultimately, this basin discharges to POA-1.

Teel Road
Winchendon, Massachusetts
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Area 4 includes the area south of Area 3. This area sheet flows to infiltration basin 4. Ultimately, this basin discharges to the D-series wetland, which is considered Point of Analysis 3 (POA-3).

Area 5 includes the eastern most side of the parcel. This area sheet flows infiltration basin 5. Ultimately, this basin discharges to POA-2.

Area 6 includes the gravel access roadway leading into the property. This area sheet flows directly to POA-1. Refer to **Figure 3** – Proposed Watershed Plan.

STORMWATER MANAGEMENT

The proposed drainage design was based on the Massachusetts Department of Environmental Protection (MADEP) Stormwater Management Standards (Stormwater Policy, latest edition). The standards have been revised to promote increased stormwater recharge, the treatment of more runoff from polluting land uses, pollution prevention, the removal of illicit discharges to stormwater management systems, and improved operation and maintenance of stormwater best management practices (BMP's). The following summarizes the proposed project's compliance with both the MADEP Stormwater Management Standards and the Town of Westminster Stormwater Bylaws.

Standard #1 Untreated Storm Water: No new untreated storm water conveyances have been proposed to discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth. Storm water Best Management Practices (BMP's), such as infiltration trenches and at grade infiltration basins are proposed within the project to provide stormwater quality control prior to discharging runoff from the site.

Standard #2 Post-Development Peak Discharge Rates: Storm water BMP's have been developed to attenuate the peak discharge rates for the 2, 10, 25, 50 and 100 year, 24-hour storm events. Refer to **Table 1** for the pre and post-development peak discharge rates.

Standard #3 Recharge to Groundwater: As there is no impervious area proposed for this project, there will be no loss of recharge.

Standard #4 80 Percent TSS Removal: As there is no impervious area proposed for this project, there will be no TSS removal required. However, the proposed infiltration trenches and infiltration basins have been designed to pretreat the stormwater runoff prior to infiltrating into the ground.

Standard #5 Higher Potential Pollutant Loads: The proposed project is not classified by the DEP as a source for higher pollutant loads. Though the proposed work includes the removal of sand and gravel, the site is not located within a Zone II or Zone A and removal will not occur within 4 feet of the historical high water table.

Standard #6 Protection of Critical Areas: The project site is not considered a critical area as defined by the MA DEP.

Standard #7 Redevelopment Project: The project is not considered a redevelopment site.

Standard #8 Erosion/Sediment Control: Erosion and sediment controls are incorporated into the project design to prevent erosion, control sediment movement, and stabilize exposed soils during construction. During construction, control practices will be utilized such as the placement of straw wattles / bales barriers, silt fencing, and the implementation of soil stabilization practices. These control measures will be periodically checked and maintained as necessary throughout the entire construction duration.

Standard #9 Operation/Maintenance Plan: A long term operation and maintenance plan has been developed to ensure the stormwater management system will function as designed. See **Appendix A** for the Operation and Maintenance Plan.

Standard #10 Illicit Discharges to Stormwater Management System: The Stormwater Management System associated with this property has been designed such that prior to storm water runoff discharging from the site, it is treated through a series of best management practices. To the Engineer's knowledge, there are no known or designed non-storm water discharges that are or will be connected to the storm water collection system that would convey pollutants directly to groundwater or surface waters. Refer to **Appendix A** for the Illicit Discharge Compliance Statement.

The proposed design meets **all** applicable DEP Stormwater Management Standards and the Town of Westminster Stormwater Bylaws. Refer to **Appendix A** for the MADEP Stormwater Checklist.

DRAINAGE COLLECTION SYSTEM DESIGN

The proposed drain pipe network is composed of a 12" RCP pipe that connects the two infiltration basins located in the phase 5 area. The pipe layout is depicted on the Phase 5 Plan in the plan set.

Pipe size was determined using the Rational Method to determine contributing flows to catch basin, as well as the Manning's Equation to calculate pipe flows (refer to **Appendix A** for pipe sizing calculations.)

The following criteria were used to design the pipe network:

- Pipe sizes are based on flows for the 100-year storm frequency.
- Storm drain pipe shall be RCP unless otherwise noted.
- Pipe flow velocities are maintained at a maximum of 12 fps.

STORMWATER QUANTITY

The stormwater facilities proposed will include at grade infiltration basins and infiltration trenches. The proposed basins will attenuate the peak runoff rates for the 2, 10, 25, 50 and 100-year, 24-hour storm events, and all discharges will be mitigated to below existing conditions.

Hydrologic analyses were performed utilizing the computer program, HydroCAD[®]. In order to determine the peak rate of discharge for existing and proposed conditions, runoff hydrographs were generated for the 2-, 10-, 25-, 50- and 100-year, 24-hour storm events using the SCS TR-20 Method and Type III rainfall distribution (refer to **Appendix B** for the existing and proposed HydroCAD models). Under proposed conditions, the post development runoff hydrographs were flood routed through the proposed stormwater management facilities.

Table 1 compares peak runoff rates for the 2-year, 10-year, 25-year, 50-year and 100-year storm events for existing and proposed conditions.

Table 1 Comparison of Peak Runoff Rates

Storm Event	Existing Flow (cfs)	Proposed Flow (cfs)	Existing Flow (cfs)	Proposed Flow (cfs)	Existing Flow (cfs)	Proposed Flow (cfs)
	POA-1	POA-1	POA-2	POA-2	POA-3	POA-3
2-Year	0.51	0.00	0.00	0.00	0.00	0.00
10-Year	1.24	0.00	0.00	0.00	0.00	0.00
25-Year	1.88	0.00	0.08	0.00	0.02	0.00
50-Year	2.51	0.00	0.33	0.00	0.07	0.00
100-Year	3.28	2.43	1.77	0.00	0.39	0.00

As shown in Table 1, peak runoff rates under proposed conditions are less than existing conditions for the 2-, 10-, 25-, 50-year and 100-year storm events. Therefore, the proposed stormwater design complies with Standard #2 of the MA DEP Stormwater Management Policy.

STORMWATER QUALITY

Stormwater runoff will be treated to address water quality concerns through the use of MADEP approved BMP's. The following BMP's will be provided on-site and when combined will achieve 80% TSS removal: infiltration trenches and infiltration basins. (See **Appendix A** for TSS Removal Worksheets)

Infiltration Trenches

- The stone filter layer shall be inspected every 6 months and after every major storm event to verify no erosion has occurred and the system is functioning as desired.
- If it is found that the stone filter layer is clogged with sediment, the pea stone and filter fabric should be replaced on an as needed basis.
- All sediments and hydrocarbons will be properly handled and disposed of off-site, in accordance with local, state, and federal guidelines and regulations.

At Grade Infiltration Basin

- The infiltration basin will be inspected after several storm events to confirm drainage system functions, bank stability, and vegetation growth. Any problems will be addressed immediately. The basin will be inspected for property operation at least once per year. Inspections will be conducted during wet weather to determine if the basin is functioning properly. At least twice during the growing season, the upper-stage, side slopes, and embankment will be mowed. Accumulated trash and debris will be removed. Sediment will be removed from the basin as necessary, at least once every 10 years.

CONCLUSION

The proposed stormwater management plan for the project addresses both water quantity and quality and conforms to the standards outlined in the MADEP Stormwater Management Policy.

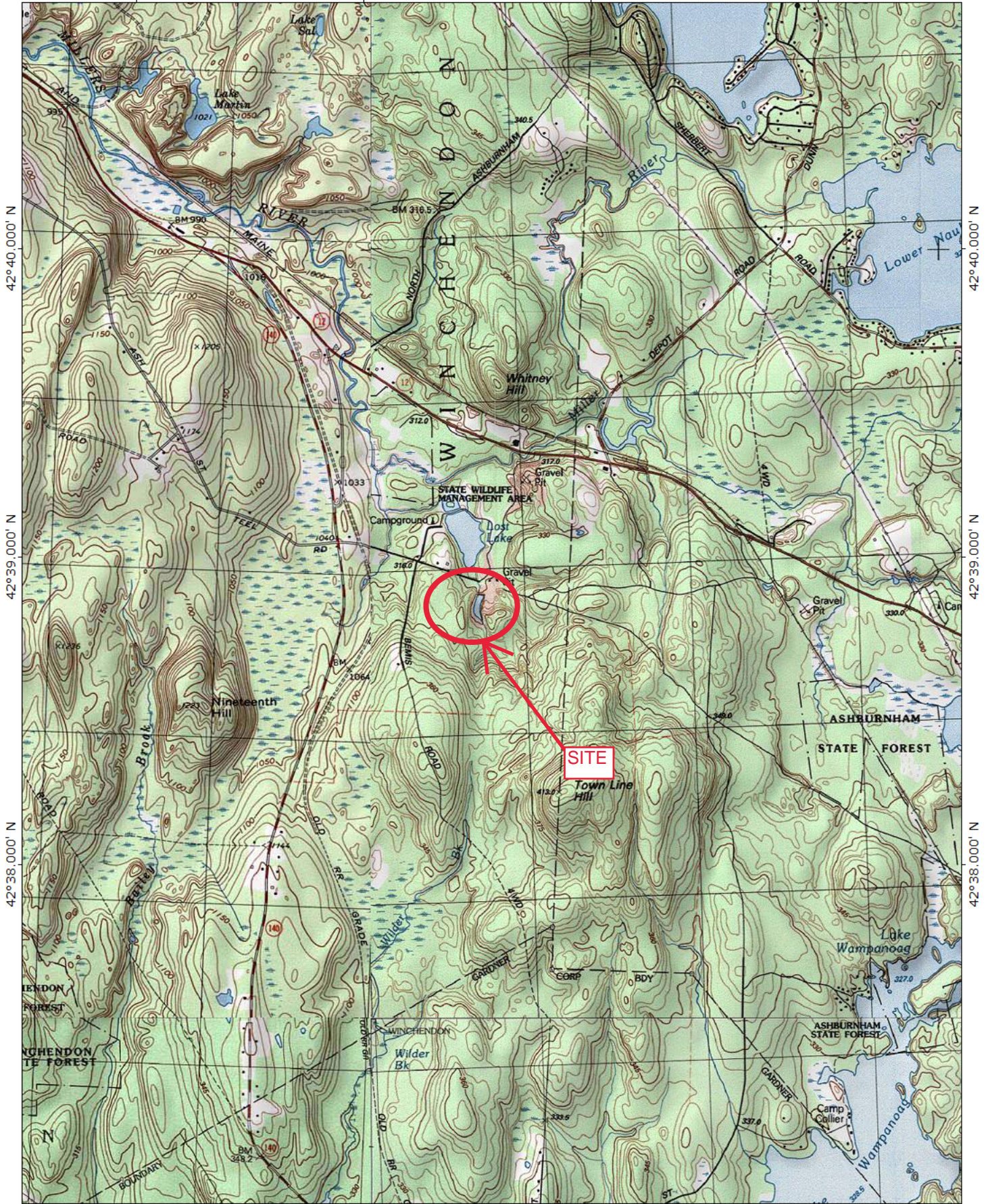
Figures

72°01.000' W

TOPO! map printed on 10/20/23 from "NRTHEAST.TPO" and "Untitled.tpg"
72°00.000' W

71°59.000' W

WGS84 71°58.000' W



42°40.000' N

42°39.000' N

42°38.000' N

42°40.000' N

42°39.000' N

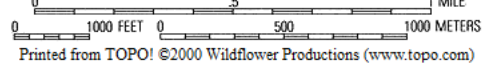
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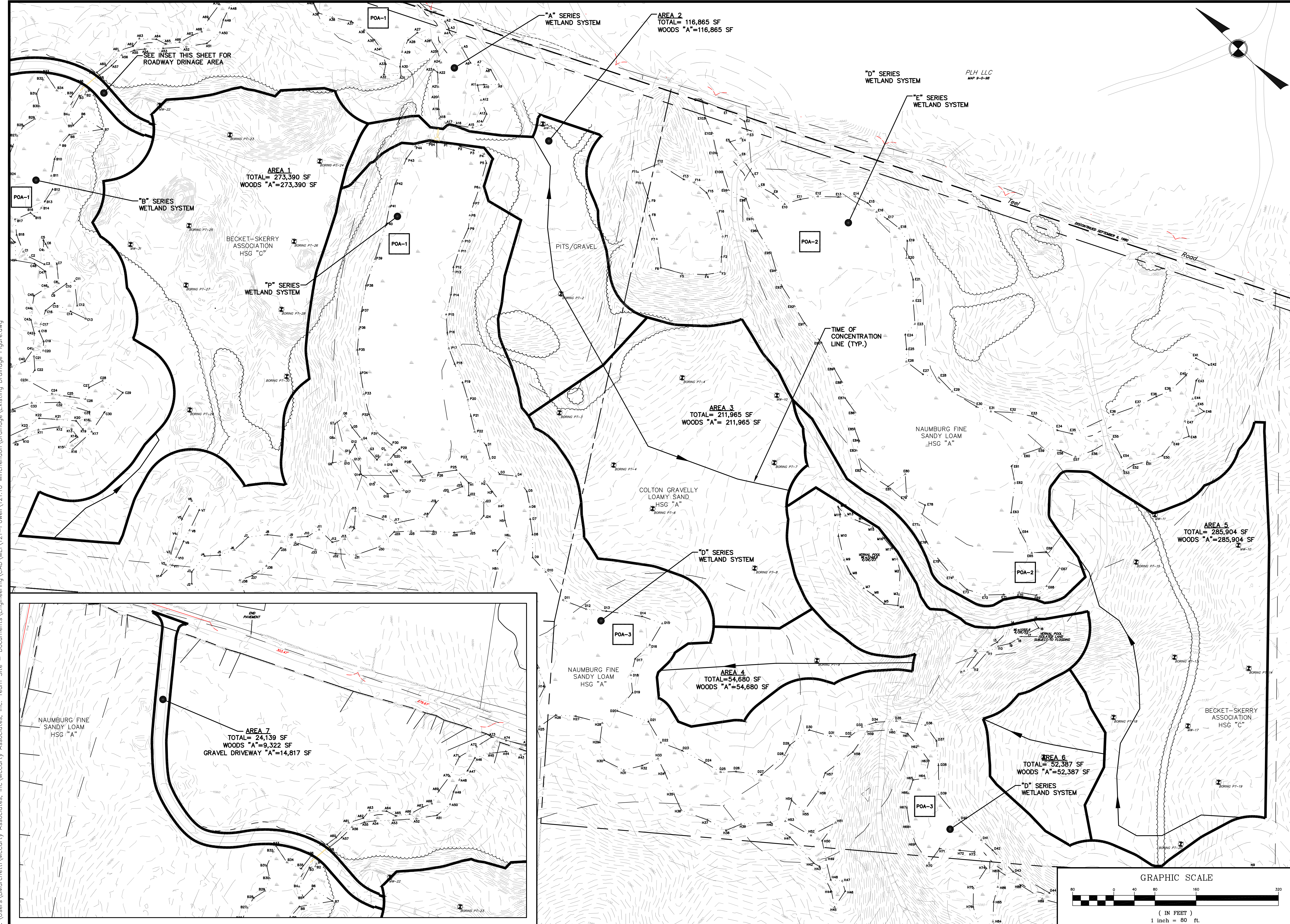
WGS84 71°58.000' W



Printed from TOPO! ©2000 Wildflower Productions (www.topo.com)

Figure 1
Locus Plan

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NOT FOR CONSTRUCTION
THESE PLANS WERE PREPARED FOR THE PURPOSE OF OBTAINING STATE AND LOCAL PERMITS AND ARE NOT INTENDED TO BE USED AS CONSTRUCTION DOCUMENTS.

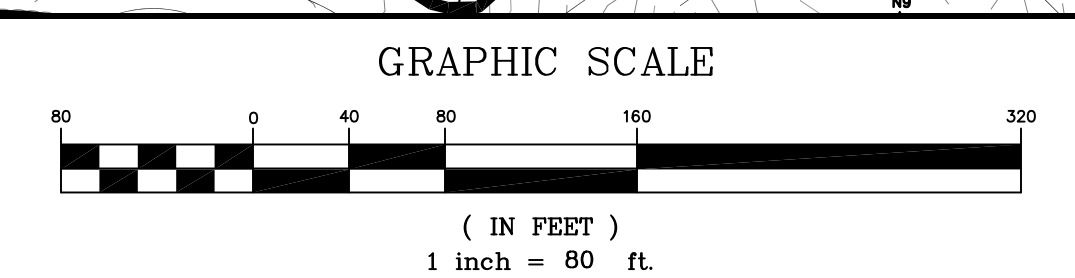
No.	Date	Revision

Drawn By: JLL
Designed By: JLL
Checked By: JLL

McCarty Engineering, Inc.
Civil Engineers
42 Tucker Drive, Leominster, MA 01453
phone: (978) 534-1318 fax: (978) 840-6907
www.mccartydb.com

Project Name
Earth Removal Operation
Teel Road
Winchendon, MA

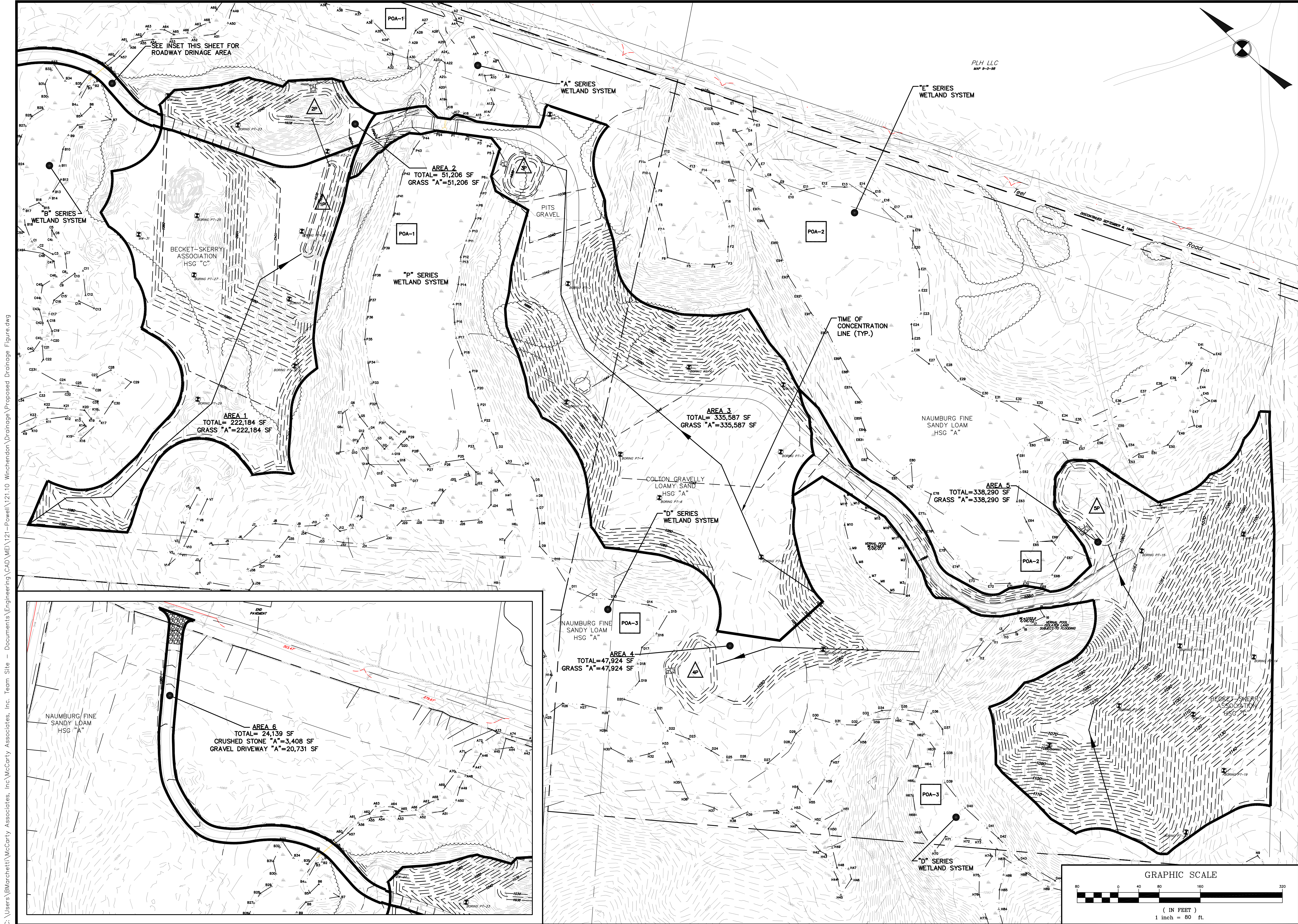
Sheet Title
Existing Watershed Plan



Job No: 121.10
File Name: Existing Drainage
Date: January 19, 2024
Scale: 1"=80'

Sheet No.
2

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No.	Date	Revision

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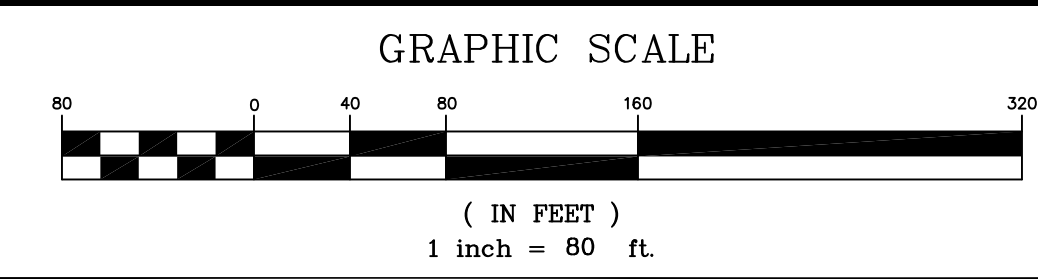
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Project Name
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 Winchendon, MA**

Sheet Title
Proposed Watershed Plan

Job No: 121.10
 File Name: Proposed Drainage
 Date: January 19, 2024
 Scale: 1"=80'

Sheet No.
3



Appendix A

NRCS Soil Survey

Hydrologic Soil Group—Worcester County, Massachusetts, Northwestern Part



Soil Map may not be valid at this scale.

Map Scale: 1:5,390 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84



MAP LEGEND

Area of Interest (AOI)









 Area of Interest (AOI)

Soils

Soil Rating Polygons





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

Soil Rating Lines


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

Soil Rating Points






 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

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

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

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

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

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

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

Soil Survey Area: Worcester County, Massachusetts, Northwestern Part
 Survey Area Data: Version 17, Sep 13, 2023

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

Date(s) aerial images were photographed: Oct 15, 2020—Jun 5, 2022

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
29B	Naumburg fine sandy loam, 0 to 5 percent slopes	A/D	9.9	12.2%
282B	Colton gravelly loamy sand, 3 to 8 percent slopes	A	8.8	10.8%
282C	Colton gravelly loamy sand, 8 to 15 percent slopes	A	15.4	19.0%
600	Pits, gravel		8.7	10.7%
905C	Peru-Marlow association, 3 to 15 percent slopes, extremely stony	C/D	2.1	2.6%
908C	Becket-Skerry association, 0 to 15 percent slopes, extremely stony	C	36.3	44.7%
Totals for Area of Interest			81.3	100.0%

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Soil Borings

GEOSEARCH, INC.

Client: Powell Stone & Gravel Date: 7/10/23 Page # 1 of 1

Location: Teel Road, Winchendon, MA

Boring No. B1 Ground Elev Date Start 7/10/23 Date Complete Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
	1	0-2'	3-4-3-3	19"			Dry, loose, FINE SAND
5	2	5'-7'	25-30-18-20	17"			Dry, dense, COARSE GRAVEL and fine sand, trace silt
10	3	10'-12'	16-21-20-24	20"			Dry, dense, COARSE GRAVEL and fine sand, trace silt
15							B1 Auger refusal at 13' B1A <i>moved 6' away</i> Auger refusal at 12' No water upon completion
20							
25							
30							
35							

Type Of Boring:	Casing Size	Hollow Stem Auger Size 4.25"	Standard Penetration Test (ST) = 140lb hammer falling 30"
Proportion Percentages	Granular Soils (blows per ft.)		Cohesive Soils (blows per ft.)
Trace 0 to 10%	0 to 4 Very Loose	30 to 50 Dense	0 to 2 Very Soft 8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose	Over 50 Very Dense	2 to 4 Soft 15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense		4 to 8 Medium Stiff Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.			

GEOSEARCH, INC.

Client: Powell Stone & Gravel Date: 7/10/23 Page # 1 of 1

Location: Teel Road, Winchendon, MA

Boring #MW1 Ground Elev Start 7/10/23 Date Complete Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
	1	0-2'	1-1-2-2	18"			Dry, loose, FINE SAND
5	2	5'-7'	4-12-14-14	21"		H2O	Wet, medium dense, FINE TO MEDIUM SAND, some silt, little gravel
10	3	10'-12'	3-3-4-4	24"			Wet, loose, FINE SAND, some silt, trace gravel
15							Set MW-1 at 13' (10' screen 7' riser) END OF BORING AT 13'
20							
25							
30							
35							

Type Of Boring: Casing Size Hollow Stem Auger Size 4.25" Standard Penetration Test (ST) = 140lb hammer falling 30"

Proportion Percentages	Granular Soils (blows per ft.)		Cohesive Soils (blows per ft.)	
Trace 0 to 10%	0 to 4 Very Loose	30 to 50 Dense	0 to 2 Very Soft	8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose	Over 50 Very Dense	2 to 4 Soft	15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense		4 to 8 Medium Stiff	Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.				

GEOSEARCH, INC.

Client: Powell Stone & Gravel Date: 7/10/23 Page # 1 of 1

Location: Teel Road, Winchendon, MA

Boring #MW10 Ground Elev Start 7/10/23 Date Complete Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
	1	0-2'	2-3-3-2	18"			Dry, loose, FINE SAND, little gravel
5	2	5'-7'	3-11-13-19	14"			Dry, medium dense, MEDIUM TO COARSE SAND and gravel, trace silt
10	3	10'-12'	4-3-4-5	18"			
15	4	15'-17'	6-14-16-14	13"			
20	5	20'-22'	7-11-17-15	17"	H2O		Wet, medium dense, FINE SAND, little gravel, trace silt
25	6	25'-27'	4-7-13-15	17"			Wet, medium dense, FINE TO MEDIUM COARSE SAND and gravel, trace silt
	7	27'-29'	12-12-14-13	20"			Set MW-10 at 27' (10'screen, 21' riser) END OF BORING AT 27'
30							
35							

Type Of Boring: Casing Size Hollow Stem Auger Size 4.25" Standard Penetration Test (ST) = 140lb hammer falling 30"

Proportion Percentages	Granular Soils (blows per ft.)	Cohesive Soils (blows per ft.)
Trace 0 to 10%	0 to 4 Very Loose 30 to 50 Dense	0 to 2 Very Soft 8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose Over 50 Very Dense	2 to 4 Soft 15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense	4 to 8 Medium Stiff Over 30 Hard

Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.

GEOSEARCH, INC.

Client: Powell Stone & Gravel	Date: 7/ /2023	Page # 1 of 1
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Location: Teel Road, Winchendon, MA

Boring #MW-11	Ground Elev	Date Start 7/ /2023	Date Complete	Drilling Foreman: Mike DeAmicis	Eng/Hydrol. Geologist:
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DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata	
	Sample		Blows	Rec.				
	NO.	Depth(ft.)	6" Penetration	Inches				
1	0-2"	1-1-1-1	16"		H2O	Moist, very loose, FINE TO MEDIUM SAND, some gravel, trace silt		
5	5'-6'8"	11-36-60/2"	11"				H2O	Moist, very dense, FINE TO MEDIUM COARSE SAND and gravel, trace silt FINE SAND at 7'
10	10'-12'	17-35-41-45	17"		H2O	Wet, very dense, FINE SAND, trace silt		
15	15'-17'	10-30-31-35	22"		H2O	Wet, very dense, FINE SAND, trace silt Set MW-11 at 15' (10' screen, 9' riser) END OF BORING AT 17'		
20					H2O	PT-11 Very boney 0-7'		

Type Of Boring: Casing Size	Hollow Stem Auger Size 4.25"	Standard Penetration Test (ST) = 140lb hammer falling 30"
Proportion Percentages Trace 0 to 10% Some 10 to 40% And 40 to 50%	Granular Soils (blows per ft.) 0 to 4 Very Loose 30 to 50 Dense 4 to 10 Loose Over 50 Very Dense 10 to 30 Medium Dense	Cohesive Soils (blows per ft.) 0 to 2 Very Soft 8 to 15 Stiff 2 to 4 Soft 15 to 30 Very Stiff 4 to 8 Medium Stiff Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.		

GEOSEARCH, INC.

Client: Powell Stone & Gravel Date: 7/ /2023 Page # 1 of 1

Location: Teel Road, Winchendon, MA

Boring Ground Date Date Drilling Eng/Hydrol.
 #MW-17 Elev Start 7/ /2023 Complete Foreman: Mike DeAmicis Geologist:

D E P T H	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
	1	0-2"	2-4-3-6	17"			Dry, loose, FINE SAND, trace silt
5	2	5'-7'	4-6-7-8	24"			Dry, medium dense, FINE SAND
10	3	10'-12'	3-5-7-8	21"			
15	4	15'-17'	4-5-6-6	20"			
20	5	20'-22'	15-15-19-19	13"			Moist, dense, TIGHT SOIL, fine sand, some silt
25	6	25'-26'8"	33-44-60/2"	14"	H2O		Wet, very dense, FINE SAND, little gravel, some silt, tight till
							Set MW-17 at 27' (15' screen, 14' riser)
30							
35							

Type Of Boring:	Casing Size	Hollow Stem Auger Size 4.25"	Standard Penetration Test (ST) = 140lb hammer falling 30"
Proportion Percentages		Granular Soils (blows per ft.)	
Trace 0 to 10%		0 to 4 Very Loose	30 to 50 Dense
Some 10 to 40%		4 to 10 Loose	Over 50 Very Dense
And 40 to 50%		10 to 30 Medium Dense	
		Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.	
		Cohesive Soils (blows per ft.)	
		0 to 2 Very Soft	8 to 15 Stiff
		2 to 4 Soft	15 to 30 Very Stiff
		4 to 8 Medium Stiff	Over 30 Hard

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Client: Powell Stone & Gravel Date: 7/10/23 Page # 1 of 1

Location: Teel Road, Winchendon, MA

Boring #MW22 Ground Elev Start 7/10/23 Date Complete Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

D E P T H	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
	1	0-2'	7-4-6-6	19"			Dry, loose, FINE SAND, some gravel, trace silt
5	2	5'-7'	13-19-27-34	19"			Dry, dense, COARSE GRAVEL and sand
10	3	10'-10'8"	23-60/2"	8"		H2O	Wet, very dense, COARSE GRAVEL and fine sand, some silt Set MW-22 at 11' (9' screen, 5' riser) Auger refusal at 11' END OF BORING AT 11'
15							
20							
25							
30							
35							

Type Of Boring:	Casing Size	Hollow Stem Auger Size 4.25"	Standard Penetration Test (ST) = 140lb hammer falling 30"
Proportion Percentages		Granular Soils (blows per ft.)	
Trace 0 to 10%	Some 10 to 40%	0 to 4 Very Loose	30 to 50 Dense
And 40 to 50%		4 to 10 Loose	Over 50 Very Dense
		10 to 30 Medium Dense	
		Cohesive Soils (blows per ft.)	
		0 to 2 Very Soft	8 to 15 Stiff
		2 to 4 Soft	15 to 30 Very Stiff
		4 to 8 Medium Stiff	Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.			

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Client: Powell Stone & Gravel **Date:** 7/ /2023 **Page #** 1 of 1

Location: Teel Road, Winchendon, MA

Boring #: MW31 **Ground Elev:** **Date Start:** 7/10/23 **Date Complete:** **Drilling Foreman:** Mike DeAmicis **Eng/Hydr. Geologist:**

D E P T H	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
1	0-2'	3-3-2-3	22"			Dry, loose, FINE SAND, little gravel, trace silt	
5	5'-7'	11-23-50/5	16"			Dry, very dense, COARSE GRAVEL, fine sand, trace silt Auger refusal at 7' Boulders Set MW-31 at 9' (8' screen, 5' riser) Auger refusal at 9' END OF BORING AT 9'	
10							
15							
20							
25							
30							
35							

Type Of Boring: **Casing Size** **Hollow Stem Auger Size 4.25"** **Standard Penetration Test (ST) = 140lb hammer falling 30"**

Proportion Percentages	Granular Soils (blows per ft.)	Cohesive Soils (blows per ft.)
Trace 0 to 10%	0 to 4 Very Loose 30 to 50 Dense	0 to 2 Very Soft 8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose Over 50 Very Dense	2 to 4 Soft 15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense	4 to 8 Medium Stiff Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.		

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Client: Powell Stone & Gravel Date: 7/ /2023 Page # 1 of 1

Location: Teel Road, Winchendon, MA

Boring #PT-2 Ground Elev Start 7/ /2023 Complete Date Date Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
	1	0-2"	1-1-2-2	17"			Dry, very loose, FINE SAND
5	2	5'-7'	15-25-22-20	20"			Dry, dense, FINE SAND and gravel, trace silt
10	3	10'-12"	6-7-6-6	14"			Dry, medium dense, FINE SAND and gravel, trace silt
15	4	15'-17'	5-5-8-8	16"	H2O		Wet, medium dense, MEDIUM COARSE SAND, some gravel, some silt
20	5	20'-22'	9-35-26-23	20"			Wet, very dense, FINE SAND, some silt, some gravel
							END OF BORING AT 22'
25							
30							
35							

Type Of Boring:	Casing Size	Hollow Stem Auger Size 4.25"	Standard Penetration Test (ST) = 140lb hammer falling 30"
Proportion Percentages		Granular Soils (blows per ft.)	Cohesive Soils (blows per ft.)
Trace 0 to 10%		0 to 4 Very Loose	30 to 50 Dense
Some 10 to 40%		4 to 10 Loose	Over 50 Very Dense
And 40 to 50%		10 to 30 Medium Dense	
		0 to 2 Very Soft	8 to 15 Stiff
		2 to 4 Soft	15 to 30 Very Stiff
		4 to 8 Medium Stiff	Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.			

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Client: Powell Stone & Gravel Date: 7/ /2023 Page # 1 of 2

Location: Teel Road, Winchendon, MA

Boring #PT-3 Ground Elev Start 7/10/23 Date Complete Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
	1	0-2'	1-1-2-2	21"			Dry, very loose, FINE SAND
5	2	5-7'	2-3-3-4	22"			Dry, loose, FINE SAND
10	3	10'-12'	2-3-4-5	20"			
15	4	15'-17'	5-5-6-6	19"			Dry, medium dense, FINE SAND
20	5	20'-22'	5-7-8-7	21"			
25	6	25'-27'	6-6-7-8-	22"			Dry, medium dense, FINE SAND, trace silt
30	7	30'-32'	6-8-8-8	21"			
35	8	35'-37'	6-10-8-9	23"			Dry, medium dense, FINE SAND, some silt

Type Of Boring: Casing Size Hollow Stem Auger Size 4.25" Standard Penetration Test (ST) = 140lb hammer falling 30"

Proportion Percentages	Granular Soils (blows per ft.)	Cohesive Soils (blows per ft.)
Trace 0 to 10%	0 to 4 Very Loose 30 to 50 Dense	0 to 2 Very Soft 8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose Over 50 Very Dense	2 to 4 Soft 15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense	4 to 8 Medium Stiff Over 30 Hard

Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.

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Client: Powell Stone & Gravel Date: 7/ /2023 Page # 2 of 2

Location: Teel Road, Winchendon, MA

Boring #PT-3 Ground Elev Start 7/10/23 Complete Date Drilling Eng/Hydrol. Foreman: Mike DeAmicis Geologist:

DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata	
	Sample NO.	Sample Depth(ft.)	Blows 6" Penetration	Rec. Inches				
40	9	40'-42'	6-10-12-10	22"			Dry, medium dense, FINE SAND, some silt	
45	10	45'-47'	6-8-10-11	18"			Moist, medium dense, FINE SAND	
50	11	50'-52'	6-9-10-9	24"	H2O		Wet, medium dense, FINE SAND, some silt	
	12	52'-54'	6-9-15-17	22"				END OF BORING AT 54'

Type Of Boring: Casing Size Hollow Stem Auger Size 4.25" Standard Penetration Test (ST) = 140lb hammer falling 30"

Proportion Percentages	Granular Soils (blows per ft.)	Cohesive Soils (blows per ft.)
Trace 0 to 10%	0 to 4 Very Loose 30 to 50 Dense	0 to 2 Very Soft 8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose Over 50 Very Dense	2 to 4 Soft 15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense	4 to 8 Medium Stiff Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.		

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Client: Powell Stone & Gravel Date: 7/ /2023 Page # 1 of 2

Location: Teel Road, Winchendon, MA

Boring Ground Date Date Drilling Eng/Hydrol.
 #PT-4 Elev Start 7/ /2023 Complete Foreman: Mike DeAmicis Geologist:

DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
	1	0-2'	1-2-2-3	20"			Dry, very loose, FINE TO MEDIUM SAND, some silt
5	2	5'-7'	13-28-34-33	17"			Dry, very dense, FINE SAND and gravel, trace silt
10	3	10'-12'	14-5-5-6	17"			Dry, loose, FINE SAND, trace silt
15	4	15'-17'	5-6-6-8	20"			Dry, medium dense. FINE SAND, trace silt
20	5	20'-22'	6-8-8-9	17"			
25	6	25'-27'	10-10-10-11	22"			
30	7	30'-32'	7-7-8-9	20"			Moist, medium dense, FINE SAND, trace silt
35	8	35'-37'	4-7-18-15-	23"		H2O	Wet, dense, FINE SAND, trace silt

Type Of Boring: Casing Size Hollow Stem Auger Size 4.25" Standard Penetration Test (ST) = 140lb hammer falling 30"

Proportion Percentages	Granular Soils (blows per ft.)		Cohesive Soils (blows per ft.)	
Trace 0 to 10%	0 to 4 Very Loose	30 to 50 Dense	0 to 2 Very Soft	8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose	Over 50 Very Dense	2 to 4 Soft	15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense		4 to 8 Medium Stiff	Over 30 Hard

Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.

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Client: Powell Stone & Gravel **Date:** 7/ /2023 **Page #** 2 of 2

Location: Teel Road, Winchendon, MA

Boring #PT-4 **Ground Elev** **Date** 7/ /2023 **Date** Complete **Drilling Foreman:** Mike DeAmicis **Eng/Hydrol. Geologist:**

DEPTH	Sample Data			Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata	
	Sample		Blows				Rec.
	NO.	Depth(ft.)	6" Penetration				Inches
40	9	37-39'	13-17-15-15	20"		END OF BORING AT 39'	

Type Of Boring: Casing Size	Hollow Stem Auger Size 4.25"	Standard Penetration Test (ST) = 140lb hammer falling 30"
Proportion Percentages	Granular Soils (blows per ft.)	Cohesive Soils (blows per ft.)
Trace 0 to 10%	0 to 4 Very Loose 30 to 50 Dense	0 to 2 Very Soft 8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose Over 50 Very Dense	2 to 4 Soft 15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense	4 to 8 Medium Stiff Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.		

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Client: Powell Stone & Gravel Date: 7/ /2023 Page # 1 of 1

Location: Teel Road, Winchendon, MA

Boring #PT-5 Ground Elev Start 7/ /2023 Complete Date Date Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

D E P T H	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
	1	0-2'	3-2-2-2	17"			Dry, very loose, FINE SAND, some silt
5	2	5'-7'	6-6-5-7	21"			Dry, medium dense, FINE SAND, some silt
10	3	10'-12'	6-8-7-7	21"			
15	4	15'-17'	4-7-8-12	19"			
20	5	20'-22'	5-6-6-11	20"			Moist, medium dense, FINE SAND, some silt, some clay
25	6	25'-27'	5-7-13-15	22"	H2O		Wet, medium dense, FINE SAND, trace silt
	7	27'-29'	12-12-14-13	20"			
30							END OF BORING AT 29'
35							

Type Of Boring: Casing Size Hollow Stem Auger Size 4.25" Standard Penetration Test (ST) = 140lb hammer falling 30"

Proportion Percentages	Granular Soils (blows per ft.)		Cohesive Soils (blows per ft.)	
Trace 0 to 10%	0 to 4 Very Loose	30 to 50 Dense	0 to 2 Very Soft	8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose	Over 50 Very Dense	2 to 4 Soft	15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense		4 to 8 Medium Stiff	Over 30 Hard

Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.

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Location: Teel Road, Winchendon, MA

Boring #PT-6 Ground Elev Start 7/ /2023 Complete Date Date Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
	1	0-2'	1-1-1-2	16"			Dry, very loose, FINE SAND, trace silt
5	2	5-7'	3-5-9-11	21"			Dry, medium dense, FINE SAND, trace silt
10	3	10'-12'	4-5-6-9	23"			
15	4	15'-17'	2-3-4-4	18"	H2O		Wet, loose, FINE SAND
20	5	20'-22'	6-13-23-24	19"			Wet, dense, MEDIUM COARSE SAND and gravel
	6	22'-24'	17-20-18-23	21"			
25							END OF BORING AT 24'
30							
35							

Type Of Boring:	Casing Size	Hollow Stem Auger Size 4.25"	Standard Penetration Test (ST) = 140lb hammer falling 30"
Proportion Percentages	Granular Soils (blows per ft.)		Cohesive Soils (blows per ft.)
Trace 0 to 10%	0 to 4 Very Loose	30 to 50 Dense	0 to 2 Very Soft 8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose	Over 50 Very Dense	2 to 4 Soft 15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense		4 to 8 Medium Stiff Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.			

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Client: Powell Stone & Gravel Date: 7/ /2023 Page # 1 of 1

Location: Teel Road, Winchendon, MA

Boring #PT-7 Ground Elev Start 7/ /2023 Complete Date Date Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
	1	0-2'	1-2-2-2	23"			Dry, very loose, FINE SAND, some silt
5	2	5'-7'	10-7-13-12	15"			Dry, medium dense, FINE SAND and gravel, some silt
10	3	10'-12'	4-4-8-9	18"		H2O	Wet, medium dense, FINE SAND, some gravel
15	4	15'-17'	4-6-8-16	22"			END OF BORING AT 17'
20							
25							
30							
35							

Type Of Boring: Casing Size Hollow Stem Auger Size 4.25" Standard Penetration Test (ST) = 140lb hammer falling 30"

Proportion Percentages	Granular Soils (blows per ft.)	Cohesive Soils (blows per ft.)
Trace 0 to 10%	0 to 4 Very Loose 30 to 50 Dense	0 to 2 Very Soft 8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose Over 50 Very Dense	2 to 4 Soft 15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense	4 to 8 Medium Stiff Over 30 Hard

Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.

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Client: Powell Stone & Gravel Date: 7/ /2023 Page # 1 of 1

Location: Teel Road, Winchendon, MA

Boring #PT-8 Ground Elev Start 7/ /2023 Complete Date Date Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

D E P T H	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
1	0-2'	1-1-1-2	18"			Dry, very loose, FINE SAND	
5	5-7'	5-15-13-13	21"			Dry, medium dense, FINE TO MEDIUM SAND, trace silt Dry, medium dense, MEDIUM TO COARSE SAND and gravel, trace silt	
10	10'-12'	2-3-3-4	19"		H2O	Wet, loose, FINE SAND, trace silt	
15	15'-17'	4-4-5-8	17"			Wet, loose, FINE SAND, trace silt END OF BORING AT 17'	
20							
25							
30							
35							

Type Of Boring: Casing Size Hollow Stem Auger Size 4.25" Standard Penetration Test (ST) = 140lb hammer falling 30"

Proportion Percentages	Granular Soils (blows per ft.)		Cohesive Soils (blows per ft.)	
Trace 0 to 10%	0 to 4 Very Loose	30 to 50 Dense	0 to 2 Very Soft	8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose	Over 50 Very Dense	2 to 4 Soft	15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense		4 to 8 Medium Stiff	Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.				

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Client: Powell Stone & Gravel Date: 7/ /2023 Page # 1 of 2

Location: Teel Road, Winchendon, MA

Boring #PT-9 Ground Elev Start 7/ /2023 Complete Date Date Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

D E P T H	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
	1	0-2'	2-2-2-3	17"			Dry, very loose, FINE SAND
5	2	5'-7'	3-3-4-4	14"			Dry, loose, MEDIUM TO COARSE SAND and gravel
10	3	10'-12'	2-2-3-2	14"			
15	4	15'-17'	14-18-15-13	18"			Dry, dense, COARSE SAND and gravel, trace silt
20	5	20'-22'	9-7-8-8	15"			
25	6	25'-27'	60/6"	no rec			Large Cobble
30	7	30'-32'	4-4-5-6	20"			Dry, loose, FINE SAND
35	8	35'-37'	4-8-8-10	19"		H2O	Wet, medium dense, FINE SAND, some gravel, trace silt

Type Of Boring: Casing Size Hollow Stem Auger Size 4.25" Standard Penetration Test (ST) = 140lb hammer falling 30"

Proportion Percentages	Granular Soils (blows per ft.)	Cohesive Soils (blows per ft.)
Trace 0 to 10%	0 to 4 Very Loose 30 to 50 Dense	0 to 2 Very Soft 8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose Over 50 Very Dense	2 to 4 Soft 15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense	4 to 8 Medium Stiff Over 30 Hard

Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.

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Client: Powell Stone & Gravel **Date:** 7/ /2023 **Page #** 2 of 2

Location: Teel Road, Winchendon, MA

Boring #PT-9: **Ground Elev:** **Date Start:** 7/ /2023 **Date Complete:** **Drilling Foreman:** Mike DeAmicis **Eng/Hydrol. Geologist:**

D E P T H	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
40	9	40'-41'	17-27-31-60/3"	16"			Wet, very dense, COARSE GRAVEL and sand END OF BORING AT 41' 9"

Type Of Boring: Casing Size **Hollow Stem Auger Size 4.25"** **Standard Penetration Test (ST) = 140lb hammer falling 30"**

Proportion Percentages	Granular Soils (blows per ft.)	Cohesive Soils (blows per ft.)
Trace 0 to 10%	0 to 4 Very Loose 30 to 50 Dense	0 to 2 Very Soft 8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose Over 50 Very Dense	2 to 4 Soft 15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense	4 to 8 Medium Stiff Over 30 Hard

Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.

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Client: Powell Stone & Gravel Date: 7/ /2023 Page # 1 of 2

Location: Teel Road, Winchendon, MA

Boring #PT-13 Ground Elev Start 7/ /2023 Complete Date Date Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
	1	0-2"	1-2-2-1	20"			Dry, very loose, FINE SAND
5	2	5'-7'	2-4-4-5	19"			Dry, loose, FINE SAND
10	3	10'-12'	2-3-5-4	20"			
15	4	15'-17'	3-3-5-6	22"			
20	5	20'-22'	6-6-6-6	24"			Dry, medium dense, FINE SAND
25	6	25'-27'	19-10-10-7	18"			Dry, medium dense, FINE SAND, some gravel, trace silt
30	7	30'-32'	6-10-15-13	17"			
35	8	35'-36'	48-60/6"	4"			Dry, very dense, FINE SAND, some gravel, trace silt

Type Of Boring: Casing Size Hollow Stem Auger Size 4.25" Standard Penetration Test (ST) = 140lb hammer falling 30"

Proportion Percentages	Granular Soils (blows per ft.)	Cohesive Soils (blows per ft.)
Trace 0 to 10%	0 to 4 Very Loose 30 to 50 Dense	0 to 2 Very Soft 8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose Over 50 Very Dense	2 to 4 Soft 15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense	4 to 8 Medium Stiff Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.		

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Client: Powell Stone & Gravel Date: 7/ /2023 Page # 2 of 2

Location: Teel Road, Winchendon, MA

Boring Ground Date Date Drilling Eng/Hydrol.
 #PT-13 Elev Start 7/ /2023 Complete Foreman: Mike DeAmicis Geologist:

D E P T H	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
40	9	40'-41'	47-60/6"	6"	H2O	Moist, very dense, TILL LAYER, some silt AUGER REFUSAL AT 42'	

Type Of Boring: Casing Size Hollow Stem Auger Size 4.25" Standard Penetration Test (ST) = 140lb hammer falling 30"

Proportion Percentages	Granular Soils (blows per ft.)		Cohesive Soils (blows per ft.)	
Trace 0 to 10%	0 to 4 Very Loose	30 to 50 Dense	0 to 2 Very Soft	8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose	Over 50 Very Dense	2 to 4 Soft	15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense		4 to 8 Medium Stiff	Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.				

GEOSEARCH, INC.

Client: Powell Stone & Gravel Date: 7/ /2023 Page # 1 of 1

Location: Teel Road, Winchendon, MA

Boring #PT-14 Ground Elev Start 7/ /2023 Complete Date Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
	1	0-2"	2-5-4-3	15"			Dry, loose, SAND, some silt
5	2	5'-5'8"	12-60/2"	8"			Dry, very dense, MEDIUM TO COARSE SAND and gravel, some silt
10	3	10'-11'2"	12-22-60/2"	15"			Moist, very dense, FINE TO MEDIUM SAND, some gravel, trace silt
							PT-14A Auger refusal at 10'7"
15							Water at 7' upon completion
20							
25							
30							
35							

Type Of Boring: Casing Size Hollow Stem Auger Size 4.25" Standard Penetration Test (ST) = 140lb hammer falling 30"

Proportion Percentages	Granular Soils (blows per ft.)		Cohesive Soils (blows per ft.)	
Trace 0 to 10%	0 to 4 Very Loose	30 to 50 Dense	0 to 2 Very Soft	8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose	Over 50 Very Dense	2 to 4 Soft	15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense		4 to 8 Medium Stiff	Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.				

GEOSEARCH, INC.

Client: Powell Stone & Gravel Date: 7/25/23 Page # 1 of 1

Location: Teel Road, Winchendon, MA

Boring #PT-15 Ground Elev Start 7/25/23 Complete 7/25/23 Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
	1	0-2"	1-1-2-2	18"			Moist, very loose, FINE TO MEDIUM SAND and gravel, some silt
5	2	5'-7'	9-21-32-31	24"			Dry, very dense, FINE SAND, some silt, trace gravel
10	3	10'-12"	9-36-39-43	20"			Dry, very dense, FINE SAND, trace gravel, some silt
15	4	15'-15'4"	60/4"	0"		H2O	
20	5	20'-22'	24-31-36-40	21"			Wet, very dense, FINE SAND, some silt, some gravel
							END OF BORING AT 22'
25							
30							
35							

Type Of Boring:	Casing Size	Hollow Stem Auger Size 4.25"	Standard Penetration Test (ST) = 140lb hammer falling 30"
Proportion Percentages		Granular Soils (blows per ft.)	Cohesive Soils (blows per ft.)
Trace 0 to 10%		0 to 4 Very Loose	30 to 50 Dense
Some 10 to 40%		4 to 10 Loose	Over 50 Very Dense
And 40 to 50%		10 to 30 Medium Dense	
		0 to 2 Very Soft	8 to 15 Stiff
		2 to 4 Soft	15 to 30 Very Stiff
		4 to 8 Medium Stiff	Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.			

GEOSEARCH, INC.

Client: Powell Stone & Gravel Date: 7/ /2023 Page # 1 of 1

Location: Teel Road, Winchendon, MA

Boring #PT-16 Ground Elev Start 7/ /2023 Complete Date Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

DEPTH	Sample Data			Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata	
	Sample		Blows				Rec. Inches
	NO.	Depth(ft.)	6" Penetration				
5	1	0-2"	1-2-2-3	18"		Dry, very loose, FINE SAND, some silt PT-16 Auger refusal at 2'6"	
5	2	4'-5'	31-60/6"	10"		Moist, very dense, MEDIUM TO COARSE SAND and gravel, trace silt PT-16 (2) Auger refusal 5'7"	
10	3	9'-9"	29-60/3"			Wet, very dense, FINE SAND and gravel, some silt PT-16 (3) Auger refusal 11'8" END OF BORING AT 11'8"	
15							
20							
25							
30							
35							

Type Of Boring:	Casing Size	Hollow Stem Auger Size 4.25"	Standard Penetration Test (ST) = 140lb hammer falling 30"
Proportion Percentages		Granular Soils (blows per ft.)	
Trace 0 to 10%	Some 10 to 40%	0 to 4 Very Loose	30 to 50 Dense
And 40 to 50%		4 to 10 Loose	Over 50 Very Dense
		10 to 30 Medium Dense	
		Cohesive Soils (blows per ft.)	
		0 to 2 Very Soft	8 to 15 Stiff
		2 to 4 Soft	15 to 30 Very Stiff
		4 to 8 Medium Stiff	Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.			

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Client: Powell Stone & Gravel Date: 7/26/23 Page # 1 of 2

Location: Teel Road, Winchendon, MA

Boring #PT-18 Ground Elev Start 7/26/23 Complete 7/26/23 Date Date Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

D E P T H	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
1	0-2"	2-4-3-4	16"			5	Dry, loose, FINE SAND and gravel, trace silt
2	5'-7'	5-5-5-5	19"				
3	10'-12"	2-2-4-4	16"				
4	15'-17'	6-13-14-8	11"				
5	20'-22'	5-6-6-5	19"				
6	25'-27'	6-8-12-17	22"				
7	30'-32'	27-21-19-12	17"				
8	35'-37'	8-10-17-16	19"				

Type Of Boring: Casing Size Hollow Stem Auger Size 4.25" Standard Penetration Test (ST) = 140lb hammer falling 30"

Proportion Percentages	Granular Soils (blows per ft.)		Cohesive Soils (blows per ft.)	
Trace 0 to 10%	0 to 4 Very Loose	30 to 50 Dense	0 to 2 Very Soft	8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose	Over 50 Very Dense	2 to 4 Soft	15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense		4 to 8 Medium Stiff	Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.				

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Client: Powell Stone & Gravel Date: 7/26/23 Page # 2 of 2

Location: Teel Road, Winchendon, MA

Boring #PT-18 Ground Elev Date Start 7/26/23 Date Complete 7/26/23 Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

D E P T H	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
40	9	40'-42'	9-11-13-13	22"			Dry, medium dense, FINE SAND, trace silt
45	10	45'-47'	11-18-18-20	23"			Dry, dense, FINE SAND, trace silt
50	11	50'-52'	9-10-12-12	21"			Dry, medium dense, FINE SAND, trace silt
55	12	55'-57'	8-14-16-15	23"			
	13	57'-59'	16-16-17-15	21"			Dry, dense, FINE SAND, trace silt
60							Auger refusal at 60' END OF BORING AT 60'
							NO WATER UPON COMPLETION

Type Of Boring:	Casing Size	Hollow Stem Auger Size 4.25"	Standard Penetration Test (ST) = 140lb hammer falling 30"
Proportion Percentages		Granular Soils (blows per ft.)	
Trace 0 to 10%	Some 10 to 40%	0 to 4 Very Loose	30 to 50 Dense
And 40 to 50%		4 to 10 Loose	Over 50 Very Dense
		10 to 30 Medium Dense	
		Cohesive Soils (blows per ft.)	
		0 to 2 Very Soft	8 to 15 Stiff
		2 to 4 Soft	15 to 30 Very Stiff
		4 to 8 Medium Stiff	Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.			

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Client: Powell Stone & Gravel **Date:** 7/ /2023 **Page #** 1 of 1

Location: Teel Road, Winchendon, MA

Boring #PT-19 **Ground** Elev **Date** Start 7/ /2023 **Date** Complete **Drilling** Foreman: Mike DeAmicis **Eng/Hydr.** Geologist:

DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
1	0-2"	5-16-15-16	9"			Dry, dense, MEDIUM TO COARSE SAND and gravel	
5	5'-7"	14-22-22-16	16"			Dry, dense, COARSE SAND and gravel, trace silt	
10	10'-10'9"	4-39-60/3"	21"		H2O	Wet, very dense, COARSE SAND and gravel Auger refusal 11'	
15							
20							
25							
30							
35							

Type Of Boring:	Casing Size	Hollow Stem Auger Size 4.25"	Standard Penetration Test (ST) = 140lb hammer falling 30"
Proportion Percentages	Granular Soils (blows per ft.)		Cohesive Soils (blows per ft.)
Trace 0 to 10%	0 to 4 Very Loose	30 to 50 Dense	0 to 2 Very Soft 8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose	Over 50 Very Dense	2 to 4 Soft 15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense		4 to 8 Medium Stiff Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.			

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Client: Powell Stone & Gravel Date: 7/ /2023 Page # 1 of 1

Location: Teel Road, Winchendon, MA

Boring #PT-20 Ground Elev Start 7/ /2023 Complete Date Date Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
	1	0-2"	1-1-1-2	17"			Dry, very loose, MEDIUM TO COARSE SAND and gravel
5	2	5'-7'	5-26-26-30	17"			Dry, very dense, MEDIUM TO COARSE SAND and gravel, some silt
						8'	Wet, FINE SAND, some silt, little gravel
10	3	10'-12'	4-7-9-13	15"		H2O	Wet, medium dense, FINE SAND, some silt
15	4	15'-17'	4-8-21-33	17"			Wet, medium dense, FINE SAND
							END OF BORING AT 17'
20							
25							
30							
35							

Type Of Boring:	Casing Size	Hollow Stem Auger Size 4.25"	Standard Penetration Test (ST) = 140lb hammer falling 30"
Proportion Percentages		Granular Soils (blows per ft.)	Cohesive Soils (blows per ft.)
Trace 0 to 10%		0 to 4 Very Loose 30 to 50 Dense	0 to 2 Very Soft 8 to 15 Stiff
Some 10 to 40%		4 to 10 Loose Over 50 Very Dense	2 to 4 Soft 15 to 30 Very Stiff
And 40 to 50%		10 to 30 Medium Dense	4 to 8 Medium Stiff Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.			

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Client: Powell Stone & Gravel Date: 7/27/23 Page # 1 of 2

Location: Teel Road, Winchendon, MA

Boring #PT-21 Ground Elev Start 7/26/23 Complete 7/27/23 Date Date Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
	1	0-2"	2-2-3-4	18"			Dry, loose, FINE SAND, some gravel, trace silt
5	2	5'-7'	3-5-7-11	20"			Dry, medium dense FINE SAND, some gravel, trace silt
10	3	10'-12'	4-7-5-7	16"			
15	4	15'-17'	21-21-14-15	13"			Dry, dense, MEDIUM TO COARSE GRAVEL and sand, trace silt
20	5	20'-22'	8-5-3-4	12"			Dry, loose, MEDIUM TO COARSE GRAVEL and sand, trace silt
25	6	25'-27'	4-5-7-7	24"		23'	Dry, medium dense, FINE SAND, trace silt
30	7	30'-32'	14-14-19-21	21"			Dry, dense COARSE GRAVEL, fine sand, trace silt
35	8	35'-37'	12-21-21-18	13"			

Type Of Boring: Casing Size Hollow Stem Auger Size 4.25" Standard Penetration Test (ST) = 140lb hammer falling 30"

Proportion Percentages	Granular Soils (blows per ft.)		Cohesive Soils (blows per ft.)	
Trace 0 to 10%	0 to 4 Very Loose	30 to 50 Dense	0 to 2 Very Soft	8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose	Over 50 Very Dense	2 to 4 Soft	15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense		4 to 8 Medium Stiff	Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.				

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Location: Teel Road, Winchendon, MA

Boring #PT-21 Ground Elev Date Start 7/26/23 Complete 7/27/23 Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
40	9	40'-42'	16-19-21-21	18"			Dry, dense, FINE SAND, some gravel, trace silt
45	10	45'-47'	6-11-12-15	17"			Dry, medium dense, FINE SAND, some gravel, trace silt
50	11	50'-52'	14-37-24-21	16"			Dry, very dense, COARSE GRAVEL and fine sand, trace silt
55	12	55'-57'	7-9-12-13	20"			Moist, medium dense, FINE SAND
60	13	60'-62'	5-6-13-12		H2O		Wet, medium dense, FINE SAND, some silt END OF BORING AT 62'

Type Of Boring:	Casing Size	Hollow Stem Auger Size 4.25"	Standard Penetration Test (ST) = 140lb hammer falling 30"
Proportion Percentages		Granular Soils (blows per ft.)	
Trace 0 to 10%	Some 10 to 40%	0 to 4 Very Loose	30 to 50 Dense
And 40 to 50%		4 to 10 Loose	Over 50 Very Dense
		10 to 30 Medium Dense	
		Cohesive Soils (blows per ft.)	
		0 to 2 Very Soft	8 to 15 Stiff
		2 to 4 Soft	15 to 30 Very Stiff
		4 to 8 Medium Stiff	Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.			

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Location: Teel Road, Winchendon, MA

Boring #PT-23 Ground Elev Date Start 7/27/23 Date Complete 7/27/23 Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
5	1	0-2'	3-7-5-5	20"		Dry, medium dense, FINE SAND and gravel, trace silt	
10	2	5'-7'	14-8-8-9	13"		Moist, medium dense, FINE SAND, trace silt	
15	3	10'-12'	3-5-18-9	16"		Moist, medium dense, FINE SAND, trace silt	
20	4	15'-15'9"	43-50/3"	9"	H2O	Wet, very dense, FINE TO MEDIUM COARSE SAND and gravel Auger refusal at 16'6"	

Type Of Boring:	Casing Size	Hollow Stem Auger Size 4.25"	Standard Penetration Test (ST) = 140lb hammer falling 30"
Proportion Percentages		Granular Soils (blows per ft.)	
Trace 0 to 10%	Some 10 to 40%	0 to 4 Very Loose	30 to 50 Dense
And 40 to 50%		4 to 10 Loose	Over 50 Very Dense
		10 to 30 Medium Dense	
		Cohesive Soils (blows per ft.)	
		0 to 2 Very Soft	8 to 15 Stiff
		2 to 4 Soft	15 to 30 Very Stiff
		4 to 8 Medium Stiff	Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.			

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Client: Powell Stone & Gravel Date: 7/27/23 Page # 1 of 1

Location: Teel Road, Winchendon, MA

Boring #PT-24 Ground Elev Date Start 7/27/23 Date Complete 7/27/23 Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
5	1	0-2'	5-5-4-6	21"		Dry, loose, FINE SAND, some gravel, trace silt	
10	2	5'-7'	7-8-6-7	19"		Moist, medium dense, FINE SAND, trace silt	
15	3	10'-12'	2-2-3-6	16"		Wet, loose, FINE SAND, trace silt	
20	4	15'-17'	3-4-5-5	15"	H2O	END OF BORING AT 17'	

Type Of Boring:	Casing Size	Hollow Stem Auger Size 4.25"	Standard Penetration Test (ST) = 140lb hammer falling 30"
Proportion Percentages		Granular Soils (blows per ft.)	Cohesive Soils (blows per ft.)
Trace 0 to 10%	0 to 4 Very Loose	30 to 50 Dense	0 to 2 Very Soft 8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose	Over 50 Very Dense	2 to 4 Soft 15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense		4 to 8 Medium Stiff Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.			

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Client: Powell Stone & Gravel Date: 7/ /2023 Page # 1 of 1

Location: Teel Road, Winchendon, MA

Boring #PT-25 Ground Elev 7/ /2023 Date Complete Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
	1	0-2"	2-5-4-7	21"			Dry, loose, FINE SAND, little gravel, trace silt
5	2	5'-6'9"	8-17-60/3"	15"	H2O		Wet, very dense, COARSE GRAVEL and sand, some silt PT-25 Auger refusal at 5' (2) Moved 5' Refusal 4'6" (3) Moved 5' Auger refusal 5'6" (4) Moved 5' Refusal 7' END OF BORING AT 7'
10							
15							
20							
25							
30							
35							

Type Of Boring:	Casing Size	Hollow Stem Auger Size 4.25"	Standard Penetration Test (ST) = 140lb hammer falling 30"
Proportion Percentages		Granular Soils (blows per ft.)	
Trace 0 to 10%	Some 10 to 40%	0 to 4 Very Loose	30 to 50 Dense
And 40 to 50%		4 to 10 Loose	Over 50 Very Dense
		10 to 30 Medium Dense	
		Cohesive Soils (blows per ft.)	
		0 to 2 Very Soft	8 to 15 Stiff
		2 to 4 Soft	15 to 30 Very Stiff
		4 to 8 Medium Stiff	Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.			

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Location: Teel Road, Winchendon, MA

Boring #PT-26 Ground Elev Start 7/27/23 Complete 7/27/23 Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
5	1	0-2'	5-7-4-4	16"			Dry, medium dense, FINE SAND, some gravel, trace silt
5	2	5'-7'	3-4-9-13	17"			
10	3	10'-12'	5-5-6-9	16"	H2O		Wet, medium dense, FINE SAND
15	4	15'-17'	17-27-25-28	15"			Wet, very dense, COARSE SAND and gravel, some silt END OF BORING AT 17'
20							

Type Of Boring:	Casing Size	Hollow Stem Auger Size 4.25"	Standard Penetration Test (ST) = 140lb hammer falling 30"
Proportion Percentages Trace 0 to 10% Some 10 to 40% And 40 to 50%		Granular Soils (blows per ft.) 0 to 4 Very Loose 30 to 50 Dense 4 to 10 Loose Over 50 Very Dense 10 to 30 Medium Dense	Cohesive Soils (blows per ft.) 0 to 2 Very Soft 8 to 15 Stiff 2 to 4 Soft 15 to 30 Very Stiff 4 to 8 Medium Stiff Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.			

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Client: Powell Stone & Gravel	Date: 7/27/23	Page # 1 of 1
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Location: Teel Road, Winchendon, MA					
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Boring #PT-27	Ground Elev	Date Start 7/27/23	Date Complete 7/27/23	Drilling Foreman: Mike DeAmicis	Eng/Hydrol. Geologist:
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DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
	1	0-2'	2-2-3-3	21"			Dry, loose, PAPER PULP IN SOIL, fine sand
5	2	5'-7'	25-28-23-27	20"			Dry, very dense, FINE SAND and coarse gravel, trace silt
10	3	10'-12'	23-23-19-20	21"			Dry, very dense, GRAVEL and sand
15	4	15'-17'	25-48-49-60/3"	19"	H2O		Wet, very dense, COARSE GRAVEL and sand, some silt
							Auger refusal at 17' END OF BORING AT 17'
20							

Type Of Boring:	Casing Size	Hollow Stem Auger Size 4.25"	Standard Penetration Test (ST) = 140lb hammer falling 30"
Proportion Percentages	Granular Soils (blows per ft.)		Cohesive Soils (blows per ft.)
Trace 0 to 10%	0 to 4 Very Loose	30 to 50 Dense	0 to 2 Very Soft 8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose	Over 50 Very Dense	2 to 4 Soft 15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense		4 to 8 Medium Stiff Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.			

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Location: Teel Road, Winchendon, MA

Boring #PT-29 Ground Elev Date Start 7/ /2023 Date Complete Drilling Foreman: Mike DeAmicis Eng/Hydrol. Geologist:

D E P T H	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
	1	0-2"	2-5-4-5	17"			Dry, loose, FINE SAND, little gravel, trace silt
5	2	5'-7'	18-60/3"	9"			Dry, very dense, FINE SAND and gravel, trace silt
10	3	10'-12'	9-14-16-48	19"			Moist, dense, COARSE GRAVEL, fine sand, some silt
15							
20							
25							
30							
35							

H2O

Auger refusal at 12'

Type Of Boring:	Casing Size	Hollow Stem Auger Size 4.25"	Standard Penetration Test (ST) = 140lb hammer falling 30"
Proportion Percentages		Granular Soils (blows per ft.)	
Trace 0 to 10%	Some 10 to 40%	0 to 4 Very Loose	30 to 50 Dense
And 40 to 50%		4 to 10 Loose	Over 50 Very Dense
		10 to 30 Medium Dense	
		Cohesive Soils (blows per ft.)	
		0 to 2 Very Soft	8 to 15 Stiff
		2 to 4 Soft	15 to 30 Very Stiff
		4 to 8 Medium Stiff	Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.			

GEOSEARCH, INC.

Client: Powell Stone & Gravel Date: 7/27/23 Page # 1 of 1

Location: Teel Road, Winchendon, MA

Boring #PT-30 Ground Elev Start 7/27/23 Complete 7/27/23 Drilling Foreman: Mike DeAmicis Eng/Hydr. Geologist:

DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
	1	0-2'	2-2-2-3	23"			Dry, loose, FINE SAND, some gravel, trace silt
5	2	5'-7'	4-4-6-6	18"			Dry, medium dense, FINE SAND, trace silt
10	3	10'-12'	3-3-5-5	21"			Dry, loose, FINE SAND, trace silt
15	4	15'-17'	5-6-6-7	22"			Dry, medium dense, FINE SAND, trace silt
20	5	20'-22'	5-5-7-7	21"			
25	6	25'-27'	4-8-15-22	19"			Moist, medium dense, FINE SAND, little gravel, some silt
30	7	30'-32'	39-41-43-49	20"		H2O	Wet, very dense, COARSE GRAVEL and fine sand, some silt
							END OF BORING AT 32'

Type Of Boring:	Casing Size	Hollow Stem Auger Size 4.25"	Standard Penetration Test (ST) = 140lb hammer falling 30"
Proportion Percentages		Granular Soils (blows per ft.)	
Trace 0 to 10%	Some 10 to 40%	And 40 to 50%	
0 to 4 Very Loose	4 to 10 Loose	10 to 30 Medium Dense	30 to 50 Dense Over 50 Very Dense
		Cohesive Soils (blows per ft.)	
		0 to 2 Very Soft	8 to 15 Stiff
		2 to 4 Soft	15 to 30 Very Stiff
		4 to 8 Medium Stiff	Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.			

Drawdown Analysis

BASIN 1 DRAWDOWN

2024-02-19 Proposed

Type III 24-hr 100-Year Rainfall=8.34"

Prepared by McCarty Engineering, Inc.

Printed 2/19/2024

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Hydrograph for Pond 1P: Basin 1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	1,035.00	0.00	0.00	0.00
1.00	0.00	0	1,035.00	0.00	0.00	0.00
2.00	0.00	0	1,035.00	0.00	0.00	0.00
3.00	0.00	0	1,035.00	0.00	0.00	0.00
4.00	0.00	0	1,035.00	0.00	0.00	0.00
5.00	0.00	0	1,035.00	0.00	0.00	0.00
6.00	0.00	0	1,035.00	0.00	0.00	0.00
7.00	0.00	0	1,035.00	0.00	0.00	0.00
8.00	0.00	0	1,035.00	0.00	0.00	0.00
9.00	0.00	0	1,035.00	0.00	0.00	0.00
10.00	0.00	0	1,035.00	0.00	0.00	0.00
11.00	0.00	0	1,035.00	0.00	0.00	0.00
12.00	1.41	104	1,035.05	0.42	0.42	0.00
13.00	1.06	2,292	1,035.88	1.37	0.68	0.69
14.00	0.75	1,767	1,035.71	0.84	0.62	0.21
15.00	0.60	1,521	1,035.62	0.66	0.59	0.07
16.00	0.44	1,223	1,035.51	0.56	0.56	0.00
17.00	0.36	749	1,035.33	0.50	0.50	0.00
18.00	0.28	232	1,035.11	0.43	0.43	0.00
19.00	0.26	13	1,035.01	0.26	0.26	0.00
20.00	0.24	12	1,035.01	0.24	0.24	0.00
21.00	0.22	11	1,035.01	0.22	0.22	0.00
22.00	0.20	10	1,035.00	0.20	0.20	0.00
23.00	0.18	9	1,035.00	0.18	0.18	0.00
24.00	0.16	8	1,035.00	0.16	0.16	0.00
25.00	0.00	0	1,035.00	0.00	0.00	0.00
26.00	0.00	0	1,035.00	0.00	0.00	0.00
27.00	0.00	0	1,035.00	0.00	0.00	0.00
28.00	0.00	0	1,035.00	0.00	0.00	0.00
29.00	0.00	0	1,035.00	0.00	0.00	0.00
30.00	0.00	0	1,035.00	0.00	0.00	0.00
31.00	0.00	0	1,035.00	0.00	0.00	0.00
32.00	0.00	0	1,035.00	0.00	0.00	0.00
33.00	0.00	0	1,035.00	0.00	0.00	0.00
34.00	0.00	0	1,035.00	0.00	0.00	0.00
35.00	0.00	0	1,035.00	0.00	0.00	0.00
36.00	0.00	0	1,035.00	0.00	0.00	0.00
37.00	0.00	0	1,035.00	0.00	0.00	0.00
38.00	0.00	0	1,035.00	0.00	0.00	0.00
39.00	0.00	0	1,035.00	0.00	0.00	0.00
40.00	0.00	0	1,035.00	0.00	0.00	0.00
41.00	0.00	0	1,035.00	0.00	0.00	0.00
42.00	0.00	0	1,035.00	0.00	0.00	0.00
43.00	0.00	0	1,035.00	0.00	0.00	0.00
44.00	0.00	0	1,035.00	0.00	0.00	0.00
45.00	0.00	0	1,035.00	0.00	0.00	0.00
46.00	0.00	0	1,035.00	0.00	0.00	0.00
47.00	0.00	0	1,035.00	0.00	0.00	0.00
48.00	0.00	0	1,035.00	0.00	0.00	0.00

Time of Drawdown

BASIN 2 DRAWDOWN

2024-02-19 Proposed

Type III 24-hr 100-Year Rainfall=8.34"

Prepared by McCarty Engineering, Inc.

Printed 2/19/2024

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Hydrograph for Pond 2P: Basin 2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	1,034.00	0.00	0.00	0.00
1.00	0.00	0	1,034.00	0.00	0.00	0.00
2.00	0.00	0	1,034.00	0.00	0.00	0.00
3.00	0.00	0	1,034.00	0.00	0.00	0.00
4.00	0.00	0	1,034.00	0.00	0.00	0.00
5.00	0.00	0	1,034.00	0.00	0.00	0.00
6.00	0.00	0	1,034.00	0.00	0.00	0.00
7.00	0.00	0	1,034.00	0.00	0.00	0.00
8.00	0.00	0	1,034.00	0.00	0.00	0.00
9.00	0.00	0	1,034.00	0.00	0.00	0.00
10.00	0.00	0	1,034.00	0.00	0.00	0.00
11.00	0.00	0	1,034.00	0.00	0.00	0.00
12.00	0.43	17	1,034.00	0.33	0.33	0.00
13.00	0.93	3,446	1,034.82	0.92	0.92	0.00
14.00	0.39	2,289	1,034.56	0.86	0.86	0.00
15.00	0.21	392	1,034.10	0.76	0.76	0.00
16.00	0.10	5	1,034.00	0.10	0.10	0.00
17.00	0.08	4	1,034.00	0.08	0.08	0.00
18.00	0.07	3	1,034.00	0.07	0.07	0.00
19.00	0.06	3	1,034.00	0.06	0.06	0.00
20.00	0.05	3	1,034.00	0.05	0.05	0.00
21.00	0.05	3	1,034.00	0.05	0.05	0.00
22.00	0.05	2	1,034.00	0.05	0.05	0.00
23.00	0.04	2	1,034.00	0.04	0.04	0.00
24.00	0.04	2	1,034.00	0.04	0.04	0.00
25.00	0.00	0	1,034.00	0.00	0.00	0.00
26.00	0.00	0	1,034.00	0.00	0.00	0.00
27.00	0.00	0	1,034.00	0.00	0.00	0.00
28.00	0.00	0	1,034.00	0.00	0.00	0.00
29.00	0.00	0	1,034.00	0.00	0.00	0.00
30.00	0.00	0	1,034.00	0.00	0.00	0.00
31.00	0.00	0	1,034.00	0.00	0.00	0.00
32.00	0.00	0	1,034.00	0.00	0.00	0.00
33.00	0.00	0	1,034.00	0.00	0.00	0.00
34.00	0.00	0	1,034.00	0.00	0.00	0.00
35.00	0.00	0	1,034.00	0.00	0.00	0.00
36.00	0.00	0	1,034.00	0.00	0.00	0.00
37.00	0.00	0	1,034.00	0.00	0.00	0.00
38.00	0.00	0	1,034.00	0.00	0.00	0.00
39.00	0.00	0	1,034.00	0.00	0.00	0.00
40.00	0.00	0	1,034.00	0.00	0.00	0.00
41.00	0.00	0	1,034.00	0.00	0.00	0.00
42.00	0.00	0	1,034.00	0.00	0.00	0.00
43.00	0.00	0	1,034.00	0.00	0.00	0.00
44.00	0.00	0	1,034.00	0.00	0.00	0.00
45.00	0.00	0	1,034.00	0.00	0.00	0.00
46.00	0.00	0	1,034.00	0.00	0.00	0.00
47.00	0.00	0	1,034.00	0.00	0.00	0.00
48.00	0.00	0	1,034.00	0.00	0.00	0.00

Time of Drawdown



BASIN 3 DRAWDOWN

2024-02-19 Proposed

Type III 24-hr 100-Year Rainfall=8.34"

Prepared by McCarty Engineering, Inc.

Printed 2/19/2024

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Hydrograph for Pond 3P: Basin 3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	1,030.00	0.00	0.00	0.00
1.00	0.00	0	1,030.00	0.00	0.00	0.00
2.00	0.00	0	1,030.00	0.00	0.00	0.00
3.00	0.00	0	1,030.00	0.00	0.00	0.00
4.00	0.00	0	1,030.00	0.00	0.00	0.00
5.00	0.00	0	1,030.00	0.00	0.00	0.00
6.00	0.00	0	1,030.00	0.00	0.00	0.00
7.00	0.00	0	1,030.00	0.00	0.00	0.00
8.00	0.00	0	1,030.00	0.00	0.00	0.00
9.00	0.00	0	1,030.00	0.00	0.00	0.00
10.00	0.00	0	1,030.00	0.00	0.00	0.00
11.00	0.00	0	1,030.00	0.00	0.00	0.00
12.00	0.94	49	1,030.02	0.41	0.41	0.00
13.00	1.68	10,700	1,033.40	1.01	1.01	0.00
14.00	1.15	11,809	1,033.65	1.06	1.06	0.00
15.00	0.92	11,672	1,033.62	1.06	1.06	0.00
16.00	0.68	10,833	1,033.43	1.02	1.02	0.00
17.00	0.55	9,487	1,033.11	0.95	0.95	0.00
18.00	0.44	7,989	1,032.72	0.87	0.87	0.00
19.00	0.39	6,467	1,032.31	0.79	0.79	0.00
20.00	0.36	5,110	1,031.90	0.71	0.71	0.00
21.00	0.33	3,891	1,031.51	0.65	0.65	0.00
22.00	0.30	2,804	1,031.14	0.59	0.59	0.00
23.00	0.27	1,833	1,030.77	0.53	0.53	0.00
24.00	0.25	961	1,030.42	0.48	0.48	0.00
25.00	0.00	0	1,030.00	0.00	0.00	0.00
26.00	0.00	0	1,030.00	0.00	0.00	0.00
27.00	0.00	0	1,030.00	0.00	0.00	0.00
28.00	0.00	0	1,030.00	0.00	0.00	0.00
29.00	0.00	0	1,030.00	0.00	0.00	0.00
30.00	0.00	0	1,030.00	0.00	0.00	0.00
31.00	0.00	0	1,030.00	0.00	0.00	0.00
32.00	0.00	0	1,030.00	0.00	0.00	0.00
33.00	0.00	0	1,030.00	0.00	0.00	0.00
34.00	0.00	0	1,030.00	0.00	0.00	0.00
35.00	0.00	0	1,030.00	0.00	0.00	0.00
36.00	0.00	0	1,030.00	0.00	0.00	0.00
37.00	0.00	0	1,030.00	0.00	0.00	0.00
38.00	0.00	0	1,030.00	0.00	0.00	0.00
39.00	0.00	0	1,030.00	0.00	0.00	0.00
40.00	0.00	0	1,030.00	0.00	0.00	0.00
41.00	0.00	0	1,030.00	0.00	0.00	0.00
42.00	0.00	0	1,030.00	0.00	0.00	0.00
43.00	0.00	0	1,030.00	0.00	0.00	0.00
44.00	0.00	0	1,030.00	0.00	0.00	0.00
45.00	0.00	0	1,030.00	0.00	0.00	0.00
46.00	0.00	0	1,030.00	0.00	0.00	0.00
47.00	0.00	0	1,030.00	0.00	0.00	0.00
48.00	0.00	0	1,030.00	0.00	0.00	0.00

Time of Drawdown

BASIN 4 DRAWDOWN

2024-02-19 Proposed

Type III 24-hr 100-Year Rainfall=8.34"

Prepared by McCarty Engineering, Inc.


Printed 2/19/2024

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Hydrograph for Pond 4P: Basin 4

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	1,044.00	0.00	0.00	0.00
1.00	0.00	0	1,044.00	0.00	0.00	0.00
2.00	0.00	0	1,044.00	0.00	0.00	0.00
3.00	0.00	0	1,044.00	0.00	0.00	0.00
4.00	0.00	0	1,044.00	0.00	0.00	0.00
5.00	0.00	0	1,044.00	0.00	0.00	0.00
6.00	0.00	0	1,044.00	0.00	0.00	0.00
7.00	0.00	0	1,044.00	0.00	0.00	0.00
8.00	0.00	0	1,044.00	0.00	0.00	0.00
9.00	0.00	0	1,044.00	0.00	0.00	0.00
10.00	0.00	0	1,044.00	0.00	0.00	0.00
11.00	0.00	0	1,044.00	0.00	0.00	0.00
12.00	0.40	16	1,044.00	0.31	0.31	0.00
13.00	0.22	12	1,044.00	0.23	0.23	0.00
14.00	0.16	8	1,044.00	0.16	0.16	0.00
15.00	0.13	7	1,044.00	0.13	0.13	0.00
16.00	0.09	5	1,044.00	0.10	0.10	0.00
17.00	0.08	4	1,044.00	0.08	0.08	0.00
18.00	0.06	3	1,044.00	0.06	0.06	0.00
19.00	0.06	3	1,044.00	0.06	0.06	0.00
20.00	0.05	3	1,044.00	0.05	0.05	0.00
21.00	0.05	2	1,044.00	0.05	0.05	0.00
22.00	0.04	2	1,044.00	0.04	0.04	0.00
23.00	0.04	2	1,044.00	0.04	0.04	0.00
24.00	0.03	2	1,044.00	0.03	0.03	0.00
25.00	0.00	0	1,044.00	0.00	0.00	0.00
26.00	0.00	0	1,044.00	0.00	0.00	0.00
27.00	0.00	0	1,044.00	0.00	0.00	0.00
28.00	0.00	0	1,044.00	0.00	0.00	0.00
29.00	0.00	0	1,044.00	0.00	0.00	0.00
30.00	0.00	0	1,044.00	0.00	0.00	0.00
31.00	0.00	0	1,044.00	0.00	0.00	0.00
32.00	0.00	0	1,044.00	0.00	0.00	0.00
33.00	0.00	0	1,044.00	0.00	0.00	0.00
34.00	0.00	0	1,044.00	0.00	0.00	0.00
35.00	0.00	0	1,044.00	0.00	0.00	0.00
36.00	0.00	0	1,044.00	0.00	0.00	0.00
37.00	0.00	0	1,044.00	0.00	0.00	0.00
38.00	0.00	0	1,044.00	0.00	0.00	0.00
39.00	0.00	0	1,044.00	0.00	0.00	0.00
40.00	0.00	0	1,044.00	0.00	0.00	0.00
41.00	0.00	0	1,044.00	0.00	0.00	0.00
42.00	0.00	0	1,044.00	0.00	0.00	0.00
43.00	0.00	0	1,044.00	0.00	0.00	0.00
44.00	0.00	0	1,044.00	0.00	0.00	0.00
45.00	0.00	0	1,044.00	0.00	0.00	0.00
46.00	0.00	0	1,044.00	0.00	0.00	0.00
47.00	0.00	0	1,044.00	0.00	0.00	0.00
48.00	0.00	0	1,044.00	0.00	0.00	0.00

Time of Drawdown



BASIN 5 DRAWDOWN

2024-02-19 Proposed

Type III 24-hr 100-Year Rainfall=8.34"

Prepared by McCarty Engineering, Inc.

Printed 2/19/2024

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Hydrograph for Pond 5P: Basin 5

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	1,052.00	0.00	0.00	0.00
1.00	0.00	0	1,052.00	0.00	0.00	0.00
2.00	0.00	0	1,052.00	0.00	0.00	0.00
3.00	0.00	0	1,052.00	0.00	0.00	0.00
4.00	0.00	0	1,052.00	0.00	0.00	0.00
5.00	0.00	0	1,052.00	0.00	0.00	0.00
6.00	0.00	0	1,052.00	0.00	0.00	0.00
7.00	0.00	0	1,052.00	0.00	0.00	0.00
8.00	0.00	0	1,052.00	0.00	0.00	0.00
9.00	0.00	0	1,052.00	0.00	0.00	0.00
10.00	0.00	0	1,052.00	0.00	0.00	0.00
11.00	0.00	0	1,052.00	0.00	0.00	0.00
12.00	2.84	136	1,052.02	1.53	1.53	0.00
13.00	1.58	7,765	1,052.92	1.77	1.77	0.00
14.00	1.13	6,223	1,052.74	1.72	1.72	0.00
15.00	0.91	3,806	1,052.46	1.65	1.65	0.00
16.00	0.67	902	1,052.11	1.55	1.55	0.00
17.00	0.55	29	1,052.00	0.55	0.55	0.00
18.00	0.43	23	1,052.00	0.43	0.43	0.00
19.00	0.39	20	1,052.00	0.39	0.39	0.00
20.00	0.36	19	1,052.00	0.36	0.36	0.00
21.00	0.33	17	1,052.00	0.33	0.33	0.00
22.00	0.30	16	1,052.00	0.30	0.30	0.00
23.00	0.27	14	1,052.00	0.28	0.28	0.00
24.00	0.25	13	1,052.00	0.25	0.25	0.00
25.00	0.00	0	1,052.00	0.00	0.00	0.00
26.00	0.00	0	1,052.00	0.00	0.00	0.00
27.00	0.00	0	1,052.00	0.00	0.00	0.00
28.00	0.00	0	1,052.00	0.00	0.00	0.00
29.00	0.00	0	1,052.00	0.00	0.00	0.00
30.00	0.00	0	1,052.00	0.00	0.00	0.00
31.00	0.00	0	1,052.00	0.00	0.00	0.00
32.00	0.00	0	1,052.00	0.00	0.00	0.00
33.00	0.00	0	1,052.00	0.00	0.00	0.00
34.00	0.00	0	1,052.00	0.00	0.00	0.00
35.00	0.00	0	1,052.00	0.00	0.00	0.00
36.00	0.00	0	1,052.00	0.00	0.00	0.00
37.00	0.00	0	1,052.00	0.00	0.00	0.00
38.00	0.00	0	1,052.00	0.00	0.00	0.00
39.00	0.00	0	1,052.00	0.00	0.00	0.00
40.00	0.00	0	1,052.00	0.00	0.00	0.00
41.00	0.00	0	1,052.00	0.00	0.00	0.00
42.00	0.00	0	1,052.00	0.00	0.00	0.00
43.00	0.00	0	1,052.00	0.00	0.00	0.00
44.00	0.00	0	1,052.00	0.00	0.00	0.00
45.00	0.00	0	1,052.00	0.00	0.00	0.00
46.00	0.00	0	1,052.00	0.00	0.00	0.00
47.00	0.00	0	1,052.00	0.00	0.00	0.00
48.00	0.00	0	1,052.00	0.00	0.00	0.00

Time of Drawdown

Operation and Maintenance Plan

**Earth Removal Operation
Teel Road
Winchendon, Massachusetts
Operation and Maintenance Plan**

The site contractor will be responsible for the operation and maintenance of the stormwater collection system including deep sump catch basins and an at grade infiltration basin during construction. After construction, the Property Owner is responsible for the operation and maintenance of the proposed stormwater collection system. The following long-term Operation and Maintenance Plan for the project is proposed in accordance with DEP Stormwater Management Standard No. 9 to ensure that the stormwater collection and treatment system operates in accordance with the MADEP Stormwater Management Policy.

Schedule for Inspection and Maintenance after Construction:

Stormwater Management System Owner/Operator

- The property owner will be the owner and operator of the proposed stormwater collection system on site.
- If the property is sold, a copy of this Operation and Maintenance Plan will be transferred to the new property owners.

At Grade Infiltration Basins

- Once constructed, the basin will be inspected at a minimum after several storm events to confirm drainage system functions, bank stability, and vegetation growth. Problems will be addressed immediately.
- During the first six months of operation, the basin will be inspected immediately after significant storm events and cleaned to remove sediment buildup.
- The outlet structure will be inspected and repaired where sediment appears to have clogged the invert.
- A stake shall be placed at the bottom of the pond with marks at 1” increments to measure the sediment accumulation. Sediment will be removed from ponds at a minimum when accumulation is at 4”, but as often as necessary, and at least once every 10 years.
- At least twice during the growing season, the side slopes will be mowed, and accumulated trash and debris removed. Accumulated sediment in forebay will also be removed at this time.

Infiltration Trench

- The stone filter layer shall be inspected every 6 months and after every major storm event to verify no erosion has occurred and the system is functioning as desired.
-

- If it is found that the stone filter layer is clogged with sediment, the pea stone and filter fabric should be replaced on an as needed basis.
- All sediments and hydrocarbons will be properly handled and disposed of off-site, in accordance with local, state, and federal guidelines and regulations.

The routine and non-routine maintenance tasks to be undertaken after construction and a schedule for implementing those task.

- A site maintenance log will be kept. This log will record the dates when maintenance tasks were completed, the person who completed the task, and any observations of malfunctions in components of the stormwater management system. A sample maintenance log form is attached.

Estimated Operations and Maintenance Budget

- Operation and maintenance costs for the project are expected to be approximately \$5,000/year
-

**Proposed Development
Teel Road
Westminster, Massachusetts
Operation and Maintenance Plan**

Operation and Maintenance Schedule

BMP	Frequency	Date Performed	Comments	Cleaning/ Repair Needed? Yes/No	Date of Cleaning/ Repair	Performed By
Above Grade Infiltration Basins	Annual Inspections and after each major storm event. Banks mowed twice a year. Cleaning as needed (Min once every 10 years)					
Infiltration Trench	Inspection after each major storm event for the first year Replace fabric and stone filter layer as needed					

Site Maintenance Supervisor: _____

Date: _____

SAMPLE

MADEP Stormwater Checklist

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the [Massachusetts Stormwater Handbook](#). The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.¹ This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8²
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

¹ The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

² For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



Brian Marchetti

2/19/2024

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

- New development
- Redevelopment
- Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- No disturbance to any Wetland Resource Areas
- Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- Reduced Impervious Area (Redevelopment Only)
- Minimizing disturbance to existing trees and shrubs
- LID Site Design Credit Requested:
 - Credit 1
 - Credit 2
 - Credit 3
- Use of “country drainage” versus curb and gutter conveyance and pipe
- Bioretention Cells (includes Rain Gardens)
- Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- Treebox Filter
- Water Quality Swale
- Grass Channel
- Green Roof
- Other (describe): _____

Standard 1: No New Untreated Discharges

- No new untreated discharges
- Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

- Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.
- Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

- Soil Analysis provided.
- Required Recharge Volume calculation provided.
- Required Recharge volume reduced through use of the LID site Design Credits.
- Sizing the infiltration, BMPs is based on the following method: Check the method used.
 - Static
 - Simple Dynamic
 - Dynamic Field¹
- Runoff from all impervious areas at the site discharging to the infiltration BMP.
- Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
 - Site is comprised solely of C and D soils and/or bedrock at the land surface
 - M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
 - Solid Waste Landfill pursuant to 310 CMR 19.000
 - Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

¹ 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

- The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
 - Provisions for storing materials and waste products inside or under cover;
 - Vehicle washing controls;
 - Requirements for routine inspections and maintenance of stormwater BMPs;
 - Spill prevention and response plans;
 - Provisions for maintenance of lawns, gardens, and other landscaped areas;
 - Requirements for storage and use of fertilizers, herbicides, and pesticides;
 - Pet waste management provisions;
 - Provisions for operation and management of septic systems;
 - Provisions for solid waste management;
 - Snow disposal and plowing plans relative to Wetland Resource Areas;
 - Winter Road Salt and/or Sand Use and Storage restrictions;
 - Street sweeping schedules;
 - Provisions for prevention of illicit discharges to the stormwater management system;
 - Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
 - Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
 - List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
 - Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
 - is within the Zone II or Interim Wellhead Protection Area
 - is near or to other critical areas
 - is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
 - involves runoff from land uses with higher potential pollutant loads.
 - The Required Water Quality Volume is reduced through use of the LID site Design Credits.
 - Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

- The BMP is sized (and calculations provided) based on:
 - The ½" or 1" Water Quality Volume or
 - The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

- The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- The NPDES Multi-Sector General Permit does **not** cover the land use.
- LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- All exposure has been eliminated.
- All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

- The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

- The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:
 - Limited Project
 - Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
 - Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
 - Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
 - Bike Path and/or Foot Path
 - Redevelopment Project
 - Redevelopment portion of mix of new and redevelopment.
- Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.
- The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
 - Construction Period Operation and Maintenance Plan;
 - Names of Persons or Entity Responsible for Plan Compliance;
 - Construction Period Pollution Prevention Measures;
 - Erosion and Sedimentation Control Plan Drawings;
 - Detail drawings and specifications for erosion control BMPs, including sizing calculations;
 - Vegetation Planning;
 - Site Development Plan;
 - Construction Sequencing Plan;
 - Sequencing of Erosion and Sedimentation Controls;
 - Operation and Maintenance of Erosion and Sedimentation Controls;
 - Inspection Schedule;
 - Maintenance Schedule;
 - Inspection and Maintenance Log Form.
- A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.
- The project is **not** covered by a NPDES Construction General Permit.
- The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

- The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
 - Name of the stormwater management system owners;
 - Party responsible for operation and maintenance;
 - Schedule for implementation of routine and non-routine maintenance tasks;
 - Plan showing the location of all stormwater BMPs maintenance access areas;
 - Description and delineation of public safety features;
 - Estimated operation and maintenance budget; and
 - Operation and Maintenance Log Form.
- The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
 - A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
 - A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

- The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- An Illicit Discharge Compliance Statement is attached;
- NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.

Illicit Discharge Compliance Statement

Earth Removal Operation
Teel Road
Winchendon, Massachusetts

Illicit Discharge Compliance Statement

The Stormwater Management System associated with the redevelopment of Teel Road in Winchendon, MA has been designed such that prior to storm water runoff discharging from the site, it is treated through a series of best management practices. To the Engineer's knowledge, there are no known or designed non-storm water discharges that are or will be connected to the storm water collection system that would convey pollutants directly to groundwater or surface waters.

Name: Brian Marchetti, P.E.

Title: Vice President

Signature: _____



Date: 2/19/2024

Pipe Sizing Calculations

Pipe Design Worksheet

Project # /Name: Teel Road

Calculated By: JLL

Date: 2/19/2024

Checked By: BRM

Date: 2/19/2024

**Flows from the 100-year storm event from HydroCAD were*

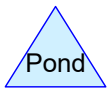
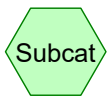
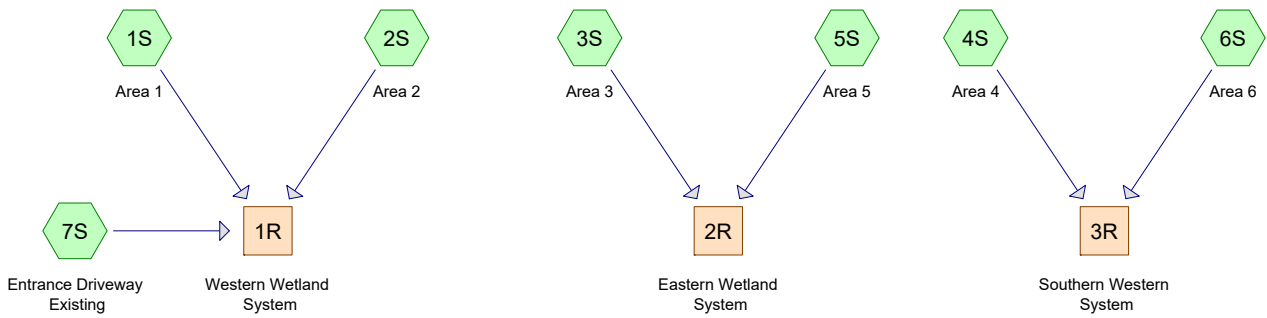
n= 0.011 RCP Pipe

Culvert	Q	Qsum	Length	Slope	Dia.	Full-Flow Velocity	Full-Flow Capacity ²
(ID, Lot #)	(cfs)	(cfs)	(ft.)	(ft./ft.)	(in.)	(fps)	(cfs)
Pond 1 to Pond 2*	2.10		97.0	0.01	12	5.38	4.22 O.K

¹ $V=1.49/n \times R^{2/3} \times S^{1/2}$ ² $Q=VA$

Appendix B

Existing Conditions HydroCAD Model



Routing Diagram for 2024-02-19 Existing
 Prepared by McCarty Engineering, Inc., Printed 2/19/2024
 HydroCAD® 10.00-26 s/n 02034 © 2020 HydroCAD Software Solutions LLC

2024-02-19 Existing

Prepared by McCarty Engineering, Inc.

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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.340	96	Gravel surface, HSG A (7S)
23.060	30	Woods, Good, HSG A (1S, 2S, 3S, 4S, 5S, 6S, 7S)
23.401	31	TOTAL AREA

2024-02-19 Existing

Prepared by McCarty Engineering, Inc.

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Page 3

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
23.401	HSG A	1S, 2S, 3S, 4S, 5S, 6S, 7S
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
23.401		TOTAL AREA

2024-02-19 Existing

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Page 4

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.340	0.000	0.000	0.000	0.000	0.340	Gravel surface	7S
23.060	0.000	0.000	0.000	0.000	23.060	Woods, Good	1S, 2S, 3S, 4S, 5S, 6S, 7S
23.401	0.000	0.000	0.000	0.000	23.401	TOTAL AREA	

2024-02-19 Existing

Prepared by McCarty Engineering, Inc.

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Type III 24-hr 2-Year Rainfall=3.13"

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Page 5

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 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 1S: Area 1	Runoff Area=273,390 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=298' Tc=7.7 min CN=30 Runoff=0.00 cfs 0.000 af
Subcatchment 2S: Area 2	Runoff Area=116,865 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=948' Tc=18.8 min CN=30 Runoff=0.00 cfs 0.000 af
Subcatchment 3S: Area 3	Runoff Area=211,965 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=468' Tc=9.2 min CN=30 Runoff=0.00 cfs 0.000 af
Subcatchment 4S: Area 4	Runoff Area=54,680 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=492' Tc=9.5 min CN=30 Runoff=0.00 cfs 0.000 af
Subcatchment 5S: Area 5	Runoff Area=285,904 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=825' Tc=11.9 min CN=30 Runoff=0.00 cfs 0.000 af
Subcatchment 6S: Area 6	Runoff Area=52,387 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=248' Tc=9.4 min CN=30 Runoff=0.00 cfs 0.000 af
Subcatchment 7S: Entrance Driveway	Runoff Area=24,139 sf 0.00% Impervious Runoff Depth=0.84" Tc=5.0 min CN=71 Runoff=0.51 cfs 0.039 af
Reach 1R: Western Wetland System	Inflow=0.51 cfs 0.039 af Outflow=0.51 cfs 0.039 af
Reach 2R: Eastern Wetland System	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach 3R: Southern Western System	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Total Runoff Area = 23.401 ac Runoff Volume = 0.039 af Average Runoff Depth = 0.02"
100.00% Pervious = 23.401 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Area 1

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Rainfall=3.13"

Area (sf)	CN	Description
273,390	30	Woods, Good, HSG A
273,390		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1400	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
1.9	248	0.1800	2.12		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
7.7	298	Total			

Summary for Subcatchment 2S: Area 2

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Rainfall=3.13"

Area (sf)	CN	Description
116,865	30	Woods, Good, HSG A
116,865		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	50	0.0500	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
2.8	238	0.0800	1.41		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.2	136	0.1400	1.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.2	337	0.1200	1.73		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.9	187	0.0460	1.07		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
18.8	948	Total			

Summary for Subcatchment 3S: Area 3

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Rainfall=3.13"

Area (sf)	CN	Description
211,965	30	Woods, Good, HSG A
211,965		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.2500	0.18		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
1.2	130	0.1300	1.80		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.4	288	0.0800	1.41		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.2	468	Total			

Summary for Subcatchment 4S: Area 4

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Rainfall=3.13"

Area (sf)	CN	Description
54,680	30	Woods, Good, HSG A
54,680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	50	0.5000	0.24		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
6.0	442	0.0600	1.22		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.5	492	Total			

Summary for Subcatchment 5S: Area 5

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Rainfall=3.13"

Area (sf)	CN	Description
285,904	30	Woods, Good, HSG A
285,904		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.1700	0.16		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
5.0	516	0.1200	1.73		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.6	259	0.2800	2.65		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.9	825	Total			

Summary for Subcatchment 6S: Area 6

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Rainfall=3.13"

Area (sf)	CN	Description
52,387	30	Woods, Good, HSG A
52,387		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	50	0.0700	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
1.1	87	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.7	111	0.2500	2.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.4	248	Total			

2024-02-19 Existing

Type III 24-hr 2-Year Rainfall=3.13"

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Summary for Subcatchment 7S: Entrance Driveway Existing

Runoff = 0.51 cfs @ 12.08 hrs, Volume= 0.039 af, Depth= 0.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.13"

Area (sf)	CN	Description
9,322	30	Woods, Good, HSG A
14,817	96	Gravel surface, HSG A
24,139	71	Weighted Average
24,139		100.00% Pervious Area

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

Summary for Reach 1R: Western Wetland System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 9.513 ac, 0.00% Impervious, Inflow Depth = 0.05" for 2-Year event
Inflow = 0.51 cfs @ 12.08 hrs, Volume= 0.039 af
Outflow = 0.51 cfs @ 12.08 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Reach 2R: Eastern Wetland System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 11.429 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Reach 3R: Southern Western System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.458 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

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Type III 24-hr 10-Year Rainfall=4.68"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 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 1S: Area 1	Runoff Area=273,390 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=298' Tc=7.7 min CN=30 Runoff=0.00 cfs 0.000 af
Subcatchment 2S: Area 2	Runoff Area=116,865 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=948' Tc=18.8 min CN=30 Runoff=0.00 cfs 0.000 af
Subcatchment 3S: Area 3	Runoff Area=211,965 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=468' Tc=9.2 min CN=30 Runoff=0.00 cfs 0.000 af
Subcatchment 4S: Area 4	Runoff Area=54,680 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=492' Tc=9.5 min CN=30 Runoff=0.00 cfs 0.000 af
Subcatchment 5S: Area 5	Runoff Area=285,904 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=825' Tc=11.9 min CN=30 Runoff=0.00 cfs 0.000 af
Subcatchment 6S: Area 6	Runoff Area=52,387 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=248' Tc=9.4 min CN=30 Runoff=0.00 cfs 0.000 af
Subcatchment 7S: Entrance Driveway	Runoff Area=24,139 sf 0.00% Impervious Runoff Depth=1.88" Tc=5.0 min CN=71 Runoff=1.24 cfs 0.087 af
Reach 1R: Western Wetland System	Inflow=1.24 cfs 0.087 af Outflow=1.24 cfs 0.087 af
Reach 2R: Eastern Wetland System	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach 3R: Southern Western System	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Total Runoff Area = 23.401 ac Runoff Volume = 0.087 af Average Runoff Depth = 0.04"
100.00% Pervious = 23.401 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Area 1

Runoff = 0.00 cfs @ 24.04 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-Year Rainfall=4.68"

Area (sf)	CN	Description
273,390	30	Woods, Good, HSG A
273,390		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1400	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
1.9	248	0.1800	2.12		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
7.7	298	Total			

Summary for Subcatchment 2S: Area 2

Runoff = 0.00 cfs @ 24.15 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.68"

Area (sf)	CN	Description
116,865	30	Woods, Good, HSG A
116,865		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	50	0.0500	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
2.8	238	0.0800	1.41		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.2	136	0.1400	1.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.2	337	0.1200	1.73		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.9	187	0.0460	1.07		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
18.8	948	Total			

Summary for Subcatchment 3S: Area 3

Runoff = 0.00 cfs @ 24.06 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-Year Rainfall=4.68"

Area (sf)	CN	Description
211,965	30	Woods, Good, HSG A
211,965		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.2500	0.18		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
1.2	130	0.1300	1.80		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.4	288	0.0800	1.41		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.2	468	Total			

Summary for Subcatchment 4S: Area 4

Runoff = 0.00 cfs @ 24.06 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-Year Rainfall=4.68"

Area (sf)	CN	Description
54,680	30	Woods, Good, HSG A
54,680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	50	0.5000	0.24		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
6.0	442	0.0600	1.22		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.5	492	Total			

Summary for Subcatchment 5S: Area 5

Runoff = 0.00 cfs @ 24.08 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-Year Rainfall=4.68"

Area (sf)	CN	Description
285,904	30	Woods, Good, HSG A
285,904		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.1700	0.16		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
5.0	516	0.1200	1.73		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.6	259	0.2800	2.65		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.9	825	Total			

Summary for Subcatchment 6S: Area 6

Runoff = 0.00 cfs @ 24.06 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-Year Rainfall=4.68"

Area (sf)	CN	Description
52,387	30	Woods, Good, HSG A
52,387		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	50	0.0700	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
1.1	87	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.7	111	0.2500	2.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.4	248	Total			

2024-02-19 Existing

Type III 24-hr 10-Year Rainfall=4.68"

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Summary for Subcatchment 7S: Entrance Driveway Existing

Runoff = 1.24 cfs @ 12.08 hrs, Volume= 0.087 af, Depth= 1.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.68"

Area (sf)	CN	Description
9,322	30	Woods, Good, HSG A
14,817	96	Gravel surface, HSG A
24,139	71	Weighted Average
24,139		100.00% Pervious Area

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

Summary for Reach 1R: Western Wetland System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 9.513 ac, 0.00% Impervious, Inflow Depth = 0.11" for 10-Year event
Inflow = 1.24 cfs @ 12.08 hrs, Volume= 0.087 af
Outflow = 1.24 cfs @ 12.08 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Reach 2R: Eastern Wetland System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 11.429 ac, 0.00% Impervious, Inflow Depth = 0.00" for 10-Year event
Inflow = 0.00 cfs @ 24.07 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 24.07 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Reach 3R: Southern Western System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.458 ac, 0.00% Impervious, Inflow Depth = 0.00" for 10-Year event
Inflow = 0.00 cfs @ 24.06 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 24.06 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

2024-02-19 Existing

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Type III 24-hr 25-Year Rainfall=5.88"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 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 1S: Area 1	Runoff Area=273,390 sf 0.00% Impervious Runoff Depth=0.06" Flow Length=298' Tc=7.7 min CN=30 Runoff=0.05 cfs 0.031 af
Subcatchment 2S: Area 2	Runoff Area=116,865 sf 0.00% Impervious Runoff Depth=0.06" Flow Length=948' Tc=18.8 min CN=30 Runoff=0.02 cfs 0.013 af
Subcatchment 3S: Area 3	Runoff Area=211,965 sf 0.00% Impervious Runoff Depth=0.06" Flow Length=468' Tc=9.2 min CN=30 Runoff=0.03 cfs 0.024 af
Subcatchment 4S: Area 4	Runoff Area=54,680 sf 0.00% Impervious Runoff Depth=0.06" Flow Length=492' Tc=9.5 min CN=30 Runoff=0.01 cfs 0.006 af
Subcatchment 5S: Area 5	Runoff Area=285,904 sf 0.00% Impervious Runoff Depth=0.06" Flow Length=825' Tc=11.9 min CN=30 Runoff=0.05 cfs 0.033 af
Subcatchment 6S: Area 6	Runoff Area=52,387 sf 0.00% Impervious Runoff Depth=0.06" Flow Length=248' Tc=9.4 min CN=30 Runoff=0.01 cfs 0.006 af
Subcatchment 7S: Entrance Driveway	Runoff Area=24,139 sf 0.00% Impervious Runoff Depth=2.80" Tc=5.0 min CN=71 Runoff=1.88 cfs 0.129 af
Reach 1R: Western Wetland System	Inflow=1.88 cfs 0.174 af Outflow=1.88 cfs 0.174 af
Reach 2R: Eastern Wetland System	Inflow=0.08 cfs 0.057 af Outflow=0.08 cfs 0.057 af
Reach 3R: Southern Western System	Inflow=0.02 cfs 0.012 af Outflow=0.02 cfs 0.012 af

Total Runoff Area = 23.401 ac Runoff Volume = 0.244 af Average Runoff Depth = 0.12"
100.00% Pervious = 23.401 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Area 1

Runoff = 0.05 cfs @ 15.70 hrs, Volume= 0.031 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-Year Rainfall=5.88"

Area (sf)	CN	Description
273,390	30	Woods, Good, HSG A
273,390		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1400	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
1.9	248	0.1800	2.12		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
7.7	298	Total			

Summary for Subcatchment 2S: Area 2

Runoff = 0.02 cfs @ 15.86 hrs, Volume= 0.013 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.88"

Area (sf)	CN	Description
116,865	30	Woods, Good, HSG A
116,865		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	50	0.0500	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
2.8	238	0.0800	1.41		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.2	136	0.1400	1.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.2	337	0.1200	1.73		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.9	187	0.0460	1.07		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
18.8	948	Total			

Summary for Subcatchment 3S: Area 3

Runoff = 0.03 cfs @ 15.71 hrs, Volume= 0.024 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.88"

Area (sf)	CN	Description
211,965	30	Woods, Good, HSG A
211,965		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.2500	0.18		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
1.2	130	0.1300	1.80		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.4	288	0.0800	1.41		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.2	468	Total			

Summary for Subcatchment 4S: Area 4

Runoff = 0.01 cfs @ 15.74 hrs, Volume= 0.006 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-Year Rainfall=5.88"

Area (sf)	CN	Description
54,680	30	Woods, Good, HSG A
54,680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	50	0.5000	0.24		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
6.0	442	0.0600	1.22		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.5	492	Total			

Summary for Subcatchment 5S: Area 5

Runoff = 0.05 cfs @ 15.75 hrs, Volume= 0.033 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-Year Rainfall=5.88"

Area (sf)	CN	Description
285,904	30	Woods, Good, HSG A
285,904		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.1700	0.16		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
5.0	516	0.1200	1.73		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.6	259	0.2800	2.65		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.9	825	Total			

Summary for Subcatchment 6S: Area 6

Runoff = 0.01 cfs @ 15.72 hrs, Volume= 0.006 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.88"

Area (sf)	CN	Description
52,387	30	Woods, Good, HSG A
52,387		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	50	0.0700	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
1.1	87	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.7	111	0.2500	2.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.4	248	Total			

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Type III 24-hr 25-Year Rainfall=5.88"

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Summary for Subcatchment 7S: Entrance Driveway Existing

Runoff = 1.88 cfs @ 12.08 hrs, Volume= 0.129 af, Depth= 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.88"

Area (sf)	CN	Description
9,322	30	Woods, Good, HSG A
14,817	96	Gravel surface, HSG A
24,139	71	Weighted Average
24,139		100.00% Pervious Area

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

Summary for Reach 1R: Western Wetland System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 9.513 ac, 0.00% Impervious, Inflow Depth = 0.22" for 25-Year event
Inflow = 1.88 cfs @ 12.08 hrs, Volume= 0.174 af
Outflow = 1.88 cfs @ 12.08 hrs, Volume= 0.174 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Reach 2R: Eastern Wetland System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 11.429 ac, 0.00% Impervious, Inflow Depth = 0.06" for 25-Year event
Inflow = 0.08 cfs @ 15.75 hrs, Volume= 0.057 af
Outflow = 0.08 cfs @ 15.75 hrs, Volume= 0.057 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Reach 3R: Southern Western System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.458 ac, 0.00% Impervious, Inflow Depth = 0.06" for 25-Year event
Inflow = 0.02 cfs @ 15.74 hrs, Volume= 0.012 af
Outflow = 0.02 cfs @ 15.74 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

2024-02-19 Existing

Type III 24-hr 50-Year Rainfall=7.00"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 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 1S: Area 1	Runoff Area=273,390 sf 0.00% Impervious Runoff Depth=0.21" Flow Length=298' Tc=7.7 min CN=30 Runoff=0.18 cfs 0.111 af
Subcatchment 2S: Area 2	Runoff Area=116,865 sf 0.00% Impervious Runoff Depth=0.21" Flow Length=948' Tc=18.8 min CN=30 Runoff=0.08 cfs 0.047 af
Subcatchment 3S: Area 3	Runoff Area=211,965 sf 0.00% Impervious Runoff Depth=0.21" Flow Length=468' Tc=9.2 min CN=30 Runoff=0.14 cfs 0.086 af
Subcatchment 4S: Area 4	Runoff Area=54,680 sf 0.00% Impervious Runoff Depth=0.21" Flow Length=492' Tc=9.5 min CN=30 Runoff=0.04 cfs 0.022 af
Subcatchment 5S: Area 5	Runoff Area=285,904 sf 0.00% Impervious Runoff Depth=0.21" Flow Length=825' Tc=11.9 min CN=30 Runoff=0.19 cfs 0.116 af
Subcatchment 6S: Area 6	Runoff Area=52,387 sf 0.00% Impervious Runoff Depth=0.21" Flow Length=248' Tc=9.4 min CN=30 Runoff=0.03 cfs 0.021 af
Subcatchment 7S: Entrance Driveway	Runoff Area=24,139 sf 0.00% Impervious Runoff Depth=3.72" Tc=5.0 min CN=71 Runoff=2.51 cfs 0.172 af
Reach 1R: Western Wetland System	Inflow=2.51 cfs 0.330 af Outflow=2.51 cfs 0.330 af
Reach 2R: Eastern Wetland System	Inflow=0.33 cfs 0.202 af Outflow=0.33 cfs 0.202 af
Reach 3R: Southern Western System	Inflow=0.07 cfs 0.043 af Outflow=0.07 cfs 0.043 af

Total Runoff Area = 23.401 ac Runoff Volume = 0.576 af Average Runoff Depth = 0.30"
100.00% Pervious = 23.401 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Area 1

Runoff = 0.18 cfs @ 13.80 hrs, Volume= 0.111 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 50-Year Rainfall=7.00"

Area (sf)	CN	Description
273,390	30	Woods, Good, HSG A
273,390		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1400	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
1.9	248	0.1800	2.12		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
7.7	298	Total			

Summary for Subcatchment 2S: Area 2

Runoff = 0.08 cfs @ 13.97 hrs, Volume= 0.047 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=7.00"

Area (sf)	CN	Description
116,865	30	Woods, Good, HSG A
116,865		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	50	0.0500	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
2.8	238	0.0800	1.41		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.2	136	0.1400	1.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.2	337	0.1200	1.73		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.9	187	0.0460	1.07		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
18.8	948	Total			

Summary for Subcatchment 3S: Area 3

Runoff = 0.14 cfs @ 13.81 hrs, Volume= 0.086 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 50-Year Rainfall=7.00"

Area (sf)	CN	Description
211,965	30	Woods, Good, HSG A
211,965		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.2500	0.18		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
1.2	130	0.1300	1.80		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.4	288	0.0800	1.41		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.2	468	Total			

Summary for Subcatchment 4S: Area 4

Runoff = 0.04 cfs @ 13.82 hrs, Volume= 0.022 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 50-Year Rainfall=7.00"

Area (sf)	CN	Description
54,680	30	Woods, Good, HSG A
54,680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	50	0.5000	0.24		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
6.0	442	0.0600	1.22		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.5	492	Total			

2024-02-19 Existing

Type III 24-hr 50-Year Rainfall=7.00"

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Summary for Subcatchment 5S: Area 5

Runoff = 0.19 cfs @ 13.87 hrs, Volume= 0.116 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=7.00"

Area (sf)	CN	Description
285,904	30	Woods, Good, HSG A
285,904		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.1700	0.16		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
5.0	516	0.1200	1.73		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.6	259	0.2800	2.65		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.9	825	Total			

Summary for Subcatchment 6S: Area 6

Runoff = 0.03 cfs @ 13.82 hrs, Volume= 0.021 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 50-Year Rainfall=7.00"

Area (sf)	CN	Description
52,387	30	Woods, Good, HSG A
52,387		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	50	0.0700	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
1.1	87	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.7	111	0.2500	2.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.4	248	Total			

Summary for Subcatchment 7S: Entrance Driveway Existing

Runoff = 2.51 cfs @ 12.08 hrs, Volume= 0.172 af, Depth= 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 50-Year Rainfall=7.00"

Area (sf)	CN	Description
9,322	30	Woods, Good, HSG A
14,817	96	Gravel surface, HSG A
24,139	71	Weighted Average
24,139		100.00% Pervious Area

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

Summary for Reach 1R: Western Wetland System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	9.513 ac,	0.00% Impervious,	Inflow Depth = 0.42"	for 50-Year event
Inflow =	2.51 cfs @	12.08 hrs,	Volume=	0.330 af
Outflow =	2.51 cfs @	12.08 hrs,	Volume=	0.330 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Reach 2R: Eastern Wetland System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 11.429 ac, 0.00% Impervious, Inflow Depth = 0.21" for 50-Year event
Inflow = 0.33 cfs @ 13.87 hrs, Volume= 0.202 af
Outflow = 0.33 cfs @ 13.87 hrs, Volume= 0.202 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Reach 3R: Southern Western System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.458 ac, 0.00% Impervious, Inflow Depth = 0.21" for 50-Year event
Inflow = 0.07 cfs @ 13.82 hrs, Volume= 0.043 af
Outflow = 0.07 cfs @ 13.82 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

2024-02-19 Existing

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Type III 24-hr 100-Year Rainfall=8.34"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 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 1S: Area 1	Runoff Area=273,390 sf 0.00% Impervious Runoff Depth=0.50" Flow Length=298' Tc=7.7 min CN=30 Runoff=1.02 cfs 0.261 af
Subcatchment 2S: Area 2	Runoff Area=116,865 sf 0.00% Impervious Runoff Depth=0.50" Flow Length=948' Tc=18.8 min CN=30 Runoff=0.37 cfs 0.112 af
Subcatchment 3S: Area 3	Runoff Area=211,965 sf 0.00% Impervious Runoff Depth=0.50" Flow Length=468' Tc=9.2 min CN=30 Runoff=0.78 cfs 0.203 af
Subcatchment 4S: Area 4	Runoff Area=54,680 sf 0.00% Impervious Runoff Depth=0.50" Flow Length=492' Tc=9.5 min CN=30 Runoff=0.20 cfs 0.052 af
Subcatchment 5S: Area 5	Runoff Area=285,904 sf 0.00% Impervious Runoff Depth=0.50" Flow Length=825' Tc=11.9 min CN=30 Runoff=1.00 cfs 0.273 af
Subcatchment 6S: Area 6	Runoff Area=52,387 sf 0.00% Impervious Runoff Depth=0.50" Flow Length=248' Tc=9.4 min CN=30 Runoff=0.19 cfs 0.050 af
Subcatchment 7S: Entrance Driveway	Runoff Area=24,139 sf 0.00% Impervious Runoff Depth=4.88" Tc=5.0 min CN=71 Runoff=3.28 cfs 0.225 af
Reach 1R: Western Wetland System	Inflow=3.28 cfs 0.598 af Outflow=3.28 cfs 0.598 af
Reach 2R: Eastern Wetland System	Inflow=1.77 cfs 0.476 af Outflow=1.77 cfs 0.476 af
Reach 3R: Southern Western System	Inflow=0.39 cfs 0.102 af Outflow=0.39 cfs 0.102 af

Total Runoff Area = 23.401 ac Runoff Volume = 1.176 af Average Runoff Depth = 0.60"
100.00% Pervious = 23.401 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Area 1

Runoff = 1.02 cfs @ 12.41 hrs, Volume= 0.261 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-Year Rainfall=8.34"

Area (sf)	CN	Description
273,390	30	Woods, Good, HSG A
273,390		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1400	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
1.9	248	0.1800	2.12		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
7.7	298	Total			

Summary for Subcatchment 2S: Area 2

Runoff = 0.37 cfs @ 12.58 hrs, Volume= 0.112 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-Year Rainfall=8.34"

Area (sf)	CN	Description
116,865	30	Woods, Good, HSG A
116,865		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	50	0.0500	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
2.8	238	0.0800	1.41		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.2	136	0.1400	1.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.2	337	0.1200	1.73		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.9	187	0.0460	1.07		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
18.8	948	Total			

Summary for Subcatchment 3S: Area 3

Runoff = 0.78 cfs @ 12.44 hrs, Volume= 0.203 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-Year Rainfall=8.34"

Area (sf)	CN	Description
211,965	30	Woods, Good, HSG A
211,965		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.2500	0.18		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
1.2	130	0.1300	1.80		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.4	288	0.0800	1.41		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.2	468	Total			

Summary for Subcatchment 4S: Area 4

Runoff = 0.20 cfs @ 12.44 hrs, Volume= 0.052 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-Year Rainfall=8.34"

Area (sf)	CN	Description
54,680	30	Woods, Good, HSG A
54,680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	50	0.5000	0.24		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
6.0	442	0.0600	1.22		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.5	492	Total			

Summary for Subcatchment 5S: Area 5

Runoff = 1.00 cfs @ 12.48 hrs, Volume= 0.273 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-Year Rainfall=8.34"

Area (sf)	CN	Description
285,904	30	Woods, Good, HSG A
285,904		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.1700	0.16		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
5.0	516	0.1200	1.73		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.6	259	0.2800	2.65		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.9	825	Total			

Summary for Subcatchment 6S: Area 6

Runoff = 0.19 cfs @ 12.44 hrs, Volume= 0.050 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.34"

Area (sf)	CN	Description
52,387	30	Woods, Good, HSG A
52,387		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	50	0.0700	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
1.1	87	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.7	111	0.2500	2.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.4	248	Total			

2024-02-19 Existing

Type III 24-hr 100-Year Rainfall=8.34"

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Summary for Subcatchment 7S: Entrance Driveway Existing

Runoff = 3.28 cfs @ 12.07 hrs, Volume= 0.225 af, Depth= 4.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.34"

Area (sf)	CN	Description
9,322	30	Woods, Good, HSG A
14,817	96	Gravel surface, HSG A
24,139	71	Weighted Average
24,139		100.00% Pervious Area

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

Summary for Reach 1R: Western Wetland System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	9.513 ac,	0.00% Impervious,	Inflow Depth = 0.75"	for 100-Year event
Inflow =	3.28 cfs @	12.07 hrs,	Volume=	0.598 af
Outflow =	3.28 cfs @	12.07 hrs,	Volume=	0.598 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Reach 2R: Eastern Wetland System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 11.429 ac, 0.00% Impervious, Inflow Depth = 0.50" for 100-Year event
Inflow = 1.77 cfs @ 12.46 hrs, Volume= 0.476 af
Outflow = 1.77 cfs @ 12.46 hrs, Volume= 0.476 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

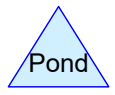
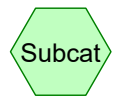
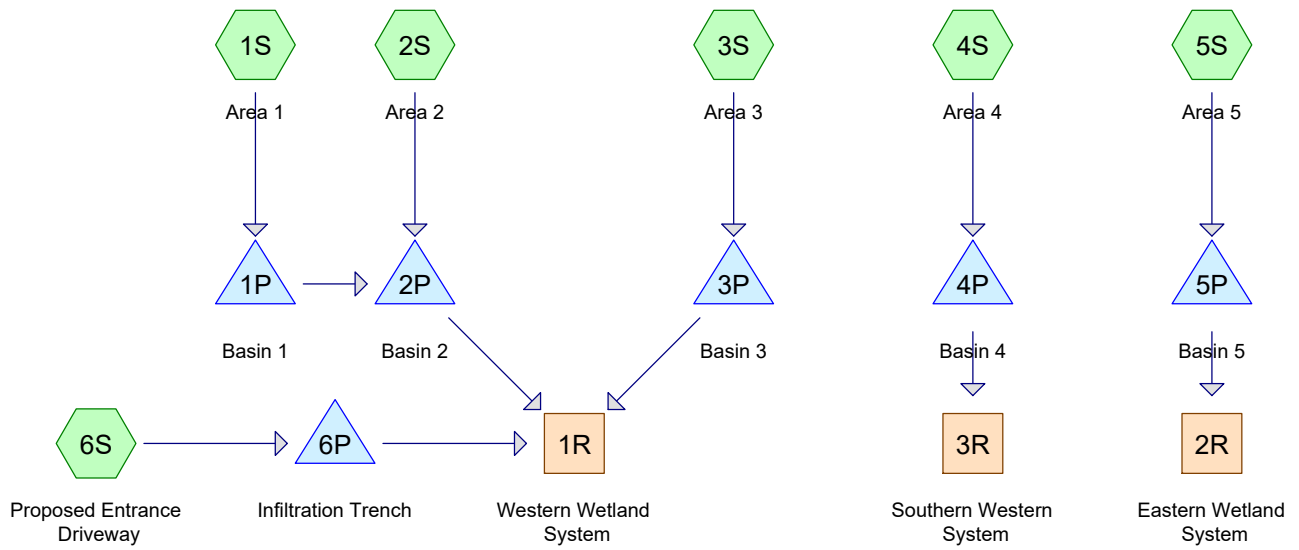
Summary for Reach 3R: Southern Western System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.458 ac, 0.00% Impervious, Inflow Depth = 0.50" for 100-Year event
Inflow = 0.39 cfs @ 12.44 hrs, Volume= 0.102 af
Outflow = 0.39 cfs @ 12.44 hrs, Volume= 0.102 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Proposed Conditions HydroCAD Model



Routing Diagram for 2024-02-19 Proposed
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
22.925	39	>75% Grass cover, Good, HSG A (1S, 2S, 3S, 4S, 5S, 6S)
0.476	96	Gravel surface, HSG A (6S)
23.401	40	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
23.401	HSG A	1S, 2S, 3S, 4S, 5S, 6S
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
23.401		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
22.925	0.000	0.000	0.000	0.000	22.925	>75% Grass cover, Good	1S, 2S, 3S, 4S, 5S, 6S
0.476	0.000	0.000	0.000	0.000	0.476	Gravel surface	6S
23.401	0.000	0.000	0.000	0.000	23.401	TOTAL AREA	

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	1,035.50	1,034.50	97.0	0.0103	0.011	12.0	0.0	0.0

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Type III 24-hr 2-Year Rainfall=3.13"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Area 1 Runoff Area=222,184 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=798' Tc=6.2 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment 2S: Area 2 Runoff Area=51,206 sf 0.00% Impervious Runoff Depth=0.00"
Tc=5.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment 3S: Area 3 Runoff Area=335,587 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=1,136' Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment 4S: Area 4 Runoff Area=47,924 sf 0.00% Impervious Runoff Depth=0.00"
Tc=5.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment 5S: Area 5 Runoff Area=338,290 sf 0.00% Impervious Runoff Depth=0.00"
Tc=5.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment 6S: Proposed Entrance Runoff Area=24,139 sf 0.00% Impervious Runoff Depth=1.93"
Tc=5.0 min CN=88 Runoff=1.30 cfs 0.089 af

Reach 1R: Western Wetland System Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 2R: Eastern Wetland System Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 3R: Southern Western System Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 1P: Basin 1 Peak Elev=1,035.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 2P: Basin 2 Peak Elev=1,034.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 3P: Basin 3 Peak Elev=1,030.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 4P: Basin 4 Peak Elev=1,044.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 5P: Basin 5 Peak Elev=1,052.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 6P: Infiltration Trench Peak Elev=1.21' Storage=280 cf Inflow=1.30 cfs 0.089 af
Discarded=0.69 cfs 0.089 af Primary=0.00 cfs 0.000 af Outflow=0.69 cfs 0.089 af

Total Runoff Area = 23.401 ac Runoff Volume = 0.089 af Average Runoff Depth = 0.05"
100.00% Pervious = 23.401 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Area 1

Runoff = 0.00 cfs @ 24.06 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Rainfall=3.13"

Area (sf)	CN	Description
222,184	39	>75% Grass cover, Good, HSG A
222,184		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.3300	1.08		Sheet Flow, Fallow n= 0.050 P2= 3.10"
0.4	114	0.0700	4.26		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
3.8	407	0.0120	1.76		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	120	0.2000	7.20		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.9	107	0.0150	1.97		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
6.2	798	Total			

2024-02-19 Proposed

Type III 24-hr 2-Year Rainfall=3.13"

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Summary for Subcatchment 2S: Area 2

Runoff = 0.00 cfs @ 24.04 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.13"

Area (sf)	CN	Description
51,206	39	>75% Grass cover, Good, HSG A
51,206		100.00% Pervious Area

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

Summary for Subcatchment 3S: Area 3

Runoff = 0.00 cfs @ 24.10 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Rainfall=3.13"

Area (sf)	CN	Description
335,587	39	>75% Grass cover, Good, HSG A
335,587		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.3300	1.08		Sheet Flow, Fallow n= 0.050 P2= 3.10"
9.2	1,086	0.0150	1.97		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.0	1,136	Total			

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Type III 24-hr 2-Year Rainfall=3.13"

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Summary for Subcatchment 4S: Area 4

Runoff = 0.00 cfs @ 24.04 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.13"

Area (sf)	CN	Description
47,924	39	>75% Grass cover, Good, HSG A
47,924		100.00% Pervious Area

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

Summary for Subcatchment 5S: Area 5

Runoff = 0.00 cfs @ 24.04 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.13"

Area (sf)	CN	Description
338,290	39	>75% Grass cover, Good, HSG A
338,290		100.00% Pervious Area

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

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Type III 24-hr 2-Year Rainfall=3.13"

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Summary for Subcatchment 6S: Proposed Entrance Driveway

Runoff = 1.30 cfs @ 12.07 hrs, Volume= 0.089 af, Depth= 1.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.13"

Area (sf)	CN	Description
3,408	39	>75% Grass cover, Good, HSG A
20,731	96	Gravel surface, HSG A
24,139	88	Weighted Average
24,139		100.00% Pervious Area

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

Summary for Reach 1R: Western Wetland System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 14.534 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Reach 2R: Eastern Wetland System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 7.766 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Reach 3R: Southern Western System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.100 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Pond 1P: Basin 1

Inflow Area = 5.101 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
 Inflow = 0.00 cfs @ 24.06 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 24.07 hrs, Volume= 0.000 af, Atten= 7%, Lag= 0.9 min
 Discarded = 0.00 cfs @ 24.07 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,035.00' @ 24.07 hrs Surf.Area= 2,095 sf Storage= 0 cf

Plug-Flow detention time= 0.9 min calculated for 0.000 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (1,445.3 - 1,444.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,035.00'	11,553 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,035.00	2,095	0	0
1,036.00	3,228	2,662	2,662
1,038.00	5,663	8,891	11,553

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,035.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,030.00' Phase-In= 0.01'
#2	Primary	1,035.50'	12.0" Round Culvert L= 97.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 1,035.50' / 1,034.50' S= 0.0103 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Discarded OutFlow Max=0.00 cfs @ 24.07 hrs HW=1,035.00' (Free Discharge)
 ↑1=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,035.00' TW=1,034.00' (Dynamic Tailwater)
 ↑2=Culvert (Controls 0.00 cfs)

Summary for Pond 2P: Basin 2

Inflow Area = 6.276 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
 Inflow = 0.00 cfs @ 24.04 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 24.06 hrs, Volume= 0.000 af, Atten= 9%, Lag= 0.8 min
 Discarded = 0.00 cfs @ 24.06 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,034.00' @ 24.06 hrs Surf.Area= 3,850 sf Storage= 0 cf

Plug-Flow detention time= 0.9 min calculated for 0.000 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (1,444.1 - 1,443.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,034.00'	22,643 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,034.00	3,850	0	0
1,036.00	5,604	9,454	9,454
1,038.00	7,585	13,189	22,643

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,034.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,020.00' Phase-In= 0.01'
#2	Primary	1,037.50'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.00 cfs @ 24.06 hrs HW=1,034.00' (Free Discharge)
 ↑1=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,034.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 3P: Basin 3

Inflow Area = 7.704 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
 Inflow = 0.00 cfs @ 24.10 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 24.12 hrs, Volume= 0.000 af, Atten= 3%, Lag= 0.9 min
 Discarded = 0.00 cfs @ 24.12 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,030.00' @ 24.12 hrs Surf.Area= 2,144 sf Storage= 0 cf

Plug-Flow detention time= 0.9 min calculated for 0.000 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (1,448.7 - 1,447.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,030.00'	18,417 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,030.00	2,144	0	0
1,032.00	3,287	5,431	5,431
1,034.00	4,657	7,944	13,375
1,035.00	5,427	5,042	18,417

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,030.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,020.00' Phase-In= 0.01'
#2	Primary	1,034.50'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.00 cfs @ 24.12 hrs HW=1,030.00' (Free Discharge)
 ↑1=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,030.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 4P: Basin 4

Inflow Area = 1.100 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
 Inflow = 0.00 cfs @ 24.04 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 24.06 hrs, Volume= 0.000 af, Atten= 9%, Lag= 0.8 min
 Discarded = 0.00 cfs @ 24.06 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,044.00' @ 24.06 hrs Surf.Area= 4,742 sf Storage= 0 cf

Plug-Flow detention time= 0.9 min calculated for 0.000 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (1,444.1 - 1,443.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,044.00'	26,170 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,044.00	4,742	0	0
1,046.00	6,486	11,228	11,228
1,048.00	8,456	14,942	26,170

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,044.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,020.00' Phase-In= 0.01'
#2	Primary	1,047.50'	10.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Discarded OutFlow Max=0.00 cfs @ 24.06 hrs HW=1,044.00' (Free Discharge)
 ↑1=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,044.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 5P: Basin 5

Inflow Area = 7.766 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
 Inflow = 0.00 cfs @ 24.04 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 24.06 hrs, Volume= 0.000 af, Atten= 9%, Lag= 0.8 min
 Discarded = 0.00 cfs @ 24.06 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,052.00' @ 24.06 hrs Surf.Area= 7,945 sf Storage= 0 cf

Plug-Flow detention time= 0.9 min calculated for 0.000 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (1,444.1 - 1,443.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,052.00'	41,318 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,052.00	7,945	0	0
1,054.00	10,273	18,218	18,218
1,056.00	12,827	23,100	41,318

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,052.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,020.00' Phase-In= 0.01'
#2	Primary	1,055.50'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.00 cfs @ 24.06 hrs HW=1,052.00' (Free Discharge)
 ↑1=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,052.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 6P: Infiltration Trench

Inflow Area = 0.554 ac, 0.00% Impervious, Inflow Depth = 1.93" for 2-Year event
 Inflow = 1.30 cfs @ 12.07 hrs, Volume= 0.089 af
 Outflow = 0.69 cfs @ 12.19 hrs, Volume= 0.089 af, Atten= 47%, Lag= 7.2 min
 Discarded = 0.69 cfs @ 12.19 hrs, Volume= 0.089 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1.21' @ 12.19 hrs Surf.Area= 3,395 sf Storage= 280 cf

Plug-Flow detention time= 1.7 min calculated for 0.089 af (100% of inflow)
 Center-of-Mass det. time= 1.7 min (816.7 - 815.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1.00'	2,716 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 6,790 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1.00	3,395	0	0
3.00	3,395	6,790	6,790

Device	Routing	Invert	Outlet Devices
#1	Discarded	1.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = -2.00' Phase-In= 0.01'
#2	Primary	2.75'	200.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.69 cfs @ 12.19 hrs HW=1.21' (Free Discharge)
 ↑1=Exfiltration (Controls 0.69 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

2024-02-19 Proposed

Type III 24-hr 10-Year Rainfall=4.68"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Area 1 Runoff Area=222,184 sf 0.00% Impervious Runoff Depth=0.14"
Flow Length=798' Tc=6.2 min CN=39 Runoff=0.10 cfs 0.060 af

Subcatchment 2S: Area 2 Runoff Area=51,206 sf 0.00% Impervious Runoff Depth=0.14"
Tc=5.0 min CN=39 Runoff=0.02 cfs 0.014 af

Subcatchment 3S: Area 3 Runoff Area=335,587 sf 0.00% Impervious Runoff Depth=0.14"
Flow Length=1,136' Tc=10.0 min CN=39 Runoff=0.15 cfs 0.090 af

Subcatchment 4S: Area 4 Runoff Area=47,924 sf 0.00% Impervious Runoff Depth=0.14"
Tc=5.0 min CN=39 Runoff=0.02 cfs 0.013 af

Subcatchment 5S: Area 5 Runoff Area=338,290 sf 0.00% Impervious Runoff Depth=0.14"
Tc=5.0 min CN=39 Runoff=0.15 cfs 0.091 af

Subcatchment 6S: Proposed Entrance Runoff Area=24,139 sf 0.00% Impervious Runoff Depth=3.37"
Tc=5.0 min CN=88 Runoff=2.22 cfs 0.155 af

Reach 1R: Western Wetland System Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 2R: Eastern Wetland System Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 3R: Southern Western System Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 1P: Basin 1 Peak Elev=1,035.00' Storage=5 cf Inflow=0.10 cfs 0.060 af
Discarded=0.10 cfs 0.060 af Primary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.060 af

Pond 2P: Basin 2 Peak Elev=1,034.00' Storage=1 cf Inflow=0.02 cfs 0.014 af
Discarded=0.02 cfs 0.014 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.014 af

Pond 3P: Basin 3 Peak Elev=1,030.00' Storage=8 cf Inflow=0.15 cfs 0.090 af
Discarded=0.15 cfs 0.090 af Primary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.090 af

Pond 4P: Basin 4 Peak Elev=1,044.00' Storage=1 cf Inflow=0.02 cfs 0.013 af
Discarded=0.02 cfs 0.013 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.013 af

Pond 5P: Basin 5 Peak Elev=1,052.00' Storage=8 cf Inflow=0.15 cfs 0.091 af
Discarded=0.15 cfs 0.091 af Primary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.091 af

Pond 6P: Infiltration Trench Peak Elev=1.71' Storage=969 cf Inflow=2.22 cfs 0.155 af
Discarded=0.80 cfs 0.155 af Primary=0.00 cfs 0.000 af Outflow=0.80 cfs 0.155 af

Total Runoff Area = 23.401 ac Runoff Volume = 0.422 af Average Runoff Depth = 0.22"
100.00% Pervious = 23.401 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Area 1

Runoff = 0.10 cfs @ 13.77 hrs, Volume= 0.060 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-Year Rainfall=4.68"

Area (sf)	CN	Description
222,184	39	>75% Grass cover, Good, HSG A
222,184		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.3300	1.08		Sheet Flow, Fallow n= 0.050 P2= 3.10"
0.4	114	0.0700	4.26		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
3.8	407	0.0120	1.76		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	120	0.2000	7.20		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.9	107	0.0150	1.97		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
6.2	798	Total			

2024-02-19 Proposed

Type III 24-hr 10-Year Rainfall=4.68"

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Summary for Subcatchment 2S: Area 2

Runoff = 0.02 cfs @ 13.76 hrs, Volume= 0.014 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.68"

Area (sf)	CN	Description
51,206	39	>75% Grass cover, Good, HSG A
51,206		100.00% Pervious Area

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

Summary for Subcatchment 3S: Area 3

Runoff = 0.15 cfs @ 13.83 hrs, Volume= 0.090 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-Year Rainfall=4.68"

Area (sf)	CN	Description
335,587	39	>75% Grass cover, Good, HSG A
335,587		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.3300	1.08		Sheet Flow, Fallow n= 0.050 P2= 3.10"
9.2	1,086	0.0150	1.97		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.0	1,136	Total			

Summary for Subcatchment 4S: Area 4

Runoff = 0.02 cfs @ 13.76 hrs, Volume= 0.013 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-Year Rainfall=4.68"

Area (sf)	CN	Description
47,924	39	>75% Grass cover, Good, HSG A
47,924		100.00% Pervious Area

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

Summary for Subcatchment 5S: Area 5

Runoff = 0.15 cfs @ 13.76 hrs, Volume= 0.091 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-Year Rainfall=4.68"

Area (sf)	CN	Description
338,290	39	>75% Grass cover, Good, HSG A
338,290		100.00% Pervious Area

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

Summary for Subcatchment 6S: Proposed Entrance Driveway

Runoff = 2.22 cfs @ 12.07 hrs, Volume= 0.155 af, Depth= 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-Year Rainfall=4.68"

Area (sf)	CN	Description
3,408	39	>75% Grass cover, Good, HSG A
20,731	96	Gravel surface, HSG A
24,139	88	Weighted Average
24,139		100.00% Pervious Area

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

Summary for Reach 1R: Western Wetland System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 14.534 ac, 0.00% Impervious, Inflow Depth = 0.00" for 10-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Reach 2R: Eastern Wetland System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 7.766 ac, 0.00% Impervious, Inflow Depth = 0.00" for 10-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Reach 3R: Southern Western System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.100 ac, 0.00% Impervious, Inflow Depth = 0.00" for 10-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Pond 1P: Basin 1

Inflow Area = 5.101 ac, 0.00% Impervious, Inflow Depth = 0.14" for 10-Year event
 Inflow = 0.10 cfs @ 13.77 hrs, Volume= 0.060 af
 Outflow = 0.10 cfs @ 13.81 hrs, Volume= 0.060 af, Atten= 0%, Lag= 2.2 min
 Discarded = 0.10 cfs @ 13.81 hrs, Volume= 0.060 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,035.00' @ 13.81 hrs Surf.Area= 2,098 sf Storage= 5 cf

Plug-Flow detention time= 0.9 min calculated for 0.060 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (1,037.0 - 1,036.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,035.00'	11,553 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,035.00	2,095	0	0
1,036.00	3,228	2,662	2,662
1,038.00	5,663	8,891	11,553

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,035.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,030.00' Phase-In= 0.01'
#2	Primary	1,035.50'	12.0" Round Culvert L= 97.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 1,035.50' / 1,034.50' S= 0.0103 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Discarded OutFlow Max=0.10 cfs @ 13.81 hrs HW=1,035.00' (Free Discharge)
 ↑1=Exfiltration (Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,035.00' TW=1,034.00' (Dynamic Tailwater)
 ↑2=Culvert (Controls 0.00 cfs)

Summary for Pond 2P: Basin 2

Inflow Area = 6.276 ac, 0.00% Impervious, Inflow Depth = 0.03" for 10-Year event
 Inflow = 0.02 cfs @ 13.76 hrs, Volume= 0.014 af
 Outflow = 0.02 cfs @ 13.77 hrs, Volume= 0.014 af, Atten= 0%, Lag= 1.0 min
 Discarded = 0.02 cfs @ 13.77 hrs, Volume= 0.014 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,034.00' @ 13.77 hrs Surf.Area= 3,850 sf Storage= 1 cf

Plug-Flow detention time= 0.9 min calculated for 0.014 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (1,035.9 - 1,035.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,034.00'	22,643 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,034.00	3,850	0	0
1,036.00	5,604	9,454	9,454
1,038.00	7,585	13,189	22,643

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,034.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,020.00' Phase-In= 0.01'
#2	Primary	1,037.50'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.02 cfs @ 13.77 hrs HW=1,034.00' (Free Discharge)
 ↑1=Exfiltration (Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,034.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 3P: Basin 3

Inflow Area = 7.704 ac, 0.00% Impervious, Inflow Depth = 0.14" for 10-Year event
 Inflow = 0.15 cfs @ 13.83 hrs, Volume= 0.090 af
 Outflow = 0.15 cfs @ 13.86 hrs, Volume= 0.090 af, Atten= 0%, Lag= 1.6 min
 Discarded = 0.15 cfs @ 13.86 hrs, Volume= 0.090 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,030.00' @ 13.86 hrs Surf.Area= 2,146 sf Storage= 8 cf

Plug-Flow detention time= 0.9 min calculated for 0.090 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (1,040.6 - 1,039.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,030.00'	18,417 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,030.00	2,144	0	0
1,032.00	3,287	5,431	5,431
1,034.00	4,657	7,944	13,375
1,035.00	5,427	5,042	18,417

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,030.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,020.00' Phase-In= 0.01'
#2	Primary	1,034.50'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.15 cfs @ 13.86 hrs HW=1,030.00' (Free Discharge)
 ↑1=Exfiltration (Controls 0.15 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,030.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 4P: Basin 4

Inflow Area = 1.100 ac, 0.00% Impervious, Inflow Depth = 0.14" for 10-Year event
 Inflow = 0.02 cfs @ 13.76 hrs, Volume= 0.013 af
 Outflow = 0.02 cfs @ 13.77 hrs, Volume= 0.013 af, Atten= 0%, Lag= 1.0 min
 Discarded = 0.02 cfs @ 13.77 hrs, Volume= 0.013 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,044.00' @ 13.77 hrs Surf.Area= 4,742 sf Storage= 1 cf

Plug-Flow detention time= 0.9 min calculated for 0.013 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (1,035.9 - 1,035.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,044.00'	26,170 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,044.00	4,742	0	0
1,046.00	6,486	11,228	11,228
1,048.00	8,456	14,942	26,170

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,044.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,020.00' Phase-In= 0.01'
#2	Primary	1,047.50'	10.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Discarded OutFlow Max=0.02 cfs @ 13.77 hrs HW=1,044.00' (Free Discharge)
 ↑1=Exfiltration (Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,044.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 5P: Basin 5

Inflow Area = 7.766 ac, 0.00% Impervious, Inflow Depth = 0.14" for 10-Year event
 Inflow = 0.15 cfs @ 13.76 hrs, Volume= 0.091 af
 Outflow = 0.15 cfs @ 13.77 hrs, Volume= 0.091 af, Atten= 0%, Lag= 1.0 min
 Discarded = 0.15 cfs @ 13.77 hrs, Volume= 0.091 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,052.00' @ 13.77 hrs Surf.Area= 7,946 sf Storage= 8 cf

Plug-Flow detention time= 0.9 min calculated for 0.091 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (1,035.9 - 1,035.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,052.00'	41,318 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,052.00	7,945	0	0
1,054.00	10,273	18,218	18,218
1,056.00	12,827	23,100	41,318

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,052.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,020.00' Phase-In= 0.01'
#2	Primary	1,055.50'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.15 cfs @ 13.77 hrs HW=1,052.00' (Free Discharge)
 ↑1=Exfiltration (Controls 0.15 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,052.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 6P: Infiltration Trench

Inflow Area = 0.554 ac, 0.00% Impervious, Inflow Depth = 3.37" for 10-Year event
 Inflow = 2.22 cfs @ 12.07 hrs, Volume= 0.155 af
 Outflow = 0.80 cfs @ 12.32 hrs, Volume= 0.155 af, Atten= 64%, Lag= 14.9 min
 Discarded = 0.80 cfs @ 12.32 hrs, Volume= 0.155 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1.71' @ 12.32 hrs Surf.Area= 3,395 sf Storage= 969 cf

Plug-Flow detention time= 5.8 min calculated for 0.155 af (100% of inflow)
 Center-of-Mass det. time= 5.8 min (805.2 - 799.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1.00'	2,716 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 6,790 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1.00	3,395	0	0
3.00	3,395	6,790	6,790

Device	Routing	Invert	Outlet Devices
#1	Discarded	1.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = -2.00' Phase-In= 0.01'
#2	Primary	2.75'	200.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.80 cfs @ 12.32 hrs HW=1.71' (Free Discharge)
 ↑1=Exfiltration (Controls 0.80 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

2024-02-19 Proposed

Type III 24-hr 25-Year Rainfall=5.88"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Area 1 Runoff Area=222,184 sf 0.00% Impervious Runoff Depth=0.41"
Flow Length=798' Tc=6.2 min CN=39 Runoff=0.80 cfs 0.175 af

Subcatchment 2S: Area 2 Runoff Area=51,206 sf 0.00% Impervious Runoff Depth=0.41"
Tc=5.0 min CN=39 Runoff=0.19 cfs 0.040 af

Subcatchment 3S: Area 3 Runoff Area=335,587 sf 0.00% Impervious Runoff Depth=0.41"
Flow Length=1,136' Tc=10.0 min CN=39 Runoff=1.16 cfs 0.264 af

Subcatchment 4S: Area 4 Runoff Area=47,924 sf 0.00% Impervious Runoff Depth=0.41"
Tc=5.0 min CN=39 Runoff=0.17 cfs 0.038 af

Subcatchment 5S: Area 5 Runoff Area=338,290 sf 0.00% Impervious Runoff Depth=0.41"
Tc=5.0 min CN=39 Runoff=1.23 cfs 0.266 af

Subcatchment 6S: Proposed Entrance Runoff Area=24,139 sf 0.00% Impervious Runoff Depth=4.51"
Tc=5.0 min CN=88 Runoff=2.94 cfs 0.208 af

Reach 1R: Western Wetland System Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 2R: Eastern Wetland System Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 3R: Southern Western System Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 1P: Basin 1 Peak Elev=1,035.18' Storage=388 cf Inflow=0.80 cfs 0.175 af
Discarded=0.45 cfs 0.175 af Primary=0.00 cfs 0.000 af Outflow=0.45 cfs 0.175 af

Pond 2P: Basin 2 Peak Elev=1,034.00' Storage=10 cf Inflow=0.19 cfs 0.040 af
Discarded=0.19 cfs 0.040 af Primary=0.00 cfs 0.000 af Outflow=0.19 cfs 0.040 af

Pond 3P: Basin 3 Peak Elev=1,030.47' Storage=1,070 cf Inflow=1.16 cfs 0.264 af
Discarded=0.48 cfs 0.264 af Primary=0.00 cfs 0.000 af Outflow=0.48 cfs 0.264 af

Pond 4P: Basin 4 Peak Elev=1,044.00' Storage=9 cf Inflow=0.17 cfs 0.038 af
Discarded=0.17 cfs 0.038 af Primary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.038 af

Pond 5P: Basin 5 Peak Elev=1,052.01' Storage=64 cf Inflow=1.23 cfs 0.266 af
Discarded=1.22 cfs 0.266 af Primary=0.00 cfs 0.000 af Outflow=1.22 cfs 0.266 af

Pond 6P: Infiltration Trench Peak Elev=2.21' Storage=1,648 cf Inflow=2.94 cfs 0.208 af
Discarded=0.91 cfs 0.208 af Primary=0.00 cfs 0.000 af Outflow=0.91 cfs 0.208 af

Total Runoff Area = 23.401 ac Runoff Volume = 0.992 af Average Runoff Depth = 0.51"
100.00% Pervious = 23.401 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Area 1

Runoff = 0.80 cfs @ 12.36 hrs, Volume= 0.175 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.88"

Area (sf)	CN	Description
222,184	39	>75% Grass cover, Good, HSG A
222,184		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.3300	1.08		Sheet Flow, Fallow n= 0.050 P2= 3.10"
0.4	114	0.0700	4.26		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
3.8	407	0.0120	1.76		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	120	0.2000	7.20		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.9	107	0.0150	1.97		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
6.2	798	Total			

Summary for Subcatchment 2S: Area 2

Runoff = 0.19 cfs @ 12.34 hrs, Volume= 0.040 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.88"

Area (sf)	CN	Description
51,206	39	>75% Grass cover, Good, HSG A
51,206		100.00% Pervious Area

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

Summary for Subcatchment 3S: Area 3

Runoff = 1.16 cfs @ 12.42 hrs, Volume= 0.264 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.88"

Area (sf)	CN	Description
335,587	39	>75% Grass cover, Good, HSG A
335,587		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.3300	1.08		Sheet Flow, Fallow n= 0.050 P2= 3.10"
9.2	1,086	0.0150	1.97		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.0	1,136	Total			

2024-02-19 Proposed

Type III 24-hr 25-Year Rainfall=5.88"

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Summary for Subcatchment 4S: Area 4

Runoff = 0.17 cfs @ 12.34 hrs, Volume= 0.038 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.88"

Area (sf)	CN	Description
47,924	39	>75% Grass cover, Good, HSG A
47,924		100.00% Pervious Area

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

Summary for Subcatchment 5S: Area 5

Runoff = 1.23 cfs @ 12.34 hrs, Volume= 0.266 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-Year Rainfall=5.88"

Area (sf)	CN	Description
338,290	39	>75% Grass cover, Good, HSG A
338,290		100.00% Pervious Area

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

2024-02-19 Proposed

Type III 24-hr 25-Year Rainfall=5.88"

Prepared by McCarty Engineering, Inc.

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Summary for Subcatchment 6S: Proposed Entrance Driveway

Runoff = 2.94 cfs @ 12.07 hrs, Volume= 0.208 af, Depth= 4.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.88"

Area (sf)	CN	Description
3,408	39	>75% Grass cover, Good, HSG A
20,731	96	Gravel surface, HSG A
24,139	88	Weighted Average
24,139		100.00% Pervious Area

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

Summary for Reach 1R: Western Wetland System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 14.534 ac, 0.00% Impervious, Inflow Depth = 0.00" for 25-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Reach 2R: Eastern Wetland System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 7.766 ac, 0.00% Impervious, Inflow Depth = 0.00" for 25-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Reach 3R: Southern Western System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.100 ac, 0.00% Impervious, Inflow Depth = 0.00" for 25-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Pond 1P: Basin 1

Inflow Area = 5.101 ac, 0.00% Impervious, Inflow Depth = 0.41" for 25-Year event
 Inflow = 0.80 cfs @ 12.36 hrs, Volume= 0.175 af
 Outflow = 0.45 cfs @ 12.60 hrs, Volume= 0.175 af, Atten= 43%, Lag= 14.7 min
 Discarded = 0.45 cfs @ 12.60 hrs, Volume= 0.175 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,035.18' @ 12.60 hrs Surf.Area= 2,295 sf Storage= 388 cf

Plug-Flow detention time= 3.4 min calculated for 0.175 af (100% of inflow)
 Center-of-Mass det. time= 3.4 min (967.7 - 964.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,035.00'	11,553 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,035.00	2,095	0	0
1,036.00	3,228	2,662	2,662
1,038.00	5,663	8,891	11,553

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,035.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,030.00' Phase-In= 0.01'
#2	Primary	1,035.50'	12.0" Round Culvert L= 97.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 1,035.50' / 1,034.50' S= 0.0103 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Discarded OutFlow Max=0.45 cfs @ 12.60 hrs HW=1,035.18' (Free Discharge)
 ↑1=Exfiltration (Controls 0.45 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,035.00' TW=1,034.00' (Dynamic Tailwater)
 ↑2=Culvert (Controls 0.00 cfs)

Summary for Pond 2P: Basin 2

Inflow Area = 6.276 ac, 0.00% Impervious, Inflow Depth = 0.08" for 25-Year event
 Inflow = 0.19 cfs @ 12.34 hrs, Volume= 0.040 af
 Outflow = 0.19 cfs @ 12.35 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.9 min
 Discarded = 0.19 cfs @ 12.35 hrs, Volume= 0.040 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,034.00' @ 12.35 hrs Surf.Area= 3,852 sf Storage= 10 cf

Plug-Flow detention time= 0.9 min calculated for 0.040 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (964.0 - 963.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,034.00'	22,643 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,034.00	3,850	0	0
1,036.00	5,604	9,454	9,454
1,038.00	7,585	13,189	22,643

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,034.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,020.00' Phase-In= 0.01'
#2	Primary	1,037.50'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.18 cfs @ 12.35 hrs HW=1,034.00' (Free Discharge)
 ↑1=Exfiltration (Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,034.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 3P: Basin 3

Inflow Area = 7.704 ac, 0.00% Impervious, Inflow Depth = 0.41" for 25-Year event
 Inflow = 1.16 cfs @ 12.42 hrs, Volume= 0.264 af
 Outflow = 0.48 cfs @ 13.32 hrs, Volume= 0.264 af, Atten= 58%, Lag= 53.8 min
 Discarded = 0.48 cfs @ 13.32 hrs, Volume= 0.264 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,030.47' @ 13.32 hrs Surf.Area= 2,412 sf Storage= 1,070 cf

Plug-Flow detention time= 16.3 min calculated for 0.264 af (100% of inflow)
 Center-of-Mass det. time= 16.3 min (984.1 - 967.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,030.00'	18,417 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,030.00	2,144	0	0
1,032.00	3,287	5,431	5,431
1,034.00	4,657	7,944	13,375
1,035.00	5,427	5,042	18,417

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,030.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,020.00' Phase-In= 0.01'
#2	Primary	1,034.50'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.48 cfs @ 13.32 hrs HW=1,030.47' (Free Discharge)
 ↑1=Exfiltration (Controls 0.48 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,030.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 4P: Basin 4

Inflow Area = 1.100 ac, 0.00% Impervious, Inflow Depth = 0.41" for 25-Year event
 Inflow = 0.17 cfs @ 12.34 hrs, Volume= 0.038 af
 Outflow = 0.17 cfs @ 12.35 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.9 min
 Discarded = 0.17 cfs @ 12.35 hrs, Volume= 0.038 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,044.00' @ 12.35 hrs Surf.Area= 4,744 sf Storage= 9 cf

Plug-Flow detention time= 0.9 min calculated for 0.038 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (964.0 - 963.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,044.00'	26,170 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,044.00	4,742	0	0
1,046.00	6,486	11,228	11,228
1,048.00	8,456	14,942	26,170

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,044.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,020.00' Phase-In= 0.01'
#2	Primary	1,047.50'	10.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Discarded OutFlow Max=0.17 cfs @ 12.35 hrs HW=1,044.00' (Free Discharge)
 ↑1=Exfiltration (Controls 0.17 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,044.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 5P: Basin 5

Inflow Area = 7.766 ac, 0.00% Impervious, Inflow Depth = 0.41" for 25-Year event
 Inflow = 1.23 cfs @ 12.34 hrs, Volume= 0.266 af
 Outflow = 1.22 cfs @ 12.35 hrs, Volume= 0.266 af, Atten= 0%, Lag= 0.9 min
 Discarded = 1.22 cfs @ 12.35 hrs, Volume= 0.266 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,052.01' @ 12.35 hrs Surf.Area= 7,954 sf Storage= 64 cf

Plug-Flow detention time= 0.9 min calculated for 0.266 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (964.0 - 963.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,052.00'	41,318 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,052.00	7,945	0	0
1,054.00	10,273	18,218	18,218
1,056.00	12,827	23,100	41,318

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,052.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,020.00' Phase-In= 0.01'
#2	Primary	1,055.50'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=1.22 cfs @ 12.35 hrs HW=1,052.01' (Free Discharge)
 ↑1=Exfiltration (Controls 1.22 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,052.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 6P: Infiltration Trench

Inflow Area = 0.554 ac, 0.00% Impervious, Inflow Depth = 4.51" for 25-Year event
 Inflow = 2.94 cfs @ 12.07 hrs, Volume= 0.208 af
 Outflow = 0.91 cfs @ 12.37 hrs, Volume= 0.208 af, Atten= 69%, Lag= 18.0 min
 Discarded = 0.91 cfs @ 12.37 hrs, Volume= 0.208 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 2.21' @ 12.37 hrs Surf.Area= 3,395 sf Storage= 1,648 cf

Plug-Flow detention time= 9.5 min calculated for 0.208 af (100% of inflow)
 Center-of-Mass det. time= 9.5 min (800.8 - 791.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1.00'	2,716 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 6,790 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1.00	3,395	0	0
3.00	3,395	6,790	6,790

Device	Routing	Invert	Outlet Devices
#1	Discarded	1.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = -2.00' Phase-In= 0.01'
#2	Primary	2.75'	200.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.91 cfs @ 12.37 hrs HW=2.21' (Free Discharge)
 ↑1=Exfiltration (Controls 0.91 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

2024-02-19 Proposed

Type III 24-hr 50-Year Rainfall=7.00"

Prepared by McCarty Engineering, Inc.

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Area 1 Runoff Area=222,184 sf 0.00% Impervious Runoff Depth=0.77"
Flow Length=798' Tc=6.2 min CN=39 Runoff=2.17 cfs 0.327 af

Subcatchment 2S: Area 2 Runoff Area=51,206 sf 0.00% Impervious Runoff Depth=0.77"
Tc=5.0 min CN=39 Runoff=0.53 cfs 0.075 af

Subcatchment 3S: Area 3 Runoff Area=335,587 sf 0.00% Impervious Runoff Depth=0.77"
Flow Length=1,136' Tc=10.0 min CN=39 Runoff=2.97 cfs 0.493 af

Subcatchment 4S: Area 4 Runoff Area=47,924 sf 0.00% Impervious Runoff Depth=0.77"
Tc=5.0 min CN=39 Runoff=0.49 cfs 0.070 af

Subcatchment 5S: Area 5 Runoff Area=338,290 sf 0.00% Impervious Runoff Depth=0.77"
Tc=5.0 min CN=39 Runoff=3.48 cfs 0.497 af

Subcatchment 6S: Proposed Entrance Runoff Area=24,139 sf 0.00% Impervious Runoff Depth=5.59"
Tc=5.0 min CN=88 Runoff=3.60 cfs 0.258 af

Reach 1R: Western Wetland System Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 2R: Eastern Wetland System Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 3R: Southern Western System Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 1P: Basin 1 Peak Elev=1,035.78' Storage=1,987 cf Inflow=2.17 cfs 0.327 af
Discarded=0.65 cfs 0.305 af Primary=0.39 cfs 0.022 af Outflow=1.04 cfs 0.327 af

Pond 2P: Basin 2 Peak Elev=1,034.01' Storage=34 cf Inflow=0.65 cfs 0.097 af
Discarded=0.65 cfs 0.097 af Primary=0.00 cfs 0.000 af Outflow=0.65 cfs 0.097 af

Pond 3P: Basin 3 Peak Elev=1,031.89' Storage=5,060 cf Inflow=2.97 cfs 0.493 af
Discarded=0.71 cfs 0.493 af Primary=0.00 cfs 0.000 af Outflow=0.71 cfs 0.493 af

Pond 4P: Basin 4 Peak Elev=1,044.01' Storage=25 cf Inflow=0.49 cfs 0.070 af
Discarded=0.48 cfs 0.070 af Primary=0.00 cfs 0.000 af Outflow=0.48 cfs 0.070 af

Pond 5P: Basin 5 Peak Elev=1,052.26' Storage=2,112 cf Inflow=3.48 cfs 0.497 af
Discarded=1.59 cfs 0.497 af Primary=0.00 cfs 0.000 af Outflow=1.59 cfs 0.497 af

Pond 6P: Infiltration Trench Peak Elev=2.71' Storage=2,324 cf Inflow=3.60 cfs 0.258 af
Discarded=1.02 cfs 0.258 af Primary=0.00 cfs 0.000 af Outflow=1.02 cfs 0.258 af

Total Runoff Area = 23.401 ac Runoff Volume = 1.721 af Average Runoff Depth = 0.88"
100.00% Pervious = 23.401 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Area 1

Runoff = 2.17 cfs @ 12.15 hrs, Volume= 0.327 af, Depth= 0.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=7.00"

Area (sf)	CN	Description
222,184	39	>75% Grass cover, Good, HSG A
222,184		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.3300	1.08		Sheet Flow, Fallow n= 0.050 P2= 3.10"
0.4	114	0.0700	4.26		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
3.8	407	0.0120	1.76		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	120	0.2000	7.20		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.9	107	0.0150	1.97		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
6.2	798	Total			

Summary for Subcatchment 2S: Area 2

Runoff = 0.53 cfs @ 12.12 hrs, Volume= 0.075 af, Depth= 0.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 50-Year Rainfall=7.00"

Area (sf)	CN	Description
51,206	39	>75% Grass cover, Good, HSG A
51,206		100.00% Pervious Area

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

Summary for Subcatchment 3S: Area 3

Runoff = 2.97 cfs @ 12.28 hrs, Volume= 0.493 af, Depth= 0.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 50-Year Rainfall=7.00"

Area (sf)	CN	Description
335,587	39	>75% Grass cover, Good, HSG A
335,587		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.3300	1.08		Sheet Flow, Fallow n= 0.050 P2= 3.10"
9.2	1,086	0.0150	1.97		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.0	1,136	Total			

Summary for Subcatchment 4S: Area 4

Runoff = 0.49 cfs @ 12.12 hrs, Volume= 0.070 af, Depth= 0.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 50-Year Rainfall=7.00"

Area (sf)	CN	Description
47,924	39	>75% Grass cover, Good, HSG A
47,924		100.00% Pervious Area

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

Summary for Subcatchment 5S: Area 5

Runoff = 3.48 cfs @ 12.12 hrs, Volume= 0.497 af, Depth= 0.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 50-Year Rainfall=7.00"

Area (sf)	CN	Description
338,290	39	>75% Grass cover, Good, HSG A
338,290		100.00% Pervious Area

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

Summary for Subcatchment 6S: Proposed Entrance Driveway

Runoff = 3.60 cfs @ 12.07 hrs, Volume= 0.258 af, Depth= 5.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=7.00"

Area (sf)	CN	Description
3,408	39	>75% Grass cover, Good, HSG A
20,731	96	Gravel surface, HSG A
24,139	88	Weighted Average
24,139		100.00% Pervious Area

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

Summary for Reach 1R: Western Wetland System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 14.534 ac, 0.00% Impervious, Inflow Depth = 0.00" for 50-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Reach 2R: Eastern Wetland System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 7.766 ac, 0.00% Impervious, Inflow Depth = 0.00" for 50-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Reach 3R: Southern Western System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.100 ac, 0.00% Impervious, Inflow Depth = 0.00" for 50-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Pond 1P: Basin 1

Inflow Area = 5.101 ac, 0.00% Impervious, Inflow Depth = 0.77" for 50-Year event
 Inflow = 2.17 cfs @ 12.15 hrs, Volume= 0.327 af
 Outflow = 1.04 cfs @ 12.56 hrs, Volume= 0.327 af, Atten= 52%, Lag= 25.0 min
 Discarded = 0.65 cfs @ 12.56 hrs, Volume= 0.305 af
 Primary = 0.39 cfs @ 12.56 hrs, Volume= 0.022 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,035.78' @ 12.56 hrs Surf.Area= 2,982 sf Storage= 1,987 cf

Plug-Flow detention time= 20.7 min calculated for 0.327 af (100% of inflow)
 Center-of-Mass det. time= 20.7 min (951.7 - 931.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,035.00'	11,553 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,035.00	2,095	0	0
1,036.00	3,228	2,662	2,662
1,038.00	5,663	8,891	11,553

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,035.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,030.00' Phase-In= 0.01'
#2	Primary	1,035.50'	12.0" Round Culvert L= 97.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 1,035.50' / 1,034.50' S= 0.0103 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Discarded OutFlow Max=0.65 cfs @ 12.56 hrs HW=1,035.78' (Free Discharge)
 ↳1=Exfiltration (Controls 0.65 cfs)

Primary OutFlow Max=0.39 cfs @ 12.56 hrs HW=1,035.78' TW=1,034.01' (Dynamic Tailwater)
 ↳2=Culvert (Barrel Controls 0.39 cfs @ 3.24 fps)

Summary for Pond 2P: Basin 2

Inflow Area = 6.276 ac, 0.00% Impervious, Inflow Depth = 0.19" for 50-Year event
 Inflow = 0.65 cfs @ 12.49 hrs, Volume= 0.097 af
 Outflow = 0.65 cfs @ 12.51 hrs, Volume= 0.097 af, Atten= 0%, Lag= 0.9 min
 Discarded = 0.65 cfs @ 12.51 hrs, Volume= 0.097 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,034.01' @ 12.51 hrs Surf.Area= 3,858 sf Storage= 34 cf

Plug-Flow detention time= 0.9 min calculated for 0.097 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (894.8 - 894.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,034.00'	22,643 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,034.00	3,850	0	0
1,036.00	5,604	9,454	9,454
1,038.00	7,585	13,189	22,643

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,034.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,020.00' Phase-In= 0.01'
#2	Primary	1,037.50'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.65 cfs @ 12.51 hrs HW=1,034.01' (Free Discharge)
 ↑1=Exfiltration (Controls 0.65 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,034.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 3P: Basin 3

Inflow Area = 7.704 ac, 0.00% Impervious, Inflow Depth = 0.77" for 50-Year event
 Inflow = 2.97 cfs @ 12.28 hrs, Volume= 0.493 af
 Outflow = 0.71 cfs @ 14.09 hrs, Volume= 0.493 af, Atten= 76%, Lag= 108.4 min
 Discarded = 0.71 cfs @ 14.09 hrs, Volume= 0.493 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,031.89' @ 14.09 hrs Surf.Area= 3,222 sf Storage= 5,060 cf

Plug-Flow detention time= 76.7 min calculated for 0.493 af (100% of inflow)
 Center-of-Mass det. time= 76.7 min (1,011.2 - 934.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,030.00'	18,417 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,030.00	2,144	0	0
1,032.00	3,287	5,431	5,431
1,034.00	4,657	7,944	13,375
1,035.00	5,427	5,042	18,417

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,030.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,020.00' Phase-In= 0.01'
#2	Primary	1,034.50'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.71 cfs @ 14.09 hrs HW=1,031.89' (Free Discharge)
 ↑1=Exfiltration (Controls 0.71 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,030.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 4P: Basin 4

Inflow Area = 1.100 ac, 0.00% Impervious, Inflow Depth = 0.77" for 50-Year event
 Inflow = 0.49 cfs @ 12.12 hrs, Volume= 0.070 af
 Outflow = 0.48 cfs @ 12.14 hrs, Volume= 0.070 af, Atten= 2%, Lag= 1.0 min
 Discarded = 0.48 cfs @ 12.14 hrs, Volume= 0.070 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,044.01' @ 12.14 hrs Surf.Area= 4,747 sf Storage= 25 cf

Plug-Flow detention time= 0.9 min calculated for 0.070 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (930.7 - 929.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,044.00'	26,170 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,044.00	4,742	0	0
1,046.00	6,486	11,228	11,228
1,048.00	8,456	14,942	26,170

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,044.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,020.00' Phase-In= 0.01'
#2	Primary	1,047.50'	10.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Discarded OutFlow Max=0.48 cfs @ 12.14 hrs HW=1,044.01' (Free Discharge)
 ↑1=Exfiltration (Controls 0.48 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,044.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 5P: Basin 5

Inflow Area = 7.766 ac, 0.00% Impervious, Inflow Depth = 0.77" for 50-Year event
 Inflow = 3.48 cfs @ 12.12 hrs, Volume= 0.497 af
 Outflow = 1.59 cfs @ 12.54 hrs, Volume= 0.497 af, Atten= 54%, Lag= 25.0 min
 Discarded = 1.59 cfs @ 12.54 hrs, Volume= 0.497 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,052.26' @ 12.54 hrs Surf.Area= 8,249 sf Storage= 2,112 cf

Plug-Flow detention time= 5.8 min calculated for 0.497 af (100% of inflow)
 Center-of-Mass det. time= 5.8 min (935.6 - 929.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,052.00'	41,318 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,052.00	7,945	0	0
1,054.00	10,273	18,218	18,218
1,056.00	12,827	23,100	41,318

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,052.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,020.00' Phase-In= 0.01'
#2	Primary	1,055.50'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=1.59 cfs @ 12.54 hrs HW=1,052.26' (Free Discharge)
 ↑1=Exfiltration (Controls 1.59 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,052.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 6P: Infiltration Trench

Inflow Area = 0.554 ac, 0.00% Impervious, Inflow Depth = 5.59" for 50-Year event
 Inflow = 3.60 cfs @ 12.07 hrs, Volume= 0.258 af
 Outflow = 1.02 cfs @ 12.40 hrs, Volume= 0.258 af, Atten= 72%, Lag= 19.6 min
 Discarded = 1.02 cfs @ 12.40 hrs, Volume= 0.258 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 2.71' @ 12.40 hrs Surf.Area= 3,395 sf Storage= 2,324 cf

Plug-Flow detention time= 12.9 min calculated for 0.258 af (100% of inflow)
 Center-of-Mass det. time= 12.9 min (798.3 - 785.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1.00'	2,716 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 6,790 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1.00	3,395	0	0
3.00	3,395	6,790	6,790

Device	Routing	Invert	Outlet Devices
#1	Discarded	1.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = -2.00' Phase-In= 0.01'
#2	Primary	2.75'	200.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=1.02 cfs @ 12.40 hrs HW=2.71' (Free Discharge)
 ↑1=Exfiltration (Controls 1.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

2024-02-19 Proposed

Type III 24-hr 100-Year Rainfall=8.34"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Area 1 Runoff Area=222,184 sf 0.00% Impervious Runoff Depth=1.30"
Flow Length=798' Tc=6.2 min CN=39 Runoff=5.35 cfs 0.554 af

Subcatchment 2S: Area 2 Runoff Area=51,206 sf 0.00% Impervious Runoff Depth=1.30"
Tc=5.0 min CN=39 Runoff=1.29 cfs 0.128 af

Subcatchment 3S: Area 3 Runoff Area=335,587 sf 0.00% Impervious Runoff Depth=1.30"
Flow Length=1,136' Tc=10.0 min CN=39 Runoff=7.00 cfs 0.836 af

Subcatchment 4S: Area 4 Runoff Area=47,924 sf 0.00% Impervious Runoff Depth=1.30"
Tc=5.0 min CN=39 Runoff=1.21 cfs 0.119 af

Subcatchment 5S: Area 5 Runoff Area=338,290 sf 0.00% Impervious Runoff Depth=1.30"
Tc=5.0 min CN=39 Runoff=8.54 cfs 0.843 af

Subcatchment 6S: Proposed Entrance Runoff Area=24,139 sf 0.00% Impervious Runoff Depth=6.90"
Tc=5.0 min CN=88 Runoff=4.39 cfs 0.319 af

Reach 1R: Western Wetland System Inflow=2.43 cfs 0.020 af
Outflow=2.43 cfs 0.020 af

Reach 2R: Eastern Wetland System Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 3R: Southern Western System Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 1P: Basin 1 Peak Elev=1,036.22' Storage=3,404 cf Inflow=5.35 cfs 0.554 af
Discarded=0.80 cfs 0.409 af Primary=2.10 cfs 0.144 af Outflow=2.89 cfs 0.554 af

Pond 2P: Basin 2 Peak Elev=1,034.82' Storage=3,446 cf Inflow=2.77 cfs 0.272 af
Discarded=0.92 cfs 0.272 af Primary=0.00 cfs 0.000 af Outflow=0.92 cfs 0.272 af

Pond 3P: Basin 3 Peak Elev=1,033.66' Storage=11,845 cf Inflow=7.00 cfs 0.836 af
Discarded=1.06 cfs 0.836 af Primary=0.00 cfs 0.000 af Outflow=1.06 cfs 0.836 af

Pond 4P: Basin 4 Peak Elev=1,044.03' Storage=129 cf Inflow=1.21 cfs 0.119 af
Discarded=0.91 cfs 0.119 af Primary=0.00 cfs 0.000 af Outflow=0.91 cfs 0.119 af

Pond 5P: Basin 5 Peak Elev=1,052.92' Storage=7,810 cf Inflow=8.54 cfs 0.843 af
Discarded=1.77 cfs 0.843 af Primary=0.00 cfs 0.000 af Outflow=1.77 cfs 0.843 af

Pond 6P: Infiltration Trench Peak Elev=2.78' Storage=2,414 cf Inflow=4.39 cfs 0.319 af
Discarded=1.04 cfs 0.299 af Primary=2.43 cfs 0.020 af Outflow=3.46 cfs 0.319 af

Total Runoff Area = 23.401 ac Runoff Volume = 2.799 af Average Runoff Depth = 1.44"
100.00% Pervious = 23.401 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Area 1

Runoff = 5.35 cfs @ 12.12 hrs, Volume= 0.554 af, Depth= 1.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-Year Rainfall=8.34"

Area (sf)	CN	Description
222,184	39	>75% Grass cover, Good, HSG A
222,184		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.3300	1.08		Sheet Flow, Fallow n= 0.050 P2= 3.10"
0.4	114	0.0700	4.26		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
3.8	407	0.0120	1.76		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	120	0.2000	7.20		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.9	107	0.0150	1.97		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
6.2	798	Total			

Summary for Subcatchment 2S: Area 2

Runoff = 1.29 cfs @ 12.10 hrs, Volume= 0.128 af, Depth= 1.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.34"

Area (sf)	CN	Description
51,206	39	>75% Grass cover, Good, HSG A
51,206		100.00% Pervious Area

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

Summary for Subcatchment 3S: Area 3

Runoff = 7.00 cfs @ 12.18 hrs, Volume= 0.836 af, Depth= 1.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-Year Rainfall=8.34"

Area (sf)	CN	Description
335,587	39	>75% Grass cover, Good, HSG A
335,587		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.3300	1.08		Sheet Flow, Fallow n= 0.050 P2= 3.10"
9.2	1,086	0.0150	1.97		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.0	1,136	Total			

2024-02-19 Proposed

Type III 24-hr 100-Year Rainfall=8.34"

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Summary for Subcatchment 4S: Area 4

Runoff = 1.21 cfs @ 12.10 hrs, Volume= 0.119 af, Depth= 1.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.34"

Area (sf)	CN	Description
47,924	39	>75% Grass cover, Good, HSG A
47,924		100.00% Pervious Area

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

Summary for Subcatchment 5S: Area 5

Runoff = 8.54 cfs @ 12.10 hrs, Volume= 0.843 af, Depth= 1.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-Year Rainfall=8.34"

Area (sf)	CN	Description
338,290	39	>75% Grass cover, Good, HSG A
338,290		100.00% Pervious Area

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

Summary for Subcatchment 6S: Proposed Entrance Driveway

Runoff = 4.39 cfs @ 12.07 hrs, Volume= 0.319 af, Depth= 6.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-Year Rainfall=8.34"

Area (sf)	CN	Description
3,408	39	>75% Grass cover, Good, HSG A
20,731	96	Gravel surface, HSG A
24,139	88	Weighted Average
24,139		100.00% Pervious Area

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

Summary for Reach 1R: Western Wetland System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 14.534 ac, 0.00% Impervious, Inflow Depth = 0.02" for 100-Year event
Inflow = 2.43 cfs @ 12.14 hrs, Volume= 0.020 af
Outflow = 2.43 cfs @ 12.14 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Reach 2R: Eastern Wetland System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 7.766 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Reach 3R: Southern Western System

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.100 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Pond 1P: Basin 1

Inflow Area = 5.101 ac, 0.00% Impervious, Inflow Depth = 1.30" for 100-Year event
 Inflow = 5.35 cfs @ 12.12 hrs, Volume= 0.554 af
 Outflow = 2.89 cfs @ 12.42 hrs, Volume= 0.554 af, Atten= 46%, Lag= 18.4 min
 Discarded = 0.80 cfs @ 12.42 hrs, Volume= 0.409 af
 Primary = 2.10 cfs @ 12.42 hrs, Volume= 0.144 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,036.22' @ 12.42 hrs Surf.Area= 3,497 sf Storage= 3,404 cf

Plug-Flow detention time= 22.8 min calculated for 0.554 af (100% of inflow)
 Center-of-Mass det. time= 22.8 min (930.0 - 907.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,035.00'	11,553 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,035.00	2,095	0	0
1,036.00	3,228	2,662	2,662
1,038.00	5,663	8,891	11,553

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,035.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,030.00' Phase-In= 0.01'
#2	Primary	1,035.50'	12.0" Round Culvert L= 97.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 1,035.50' / 1,034.50' S= 0.0103 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Discarded OutFlow Max=0.80 cfs @ 12.42 hrs HW=1,036.22' (Free Discharge)
 ↗**1=Exfiltration** (Controls 0.80 cfs)

Primary OutFlow Max=2.10 cfs @ 12.42 hrs HW=1,036.22' TW=1,034.45' (Dynamic Tailwater)
 ↗**2=Culvert** (Barrel Controls 2.10 cfs @ 4.84 fps)

Summary for Pond 2P: Basin 2

Inflow Area = 6.276 ac, 0.00% Impervious, Inflow Depth = 0.52" for 100-Year event
 Inflow = 2.77 cfs @ 12.38 hrs, Volume= 0.272 af
 Outflow = 0.92 cfs @ 13.01 hrs, Volume= 0.272 af, Atten= 67%, Lag= 37.5 min
 Discarded = 0.92 cfs @ 13.01 hrs, Volume= 0.272 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,034.82' @ 13.01 hrs Surf.Area= 4,568 sf Storage= 3,446 cf

Plug-Flow detention time= 32.5 min calculated for 0.272 af (100% of inflow)
 Center-of-Mass det. time= 32.5 min (868.7 - 836.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,034.00'	22,643 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,034.00	3,850	0	0
1,036.00	5,604	9,454	9,454
1,038.00	7,585	13,189	22,643

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,034.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,020.00' Phase-In= 0.01'
#2	Primary	1,037.50'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.92 cfs @ 13.01 hrs HW=1,034.82' (Free Discharge)
 ↑1=Exfiltration (Controls 0.92 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,034.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 3P: Basin 3

Inflow Area = 7.704 ac, 0.00% Impervious, Inflow Depth = 1.30" for 100-Year event
 Inflow = 7.00 cfs @ 12.18 hrs, Volume= 0.836 af
 Outflow = 1.06 cfs @ 14.28 hrs, Volume= 0.836 af, Atten= 85%, Lag= 125.9 min
 Discarded = 1.06 cfs @ 14.28 hrs, Volume= 0.836 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,033.66' @ 14.28 hrs Surf.Area= 4,426 sf Storage= 11,845 cf

Plug-Flow detention time= 140.3 min calculated for 0.836 af (100% of inflow)
 Center-of-Mass det. time= 140.3 min (1,051.0 - 910.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,030.00'	18,417 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,030.00	2,144	0	0
1,032.00	3,287	5,431	5,431
1,034.00	4,657	7,944	13,375
1,035.00	5,427	5,042	18,417

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,030.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,020.00' Phase-In= 0.01'
#2	Primary	1,034.50'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=1.06 cfs @ 14.28 hrs HW=1,033.66' (Free Discharge)
 ↑1=Exfiltration (Controls 1.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,030.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 4P: Basin 4

Inflow Area = 1.100 ac, 0.00% Impervious, Inflow Depth = 1.30" for 100-Year event
 Inflow = 1.21 cfs @ 12.10 hrs, Volume= 0.119 af
 Outflow = 0.91 cfs @ 12.18 hrs, Volume= 0.119 af, Atten= 25%, Lag= 4.9 min
 Discarded = 0.91 cfs @ 12.18 hrs, Volume= 0.119 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,044.03' @ 12.18 hrs Surf.Area= 4,766 sf Storage= 129 cf

Plug-Flow detention time= 1.1 min calculated for 0.119 af (100% of inflow)
 Center-of-Mass det. time= 1.1 min (907.1 - 906.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,044.00'	26,170 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,044.00	4,742	0	0
1,046.00	6,486	11,228	11,228
1,048.00	8,456	14,942	26,170

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,044.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,020.00' Phase-In= 0.01'
#2	Primary	1,047.50'	10.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Discarded OutFlow Max=0.91 cfs @ 12.18 hrs HW=1,044.03' (Free Discharge)
 ↑1=Exfiltration (Controls 0.91 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,044.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 5P: Basin 5

Inflow Area = 7.766 ac, 0.00% Impervious, Inflow Depth = 1.30" for 100-Year event
 Inflow = 8.54 cfs @ 12.10 hrs, Volume= 0.843 af
 Outflow = 1.77 cfs @ 12.87 hrs, Volume= 0.843 af, Atten= 79%, Lag= 46.1 min
 Discarded = 1.77 cfs @ 12.87 hrs, Volume= 0.843 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,052.92' @ 12.87 hrs Surf.Area= 9,017 sf Storage= 7,810 cf

Plug-Flow detention time= 34.0 min calculated for 0.843 af (100% of inflow)
 Center-of-Mass det. time= 34.0 min (940.1 - 906.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,052.00'	41,318 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,052.00	7,945	0	0
1,054.00	10,273	18,218	18,218
1,056.00	12,827	23,100	41,318

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,052.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1,020.00' Phase-In= 0.01'
#2	Primary	1,055.50'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=1.77 cfs @ 12.87 hrs HW=1,052.92' (Free Discharge)
 ↑1=Exfiltration (Controls 1.77 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,052.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 6P: Infiltration Trench

Inflow Area = 0.554 ac, 0.00% Impervious, Inflow Depth = 6.90" for 100-Year event
 Inflow = 4.39 cfs @ 12.07 hrs, Volume= 0.319 af
 Outflow = 3.46 cfs @ 12.14 hrs, Volume= 0.319 af, Atten= 21%, Lag= 4.4 min
 Discarded = 1.04 cfs @ 12.14 hrs, Volume= 0.299 af
 Primary = 2.43 cfs @ 12.14 hrs, Volume= 0.020 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 2.78' @ 12.14 hrs Surf.Area= 3,395 sf Storage= 2,414 cf

Plug-Flow detention time= 12.4 min calculated for 0.319 af (100% of inflow)
 Center-of-Mass det. time= 12.4 min (792.3 - 779.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1.00'	2,716 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 6,790 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1.00	3,395	0	0
3.00	3,395	6,790	6,790

Device	Routing	Invert	Outlet Devices
#1	Discarded	1.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = -2.00' Phase-In= 0.01'
#2	Primary	2.75'	200.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=1.04 cfs @ 12.14 hrs HW=2.78' (Free Discharge)
 ↑1=Exfiltration (Controls 1.04 cfs)

Primary OutFlow Max=2.13 cfs @ 12.14 hrs HW=2.78' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 2.13 cfs @ 0.40 fps)