Stormwater Management Study

Northern Pass Transmission, LLC

Transition Station #3
Project No. 58466

RE-ISSUED FOR PERMITTING
December 13, 2016

Stormwater Management Study

prepared for

Northern Pass Transmission, LLC

Transition Station #3
Clarksville, Coos County, NH, 03592

Project No. 58466

RE-ISSUED FOR PERMITTING
December 13, 2016

prepared by

Burns & McDonnell Engineering Company, Inc.

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INDEX AND CERTIFICATION

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Report Index

Certification

I hereby certify, as a Professional Engineer in the State of New Hampshire, that the information in this document was assembled under my direct personal charge. This report is not intended or represented to be suitable for reuse by the Northern Pass Transmission, LLC or others without specific verification or adaptation by the Engineer.

STATE OF NEW HAMPSHIRE
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LICENSED
PROFESSIONAL ENGINEER

12/13/16

Robbyn Reed, P.E. Date

Additional reference information provided by others and not certified by the above sealing Engineer.

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LIST OF ABBREVIATIONS

Abbreviation	**Term/Phrase/Name**
BMcD	Burns & McDonnell
BMP	Best Management Practice
CFS	Cubic Feet per Second
E&S	Erosion and Sedimentation Control
FPS	Feet per Second
FT	Feet
LF	Linear Feet
LiDAR	Light Detection and Ranging
NAD	North American Datum
NAVD	North American Vertical Datum
NH DES	New Hampshire Department of Environmental Services
ORW	Outstanding Resource Water
ROW	Right-of-way
TMDL	Total Maximum Daily Loads
TN	Total Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
WQF	Water Quality Flow
WQV	Water Quality Volume

1.0 PROJECT OVERVIEW

1.1 Location and Project Summary

Northern Pass Transmission, LLC (NPT) plans to construct Transition Station #3 (Project), a new transition station located on Eversource owned property on Wiswell Road (45.010916 latitude and -71.422358 longitude) in Clarksville, Coos County, NH (Site). Refer to Figure 1-1: USGS Site Location Map.

The Site is bounded by Wiswell Road and Favreau Brook to the north, and woods to the east, south and west. The Site is located within the surface watershed of Favreau Brook, a tributary to the Connecticut River.

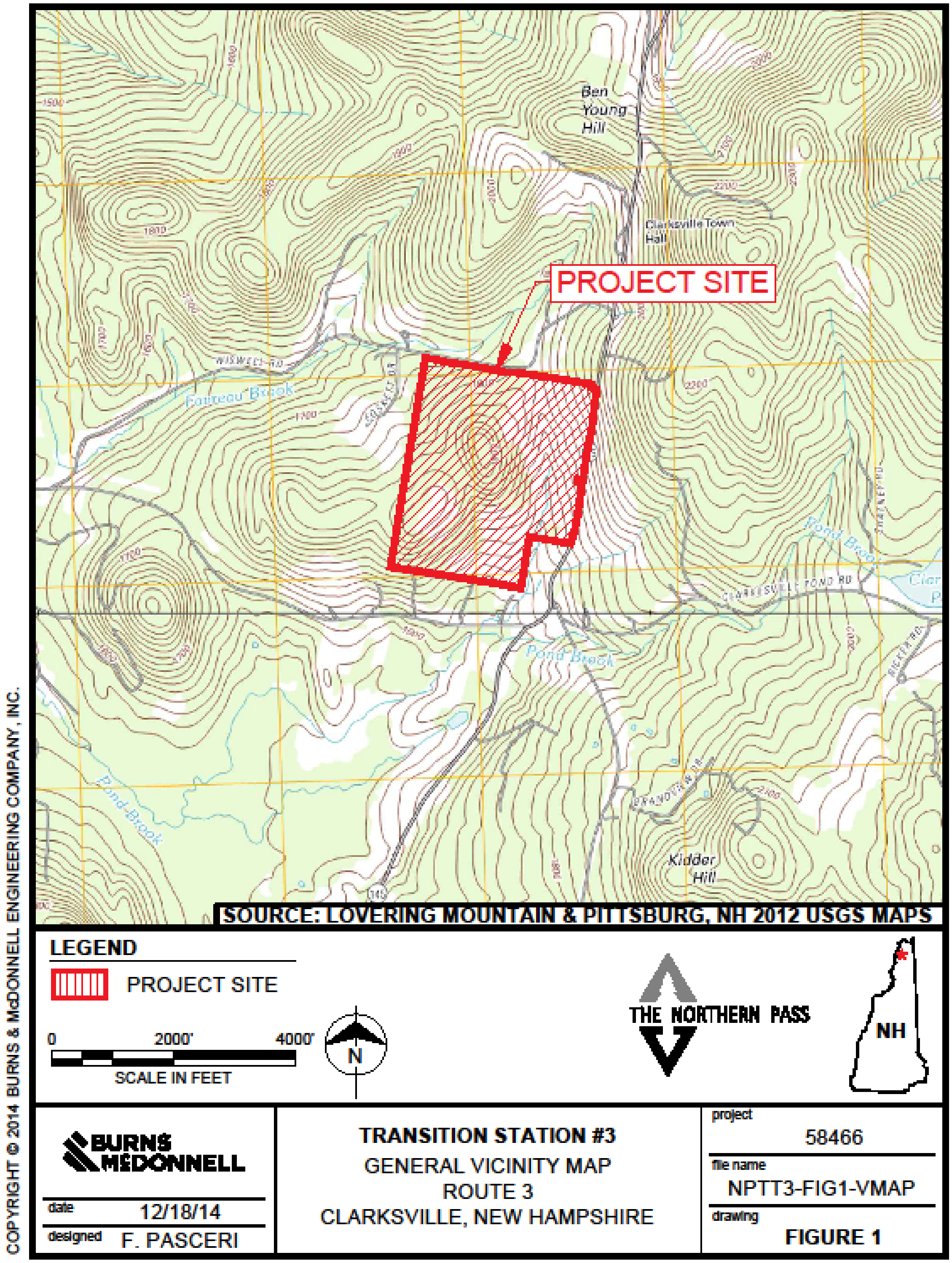
Pre-development conditions primarily consist of undeveloped woodland areas. Stormwater runoff in existing conditions generally sheet flows overland from south to north to existing wetlands located on the northern portion of the Site and a roadside ditch which flows toward an existing 24-inch CMP culvert crossing under Wiswell Road in the northwest corner of the Site.

The post-development conditions of the Site include construction of a transition station associated with the Northern Pass Transmission (NPT) project. The NPT project is an approximately 200-mile AC and DC transmission line route extending from the United States/Canadian border in Pittsburg, NH to Deerfield, NH. The station development consists of a gravel pad approximately 76-ft by 129-ft with a perimeter fence and access gates. A paved access drive and gravel vehicle turnaround area is also proposed. The post-development conditions will increase the peak stormwater runoff rate and as a result, stormwater attenuation systems will be implemented. Wherever possible, the pre-development drainage and grading patterns were maintained in the post-development conditions.

A hydrologic model was developed to evaluate the pre- and post-development drainage conditions on the Site for the 2-, 10-, and 50-year design frequency storm events. The results of the analysis indicate that there is no increase in peak discharge rates in post-development conditions from pre-development conditions. The analyses summary, results, and model output are located in further sections.

The Project Site property area is 215.45 acres. The Project will result in approximately 2.30-acres of disturbance of which 2.25-acres is on-site and 0.05- acres off-site in roadways. The existing impervious cover within the property is 0.68 acres and the additional impervious cover as a result of the project is 0.24 acres. The total impervious cover within the property is 0.92 acres. The total undisturbed cover of the property is 212.52 acres.

Figure 1-1: USGS Site Location Map



1.2 Existing Conditions Survey Information

An Existing Conditions Plan with topography was prepared for the Project and was used as a base throughout the analysis and design of the Site Development Plans and Stormwater Management Study. In the instance where the watershed areas extended outside the survey topography limits, State published LiDAR was obtained from the New Hampshire GRANIT Statewide GIS Clearinghouse and used to determine the watershed limits.

Horizontal Datum: The survey references the New Hampshire State Plane Coordinate System, NAD 83. The Site Development Plans are drawn in the same state plane coordinate system.

Vertical Datum: North American Vertical Datum of 1988 (NAVD88). The proposed elevations referenced within the Site Development Plans refer to the same vertical datum.

1.3 Geotechnical Investigations

A Geotechnical Engineering Report has been prepared for NPT.

- “Geotechnical Engineering Report, Transition Station #3 Project, Northern Pass Transmission Line, Clarksville, New Hampshire” by Quanta Subsurface.

Furthermore infiltration testing has been completed for the site at specified locations relevant to the Stormwater Management Study. Refer to the Infiltration Feasibility Report included in Appendix H.

The geotechnical investigation report can be found in Appendix H.

1.4 Soils

National Resource Conservation Service (NRCS) Web Soil Survey describes the soil at the Project Site as Tunbridge, Lyman, Plaisted, Howland and Cabot silt loams with rock outcrop. The soils were classified as hydrologic soil group D. Five soil types are present on and in the vicinity of the Project Site according to the US Department of Agriculture Soil Conservation Service Soil Survey for Coos County, New Hampshire. The NRCS Web Soil Survey information is located in Appendix G

There is also a survey report for the site entitled “Northern Pass Transmission Project, Soil Survey Report for Transition Stations, Substation Expansions, and Converter Terminal” by Normandeau Environmental Consultants, dated February 6, 2015 which further describes fourteen types of soils that are present in the vicinity of the disturbed area of the Project Site.

Tunbridge fine sandy loam and Lyman loam are bedrock controlled soils. Tunbridge soils are moderately deep with bedrock within 40 inches of the soil surface. Lyman soils are shallow with bedrock within 20 inches of the soil surface. Bedrock outcrops were mapped within both map units. Complexes were mapped in those areas where differentiating the individual map units was too difficult. Plaisted silt loam is very deep, well-drained soil that has formed in dense glacial till. Howland silt loam is very deep, moderately well drained soil found at lower hillslope positions. Telos silt loam is somewhat poorly drained with a seasonal water table within 15 inches of the soil surface due to the presence of dense lodgment till. Cabot, very stony, silt loam is poorly drained with dense lodgment till in the substratum. Free water is commonly at or near the surface to result in hydric conditions. Most of the soils were classified as hydrologic soil group C with one classified as hydrologic group D. The soil survey report is also located in Appendix G.

Table 1-1 below lists the soil types and hydrologic soil groups.

Table 1-1: Soil Types

Map Legend	Soil Type	Hydrologic Soil Group
61B/RK	Turnbridge – Lyman Complex-Rock Outcrop Complex, 3 to 8 percent slopes	C/A/D
61C/RK	Turnbridge – Lyman Complex-Rock Outcrop Complex, 8 to 15 percent slopes	C/A/D
61D/RK	Turnbridge – Lyman Complex-Rock Outcrop Complex, 15 to 25 percent slopes	C/A/D
61E/RK	Turnbridge – Lyman Complex-Rock Outcrop Complex, 25 to 50 percent slopes	C/A/D
99B/RK	Turnbridge, very stony, 3 to 8 percent slopes	C
99D/RK	Turnbridge, very stony, 15 to 25 percent slopes	C
123B	Telos, very stony, 3 to 9 percent slopes	C
161B/RK	Lyman-Turnbridge-Rock Outcrop Complex, 3 to 8 percent slopes	A/D/C
161C/RK	Lyman-Turnbridge-Rock Outcrop Complex, 8 to 15 percent slopes	A/D/C

Map Legend	Soil Type	Hydrologic Soil Group
161D/RK	Lyman-Turnbridge-Rock Outcrop Complex, 15 to 25 percent slopes	A/D/C
567B	Howland silt loam, Very stony, 3 to 8 percent slopes	C
590B/P	Cabot gravelly silt loam, very stony, 3 to 8 percent slopes	D
61D	Tunbridge-Lyman-Rock Outcrop Complex, 15 to 25 percent slopes	C
61E	Tunbridge-Lyman-Rock Outcrop Complex, 25 to 35 percent slopes	C
560D	Tunbridge-Plaisted-Lyman Complex, 15 to 25 percent slopes	B
567C	Howland Silt Loam, 8 to 15 percent slopes, Very Stony	C
590B	Cabot Gravelly Silt Loam, 3 to 8 percent slopes, Very Stony	D

This soil series has an erosion factor K of 0.24-0.32 or is not rated. The erosion factor K, with values ranging from 0.02 to 0.69, signifies how susceptible a soil is to erosion. The larger the K value the more susceptible the soil is to erosion by water. The K factor for the Project site indicates that the soils are moderately susceptible to erosion by water. The susceptibility of the soils to moderate erosion will be resolved by the site stabilization with rock and native vegetation.

1.5 Wetlands, Rivers, Streams and Vernal Pools

A report entitled “Wetlands, Rivers, Streams and Vernal Pools Resource Report and Impact Analysis” by Normandeau Environmental Consultants, dated October 1, 2015 has been prepared for the NPT Project. Environmentally sensitive areas were found within the Project Site. Refer to Appendix I for a copy of this report.

1.6 Floodplain

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Map No. 33007C0220D Panel 220 of 1300 for Coos County, New Hampshire, Effective Date February 20, 2013, the Project Site is located in Zone “X” areas determined to be outside the 0.2% annual chance floodplain. The FIRM Map is located in Appendix F.

1.7 Receiving Surface Waters

The Site is within the Favreau Brook Watershed which is part of the Connecticut River Watershed. The site and onsite wetlands are tributary to the roadside ditch, which is tributary to Favreau Brook and ultimately the Connecticut River.

1.8 Pre-Development Site Conditions

The Pre-developed Site consists of heavily forested rolling hill terrain that drains to the north toward existing on-site wetlands and Wiswell Road. There is only discharge point from this site which is a 24-inch CMP culvert crossing under Wiswell Road.

1.9 Post-Development Site Conditions

Pre-developed stormwater drainage patterns are mimicked in post-developed conditions and utilize the same aforementioned Site discharge point as pre-development. Pre- and Post-development watershed maps are located in Appendix A. The post-development peak stormwater discharge rates are the same or below pre-development rates.

No new water or septic/sanitary sewer services are required for the Project.

No proposed improvements are located within a FEMA 100-year flood plain. As a result, there are no adverse impacts to properties.

* * * * *

2.0 HYDROLOGY AND HYDRAULICS

The stormwater management for the Project has been developed to minimize the downstream effects of development at the Site. The stormwater requirements set forth by the New Hampshire Department of Environmental Services Stormwater Manual Volumes 1, 2, & 3, dated December 2008 and the New Hampshire Department of Transportation Manual on Design for Highways, Revision Date April 1998 were followed to the maximum extent practical for the design of the Site Development Plans and this Report.

The development of the Site results in the need to attenuate stormwater onsite. One above-ground infiltration basin is proposed and is discussed in further detail below. The following is the data used in the stormwater management analysis.

2.1 Methodology and Design Criteria

2.1.1 Rainfall Data

Type II 24-hour rainfall depths for Clarksville, NH were obtained from the Northeast Regional Climate Center – http://precip.eas.cornell.edu/.

Table 2-1: 24-Hour Type II Rainfall Data

Return Frequency (yr)	24 Hour Depth (in)
2	2.21
10	3.09
50	4.30

2.1.2 Runoff Data

The stormwater runoff calculations were completed using the USDA NRCS/SCS TR-55 runoff curve number method in Bentley's PondPack v8i modeling software. Refer to Appendix B for the inputs and generated outputs. The input values that were used in the PondPack model are shown in the tables below.

Maximum sheet flow length for unpaved areas according to the NH DES Stormwater Manual is 100-ft. Below are the standard SCS runoff curve numbers used in the hydrology modeling and the pre-development and post-development watershed cover data used in the hydrology modeling.

Table 2-2: Standard SCS Runoff Curve Numbers

Land Type	Hydrologic Soil Group	Curve Number
Woods	B	55
Woods	C	70
Woods	D	77
Meadow	C	71
Meadow	D	78
Gravel	C	89
Impervious (Asphalt Pavement, Water, Structures, Foundations)	-	98

Table 2-3: Pre-Developed Model Data

Subarea	Area (ac)	Curve Number	Time of Concentration (Minutes)
1	8.553	67	17.3

Table 2-4: Post-Developed Model Data

Subarea	Area (ac)	Composite Curve Number	Time of Concentration (Minutes)
1	0.859	88	12.9
2	0.895	67	18.2
3	0.195	89	5.0
4	1.549	70	19.9
5	5.065	66	17.3
Total	8.648	-	-

The below table summarizes the Manning's roughness coefficients used in the analysis.

Table 2-5: Manning's Roughness Coefficients

Surface Description	Manning's n
Grass, Dense grasses (sheet)	0.240
Woods, Dense underbrush (sheet)	0.800
Smooth Surface Gravel (sheet)	0.100
Woods, Light underbrush (sheet)	0.400
Woods, Dense underbrush (sheet)	0.800
Concrete/RCP	0.013
PVC	0.010
HDPE	0.012
Riprap lined Swale	0.069
Vegetated Swale	0.030
Grass w/ NAG Stabilization	0.045

2.2 Stormwater Modeling Results

For the proposed Project, a new infiltration basin is proposed to be constructed on the northwest side of the Site. Runoff from the wooded hillsides to the east and south of the transition station pad will collect in Swale 2, which will bypass flow around the pad and discharge to a new culvert that will flow under the new access road. The runoff from the northern portion of the access road will be collected in Swale 3 which will flow into Swale 5 which will function as a treatment swale. Swale 3 will also collect the discharge from the culvert under the access road. Runoff from the transition station's cut slopes and a portion of the wooded area to the south will be collected in Swale 4 and flow through Swale 6, which will discharge through a level spreader at the northwest corner of the station. Runoff from the transition station pad and a large portion of the access road will collect in Swale 1. Swale 1 discharges to the infiltration basin. Remaining wooded areas within the watershed not draining to the swales or basin will drain to the same discharge points as the pre-development runoff. The infiltration basin includes a concrete outlet control structure to control the runoff rate from the basin and an emergency spillway to manage storm events larger than the 50 year storm event.

The proposed infiltration basin was analyzed to mitigate the impacts of stormwater runoff from changes in drainage patterns that would result from the construction of this project. The hydrology model was analyzed using an infiltration rate of 4.9 inches per hour (based on results from field data). The concrete outlet control structure will control the rate of runoff to below the pre-development runoff as shown by the modeling results. The following tables summarize flow conditions for the Project and the reduction of flow achieved by the infiltration basin.

There is only one Analysis Point for the Site located at existing Outlet-1. The tables below summarize the pre- and post-developed peak discharge runoff rates from the analysis point. Refer to Appendix A for the Pre-Developed and Post-Developed Watershed Maps. Modeling results and output can be found in Appendix B.

Table 2-6: Outlet-1 Flow

Return Frequency (yr)	Pre-Developed Flow (cfs)	Post-Developed Flow (cfs)
2	1.39	1.30
10	5.16	4.78
50	12.43	11.91

2.3 Infiltration Basin Design

The infiltration basin was designed and analyzed to provide long term stormwater attenuation, water quality treatment, and infiltration once the Project has been constructed. The basin has been designed to meet the requirements in the NH DES Stormwater Manual. The infiltration basin contains storm events up to and including the 50-year design storm with a minimum 1-ft freeboard above the emergency spillway crest elevation. The infiltration basin has been designed as to not require a State Dam permit. The below tables summarize the infiltration basin storage volumes and water surface elevations respect to the design storm events.

Table 2-7: Infiltration Basin Storage Volume

Elevation (feet-NAVD88)	Surface Area (ac)	Cumulative Storage Volume (Acre-ft)
1801.50	0.029	-
1802.00	0.035	0.0158
1803.00	0.048	0.0568
1804.00	0.062	0.1114
1805.00	0.077	0.1831

Table 2-8: Infiltration Basin Water Surface Elevation

Return Frequency (yr)	Maximum Water Surface Elevation (ft)
2	1802.38
10	1802.84
50	1803.30

2.4 Stormwater Swales

The stormwater swales are designed for the 10-year storm event with a minimum of one foot of freeboard. In addition, all open swales are expected to convey the 100-year storm event without overtopping. The open swales will be lined with an erosion control blanket and vegetated or lined with riprap as specified in the Site Development Plans. The following table summarizes the design criteria as well as the proposed lining for the proposed open swales. The results show that the swale will be stable for storms up to the 10 year flow.

Table 2-9: Stormwater Swale Summary

Swale	10 Year Max. Flow (cfs)	10 Year Velocity (ft/s)	100 Year Max. Flow (cfs)	100 Year Velocity (ft/s)	Swale Depth (ft)	Swale Width (ft)	Side Slopes (H:V ft)	Slope (%)
1	2.07	2.84	3.90	3.43	2.0	2.0	3:1	0.5-15.0
2	0.53	1.61	1.73	2.34	2.0	2.0	3:1	3.0-10.0
3	1.13	1.17	2.84	1.52	2.0	2.0	3:1	2.0
4	1.13	1.29	3.31	1.75	2.0	2.0	3:1	0.5
5	1.13	0.97	2.84	1.22	0.56	2.0	333:1/45:1	2.9
6	1.13	2.82	3.31	3.94	1.0	2.0	3:1	25.4

Refer to Appendix C for the FlowMaster model results for the Swales.

The table below summarizes the stormwater swale stabilization types. The calculations can be found in Appendix C.

Table 2-10: Stormwater Swale Stability

Swale	Stabilization Type	10 Yr. Design Discharge (cfs)	Allowable Shear Stress (psf)	Calculated Shear Stress (psf)
1	Riprap Lining	2.07	6	2.43
2	Riprap Lining	0.53	6	0.87
3	Riprap Lining	1.13	6	0.39
4	Unreinforced Vegetation	1.13	3	0.09
5	Unreinforced Vegetation	1.13	3	0.13
6	Riprap Lining	1.13	6	4.60

2.5 Treatment Swale Design

The steep terrain on the site requires the use of an access road that exceeds a five percent longitudinal slope. New Hampshire Utilities standards require that the access road be paved if this slope is exceeded. Due to the steeply sloping terrain it is not possible to route all the runoff from the impervious pavement areas through the infiltration basin. A small portion of the site consisting of 0.90 acres, of which 0.11 acres is impervious pavement, is located below the elevation of the inlet to the infiltration basin and must be treated with another BMP. The terrain in this area slopes steeply upward from the roadside ditch which makes it infeasible to install a small stormwater pond, such as a pocket pond for treatment. In addition, stormwater wetland BMPs are also not feasible due to the lack of available space between the roadside ditch and steep terrain. Infiltration and filtering BMPs would not function well in the roadside ditch adjacent to a steep slope due to possible slope instability caused by seepage and the extra maintenance that would be required to keep the BMP clean and functioning properly within the road right-of-way. Lower infiltration rates of the soil would also reduce the effectiveness of infiltration and filtration BMPs.

The most feasible BMP for treatment is a vegetated treatment swale, which is designed to promote sedimentation by providing a minimum hydraulic residence time within the channel under water quality flow conditions. The existing roadside ditch can be used as a treatment swale since it already has established vegetation. However, this conflicts with the guidelines that state that portions of the treatment swale cannot include a roadside ditch. Therefore, a variance is requested due to the steep slopes at the site that prevent all the runoff from the impervious paved areas from being treated in the infiltration basin and the infeasibility of constructing another type BMPs in the roadside ditch. A 107' portion of the existing roadside ditch will be designated a treatment swale, see the design calculations in Appendix D.

2.6 Basin Spillway

The infiltration basin is designed to contain the 100-year storm event without overtopping; the spillway is designed to provide for emergency flow for events higher than the 100-year storm. The spillway was modeled with a headwater elevation 0.25' higher than the crest for modeling purposes. The basin spillway will be lined with riprap as specified in the Site Development Plans.

Table 2-11: Basin Spillway Summary & Stability

100 Year Max. Flow (cfs)	100 Year Velocity (ft/s)	Spillway (weir) Width (ft)	Side Slopes (H:V ft)	Downstream Slope (%)	Allowable Shear Stress (psf)	Calculated Shear Stress (psf)
0.98	1.30	3	3	33	6	4.60

See Appendix C for spillway and shear flow calculation.

2.7 Storm Drainage System

Storm drainage collection system is modeled using Bentley CulvertMaster. A series of perforated underdrains are proposed around the transition station and the turnaround area to relieve stormwater by acting as curtain drains and aid in surface drainage. Underdrains were not modeled for the design, standard 6 inch diameter underdrains are specified, which should be adequate for subsurface drainage. Riprap outlet protection is provided at all pipe discharge locations refer to Section 2.9 for further information.

2.8 Culverts

In accordance with the New Hampshire Department of Transportation Manual on Drainage Design for Highways, all culverts are designed for the 10-year storm event. They are expected to convey the 25-year and 100-year design storm events without overtopping as they are an integral part of the stormwater system. Drainline A conveys the runoff from the transition station and a majority of the access road collected in Swale 1 to the infiltration basin. Drainline B conveys the runoff from the east portion of the site collected in Swale 2 under the access road to Swale 3 and Swale 5. Drainline C is the outlet from the infiltration basin. The culverts have been designed as to not be considered a dam. Below is a summary of the proposed culverts and design criteria. The culvert calculations were performed using Bentley CulvertMaster v3.3 and are located in Appendix C.

Table 2-12: Culverts

Culvert	Size	Material	Roughness Coefficient	Length (ft)	Slope (%)	10-Year Design Discharge (cfs)	25-Year Design Discharge (cfs)	100-Year Design Discharge (cfs)
A	24”	HDPE	0.012	41	1.00	2.07	2.73	3.90
B	18”	HDPE	0.012	75	1.00	0.53	0.89	1.73
C	18”	HDPE	0.012	25	1.00	0.59	0.99	1.82

2.9 Outlet Protection

Outlet protection is designed for the 25-year frequency design storm as required by the NH DES Stormwater Manual. Calculations for riprap apron protection are located in Appendix C.

Table 2-13: Outlet Protection

Outlet No.	Length (ft)	Depth (ft)	Width at Culvert	Width at End of Apron (ft)	Median Stone Size (in)	25-Year Flow (cfs)	25-Year Velocity (fps)
A	16	1.5	4.5	22	6	2.73	5.08
B	12	1.5	4.5	16	6	0.89	3.83
C	12	1.5	4.5	16	6	0.99	3.94

* * * * *

3.0 BEST MANAGEMENT PRACTICES

The proposed Stormwater Management System contains Best Management Practices (BMPs) that will, if maintained properly, provide treatment of Site generated stormwater runoff. The proposed BMPs are described below.

3.1 Groundwater Recharge Volume & Water Quality Volume

There are two locations that will treat the runoff from the impervious areas of the site. The first area is the infiltration basin that will treat the runoff from a portion of the paved access road and the structure and foundations on the transition station pad. The Water Quality Volume (WQV) that is required to be treated from these areas is 450 cubic feet. The infiltration basin has a volume of 873 cubic feet (does NOT include the sediment forebay volume) which above the minimum required. The second area is a treatment swale that will treat the runoff from the remaining portion of the access road that does not flow into the stormwater pond. The WQV that is required to be treated is 590 cubic feet. The Water Quality Flow (WQF) is 0.21 cfs and the treatment swale will have a residence time of 10 minutes. The Groundwater Recharge Volume (GRV) is 76 cubic feet based on 0.21 acres of Hydrologic Soil Group C replaced by impervious cover. The worksheets for the infiltration basin, treatment swale and ground water recharge volume are located in Appendix D.

3.2 Temporary Erosion Controls

During construction of the proposed station, the Contractor will be responsible for installation, implementation, and maintenance of temporary erosion and sedimentation control measures, that if implemented and maintained properly, will help to prevent off-site tracking and conveyance of waterborne loss of sediment and debris. The specific measures proposed are located in the Site Development Plans, which are under separate cover.

Temporary erosion and sedimentation controls shall not be removed until construction is complete and site stabilization is achieved.

3.3 Permanent Erosion Controls

Upon completion of construction, the Site shall be stabilized by one or more of the following measures in accordance with the Site Development Plans (under separate cover):

3.3.1 Crushed Rock/Paving

Crushed rock will be installed on the station pad and turnaround area and the access road will be paved with asphalt. Additional rock may be required during final stabilization as a result of the original crushed rock application being disturbed during construction.

3.3.2 Seeding

Any disturbed area not proposed as an impervious or gravel surface will be restored to natural meadow vegetation over 4" of topsoil. Planting and mulching of permanent seed will occur as soon as practical after final grading, placement of topsoil, and soil preparation has been completed. Seeding should occur during the growing season.

3.3.3 Stormwater Swale Lining

Stormwater swales will be lined with a permanent riprap or vegetated as to help prevent erosion.

3.3.4 Outlet Protection

Pipe outlets implement riprap outlet protection to help prevent scouring and erosion.

3.3.5 Flood Protection Analysis

Flood protection has been implemented for the detention basin as follows:

- Swales have been designed to convey the 10-year, 24-hour storm event with minimum 1.0 ft of freeboard;
- Swales have been designed to convey the 100-year, 24-hour storm event;
- Basin will detain the 2-year through 50-year, 24-hour storm event;
- An emergency spillway will be used to convey storm events larger than the 50-year storm, 24-hour event.

3.4 Antidegredation

There is no greater than 10% effective impervious cover (EIC) and no less than 65% undisturbed cover within the property boundary of the Site, therefore the Site satisfies the NHDES 1065 Rule. Refer to the Site Cover Plan located in Appendix A.

The Site stormwater runoff discharges to an Outstanding Resource Water (ORW) according to the New Hampshire Department of Environmental Services (NH DES) OneStop GIS mapper. As a result, pollutant loading calculations were performed using the NH DES standard Simple Method worksheet to demonstrate that there is no increase in Total Suspended Solids (TSS), Total Phosphorus (TP), and Total Nitrogen (TN) resulting from the Project. The pollutant loading calculations and other supporting information are located in Appendix J.

The Simple Method generates pollutant loads based on the pre- and post- drainage areas indicated on the Watershed Maps located in Appendix A. The proposed BMPs are designed to remove a percentage of the pollutants. Sub-watershed Post-Areas 1 and 3 are considered disconnected impervious areas because they drain continuously through a vegetated swale or filter strip to the property line or to the treatment BMP. The disconnected impervious credit and the treatment BMP provides water quality and limits post-development pollutant levels to less than the pre-development condition.

The Site lies within the NE Regional Mercury Total Maximum Daily Load (TMDL) according to EPA 2008 Waterbody Report for Favreau Brook. The Project is not anticipated to produce mercury byproducts, thus restrictions from the NE Regional Mercury TMDL are not applicable.

* * * * *

4.0 CONCLUSION

In order to mitigate the impacts of stormwater runoff caused by the addition of the transition station, several BMPs were implemented. Those BMPs include the addition of vegetated swales and an infiltration basin. The infiltration basin will also reduce the post-developed peak discharge rates below that of the pre-developed flows for the 2-year through the 50-year storm events. The infiltration basin utilizes one outlet control structure and emergency spillway. The outlet control structure will control up to and including the 50-year storm event. The storm events larger than the 50-year storm event will discharge through the emergency spillway. The on-site BMPs have been designed in accordance with the New Hampshire Department of Environmental Services Stormwater Manual Volumes 1, 2, & 3.

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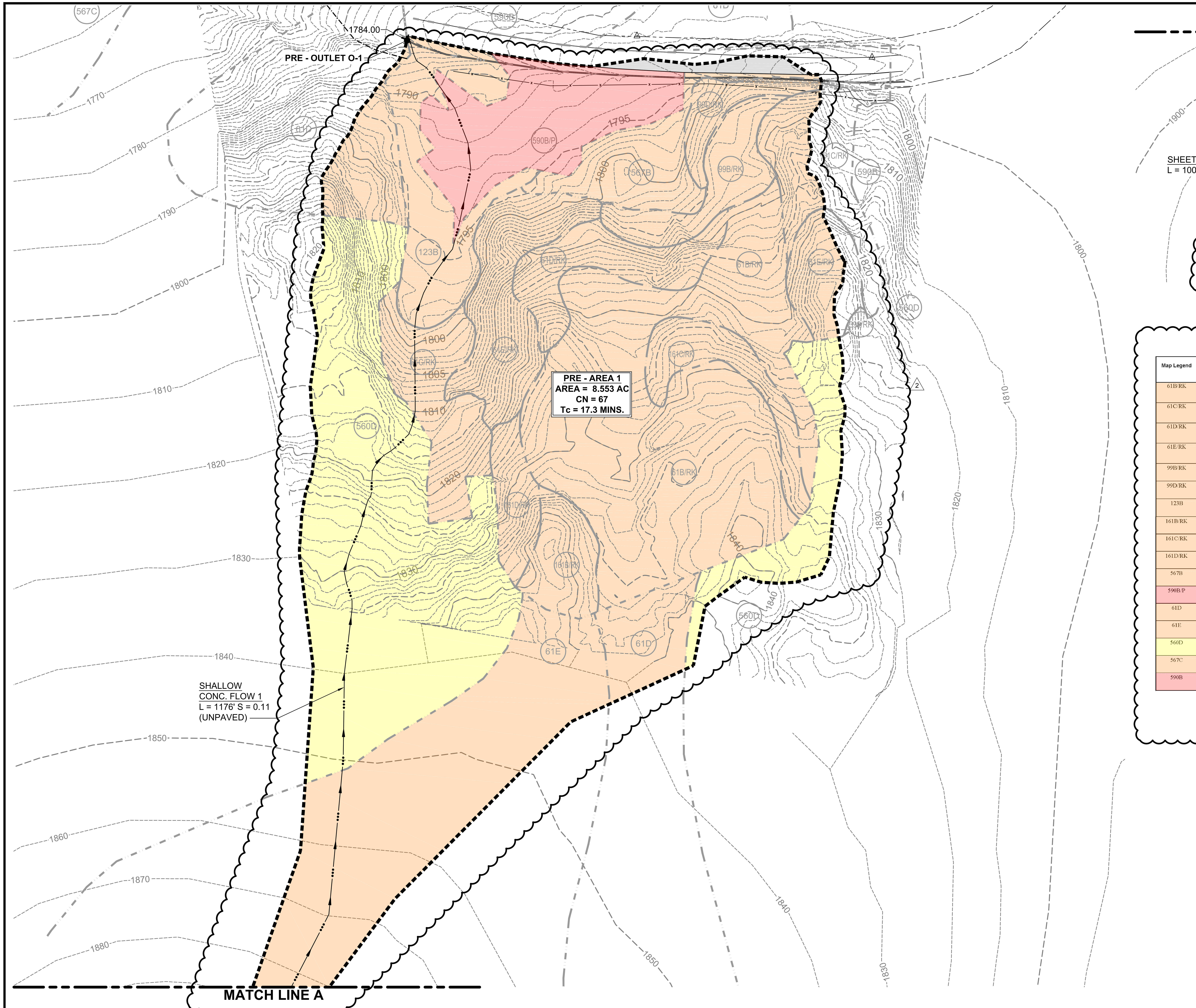
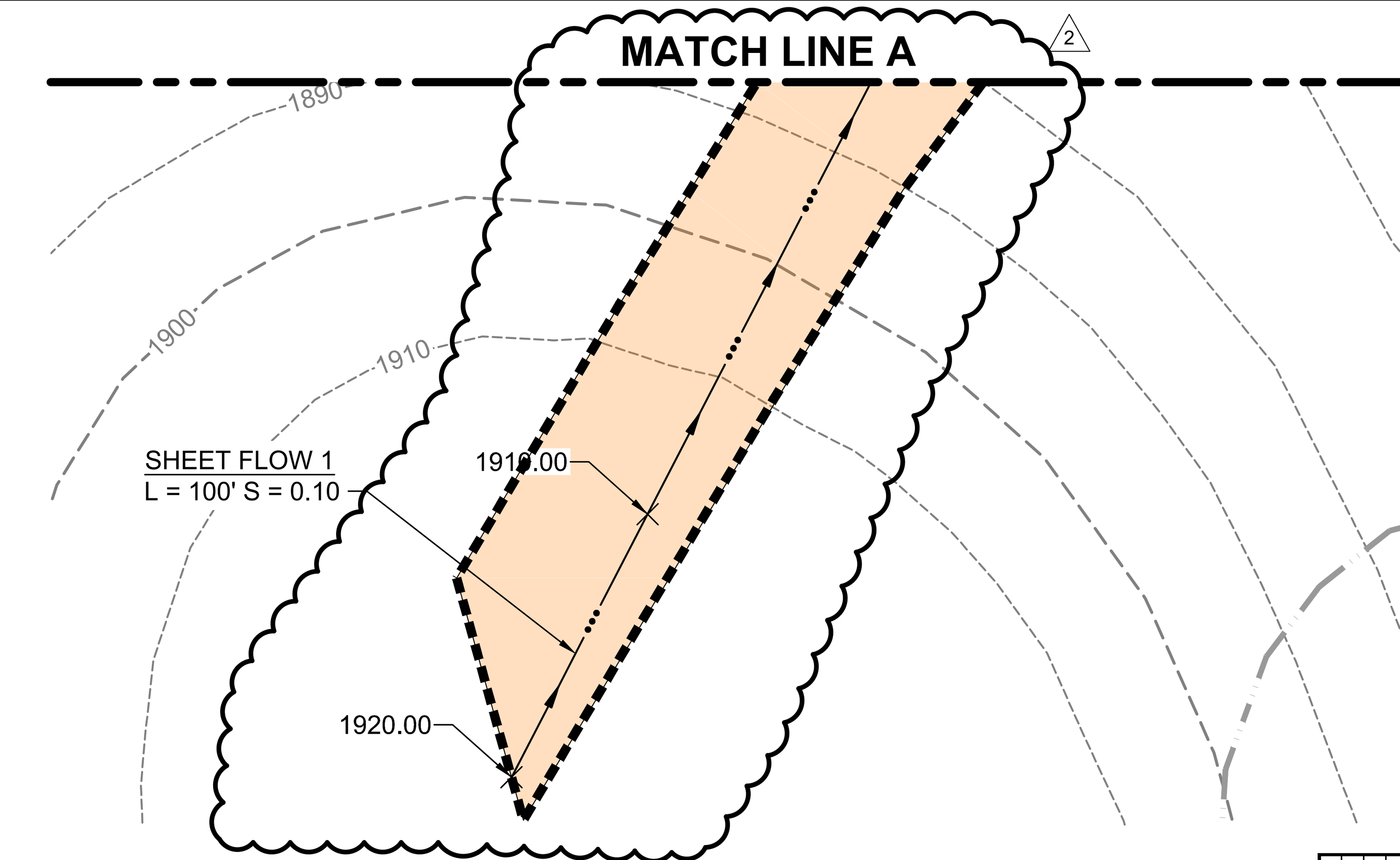
APPENDIX A – PRE- AND POST-DEVELOPMENT WATERSHED MAPS





SOIL TYPE LEGEND

Map Legend	Soil Type	Hydrologic Soil Group
61B/RK	Turnbridge – Lyman Complex-Rock Outcrop Complex, 3 to 8 percent slopes	C/A/D
61C/RK	Turnbridge – Lyman Complex-Rock Outcrop Complex, 8 to 15 percent slopes	C/A/D
61D/RK	Turnbridge – Lyman Complex-Rock Outcrop Complex, 15 to 25 percent slopes	C/A/D
61E/RK	Turnbridge – Lyman Complex-Rock Outcrop Complex, 25 to 50 percent slopes	C/A/D
99B/RK	Turnbridge, very stony, 3 to 8 percent slopes	C
99D/RK	Turnbridge, very stony, 15 to 25 percent slopes	C
123B	Telos, very stony, 3 to 9 percent slopes	C
161B/RK	Lyman-Turnbridge-Rock Outcrop Complex, 3 to 8 percent slopes	A/D/C
161C/RK	Lyman-Turnbridge-Rock Outcrop Complex, 8 to 15 percent slopes	A/D/C
161D/RK	Lyman-Turnbridge-Rock Outcrop Complex, 15 to 25 percent slopes	A/D/C
567B	Howland silt loam, Very stony, 3 to 8 percent slopes	C
590B/P	Cabot gravelly silt loam, very stony, 3 to 8 percent slopes	D
61D	Tunbridge-Lyman-Rock Outcrop Complex, 15 to 25 percent slopes	C
61E	Tunbridge-Lyman-Rock Outcrop Complex, 25 to 35 percent slopes	C
560D	Tunbridge-Plaisted-Lyman Complex, 15 to 25 percent slopes	B
567C	Howland Silt Loam, 8 to 15 percent slopes, Very Stony	C
590B	Cabot Gravelly Silt Loam, 3 to 8 percent slopes, Very Stony	D

HSG TOTAL AREA IN ACRES

HSG	AREA 1
A	-
B	1.886
C	6.087
D	0.526
WATER	-
IMPERVIOUS	0.054
TOTAL	8.553

LEGEND

- PRE-DEVELOPMENT SUB-AREA BOUNDARY
- NRCS WEB SOIL APPROX. SURVEY SOIL BOUNDARY
- TIME OF CONCENTRATION
- 140B NRCS SOIL DESIGNATION
- 380.50 SPOT ELEVATION

0 50' 100'
SCALE IN FEET

NORTH

FOR PERMITTING PURPOSES ONLY NOT FOR CONSTRUCTION

NO.	REVISION	DATE	DRWN	CHKD	APPRV.
2	REVISED PER PERMIT REVIEW COMMENTS	11/18/16	KAM	BSS	BSS
1	ISSUED FOR PERMITTING	10/1/15	JJS	RLR	BSS

SEAL

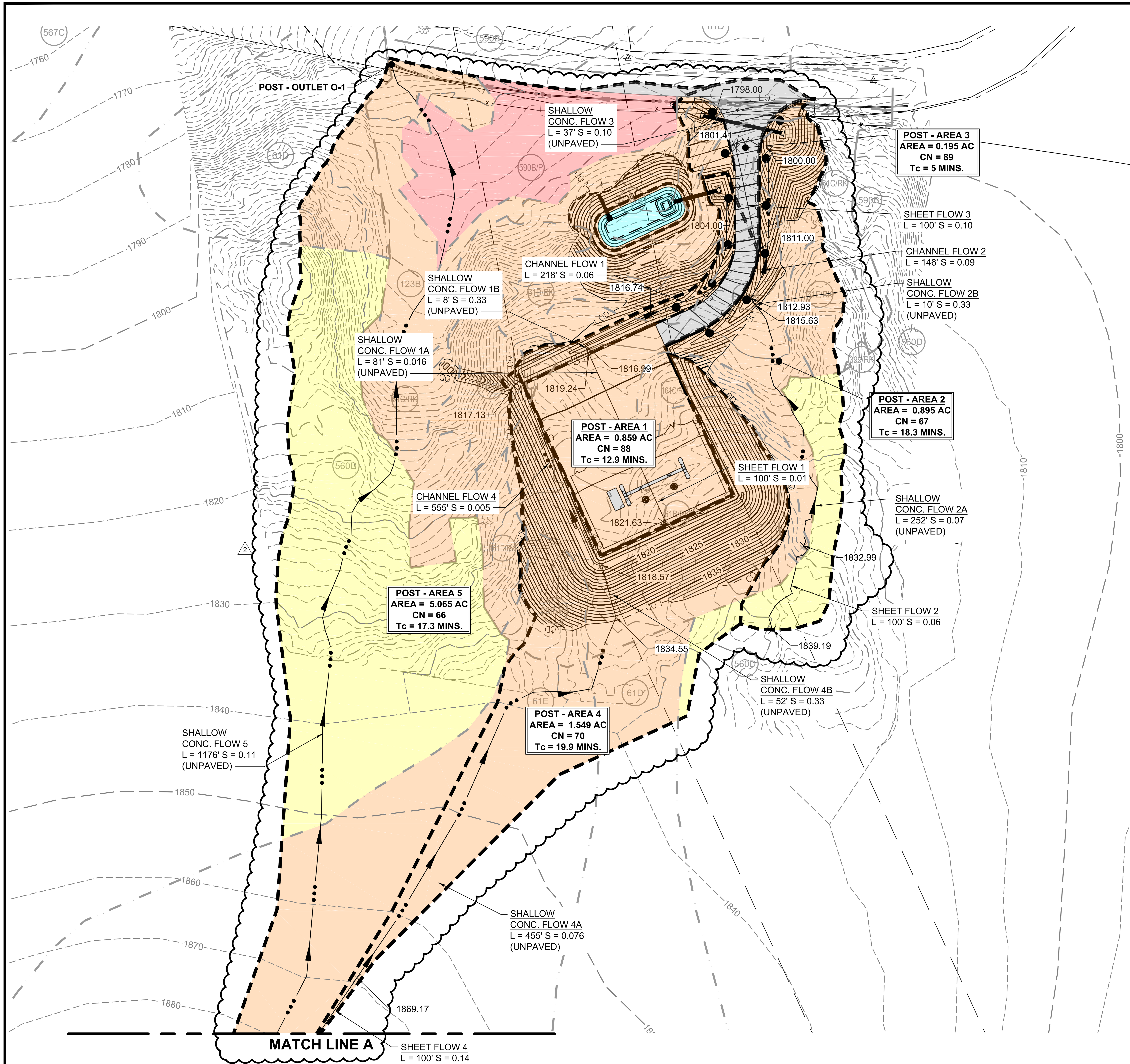
THE NORTHERN PASS
Transmission Business

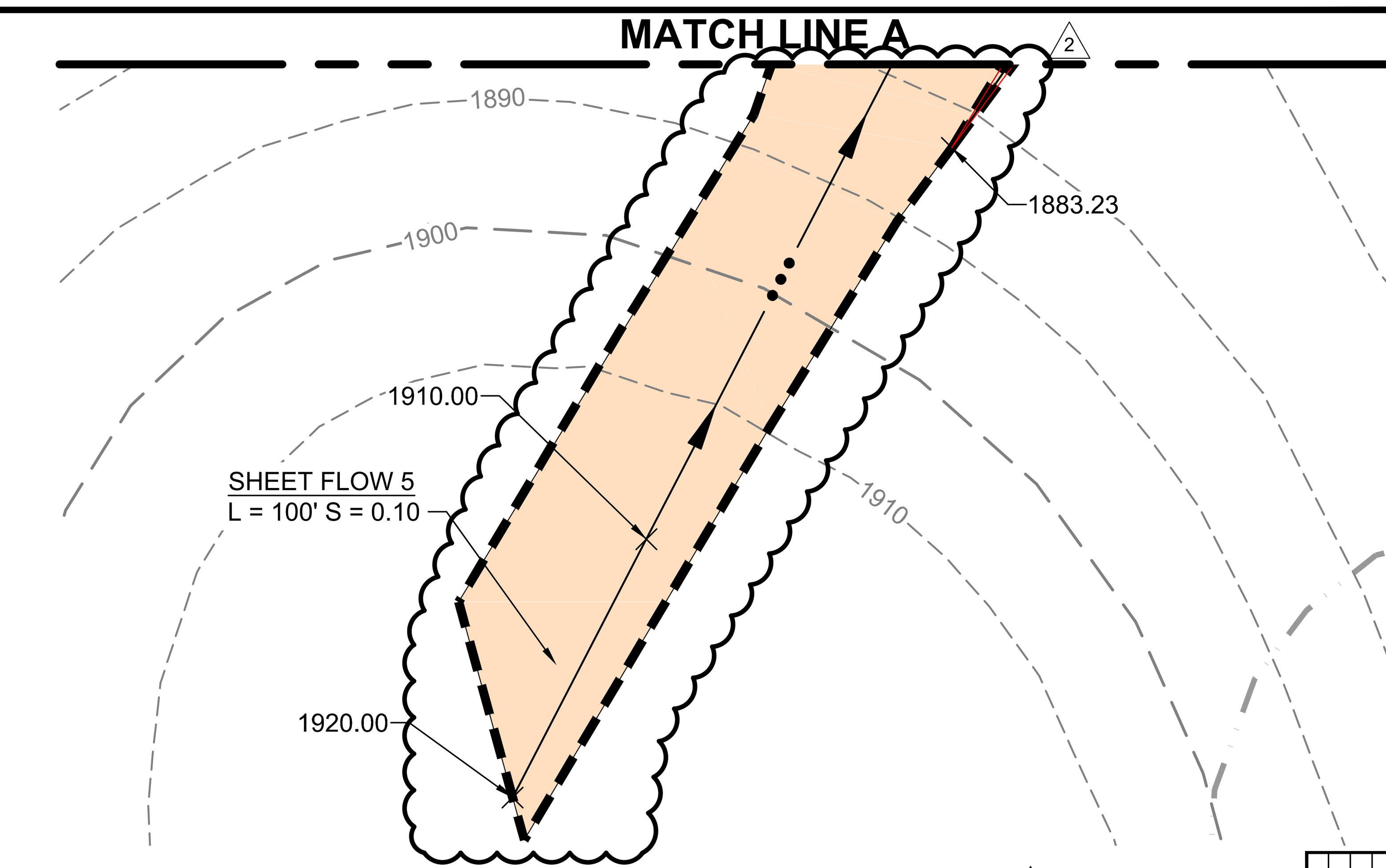
#

TRANSITION STATION #3
PRE-DEVELOPMENT
WATERSHED MAP

DATE: 10/1/2015
SCALE: 1" = 50'

DES: JJS CHK: RLR
DRW: JJS APR: BSS
TOWN: WISELL ROAD, CLARKVILLE, NH
TRANSMISSION LINE:
MILE NO:
SHEET 1 OF 2
NPTT3-WSPRE
REVISION: XXX





SOIL TYPE LEGEND

Map Legend	Soil Type	Hydrologic Soil Group
61B/RK	Turnbridge – Lyman Complex-Rock Outcrop Complex, 3 to 8 percent slopes	C/A/D
61C/RK	Turnbridge – Lyman Complex-Rock Outcrop Complex, 8 to 15 percent slopes	C/A/D
61D/RK	Turnbridge – Lyman Complex-Rock Outcrop Complex, 15 to 25 percent slopes	C/A/D
61E/RK	Turnbridge – Lyman Complex-Rock Outcrop Complex, 25 to 50 percent slopes	C/A/D
99B/RK	Turnbridge, very stony, 3 to 8 percent slopes	C
99D/RK	Turnbridge, very stony, 15 to 25 percent slopes	C
123B	Telos, very stony, 3 to 9 percent slopes	C
161B/RK	Lyman-Turnbridge-Rock Outcrop Complex, 3 to 8 percent slopes	A/D/C
161C/RK	Lyman-Turnbridge-Rock Outcrop Complex, 8 to 15 percent slopes	A/D/C
161D/RK	Lyman-Turnbridge-Rock Outcrop Complex, 15 to 25 percent slopes	A/D/C
567B	Howland silt loam, Very stony, 3 to 8 percent slopes	C
590B/P	Cabot gravelly silt loam, very stony, 3 to 8 percent slopes	D
61D	Tunbridge-Lyman-Rock Outcrop Complex, 15 to 25 percent slopes	C
61E	Tunbridge-Lyman-Rock Outcrop Complex, 25 to 35 percent slopes	C
560D	Tunbridge-Plaisted-Lyman Complex, 15 to 25 percent slopes	B
567C	Howland Silt Loam, 8 to 15 percent slopes, Very Stony	C
590B	Cabot Gravelly Silt Loam, 3 to 8 percent slopes, Very Stony	D

HSG TOTAL AREA IN ACRES

HSG	AREA 1	AREA 2	AREA 3	AREA 4	AREA 5	TOTAL
A	-	-	-	-	-	-
B	-	0.226	-	0.050	1.610	1.886
C	0.711	0.669	0.071	1.499	2.908	5.858
D	-	-	-	-	0.526	0.526
WATER	0.062	-	-	-	-	0.062
IMPERVIOUS	0.086	-	0.124	-	0.021	0.231
TOTAL	0.859	0.895	0.195	1.549	5.065	8.563

LEGEND

POST-DEVELOPMENT SUB-AREA BOUNDARY

NRCS WEB SOIL APPROX. SURVEY SOIL BOUNDARY

TIME OF CONCENTRATION

140B NRCS SOIL DESIGNATION

380.50 SPOT ELEVATION

0 50' 100'
SCALE IN FEET

NORTH

FOR PERMITTING PURPOSES ONLY NOT FOR CONSTRUCTION

NO.	REVISION	DATE	DRWN	CHKD	APPRV.
2	REVISED PER PERMIT REVIEW COMMENTS	11/18/16	KAM	BSS	RLR
1	ISSUED FOR PERMITTING	10/1/15	JJS	RLR	BSS

SEAL

A/E INFO

THE NORTHERN PASS

Transmission Business

#

TRANSITION STATION #3
POST-DEVELOPMENT WATERSHED MAP

SCALE: 1" = 50'   DATE: 10/1/2015

DES: JJS   CHK: RLR
DRW: JJS   APR: BSS

TOWN: WISWELL ROAD, CLARKSVILLE, NH

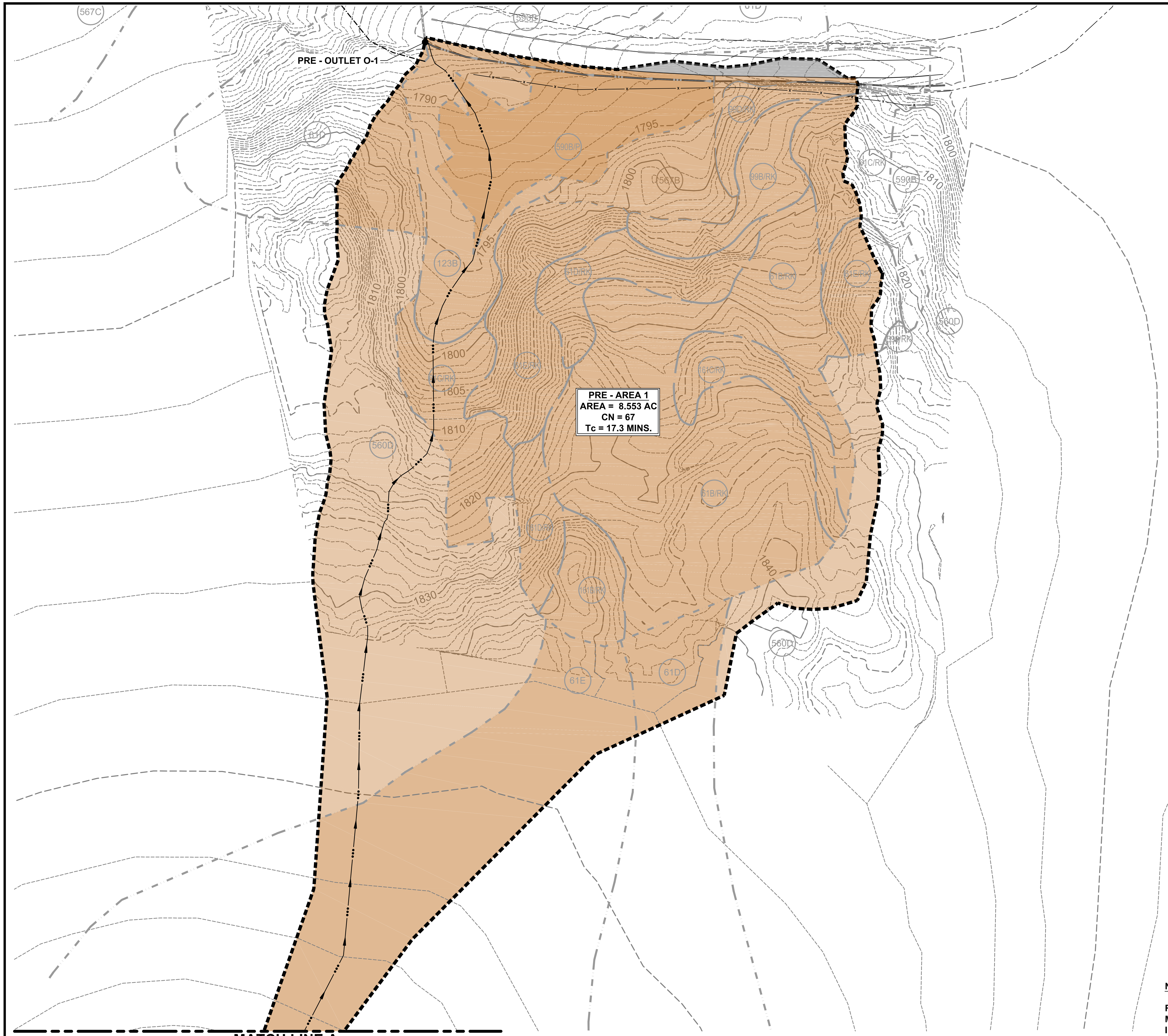
TRANSMISSION LINE:

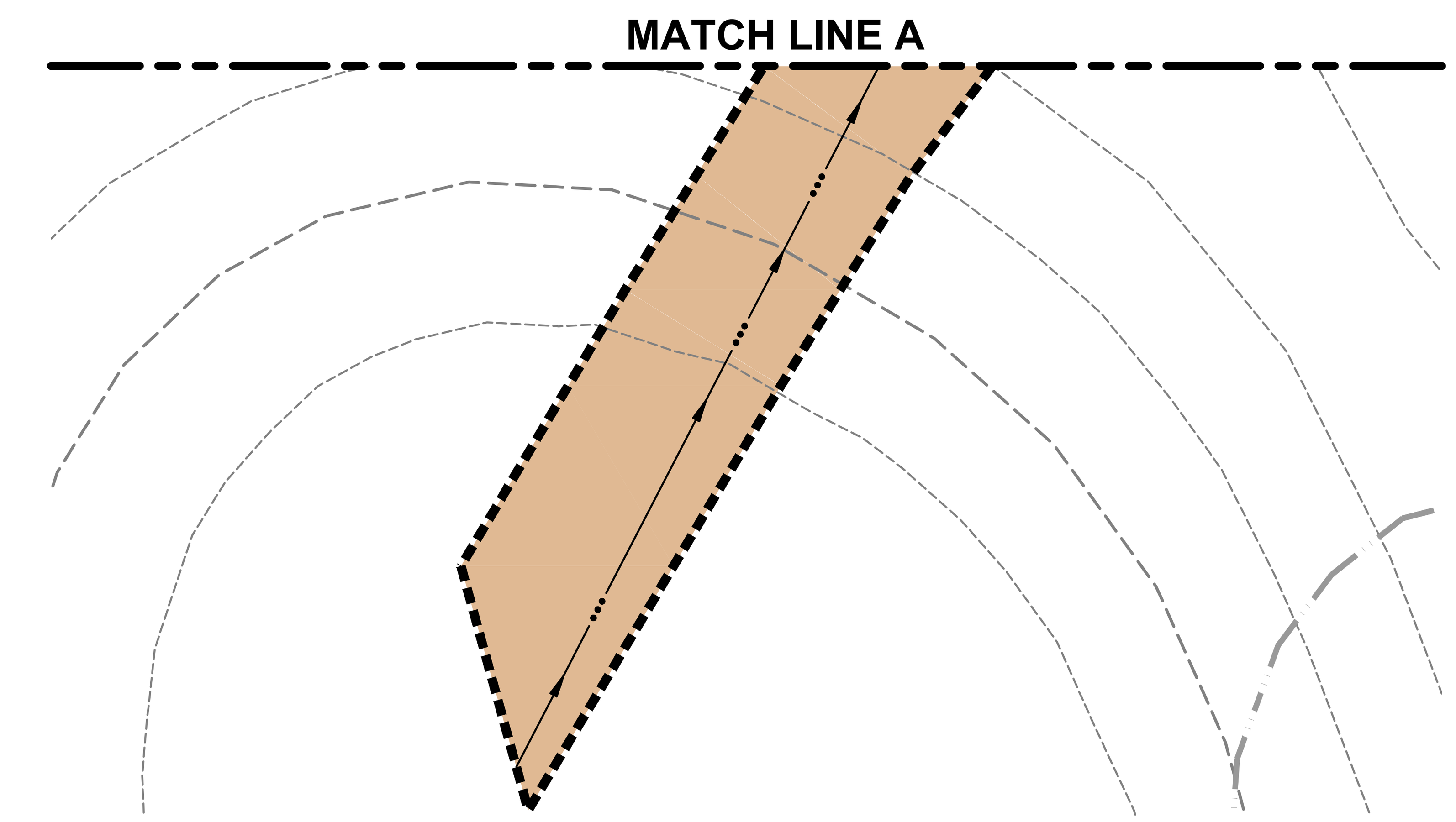
MILE NO:

SHEET 2 OF 2

NPTT3-WSPOST

REVISION: XXX





COVER TYPE TOTAL AREA IN ACRES	
COVER TYPE	AREA 1
WOODS (HSG B)	1.886
WOODS (HSG C)	6.087
WOODS (HSG D)	0.526
IMPERVIOUS (HSG C)	0.054
IMPERVIOUS (HSG D)	-
TOTAL	8.553

LEGEND

- PRE-DEVELOPMENT SUB-AREA BOUNDARY
- NRCS WEB SOIL APPROX. SURVEY SOIL BOUNDARY
- TIME OF CONCENTRATION
- 140B NRCS SOIL DESIGNATION

NOTE:

REFER TO PRE-DEVELOPMENT WATERSHED MAP DRAWING NPTT3-WSPRE FOR FURTHER INFORMATION

0 50' 100'
SCALE IN FEET

NORTH

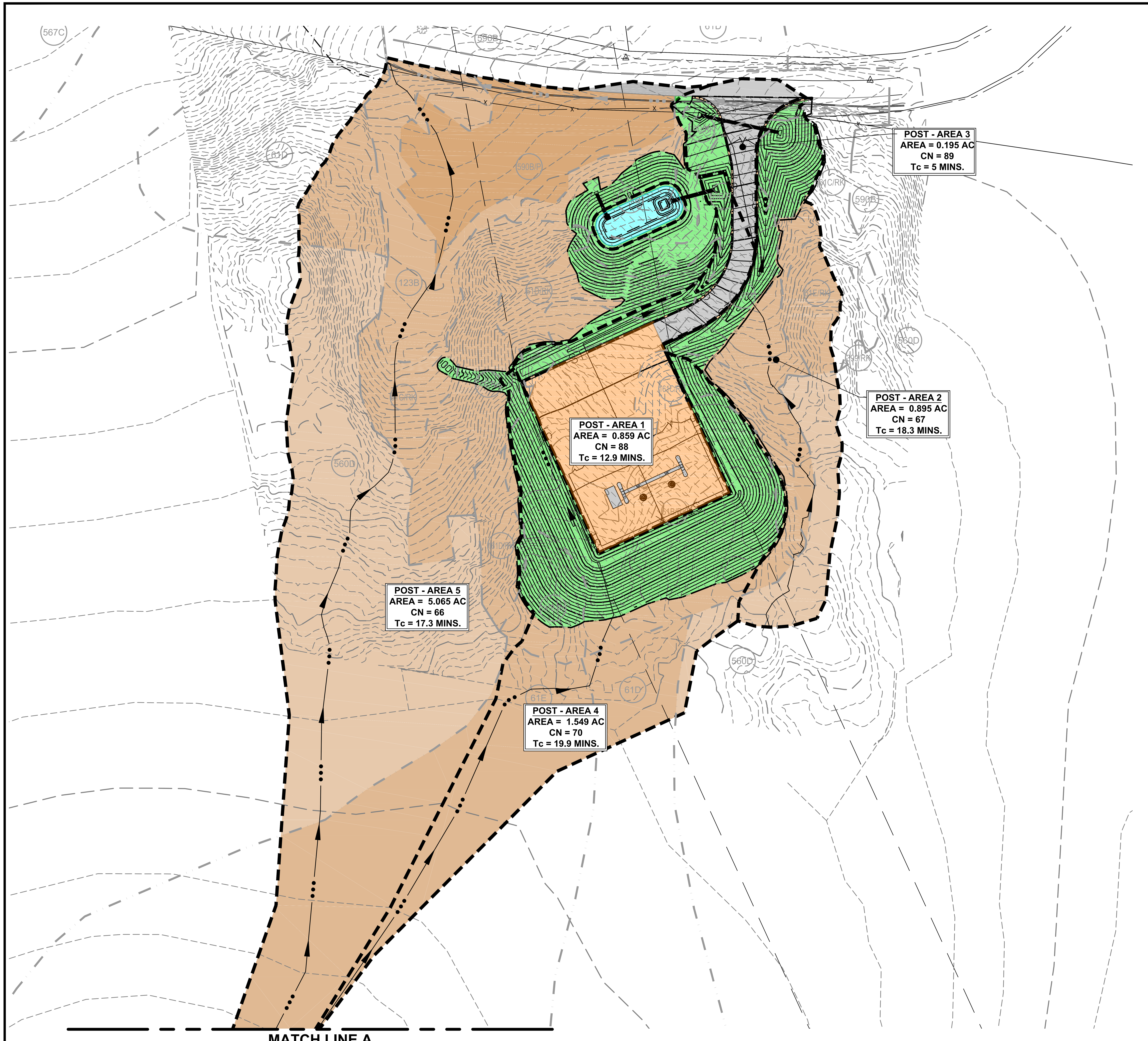
FOR PERMITTING PURPOSES ONLY NOT FOR CONSTRUCTION

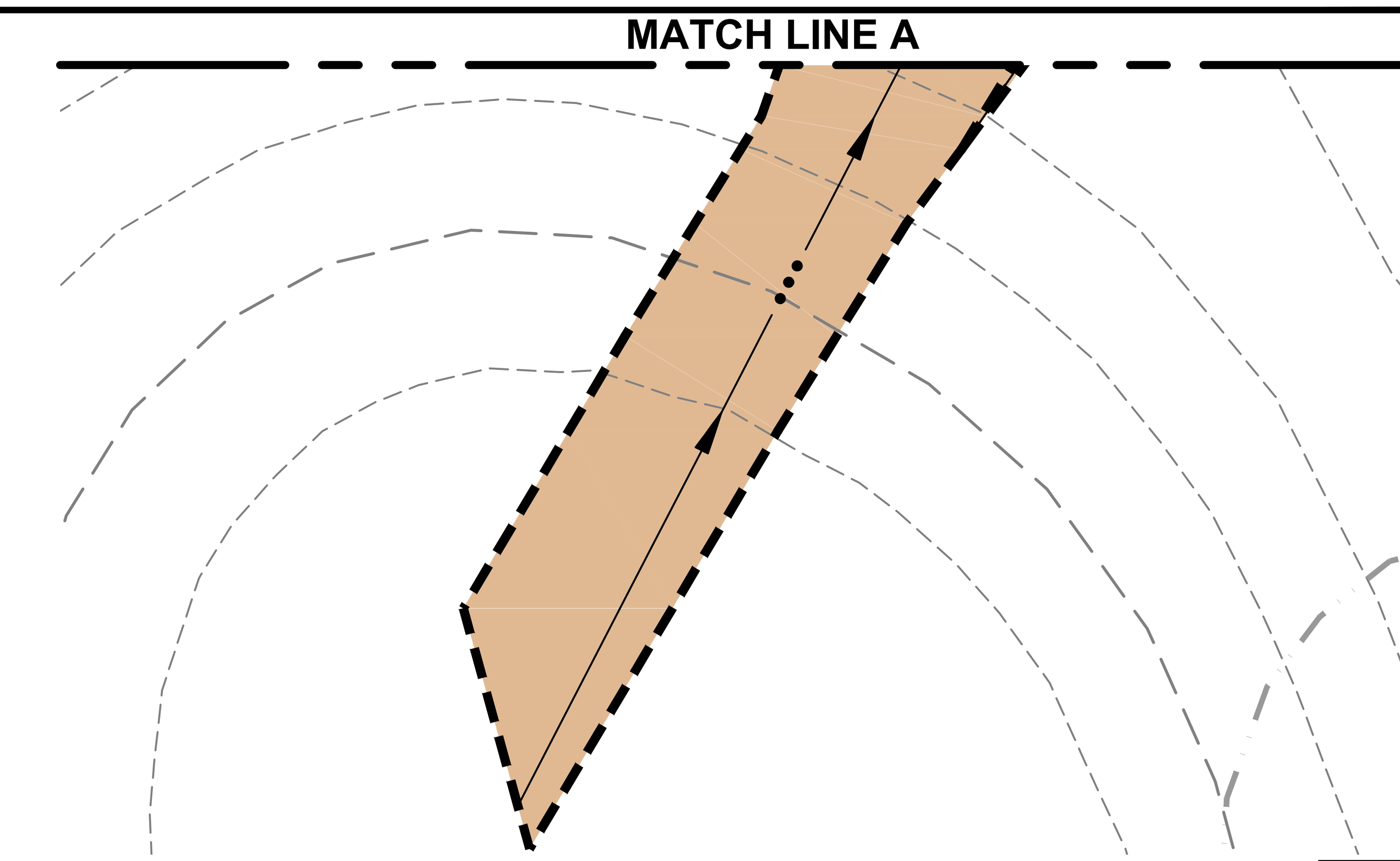
NO.	REVISION	DATE	DRAWN	CHKD	APPRV.
1	ISSUED FOR PERMITTING	11/18/2016	KAM	RLR	RLR

THE NORTHERN PASS
Transmission Business

TRANSITION STATION #3
PRE-DEVELOPMENT
COVER TYPE SUMMARY

SCALE: 1" = 50'
DATE: XX/XX/XXXX
DES: XXX CHK: XXX
DRW: XXX APR: XXX
TOWN: WIGGLE ROAD, CLARKSVILLE, NH
TRANSMISSION LINE:
MILE NO:
SHEET 1 OF 2
NPTT3-WSPRE COVER
REVISION: XXX





COVER TYPE TOTAL AREA IN ACRES						
COVER TYPE	AREA 1	AREA 2	AREA 3	AREA 4	AREA 5	TOTAL
WOODS (HSG B)	-	0.226	-	0.050	1.610	1.886
WOODS (HSG C)	-	0.450	-	0.796	2.567	3.813
WOODS (HSG D)	-	-	-	-	0.526	0.526
MEADOW (HSG C)	0.137	0.205	0.066	0.703	0.341	1.452
MEADOW (HSG D)	-	-	-	-	-	-
IMPERVIOUS (HSG C)	0.086	-	0.124	-	-	0.210
IMPERVIOUS (HSG D)	-	-	-	-	0.021	0.021
GRAVEL (HSG C)	0.574	0.014	0.005	-	-	0.593
GRAVEL (HSG D)	-	-	-	-	-	-
WATER (HSG C)	0.062	-	-	-	-	0.062
WATER (HSG D)	-	-	-	-	-	-
TOTAL	0.859	0.895	0.195	1.549	5.065	8.563

LEGEND

- POST-DEVELOPMENT SUB-AREA BOUNDARY
- NRCS WEB SOIL APPROX. SURVEY SOIL BOUNDARY
- TIME OF CONCENTRATION
- 140B NRCS SOIL DESIGNATION

NOTE:

REFER TO POST-DEVELOPMENT WATERSHED MAP DRAWING NPTT3-WSPOST FOR FURTHER INFORMATION

0 50' 100'
SCALE IN FEET

NORTH

FOR PERMITTING PURPOSES ONLY NOT FOR CONSTRUCTION

NO.	REVISION	DATE	DRWN	CHKD	APPRV.
1	ISSUED FOR PERMITTING	11/18/16	KAM	RLR	RLR

SEAL

A/E INFO

THE NORTHERN PASS

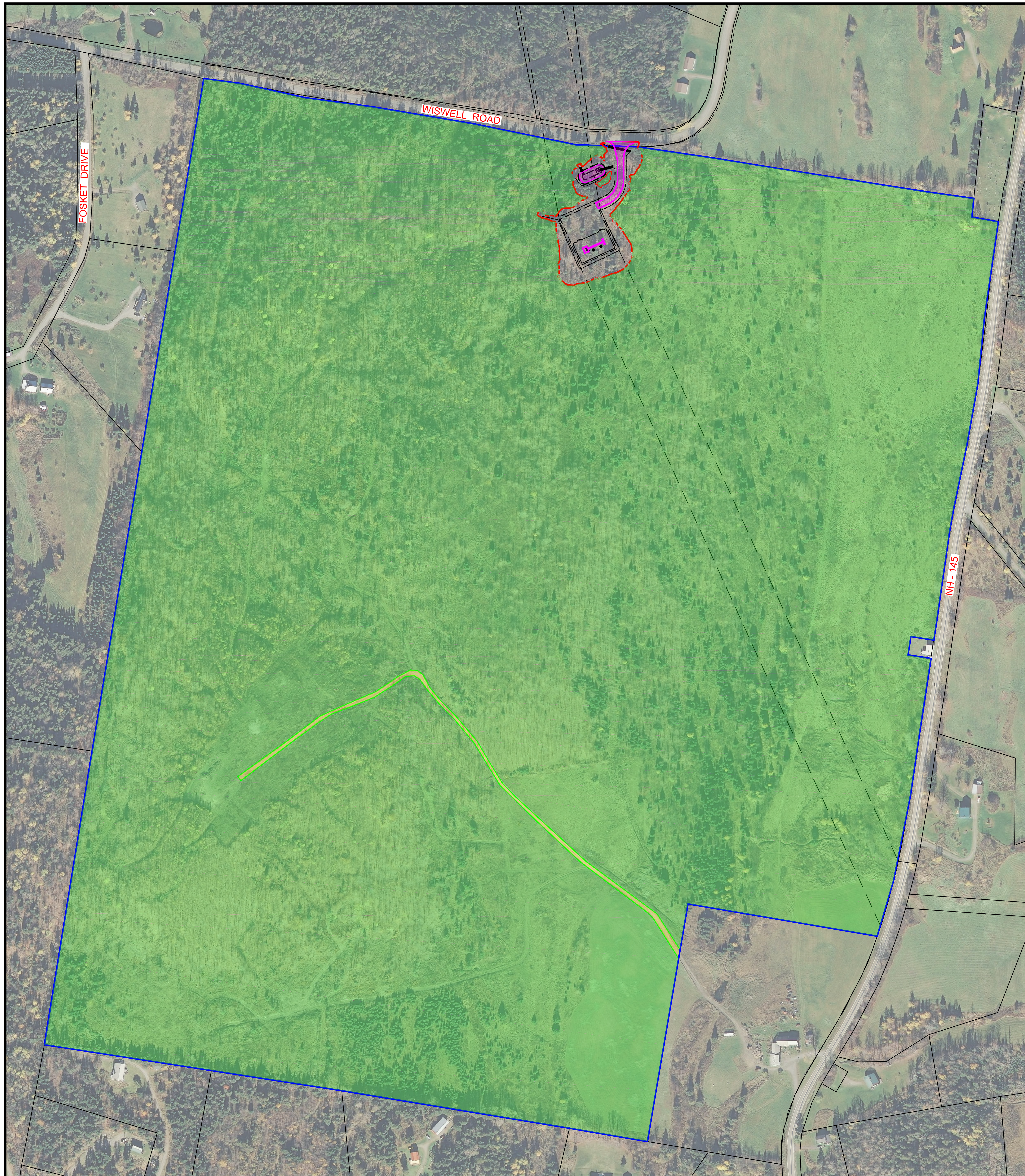
Transmission Business

#

TRANSITION STATION #3
POST-DEVELOPMENT
COVER TYPE SUMMARY

SCALE: 1" = 50'
DATE: 06/24/2016

DES: XXX CHK: XXX
DRW: XXX APR: XXX
TOWN: WISWELL ROAD, CLARKSVILLE, NH
TRANSMISSION LINE:
MILE NO:
SHEET 2 OF 2
NPTT3-WSPOST-COVER
REVISION: XXX



LEGEND

- EI - EXISTING IMPERVIOUS AREA
- UDC - UNDISTURBED COVER
- PI - PROPOSED IMPERVIOUS AREA
- DIA - PROPOSED DISCONNECTED IMPERVIOUS AREA
- EXISTING PARCEL LINE
- LOD — PROPOSED LIMIT OF DISTURBANCE LINE (LOD)

MAP REFERENCES:
1. 2011 ORTHOIMAGERY OBTAINED IN .SID FORMAT FROM NH STATEWIDE GIS CLEARINGHOUSE WEBSITE AT www.granit.unh.edu.
   TILES USED: 1045009100 & 1045009150

SITE COVER AREA			
ITEM	DESCRIPTION	AREA (SF)	AREA (AC)
PS	PARCEL SIZE	9,385,107	215.45
EI	EXISTING IMPERVIOUS	29,686	0.68
PI	PROPOSED IMPERVIOUS	10,411	0.24
PDA	PROPOSED DISTURBED AREA	98,010	2.25
UDC	UNDISTURBED COVER	9,257,411	212.52
DIA	PROPOSED DISCONNECTED IMPERVIOUS AREA	10,411	0.24

SITE COVER TABULATION			
ITEM	DESCRIPTION	FORMULA	TOTAL
TIC	TOTAL IMPERVIOUS COVER (ACRES)	EI + PI	0.92 AC
EIC	EFFECTIVE IMPERVIOUS COVER (ACRES)	TIC - DIA	0.68 AC
EIC %	EIC PERCENTAGE	EIC / PS	0.3%
UDC %	UDC PERCENTAGE	UDC / PS	98.6%

NORTH

0 200' 400'
SCALE IN FEET

FOR PERMITTING PURPOSES ONLY NOT FOR CONSTRUCTION

NO.	REVISION	DATE	DRWN	CHKD	APPRV.
2	REVISED PER PERMIT REVIEW COMMENTS	11/18/16	KAM	RLR	RLR
1	ISSUED FOR PERMITTING	10/1/15	JJS	RLR	BSS

SEAL

A/E INFO

THE NORTHERN PASS
Transmission Business

#

TRANSITION STATION #3
SITE COVER PLAN

SCALE: H 1" = 200'
DATE: 10/1/2015

DES: JJS | CHK: RLR
DRW: JJS | APR: BSS
TOWN: WISWELL ROAD, CLARKSVILLE, NH
TRANSMISSION LINE:
MILE NO:
SHEET 1 OF 1
NPTT3-SCP
REVISION: XXX

Z:\CLIENTS\TND\NUSC\58466_NPT\DESIGN\SUBSTATION\300-TRANSITION_STATION-3\CADD\CIVIL-SITE\WORKING\NPTT3-SCP.DWG 10/12/2015 1:46 PM RLREED

APPENDIX B – HYDROLOGY MODEL (PONDPACK)

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New Hampshire
Location	
Longitude	71.422 degrees West
Latitude	45.011 degrees North
Elevation	Unknown/Unavailable
Date/Time	Wed, 17 Dec 2014 12:20:43 -0500

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.27	0.42	0.52	0.68	0.85	1.04	**1yr**	0.73	0.97	1.17	1.39	1.62	1.88	2.20	**1yr**	1.67	2.12	2.53	3.13	3.74	**1yr**
2yr	0.29	0.45	0.56	0.74	0.93	1.15	**2yr**	0.80	1.05	1.30	1.57	1.87	2.21	2.55	**2yr**	1.95	2.45	2.95	3.64	4.26	**2yr**
5yr	0.34	0.53	0.67	0.89	1.14	1.42	**5yr**	0.98	1.27	1.61	1.93	2.28	2.67	3.10	**5yr**	2.36	2.98	3.54	4.28	4.96	**5yr**
10yr	0.38	0.60	0.75	1.03	1.34	1.67	**10yr**	1.15	1.47	1.90	2.27	2.66	3.09	3.59	**10yr**	2.73	3.45	4.06	4.84	5.57	**10yr**
25yr	0.44	0.71	0.90	1.24	1.65	2.07	**25yr**	1.43	1.79	2.36	2.80	3.26	3.74	4.36	**25yr**	3.31	4.19	4.87	5.71	6.50	**25yr**
50yr	0.50	0.80	1.03	1.44	1.94	2.44	**50yr**	1.68	2.07	2.78	3.29	3.81	4.32	5.05	**50yr**	3.82	4.85	5.60	6.48	7.31	**50yr**
100yr	0.57	0.92	1.19	1.68	2.28	2.88	**100yr**	1.97	2.41	3.28	3.86	4.43	5.00	5.86	**100yr**	4.43	5.63	6.44	7.35	8.23	**100yr**
200yr	0.64	1.05	1.36	1.95	2.69	3.41	**200yr**	2.32	2.80	3.87	4.54	5.17	5.79	6.80	**200yr**	5.12	6.53	7.41	8.35	9.26	**200yr**
500yr	0.77	1.26	1.64	2.39	3.35	4.24	**500yr**	2.89	3.42	4.81	5.60	6.34	7.03	8.28	**500yr**	6.22	7.96	8.93	9.89	10.85	**500yr**

Lower Confidence Limits

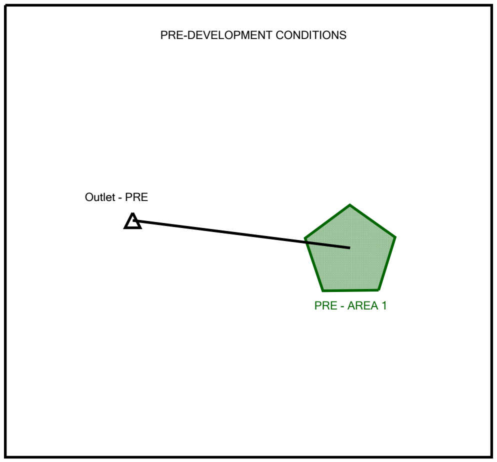
	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.22	0.34	0.41	0.56	0.68	0.88	1yr	0.59	0.86	0.88	1.12	1.49	1.65	1.99	1yr	1.46	1.92	2.24	2.80	3.32	1yr
2yr	0.28	0.43	0.53	0.72	0.88	1.03	2yr	0.76	1.01	1.14	1.38	1.72	2.13	2.47	2yr	1.89	2.38	2.86	3.53	4.15	2yr
5yr	0.31	0.48	0.59	0.81	1.03	1.19	5yr	0.89	1.17	1.32	1.65	1.98	2.47	2.86	5yr	2.18	2.75	3.28	3.99	4.65	5yr
10yr	0.33	0.51	0.63	0.88	1.14	1.33	10yr	0.98	1.30	1.48	1.86	2.21	2.73	3.17	10yr	2.42	3.05	3.62	4.35	5.04	10yr
25yr	0.36	0.55	0.68	0.98	1.29	1.54	25yr	1.11	1.51	1.73	2.11	2.54	3.13	3.61	25yr	2.77	3.47	4.10	4.85	5.57	25yr
50yr	0.38	0.58	0.72	1.03	1.39	1.72	50yr	1.20	1.68	1.94	2.29	2.81	3.45	3.98	50yr	3.05	3.82	4.48	5.26	5.97	50yr
100yr	0.40	0.61	0.76	1.10	1.51	1.92	100yr	1.30	1.88	2.17	2.49	3.12	3.80	4.36	100yr	3.36	4.19	4.89	5.67	6.40	100yr
200yr	0.43	0.64	0.81	1.18	1.64	2.16	200yr	1.42	2.11	2.44	2.68	3.44	4.17	4.77	200yr	3.69	4.58	5.32	6.11	6.83	200yr
500yr	0.46	0.68	0.88	1.27	1.81	2.52	500yr	1.56	2.47	2.85	2.98	3.91	4.69	5.32	500yr	4.15	5.12	5.90	6.69	7.35	500yr

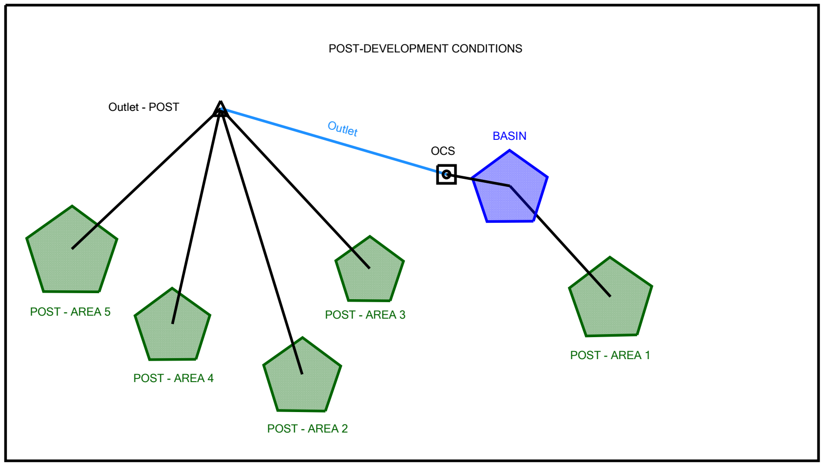
Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.30	0.46	0.57	0.76	0.94	1.09	1yr	0.81	1.06	1.21	1.49	1.77	2.06	2.44	1yr	1.82	2.34	2.78	3.40	4.04	1yr
2yr	0.30	0.47	0.58	0.78	0.96	1.12	2yr	0.83	1.10	1.25	1.56	1.83	2.28	2.66	2yr	2.02	2.55	3.06	3.75	4.40	2yr
5yr	0.36	0.56	0.70	0.96	1.22	1.37	5yr	1.05	1.34	1.53	1.88	2.36	2.88	3.33	5yr	2.55	3.21	3.80	4.57	5.26	5yr
10yr	0.42	0.65	0.81	1.13	1.46	1.64	10yr	1.26	1.60	1.84	2.26	2.72	3.45	3.99	10yr	3.05	3.84	4.49	5.32	6.08	10yr
25yr	0.53	0.81	1.01	1.44	1.89	2.09	25yr	1.63	2.04	2.36	2.93	3.43	4.37	5.08	25yr	3.87	4.88	5.64	6.54	7.37	25yr
50yr	0.62	0.95	1.18	1.70	2.29	2.49	50yr	1.98	2.44	2.85	3.58	4.10	5.23	6.09	50yr	4.63	5.85	6.70	7.66	8.54	50yr
100yr	0.74	1.12	1.41	2.03	2.79	2.98	100yr	2.41	2.92	3.43	4.38	4.92	6.27	7.31	100yr	5.55	7.03	7.97	8.98	9.91	100yr
200yr	0.89	1.34	1.70	2.45	3.42	3.56	200yr	2.95	3.48	4.15	5.35	5.88	7.51	8.78	200yr	6.64	8.44	9.48	10.54	11.51	200yr
500yr	1.13	1.68	2.16	3.15	4.47	4.53	500yr	3.86	4.43	5.33	6.96	7.48	9.54	11.19	500yr	8.44	10.76	11.95	13.05	14.04	500yr

Powered by ACIS
Northeast Regional Climate Center

Scenario: Clarksville, NH - 2 yr





Project Summary

Title	NPT Transition Station #3 Stormwater Model
Engineer	R. Reed
Company	Burns & McDonnell
Date	11/17/2016

Notes

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)
PRE - AREA 1	Clarksville, NH - 2 yr	2	0.172	12.125	1.39
PRE - AREA 1	Clarksville, NH - 10 yr	10	0.446	12.100	5.16
PRE - AREA 1	Clarksville, NH - 50 yr	50	0.955	12.075	12.43
PRE - AREA 1	Clarksville, NH - 100 yr	100	1.279	12.075	17.05
POST - AREA 5	Clarksville, NH - 2 yr	2	0.092	12.125	0.67
POST - AREA 5	Clarksville, NH - 10 yr	10	0.247	12.100	2.77
POST - AREA 5	Clarksville, NH - 50 yr	50	0.538	12.075	6.94
POST - AREA 5	Clarksville, NH - 100 yr	100	0.726	12.075	9.62
POST - AREA 4	Clarksville, NH - 2 yr	2	0.042	12.125	0.38
POST - AREA 4	Clarksville, NH - 10 yr	10	0.098	12.125	1.13
POST - AREA 4	Clarksville, NH - 50 yr	50	0.199	12.100	2.47
POST - AREA 4	Clarksville, NH - 100 yr	100	0.261	12.100	3.31
POST - AREA 1	Clarksville, NH - 2 yr	2	0.081	12.025	1.25
POST - AREA 1	Clarksville, NH - 10 yr	10	0.136	12.025	2.07
POST - AREA 1	Clarksville, NH - 50 yr	50	0.216	12.025	3.25
POST - AREA 1	Clarksville, NH - 100 yr	100	0.262	12.025	3.90
POST - AREA 3	Clarksville, NH - 2 yr	2	0.020	11.925	0.37
POST - AREA 3	Clarksville, NH - 10 yr	10	0.032	11.925	0.60
POST - AREA 3	Clarksville, NH - 50 yr	50	0.051	11.925	0.93
POST - AREA 3	Clarksville, NH - 100 yr	100	0.061	11.925	1.11
POST - AREA 2	Clarksville, NH - 2 yr	2	0.018	12.150	0.14
POST - AREA 2	Clarksville, NH - 10 yr	10	0.047	12.100	0.53
POST - AREA 2	Clarksville, NH - 50 yr	50	0.100	12.100	1.27
POST - AREA 2	Clarksville, NH - 100 yr	100	0.134	12.075	1.73

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)
Outlet - PRE	Clarksville, NH - 2 yr	2	0.172	12.125	1.39
Outlet - PRE	Clarksville, NH - 10 yr	10	0.446	12.100	5.16
Outlet - PRE	Clarksville, NH - 50 yr	50	0.955	12.075	12.43
Outlet - PRE	Clarksville, NH - 100 yr	100	1.279	12.075	17.05
Outlet - POST	Clarksville, NH - 2 yr	2	0.176	12.125	1.30
Outlet - POST	Clarksville, NH - 10 yr	10	0.452	12.100	4.78
Outlet - POST	Clarksville, NH - 50 yr	50	0.963	12.075	11.91
Outlet - POST	Clarksville, NH - 100 yr	100	1.285	12.075	16.26

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
BASIN (IN)	Clarksville, NH - 2 yr	2	0.081	12.025	1.25	(N/A)	(N/A)

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
BASIN (OUT)	Clarksville, NH - 2 yr	2	0.005	12.350	0.08	1,802.38	0.030
BASIN (IN)	Clarksville, NH - 10 yr	10	0.136	12.025	2.07	(N/A)	(N/A)
BASIN (OUT)	Clarksville, NH - 10 yr	10	0.029	12.250	0.43	1,802.84	0.049
BASIN (IN)	Clarksville, NH - 50 yr	50	0.216	12.025	3.25	(N/A)	(N/A)
BASIN (OUT)	Clarksville, NH - 50 yr	50	0.075	12.200	1.15	1,803.30	0.072
BASIN (IN)	Clarksville, NH - 100 yr	100	0.262	12.025	3.90	(N/A)	(N/A)
BASIN (OUT)	Clarksville, NH - 100 yr	100	0.103	12.200	1.40	1,803.56	0.085

Time-Depth Curve: SCS Type II - 10 yr	
Label	SCS Type II - 10 yr
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	10 years

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

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.0	0.0	0.0	0.0	0.0
1.500	0.0	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.000	0.1	0.1	0.1	0.1	0.1
3.500	0.1	0.1	0.1	0.1	0.1
4.000	0.1	0.2	0.2	0.2	0.2
4.500	0.2	0.2	0.2	0.2	0.2
5.000	0.2	0.2	0.2	0.2	0.2
5.500	0.2	0.2	0.2	0.2	0.2
6.000	0.2	0.3	0.3	0.3	0.3
6.500	0.3	0.3	0.3	0.3	0.3
7.000	0.3	0.3	0.3	0.3	0.3
7.500	0.3	0.3	0.4	0.4	0.4
8.000	0.4	0.4	0.4	0.4	0.4
8.500	0.4	0.4	0.4	0.4	0.4
9.000	0.5	0.5	0.5	0.5	0.5
9.500	0.5	0.5	0.5	0.5	0.5
10.000	0.6	0.6	0.6	0.6	0.6
10.500	0.6	0.6	0.7	0.7	0.7
11.000	0.7	0.7	0.8	0.8	0.8
11.500	0.9	0.9	1.1	1.3	1.8
12.000	2.0	2.1	2.2	2.2	2.2
12.500	2.3	2.3	2.3	2.3	2.4
13.000	2.4	2.4	2.4	2.4	2.5
13.500	2.5	2.5	2.5	2.5	2.5
14.000	2.5	2.5	2.6	2.6	2.6
14.500	2.6	2.6	2.6	2.6	2.6
15.000	2.6	2.6	2.7	2.7	2.7
15.500	2.7	2.7	2.7	2.7	2.7
16.000	2.7	2.7	2.7	2.7	2.7
16.500	2.8	2.8	2.8	2.8	2.8
17.000	2.8	2.8	2.8	2.8	2.8
17.500	2.8	2.8	2.8	2.8	2.8
18.000	2.8	2.9	2.9	2.9	2.9
18.500	2.9	2.9	2.9	2.9	2.9
19.000	2.9	2.9	2.9	2.9	2.9
19.500	2.9	2.9	2.9	2.9	2.9
20.000	2.9	2.9	2.9	3.0	3.0
20.500	3.0	3.0	3.0	3.0	3.0
21.000	3.0	3.0	3.0	3.0	3.0
21.500	3.0	3.0	3.0	3.0	3.0

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

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
22.000	3.0	3.0	3.0	3.0	3.0
22.500	3.0	3.0	3.0	3.0	3.1
23.000	3.1	3.1	3.1	3.1	3.1
23.500	3.1	3.1	3.1	3.1	3.1
24.000	3.1	(N/A)	(N/A)	(N/A)	(N/A)

Time-Depth Curve: SCS Type II - 100 yr	
Label	SCS Type II - 100 yr
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	100 years

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

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.2	0.2	0.2
3.000	0.2	0.2	0.2	0.2	0.2
3.500	0.2	0.2	0.2	0.2	0.2
4.000	0.2	0.2	0.3	0.3	0.3
4.500	0.3	0.3	0.3	0.3	0.3
5.000	0.3	0.3	0.3	0.3	0.3
5.500	0.4	0.4	0.4	0.4	0.4
6.000	0.4	0.4	0.4	0.4	0.4
6.500	0.4	0.5	0.5	0.5	0.5
7.000	0.5	0.5	0.5	0.5	0.5
7.500	0.5	0.6	0.6	0.6	0.6
8.000	0.6	0.6	0.6	0.6	0.6
8.500	0.7	0.7	0.7	0.7	0.7
9.000	0.7	0.8	0.8	0.8	0.8
9.500	0.8	0.8	0.8	0.9	0.9
10.000	0.9	0.9	0.9	1.0	1.0
10.500	1.0	1.0	1.1	1.1	1.1
11.000	1.2	1.2	1.3	1.3	1.4
11.500	1.4	1.5	1.8	2.2	2.8
12.000	3.3	3.4	3.5	3.6	3.6
12.500	3.7	3.7	3.8	3.8	3.8
13.000	3.9	3.9	3.9	3.9	4.0
13.500	4.0	4.0	4.0	4.1	4.1
14.000	4.1	4.1	4.1	4.2	4.2
14.500	4.2	4.2	4.2	4.2	4.3
15.000	4.3	4.3	4.3	4.3	4.3
15.500	4.3	4.4	4.4	4.4	4.4
16.000	4.4	4.4	4.4	4.4	4.4
16.500	4.5	4.5	4.5	4.5	4.5
17.000	4.5	4.5	4.5	4.5	4.5
17.500	4.6	4.6	4.6	4.6	4.6
18.000	4.6	4.6	4.6	4.6	4.6
18.500	4.6	4.7	4.7	4.7	4.7
19.000	4.7	4.7	4.7	4.7	4.7
19.500	4.7	4.7	4.7	4.7	4.8
20.000	4.8	4.8	4.8	4.8	4.8
20.500	4.8	4.8	4.8	4.8	4.8
21.000	4.8	4.8	4.8	4.8	4.8
21.500	4.9	4.9	4.9	4.9	4.9

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

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
22.000	4.9	4.9	4.9	4.9	4.9
22.500	4.9	4.9	4.9	4.9	4.9
23.000	4.9	4.9	5.0	5.0	5.0
23.500	5.0	5.0	5.0	5.0	5.0
24.000	5.0	(N/A)	(N/A)	(N/A)	(N/A)

Time-Depth Curve: SCS Type II - 2 yr	
Label	SCS Type II - 2 yr
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	2 years

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

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.0	0.0	0.0	0.0	0.0
1.500	0.0	0.0	0.0	0.0	0.0
2.000	0.0	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.000	0.1	0.1	0.1	0.1	0.1
3.500	0.1	0.1	0.1	0.1	0.1
4.000	0.1	0.1	0.1	0.1	0.1
4.500	0.1	0.1	0.1	0.1	0.1
5.000	0.1	0.1	0.1	0.2	0.2
5.500	0.2	0.2	0.2	0.2	0.2
6.000	0.2	0.2	0.2	0.2	0.2
6.500	0.2	0.2	0.2	0.2	0.2
7.000	0.2	0.2	0.2	0.2	0.2
7.500	0.2	0.2	0.3	0.3	0.3
8.000	0.3	0.3	0.3	0.3	0.3
8.500	0.3	0.3	0.3	0.3	0.3
9.000	0.3	0.3	0.3	0.3	0.4
9.500	0.4	0.4	0.4	0.4	0.4
10.000	0.4	0.4	0.4	0.4	0.4
10.500	0.5	0.5	0.5	0.5	0.5
11.000	0.5	0.5	0.6	0.6	0.6
11.500	0.6	0.7	0.8	1.0	1.3
12.000	1.5	1.5	1.5	1.6	1.6
12.500	1.6	1.6	1.7	1.7	1.7
13.000	1.7	1.7	1.7	1.7	1.8
13.500	1.8	1.8	1.8	1.8	1.8
14.000	1.8	1.8	1.8	1.8	1.8
14.500	1.9	1.9	1.9	1.9	1.9
15.000	1.9	1.9	1.9	1.9	1.9
15.500	1.9	1.9	1.9	1.9	1.9
16.000	1.9	1.9	2.0	2.0	2.0
16.500	2.0	2.0	2.0	2.0	2.0
17.000	2.0	2.0	2.0	2.0	2.0
17.500	2.0	2.0	2.0	2.0	2.0
18.000	2.0	2.0	2.0	2.0	2.1
18.500	2.1	2.1	2.1	2.1	2.1
19.000	2.1	2.1	2.1	2.1	2.1
19.500	2.1	2.1	2.1	2.1	2.1
20.000	2.1	2.1	2.1	2.1	2.1
20.500	2.1	2.1	2.1	2.1	2.1
21.000	2.1	2.1	2.1	2.1	2.1
21.500	2.1	2.1	2.2	2.2	2.2

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

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
22.000	2.2	2.2	2.2	2.2	2.2
22.500	2.2	2.2	2.2	2.2	2.2
23.000	2.2	2.2	2.2	2.2	2.2
23.500	2.2	2.2	2.2	2.2	2.2
24.000	2.2	(N/A)	(N/A)	(N/A)	(N/A)

Time-Depth Curve: SCS Type II - 50 yr	
Label	SCS Type II - 50 yr
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	50 years

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

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.0	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.000	0.1	0.2	0.2	0.2	0.2
3.500	0.2	0.2	0.2	0.2	0.2
4.000	0.2	0.2	0.2	0.2	0.2
4.500	0.2	0.2	0.3	0.3	0.3
5.000	0.3	0.3	0.3	0.3	0.3
5.500	0.3	0.3	0.3	0.3	0.3
6.000	0.3	0.4	0.4	0.4	0.4
6.500	0.4	0.4	0.4	0.4	0.4
7.000	0.4	0.4	0.4	0.5	0.5
7.500	0.5	0.5	0.5	0.5	0.5
8.000	0.5	0.5	0.5	0.5	0.6
8.500	0.6	0.6	0.6	0.6	0.6
9.000	0.6	0.6	0.7	0.7	0.7
9.500	0.7	0.7	0.7	0.7	0.8
10.000	0.8	0.8	0.8	0.8	0.9
10.500	0.9	0.9	0.9	1.0	1.0
11.000	1.0	1.0	1.1	1.1	1.2
11.500	1.2	1.3	1.5	1.9	2.5
12.000	2.9	2.9	3.0	3.1	3.1
12.500	3.2	3.2	3.2	3.3	3.3
13.000	3.3	3.4	3.4	3.4	3.4
13.500	3.5	3.5	3.5	3.5	3.5
14.000	3.5	3.6	3.6	3.6	3.6
14.500	3.6	3.6	3.6	3.7	3.7
15.000	3.7	3.7	3.7	3.7	3.7
15.500	3.7	3.8	3.8	3.8	3.8
16.000	3.8	3.8	3.8	3.8	3.8
16.500	3.8	3.9	3.9	3.9	3.9
17.000	3.9	3.9	3.9	3.9	3.9
17.500	3.9	3.9	4.0	4.0	4.0
18.000	4.0	4.0	4.0	4.0	4.0
18.500	4.0	4.0	4.0	4.0	4.0
19.000	4.1	4.1	4.1	4.1	4.1
19.500	4.1	4.1	4.1	4.1	4.1
20.000	4.1	4.1	4.1	4.1	4.1
20.500	4.1	4.1	4.2	4.2	4.2
21.000	4.2	4.2	4.2	4.2	4.2
21.500	4.2	4.2	4.2	4.2	4.2

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

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
22.000	4.2	4.2	4.2	4.2	4.2
22.500	4.2	4.3	4.3	4.3	4.3
23.000	4.3	4.3	4.3	4.3	4.3
23.500	4.3	4.3	4.3	4.3	4.3
24.000	4.3	(N/A)	(N/A)	(N/A)	(N/A)

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.100
Slope	0.010 ft/ft
2 Year 24 Hour Depth	2.2 in
Average Velocity	0.15 ft/s
Segment Time of Concentration	0.188 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	81.00 ft
Is Paved?	False
Slope	0.016 ft/ft
Average Velocity	2.04 ft/s
Segment Time of Concentration	0.011 hours

Segment #3: TR-55 Shallow Concentrated Flow	
Hydraulic Length	8.00 ft
Is Paved?	False
Slope	0.330 ft/ft
Average Velocity	9.27 ft/s
Segment Time of Concentration	0.000 hours

Segment #4: TR-55 Channel Flow	
Flow Area	5.0 ft²
Hydraulic Length	218.00 ft
Manning's n	0.069
Slope	0.060 ft/ft
Wetted Perimeter	8.30 ft
Average Velocity	3.77 ft/s
Segment Time of Concentration	0.016 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.215 hours

==== SCS Channel Flow

Tc =	R = Qa / Wp V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n (Lf / V) / 3600
Where:	R= Hydraulic radius Aq= Flow area, square feet Wp= Wetted perimeter, feet V= Velocity, ft/sec Sf= Slope, ft/ft n= Manning's n Tc= Time of concentration, hours Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =	Unpaved surface: V = 16.1345 * (Sf**0.5) Paved Surface: V = 20.3282 * (Sf**0.5) (Lf / V) / 3600
Where:	V= Velocity, ft/sec Sf= Slope, ft/ft Tc= Time of concentration, hours Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc =	(0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))
Where:	Tc= Time of concentration, hours n= Manning's n Lf= Flow length, feet P= 2yr, 24hr Rain depth, inches Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.400
Slope	0.060 ft/ft
2 Year 24 Hour Depth	2.2 in
Average Velocity	0.10 ft/s
Segment Time of Concentration	0.278 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	252.00 ft
Is Paved?	False
Slope	0.070 ft/ft
Average Velocity	4.27 ft/s
Segment Time of Concentration	0.016 hours

Segment #3: TR-55 Shallow Concentrated Flow	
Hydraulic Length	10.00 ft
Is Paved?	False
Slope	0.330 ft/ft
Average Velocity	9.27 ft/s
Segment Time of Concentration	0.000 hours

Segment #4: TR-55 Channel Flow	
Flow Area	5.0 ft^2
Hydraulic Length	146.00 ft
Manning's n	0.069
Slope	0.090 ft/ft
Wetted Perimeter	8.30 ft
Average Velocity	4.62 ft/s
Segment Time of Concentration	0.009 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.304 hours

==== SCS Channel Flow

Tc =	R = Qa / Wp V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n (Lf / V) / 3600
Where:	R= Hydraulic radius Aq= Flow area, square feet Wp= Wetted perimeter, feet V= Velocity, ft/sec Sf= Slope, ft/ft n= Manning's n Tc= Time of concentration, hours Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =	Unpaved surface: V = 16.1345 * (Sf**0.5) Paved Surface: V = 20.3282 * (Sf**0.5) (Lf / V) / 3600
Where:	V= Velocity, ft/sec Sf= Slope, ft/ft Tc= Time of concentration, hours Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc =	(0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))
Where:	Tc= Time of concentration, hours n= Manning's n Lf= Flow length, feet P= 2yr, 24hr Rain depth, inches Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.100
Slope	0.100 ft/ft
2 Year 24 Hour Depth	2.2 in
Average Velocity	0.37 ft/s
Segment Time of Concentration	0.075 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	37.00 ft
Is Paved?	False
Slope	0.100 ft/ft
Average Velocity	5.10 ft/s
Segment Time of Concentration	0.002 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.083 hours

==== SCS Channel Flow

Tc =

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

(Lf / V) / 3600

Where:

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

==== SCS TR-55 Shallow Concentration Flow

Tc =

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

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

(Lf / V) / 3600

Where:

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

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.400
Slope	0.140 ft/ft
2 Year 24 Hour Depth	2.2 in
Average Velocity	0.14 ft/s
Segment Time of Concentration	0.198 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	455.00 ft
Is Paved?	False
Slope	0.076 ft/ft
Average Velocity	4.45 ft/s
Segment Time of Concentration	0.028 hours

Segment #3: TR-55 Shallow Concentrated Flow	
Hydraulic Length	52.00 ft
Is Paved?	False
Slope	0.310 ft/ft
Average Velocity	8.98 ft/s
Segment Time of Concentration	0.002 hours

Segment #4: TR-55 Channel Flow	
Flow Area	5.0 ft^2
Hydraulic Length	555.00 ft
Manning's n	0.050
Slope	0.005 ft/ft
Wetted Perimeter	8.30 ft
Average Velocity	1.50 ft/s
Segment Time of Concentration	0.103 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.331 hours

==== SCS Channel Flow

Tc =	R = Qa / Wp V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n (Lf / V) / 3600
Where:	R= Hydraulic radius Aq= Flow area, square feet Wp= Wetted perimeter, feet V= Velocity, ft/sec Sf= Slope, ft/ft n= Manning's n Tc= Time of concentration, hours Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =	Unpaved surface: V = 16.1345 * (Sf**0.5) Paved Surface: V = 20.3282 * (Sf**0.5) (Lf / V) / 3600
Where:	V= Velocity, ft/sec Sf= Slope, ft/ft Tc= Time of concentration, hours Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc =	(0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))
Where:	Tc= Time of concentration, hours n= Manning's n Lf= Flow length, feet P= 2yr, 24hr Rain depth, inches Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.400
Slope	0.100 ft/ft
2 Year 24 Hour Depth	2.2 in
Average Velocity	0.12 ft/s
Segment Time of Concentration	0.227 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,176.00 ft
Is Paved?	False
Slope	0.110 ft/ft
Average Velocity	5.35 ft/s
Segment Time of Concentration	0.061 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.288 hours

==== SCS Channel Flow

Tc =	R = Qa / Wp V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n (Lf / V) / 3600
Where:	R= Hydraulic radius Aq= Flow area, square feet Wp= Wetted perimeter, feet V= Velocity, ft/sec Sf= Slope, ft/ft n= Manning's n Tc= Time of concentration, hours Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =	Unpaved surface: V = 16.1345 * (Sf**0.5) Paved Surface: V = 20.3282 * (Sf**0.5) (Lf / V) / 3600
Where:	V= Velocity, ft/sec Sf= Slope, ft/ft Tc= Time of concentration, hours Lf= Flow length, feet

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.400
Slope	0.100 ft/ft
2 Year 24 Hour Depth	2.2 in
Average Velocity	0.12 ft/s
Segment Time of Concentration	0.227 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,176.00 ft
Is Paved?	False
Slope	0.110 ft/ft
Average Velocity	5.35 ft/s
Segment Time of Concentration	0.061 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.288 hours

==== SCS Channel Flow

Tc =	R = Qa / Wp V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n (Lf / V) / 3600
Where:	R= Hydraulic radius Aq= Flow area, square feet Wp= Wetted perimeter, feet V= Velocity, ft/sec Sf= Slope, ft/ft n= Manning's n Tc= Time of concentration, hours Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =	Unpaved surface: V = 16.1345 * (Sf**0.5) Paved Surface: V = 20.3282 * (Sf**0.5) (Lf / V) / 3600
Where:	V= Velocity, ft/sec Sf= Slope, ft/ft Tc= Time of concentration, hours Lf= Flow length, feet

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Meadow - cont. grass (non grazed) - ---- - Soil C	71.000	0.137	0.0	0.0	71.000
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil C	98.000	0.086	0.0	0.0	98.000
Impervious Areas - Gravel (w/ right-of-way) - Soil C	89.000	0.574	0.0	0.0	89.000
Impervious - Basin	98.000	0.062	0.0	0.0	98.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	0.859	(N/A)	(N/A)	87.680

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Woods - good - Soil B	55.000	0.226	0.0	0.0	55.000
Woods - good - Soil C	70.000	0.450	0.0	0.0	70.000
Meadow - cont. grass (non grazed) - ---- - Soil C	71.000	0.205	0.0	0.0	71.000
Impervious Areas - Gravel (w/ right-of-way) - Soil C	89.000	0.014	0.0	0.0	89.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	0.895	(N/A)	(N/A)	66.739

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Meadow - cont. grass (non grazed) - ---- - Soil C	71.000	0.066	0.0	0.0	71.000
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil C	98.000	0.124	0.0	0.0	98.000
Impervious Areas - Gravel (w/ right-of-way) - Soil C	89.000	0.005	0.0	0.0	89.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	0.195	(N/A)	(N/A)	88.631

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Woods - good - Soil B	55.000	0.050	0.0	0.0	55.000
Woods - good - Soil C	70.000	0.796	0.0	0.0	70.000
Meadow - cont. grass (non grazed) - ---- - Soil C	71.000	0.703	0.0	0.0	71.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	1.549	(N/A)	(N/A)	69.970

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Woods - good - Soil B	55.000	1.610	0.0	0.0	55.000
Woods - good - Soil C	70.000	2.567	0.0	0.0	70.000
Woods - good - Soil D	77.000	0.526	0.0	0.0	77.000
Meadow - cont. grass (non grazed) - ---- - Soil C	71.000	0.341	0.0	0.0	71.000
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	0.021	0.0	0.0	98.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	5.065	(N/A)	(N/A)	66.142

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Woods - good - Soil B	55.000	1.886	0.0	0.0	55.000
Woods - good - Soil C	70.000	6.087	0.0	0.0	70.000
Woods - good - Soil D	77.000	0.526	0.0	0.0	77.000
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil C	98.000	0.054	0.0	0.0	98.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	8.553	(N/A)	(N/A)	67.300

Storm Event	SCS Type II - 2 yr
Return Event	2 years
Duration	24.000 hours
Depth	2.2 in
Time of Concentration (Composite)	0.215 hours
Area (User Defined)	0.859 acres

Computational Time Increment	0.029 hours
Time to Peak (Computed)	12.022 hours
Flow (Peak, Computed)	1.25 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	12.025 hours
Flow (Peak Interpolated Output)	1.25 ft³/s

Drainage Area	
SCS CN (Composite)	88.000
Area (User Defined)	0.859 acres
Maximum Retention (Pervious)	1.4 in
Maximum Retention (Pervious, 20 percent)	0.3 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.1 in
Runoff Volume (Pervious)	0.081 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.081 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.215 hours
Computational Time Increment	0.029 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	4.52 ft³/s
Unit peak time, Tp	0.143 hours
Unit receding limb, Tr	0.574 hours
Total unit time, Tb	0.717 hours

Storm Event	SCS Type II - 2 yr
Return Event	2 years
Duration	24.000 hours
Depth	2.2 in
Time of Concentration (Composite)	0.215 hours
Area (User Defined)	0.859 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

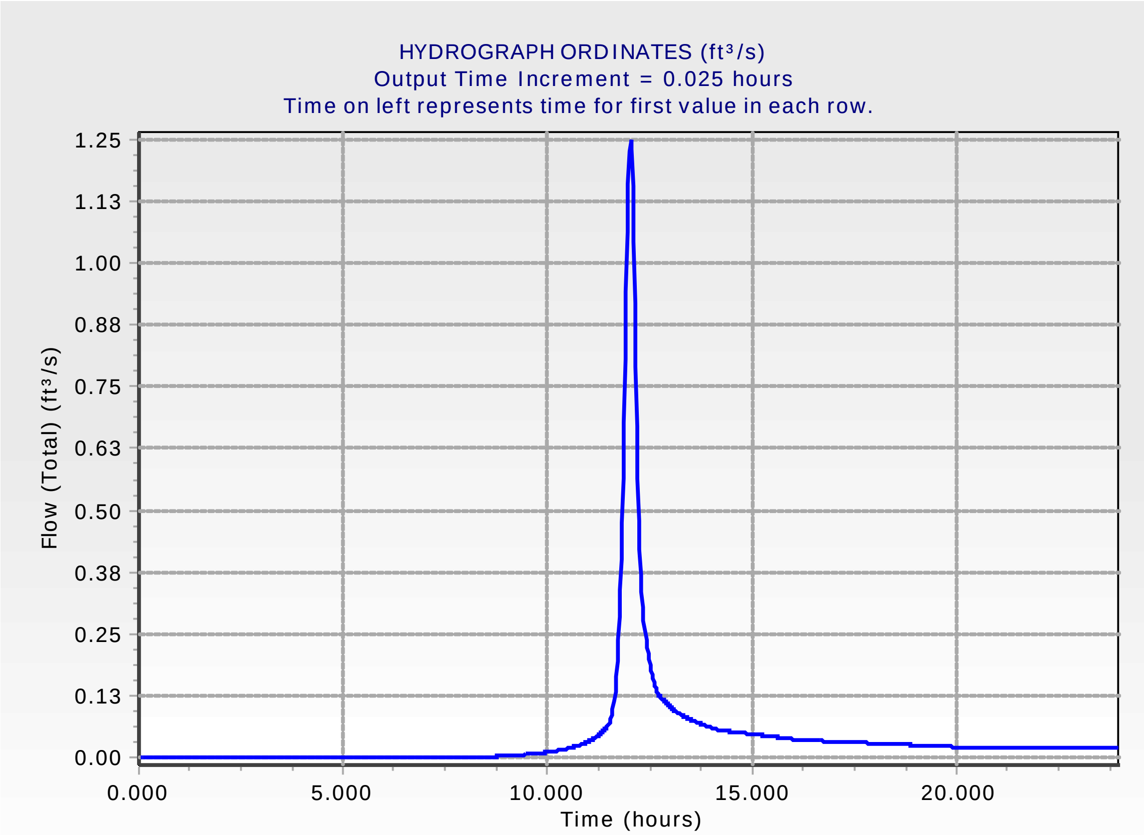
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
8.575	0.00	0.00	0.00	0.00	0.00
8.700	0.00	0.00	0.00	0.00	0.00
8.825	0.00	0.00	0.00	0.00	0.00
8.950	0.00	0.00	0.00	0.00	0.00
9.075	0.00	0.00	0.00	0.00	0.00
9.200	0.00	0.00	0.00	0.00	0.01
9.325	0.01	0.01	0.01	0.01	0.01
9.450	0.01	0.01	0.01	0.01	0.01
9.575	0.01	0.01	0.01	0.01	0.01
9.700	0.01	0.01	0.01	0.01	0.01
9.825	0.01	0.01	0.01	0.01	0.01
9.950	0.01	0.01	0.01	0.01	0.01
10.075	0.01	0.01	0.01	0.01	0.01
10.200	0.01	0.01	0.01	0.01	0.01
10.325	0.02	0.02	0.02	0.02	0.02
10.450	0.02	0.02	0.02	0.02	0.02
10.575	0.02	0.02	0.02	0.02	0.02
10.700	0.02	0.02	0.02	0.02	0.03
10.825	0.03	0.03	0.03	0.03	0.03
10.950	0.03	0.03	0.03	0.03	0.03
11.075	0.04	0.04	0.04	0.04	0.04
11.200	0.04	0.04	0.05	0.05	0.05
11.325	0.05	0.05	0.06	0.06	0.06
11.450	0.06	0.06	0.07	0.07	0.08
11.575	0.09	0.10	0.11	0.13	0.16
11.700	0.20	0.24	0.28	0.34	0.40
11.825	0.48	0.56	0.68	0.81	0.94
11.950	1.06	1.16	1.23	1.25	1.23
12.075	1.16	1.05	0.92	0.79	0.67
12.200	0.56	0.48	0.42	0.37	0.33
12.325	0.30	0.28	0.26	0.24	0.22
12.450	0.21	0.20	0.19	0.18	0.17
12.575	0.16	0.15	0.14	0.14	0.13
12.700	0.13	0.13	0.12	0.12	0.12
12.825	0.12	0.11	0.11	0.11	0.11
12.950	0.11	0.10	0.10	0.10	0.10
13.075	0.10	0.09	0.09	0.09	0.09
13.200	0.09	0.09	0.09	0.09	0.08
13.325	0.08	0.08	0.08	0.08	0.08
13.450	0.08	0.08	0.08	0.08	0.07
13.575	0.07	0.07	0.07	0.07	0.07
13.700	0.07	0.07	0.07	0.07	0.07
13.825	0.07	0.06	0.06	0.06	0.06

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
13.950	0.06	0.06	0.06	0.06	0.06
14.075	0.06	0.06	0.06	0.06	0.06
14.200	0.06	0.06	0.05	0.05	0.05
14.325	0.05	0.05	0.05	0.05	0.05
14.450	0.05	0.05	0.05	0.05	0.05
14.575	0.05	0.05	0.05	0.05	0.05
14.700	0.05	0.05	0.05	0.05	0.05
14.825	0.05	0.05	0.05	0.05	0.05
14.950	0.05	0.05	0.05	0.05	0.05
15.075	0.05	0.05	0.05	0.05	0.05
15.200	0.05	0.04	0.04	0.04	0.04
15.325	0.04	0.04	0.04	0.04	0.04
15.450	0.04	0.04	0.04	0.04	0.04
15.575	0.04	0.04	0.04	0.04	0.04
15.700	0.04	0.04	0.04	0.04	0.04
15.825	0.04	0.04	0.04	0.04	0.04
15.950	0.04	0.04	0.04	0.04	0.04
16.075	0.04	0.04	0.04	0.04	0.04
16.200	0.04	0.04	0.03	0.03	0.03
16.325	0.03	0.03	0.03	0.03	0.03
16.450	0.03	0.03	0.03	0.03	0.03
16.575	0.03	0.03	0.03	0.03	0.03
16.700	0.03	0.03	0.03	0.03	0.03
16.825	0.03	0.03	0.03	0.03	0.03
16.950	0.03	0.03	0.03	0.03	0.03
17.075	0.03	0.03	0.03	0.03	0.03
17.200	0.03	0.03	0.03	0.03	0.03
17.325	0.03	0.03	0.03	0.03	0.03
17.450	0.03	0.03	0.03	0.03	0.03
17.575	0.03	0.03	0.03	0.03	0.03
17.700	0.03	0.03	0.03	0.03	0.03
17.825	0.03	0.03	0.03	0.03	0.03
17.950	0.03	0.03	0.03	0.03	0.03
18.075	0.03	0.03	0.03	0.03	0.03
18.200	0.03	0.03	0.03	0.03	0.03
18.325	0.03	0.03	0.03	0.03	0.03
18.450	0.03	0.03	0.03	0.03	0.03
18.575	0.03	0.03	0.03	0.03	0.03
18.700	0.03	0.03	0.03	0.03	0.03
18.825	0.03	0.03	0.03	0.03	0.03
18.950	0.02	0.02	0.02	0.02	0.02
19.075	0.02	0.02	0.02	0.02	0.02
19.200	0.02	0.02	0.02	0.02	0.02
19.325	0.02	0.02	0.02	0.02	0.02
19.450	0.02	0.02	0.02	0.02	0.02
19.575	0.02	0.02	0.02	0.02	0.02
19.700	0.02	0.02	0.02	0.02	0.02
19.825	0.02	0.02	0.02	0.02	0.02
19.950	0.02	0.02	0.02	0.02	0.02
20.075	0.02	0.02	0.02	0.02	0.02
20.200	0.02	0.02	0.02	0.02	0.02
20.325	0.02	0.02	0.02	0.02	0.02

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
20.450	0.02	0.02	0.02	0.02	0.02
20.575	0.02	0.02	0.02	0.02	0.02
20.700	0.02	0.02	0.02	0.02	0.02
20.825	0.02	0.02	0.02	0.02	0.02
20.950	0.02	0.02	0.02	0.02	0.02
21.075	0.02	0.02	0.02	0.02	0.02
21.200	0.02	0.02	0.02	0.02	0.02
21.325	0.02	0.02	0.02	0.02	0.02
21.450	0.02	0.02	0.02	0.02	0.02
21.575	0.02	0.02	0.02	0.02	0.02
21.700	0.02	0.02	0.02	0.02	0.02
21.825	0.02	0.02	0.02	0.02	0.02
21.950	0.02	0.02	0.02	0.02	0.02
22.075	0.02	0.02	0.02	0.02	0.02
22.200	0.02	0.02	0.02	0.02	0.02
22.325	0.02	0.02	0.02	0.02	0.02
22.450	0.02	0.02	0.02	0.02	0.02
22.575	0.02	0.02	0.02	0.02	0.02
22.700	0.02	0.02	0.02	0.02	0.02
22.825	0.02	0.02	0.02	0.02	0.02
22.950	0.02	0.02	0.02	0.02	0.02
23.075	0.02	0.02	0.02	0.02	0.02
23.200	0.02	0.02	0.02	0.02	0.02
23.325	0.02	0.02	0.02	0.02	0.02
23.450	0.02	0.02	0.02	0.02	0.02
23.575	0.02	0.02	0.02	0.02	0.02
23.700	0.02	0.02	0.02	0.02	0.02
23.825	0.02	0.02	0.02	0.02	0.02
23.950	0.02	0.02	0.02	(N/A)	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
Flow (Total) (ft³/s)
1.25
1.13
1.00
0.88
0.75
0.63
0.50
0.38
0.25
0.13
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)

Storm Event	SCS Type II - 10 yr
Return Event	10 years
Duration	24.000 hours
Depth	3.1 in
Time of Concentration (Composite)	0.215 hours
Area (User Defined)	0.859 acres

Computational Time Increment	0.029 hours
Time to Peak (Computed)	12.022 hours
Flow (Peak, Computed)	2.08 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	12.025 hours
Flow (Peak Interpolated Output)	2.07 ft³/s

Drainage Area	
SCS CN (Composite)	88.000
Area (User Defined)	0.859 acres
Maximum Retention (Pervious)	1.4 in
Maximum Retention (Pervious, 20 percent)	0.3 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.9 in
Runoff Volume (Pervious)	0.136 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.136 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.215 hours
Computational Time Increment	0.029 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	4.52 ft³/s
Unit peak time, Tp	0.143 hours
Unit receding limb, Tr	0.574 hours
Total unit time, Tb	0.717 hours

Storm Event	SCS Type II - 10 yr
Return Event	10 years
Duration	24.000 hours
Depth	3.1 in
Time of Concentration (Composite)	0.215 hours
Area (User Defined)	0.859 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

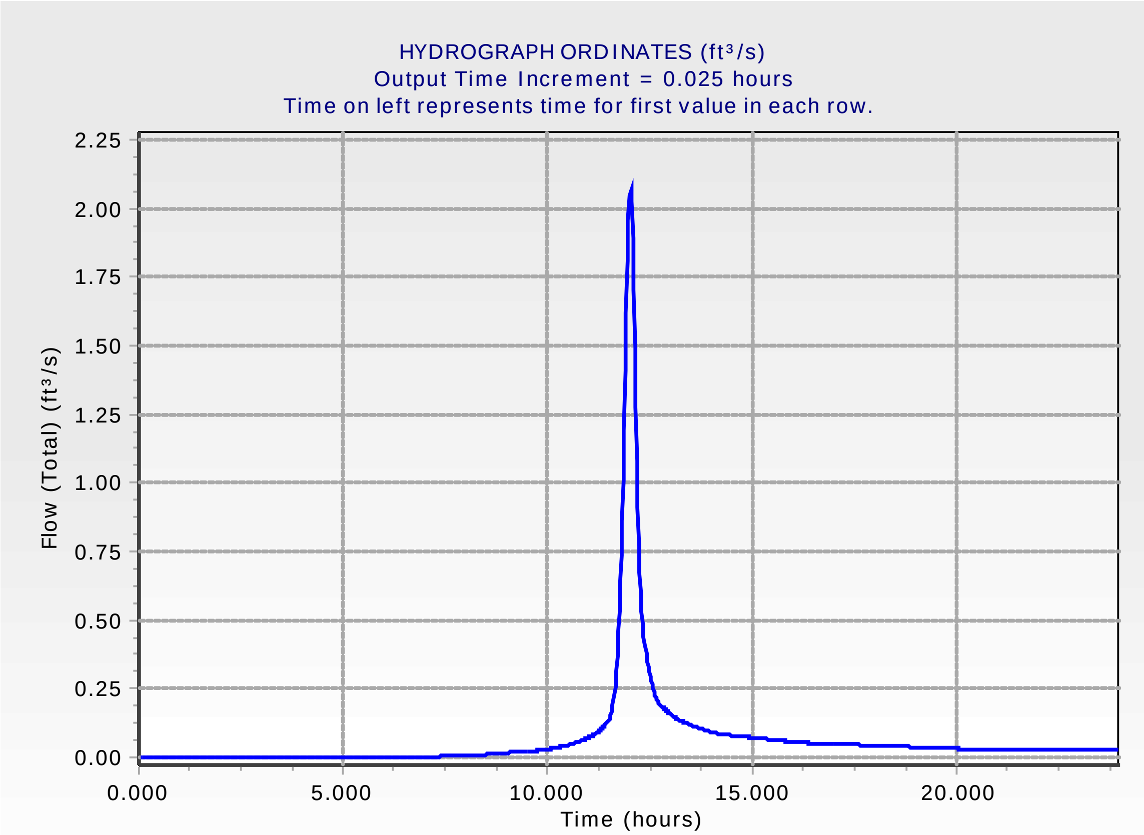
Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
6.850	0.00	0.00	0.00	0.00	0.00
6.975	0.00	0.00	0.00	0.00	0.00
7.100	0.00	0.00	0.00	0.00	0.00
7.225	0.00	0.00	0.00	0.00	0.00
7.350	0.00	0.00	0.00	0.00	0.00
7.475	0.00	0.00	0.00	0.00	0.00
7.600	0.00	0.00	0.00	0.01	0.01
7.725	0.01	0.01	0.01	0.01	0.01
7.850	0.01	0.01	0.01	0.01	0.01
7.975	0.01	0.01	0.01	0.01	0.01
8.100	0.01	0.01	0.01	0.01	0.01
8.225	0.01	0.01	0.01	0.01	0.01
8.350	0.01	0.01	0.01	0.01	0.01
8.475	0.01	0.01	0.01	0.01	0.01
8.600	0.01	0.01	0.01	0.01	0.01
8.725	0.01	0.01	0.01	0.01	0.01
8.850	0.01	0.01	0.02	0.02	0.02
8.975	0.02	0.02	0.02	0.02	0.02
9.100	0.02	0.02	0.02	0.02	0.02
9.225	0.02	0.02	0.02	0.02	0.02
9.350	0.02	0.02	0.02	0.02	0.02
9.475	0.02	0.02	0.02	0.02	0.02
9.600	0.02	0.02	0.02	0.02	0.02
9.725	0.02	0.02	0.03	0.03	0.03
9.850	0.03	0.03	0.03	0.03	0.03
9.975	0.03	0.03	0.03	0.03	0.03
10.100	0.03	0.03	0.03	0.03	0.04
10.225	0.04	0.04	0.04	0.04	0.04
10.350	0.04	0.04	0.04	0.04	0.04
10.475	0.04	0.05	0.05	0.05	0.05
10.600	0.05	0.05	0.05	0.05	0.05
10.725	0.06	0.06	0.06	0.06	0.06
10.850	0.06	0.06	0.07	0.07	0.07
10.975	0.07	0.07	0.07	0.08	0.08
11.100	0.08	0.08	0.08	0.09	0.09
11.225	0.09	0.10	0.10	0.10	0.11
11.350	0.11	0.12	0.12	0.12	0.13
11.475	0.13	0.14	0.14	0.15	0.17
11.600	0.19	0.22	0.26	0.31	0.37
11.725	0.45	0.53	0.63	0.73	0.86
11.850	1.01	1.19	1.41	1.62	1.81
11.975	1.96	2.05	2.07	2.02	1.89
12.100	1.70	1.49	1.28	1.08	0.91

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
12.225	0.77	0.67	0.59	0.53	0.48
12.350	0.44	0.41	0.38	0.35	0.33
12.475	0.31	0.29	0.28	0.26	0.25
12.600	0.24	0.23	0.22	0.21	0.20
12.725	0.20	0.19	0.19	0.18	0.18
12.850	0.18	0.17	0.17	0.17	0.16
12.975	0.16	0.16	0.15	0.15	0.15
13.100	0.15	0.14	0.14	0.14	0.14
13.225	0.14	0.13	0.13	0.13	0.13
13.350	0.13	0.13	0.12	0.12	0.12
13.475	0.12	0.12	0.12	0.11	0.11
13.600	0.11	0.11	0.11	0.11	0.11
13.725	0.11	0.10	0.10	0.10	0.10
13.850	0.10	0.10	0.10	0.10	0.09
13.975	0.09	0.09	0.09	0.09	0.09
14.100	0.09	0.09	0.09	0.09	0.09
14.225	0.08	0.08	0.08	0.08	0.08
14.350	0.08	0.08	0.08	0.08	0.08
14.475	0.08	0.08	0.08	0.08	0.08
14.600	0.08	0.08	0.08	0.08	0.08
14.725	0.08	0.08	0.08	0.08	0.07
14.850	0.07	0.07	0.07	0.07	0.07
14.975	0.07	0.07	0.07	0.07	0.07
15.100	0.07	0.07	0.07	0.07	0.07
15.225	0.07	0.07	0.07	0.07	0.07
15.350	0.07	0.07	0.07	0.07	0.07
15.475	0.06	0.06	0.06	0.06	0.06
15.600	0.06	0.06	0.06	0.06	0.06
15.725	0.06	0.06	0.06	0.06	0.06
15.850	0.06	0.06	0.06	0.06	0.06
15.975	0.06	0.06	0.06	0.06	0.06
16.100	0.05	0.05	0.05	0.05	0.05
16.225	0.05	0.05	0.05	0.05	0.05
16.350	0.05	0.05	0.05	0.05	0.05
16.475	0.05	0.05	0.05	0.05	0.05
16.600	0.05	0.05	0.05	0.05	0.05
16.725	0.05	0.05	0.05	0.05	0.05
16.850	0.05	0.05	0.05	0.05	0.05
16.975	0.05	0.05	0.05	0.05	0.05
17.100	0.05	0.05	0.05	0.05	0.05
17.225	0.05	0.05	0.05	0.05	0.05
17.350	0.05	0.05	0.05	0.05	0.05
17.475	0.05	0.05	0.05	0.05	0.05
17.600	0.05	0.05	0.05	0.05	0.05
17.725	0.04	0.04	0.04	0.04	0.04
17.850	0.04	0.04	0.04	0.04	0.04
17.975	0.04	0.04	0.04	0.04	0.04
18.100	0.04	0.04	0.04	0.04	0.04
18.225	0.04	0.04	0.04	0.04	0.04
18.350	0.04	0.04	0.04	0.04	0.04
18.475	0.04	0.04	0.04	0.04	0.04
18.600	0.04	0.04	0.04	0.04	0.04

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
18.725	0.04	0.04	0.04	0.04	0.04
18.850	0.04	0.04	0.04	0.04	0.04
18.975	0.04	0.04	0.04	0.04	0.04
19.100	0.04	0.04	0.04	0.04	0.04
19.225	0.04	0.04	0.04	0.04	0.04
19.350	0.04	0.04	0.04	0.04	0.04
19.475	0.03	0.03	0.03	0.03	0.03
19.600	0.03	0.03	0.03	0.03	0.03
19.725	0.03	0.03	0.03	0.03	0.03
19.850	0.03	0.03	0.03	0.03	0.03
19.975	0.03	0.03	0.03	0.03	0.03
20.100	0.03	0.03	0.03	0.03	0.03
20.225	0.03	0.03	0.03	0.03	0.03
20.350	0.03	0.03	0.03	0.03	0.03
20.475	0.03	0.03	0.03	0.03	0.03
20.600	0.03	0.03	0.03	0.03	0.03
20.725	0.03	0.03	0.03	0.03	0.03
20.850	0.03	0.03	0.03	0.03	0.03
20.975	0.03	0.03	0.03	0.03	0.03
21.100	0.03	0.03	0.03	0.03	0.03
21.225	0.03	0.03	0.03	0.03	0.03
21.350	0.03	0.03	0.03	0.03	0.03
21.475	0.03	0.03	0.03	0.03	0.03
21.600	0.03	0.03	0.03	0.03	0.03
21.725	0.03	0.03	0.03	0.03	0.03
21.850	0.03	0.03	0.03	0.03	0.03
21.975	0.03	0.03	0.03	0.03	0.03
22.100	0.03	0.03	0.03	0.03	0.03
22.225	0.03	0.03	0.03	0.03	0.03
22.350	0.03	0.03	0.03	0.03	0.03
22.475	0.03	0.03	0.03	0.03	0.03
22.600	0.03	0.03	0.03	0.03	0.03
22.725	0.03	0.03	0.03	0.03	0.03
22.850	0.03	0.03	0.03	0.03	0.03
22.975	0.03	0.03	0.03	0.03	0.03
23.100	0.03	0.03	0.03	0.03	0.03
23.225	0.03	0.03	0.03	0.03	0.03
23.350	0.03	0.03	0.03	0.03	0.03
23.475	0.03	0.03	0.03	0.03	0.03
23.600	0.03	0.03	0.03	0.03	0.03
23.725	0.03	0.03	0.03	0.03	0.03
23.850	0.03	0.03	0.03	0.03	0.03
23.975	0.03	0.03	(N/A)	(N/A)	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
Flow (Total) (ft³/s)
2.25
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)

Storm Event	SCS Type II - 50 yr
Return Event	50 years
Duration	24.000 hours
Depth	4.3 in
Time of Concentration (Composite)	0.215 hours
Area (User Defined)	0.859 acres

Computational Time Increment	0.029 hours
Time to Peak (Computed)	12.022 hours
Flow (Peak, Computed)	3.26 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	12.025 hours
Flow (Peak Interpolated Output)	3.25 ft³/s

Drainage Area	
SCS CN (Composite)	88.000
Area (User Defined)	0.859 acres
Maximum Retention (Pervious)	1.4 in
Maximum Retention (Pervious, 20 percent)	0.3 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.0 in
Runoff Volume (Pervious)	0.217 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.216 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.215 hours
Computational Time Increment	0.029 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	4.52 ft³/s
Unit peak time, Tp	0.143 hours
Unit receding limb, Tr	0.574 hours
Total unit time, Tb	0.717 hours

Storm Event	SCS Type II - 50 yr
Return Event	50 years
Duration	24.000 hours
Depth	4.3 in
Time of Concentration (Composite)	0.215 hours
Area (User Defined)	0.859 acres

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
5.325	0.00	0.00	0.00	0.00	0.00
5.450	0.00	0.00	0.00	0.00	0.00
5.575	0.00	0.00	0.00	0.00	0.00
5.700	0.00	0.00	0.00	0.00	0.00
5.825	0.00	0.00	0.00	0.00	0.00
5.950	0.01	0.01	0.01	0.01	0.01
6.075	0.01	0.01	0.01	0.01	0.01
6.200	0.01	0.01	0.01	0.01	0.01
6.325	0.01	0.01	0.01	0.01	0.01
6.450	0.01	0.01	0.01	0.01	0.01
6.575	0.01	0.01	0.01	0.01	0.01
6.700	0.01	0.01	0.01	0.01	0.01
6.825	0.01	0.01	0.01	0.01	0.01
6.950	0.01	0.01	0.01	0.01	0.01
7.075	0.01	0.01	0.01	0.01	0.01
7.200	0.01	0.01	0.02	0.02	0.02
7.325	0.02	0.02	0.02	0.02	0.02
7.450	0.02	0.02	0.02	0.02	0.02
7.575	0.02	0.02	0.02	0.02	0.02
7.700	0.02	0.02	0.02	0.02	0.02
7.825	0.02	0.02	0.02	0.02	0.02
7.950	0.02	0.02	0.02	0.02	0.02
8.075	0.02	0.02	0.02	0.02	0.02
8.200	0.02	0.02	0.02	0.03	0.03
8.325	0.03	0.03	0.03	0.03	0.03
8.450	0.03	0.03	0.03	0.03	0.03
8.575	0.03	0.03	0.03	0.03	0.03
8.700	0.03	0.03	0.03	0.04	0.04
8.825	0.04	0.04	0.04	0.04	0.04
8.950	0.04	0.04	0.04	0.04	0.04
9.075	0.04	0.04	0.04	0.04	0.04
9.200	0.04	0.05	0.05	0.05	0.05
9.325	0.05	0.05	0.05	0.05	0.05
9.450	0.05	0.05	0.05	0.05	0.05
9.575	0.05	0.05	0.05	0.05	0.05
9.700	0.05	0.05	0.05	0.05	0.06
9.825	0.06	0.06	0.06	0.06	0.06
9.950	0.06	0.06	0.06	0.06	0.07
10.075	0.07	0.07	0.07	0.07	0.07
10.200	0.07	0.07	0.08	0.08	0.08
10.325	0.08	0.08	0.08	0.08	0.09
10.450	0.09	0.09	0.09	0.09	0.09
10.575	0.10	0.10	0.10	0.10	0.10

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

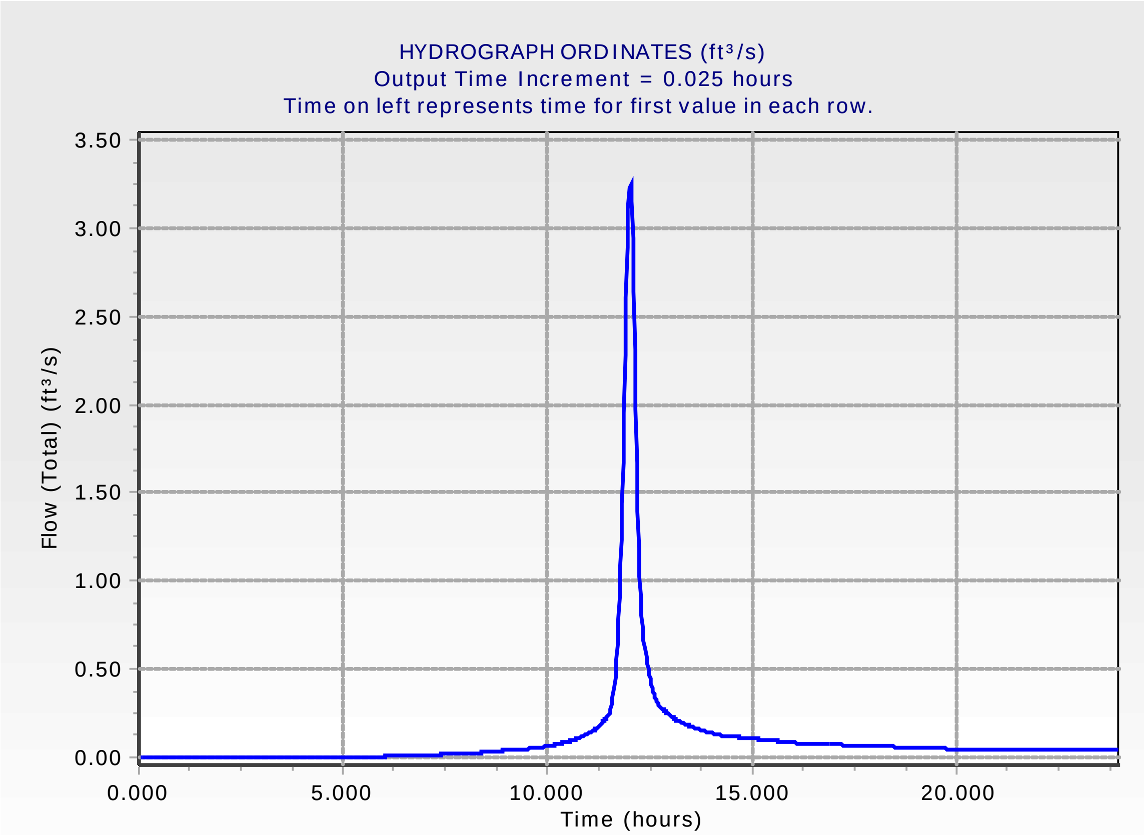
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
10.700	0.11	0.11	0.11	0.11	0.12
10.825	0.12	0.12	0.12	0.13	0.13
10.950	0.13	0.13	0.14	0.14	0.14
11.075	0.15	0.15	0.15	0.16	0.16
11.200	0.17	0.17	0.18	0.18	0.19
11.325	0.20	0.20	0.21	0.22	0.22
11.450	0.23	0.24	0.24	0.26	0.27
11.575	0.30	0.34	0.39	0.46	0.54
11.700	0.65	0.77	0.90	1.06	1.23
11.825	1.43	1.66	1.95	2.28	2.61
11.950	2.89	3.10	3.23	3.25	3.15
12.075	2.94	2.64	2.31	1.97	1.66
12.200	1.40	1.18	1.03	0.91	0.81
12.325	0.73	0.67	0.62	0.57	0.53
12.450	0.50	0.47	0.44	0.42	0.40
12.575	0.38	0.36	0.34	0.33	0.31
12.700	0.30	0.30	0.29	0.28	0.28
12.825	0.27	0.26	0.26	0.25	0.25
12.950	0.25	0.24	0.24	0.23	0.23
13.075	0.22	0.22	0.22	0.21	0.21
13.200	0.21	0.20	0.20	0.20	0.20
13.325	0.19	0.19	0.19	0.19	0.18
13.450	0.18	0.18	0.18	0.17	0.17
13.575	0.17	0.17	0.16	0.16	0.16
13.700	0.16	0.16	0.16	0.15	0.15
13.825	0.15	0.15	0.15	0.14	0.14
13.950	0.14	0.14	0.14	0.14	0.13
14.075	0.13	0.13	0.13	0.13	0.13
14.200	0.13	0.13	0.13	0.12	0.12
14.325	0.12	0.12	0.12	0.12	0.12
14.450	0.12	0.12	0.12	0.12	0.12
14.575	0.12	0.12	0.12	0.12	0.11
14.700	0.11	0.11	0.11	0.11	0.11
14.825	0.11	0.11	0.11	0.11	0.11
14.950	0.11	0.11	0.11	0.11	0.11
15.075	0.11	0.10	0.10	0.10	0.10
15.200	0.10	0.10	0.10	0.10	0.10
15.325	0.10	0.10	0.10	0.10	0.10
15.450	0.10	0.10	0.10	0.09	0.09
15.575	0.09	0.09	0.09	0.09	0.09
15.700	0.09	0.09	0.09	0.09	0.09
15.825	0.09	0.09	0.09	0.09	0.09
15.950	0.08	0.08	0.08	0.08	0.08
16.075	0.08	0.08	0.08	0.08	0.08
16.200	0.08	0.08	0.08	0.08	0.08
16.325	0.08	0.08	0.08	0.08	0.08
16.450	0.08	0.08	0.08	0.08	0.08
16.575	0.08	0.08	0.08	0.08	0.08
16.700	0.07	0.07	0.07	0.07	0.07
16.825	0.07	0.07	0.07	0.07	0.07
16.950	0.07	0.07	0.07	0.07	0.07
17.075	0.07	0.07	0.07	0.07	0.07

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
17.200	0.07	0.07	0.07	0.07	0.07
17.325	0.07	0.07	0.07	0.07	0.07
17.450	0.07	0.07	0.07	0.07	0.07
17.575	0.07	0.07	0.07	0.07	0.07
17.700	0.07	0.07	0.07	0.07	0.07
17.825	0.07	0.07	0.06	0.06	0.06
17.950	0.06	0.06	0.06	0.06	0.06
18.075	0.06	0.06	0.06	0.06	0.06
18.200	0.06	0.06	0.06	0.06	0.06
18.325	0.06	0.06	0.06	0.06	0.06
18.450	0.06	0.06	0.06	0.06	0.06
18.575	0.06	0.06	0.06	0.06	0.06
18.700	0.06	0.06	0.06	0.06	0.06
18.825	0.06	0.06	0.06	0.06	0.06
18.950	0.06	0.06	0.06	0.06	0.05
19.075	0.05	0.05	0.05	0.05	0.05
19.200	0.05	0.05	0.05	0.05	0.05
19.325	0.05	0.05	0.05	0.05	0.05
19.450	0.05	0.05	0.05	0.05	0.05
19.575	0.05	0.05	0.05	0.05	0.05
19.700	0.05	0.05	0.05	0.05	0.05
19.825	0.05	0.05	0.05	0.05	0.05
19.950	0.05	0.05	0.05	0.05	0.05
20.075	0.05	0.05	0.05	0.05	0.05
20.200	0.05	0.05	0.05	0.05	0.05
20.325	0.05	0.05	0.04	0.04	0.04
20.450	0.04	0.04	0.04	0.04	0.04
20.575	0.04	0.04	0.04	0.04	0.04
20.700	0.04	0.04	0.04	0.04	0.04
20.825	0.04	0.04	0.04	0.04	0.04
20.950	0.04	0.04	0.04	0.04	0.04
21.075	0.04	0.04	0.04	0.04	0.04
21.200	0.04	0.04	0.04	0.04	0.04
21.325	0.04	0.04	0.04	0.04	0.04
21.450	0.04	0.04	0.04	0.04	0.04
21.575	0.04	0.04	0.04	0.04	0.04
21.700	0.04	0.04	0.04	0.04	0.04
21.825	0.04	0.04	0.04	0.04	0.04
21.950	0.04	0.04	0.04	0.04	0.04
22.075	0.04	0.04	0.04	0.04	0.04
22.200	0.04	0.04	0.04	0.04	0.04
22.325	0.04	0.04	0.04	0.04	0.04
22.450	0.04	0.04	0.04	0.04	0.04
22.575	0.04	0.04	0.04	0.04	0.04
22.700	0.04	0.04	0.04	0.04	0.04
22.825	0.04	0.04	0.04	0.04	0.04
22.950	0.04	0.04	0.04	0.04	0.04
23.075	0.04	0.04	0.04	0.04	0.04
23.200	0.04	0.04	0.04	0.04	0.04
23.325	0.04	0.04	0.04	0.04	0.04
23.450	0.04	0.04	0.04	0.04	0.04
23.575	0.04	0.04	0.04	0.04	0.04

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
23.700	0.04	0.04	0.04	0.04	0.04
23.825	0.04	0.04	0.04	0.04	0.04
23.950	0.04	0.04	0.04	(N/A)	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Flow (Total) (ft³/s)
0.000
5.000
10.000
15.000
20.000
Time (hours)

Storm Event	SCS Type II - 100 yr
Return Event	100 years
Duration	24.000 hours
Depth	5.0 in
Time of Concentration (Composite)	0.215 hours
Area (User Defined)	0.859 acres

Computational Time Increment	0.029 hours
Time to Peak (Computed)	12.022 hours
Flow (Peak, Computed)	3.91 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	12.025 hours
Flow (Peak Interpolated Output)	3.90 ft³/s

Drainage Area

SCS CN (Composite)	88.000
Area (User Defined)	0.859 acres
Maximum Retention (Pervious)	1.4 in
Maximum Retention (Pervious, 20 percent)	0.3 in

Cumulative Runoff

Cumulative Runoff Depth (Pervious)	3.7 in
Runoff Volume (Pervious)	0.263 ac-ft

Hydrograph Volume (Area under Hydrograph curve)

Volume	0.262 ac-ft

SCS Unit Hydrograph Parameters

Time of Concentration (Composite)	0.215 hours
Computational Time Increment	0.029 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	4.52 ft³/s
Unit peak time, Tp	0.143 hours
Unit receding limb, Tr	0.574 hours
Total unit time, Tb	0.717 hours

Storm Event	SCS Type II - 100 yr
Return Event	100 years
Duration	24.000 hours
Depth	5.0 in
Time of Concentration (Composite)	0.215 hours
Area (User Defined)	0.859 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
4.750	0.00	0.00	0.00	0.00	0.00
4.875	0.00	0.00	0.00	0.00	0.00
5.000	0.00	0.00	0.00	0.00	0.00
5.125	0.00	0.00	0.00	0.00	0.00
5.250	0.00	0.00	0.01	0.01	0.01
5.375	0.01	0.01	0.01	0.01	0.01
5.500	0.01	0.01	0.01	0.01	0.01
5.625	0.01	0.01	0.01	0.01	0.01
5.750	0.01	0.01	0.01	0.01	0.01
5.875	0.01	0.01	0.01	0.01	0.01
6.000	0.01	0.01	0.01	0.01	0.01
6.125	0.01	0.01	0.01	0.01	0.01
6.250	0.01	0.01	0.01	0.01	0.01
6.375	0.01	0.01	0.02	0.02	0.02
6.500	0.02	0.02	0.02	0.02	0.02
6.625	0.02	0.02	0.02	0.02	0.02
6.750	0.02	0.02	0.02	0.02	0.02
6.875	0.02	0.02	0.02	0.02	0.02
7.000	0.02	0.02	0.02	0.02	0.02
7.125	0.02	0.02	0.02	0.02	0.02
7.250	0.02	0.02	0.02	0.02	0.02
7.375	0.02	0.02	0.03	0.03	0.03
7.500	0.03	0.03	0.03	0.03	0.03
7.625	0.03	0.03	0.03	0.03	0.03
7.750	0.03	0.03	0.03	0.03	0.03
7.875	0.03	0.03	0.03	0.03	0.03
8.000	0.03	0.03	0.03	0.03	0.03
8.125	0.03	0.03	0.03	0.03	0.03
8.250	0.04	0.04	0.04	0.04	0.04
8.375	0.04	0.04	0.04	0.04	0.04
8.500	0.04	0.04	0.04	0.04	0.04
8.625	0.04	0.05	0.05	0.05	0.05
8.750	0.05	0.05	0.05	0.05	0.05
8.875	0.05	0.05	0.05	0.05	0.06
9.000	0.06	0.06	0.06	0.06	0.06
9.125	0.06	0.06	0.06	0.06	0.06
9.250	0.06	0.06	0.06	0.06	0.06
9.375	0.06	0.06	0.06	0.06	0.07
9.500	0.07	0.07	0.07	0.07	0.07
9.625	0.07	0.07	0.07	0.07	0.07
9.750	0.07	0.07	0.07	0.08	0.08
9.875	0.08	0.08	0.08	0.08	0.08
10.000	0.08	0.08	0.09	0.09	0.09

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

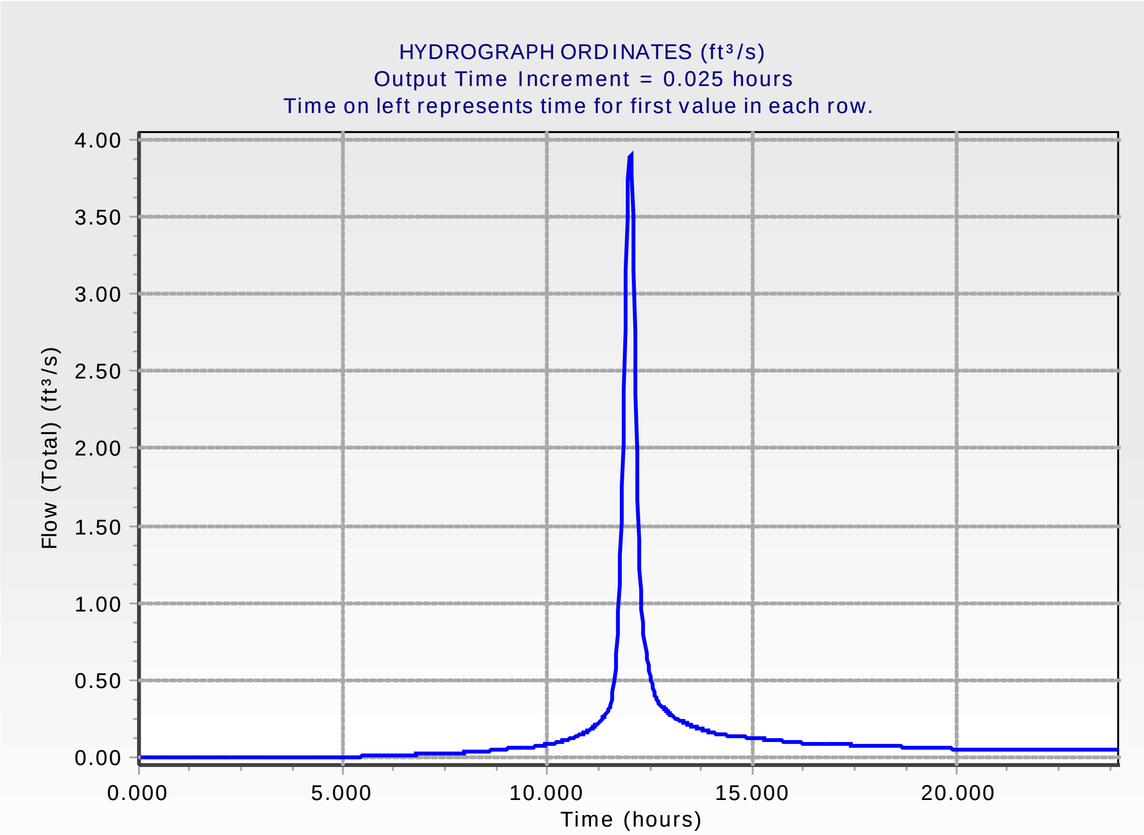
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
10.125	0.09	0.09	0.09	0.10	0.10
10.250	0.10	0.10	0.10	0.10	0.11
10.375	0.11	0.11	0.11	0.11	0.12
10.500	0.12	0.12	0.12	0.12	0.13
10.625	0.13	0.13	0.13	0.14	0.14
10.750	0.14	0.15	0.15	0.15	0.15
10.875	0.16	0.16	0.16	0.17	0.17
11.000	0.17	0.18	0.18	0.19	0.19
11.125	0.20	0.20	0.21	0.21	0.22
11.250	0.23	0.23	0.24	0.25	0.26
11.375	0.26	0.27	0.28	0.29	0.30
11.500	0.31	0.32	0.34	0.38	0.42
11.625	0.49	0.57	0.67	0.80	0.95
11.750	1.12	1.30	1.52	1.76	2.03
11.875	2.38	2.77	3.16	3.49	3.74
12.000	3.88	3.90	3.78	3.52	3.16
12.125	2.76	2.35	1.98	1.66	1.41
12.250	1.22	1.08	0.96	0.87	0.80
12.375	0.73	0.68	0.63	0.59	0.56
12.500	0.53	0.50	0.47	0.45	0.42
12.625	0.40	0.39	0.37	0.36	0.35
12.750	0.34	0.33	0.33	0.32	0.31
12.875	0.31	0.30	0.30	0.29	0.28
13.000	0.28	0.27	0.27	0.26	0.26
13.125	0.26	0.25	0.25	0.24	0.24
13.250	0.24	0.23	0.23	0.23	0.22
13.375	0.22	0.22	0.22	0.21	0.21
13.500	0.21	0.21	0.20	0.20	0.20
13.625	0.19	0.19	0.19	0.19	0.19
13.750	0.18	0.18	0.18	0.18	0.17
13.875	0.17	0.17	0.17	0.17	0.16
14.000	0.16	0.16	0.16	0.16	0.16
14.125	0.15	0.15	0.15	0.15	0.15
14.250	0.15	0.15	0.15	0.15	0.14
14.375	0.14	0.14	0.14	0.14	0.14
14.500	0.14	0.14	0.14	0.14	0.14
14.625	0.14	0.14	0.14	0.13	0.13
14.750	0.13	0.13	0.13	0.13	0.13
14.875	0.13	0.13	0.13	0.13	0.13
15.000	0.13	0.13	0.12	0.12	0.12
15.125	0.12	0.12	0.12	0.12	0.12
15.250	0.12	0.12	0.12	0.12	0.12
15.375	0.12	0.12	0.11	0.11	0.11
15.500	0.11	0.11	0.11	0.11	0.11
15.625	0.11	0.11	0.11	0.11	0.11
15.750	0.11	0.10	0.10	0.10	0.10
15.875	0.10	0.10	0.10	0.10	0.10
16.000	0.10	0.10	0.10	0.10	0.10
16.125	0.10	0.09	0.09	0.09	0.09
16.250	0.09	0.09	0.09	0.09	0.09
16.375	0.09	0.09	0.09	0.09	0.09
16.500	0.09	0.09	0.09	0.09	0.09

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
16.625	0.09	0.09	0.09	0.09	0.09
16.750	0.09	0.09	0.09	0.09	0.09
16.875	0.09	0.09	0.09	0.09	0.09
17.000	0.09	0.08	0.08	0.08	0.08
17.125	0.08	0.08	0.08	0.08	0.08
17.250	0.08	0.08	0.08	0.08	0.08
17.375	0.08	0.08	0.08	0.08	0.08
17.500	0.08	0.08	0.08	0.08	0.08
17.625	0.08	0.08	0.08	0.08	0.08
17.750	0.08	0.08	0.08	0.08	0.08
17.875	0.08	0.08	0.08	0.08	0.08
18.000	0.08	0.07	0.07	0.07	0.07
18.125	0.07	0.07	0.07	0.07	0.07
18.250	0.07	0.07	0.07	0.07	0.07
18.375	0.07	0.07	0.07	0.07	0.07
18.500	0.07	0.07	0.07	0.07	0.07
18.625	0.07	0.07	0.07	0.07	0.07
18.750	0.07	0.07	0.07	0.07	0.07
18.875	0.07	0.07	0.07	0.07	0.07
19.000	0.07	0.06	0.06	0.06	0.06
19.125	0.06	0.06	0.06	0.06	0.06
19.250	0.06	0.06	0.06	0.06	0.06
19.375	0.06	0.06	0.06	0.06	0.06
19.500	0.06	0.06	0.06	0.06	0.06
19.625	0.06	0.06	0.06	0.06	0.06
19.750	0.06	0.06	0.06	0.06	0.06
19.875	0.06	0.06	0.06	0.06	0.06
20.000	0.05	0.05	0.05	0.05	0.05
20.125	0.05	0.05	0.05	0.05	0.05
20.250	0.05	0.05	0.05	0.05	0.05
20.375	0.05	0.05	0.05	0.05	0.05
20.500	0.05	0.05	0.05	0.05	0.05
20.625	0.05	0.05	0.05	0.05	0.05
20.750	0.05	0.05	0.05	0.05	0.05
20.875	0.05	0.05	0.05	0.05	0.05
21.000	0.05	0.05	0.05	0.05	0.05
21.125	0.05	0.05	0.05	0.05	0.05
21.250	0.05	0.05	0.05	0.05	0.05
21.375	0.05	0.05	0.05	0.05	0.05
21.500	0.05	0.05	0.05	0.05	0.05
21.625	0.05	0.05	0.05	0.05	0.05
21.750	0.05	0.05	0.05	0.05	0.05
21.875	0.05	0.05	0.05	0.05	0.05
22.000	0.05	0.05	0.05	0.05	0.05
22.125	0.05	0.05	0.05	0.05	0.05
22.250	0.05	0.05	0.05	0.05	0.05
22.375	0.05	0.05	0.05	0.05	0.05
22.500	0.05	0.05	0.05	0.05	0.05
22.625	0.05	0.05	0.05	0.05	0.05
22.750	0.05	0.05	0.05	0.05	0.05
22.875	0.05	0.05	0.05	0.05	0.05
23.000	0.05	0.05	0.05	0.05	0.05

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
23.125	0.05	0.05	0.05	0.05	0.05
23.250	0.05	0.05	0.05	0.05	0.05
23.375	0.05	0.05	0.05	0.05	0.05
23.500	0.05	0.05	0.05	0.05	0.05
23.625	0.05	0.05	0.05	0.05	0.05
23.750	0.05	0.05	0.05	0.05	0.05
23.875	0.05	0.05	0.05	0.05	0.05
24.000	0.05	(N/A)	(N/A)	(N/A)	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Flow (Total) (ft³/s)
0.000
5.000
10.000
15.000
20.000
Time (hours)

Storm Event	SCS Type II - 2 yr
Return Event	2 years
Duration	24.000 hours
Depth	2.2 in
Time of Concentration (Composite)	0.304 hours
Area (User Defined)	0.895 acres

Computational Time Increment	0.040 hours
Time to Peak (Computed)	12.145 hours
Flow (Peak, Computed)	0.14 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	12.150 hours
Flow (Peak Interpolated Output)	0.14 ft³/s

Drainage Area

SCS CN (Composite)	67.000
Area (User Defined)	0.895 acres
Maximum Retention (Pervious)	4.9 in
Maximum Retention (Pervious, 20 percent)	1.0 in

Cumulative Runoff

Cumulative Runoff Depth (Pervious)	0.2 in
Runoff Volume (Pervious)	0.018 ac-ft

Hydrograph Volume (Area under Hydrograph curve)

Volume	0.018 ac-ft

SCS Unit Hydrograph Parameters

Time of Concentration (Composite)	0.304 hours
Computational Time Increment	0.040 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	3.34 ft³/s
Unit peak time, Tp	0.202 hours
Unit receding limb, Tr	0.810 hours
Total unit time, Tb	1.012 hours

Storm Event	SCS Type II - 2 yr
Return Event	2 years
Duration	24.000 hours
Depth	2.2 in
Time of Concentration (Composite)	0.304 hours
Area (User Defined)	0.895 acres

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

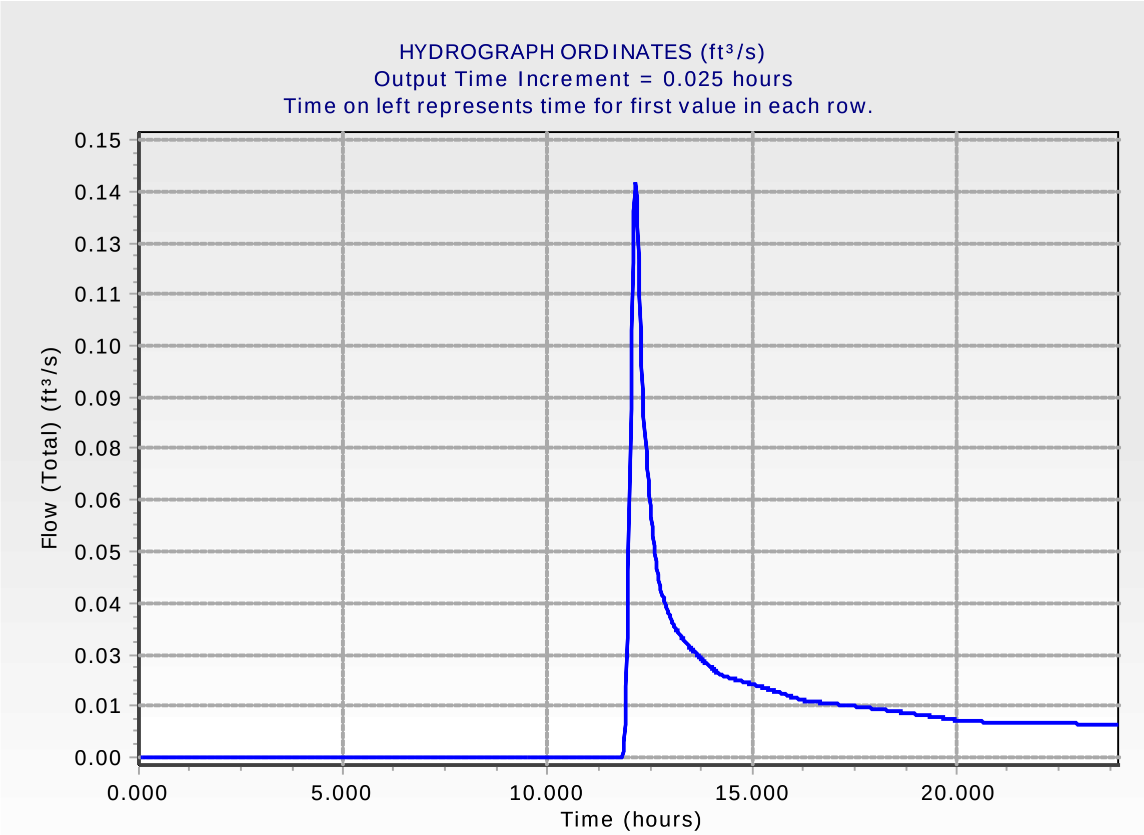
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
11.825	0.00	0.00	0.00	0.01	0.02
11.950	0.03	0.05	0.06	0.08	0.10
12.075	0.12	0.13	0.14	0.14	0.14
12.200	0.13	0.12	0.11	0.10	0.10
12.325	0.09	0.08	0.08	0.07	0.07
12.450	0.07	0.06	0.06	0.06	0.06
12.575	0.05	0.05	0.05	0.05	0.05
12.700	0.04	0.04	0.04	0.04	0.04
12.825	0.04	0.04	0.04	0.04	0.04
12.950	0.04	0.03	0.03	0.03	0.03
13.075	0.03	0.03	0.03	0.03	0.03
13.200	0.03	0.03	0.03	0.03	0.03
13.325	0.03	0.03	0.03	0.03	0.03
13.450	0.03	0.03	0.03	0.03	0.03
13.575	0.03	0.03	0.03	0.02	0.02
13.700	0.02	0.02	0.02	0.02	0.02
13.825	0.02	0.02	0.02	0.02	0.02
13.950	0.02	0.02	0.02	0.02	0.02
14.075	0.02	0.02	0.02	0.02	0.02
14.200	0.02	0.02	0.02	0.02	0.02
14.325	0.02	0.02	0.02	0.02	0.02
14.450	0.02	0.02	0.02	0.02	0.02
14.575	0.02	0.02	0.02	0.02	0.02
14.700	0.02	0.02	0.02	0.02	0.02
14.825	0.02	0.02	0.02	0.02	0.02
14.950	0.02	0.02	0.02	0.02	0.02
15.075	0.02	0.02	0.02	0.02	0.02
15.200	0.02	0.02	0.02	0.02	0.02
15.325	0.02	0.02	0.02	0.02	0.02
15.450	0.02	0.02	0.02	0.02	0.02
15.575	0.02	0.02	0.02	0.02	0.02
15.700	0.02	0.02	0.02	0.02	0.02
15.825	0.02	0.02	0.02	0.01	0.01
15.950	0.01	0.01	0.01	0.01	0.01
16.075	0.01	0.01	0.01	0.01	0.01
16.200	0.01	0.01	0.01	0.01	0.01
16.325	0.01	0.01	0.01	0.01	0.01
16.450	0.01	0.01	0.01	0.01	0.01
16.575	0.01	0.01	0.01	0.01	0.01
16.700	0.01	0.01	0.01	0.01	0.01
16.825	0.01	0.01	0.01	0.01	0.01
16.950	0.01	0.01	0.01	0.01	0.01
17.075	0.01	0.01	0.01	0.01	0.01

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
17.200	0.01	0.01	0.01	0.01	0.01
17.325	0.01	0.01	0.01	0.01	0.01
17.450	0.01	0.01	0.01	0.01	0.01
17.575	0.01	0.01	0.01	0.01	0.01
17.700	0.01	0.01	0.01	0.01	0.01
17.825	0.01	0.01	0.01	0.01	0.01
17.950	0.01	0.01	0.01	0.01	0.01
18.075	0.01	0.01	0.01	0.01	0.01
18.200	0.01	0.01	0.01	0.01	0.01
18.325	0.01	0.01	0.01	0.01	0.01
18.450	0.01	0.01	0.01	0.01	0.01
18.575	0.01	0.01	0.01	0.01	0.01
18.700	0.01	0.01	0.01	0.01	0.01
18.825	0.01	0.01	0.01	0.01	0.01
18.950	0.01	0.01	0.01	0.01	0.01
19.075	0.01	0.01	0.01	0.01	0.01
19.200	0.01	0.01	0.01	0.01	0.01
19.325	0.01	0.01	0.01	0.01	0.01
19.450	0.01	0.01	0.01	0.01	0.01
19.575	0.01	0.01	0.01	0.01	0.01
19.700	0.01	0.01	0.01	0.01	0.01
19.825	0.01	0.01	0.01	0.01	0.01
19.950	0.01	0.01	0.01	0.01	0.01
20.075	0.01	0.01	0.01	0.01	0.01
20.200	0.01	0.01	0.01	0.01	0.01
20.325	0.01	0.01	0.01	0.01	0.01
20.450	0.01	0.01	0.01	0.01	0.01
20.575	0.01	0.01	0.01	0.01	0.01
20.700	0.01	0.01	0.01	0.01	0.01
20.825	0.01	0.01	0.01	0.01	0.01
20.950	0.01	0.01	0.01	0.01	0.01
21.075	0.01	0.01	0.01	0.01	0.01
21.200	0.01	0.01	0.01	0.01	0.01
21.325	0.01	0.01	0.01	0.01	0.01
21.450	0.01	0.01	0.01	0.01	0.01
21.575	0.01	0.01	0.01	0.01	0.01
21.700	0.01	0.01	0.01	0.01	0.01
21.825	0.01	0.01	0.01	0.01	0.01
21.950	0.01	0.01	0.01	0.01	0.01
22.075	0.01	0.01	0.01	0.01	0.01
22.200	0.01	0.01	0.01	0.01	0.01
22.325	0.01	0.01	0.01	0.01	0.01
22.450	0.01	0.01	0.01	0.01	0.01
22.575	0.01	0.01	0.01	0.01	0.01
22.700	0.01	0.01	0.01	0.01	0.01
22.825	0.01	0.01	0.01	0.01	0.01
22.950	0.01	0.01	0.01	0.01	0.01
23.075	0.01	0.01	0.01	0.01	0.01
23.200	0.01	0.01	0.01	0.01	0.01
23.325	0.01	0.01	0.01	0.01	0.01
23.450	0.01	0.01	0.01	0.01	0.01
23.575	0.01	0.01	0.01	0.01	0.01

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
23.700	0.01	0.01	0.01	0.01	0.01
23.825	0.01	0.01	0.01	0.01	0.01
23.950	0.01	0.01	0.01	(N/A)	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
Flow (Total) (ft³/s)
0.15
0.14
0.13
0.11
0.10
0.09
0.08
0.06
0.05
0.04
0.03
0.01
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)

Storm Event	SCS Type II - 10 yr
Return Event	10 years
Duration	24.000 hours
Depth	3.1 in
Time of Concentration (Composite)	0.304 hours
Area (User Defined)	0.895 acres

Computational Time Increment	0.040 hours
Time to Peak (Computed)	12.104 hours
Flow (Peak, Computed)	0.53 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.53 ft³/s

Drainage Area	
SCS CN (Composite)	67.000
Area (User Defined)	0.895 acres
Maximum Retention (Pervious)	4.9 in
Maximum Retention (Pervious, 20 percent)	1.0 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	0.6 in
Runoff Volume (Pervious)	0.047 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.047 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.304 hours
Computational Time Increment	0.040 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	3.34 ft³/s
Unit peak time, Tp	0.202 hours
Unit receding limb, Tr	0.810 hours
Total unit time, Tb	1.012 hours

Storm Event	SCS Type II - 10 yr
Return Event	10 years
Duration	24.000 hours
Depth	3.1 in
Time of Concentration (Composite)	0.304 hours
Area (User Defined)	0.895 acres

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

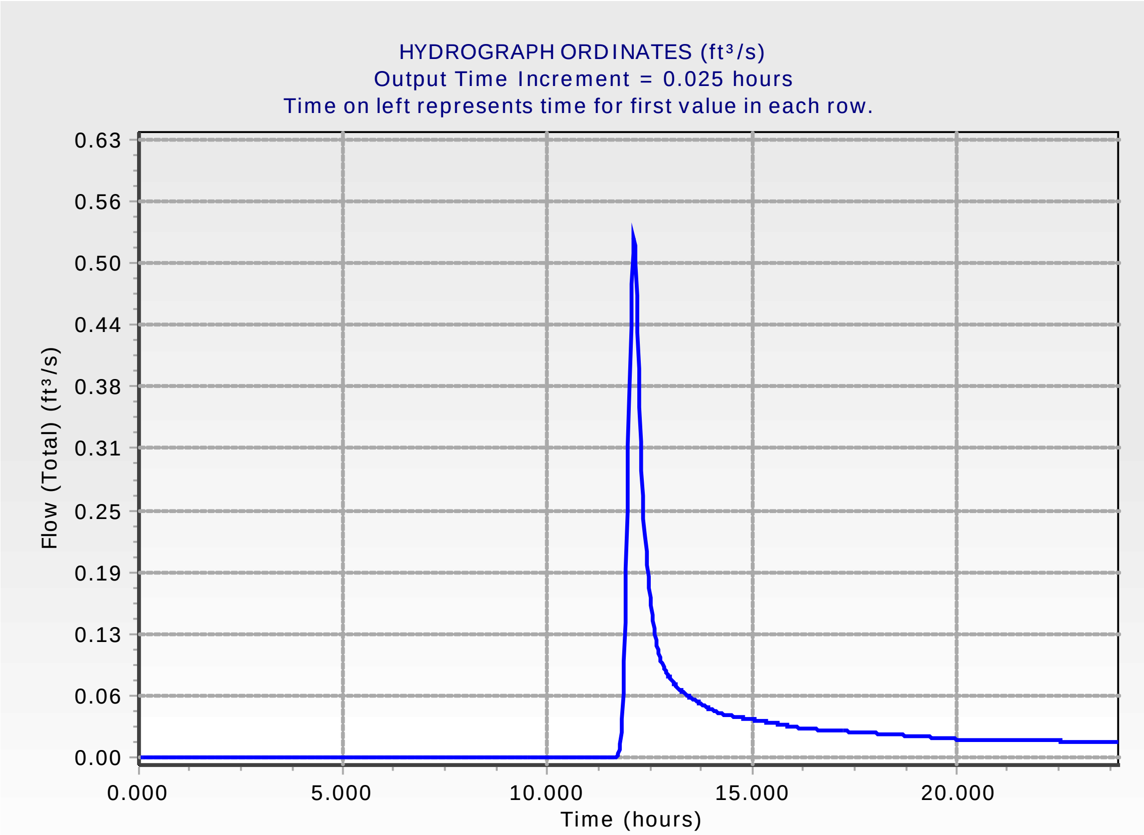
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
11.675	0.00	0.00	0.00	0.01	0.01
11.800	0.02	0.04	0.06	0.10	0.14
11.925	0.19	0.25	0.32	0.38	0.44
12.050	0.48	0.51	0.53	0.52	0.50
12.175	0.47	0.43	0.39	0.36	0.32
12.300	0.29	0.26	0.24	0.22	0.21
12.425	0.19	0.18	0.17	0.16	0.15
12.550	0.14	0.14	0.13	0.12	0.12
12.675	0.11	0.11	0.10	0.10	0.10
12.800	0.10	0.09	0.09	0.09	0.09
12.925	0.08	0.08	0.08	0.08	0.08
13.050	0.08	0.08	0.07	0.07	0.07
13.175	0.07	0.07	0.07	0.07	0.07
13.300	0.07	0.07	0.06	0.06	0.06
13.425	0.06	0.06	0.06	0.06	0.06
13.550	0.06	0.06	0.06	0.06	0.06
13.675	0.06	0.06	0.05	0.05	0.05
13.800	0.05	0.05	0.05	0.05	0.05
13.925	0.05	0.05	0.05	0.05	0.05
14.050	0.05	0.05	0.05	0.05	0.05
14.175	0.05	0.04	0.04	0.04	0.04
14.300	0.04	0.04	0.04	0.04	0.04
14.425	0.04	0.04	0.04	0.04	0.04
14.550	0.04	0.04	0.04	0.04	0.04
14.675	0.04	0.04	0.04	0.04	0.04
14.800	0.04	0.04	0.04	0.04	0.04
14.925	0.04	0.04	0.04	0.04	0.04
15.050	0.04	0.04	0.04	0.04	0.04
15.175	0.04	0.04	0.04	0.04	0.04
15.300	0.04	0.04	0.04	0.04	0.04
15.425	0.04	0.04	0.04	0.03	0.03
15.550	0.03	0.03	0.03	0.03	0.03
15.675	0.03	0.03	0.03	0.03	0.03
15.800	0.03	0.03	0.03	0.03	0.03
15.925	0.03	0.03	0.03	0.03	0.03
16.050	0.03	0.03	0.03	0.03	0.03
16.175	0.03	0.03	0.03	0.03	0.03
16.300	0.03	0.03	0.03	0.03	0.03
16.425	0.03	0.03	0.03	0.03	0.03
16.550	0.03	0.03	0.03	0.03	0.03
16.675	0.03	0.03	0.03	0.03	0.03
16.800	0.03	0.03	0.03	0.03	0.03
16.925	0.03	0.03	0.03	0.03	0.03

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
17.050	0.03	0.03	0.03	0.03	0.03
17.175	0.03	0.03	0.03	0.03	0.03
17.300	0.03	0.03	0.03	0.03	0.03
17.425	0.03	0.03	0.03	0.03	0.03
17.550	0.03	0.03	0.03	0.03	0.03
17.675	0.03	0.03	0.03	0.03	0.03
17.800	0.02	0.02	0.02	0.02	0.02
17.925	0.02	0.02	0.02	0.02	0.02
18.050	0.02	0.02	0.02	0.02	0.02
18.175	0.02	0.02	0.02	0.02	0.02
18.300	0.02	0.02	0.02	0.02	0.02
18.425	0.02	0.02	0.02	0.02	0.02
18.550	0.02	0.02	0.02	0.02	0.02
18.675	0.02	0.02	0.02	0.02	0.02
18.800	0.02	0.02	0.02	0.02	0.02
18.925	0.02	0.02	0.02	0.02	0.02
19.050	0.02	0.02	0.02	0.02	0.02
19.175	0.02	0.02	0.02	0.02	0.02
19.300	0.02	0.02	0.02	0.02	0.02
19.425	0.02	0.02	0.02	0.02	0.02
19.550	0.02	0.02	0.02	0.02	0.02
19.675	0.02	0.02	0.02	0.02	0.02
19.800	0.02	0.02	0.02	0.02	0.02
19.925	0.02	0.02	0.02	0.02	0.02
20.050	0.02	0.02	0.02	0.02	0.02
20.175	0.02	0.02	0.02	0.02	0.02
20.300	0.02	0.02	0.02	0.02	0.02
20.425	0.02	0.02	0.02	0.02	0.02
20.550	0.02	0.02	0.02	0.02	0.02
20.675	0.02	0.02	0.02	0.02	0.02
20.800	0.02	0.02	0.02	0.02	0.02
20.925	0.02	0.02	0.02	0.02	0.02
21.050	0.02	0.02	0.02	0.02	0.02
21.175	0.02	0.02	0.02	0.02	0.02
21.300	0.02	0.02	0.02	0.02	0.02
21.425	0.02	0.02	0.02	0.02	0.02
21.550	0.02	0.02	0.02	0.02	0.02
21.675	0.02	0.02	0.02	0.02	0.02
21.800	0.02	0.02	0.02	0.02	0.02
21.925	0.02	0.02	0.02	0.02	0.02
22.050	0.02	0.02	0.02	0.02	0.02
22.175	0.02	0.02	0.02	0.02	0.02
22.300	0.02	0.02	0.02	0.02	0.02
22.425	0.02	0.02	0.02	0.02	0.02
22.550	0.02	0.02	0.02	0.02	0.02
22.675	0.02	0.02	0.02	0.02	0.02
22.800	0.02	0.02	0.02	0.02	0.02
22.925	0.02	0.02	0.02	0.02	0.02
23.050	0.02	0.02	0.02	0.02	0.02
23.175	0.02	0.02	0.02	0.02	0.02
23.300	0.02	0.02	0.02	0.02	0.02
23.425	0.02	0.02	0.02	0.02	0.02

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
23.550	0.02	0.02	0.02	0.02	0.02
23.675	0.02	0.02	0.02	0.02	0.02
23.800	0.02	0.02	0.02	0.02	0.02
23.925	0.02	0.02	0.02	0.02	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
Flow (Total) (ft³/s)
0.63
0.56
0.50
0.44
0.38
0.31
0.25
0.19
0.13
0.06
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)

Storm Event	SCS Type II - 50 yr
Return Event	50 years
Duration	24.000 hours
Depth	4.3 in
Time of Concentration (Composite)	0.304 hours
Area (User Defined)	0.895 acres

Computational Time Increment	0.040 hours
Time to Peak (Computed)	12.104 hours
Flow (Peak, Computed)	1.27 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	1.27 ft³/s

Drainage Area

SCS CN (Composite)	67.000
Area (User Defined)	0.895 acres
Maximum Retention (Pervious)	4.9 in
Maximum Retention (Pervious, 20 percent)	1.0 in

Cumulative Runoff

Cumulative Runoff Depth (Pervious)	1.3 in
Runoff Volume (Pervious)	0.100 ac-ft

Hydrograph Volume (Area under Hydrograph curve)

Volume	0.100 ac-ft

SCS Unit Hydrograph Parameters

Time of Concentration (Composite)	0.304 hours
Computational Time Increment	0.040 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	3.34 ft³/s
Unit peak time, Tp	0.202 hours
Unit receding limb, Tr	0.810 hours
Total unit time, Tb	1.012 hours

Storm Event	SCS Type II - 50 yr
Return Event	50 years
Duration	24.000 hours
Depth	4.3 in
Time of Concentration (Composite)	0.304 hours
Area (User Defined)	0.895 acres

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

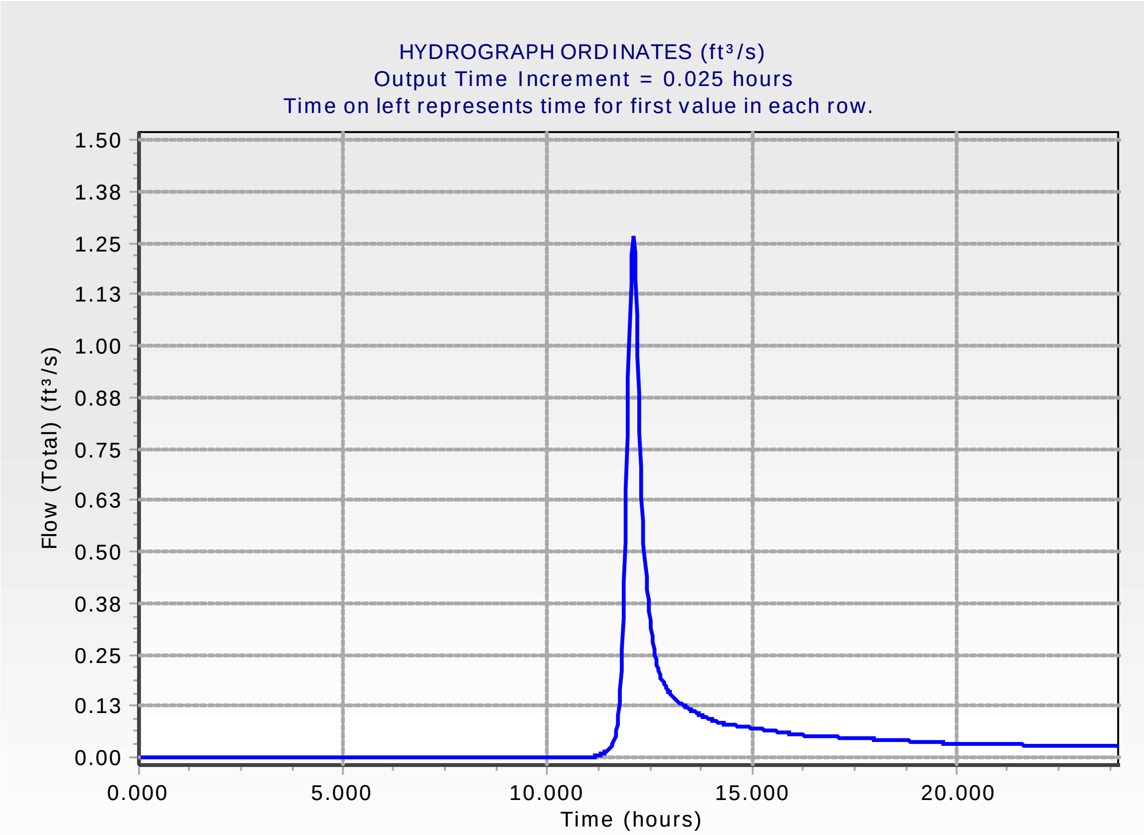
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
11.075	0.00	0.00	0.00	0.00	0.00
11.200	0.00	0.00	0.01	0.01	0.01
11.325	0.01	0.01	0.01	0.01	0.01
11.450	0.02	0.02	0.02	0.02	0.03
11.575	0.03	0.03	0.04	0.05	0.06
11.700	0.08	0.10	0.13	0.16	0.21
11.825	0.26	0.33	0.42	0.53	0.65
11.950	0.78	0.92	1.04	1.15	1.22
12.075	1.26	1.27	1.22	1.16	1.07
12.200	0.98	0.88	0.79	0.71	0.63
12.325	0.57	0.52	0.48	0.44	0.41
12.450	0.38	0.36	0.33	0.31	0.29
12.575	0.28	0.26	0.25	0.24	0.23
12.700	0.22	0.21	0.20	0.19	0.19
12.825	0.18	0.18	0.17	0.17	0.16
12.950	0.16	0.16	0.15	0.15	0.15
13.075	0.15	0.14	0.14	0.14	0.14
13.200	0.13	0.13	0.13	0.13	0.13
13.325	0.13	0.12	0.12	0.12	0.12
13.450	0.12	0.12	0.12	0.11	0.11
13.575	0.11	0.11	0.11	0.11	0.11
13.700	0.10	0.10	0.10	0.10	0.10
13.825	0.10	0.10	0.10	0.10	0.09
13.950	0.09	0.09	0.09	0.09	0.09
14.075	0.09	0.09	0.09	0.09	0.09
14.200	0.08	0.08	0.08	0.08	0.08
14.325	0.08	0.08	0.08	0.08	0.08
14.450	0.08	0.08	0.08	0.08	0.08
14.575	0.08	0.08	0.08	0.08	0.08
14.700	0.08	0.08	0.08	0.07	0.07
14.825	0.07	0.07	0.07	0.07	0.07
14.950	0.07	0.07	0.07	0.07	0.07
15.075	0.07	0.07	0.07	0.07	0.07
15.200	0.07	0.07	0.07	0.07	0.07
15.325	0.07	0.07	0.07	0.07	0.07
15.450	0.07	0.06	0.06	0.06	0.06
15.575	0.06	0.06	0.06	0.06	0.06
15.700	0.06	0.06	0.06	0.06	0.06
15.825	0.06	0.06	0.06	0.06	0.06
15.950	0.06	0.06	0.06	0.06	0.06
16.075	0.06	0.06	0.06	0.05	0.05
16.200	0.05	0.05	0.05	0.05	0.05
16.325	0.05	0.05	0.05	0.05	0.05

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
16.450	0.05	0.05	0.05	0.05	0.05
16.575	0.05	0.05	0.05	0.05	0.05
16.700	0.05	0.05	0.05	0.05	0.05
16.825	0.05	0.05	0.05	0.05	0.05
16.950	0.05	0.05	0.05	0.05	0.05
17.075	0.05	0.05	0.05	0.05	0.05
17.200	0.05	0.05	0.05	0.05	0.05
17.325	0.05	0.05	0.05	0.05	0.05
17.450	0.05	0.05	0.05	0.05	0.05
17.575	0.05	0.05	0.05	0.05	0.05
17.700	0.05	0.05	0.05	0.05	0.05
17.825	0.05	0.05	0.05	0.04	0.04
17.950	0.04	0.04	0.04	0.04	0.04
18.075	0.04	0.04	0.04	0.04	0.04
18.200	0.04	0.04	0.04	0.04	0.04
18.325	0.04	0.04	0.04	0.04	0.04
18.450	0.04	0.04	0.04	0.04	0.04
18.575	0.04	0.04	0.04	0.04	0.04
18.700	0.04	0.04	0.04	0.04	0.04
18.825	0.04	0.04	0.04	0.04	0.04
18.950	0.04	0.04	0.04	0.04	0.04
19.075	0.04	0.04	0.04	0.04	0.04
19.200	0.04	0.04	0.04	0.04	0.04
19.325	0.04	0.04	0.04	0.04	0.04
19.450	0.04	0.04	0.04	0.04	0.04
19.575	0.04	0.04	0.04	0.04	0.03
19.700	0.03	0.03	0.03	0.03	0.03
19.825	0.03	0.03	0.03	0.03	0.03
19.950	0.03	0.03	0.03	0.03	0.03
20.075	0.03	0.03	0.03	0.03	0.03
20.200	0.03	0.03	0.03	0.03	0.03
20.325	0.03	0.03	0.03	0.03	0.03
20.450	0.03	0.03	0.03	0.03	0.03
20.575	0.03	0.03	0.03	0.03	0.03
20.700	0.03	0.03	0.03	0.03	0.03
20.825	0.03	0.03	0.03	0.03	0.03
20.950	0.03	0.03	0.03	0.03	0.03
21.075	0.03	0.03	0.03	0.03	0.03
21.200	0.03	0.03	0.03	0.03	0.03
21.325	0.03	0.03	0.03	0.03	0.03
21.450	0.03	0.03	0.03	0.03	0.03
21.575	0.03	0.03	0.03	0.03	0.03
21.700	0.03	0.03	0.03	0.03	0.03
21.825	0.03	0.03	0.03	0.03	0.03
21.950	0.03	0.03	0.03	0.03	0.03
22.075	0.03	0.03	0.03	0.03	0.03
22.200	0.03	0.03	0.03	0.03	0.03
22.325	0.03	0.03	0.03	0.03	0.03
22.450	0.03	0.03	0.03	0.03	0.03
22.575	0.03	0.03	0.03	0.03	0.03
22.700	0.03	0.03	0.03	0.03	0.03
22.825	0.03	0.03	0.03	0.03	0.03

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
22.950	0.03	0.03	0.03	0.03	0.03
23.075	0.03	0.03	0.03	0.03	0.03
23.200	0.03	0.03	0.03	0.03	0.03
23.325	0.03	0.03	0.03	0.03	0.03
23.450	0.03	0.03	0.03	0.03	0.03
23.575	0.03	0.03	0.03	0.03	0.03
23.700	0.03	0.03	0.03	0.03	0.03
23.825	0.03	0.03	0.03	0.03	0.03
23.950	0.03	0.03	0.03	(N/A)	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
Flow (Total) (ft³/s)
1.50
1.38
1.25
1.13
1.00
0.88
0.75
0.63
0.50
0.38
0.25
0.13
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)

Storm Event	SCS Type II - 100 yr
Return Event	100 years
Duration	24.000 hours
Depth	5.0 in
Time of Concentration (Composite)	0.304 hours
Area (User Defined)	0.895 acres

Computational Time Increment	0.040 hours
Time to Peak (Computed)	12.064 hours
Flow (Peak, Computed)	1.73 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	12.075 hours
Flow (Peak Interpolated Output)	1.73 ft³/s

Drainage Area	
SCS CN (Composite)	67.000
Area (User Defined)	0.895 acres
Maximum Retention (Pervious)	4.9 in
Maximum Retention (Pervious, 20 percent)	1.0 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.8 in
Runoff Volume (Pervious)	0.134 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.134 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.304 hours
Computational Time Increment	0.040 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	3.34 ft³/s
Unit peak time, Tp	0.202 hours
Unit receding limb, Tr	0.810 hours
Total unit time, Tb	1.012 hours

Storm Event	SCS Type II - 100 yr
Return Event	100 years
Duration	24.000 hours
Depth	5.0 in
Time of Concentration (Composite)	0.304 hours
Area (User Defined)	0.895 acres

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

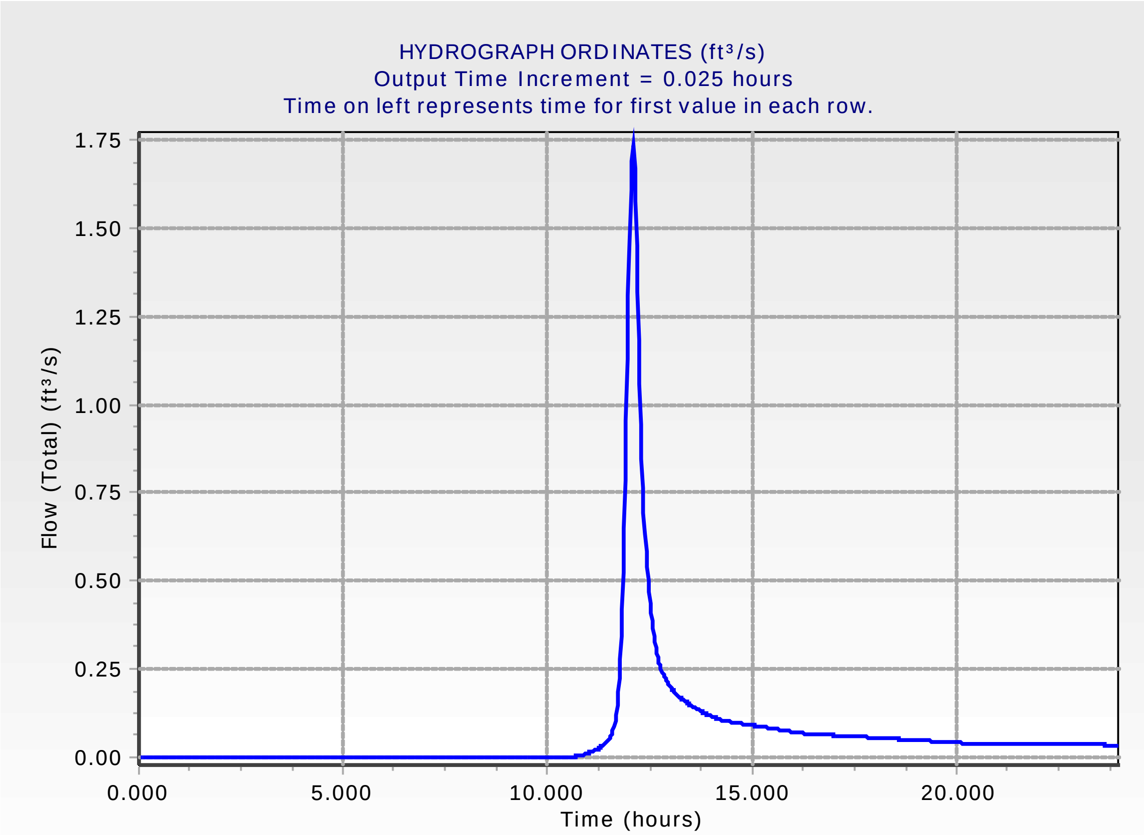
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
10.575	0.00	0.00	0.00	0.00	0.00
10.700	0.00	0.00	0.00	0.00	0.01
10.825	0.01	0.01	0.01	0.01	0.01
10.950	0.01	0.01	0.01	0.01	0.01
11.075	0.02	0.02	0.02	0.02	0.02
11.200	0.02	0.02	0.03	0.03	0.03
11.325	0.03	0.03	0.04	0.04	0.04
11.450	0.04	0.05	0.05	0.05	0.06
11.575	0.06	0.07	0.09	0.10	0.12
11.700	0.15	0.18	0.23	0.28	0.34
11.825	0.42	0.52	0.65	0.79	0.96
11.950	1.13	1.31	1.47	1.61	1.69
12.075	1.73	1.73	1.67	1.58	1.45
12.200	1.32	1.18	1.06	0.94	0.84
12.325	0.76	0.69	0.63	0.58	0.54
12.450	0.50	0.47	0.44	0.41	0.39
12.575	0.36	0.34	0.33	0.31	0.29
12.700	0.28	0.27	0.26	0.25	0.24
12.825	0.23	0.23	0.22	0.22	0.21
12.950	0.21	0.20	0.20	0.20	0.19
13.075	0.19	0.19	0.18	0.18	0.18
13.200	0.17	0.17	0.17	0.17	0.16
13.325	0.16	0.16	0.16	0.16	0.15
13.450	0.15	0.15	0.15	0.15	0.14
13.575	0.14	0.14	0.14	0.14	0.14
13.700	0.13	0.13	0.13	0.13	0.13
13.825	0.13	0.13	0.12	0.12	0.12
13.950	0.12	0.12	0.12	0.12	0.11
14.075	0.11	0.11	0.11	0.11	0.11
14.200	0.11	0.11	0.11	0.11	0.10
14.325	0.10	0.10	0.10	0.10	0.10
14.450	0.10	0.10	0.10	0.10	0.10
14.575	0.10	0.10	0.10	0.10	0.10
14.700	0.10	0.10	0.10	0.10	0.09
14.825	0.09	0.09	0.09	0.09	0.09
14.950	0.09	0.09	0.09	0.09	0.09
15.075	0.09	0.09	0.09	0.09	0.09
15.200	0.09	0.09	0.09	0.09	0.09
15.325	0.09	0.08	0.08	0.08	0.08
15.450	0.08	0.08	0.08	0.08	0.08
15.575	0.08	0.08	0.08	0.08	0.08
15.700	0.08	0.08	0.08	0.08	0.08
15.825	0.08	0.08	0.07	0.07	0.07

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
15.950	0.07	0.07	0.07	0.07	0.07
16.075	0.07	0.07	0.07	0.07	0.07
16.200	0.07	0.07	0.07	0.07	0.07
16.325	0.07	0.07	0.07	0.07	0.07
16.450	0.07	0.07	0.07	0.07	0.07
16.575	0.07	0.07	0.07	0.06	0.06
16.700	0.06	0.06	0.06	0.06	0.06
16.825	0.06	0.06	0.06	0.06	0.06
16.950	0.06	0.06	0.06	0.06	0.06
17.075	0.06	0.06	0.06	0.06	0.06
17.200	0.06	0.06	0.06	0.06	0.06
17.325	0.06	0.06	0.06	0.06	0.06
17.450	0.06	0.06	0.06	0.06	0.06
17.575	0.06	0.06	0.06	0.06	0.06
17.700	0.06	0.06	0.06	0.06	0.06
17.825	0.06	0.06	0.06	0.06	0.06
17.950	0.06	0.06	0.06	0.06	0.06
18.075	0.06	0.06	0.06	0.05	0.05
18.200	0.05	0.05	0.05	0.05	0.05
18.325	0.05	0.05	0.05	0.05	0.05
18.450	0.05	0.05	0.05	0.05	0.05
18.575	0.05	0.05	0.05	0.05	0.05
18.700	0.05	0.05	0.05	0.05	0.05
18.825	0.05	0.05	0.05	0.05	0.05
18.950	0.05	0.05	0.05	0.05	0.05
19.075	0.05	0.05	0.05	0.05	0.05
19.200	0.05	0.05	0.05	0.05	0.05
19.325	0.05	0.05	0.05	0.05	0.05
19.450	0.05	0.05	0.05	0.05	0.04
19.575	0.04	0.04	0.04	0.04	0.04
19.700	0.04	0.04	0.04	0.04	0.04
19.825	0.04	0.04	0.04	0.04	0.04
19.950	0.04	0.04	0.04	0.04	0.04
20.075	0.04	0.04	0.04	0.04	0.04
20.200	0.04	0.04	0.04	0.04	0.04
20.325	0.04	0.04	0.04	0.04	0.04
20.450	0.04	0.04	0.04	0.04	0.04
20.575	0.04	0.04	0.04	0.04	0.04
20.700	0.04	0.04	0.04	0.04	0.04
20.825	0.04	0.04	0.04	0.04	0.04
20.950	0.04	0.04	0.04	0.04	0.04
21.075	0.04	0.04	0.04	0.04	0.04
21.200	0.04	0.04	0.04	0.04	0.04
21.325	0.04	0.04	0.04	0.04	0.04
21.450	0.04	0.04	0.04	0.04	0.04
21.575	0.04	0.04	0.04	0.04	0.04
21.700	0.04	0.04	0.04	0.04	0.04
21.825	0.04	0.04	0.04	0.04	0.04
21.950	0.04	0.04	0.04	0.04	0.04
22.075	0.04	0.04	0.04	0.04	0.04
22.200	0.04	0.04	0.04	0.04	0.04
22.325	0.04	0.04	0.04	0.04	0.04

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
22.450	0.04	0.04	0.04	0.04	0.04
22.575	0.04	0.04	0.04	0.04	0.04
22.700	0.04	0.04	0.04	0.04	0.04
22.825	0.04	0.04	0.04	0.04	0.04
22.950	0.04	0.04	0.04	0.04	0.04
23.075	0.04	0.04	0.04	0.04	0.04
23.200	0.04	0.04	0.04	0.04	0.04
23.325	0.04	0.04	0.04	0.04	0.04
23.450	0.04	0.04	0.04	0.04	0.04
23.575	0.04	0.04	0.04	0.04	0.04
23.700	0.04	0.04	0.04	0.04	0.04
23.825	0.04	0.04	0.04	0.04	0.04
23.950	0.03	0.03	0.03	(N/A)	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
Flow (Total) (ft³/s)
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)

Storm Event	SCS Type II - 2 yr
Return Event	2 years
Duration	24.000 hours
Depth	2.2 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	0.195 acres

Computational Time Increment	0.011 hours
Time to Peak (Computed)	11.922 hours
Flow (Peak, Computed)	0.37 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	11.925 hours
Flow (Peak Interpolated Output)	0.37 ft³/s

Drainage Area	
SCS CN (Composite)	89.000
Area (User Defined)	0.195 acres
Maximum Retention (Pervious)	1.2 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.2 in
Runoff Volume (Pervious)	0.020 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.020 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	2.65 ft³/s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Storm Event	SCS Type II - 2 yr
Return Event	2 years
Duration	24.000 hours
Depth	2.2 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	0.195 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

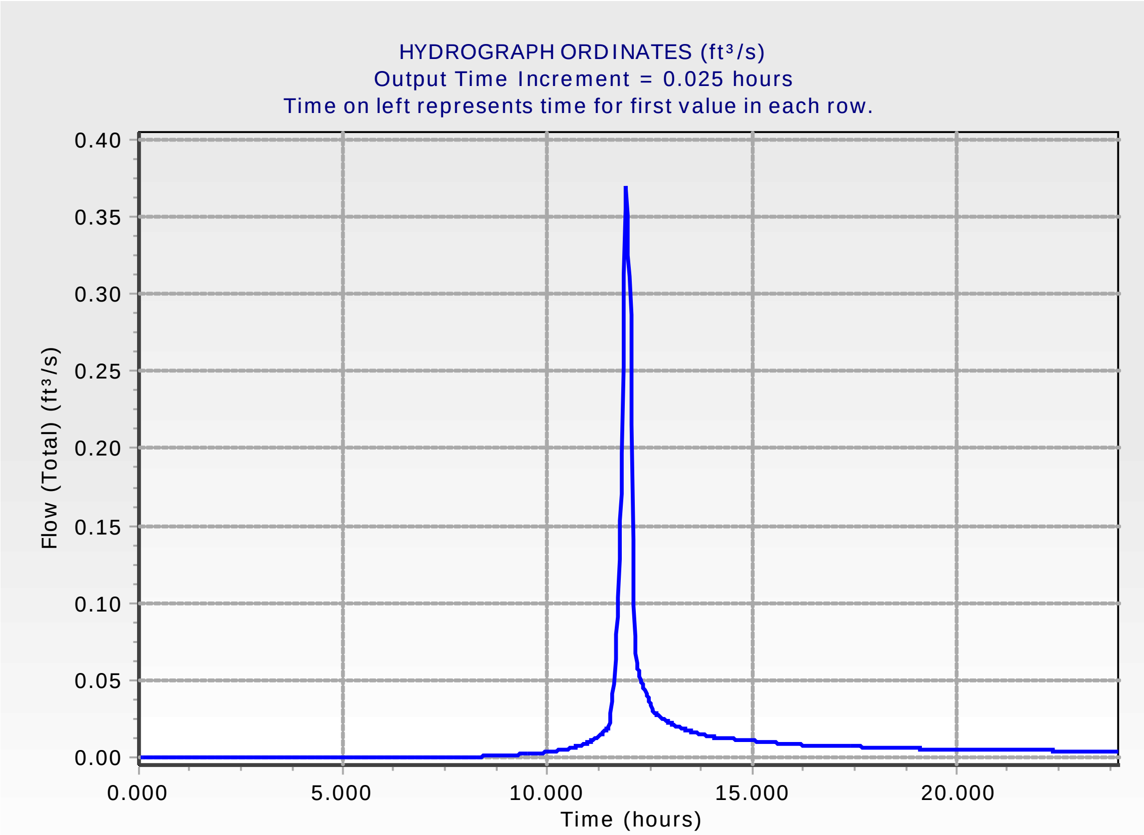
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
8.725	0.00	0.00	0.00	0.00	0.00
8.850	0.00	0.00	0.00	0.00	0.00
8.975	0.00	0.00	0.00	0.00	0.00
9.100	0.00	0.00	0.00	0.00	0.00
9.225	0.00	0.00	0.00	0.00	0.00
9.350	0.00	0.00	0.00	0.00	0.00
9.475	0.00	0.00	0.00	0.00	0.00
9.600	0.00	0.00	0.00	0.00	0.00
9.725	0.00	0.00	0.00	0.00	0.00
9.850	0.00	0.00	0.00	0.00	0.00
9.975	0.00	0.00	0.00	0.00	0.00
10.100	0.00	0.00	0.00	0.00	0.00
10.225	0.00	0.00	0.00	0.00	0.00
10.350	0.00	0.00	0.01	0.01	0.01
10.475	0.01	0.01	0.01	0.01	0.01
10.600	0.01	0.01	0.01	0.01	0.01
10.725	0.01	0.01	0.01	0.01	0.01
10.850	0.01	0.01	0.01	0.01	0.01
10.975	0.01	0.01	0.01	0.01	0.01
11.100	0.01	0.01	0.01	0.01	0.01
11.225	0.01	0.01	0.01	0.02	0.02
11.350	0.02	0.02	0.02	0.02	0.02
11.475	0.02	0.02	0.02	0.03	0.04
11.600	0.04	0.05	0.06	0.08	0.09
11.725	0.10	0.13	0.15	0.17	0.20
11.850	0.25	0.31	0.35	0.37	0.35
11.975	0.33	0.31	0.29	0.22	0.14
12.100	0.10	0.08	0.07	0.06	0.06
12.225	0.06	0.05	0.05	0.05	0.05
12.350	0.05	0.04	0.04	0.04	0.04
12.475	0.04	0.03	0.03	0.03	0.03
12.600	0.03	0.03	0.03	0.03	0.03
12.725	0.03	0.03	0.03	0.03	0.03
12.850	0.02	0.02	0.02	0.02	0.02
12.975	0.02	0.02	0.02	0.02	0.02
13.100	0.02	0.02	0.02	0.02	0.02
13.225	0.02	0.02	0.02	0.02	0.02
13.350	0.02	0.02	0.02	0.02	0.02
13.475	0.02	0.02	0.02	0.02	0.02
13.600	0.02	0.02	0.02	0.02	0.02
13.725	0.02	0.02	0.01	0.01	0.01
13.850	0.01	0.01	0.01	0.01	0.01
13.975	0.01	0.01	0.01	0.01	0.01

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
14.100	0.01	0.01	0.01	0.01	0.01
14.225	0.01	0.01	0.01	0.01	0.01
14.350	0.01	0.01	0.01	0.01	0.01
14.475	0.01	0.01	0.01	0.01	0.01
14.600	0.01	0.01	0.01	0.01	0.01
14.725	0.01	0.01	0.01	0.01	0.01
14.850	0.01	0.01	0.01	0.01	0.01
14.975	0.01	0.01	0.01	0.01	0.01
15.100	0.01	0.01	0.01	0.01	0.01
15.225	0.01	0.01	0.01	0.01	0.01
15.350	0.01	0.01	0.01	0.01	0.01
15.475	0.01	0.01	0.01	0.01	0.01
15.600	0.01	0.01	0.01	0.01	0.01
15.725	0.01	0.01	0.01	0.01	0.01
15.850	0.01	0.01	0.01	0.01	0.01
15.975	0.01	0.01	0.01	0.01	0.01
16.100	0.01	0.01	0.01	0.01	0.01
16.225	0.01	0.01	0.01	0.01	0.01
16.350	0.01	0.01	0.01	0.01	0.01
16.475	0.01	0.01	0.01	0.01	0.01
16.600	0.01	0.01	0.01	0.01	0.01
16.725	0.01	0.01	0.01	0.01	0.01
16.850	0.01	0.01	0.01	0.01	0.01
16.975	0.01	0.01	0.01	0.01	0.01
17.100	0.01	0.01	0.01	0.01	0.01
17.225	0.01	0.01	0.01	0.01	0.01
17.350	0.01	0.01	0.01	0.01	0.01
17.475	0.01	0.01	0.01	0.01	0.01
17.600	0.01	0.01	0.01	0.01	0.01
17.725	0.01	0.01	0.01	0.01	0.01
17.850	0.01	0.01	0.01	0.01	0.01
17.975	0.01	0.01	0.01	0.01	0.01
18.100	0.01	0.01	0.01	0.01	0.01
18.225	0.01	0.01	0.01	0.01	0.01
18.350	0.01	0.01	0.01	0.01	0.01
18.475	0.01	0.01	0.01	0.01	0.01
18.600	0.01	0.01	0.01	0.01	0.01
18.725	0.01	0.01	0.01	0.01	0.01
18.850	0.01	0.01	0.01	0.01	0.01
18.975	0.01	0.01	0.01	0.01	0.01
19.100	0.01	0.01	0.01	0.01	0.01
19.225	0.01	0.01	0.01	0.01	0.01
19.350	0.01	0.01	0.01	0.01	0.01
19.475	0.01	0.01	0.01	0.01	0.01
19.600	0.01	0.01	0.01	0.01	0.01
19.725	0.01	0.01	0.00	0.00	0.00
19.850	0.00	0.00	0.00	0.00	0.00
19.975	0.00	0.00	0.00	0.00	0.00
20.100	0.00	0.00	0.00	0.00	0.00
20.225	0.00	0.00	0.00	0.00	0.00
20.350	0.00	0.00	0.00	0.00	0.00
20.475	0.00	0.00	0.00	0.00	0.00

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
20.600	0.00	0.00	0.00	0.00	0.00
20.725	0.00	0.00	0.00	0.00	0.00
20.850	0.00	0.00	0.00	0.00	0.00
20.975	0.00	0.00	0.00	0.00	0.00
21.100	0.00	0.00	0.00	0.00	0.00
21.225	0.00	0.00	0.00	0.00	0.00
21.350	0.00	0.00	0.00	0.00	0.00
21.475	0.00	0.00	0.00	0.00	0.00
21.600	0.00	0.00	0.00	0.00	0.00
21.725	0.00	0.00	0.00	0.00	0.00
21.850	0.00	0.00	0.00	0.00	0.00
21.975	0.00	0.00	0.00	0.00	0.00
22.100	0.00	0.00	0.00	0.00	0.00
22.225	0.00	0.00	0.00	0.00	0.00
22.350	0.00	0.00	0.00	0.00	0.00
22.475	0.00	0.00	0.00	0.00	0.00
22.600	0.00	0.00	0.00	0.00	0.00
22.725	0.00	0.00	0.00	0.00	0.00
22.850	0.00	0.00	0.00	0.00	0.00
22.975	0.00	0.00	0.00	0.00	0.00
23.100	0.00	0.00	0.00	0.00	0.00
23.225	0.00	0.00	0.00	0.00	0.00
23.350	0.00	0.00	0.00	0.00	0.00
23.475	0.00	0.00	0.00	0.00	0.00
23.600	0.00	0.00	0.00	0.00	0.00
23.725	0.00	0.00	0.00	0.00	0.00
23.850	0.00	0.00	0.00	0.00	0.00
23.975	0.00	0.00	(N/A)	(N/A)	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
Flow (Total) (ft³/s)
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)

Storm Event	SCS Type II - 10 yr
Return Event	10 years
Duration	24.000 hours
Depth	3.1 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	0.195 acres

Computational Time Increment	0.011 hours
Time to Peak (Computed)	11.922 hours
Flow (Peak, Computed)	0.60 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	11.925 hours
Flow (Peak Interpolated Output)	0.60 ft³/s

Drainage Area

SCS CN (Composite)	89.000
Area (User Defined)	0.195 acres
Maximum Retention (Pervious)	1.2 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff

Cumulative Runoff Depth (Pervious)	2.0 in
Runoff Volume (Pervious)	0.032 ac-ft

Hydrograph Volume (Area under Hydrograph curve)

Volume	0.032 ac-ft

SCS Unit Hydrograph Parameters

Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	2.65 ft³/s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Storm Event	SCS Type II - 10 yr
Return Event	10 years
Duration	24.000 hours
Depth	3.1 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	0.195 acres

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

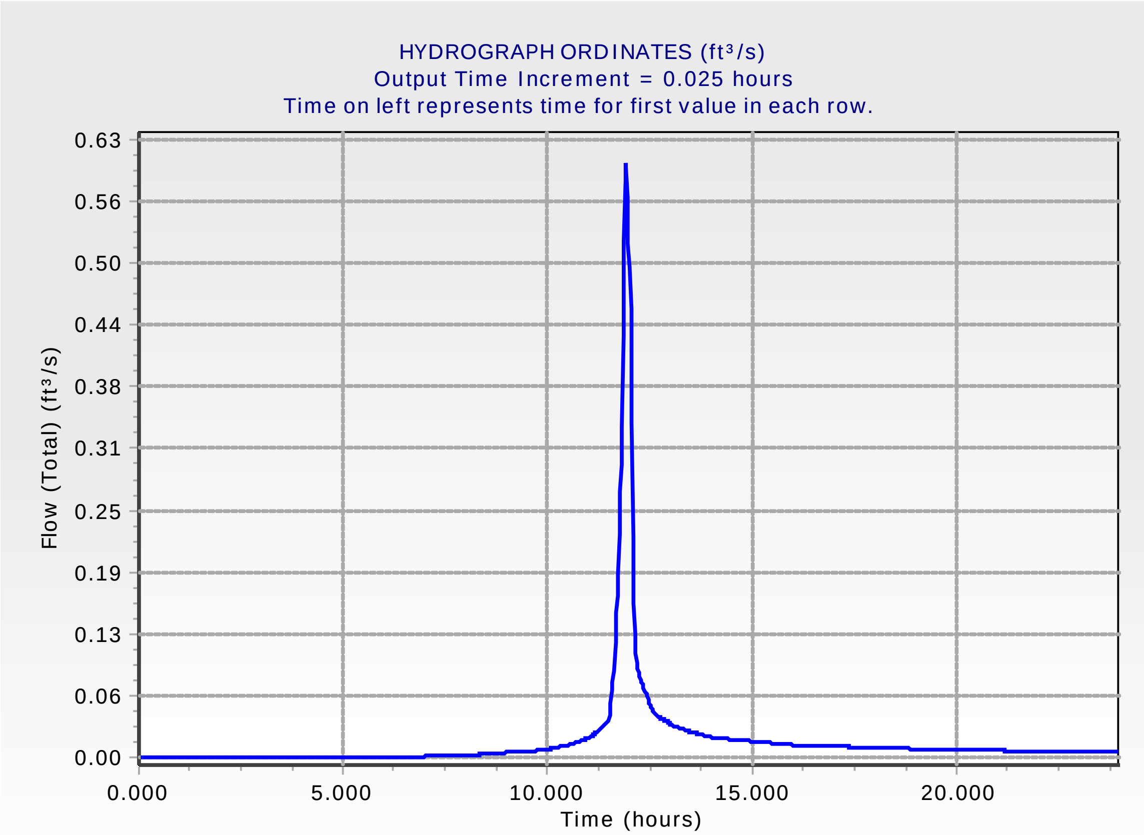
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
7.025	0.00	0.00	0.00	0.00	0.00
7.150	0.00	0.00	0.00	0.00	0.00
7.275	0.00	0.00	0.00	0.00	0.00
7.400	0.00	0.00	0.00	0.00	0.00
7.525	0.00	0.00	0.00	0.00	0.00
7.650	0.00	0.00	0.00	0.00	0.00
7.775	0.00	0.00	0.00	0.00	0.00
7.900	0.00	0.00	0.00	0.00	0.00
8.025	0.00	0.00	0.00	0.00	0.00
8.150	0.00	0.00	0.00	0.00	0.00
8.275	0.00	0.00	0.00	0.00	0.00
8.400	0.00	0.00	0.00	0.00	0.00
8.525	0.00	0.00	0.00	0.00	0.00
8.650	0.00	0.00	0.00	0.00	0.00
8.775	0.00	0.00	0.00	0.00	0.00
8.900	0.00	0.00	0.00	0.00	0.00
9.025	0.01	0.01	0.01	0.01	0.01
9.150	0.01	0.01	0.01	0.01	0.01
9.275	0.01	0.01	0.01	0.01	0.01
9.400	0.01	0.01	0.01	0.01	0.01
9.525	0.01	0.01	0.01	0.01	0.01
9.650	0.01	0.01	0.01	0.01	0.01
9.775	0.01	0.01	0.01	0.01	0.01
9.900	0.01	0.01	0.01	0.01	0.01
10.025	0.01	0.01	0.01	0.01	0.01
10.150	0.01	0.01	0.01	0.01	0.01
10.275	0.01	0.01	0.01	0.01	0.01
10.400	0.01	0.01	0.01	0.01	0.01
10.525	0.01	0.01	0.01	0.01	0.01
10.650	0.01	0.01	0.02	0.02	0.02
10.775	0.02	0.02	0.02	0.02	0.02
10.900	0.02	0.02	0.02	0.02	0.02
11.025	0.02	0.02	0.02	0.02	0.02
11.150	0.02	0.03	0.03	0.03	0.03
11.275	0.03	0.03	0.03	0.03	0.03
11.400	0.03	0.03	0.04	0.04	0.04
11.525	0.04	0.05	0.07	0.08	0.09
11.650	0.12	0.15	0.16	0.18	0.23
11.775	0.27	0.30	0.34	0.43	0.52
11.900	0.58	0.60	0.57	0.52	0.50
12.025	0.45	0.34	0.22	0.16	0.12
12.150	0.11	0.10	0.09	0.09	0.08
12.275	0.08	0.08	0.07	0.07	0.07

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
12.400	0.06	0.06	0.06	0.06	0.05
12.525	0.05	0.05	0.05	0.05	0.04
12.650	0.04	0.04	0.04	0.04	0.04
12.775	0.04	0.04	0.04	0.04	0.04
12.900	0.04	0.04	0.04	0.03	0.03
13.025	0.03	0.03	0.03	0.03	0.03
13.150	0.03	0.03	0.03	0.03	0.03
13.275	0.03	0.03	0.03	0.03	0.03
13.400	0.03	0.03	0.03	0.03	0.03
13.525	0.03	0.03	0.02	0.02	0.02
13.650	0.02	0.02	0.02	0.02	0.02
13.775	0.02	0.02	0.02	0.02	0.02
13.900	0.02	0.02	0.02	0.02	0.02
14.025	0.02	0.02	0.02	0.02	0.02
14.150	0.02	0.02	0.02	0.02	0.02
14.275	0.02	0.02	0.02	0.02	0.02
14.400	0.02	0.02	0.02	0.02	0.02
14.525	0.02	0.02	0.02	0.02	0.02
14.650	0.02	0.02	0.02	0.02	0.02
14.775	0.02	0.02	0.02	0.02	0.02
14.900	0.02	0.02	0.02	0.02	0.02
15.025	0.02	0.02	0.02	0.02	0.02
15.150	0.02	0.02	0.02	0.02	0.02
15.275	0.02	0.02	0.02	0.02	0.01
15.400	0.01	0.01	0.01	0.01	0.01
15.525	0.01	0.01	0.01	0.01	0.01
15.650	0.01	0.01	0.01	0.01	0.01
15.775	0.01	0.01	0.01	0.01	0.01
15.900	0.01	0.01	0.01	0.01	0.01
16.025	0.01	0.01	0.01	0.01	0.01
16.150	0.01	0.01	0.01	0.01	0.01
16.275	0.01	0.01	0.01	0.01	0.01
16.400	0.01	0.01	0.01	0.01	0.01
16.525	0.01	0.01	0.01	0.01	0.01
16.650	0.01	0.01	0.01	0.01	0.01
16.775	0.01	0.01	0.01	0.01	0.01
16.900	0.01	0.01	0.01	0.01	0.01
17.025	0.01	0.01	0.01	0.01	0.01
17.150	0.01	0.01	0.01	0.01	0.01
17.275	0.01	0.01	0.01	0.01	0.01
17.400	0.01	0.01	0.01	0.01	0.01
17.525	0.01	0.01	0.01	0.01	0.01
17.650	0.01	0.01	0.01	0.01	0.01
17.775	0.01	0.01	0.01	0.01	0.01
17.900	0.01	0.01	0.01	0.01	0.01
18.025	0.01	0.01	0.01	0.01	0.01
18.150	0.01	0.01	0.01	0.01	0.01
18.275	0.01	0.01	0.01	0.01	0.01
18.400	0.01	0.01	0.01	0.01	0.01
18.525	0.01	0.01	0.01	0.01	0.01
18.650	0.01	0.01	0.01	0.01	0.01
18.775	0.01	0.01	0.01	0.01	0.01

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
18.900	0.01	0.01	0.01	0.01	0.01
19.025	0.01	0.01	0.01	0.01	0.01
19.150	0.01	0.01	0.01	0.01	0.01
19.275	0.01	0.01	0.01	0.01	0.01
19.400	0.01	0.01	0.01	0.01	0.01
19.525	0.01	0.01	0.01	0.01	0.01
19.650	0.01	0.01	0.01	0.01	0.01
19.775	0.01	0.01	0.01	0.01	0.01
19.900	0.01	0.01	0.01	0.01	0.01
20.025	0.01	0.01	0.01	0.01	0.01
20.150	0.01	0.01	0.01	0.01	0.01
20.275	0.01	0.01	0.01	0.01	0.01
20.400	0.01	0.01	0.01	0.01	0.01
20.525	0.01	0.01	0.01	0.01	0.01
20.650	0.01	0.01	0.01	0.01	0.01
20.775	0.01	0.01	0.01	0.01	0.01
20.900	0.01	0.01	0.01	0.01	0.01
21.025	0.01	0.01	0.01	0.01	0.01
21.150	0.01	0.01	0.01	0.01	0.01
21.275	0.01	0.01	0.01	0.01	0.01
21.400	0.01	0.01	0.01	0.01	0.01
21.525	0.01	0.01	0.01	0.01	0.01
21.650	0.01	0.01	0.01	0.01	0.01
21.775	0.01	0.01	0.01	0.01	0.01
21.900	0.01	0.01	0.01	0.01	0.01
22.025	0.01	0.01	0.01	0.01	0.01
22.150	0.01	0.01	0.01	0.01	0.01
22.275	0.01	0.01	0.01	0.01	0.01
22.400	0.01	0.01	0.01	0.01	0.01
22.525	0.01	0.01	0.01	0.01	0.01
22.650	0.01	0.01	0.01	0.01	0.01
22.775	0.01	0.01	0.01	0.01	0.01
22.900	0.01	0.01	0.01	0.01	0.01
23.025	0.01	0.01	0.01	0.01	0.01
23.150	0.01	0.01	0.01	0.01	0.01
23.275	0.01	0.01	0.01	0.01	0.01
23.400	0.01	0.01	0.01	0.01	0.01
23.525	0.01	0.01	0.01	0.01	0.01
23.650	0.01	0.01	0.01	0.01	0.01
23.775	0.01	0.01	0.01	0.01	0.01
23.900	0.01	0.01	0.01	0.01	0.01


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
Flow (Total) (ft³/s)
0.63
0.56
0.50
0.44
0.38
0.31
0.25
0.19
0.13
0.06
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)

Storm Event	SCS Type II - 50 yr
Return Event	50 years
Duration	24.000 hours
Depth	4.3 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	0.195 acres

Computational Time Increment	0.011 hours
Time to Peak (Computed)	11.922 hours
Flow (Peak, Computed)	0.94 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	11.925 hours
Flow (Peak Interpolated Output)	0.93 ft³/s

Drainage Area

SCS CN (Composite)	89.000
Area (User Defined)	0.195 acres
Maximum Retention (Pervious)	1.2 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff

Cumulative Runoff Depth (Pervious)	3.1 in
Runoff Volume (Pervious)	0.051 ac-ft

Hydrograph Volume (Area under Hydrograph curve)

Volume	0.051 ac-ft

SCS Unit Hydrograph Parameters

Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	2.65 ft³/s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Storm Event	SCS Type II - 50 yr
Return Event	50 years
Duration	24.000 hours
Depth	4.3 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	0.195 acres

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
5.400	0.00	0.00	0.00	0.00	0.00
5.525	0.00	0.00	0.00	0.00	0.00
5.650	0.00	0.00	0.00	0.00	0.00
5.775	0.00	0.00	0.00	0.00	0.00
5.900	0.00	0.00	0.00	0.00	0.00
6.025	0.00	0.00	0.00	0.00	0.00
6.150	0.00	0.00	0.00	0.00	0.00
6.275	0.00	0.00	0.00	0.00	0.00
6.400	0.00	0.00	0.00	0.00	0.00
6.525	0.00	0.00	0.00	0.00	0.00
6.650	0.00	0.00	0.00	0.00	0.00
6.775	0.00	0.00	0.00	0.00	0.00
6.900	0.00	0.00	0.00	0.00	0.00
7.025	0.00	0.00	0.00	0.00	0.00
7.150	0.00	0.00	0.00	0.00	0.00
7.275	0.00	0.00	0.00	0.00	0.00
7.400	0.00	0.00	0.00	0.00	0.00
7.525	0.00	0.01	0.01	0.01	0.01
7.650	0.01	0.01	0.01	0.01	0.01
7.775	0.01	0.01	0.01	0.01	0.01
7.900	0.01	0.01	0.01	0.01	0.01
8.025	0.01	0.01	0.01	0.01	0.01
8.150	0.01	0.01	0.01	0.01	0.01
8.275	0.01	0.01	0.01	0.01	0.01
8.400	0.01	0.01	0.01	0.01	0.01
8.525	0.01	0.01	0.01	0.01	0.01
8.650	0.01	0.01	0.01	0.01	0.01
8.775	0.01	0.01	0.01	0.01	0.01
8.900	0.01	0.01	0.01	0.01	0.01
9.025	0.01	0.01	0.01	0.01	0.01
9.150	0.01	0.01	0.01	0.01	0.01
9.275	0.01	0.01	0.01	0.01	0.01
9.400	0.01	0.01	0.01	0.01	0.01
9.525	0.01	0.01	0.01	0.01	0.01
9.650	0.01	0.01	0.01	0.01	0.01
9.775	0.01	0.01	0.01	0.02	0.02
9.900	0.02	0.02	0.02	0.02	0.02
10.025	0.02	0.02	0.02	0.02	0.02
10.150	0.02	0.02	0.02	0.02	0.02
10.275	0.02	0.02	0.02	0.02	0.02
10.400	0.02	0.02	0.02	0.02	0.02
10.525	0.02	0.02	0.03	0.03	0.03
10.650	0.03	0.03	0.03	0.03	0.03

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

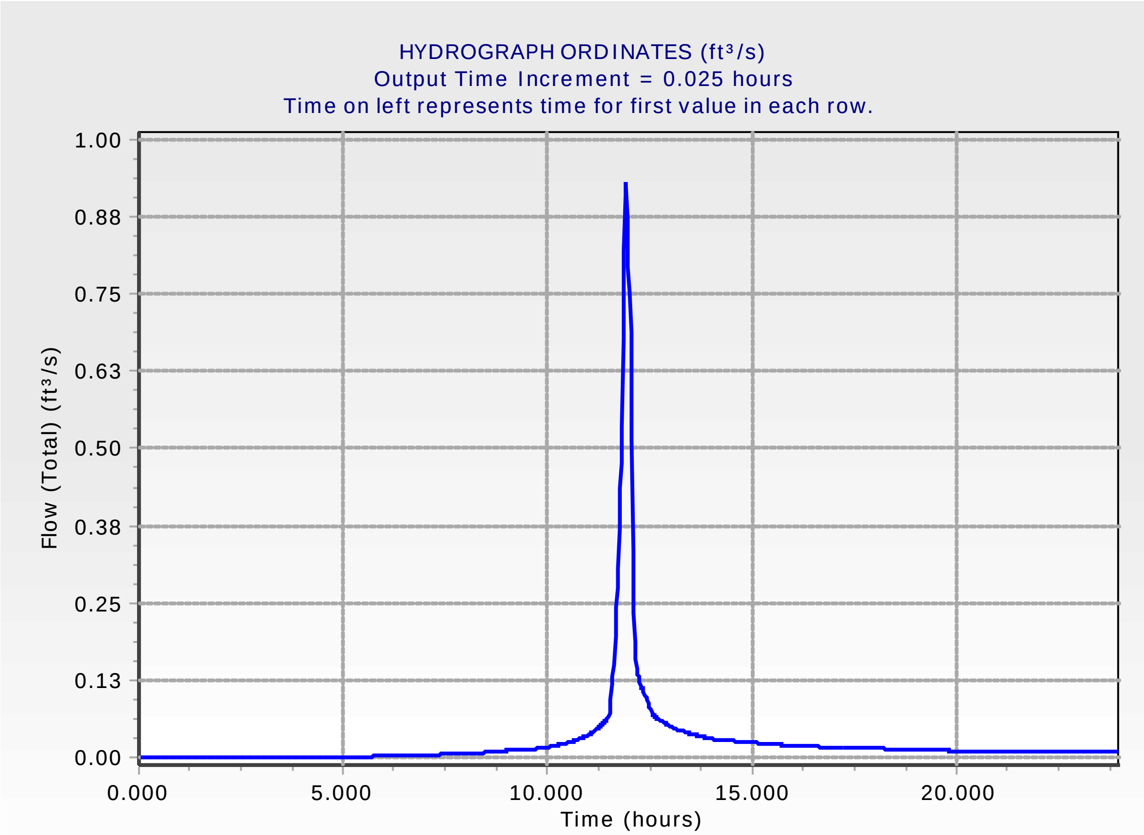
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
10.775	0.03	0.03	0.03	0.03	0.03
10.900	0.03	0.03	0.03	0.04	0.04
11.025	0.04	0.04	0.04	0.04	0.04
11.150	0.04	0.04	0.05	0.05	0.05
11.275	0.05	0.05	0.05	0.06	0.06
11.400	0.06	0.06	0.06	0.06	0.07
11.525	0.07	0.09	0.12	0.13	0.15
11.650	0.20	0.24	0.27	0.31	0.37
11.775	0.44	0.48	0.54	0.68	0.82
11.900	0.91	0.93	0.87	0.80	0.75
12.025	0.69	0.51	0.33	0.23	0.19
12.150	0.16	0.14	0.13	0.13	0.12
12.275	0.12	0.11	0.11	0.10	0.10
12.400	0.10	0.09	0.09	0.08	0.08
12.525	0.08	0.07	0.07	0.07	0.07
12.650	0.06	0.06	0.06	0.06	0.06
12.775	0.06	0.06	0.06	0.06	0.05
12.900	0.05	0.05	0.05	0.05	0.05
13.025	0.05	0.05	0.05	0.05	0.05
13.150	0.05	0.05	0.04	0.04	0.04
13.275	0.04	0.04	0.04	0.04	0.04
13.400	0.04	0.04	0.04	0.04	0.04
13.525	0.04	0.04	0.04	0.04	0.04
13.650	0.04	0.04	0.03	0.03	0.03
13.775	0.03	0.03	0.03	0.03	0.03
13.900	0.03	0.03	0.03	0.03	0.03
14.025	0.03	0.03	0.03	0.03	0.03
14.150	0.03	0.03	0.03	0.03	0.03
14.275	0.03	0.03	0.03	0.03	0.03
14.400	0.03	0.03	0.03	0.03	0.03
14.525	0.03	0.03	0.03	0.03	0.03
14.650	0.03	0.03	0.03	0.03	0.03
14.775	0.03	0.03	0.03	0.02	0.02
14.900	0.02	0.02	0.02	0.02	0.02
15.025	0.02	0.02	0.02	0.02	0.02
15.150	0.02	0.02	0.02	0.02	0.02
15.275	0.02	0.02	0.02	0.02	0.02
15.400	0.02	0.02	0.02	0.02	0.02
15.525	0.02	0.02	0.02	0.02	0.02
15.650	0.02	0.02	0.02	0.02	0.02
15.775	0.02	0.02	0.02	0.02	0.02
15.900	0.02	0.02	0.02	0.02	0.02
16.025	0.02	0.02	0.02	0.02	0.02
16.150	0.02	0.02	0.02	0.02	0.02
16.275	0.02	0.02	0.02	0.02	0.02
16.400	0.02	0.02	0.02	0.02	0.02
16.525	0.02	0.02	0.02	0.02	0.02
16.650	0.02	0.02	0.02	0.02	0.02
16.775	0.02	0.02	0.02	0.02	0.02
16.900	0.02	0.02	0.02	0.02	0.02
17.025	0.02	0.02	0.02	0.02	0.02
17.150	0.02	0.02	0.02	0.02	0.02

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
17.275	0.02	0.02	0.02	0.02	0.02
17.400	0.02	0.02	0.02	0.02	0.02
17.525	0.02	0.02	0.02	0.02	0.02
17.650	0.02	0.02	0.02	0.02	0.01
17.775	0.01	0.01	0.01	0.01	0.01
17.900	0.01	0.01	0.01	0.01	0.01
18.025	0.01	0.01	0.01	0.01	0.01
18.150	0.01	0.01	0.01	0.01	0.01
18.275	0.01	0.01	0.01	0.01	0.01
18.400	0.01	0.01	0.01	0.01	0.01
18.525	0.01	0.01	0.01	0.01	0.01
18.650	0.01	0.01	0.01	0.01	0.01
18.775	0.01	0.01	0.01	0.01	0.01
18.900	0.01	0.01	0.01	0.01	0.01
19.025	0.01	0.01	0.01	0.01	0.01
19.150	0.01	0.01	0.01	0.01	0.01
19.275	0.01	0.01	0.01	0.01	0.01
19.400	0.01	0.01	0.01	0.01	0.01
19.525	0.01	0.01	0.01	0.01	0.01
19.650	0.01	0.01	0.01	0.01	0.01
19.775	0.01	0.01	0.01	0.01	0.01
19.900	0.01	0.01	0.01	0.01	0.01
20.025	0.01	0.01	0.01	0.01	0.01
20.150	0.01	0.01	0.01	0.01	0.01
20.275	0.01	0.01	0.01	0.01	0.01
20.400	0.01	0.01	0.01	0.01	0.01
20.525	0.01	0.01	0.01	0.01	0.01
20.650	0.01	0.01	0.01	0.01	0.01
20.775	0.01	0.01	0.01	0.01	0.01
20.900	0.01	0.01	0.01	0.01	0.01
21.025	0.01	0.01	0.01	0.01	0.01
21.150	0.01	0.01	0.01	0.01	0.01
21.275	0.01	0.01	0.01	0.01	0.01
21.400	0.01	0.01	0.01	0.01	0.01
21.525	0.01	0.01	0.01	0.01	0.01
21.650	0.01	0.01	0.01	0.01	0.01
21.775	0.01	0.01	0.01	0.01	0.01
21.900	0.01	0.01	0.01	0.01	0.01
22.025	0.01	0.01	0.01	0.01	0.01
22.150	0.01	0.01	0.01	0.01	0.01
22.275	0.01	0.01	0.01	0.01	0.01
22.400	0.01	0.01	0.01	0.01	0.01
22.525	0.01	0.01	0.01	0.01	0.01
22.650	0.01	0.01	0.01	0.01	0.01
22.775	0.01	0.01	0.01	0.01	0.01
22.900	0.01	0.01	0.01	0.01	0.01
23.025	0.01	0.01	0.01	0.01	0.01
23.150	0.01	0.01	0.01	0.01	0.01
23.275	0.01	0.01	0.01	0.01	0.01
23.400	0.01	0.01	0.01	0.01	0.01
23.525	0.01	0.01	0.01	0.01	0.01
23.650	0.01	0.01	0.01	0.01	0.01

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
23.775	0.01	0.01	0.01	0.01	0.01
23.900	0.01	0.01	0.01	0.01	0.01


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
Flow (Total) (ft³/s)
1.00
0.88
0.75
0.63
0.50
0.38
0.25
0.13
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)

Storm Event	SCS Type II - 100 yr
Return Event	100 years
Duration	24.000 hours
Depth	5.0 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	0.195 acres

Computational Time Increment	0.011 hours
Time to Peak (Computed)	11.922 hours
Flow (Peak, Computed)	1.12 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	11.925 hours
Flow (Peak Interpolated Output)	1.11 ft³/s

Drainage Area

SCS CN (Composite)	89.000
Area (User Defined)	0.195 acres
Maximum Retention (Pervious)	1.2 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff

Cumulative Runoff Depth (Pervious)	3.8 in
Runoff Volume (Pervious)	0.061 ac-ft

Hydrograph Volume (Area under Hydrograph curve)

Volume	0.061 ac-ft

SCS Unit Hydrograph Parameters

Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	2.65 ft³/s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Storm Event	SCS Type II - 100 yr
Return Event	100 years
Duration	24.000 hours
Depth	5.0 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	0.195 acres

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
4.775	0.00	0.00	0.00	0.00	0.00
4.900	0.00	0.00	0.00	0.00	0.00
5.025	0.00	0.00	0.00	0.00	0.00
5.150	0.00	0.00	0.00	0.00	0.00
5.275	0.00	0.00	0.00	0.00	0.00
5.400	0.00	0.00	0.00	0.00	0.00
5.525	0.00	0.00	0.00	0.00	0.00
5.650	0.00	0.00	0.00	0.00	0.00
5.775	0.00	0.00	0.00	0.00	0.00
5.900	0.00	0.00	0.00	0.00	0.00
6.025	0.00	0.00	0.00	0.00	0.00
6.150	0.00	0.00	0.00	0.00	0.00
6.275	0.00	0.00	0.00	0.00	0.00
6.400	0.00	0.00	0.00	0.00	0.00
6.525	0.00	0.00	0.00	0.00	0.00
6.650	0.01	0.01	0.01	0.01	0.01
6.775	0.01	0.01	0.01	0.01	0.01
6.900	0.01	0.01	0.01	0.01	0.01
7.025	0.01	0.01	0.01	0.01	0.01
7.150	0.01	0.01	0.01	0.01	0.01
7.275	0.01	0.01	0.01	0.01	0.01
7.400	0.01	0.01	0.01	0.01	0.01
7.525	0.01	0.01	0.01	0.01	0.01
7.650	0.01	0.01	0.01	0.01	0.01
7.775	0.01	0.01	0.01	0.01	0.01
7.900	0.01	0.01	0.01	0.01	0.01
8.025	0.01	0.01	0.01	0.01	0.01
8.150	0.01	0.01	0.01	0.01	0.01
8.275	0.01	0.01	0.01	0.01	0.01
8.400	0.01	0.01	0.01	0.01	0.01
8.525	0.01	0.01	0.01	0.01	0.01
8.650	0.01	0.01	0.01	0.01	0.01
8.775	0.01	0.01	0.01	0.01	0.01
8.900	0.01	0.01	0.01	0.01	0.01
9.025	0.01	0.02	0.02	0.02	0.02
9.150	0.02	0.02	0.02	0.02	0.02
9.275	0.02	0.02	0.02	0.02	0.02
9.400	0.02	0.02	0.02	0.02	0.02
9.525	0.02	0.02	0.02	0.02	0.02
9.650	0.02	0.02	0.02	0.02	0.02
9.775	0.02	0.02	0.02	0.02	0.02
9.900	0.02	0.02	0.02	0.02	0.02
10.025	0.02	0.02	0.02	0.02	0.02

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

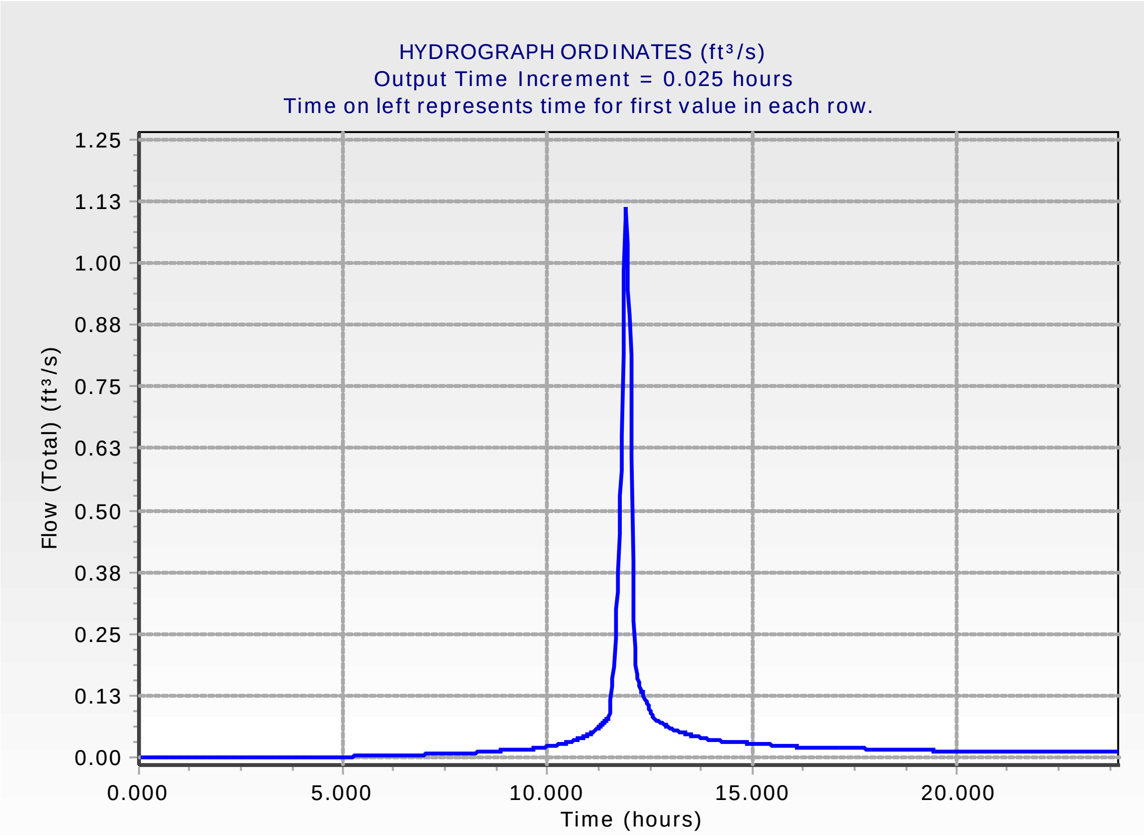
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
10.150	0.02	0.02	0.02	0.03	0.03
10.275	0.03	0.03	0.03	0.03	0.03
10.400	0.03	0.03	0.03	0.03	0.03
10.525	0.03	0.03	0.03	0.03	0.03
10.650	0.03	0.04	0.04	0.04	0.04
10.775	0.04	0.04	0.04	0.04	0.04
10.900	0.04	0.04	0.04	0.04	0.05
11.025	0.05	0.05	0.05	0.05	0.05
11.150	0.05	0.06	0.06	0.06	0.06
11.275	0.06	0.07	0.07	0.07	0.07
11.400	0.07	0.07	0.08	0.08	0.08
11.525	0.09	0.12	0.14	0.16	0.18
11.650	0.24	0.30	0.34	0.37	0.45
11.775	0.53	0.58	0.65	0.81	0.99
11.900	1.09	1.11	1.04	0.95	0.90
12.025	0.82	0.61	0.40	0.28	0.22
12.150	0.19	0.17	0.16	0.15	0.14
12.275	0.14	0.13	0.13	0.12	0.12
12.400	0.11	0.11	0.10	0.10	0.09
12.525	0.09	0.09	0.08	0.08	0.08
12.650	0.08	0.07	0.07	0.07	0.07
12.775	0.07	0.07	0.07	0.07	0.06
12.900	0.06	0.06	0.06	0.06	0.06
13.025	0.06	0.06	0.06	0.06	0.05
13.150	0.05	0.05	0.05	0.05	0.05
13.275	0.05	0.05	0.05	0.05	0.05
13.400	0.05	0.05	0.05	0.05	0.05
13.525	0.04	0.04	0.04	0.04	0.04
13.650	0.04	0.04	0.04	0.04	0.04
13.775	0.04	0.04	0.04	0.04	0.04
13.900	0.04	0.04	0.04	0.04	0.04
14.025	0.04	0.03	0.03	0.03	0.03
14.150	0.03	0.03	0.03	0.03	0.03
14.275	0.03	0.03	0.03	0.03	0.03
14.400	0.03	0.03	0.03	0.03	0.03
14.525	0.03	0.03	0.03	0.03	0.03
14.650	0.03	0.03	0.03	0.03	0.03
14.775	0.03	0.03	0.03	0.03	0.03
14.900	0.03	0.03	0.03	0.03	0.03
15.025	0.03	0.03	0.03	0.03	0.03
15.150	0.03	0.03	0.03	0.03	0.03
15.275	0.03	0.03	0.03	0.03	0.03
15.400	0.03	0.03	0.03	0.03	0.03
15.525	0.02	0.02	0.02	0.02	0.02
15.650	0.02	0.02	0.02	0.02	0.02
15.775	0.02	0.02	0.02	0.02	0.02
15.900	0.02	0.02	0.02	0.02	0.02
16.025	0.02	0.02	0.02	0.02	0.02
16.150	0.02	0.02	0.02	0.02	0.02
16.275	0.02	0.02	0.02	0.02	0.02
16.400	0.02	0.02	0.02	0.02	0.02
16.525	0.02	0.02	0.02	0.02	0.02

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
16.650	0.02	0.02	0.02	0.02	0.02
16.775	0.02	0.02	0.02	0.02	0.02
16.900	0.02	0.02	0.02	0.02	0.02
17.025	0.02	0.02	0.02	0.02	0.02
17.150	0.02	0.02	0.02	0.02	0.02
17.275	0.02	0.02	0.02	0.02	0.02
17.400	0.02	0.02	0.02	0.02	0.02
17.525	0.02	0.02	0.02	0.02	0.02
17.650	0.02	0.02	0.02	0.02	0.02
17.775	0.02	0.02	0.02	0.02	0.02
17.900	0.02	0.02	0.02	0.02	0.02
18.025	0.02	0.02	0.02	0.02	0.02
18.150	0.02	0.02	0.02	0.02	0.02
18.275	0.02	0.02	0.02	0.02	0.02
18.400	0.02	0.02	0.02	0.02	0.02
18.525	0.02	0.02	0.02	0.02	0.02
18.650	0.02	0.02	0.02	0.02	0.02
18.775	0.02	0.02	0.02	0.02	0.01
18.900	0.01	0.01	0.01	0.01	0.01
19.025	0.01	0.01	0.01	0.01	0.01
19.150	0.01	0.01	0.01	0.01	0.01
19.275	0.01	0.01	0.01	0.01	0.01
19.400	0.01	0.01	0.01	0.01	0.01
19.525	0.01	0.01	0.01	0.01	0.01
19.650	0.01	0.01	0.01	0.01	0.01
19.775	0.01	0.01	0.01	0.01	0.01
19.900	0.01	0.01	0.01	0.01	0.01
20.025	0.01	0.01	0.01	0.01	0.01
20.150	0.01	0.01	0.01	0.01	0.01
20.275	0.01	0.01	0.01	0.01	0.01
20.400	0.01	0.01	0.01	0.01	0.01
20.525	0.01	0.01	0.01	0.01	0.01
20.650	0.01	0.01	0.01	0.01	0.01
20.775	0.01	0.01	0.01	0.01	0.01
20.900	0.01	0.01	0.01	0.01	0.01
21.025	0.01	0.01	0.01	0.01	0.01
21.150	0.01	0.01	0.01	0.01	0.01
21.275	0.01	0.01	0.01	0.01	0.01
21.400	0.01	0.01	0.01	0.01	0.01
21.525	0.01	0.01	0.01	0.01	0.01
21.650	0.01	0.01	0.01	0.01	0.01
21.775	0.01	0.01	0.01	0.01	0.01
21.900	0.01	0.01	0.01	0.01	0.01
22.025	0.01	0.01	0.01	0.01	0.01
22.150	0.01	0.01	0.01	0.01	0.01
22.275	0.01	0.01	0.01	0.01	0.01
22.400	0.01	0.01	0.01	0.01	0.01
22.525	0.01	0.01	0.01	0.01	0.01
22.650	0.01	0.01	0.01	0.01	0.01
22.775	0.01	0.01	0.01	0.01	0.01
22.900	0.01	0.01	0.01	0.01	0.01
23.025	0.01	0.01	0.01	0.01	0.01

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
23.150	0.01	0.01	0.01	0.01	0.01
23.275	0.01	0.01	0.01	0.01	0.01
23.400	0.01	0.01	0.01	0.01	0.01
23.525	0.01	0.01	0.01	0.01	0.01
23.650	0.01	0.01	0.01	0.01	0.01
23.775	0.01	0.01	0.01	0.01	0.01
23.900	0.01	0.01	0.01	0.01	0.01


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
Flow (Total) (ft³/s)
1.25
1.13
1.00
0.88
0.75
0.63
0.50
0.38
0.25
0.13
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)

Storm Event	SCS Type II - 2 yr
Return Event	2 years
Duration	24.000 hours
Depth	2.2 in
Time of Concentration (Composite)	0.331 hours
Area (User Defined)	1.549 acres

Computational Time Increment	0.044 hours
Time to Peak (Computed)	12.129 hours
Flow (Peak, Computed)	0.38 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	12.125 hours
Flow (Peak Interpolated Output)	0.38 ft³/s

Drainage Area

SCS CN (Composite)	70.000
Area (User Defined)	1.549 acres
Maximum Retention (Pervious)	4.3 in
Maximum Retention (Pervious, 20 percent)	0.9 in

Cumulative Runoff

Cumulative Runoff Depth (Pervious)	0.3 in
Runoff Volume (Pervious)	0.042 ac-ft

Hydrograph Volume (Area under Hydrograph curve)

Volume	0.042 ac-ft

SCS Unit Hydrograph Parameters

Time of Concentration (Composite)	0.331 hours
Computational Time Increment	0.044 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	5.31 ft³/s
Unit peak time, Tp	0.221 hours
Unit receding limb, Tr	0.882 hours
Total unit time, Tb	1.103 hours

Storm Event	SCS Type II - 2 yr
Return Event	2 years
Duration	24.000 hours
Depth	2.2 in
Time of Concentration (Composite)	0.331 hours
Area (User Defined)	1.549 acres

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

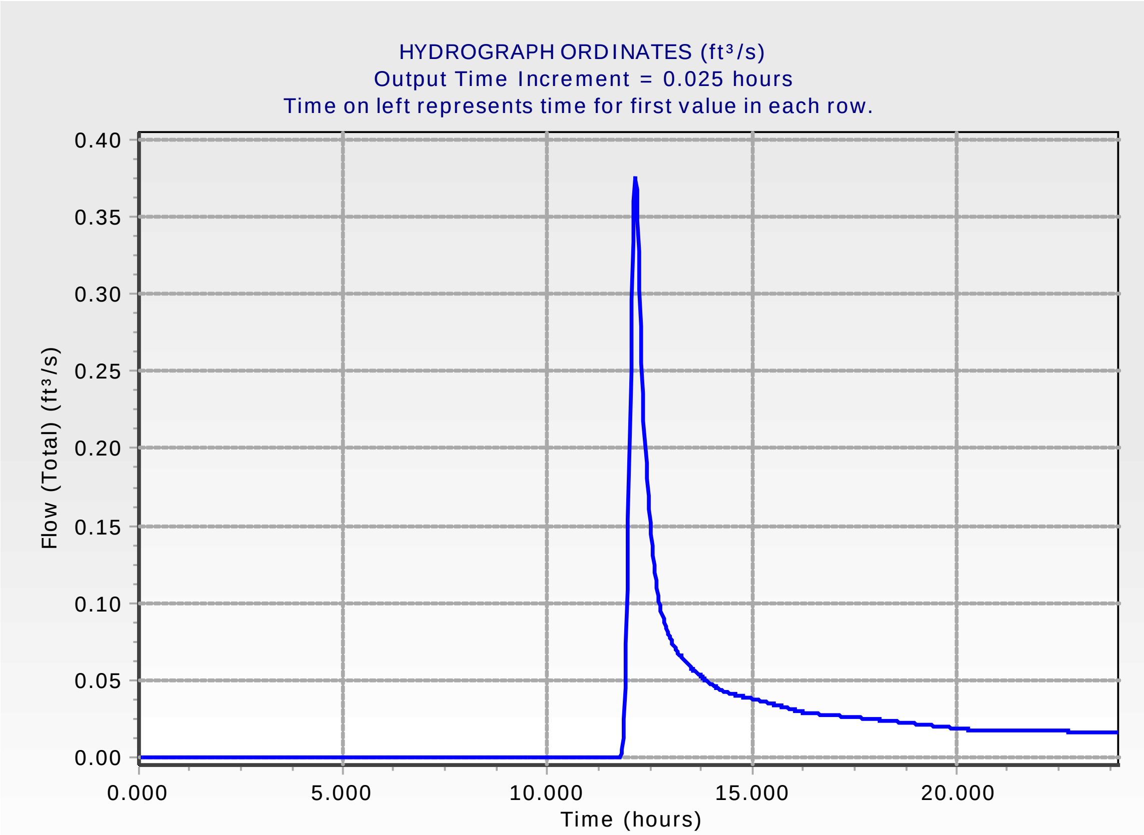
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
11.775	0.00	0.00	0.01	0.01	0.03
11.900	0.04	0.07	0.11	0.15	0.20
12.025	0.25	0.30	0.33	0.36	0.38
12.150	0.37	0.37	0.35	0.33	0.30
12.275	0.28	0.26	0.24	0.22	0.20
12.400	0.19	0.18	0.17	0.16	0.15
12.525	0.14	0.14	0.13	0.12	0.12
12.650	0.11	0.11	0.11	0.10	0.10
12.775	0.09	0.09	0.09	0.09	0.09
12.900	0.08	0.08	0.08	0.08	0.08
13.025	0.08	0.07	0.07	0.07	0.07
13.150	0.07	0.07	0.07	0.07	0.07
13.275	0.06	0.06	0.06	0.06	0.06
13.400	0.06	0.06	0.06	0.06	0.06
13.525	0.06	0.06	0.06	0.06	0.06
13.650	0.05	0.05	0.05	0.05	0.05
13.775	0.05	0.05	0.05	0.05	0.05
13.900	0.05	0.05	0.05	0.05	0.05
14.025	0.05	0.05	0.05	0.05	0.05
14.150	0.04	0.04	0.04	0.04	0.04
14.275	0.04	0.04	0.04	0.04	0.04
14.400	0.04	0.04	0.04	0.04	0.04
14.525	0.04	0.04	0.04	0.04	0.04
14.650	0.04	0.04	0.04	0.04	0.04
14.775	0.04	0.04	0.04	0.04	0.04
14.900	0.04	0.04	0.04	0.04	0.04
15.025	0.04	0.04	0.04	0.04	0.04
15.150	0.04	0.04	0.04	0.04	0.04
15.275	0.04	0.04	0.04	0.04	0.04
15.400	0.04	0.04	0.03	0.03	0.03
15.525	0.03	0.03	0.03	0.03	0.03
15.650	0.03	0.03	0.03	0.03	0.03
15.775	0.03	0.03	0.03	0.03	0.03
15.900	0.03	0.03	0.03	0.03	0.03
16.025	0.03	0.03	0.03	0.03	0.03
16.150	0.03	0.03	0.03	0.03	0.03
16.275	0.03	0.03	0.03	0.03	0.03
16.400	0.03	0.03	0.03	0.03	0.03
16.525	0.03	0.03	0.03	0.03	0.03
16.650	0.03	0.03	0.03	0.03	0.03
16.775	0.03	0.03	0.03	0.03	0.03
16.900	0.03	0.03	0.03	0.03	0.03
17.025	0.03	0.03	0.03	0.03	0.03

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
17.150	0.03	0.03	0.03	0.03	0.03
17.275	0.03	0.03	0.03	0.03	0.03
17.400	0.03	0.03	0.03	0.03	0.03
17.525	0.03	0.03	0.03	0.03	0.03
17.650	0.03	0.03	0.03	0.03	0.03
17.775	0.03	0.03	0.03	0.03	0.02
17.900	0.02	0.02	0.02	0.02	0.02
18.025	0.02	0.02	0.02	0.02	0.02
18.150	0.02	0.02	0.02	0.02	0.02
18.275	0.02	0.02	0.02	0.02	0.02
18.400	0.02	0.02	0.02	0.02	0.02
18.525	0.02	0.02	0.02	0.02	0.02
18.650	0.02	0.02	0.02	0.02	0.02
18.775	0.02	0.02	0.02	0.02	0.02
18.900	0.02	0.02	0.02	0.02	0.02
19.025	0.02	0.02	0.02	0.02	0.02
19.150	0.02	0.02	0.02	0.02	0.02
19.275	0.02	0.02	0.02	0.02	0.02
19.400	0.02	0.02	0.02	0.02	0.02
19.525	0.02	0.02	0.02	0.02	0.02
19.650	0.02	0.02	0.02	0.02	0.02
19.775	0.02	0.02	0.02	0.02	0.02
19.900	0.02	0.02	0.02	0.02	0.02
20.025	0.02	0.02	0.02	0.02	0.02
20.150	0.02	0.02	0.02	0.02	0.02
20.275	0.02	0.02	0.02	0.02	0.02
20.400	0.02	0.02	0.02	0.02	0.02
20.525	0.02	0.02	0.02	0.02	0.02
20.650	0.02	0.02	0.02	0.02	0.02
20.775	0.02	0.02	0.02	0.02	0.02
20.900	0.02	0.02	0.02	0.02	0.02
21.025	0.02	0.02	0.02	0.02	0.02
21.150	0.02	0.02	0.02	0.02	0.02
21.275	0.02	0.02	0.02	0.02	0.02
21.400	0.02	0.02	0.02	0.02	0.02
21.525	0.02	0.02	0.02	0.02	0.02
21.650	0.02	0.02	0.02	0.02	0.02
21.775	0.02	0.02	0.02	0.02	0.02
21.900	0.02	0.02	0.02	0.02	0.02
22.025	0.02	0.02	0.02	0.02	0.02
22.150	0.02	0.02	0.02	0.02	0.02
22.275	0.02	0.02	0.02	0.02	0.02
22.400	0.02	0.02	0.02	0.02	0.02
22.525	0.02	0.02	0.02	0.02	0.02
22.650	0.02	0.02	0.02	0.02	0.02
22.775	0.02	0.02	0.02	0.02	0.02
22.900	0.02	0.02	0.02	0.02	0.02
23.025	0.02	0.02	0.02	0.02	0.02
23.150	0.02	0.02	0.02	0.02	0.02
23.275	0.02	0.02	0.02	0.02	0.02
23.400	0.02	0.02	0.02	0.02	0.02
23.525	0.02	0.02	0.02	0.02	0.02

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
23.650	0.02	0.02	0.02	0.02	0.02
23.775	0.02	0.02	0.02	0.02	0.02
23.900	0.02	0.02	0.02	0.02	0.02


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
Flow (Total) (ft³/s)
0.000
5.000
10.000
15.000
20.000
Time (hours)

Storm Event	SCS Type II - 10 yr
Return Event	10 years
Duration	24.000 hours
Depth	3.1 in
Time of Concentration (Composite)	0.331 hours
Area (User Defined)	1.549 acres

Computational Time Increment	0.044 hours
Time to Peak (Computed)	12.129 hours
Flow (Peak, Computed)	1.13 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	12.125 hours
Flow (Peak Interpolated Output)	1.13 ft³/s

Drainage Area

SCS CN (Composite)	70.000
Area (User Defined)	1.549 acres
Maximum Retention (Pervious)	4.3 in
Maximum Retention (Pervious, 20 percent)	0.9 in

Cumulative Runoff

Cumulative Runoff Depth (Pervious)	0.8 in
Runoff Volume (Pervious)	0.099 ac-ft

Hydrograph Volume (Area under Hydrograph curve)

Volume	0.098 ac-ft

SCS Unit Hydrograph Parameters

Time of Concentration (Composite)	0.331 hours
Computational Time Increment	0.044 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	5.31 ft³/s
Unit peak time, Tp	0.221 hours
Unit receding limb, Tr	0.882 hours
Total unit time, Tb	1.103 hours

Storm Event	SCS Type II - 10 yr
Return Event	10 years
Duration	24.000 hours
Depth	3.1 in
Time of Concentration (Composite)	0.331 hours
Area (User Defined)	1.549 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

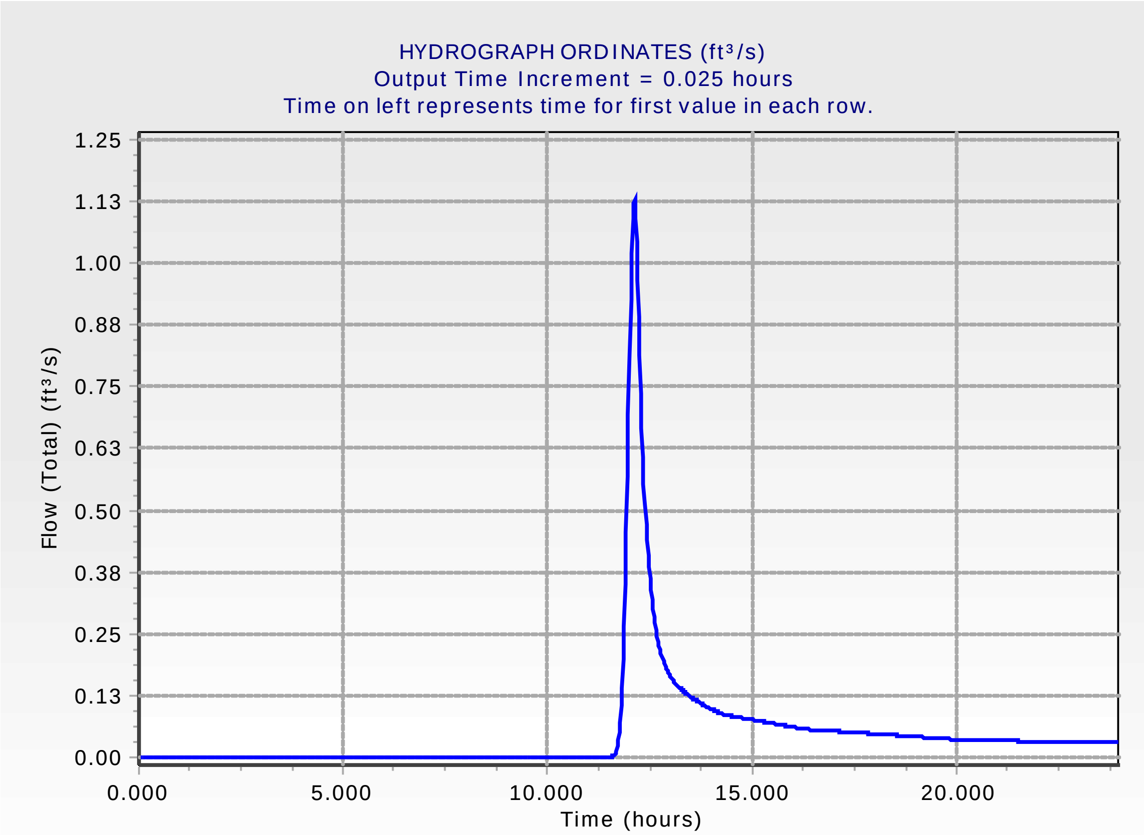
Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
11.550	0.00	0.00	0.00	0.00	0.01
11.675	0.01	0.02	0.03	0.05	0.07
11.800	0.10	0.14	0.20	0.27	0.35
11.925	0.46	0.57	0.69	0.82	0.93
12.050	1.02	1.09	1.12	1.13	1.09
12.175	1.04	0.97	0.89	0.81	0.74
12.300	0.67	0.61	0.55	0.51	0.47
12.425	0.44	0.41	0.38	0.36	0.34
12.550	0.32	0.30	0.29	0.27	0.26
12.675	0.25	0.23	0.23	0.22	0.21
12.800	0.20	0.20	0.19	0.18	0.18
12.925	0.18	0.17	0.17	0.16	0.16
13.050	0.16	0.16	0.15	0.15	0.15
13.175	0.14	0.14	0.14	0.14	0.14
13.300	0.13	0.13	0.13	0.13	0.13
13.425	0.13	0.13	0.12	0.12	0.12
13.550	0.12	0.12	0.12	0.12	0.11
13.675	0.11	0.11	0.11	0.11	0.11
13.800	0.11	0.11	0.10	0.10	0.10
13.925	0.10	0.10	0.10	0.10	0.10
14.050	0.10	0.09	0.09	0.09	0.09
14.175	0.09	0.09	0.09	0.09	0.09
14.300	0.09	0.09	0.09	0.09	0.09
14.425	0.08	0.08	0.08	0.08	0.08
14.550	0.08	0.08	0.08	0.08	0.08
14.675	0.08	0.08	0.08	0.08	0.08
14.800	0.08	0.08	0.08	0.08	0.08
14.925	0.08	0.08	0.08	0.08	0.08
15.050	0.08	0.08	0.07	0.07	0.07
15.175	0.07	0.07	0.07	0.07	0.07
15.300	0.07	0.07	0.07	0.07	0.07
15.425	0.07	0.07	0.07	0.07	0.07
15.550	0.07	0.07	0.07	0.07	0.07
15.675	0.07	0.07	0.07	0.07	0.06
15.800	0.06	0.06	0.06	0.06	0.06
15.925	0.06	0.06	0.06	0.06	0.06
16.050	0.06	0.06	0.06	0.06	0.06
16.175	0.06	0.06	0.06	0.06	0.06
16.300	0.06	0.06	0.06	0.06	0.06
16.425	0.06	0.06	0.06	0.06	0.06
16.550	0.06	0.06	0.06	0.06	0.06
16.675	0.05	0.05	0.05	0.05	0.05
16.800	0.05	0.05	0.05	0.05	0.05

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
16.925	0.05	0.05	0.05	0.05	0.05
17.050	0.05	0.05	0.05	0.05	0.05
17.175	0.05	0.05	0.05	0.05	0.05
17.300	0.05	0.05	0.05	0.05	0.05
17.425	0.05	0.05	0.05	0.05	0.05
17.550	0.05	0.05	0.05	0.05	0.05
17.675	0.05	0.05	0.05	0.05	0.05
17.800	0.05	0.05	0.05	0.05	0.05
17.925	0.05	0.05	0.05	0.05	0.05
18.050	0.05	0.05	0.05	0.05	0.05
18.175	0.05	0.05	0.05	0.05	0.05
18.300	0.05	0.05	0.05	0.05	0.05
18.425	0.05	0.05	0.05	0.04	0.04
18.550	0.04	0.04	0.04	0.04	0.04
18.675	0.04	0.04	0.04	0.04	0.04
18.800	0.04	0.04	0.04	0.04	0.04
18.925	0.04	0.04	0.04	0.04	0.04
19.050	0.04	0.04	0.04	0.04	0.04
19.175	0.04	0.04	0.04	0.04	0.04
19.300	0.04	0.04	0.04	0.04	0.04
19.425	0.04	0.04	0.04	0.04	0.04
19.550	0.04	0.04	0.04	0.04	0.04
19.675	0.04	0.04	0.04	0.04	0.04
19.800	0.04	0.04	0.04	0.04	0.04
19.925	0.04	0.04	0.04	0.04	0.04
20.050	0.04	0.04	0.04	0.04	0.04
20.175	0.03	0.03	0.03	0.03	0.03
20.300	0.03	0.03	0.03	0.03	0.03
20.425	0.03	0.03	0.03	0.03	0.03
20.550	0.03	0.03	0.03	0.03	0.03
20.675	0.03	0.03	0.03	0.03	0.03
20.800	0.03	0.03	0.03	0.03	0.03
20.925	0.03	0.03	0.03	0.03	0.03
21.050	0.03	0.03	0.03	0.03	0.03
21.175	0.03	0.03	0.03	0.03	0.03
21.300	0.03	0.03	0.03	0.03	0.03
21.425	0.03	0.03	0.03	0.03	0.03
21.550	0.03	0.03	0.03	0.03	0.03
21.675	0.03	0.03	0.03	0.03	0.03
21.800	0.03	0.03	0.03	0.03	0.03
21.925	0.03	0.03	0.03	0.03	0.03
22.050	0.03	0.03	0.03	0.03	0.03
22.175	0.03	0.03	0.03	0.03	0.03
22.300	0.03	0.03	0.03	0.03	0.03
22.425	0.03	0.03	0.03	0.03	0.03
22.550	0.03	0.03	0.03	0.03	0.03
22.675	0.03	0.03	0.03	0.03	0.03
22.800	0.03	0.03	0.03	0.03	0.03
22.925	0.03	0.03	0.03	0.03	0.03
23.050	0.03	0.03	0.03	0.03	0.03
23.175	0.03	0.03	0.03	0.03	0.03
23.300	0.03	0.03	0.03	0.03	0.03

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
23.425	0.03	0.03	0.03	0.03	0.03
23.550	0.03	0.03	0.03	0.03	0.03
23.675	0.03	0.03	0.03	0.03	0.03
23.800	0.03	0.03	0.03	0.03	0.03
23.925	0.03	0.03	0.03	0.03	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
Flow (Total) (ft³/s)
1.25
1.13
1.00
0.88
0.75
0.63
0.50
0.38
0.25
0.13
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)

Storm Event	SCS Type II - 50 yr
Return Event	50 years
Duration	24.000 hours
Depth	4.3 in
Time of Concentration (Composite)	0.331 hours
Area (User Defined)	1.549 acres

Computational Time Increment	0.044 hours
Time to Peak (Computed)	12.085 hours
Flow (Peak, Computed)	2.49 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	2.47 ft³/s

Drainage Area

SCS CN (Composite)	70.000
Area (User Defined)	1.549 acres
Maximum Retention (Pervious)	4.3 in
Maximum Retention (Pervious, 20 percent)	0.9 in

Cumulative Runoff

Cumulative Runoff Depth (Pervious)	1.5 in
Runoff Volume (Pervious)	0.200 ac-ft

Hydrograph Volume (Area under Hydrograph curve)

Volume	0.199 ac-ft

SCS Unit Hydrograph Parameters

Time of Concentration (Composite)	0.331 hours
Computational Time Increment	0.044 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	5.31 ft³/s
Unit peak time, Tp	0.221 hours
Unit receding limb, Tr	0.882 hours
Total unit time, Tb	1.103 hours

Storm Event	SCS Type II - 50 yr
Return Event	50 years
Duration	24.000 hours
Depth	4.3 in
Time of Concentration (Composite)	0.331 hours
Area (User Defined)	1.549 acres

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

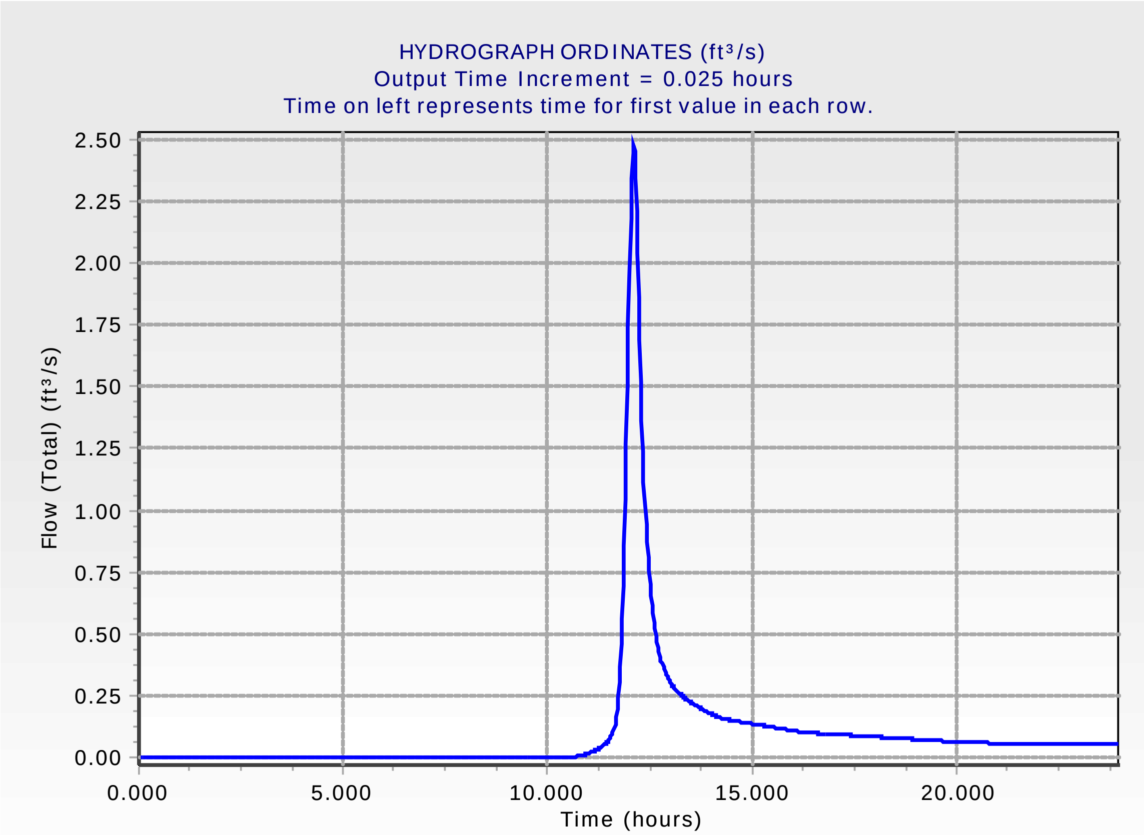
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
10.575	0.00	0.00	0.00	0.00	0.00
10.700	0.00	0.00	0.00	0.01	0.01
10.825	0.01	0.01	0.01	0.01	0.01
10.950	0.01	0.02	0.02	0.02	0.02
11.075	0.02	0.02	0.02	0.03	0.03
11.200	0.03	0.03	0.04	0.04	0.04
11.325	0.04	0.05	0.05	0.05	0.06
11.450	0.06	0.07	0.07	0.08	0.08
11.575	0.09	0.10	0.12	0.14	0.16
11.700	0.20	0.24	0.30	0.36	0.46
11.825	0.56	0.70	0.86	1.05	1.27
11.950	1.50	1.75	1.99	2.18	2.34
12.075	2.45	2.47	2.45	2.34	2.21
12.200	2.04	1.86	1.69	1.52	1.36
12.325	1.24	1.12	1.03	0.94	0.87
12.450	0.81	0.75	0.70	0.66	0.62
12.575	0.58	0.55	0.52	0.49	0.47
12.700	0.44	0.43	0.41	0.39	0.38
12.825	0.37	0.35	0.34	0.33	0.33
12.950	0.32	0.31	0.30	0.30	0.29
13.075	0.29	0.28	0.28	0.27	0.27
13.200	0.26	0.26	0.25	0.25	0.25
13.325	0.24	0.24	0.24	0.23	0.23
13.450	0.23	0.23	0.22	0.22	0.22
13.575	0.21	0.21	0.21	0.21	0.20
13.700	0.20	0.20	0.20	0.19	0.19
13.825	0.19	0.19	0.19	0.18	0.18
13.950	0.18	0.18	0.18	0.17	0.17
14.075	0.17	0.17	0.17	0.16	0.16
14.200	0.16	0.16	0.16	0.16	0.16
14.325	0.16	0.15	0.15	0.15	0.15
14.450	0.15	0.15	0.15	0.15	0.15
14.575	0.15	0.15	0.15	0.15	0.14
14.700	0.14	0.14	0.14	0.14	0.14
14.825	0.14	0.14	0.14	0.14	0.14
14.950	0.14	0.14	0.14	0.14	0.13
15.075	0.13	0.13	0.13	0.13	0.13
15.200	0.13	0.13	0.13	0.13	0.13
15.325	0.13	0.13	0.13	0.13	0.12
15.450	0.12	0.12	0.12	0.12	0.12
15.575	0.12	0.12	0.12	0.12	0.12
15.700	0.12	0.12	0.12	0.11	0.11
15.825	0.11	0.11	0.11	0.11	0.11

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
15.950	0.11	0.11	0.11	0.11	0.11
16.075	0.11	0.11	0.10	0.10	0.10
16.200	0.10	0.10	0.10	0.10	0.10
16.325	0.10	0.10	0.10	0.10	0.10
16.450	0.10	0.10	0.10	0.10	0.10
16.575	0.10	0.10	0.10	0.10	0.10
16.700	0.10	0.10	0.10	0.10	0.10
16.825	0.10	0.10	0.09	0.09	0.09
16.950	0.09	0.09	0.09	0.09	0.09
17.075	0.09	0.09	0.09	0.09	0.09
17.200	0.09	0.09	0.09	0.09	0.09
17.325	0.09	0.09	0.09	0.09	0.09
17.450	0.09	0.09	0.09	0.09	0.09
17.575	0.09	0.09	0.09	0.09	0.09
17.700	0.09	0.09	0.09	0.09	0.09
17.825	0.09	0.09	0.08	0.08	0.08
17.950	0.08	0.08	0.08	0.08	0.08
18.075	0.08	0.08	0.08	0.08	0.08
18.200	0.08	0.08	0.08	0.08	0.08
18.325	0.08	0.08	0.08	0.08	0.08
18.450	0.08	0.08	0.08	0.08	0.08
18.575	0.08	0.08	0.08	0.08	0.08
18.700	0.08	0.08	0.08	0.08	0.08
18.825	0.07	0.07	0.07	0.07	0.07
18.950	0.07	0.07	0.07	0.07	0.07
19.075	0.07	0.07	0.07	0.07	0.07
19.200	0.07	0.07	0.07	0.07	0.07
19.325	0.07	0.07	0.07	0.07	0.07
19.450	0.07	0.07	0.07	0.07	0.07
19.575	0.07	0.07	0.07	0.07	0.07
19.700	0.07	0.07	0.06	0.06	0.06
19.825	0.06	0.06	0.06	0.06	0.06
19.950	0.06	0.06	0.06	0.06	0.06
20.075	0.06	0.06	0.06	0.06	0.06
20.200	0.06	0.06	0.06	0.06	0.06
20.325	0.06	0.06	0.06	0.06	0.06
20.450	0.06	0.06	0.06	0.06	0.06
20.575	0.06	0.06	0.06	0.06	0.06
20.700	0.06	0.06	0.06	0.06	0.06
20.825	0.06	0.06	0.06	0.06	0.06
20.950	0.06	0.06	0.06	0.06	0.06
21.075	0.06	0.06	0.06	0.06	0.06
21.200	0.06	0.06	0.06	0.06	0.06
21.325	0.06	0.06	0.06	0.06	0.06
21.450	0.06	0.06	0.06	0.06	0.06
21.575	0.06	0.06	0.06	0.06	0.06
21.700	0.06	0.06	0.06	0.06	0.06
21.825	0.06	0.06	0.06	0.06	0.06
21.950	0.06	0.06	0.06	0.06	0.06
22.075	0.06	0.06	0.06	0.06	0.06
22.200	0.06	0.06	0.06	0.06	0.06
22.325	0.06	0.06	0.06	0.06	0.06

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
22.450	0.06	0.06	0.06	0.06	0.05
22.575	0.05	0.05	0.05	0.05	0.05
22.700	0.05	0.05	0.05	0.05	0.05
22.825	0.05	0.05	0.05	0.05	0.05
22.950	0.05	0.05	0.05	0.05	0.05
23.075	0.05	0.05	0.05	0.05	0.05
23.200	0.05	0.05	0.05	0.05	0.05
23.325	0.05	0.05	0.05	0.05	0.05
23.450	0.05	0.05	0.05	0.05	0.05
23.575	0.05	0.05	0.05	0.05	0.05
23.700	0.05	0.05	0.05	0.05	0.05
23.825	0.05	0.05	0.05	0.05	0.05
23.950	0.05	0.05	0.05	(N/A)	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
Flow (Total) (ft³/s)
2.50
2.25
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)

Storm Event	SCS Type II - 100 yr
Return Event	100 years
Duration	24.000 hours
Depth	5.0 in
Time of Concentration (Composite)	0.331 hours
Area (User Defined)	1.549 acres

Computational Time Increment	0.044 hours
Time to Peak (Computed)	12.085 hours
Flow (Peak, Computed)	3.33 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	3.31 ft³/s

Drainage Area

SCS CN (Composite)	70.000
Area (User Defined)	1.549 acres
Maximum Retention (Pervious)	4.3 in
Maximum Retention (Pervious, 20 percent)	0.9 in

Cumulative Runoff

Cumulative Runoff Depth (Pervious)	2.0 in
Runoff Volume (Pervious)	0.263 ac-ft

Hydrograph Volume (Area under Hydrograph curve)

Volume	0.261 ac-ft

SCS Unit Hydrograph Parameters

Time of Concentration (Composite)	0.331 hours
Computational Time Increment	0.044 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	5.31 ft³/s
Unit peak time, Tp	0.221 hours
Unit receding limb, Tr	0.882 hours
Total unit time, Tb	1.103 hours

Storm Event	SCS Type II - 100 yr
Return Event	100 years
Duration	24.000 hours
Depth	5.0 in
Time of Concentration (Composite)	0.331 hours
Area (User Defined)	1.549 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

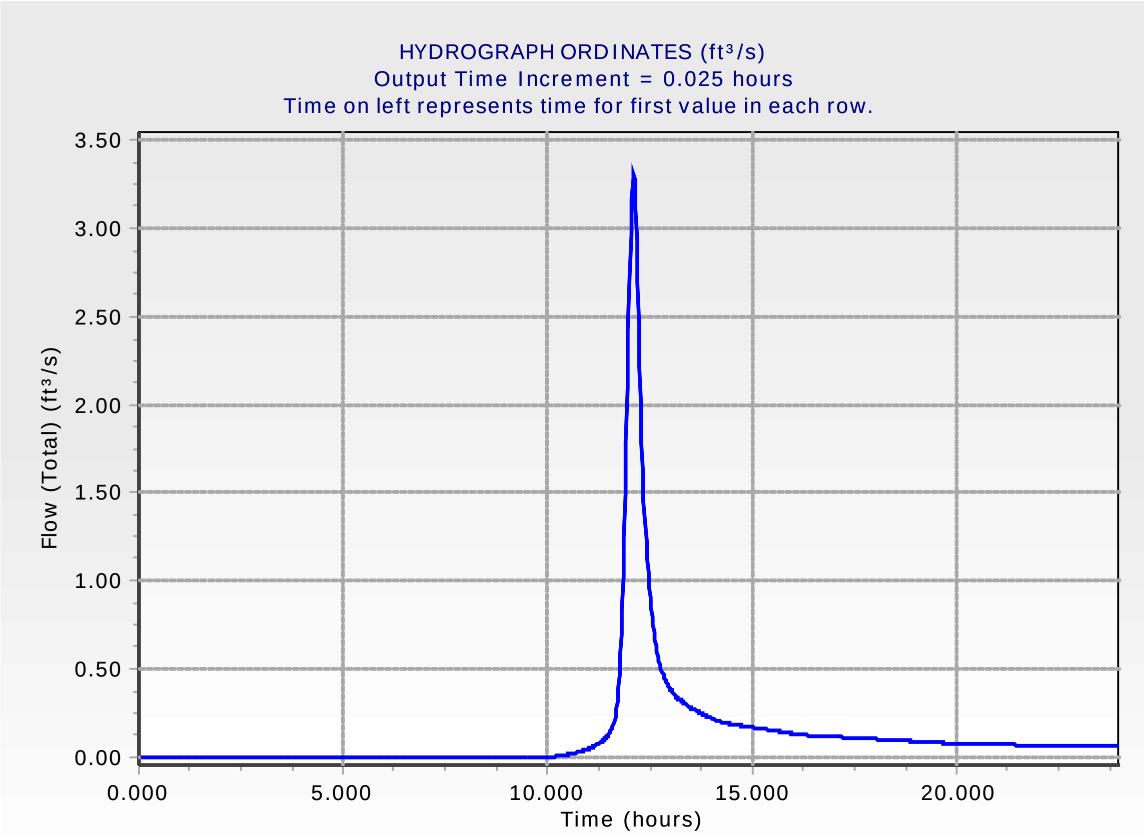
Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
9.975	0.00	0.00	0.00	0.00	0.00
10.100	0.00	0.00	0.00	0.00	0.01
10.225	0.01	0.01	0.01	0.01	0.01
10.350	0.01	0.01	0.01	0.01	0.01
10.475	0.02	0.02	0.02	0.02	0.02
10.600	0.02	0.02	0.02	0.03	0.03
10.725	0.03	0.03	0.03	0.03	0.03
10.850	0.04	0.04	0.04	0.04	0.04
10.975	0.05	0.05	0.05	0.05	0.06
11.100	0.06	0.06	0.06	0.07	0.07
11.225	0.07	0.08	0.08	0.09	0.09
11.350	0.10	0.10	0.11	0.11	0.12
11.475	0.12	0.13	0.14	0.15	0.16
11.600	0.17	0.20	0.23	0.27	0.32
11.725	0.39	0.47	0.56	0.69	0.84
11.850	1.03	1.24	1.50	1.79	2.10
11.975	2.42	2.72	2.97	3.17	3.29
12.100	3.31	3.27	3.11	2.93	2.69
12.225	2.45	2.22	1.99	1.79	1.61
12.350	1.46	1.34	1.22	1.13	1.05
12.475	0.97	0.91	0.85	0.80	0.75
12.600	0.70	0.66	0.63	0.60	0.57
12.725	0.54	0.52	0.50	0.48	0.47
12.850	0.45	0.44	0.43	0.41	0.40
12.975	0.39	0.39	0.38	0.37	0.36
13.100	0.36	0.35	0.34	0.34	0.33
13.225	0.33	0.32	0.32	0.31	0.31
13.350	0.30	0.30	0.30	0.29	0.29
13.475	0.28	0.28	0.28	0.27	0.27
13.600	0.27	0.26	0.26	0.26	0.25
13.725	0.25	0.25	0.25	0.24	0.24
13.850	0.24	0.23	0.23	0.23	0.23
13.975	0.22	0.22	0.22	0.22	0.21
14.100	0.21	0.21	0.21	0.21	0.20
14.225	0.20	0.20	0.20	0.20	0.20
14.350	0.19	0.19	0.19	0.19	0.19
14.475	0.19	0.19	0.19	0.19	0.19
14.600	0.18	0.18	0.18	0.18	0.18
14.725	0.18	0.18	0.18	0.18	0.18
14.850	0.18	0.17	0.17	0.17	0.17
14.975	0.17	0.17	0.17	0.17	0.17
15.100	0.17	0.17	0.17	0.16	0.16
15.225	0.16	0.16	0.16	0.16	0.16

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
15.350	0.16	0.16	0.16	0.16	0.16
15.475	0.15	0.15	0.15	0.15	0.15
15.600	0.15	0.15	0.15	0.15	0.15
15.725	0.15	0.14	0.14	0.14	0.14
15.850	0.14	0.14	0.14	0.14	0.14
15.975	0.14	0.14	0.13	0.13	0.13
16.100	0.13	0.13	0.13	0.13	0.13
16.225	0.13	0.13	0.13	0.13	0.13
16.350	0.13	0.13	0.12	0.12	0.12
16.475	0.12	0.12	0.12	0.12	0.12
16.600	0.12	0.12	0.12	0.12	0.12
16.725	0.12	0.12	0.12	0.12	0.12
16.850	0.12	0.12	0.12	0.12	0.12
16.975	0.12	0.12	0.12	0.12	0.12
17.100	0.12	0.12	0.11	0.11	0.11
17.225	0.11	0.11	0.11	0.11	0.11
17.350	0.11	0.11	0.11	0.11	0.11
17.475	0.11	0.11	0.11	0.11	0.11
17.600	0.11	0.11	0.11	0.11	0.11
17.725	0.11	0.11	0.11	0.11	0.11
17.850	0.11	0.11	0.11	0.10	0.10
17.975	0.10	0.10	0.10	0.10	0.10
18.100	0.10	0.10	0.10	0.10	0.10
18.225	0.10	0.10	0.10	0.10	0.10
18.350	0.10	0.10	0.10	0.10	0.10
18.475	0.10	0.10	0.10	0.10	0.10
18.600	0.10	0.10	0.10	0.10	0.09
18.725	0.09	0.09	0.09	0.09	0.09
18.850	0.09	0.09	0.09	0.09	0.09
18.975	0.09	0.09	0.09	0.09	0.09
19.100	0.09	0.09	0.09	0.09	0.09
19.225	0.09	0.09	0.09	0.09	0.09
19.350	0.09	0.09	0.09	0.09	0.08
19.475	0.08	0.08	0.08	0.08	0.08
19.600	0.08	0.08	0.08	0.08	0.08
19.725	0.08	0.08	0.08	0.08	0.08
19.850	0.08	0.08	0.08	0.08	0.08
19.975	0.08	0.08	0.08	0.08	0.08
20.100	0.08	0.08	0.08	0.08	0.07
20.225	0.07	0.07	0.07	0.07	0.07
20.350	0.07	0.07	0.07	0.07	0.07
20.475	0.07	0.07	0.07	0.07	0.07
20.600	0.07	0.07	0.07	0.07	0.07
20.725	0.07	0.07	0.07	0.07	0.07
20.850	0.07	0.07	0.07	0.07	0.07
20.975	0.07	0.07	0.07	0.07	0.07
21.100	0.07	0.07	0.07	0.07	0.07
21.225	0.07	0.07	0.07	0.07	0.07
21.350	0.07	0.07	0.07	0.07	0.07
21.475	0.07	0.07	0.07	0.07	0.07
21.600	0.07	0.07	0.07	0.07	0.07
21.725	0.07	0.07	0.07	0.07	0.07

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
21.850	0.07	0.07	0.07	0.07	0.07
21.975	0.07	0.07	0.07	0.07	0.07
22.100	0.07	0.07	0.07	0.07	0.07
22.225	0.07	0.07	0.07	0.07	0.07
22.350	0.07	0.07	0.07	0.07	0.07
22.475	0.07	0.07	0.07	0.07	0.07
22.600	0.07	0.07	0.07	0.07	0.07
22.725	0.07	0.07	0.07	0.07	0.07
22.850	0.07	0.07	0.07	0.07	0.07
22.975	0.07	0.07	0.07	0.07	0.07
23.100	0.07	0.07	0.07	0.07	0.07
23.225	0.07	0.07	0.07	0.07	0.07
23.350	0.07	0.07	0.07	0.07	0.07
23.475	0.07	0.07	0.07	0.07	0.07
23.600	0.07	0.07	0.07	0.07	0.07
23.725	0.07	0.07	0.06	0.06	0.06
23.850	0.06	0.06	0.06	0.06	0.06
23.975	0.06	0.06	(N/A)	(N/A)	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
Flow (Total) (ft³/s)
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)

Storm Event	SCS Type II - 2 yr
Return Event	2 years
Duration	24.000 hours
Depth	2.2 in
Time of Concentration (Composite)	0.288 hours
Area (User Defined)	5.065 acres

Computational Time Increment	0.038 hours
Time to Peak (Computed)	12.126 hours
Flow (Peak, Computed)	0.67 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	12.125 hours
Flow (Peak Interpolated Output)	0.67 ft³/s

Drainage Area	
SCS CN (Composite)	66.000
Area (User Defined)	5.065 acres
Maximum Retention (Pervious)	5.2 in
Maximum Retention (Pervious, 20 percent)	1.0 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	0.2 in
Runoff Volume (Pervious)	0.093 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.092 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.288 hours
Computational Time Increment	0.038 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	19.94 ft³/s
Unit peak time, Tp	0.192 hours
Unit receding limb, Tr	0.767 hours
Total unit time, Tb	0.959 hours

Storm Event	SCS Type II - 2 yr
Return Event	2 years
Duration	24.000 hours
Depth	2.2 in
Time of Concentration (Composite)	0.288 hours
Area (User Defined)	5.065 acres

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

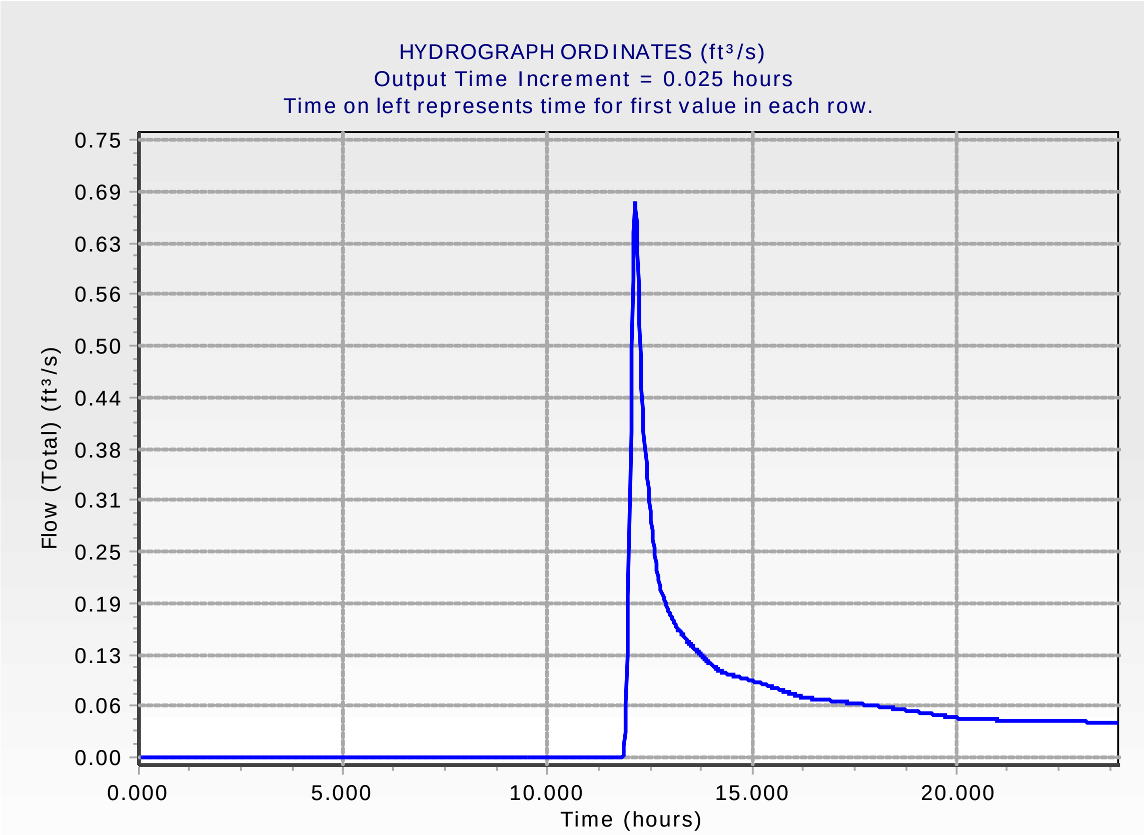
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
11.825	0.00	0.00	0.01	0.03	0.07
11.950	0.12	0.20	0.29	0.39	0.50
12.075	0.58	0.64	0.67	0.67	0.65
12.200	0.61	0.57	0.53	0.48	0.45
12.325	0.42	0.40	0.38	0.36	0.34
12.450	0.33	0.31	0.30	0.29	0.28
12.575	0.26	0.25	0.24	0.24	0.23
12.700	0.22	0.21	0.21	0.20	0.20
12.825	0.19	0.19	0.19	0.18	0.18
12.950	0.18	0.18	0.17	0.17	0.17
13.075	0.17	0.16	0.16	0.16	0.16
13.200	0.16	0.15	0.15	0.15	0.15
13.325	0.15	0.15	0.14	0.14	0.14
13.450	0.14	0.14	0.14	0.14	0.13
13.575	0.13	0.13	0.13	0.13	0.13
13.700	0.13	0.13	0.12	0.12	0.12
13.825	0.12	0.12	0.12	0.12	0.12
13.950	0.12	0.11	0.11	0.11	0.11
14.075	0.11	0.11	0.11	0.11	0.11
14.200	0.11	0.10	0.10	0.10	0.10
14.325	0.10	0.10	0.10	0.10	0.10
14.450	0.10	0.10	0.10	0.10	0.10
14.575	0.10	0.10	0.10	0.10	0.10
14.700	0.10	0.10	0.10	0.10	0.10
14.825	0.10	0.10	0.09	0.09	0.09
14.950	0.09	0.09	0.09	0.09	0.09
15.075	0.09	0.09	0.09	0.09	0.09
15.200	0.09	0.09	0.09	0.09	0.09
15.325	0.09	0.09	0.09	0.09	0.09
15.450	0.09	0.09	0.09	0.08	0.08
15.575	0.08	0.08	0.08	0.08	0.08
15.700	0.08	0.08	0.08	0.08	0.08
15.825	0.08	0.08	0.08	0.08	0.08
15.950	0.08	0.08	0.08	0.08	0.08
16.075	0.08	0.07	0.07	0.07	0.07
16.200	0.07	0.07	0.07	0.07	0.07
16.325	0.07	0.07	0.07	0.07	0.07
16.450	0.07	0.07	0.07	0.07	0.07
16.575	0.07	0.07	0.07	0.07	0.07
16.700	0.07	0.07	0.07	0.07	0.07
16.825	0.07	0.07	0.07	0.07	0.07
16.950	0.07	0.07	0.07	0.07	0.07
17.075	0.07	0.07	0.07	0.07	0.07

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
17.200	0.07	0.07	0.07	0.07	0.07
17.325	0.07	0.07	0.07	0.07	0.07
17.450	0.07	0.07	0.07	0.07	0.07
17.575	0.07	0.06	0.06	0.06	0.06
17.700	0.06	0.06	0.06	0.06	0.06
17.825	0.06	0.06	0.06	0.06	0.06
17.950	0.06	0.06	0.06	0.06	0.06
18.075	0.06	0.06	0.06	0.06	0.06
18.200	0.06	0.06	0.06	0.06	0.06
18.325	0.06	0.06	0.06	0.06	0.06
18.450	0.06	0.06	0.06	0.06	0.06
18.575	0.06	0.06	0.06	0.06	0.06
18.700	0.06	0.06	0.06	0.06	0.06
18.825	0.06	0.06	0.06	0.06	0.06
18.950	0.06	0.06	0.06	0.06	0.06
19.075	0.06	0.05	0.05	0.05	0.05
19.200	0.05	0.05	0.05	0.05	0.05
19.325	0.05	0.05	0.05	0.05	0.05
19.450	0.05	0.05	0.05	0.05	0.05
19.575	0.05	0.05	0.05	0.05	0.05
19.700	0.05	0.05	0.05	0.05	0.05
19.825	0.05	0.05	0.05	0.05	0.05
19.950	0.05	0.05	0.05	0.05	0.05
20.075	0.05	0.05	0.05	0.05	0.05
20.200	0.05	0.05	0.05	0.05	0.05
20.325	0.05	0.05	0.05	0.05	0.05
20.450	0.05	0.05	0.05	0.05	0.05
20.575	0.05	0.05	0.05	0.05	0.05
20.700	0.05	0.05	0.05	0.05	0.05
20.825	0.05	0.05	0.05	0.05	0.05
20.950	0.05	0.05	0.05	0.05	0.05
21.075	0.05	0.05	0.05	0.05	0.05
21.200	0.05	0.05	0.05	0.05	0.05
21.325	0.05	0.05	0.05	0.05	0.05
21.450	0.05	0.05	0.05	0.05	0.05
21.575	0.04	0.04	0.04	0.04	0.04
21.700	0.04	0.04	0.04	0.04	0.04
21.825	0.04	0.04	0.04	0.04	0.04
21.950	0.04	0.04	0.04	0.04	0.04
22.075	0.04	0.04	0.04	0.04	0.04
22.200	0.04	0.04	0.04	0.04	0.04
22.325	0.04	0.04	0.04	0.04	0.04
22.450	0.04	0.04	0.04	0.04	0.04
22.575	0.04	0.04	0.04	0.04	0.04
22.700	0.04	0.04	0.04	0.04	0.04
22.825	0.04	0.04	0.04	0.04	0.04
22.950	0.04	0.04	0.04	0.04	0.04
23.075	0.04	0.04	0.04	0.04	0.04
23.200	0.04	0.04	0.04	0.04	0.04
23.325	0.04	0.04	0.04	0.04	0.04
23.450	0.04	0.04	0.04	0.04	0.04
23.575	0.04	0.04	0.04	0.04	0.04

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
23.700	0.04	0.04	0.04	0.04	0.04
23.825	0.04	0.04	0.04	0.04	0.04
23.950	0.04	0.04	0.04	(N/A)	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
0.75
0.69
0.63
0.56
0.50
0.44
0.38
0.31
0.25
0.19
0.13
0.06
0.00
Flow (Total) (ft³/s)
0.000
5.000
10.000
15.000
20.000
Time (hours)

Storm Event	SCS Type II - 10 yr
Return Event	10 years
Duration	24.000 hours
Depth	3.1 in
Time of Concentration (Composite)	0.288 hours
Area (User Defined)	5.065 acres

Computational Time Increment	0.038 hours
Time to Peak (Computed)	12.087 hours
Flow (Peak, Computed)	2.79 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	2.77 ft³/s

Drainage Area

SCS CN (Composite)	66.000
Area (User Defined)	5.065 acres
Maximum Retention (Pervious)	5.2 in
Maximum Retention (Pervious, 20 percent)	1.0 in

Cumulative Runoff

Cumulative Runoff Depth (Pervious)	0.6 in
Runoff Volume (Pervious)	0.248 ac-ft

Hydrograph Volume (Area under Hydrograph curve)

Volume	0.247 ac-ft

SCS Unit Hydrograph Parameters

Time of Concentration (Composite)	0.288 hours
Computational Time Increment	0.038 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	19.94 ft³/s
Unit peak time, Tp	0.192 hours
Unit receding limb, Tr	0.767 hours
Total unit time, Tb	0.959 hours

Storm Event	SCS Type II - 10 yr
Return Event	10 years
Duration	24.000 hours
Depth	3.1 in
Time of Concentration (Composite)	0.288 hours
Area (User Defined)	5.065 acres

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

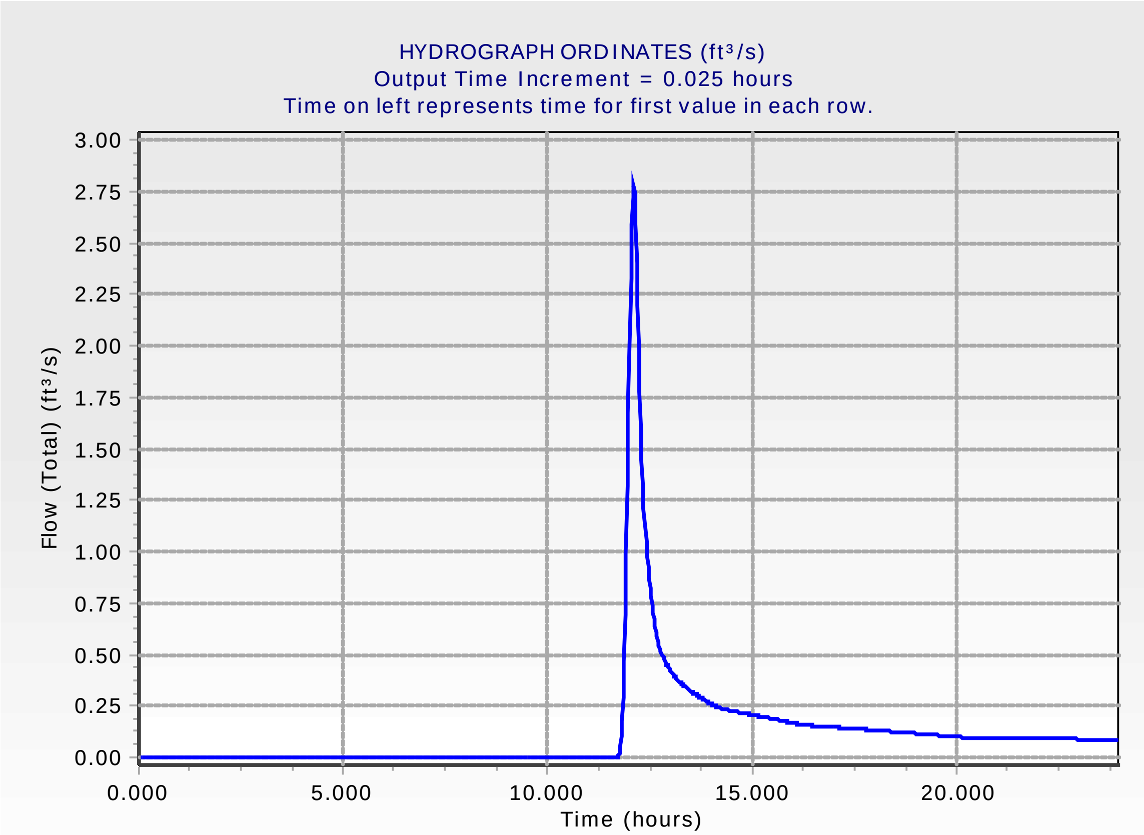
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
11.675	0.00	0.00	0.01	0.02	0.05
11.800	0.10	0.17	0.29	0.47	0.69
11.925	0.99	1.32	1.67	2.02	2.32
12.050	2.59	2.72	2.77	2.74	2.58
12.175	2.40	2.19	1.98	1.78	1.59
12.300	1.45	1.32	1.21	1.13	1.05
12.425	0.98	0.92	0.87	0.82	0.78
12.550	0.74	0.70	0.67	0.64	0.61
12.675	0.59	0.56	0.54	0.53	0.51
12.800	0.50	0.48	0.47	0.46	0.45
12.925	0.44	0.44	0.43	0.42	0.41
13.050	0.41	0.40	0.39	0.39	0.38
13.175	0.38	0.37	0.37	0.36	0.36
13.300	0.35	0.35	0.35	0.34	0.34
13.425	0.33	0.33	0.33	0.32	0.32
13.550	0.32	0.31	0.31	0.30	0.30
13.675	0.30	0.29	0.29	0.29	0.29
13.800	0.28	0.28	0.28	0.27	0.27
13.925	0.27	0.27	0.26	0.26	0.26
14.050	0.25	0.25	0.25	0.25	0.24
14.175	0.24	0.24	0.24	0.24	0.24
14.300	0.23	0.23	0.23	0.23	0.23
14.425	0.23	0.23	0.23	0.23	0.22
14.550	0.22	0.22	0.22	0.22	0.22
14.675	0.22	0.22	0.22	0.22	0.22
14.800	0.21	0.21	0.21	0.21	0.21
14.925	0.21	0.21	0.21	0.21	0.21
15.050	0.21	0.20	0.20	0.20	0.20
15.175	0.20	0.20	0.20	0.20	0.20
15.300	0.20	0.19	0.19	0.19	0.19
15.425	0.19	0.19	0.19	0.19	0.19
15.550	0.19	0.18	0.18	0.18	0.18
15.675	0.18	0.18	0.18	0.18	0.18
15.800	0.18	0.17	0.17	0.17	0.17
15.925	0.17	0.17	0.17	0.17	0.17
16.050	0.16	0.16	0.16	0.16	0.16
16.175	0.16	0.16	0.16	0.16	0.16
16.300	0.16	0.16	0.16	0.16	0.16
16.425	0.15	0.15	0.15	0.15	0.15
16.550	0.15	0.15	0.15	0.15	0.15
16.675	0.15	0.15	0.15	0.15	0.15
16.800	0.15	0.15	0.15	0.15	0.15
16.925	0.15	0.15	0.15	0.15	0.15

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
17.050	0.15	0.15	0.15	0.15	0.14
17.175	0.14	0.14	0.14	0.14	0.14
17.300	0.14	0.14	0.14	0.14	0.14
17.425	0.14	0.14	0.14	0.14	0.14
17.550	0.14	0.14	0.14	0.14	0.14
17.675	0.14	0.14	0.14	0.14	0.14
17.800	0.14	0.13	0.13	0.13	0.13
17.925	0.13	0.13	0.13	0.13	0.13
18.050	0.13	0.13	0.13	0.13	0.13
18.175	0.13	0.13	0.13	0.13	0.13
18.300	0.13	0.13	0.13	0.13	0.13
18.425	0.13	0.13	0.12	0.12	0.12
18.550	0.12	0.12	0.12	0.12	0.12
18.675	0.12	0.12	0.12	0.12	0.12
18.800	0.12	0.12	0.12	0.12	0.12
18.925	0.12	0.12	0.12	0.12	0.12
19.050	0.12	0.12	0.11	0.11	0.11
19.175	0.11	0.11	0.11	0.11	0.11
19.300	0.11	0.11	0.11	0.11	0.11
19.425	0.11	0.11	0.11	0.11	0.11
19.550	0.11	0.11	0.11	0.11	0.11
19.675	0.11	0.10	0.10	0.10	0.10
19.800	0.10	0.10	0.10	0.10	0.10
19.925	0.10	0.10	0.10	0.10	0.10
20.050	0.10	0.10	0.10	0.10	0.10
20.175	0.10	0.10	0.10	0.10	0.10
20.300	0.10	0.10	0.10	0.10	0.10
20.425	0.10	0.10	0.10	0.10	0.10
20.550	0.10	0.10	0.10	0.10	0.09
20.675	0.09	0.09	0.09	0.09	0.09
20.800	0.09	0.09	0.09	0.09	0.09
20.925	0.09	0.09	0.09	0.09	0.09
21.050	0.09	0.09	0.09	0.09	0.09
21.175	0.09	0.09	0.09	0.09	0.09
21.300	0.09	0.09	0.09	0.09	0.09
21.425	0.09	0.09	0.09	0.09	0.09
21.550	0.09	0.09	0.09	0.09	0.09
21.675	0.09	0.09	0.09	0.09	0.09
21.800	0.09	0.09	0.09	0.09	0.09
21.925	0.09	0.09	0.09	0.09	0.09
22.050	0.09	0.09	0.09	0.09	0.09
22.175	0.09	0.09	0.09	0.09	0.09
22.300	0.09	0.09	0.09	0.09	0.09
22.425	0.09	0.09	0.09	0.09	0.09
22.550	0.09	0.09	0.09	0.09	0.09
22.675	0.09	0.09	0.09	0.09	0.09
22.800	0.09	0.09	0.09	0.09	0.09
22.925	0.09	0.09	0.09	0.09	0.09
23.050	0.09	0.09	0.09	0.09	0.09
23.175	0.09	0.09	0.09	0.09	0.09
23.300	0.09	0.09	0.09	0.09	0.09
23.425	0.09	0.09	0.09	0.09	0.09

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
23.550	0.09	0.09	0.09	0.09	0.09
23.675	0.09	0.09	0.09	0.09	0.09
23.800	0.09	0.09	0.09	0.09	0.09
23.925	0.09	0.09	0.09	0.09	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
Flow (Total) (ft³/s)
3.00
2.75
2.50
2.25
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)

Storm Event	SCS Type II - 50 yr
Return Event	50 years
Duration	24.000 hours
Depth	4.3 in
Time of Concentration (Composite)	0.288 hours
Area (User Defined)	5.065 acres

Computational Time Increment	0.038 hours
Time to Peak (Computed)	12.087 hours
Flow (Peak, Computed)	7.00 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	12.075 hours
Flow (Peak Interpolated Output)	6.94 ft³/s

Drainage Area

SCS CN (Composite)	66.000
Area (User Defined)	5.065 acres
Maximum Retention (Pervious)	5.2 in
Maximum Retention (Pervious, 20 percent)	1.0 in

Cumulative Runoff

Cumulative Runoff Depth (Pervious)	1.3 in
Runoff Volume (Pervious)	0.541 ac-ft

Hydrograph Volume (Area under Hydrograph curve)

Volume	0.538 ac-ft

SCS Unit Hydrograph Parameters

Time of Concentration (Composite)	0.288 hours
Computational Time Increment	0.038 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	19.94 ft³/s
Unit peak time, Tp	0.192 hours
Unit receding limb, Tr	0.767 hours
Total unit time, Tb	0.959 hours

Storm Event	SCS Type II - 50 yr
Return Event	50 years
Duration	24.000 hours
Depth	4.3 in
Time of Concentration (Composite)	0.288 hours
Area (User Defined)	5.065 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

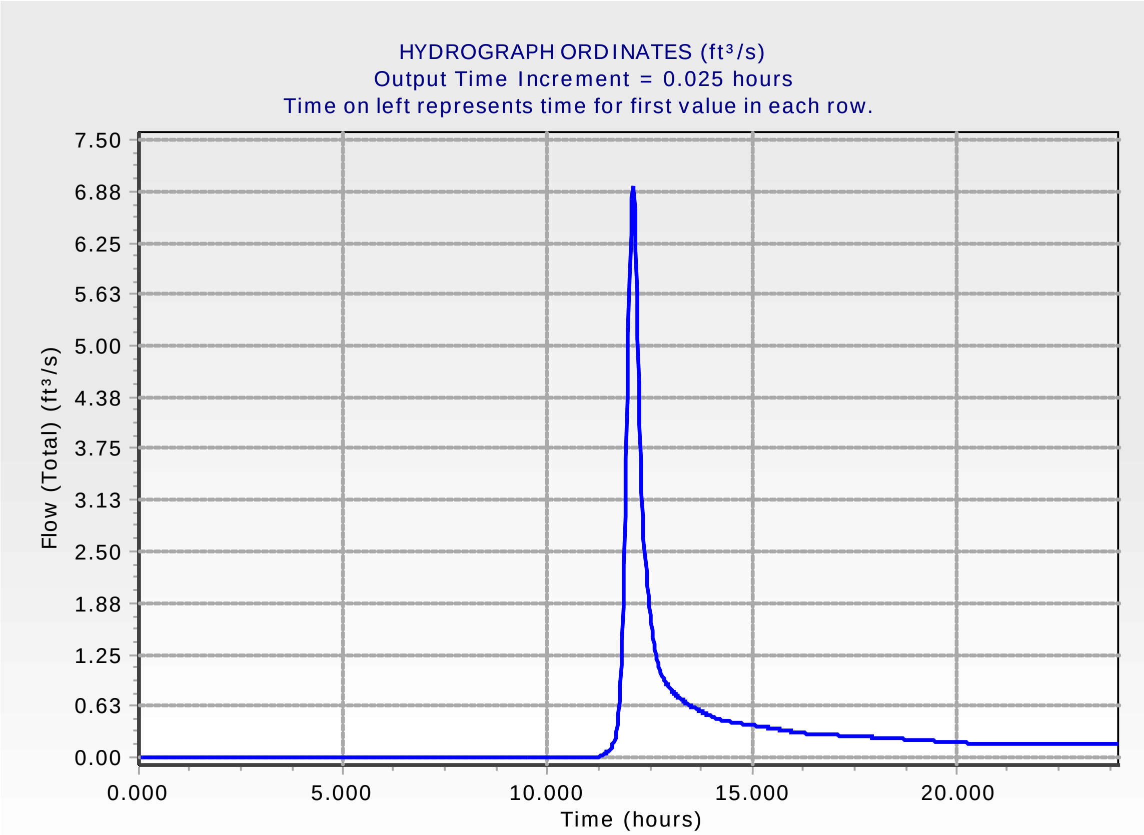
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
11.125	0.00	0.00	0.00	0.00	0.01
11.250	0.01	0.01	0.02	0.02	0.03
11.375	0.04	0.04	0.05	0.06	0.07
11.500	0.08	0.09	0.11	0.13	0.15
11.625	0.19	0.24	0.31	0.39	0.52
11.750	0.67	0.85	1.11	1.41	1.81
11.875	2.33	2.92	3.63	4.38	5.14
12.000	5.82	6.37	6.80	6.94	6.89
12.125	6.66	6.18	5.66	5.10	4.56
12.250	4.05	3.59	3.23	2.92	2.66
12.375	2.45	2.26	2.10	1.96	1.84
12.500	1.73	1.63	1.53	1.45	1.38
12.625	1.31	1.25	1.19	1.14	1.10
12.750	1.06	1.02	0.99	0.97	0.94
12.875	0.92	0.90	0.88	0.86	0.85
13.000	0.83	0.82	0.80	0.79	0.78
13.125	0.76	0.75	0.74	0.73	0.72
13.250	0.71	0.70	0.69	0.68	0.67
13.375	0.67	0.66	0.65	0.64	0.63
13.500	0.63	0.62	0.61	0.60	0.60
13.625	0.59	0.58	0.58	0.57	0.56
13.750	0.56	0.55	0.54	0.54	0.53
13.875	0.53	0.52	0.52	0.51	0.50
14.000	0.50	0.49	0.49	0.48	0.48
14.125	0.47	0.47	0.46	0.46	0.46
14.250	0.45	0.45	0.45	0.44	0.44
14.375	0.44	0.44	0.44	0.43	0.43
14.500	0.43	0.43	0.43	0.42	0.42
14.625	0.42	0.42	0.42	0.41	0.41
14.750	0.41	0.41	0.41	0.40	0.40
14.875	0.40	0.40	0.40	0.40	0.39
15.000	0.39	0.39	0.39	0.39	0.38
15.125	0.38	0.38	0.38	0.38	0.37
15.250	0.37	0.37	0.37	0.37	0.36
15.375	0.36	0.36	0.36	0.36	0.35
15.500	0.35	0.35	0.35	0.35	0.34
15.625	0.34	0.34	0.34	0.34	0.33
15.750	0.33	0.33	0.33	0.33	0.32
15.875	0.32	0.32	0.32	0.32	0.31
16.000	0.31	0.31	0.31	0.31	0.30
16.125	0.30	0.30	0.30	0.30	0.30
16.250	0.29	0.29	0.29	0.29	0.29
16.375	0.29	0.29	0.29	0.29	0.29

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
16.500	0.29	0.29	0.28	0.28	0.28
16.625	0.28	0.28	0.28	0.28	0.28
16.750	0.28	0.28	0.28	0.28	0.28
16.875	0.28	0.27	0.27	0.27	0.27
17.000	0.27	0.27	0.27	0.27	0.27
17.125	0.27	0.27	0.27	0.27	0.27
17.250	0.26	0.26	0.26	0.26	0.26
17.375	0.26	0.26	0.26	0.26	0.26
17.500	0.26	0.26	0.26	0.26	0.25
17.625	0.25	0.25	0.25	0.25	0.25
17.750	0.25	0.25	0.25	0.25	0.25
17.875	0.25	0.25	0.25	0.24	0.24
18.000	0.24	0.24	0.24	0.24	0.24
18.125	0.24	0.24	0.24	0.24	0.24
18.250	0.24	0.24	0.23	0.23	0.23
18.375	0.23	0.23	0.23	0.23	0.23
18.500	0.23	0.23	0.23	0.23	0.23
18.625	0.22	0.22	0.22	0.22	0.22
18.750	0.22	0.22	0.22	0.22	0.22
18.875	0.22	0.22	0.22	0.21	0.21
19.000	0.21	0.21	0.21	0.21	0.21
19.125	0.21	0.21	0.21	0.21	0.21
19.250	0.21	0.20	0.20	0.20	0.20
19.375	0.20	0.20	0.20	0.20	0.20
19.500	0.20	0.20	0.20	0.20	0.19
19.625	0.19	0.19	0.19	0.19	0.19
19.750	0.19	0.19	0.19	0.19	0.19
19.875	0.19	0.19	0.18	0.18	0.18
20.000	0.18	0.18	0.18	0.18	0.18
20.125	0.18	0.18	0.18	0.18	0.18
20.250	0.18	0.18	0.17	0.17	0.17
20.375	0.17	0.17	0.17	0.17	0.17
20.500	0.17	0.17	0.17	0.17	0.17
20.625	0.17	0.17	0.17	0.17	0.17
20.750	0.17	0.17	0.17	0.17	0.17
20.875	0.17	0.17	0.17	0.17	0.17
21.000	0.17	0.17	0.17	0.17	0.17
21.125	0.17	0.17	0.17	0.17	0.17
21.250	0.17	0.17	0.17	0.17	0.17
21.375	0.17	0.17	0.17	0.17	0.17
21.500	0.17	0.17	0.17	0.17	0.17
21.625	0.17	0.17	0.17	0.17	0.17
21.750	0.17	0.17	0.17	0.17	0.17
21.875	0.17	0.17	0.17	0.17	0.17
22.000	0.17	0.16	0.16	0.16	0.16
22.125	0.16	0.16	0.16	0.16	0.16
22.250	0.16	0.16	0.16	0.16	0.16
22.375	0.16	0.16	0.16	0.16	0.16
22.500	0.16	0.16	0.16	0.16	0.16
22.625	0.16	0.16	0.16	0.16	0.16
22.750	0.16	0.16	0.16	0.16	0.16
22.875	0.16	0.16	0.16	0.16	0.16

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
23.000	0.16	0.16	0.16	0.16	0.16
23.125	0.16	0.16	0.16	0.16	0.16
23.250	0.16	0.16	0.16	0.16	0.16
23.375	0.16	0.16	0.16	0.16	0.16
23.500	0.16	0.16	0.16	0.16	0.16
23.625	0.16	0.16	0.16	0.16	0.16
23.750	0.16	0.15	0.15	0.15	0.15
23.875	0.15	0.15	0.15	0.15	0.15
24.000	0.15	(N/A)	(N/A)	(N/A)	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
7.50
6.88
6.25
5.63
5.00
4.38
3.75
3.13
2.50
1.88
1.25
0.63
0.00
Flow (Total) (ft³/s)
0.000
5.000
10.000
15.000
20.000
Time (hours)

Storm Event	SCS Type II - 100 yr
Return Event	100 years
Duration	24.000 hours
Depth	5.0 in
Time of Concentration (Composite)	0.288 hours
Area (User Defined)	5.065 acres

Computational Time Increment	0.038 hours
Time to Peak (Computed)	12.087 hours
Flow (Peak, Computed)	9.67 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	12.075 hours
Flow (Peak Interpolated Output)	9.62 ft³/s

Drainage Area

SCS CN (Composite)	66.000
Area (User Defined)	5.065 acres
Maximum Retention (Pervious)	5.2 in
Maximum Retention (Pervious, 20 percent)	1.0 in

Cumulative Runoff

Cumulative Runoff Depth (Pervious)	1.7 in
Runoff Volume (Pervious)	0.729 ac-ft

Hydrograph Volume (Area under Hydrograph curve)

Volume	0.726 ac-ft

SCS Unit Hydrograph Parameters

Time of Concentration (Composite)	0.288 hours
Computational Time Increment	0.038 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	19.94 ft³/s
Unit peak time, Tp	0.192 hours
Unit receding limb, Tr	0.767 hours
Total unit time, Tb	0.959 hours

Storm Event	SCS Type II - 100 yr
Return Event	100 years
Duration	24.000 hours
Depth	5.0 in
Time of Concentration (Composite)	0.288 hours
Area (User Defined)	5.065 acres

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

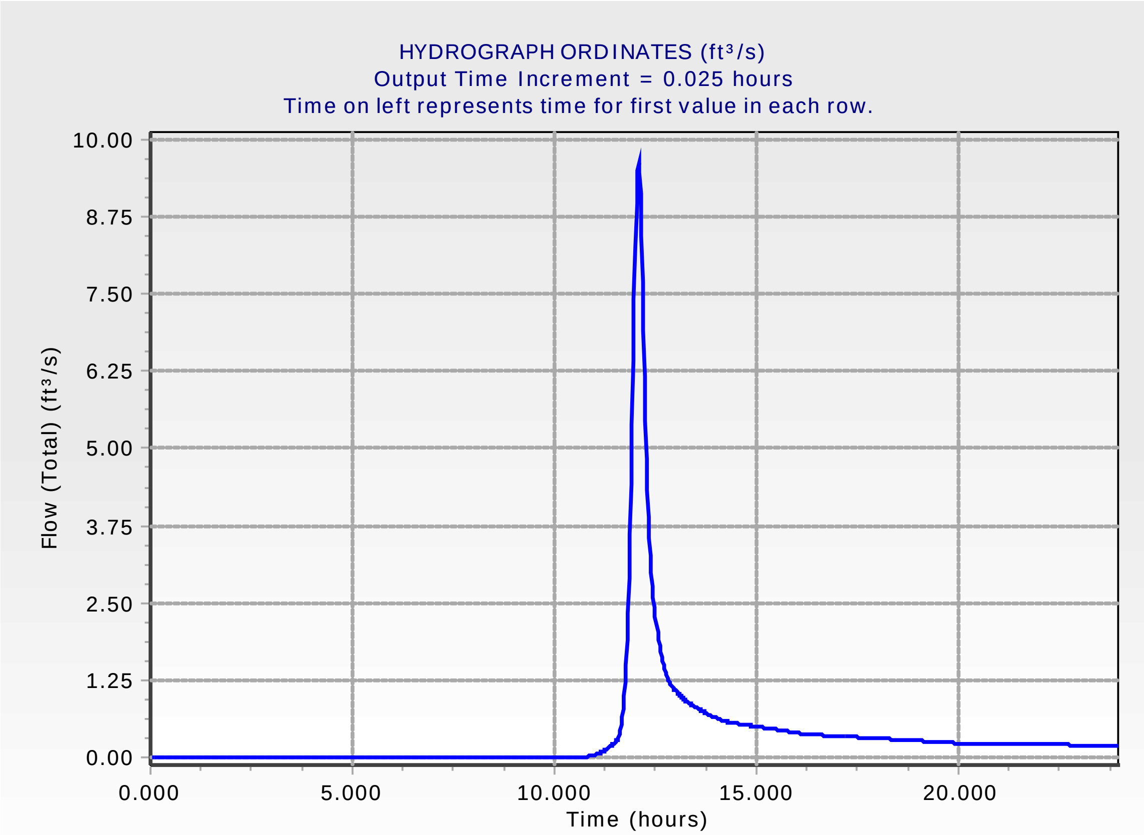
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
10.650	0.00	0.00	0.00	0.00	0.01
10.775	0.01	0.01	0.01	0.02	0.02
10.900	0.03	0.03	0.03	0.04	0.04
11.025	0.05	0.06	0.06	0.07	0.07
11.150	0.08	0.09	0.10	0.11	0.12
11.275	0.13	0.14	0.15	0.16	0.17
11.400	0.19	0.20	0.21	0.23	0.25
11.525	0.27	0.29	0.33	0.37	0.43
11.650	0.53	0.64	0.78	0.98	1.22
11.775	1.51	1.89	2.33	2.90	3.62
11.900	4.43	5.40	6.40	7.41	8.28
12.025	8.97	9.50	9.62	9.49	9.12
12.150	8.43	7.70	6.91	6.16	5.46
12.275	4.83	4.34	3.90	3.55	3.26
12.400	3.01	2.79	2.60	2.42	2.28
12.525	2.14	2.01	1.90	1.80	1.71
12.650	1.63	1.55	1.49	1.43	1.38
12.775	1.33	1.29	1.25	1.22	1.19
12.900	1.17	1.14	1.12	1.10	1.08
13.025	1.06	1.04	1.02	1.01	0.99
13.150	0.97	0.96	0.94	0.93	0.92
13.275	0.90	0.89	0.88	0.87	0.86
13.400	0.85	0.84	0.83	0.82	0.81
13.525	0.80	0.79	0.78	0.77	0.76
13.650	0.75	0.74	0.73	0.72	0.72
13.775	0.71	0.70	0.69	0.68	0.68
13.900	0.67	0.66	0.65	0.65	0.64
14.025	0.63	0.63	0.62	0.61	0.61
14.150	0.60	0.59	0.59	0.58	0.58
14.275	0.58	0.57	0.57	0.57	0.56
14.400	0.56	0.56	0.55	0.55	0.55
14.525	0.55	0.54	0.54	0.54	0.54
14.650	0.53	0.53	0.53	0.53	0.52
14.775	0.52	0.52	0.52	0.51	0.51
14.900	0.51	0.51	0.50	0.50	0.50
15.025	0.50	0.49	0.49	0.49	0.49
15.150	0.49	0.48	0.48	0.48	0.47
15.275	0.47	0.47	0.47	0.46	0.46
15.400	0.46	0.46	0.45	0.45	0.45
15.525	0.45	0.44	0.44	0.44	0.44
15.650	0.43	0.43	0.43	0.43	0.42
15.775	0.42	0.42	0.42	0.41	0.41
15.900	0.41	0.40	0.40	0.40	0.40

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
16.025	0.39	0.39	0.39	0.39	0.38
16.150	0.38	0.38	0.38	0.38	0.37
16.275	0.37	0.37	0.37	0.37	0.37
16.400	0.37	0.37	0.37	0.36	0.36
16.525	0.36	0.36	0.36	0.36	0.36
16.650	0.36	0.36	0.36	0.36	0.35
16.775	0.35	0.35	0.35	0.35	0.35
16.900	0.35	0.35	0.35	0.35	0.35
17.025	0.34	0.34	0.34	0.34	0.34
17.150	0.34	0.34	0.34	0.34	0.34
17.275	0.34	0.33	0.33	0.33	0.33
17.400	0.33	0.33	0.33	0.33	0.33
17.525	0.33	0.33	0.32	0.32	0.32
17.650	0.32	0.32	0.32	0.32	0.32
17.775	0.32	0.32	0.31	0.31	0.31
17.900	0.31	0.31	0.31	0.31	0.31
18.025	0.31	0.31	0.31	0.30	0.30
18.150	0.30	0.30	0.30	0.30	0.30
18.275	0.30	0.30	0.30	0.29	0.29
18.400	0.29	0.29	0.29	0.29	0.29
18.525	0.29	0.29	0.29	0.29	0.28
18.650	0.28	0.28	0.28	0.28	0.28
18.775	0.28	0.28	0.28	0.28	0.27
18.900	0.27	0.27	0.27	0.27	0.27
19.025	0.27	0.27	0.27	0.27	0.26
19.150	0.26	0.26	0.26	0.26	0.26
19.275	0.26	0.26	0.26	0.26	0.25
19.400	0.25	0.25	0.25	0.25	0.25
19.525	0.25	0.25	0.25	0.25	0.24
19.650	0.24	0.24	0.24	0.24	0.24
19.775	0.24	0.24	0.24	0.24	0.23
19.900	0.23	0.23	0.23	0.23	0.23
20.025	0.23	0.23	0.23	0.23	0.22
20.150	0.22	0.22	0.22	0.22	0.22
20.275	0.22	0.22	0.22	0.22	0.22
20.400	0.22	0.22	0.22	0.22	0.22
20.525	0.22	0.22	0.22	0.22	0.22
20.650	0.22	0.22	0.22	0.22	0.22
20.775	0.22	0.22	0.22	0.22	0.22
20.900	0.22	0.22	0.22	0.22	0.21
21.025	0.21	0.21	0.21	0.21	0.21
21.150	0.21	0.21	0.21	0.21	0.21
21.275	0.21	0.21	0.21	0.21	0.21
21.400	0.21	0.21	0.21	0.21	0.21
21.525	0.21	0.21	0.21	0.21	0.21
21.650	0.21	0.21	0.21	0.21	0.21
21.775	0.21	0.21	0.21	0.21	0.21
21.900	0.21	0.21	0.21	0.21	0.21
22.025	0.21	0.21	0.21	0.21	0.21
22.150	0.21	0.21	0.21	0.21	0.21
22.275	0.21	0.21	0.21	0.21	0.21
22.400	0.20	0.20	0.20	0.20	0.20

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
22.525	0.20	0.20	0.20	0.20	0.20
22.650	0.20	0.20	0.20	0.20	0.20
22.775	0.20	0.20	0.20	0.20	0.20
22.900	0.20	0.20	0.20	0.20	0.20
23.025	0.20	0.20	0.20	0.20	0.20
23.150	0.20	0.20	0.20	0.20	0.20
23.275	0.20	0.20	0.20	0.20	0.20
23.400	0.20	0.20	0.20	0.20	0.20
23.525	0.20	0.20	0.20	0.20	0.20
23.650	0.20	0.20	0.20	0.20	0.19
23.775	0.19	0.19	0.19	0.19	0.19
23.900	0.19	0.19	0.19	0.19	0.19


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
Flow (Total) (ft³/s)
10.00
8.75
7.50
6.25
5.00
3.75
2.50
1.25
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)

Storm Event	SCS Type II - 2 yr
Return Event	2 years
Duration	24.000 hours
Depth	2.2 in
Time of Concentration (Composite)	0.288 hours
Area (User Defined)	8.553 acres

Computational Time Increment	0.038 hours
Time to Peak (Computed)	12.126 hours
Flow (Peak, Computed)	1.39 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	12.125 hours
Flow (Peak Interpolated Output)	1.39 ft³/s

Drainage Area	
SCS CN (Composite)	67.000
Area (User Defined)	8.553 acres
Maximum Retention (Pervious)	4.9 in
Maximum Retention (Pervious, 20 percent)	1.0 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	0.2 in
Runoff Volume (Pervious)	0.174 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.172 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.288 hours
Computational Time Increment	0.038 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	33.67 ft³/s
Unit peak time, Tp	0.192 hours
Unit receding limb, Tr	0.767 hours
Total unit time, Tb	0.959 hours

Storm Event	SCS Type II - 2 yr
Return Event	2 years
Duration	24.000 hours
Depth	2.2 in
Time of Concentration (Composite)	0.288 hours
Area (User Defined)	8.553 acres

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

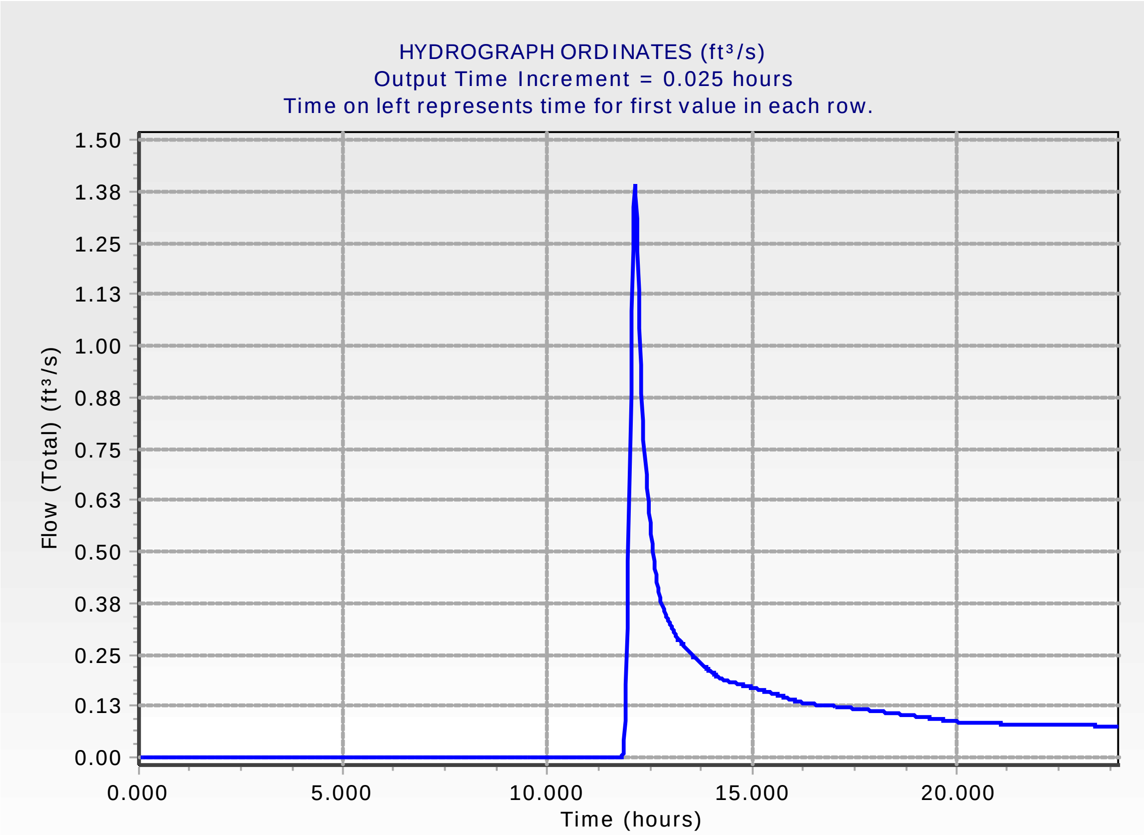
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
11.800	0.00	0.00	0.01	0.04	0.09
11.925	0.18	0.31	0.48	0.68	0.88
12.050	1.08	1.23	1.34	1.39	1.36
12.175	1.31	1.23	1.14	1.04	0.95
12.300	0.88	0.82	0.77	0.73	0.69
12.425	0.65	0.62	0.59	0.57	0.54
12.550	0.52	0.50	0.48	0.46	0.44
12.675	0.43	0.41	0.40	0.39	0.38
12.800	0.37	0.36	0.35	0.35	0.34
12.925	0.34	0.33	0.33	0.32	0.32
13.050	0.31	0.31	0.30	0.30	0.29
13.175	0.29	0.29	0.28	0.28	0.28
13.300	0.27	0.27	0.27	0.27	0.26
13.425	0.26	0.26	0.26	0.25	0.25
13.550	0.25	0.24	0.24	0.24	0.24
13.675	0.23	0.23	0.23	0.23	0.23
13.800	0.22	0.22	0.22	0.22	0.22
13.925	0.21	0.21	0.21	0.21	0.21
14.050	0.20	0.20	0.20	0.20	0.20
14.175	0.19	0.19	0.19	0.19	0.19
14.300	0.19	0.19	0.19	0.19	0.19
14.425	0.18	0.18	0.18	0.18	0.18
14.550	0.18	0.18	0.18	0.18	0.18
14.675	0.18	0.18	0.18	0.18	0.18
14.800	0.17	0.17	0.17	0.17	0.17
14.925	0.17	0.17	0.17	0.17	0.17
15.050	0.17	0.17	0.17	0.17	0.17
15.175	0.16	0.16	0.16	0.16	0.16
15.300	0.16	0.16	0.16	0.16	0.16
15.425	0.16	0.16	0.16	0.16	0.15
15.550	0.15	0.15	0.15	0.15	0.15
15.675	0.15	0.15	0.15	0.15	0.15
15.800	0.15	0.14	0.14	0.14	0.14
15.925	0.14	0.14	0.14	0.14	0.14
16.050	0.14	0.14	0.14	0.14	0.13
16.175	0.13	0.13	0.13	0.13	0.13
16.300	0.13	0.13	0.13	0.13	0.13
16.425	0.13	0.13	0.13	0.13	0.13
16.550	0.13	0.13	0.13	0.13	0.13
16.675	0.13	0.13	0.13	0.13	0.13
16.800	0.13	0.13	0.13	0.13	0.12
16.925	0.12	0.12	0.12	0.12	0.12
17.050	0.12	0.12	0.12	0.12	0.12

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
17.175	0.12	0.12	0.12	0.12	0.12
17.300	0.12	0.12	0.12	0.12	0.12
17.425	0.12	0.12	0.12	0.12	0.12
17.550	0.12	0.12	0.12	0.12	0.12
17.675	0.12	0.12	0.12	0.12	0.12
17.800	0.12	0.11	0.11	0.11	0.11
17.925	0.11	0.11	0.11	0.11	0.11
18.050	0.11	0.11	0.11	0.11	0.11
18.175	0.11	0.11	0.11	0.11	0.11
18.300	0.11	0.11	0.11	0.11	0.11
18.425	0.11	0.11	0.11	0.11	0.11
18.550	0.11	0.11	0.11	0.11	0.10
18.675	0.10	0.10	0.10	0.10	0.10
18.800	0.10	0.10	0.10	0.10	0.10
18.925	0.10	0.10	0.10	0.10	0.10
19.050	0.10	0.10	0.10	0.10	0.10
19.175	0.10	0.10	0.10	0.10	0.10
19.300	0.10	0.10	0.10	0.10	0.09
19.425	0.09	0.09	0.09	0.09	0.09
19.550	0.09	0.09	0.09	0.09	0.09
19.675	0.09	0.09	0.09	0.09	0.09
19.800	0.09	0.09	0.09	0.09	0.09
19.925	0.09	0.09	0.09	0.09	0.09
20.050	0.09	0.09	0.09	0.08	0.08
20.175	0.08	0.08	0.08	0.08	0.08
20.300	0.08	0.08	0.08	0.08	0.08
20.425	0.08	0.08	0.08	0.08	0.08
20.550	0.08	0.08	0.08	0.08	0.08
20.675	0.08	0.08	0.08	0.08	0.08
20.800	0.08	0.08	0.08	0.08	0.08
20.925	0.08	0.08	0.08	0.08	0.08
21.050	0.08	0.08	0.08	0.08	0.08
21.175	0.08	0.08	0.08	0.08	0.08
21.300	0.08	0.08	0.08	0.08	0.08
21.425	0.08	0.08	0.08	0.08	0.08
21.550	0.08	0.08	0.08	0.08	0.08
21.675	0.08	0.08	0.08	0.08	0.08
21.800	0.08	0.08	0.08	0.08	0.08
21.925	0.08	0.08	0.08	0.08	0.08
22.050	0.08	0.08	0.08	0.08	0.08
22.175	0.08	0.08	0.08	0.08	0.08
22.300	0.08	0.08	0.08	0.08	0.08
22.425	0.08	0.08	0.08	0.08	0.08
22.550	0.08	0.08	0.08	0.08	0.08
22.675	0.08	0.08	0.08	0.08	0.08
22.800	0.08	0.08	0.08	0.08	0.08
22.925	0.08	0.08	0.08	0.08	0.08
23.050	0.08	0.08	0.08	0.08	0.08
23.175	0.08	0.08	0.08	0.08	0.08
23.300	0.08	0.08	0.08	0.08	0.08
23.425	0.08	0.08	0.08	0.08	0.08
23.550	0.08	0.08	0.08	0.08	0.08

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
23.675	0.08	0.08	0.08	0.08	0.08
23.800	0.08	0.08	0.08	0.08	0.08
23.925	0.08	0.08	0.08	0.08	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
Flow (Total) (ft³/s)
1.50
1.38
1.25
1.13
1.00
0.88
0.75
0.63
0.50
0.38
0.25
0.13
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)

Storm Event	SCS Type II - 10 yr
Return Event	10 years
Duration	24.000 hours
Depth	3.1 in
Time of Concentration (Composite)	0.288 hours
Area (User Defined)	8.553 acres

Computational Time Increment	0.038 hours
Time to Peak (Computed)	12.087 hours
Flow (Peak, Computed)	5.20 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	5.16 ft³/s

Drainage Area

SCS CN (Composite)	67.000
Area (User Defined)	8.553 acres
Maximum Retention (Pervious)	4.9 in
Maximum Retention (Pervious, 20 percent)	1.0 in

Cumulative Runoff

Cumulative Runoff Depth (Pervious)	0.6 in
Runoff Volume (Pervious)	0.449 ac-ft

Hydrograph Volume (Area under Hydrograph curve)

Volume	0.446 ac-ft

SCS Unit Hydrograph Parameters

Time of Concentration (Composite)	0.288 hours
Computational Time Increment	0.038 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	33.67 ft³/s
Unit peak time, Tp	0.192 hours
Unit receding limb, Tr	0.767 hours
Total unit time, Tb	0.959 hours

Storm Event	SCS Type II - 10 yr
Return Event	10 years
Duration	24.000 hours
Depth	3.1 in
Time of Concentration (Composite)	0.288 hours
Area (User Defined)	8.553 acres

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

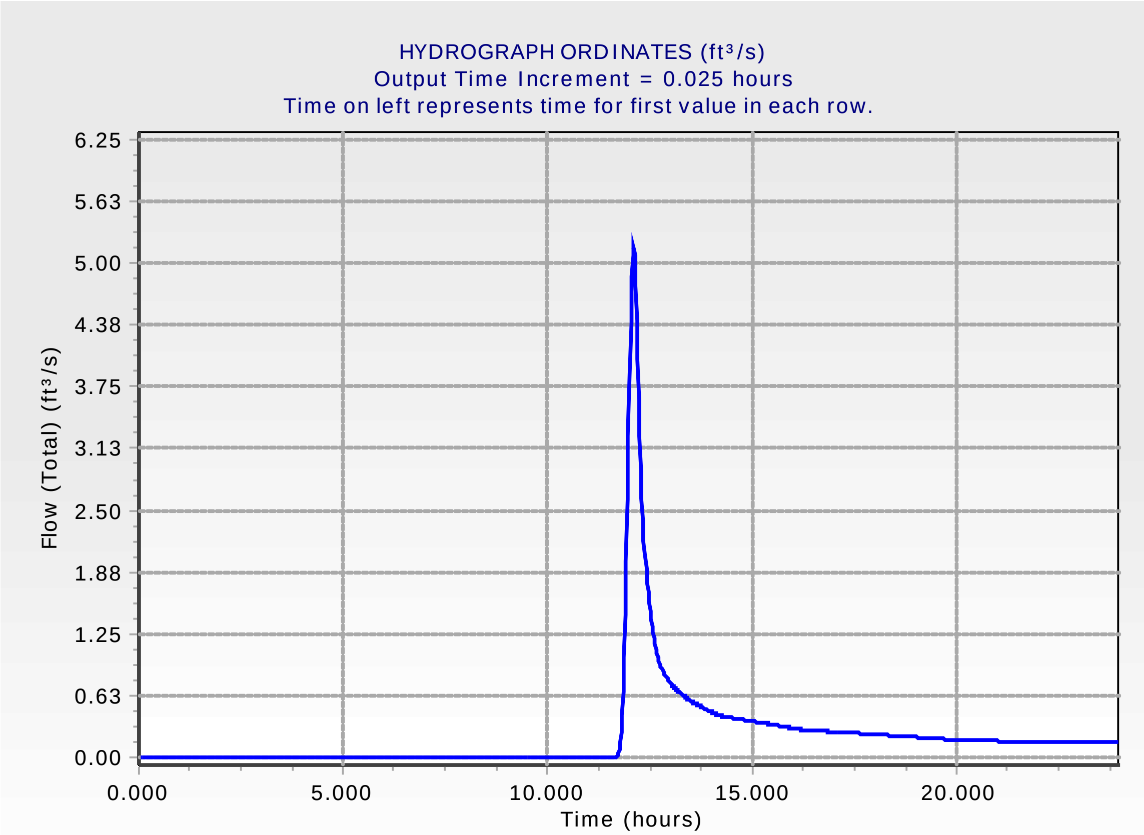
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
11.625	0.00	0.00	0.01	0.01	0.04
11.750	0.08	0.14	0.26	0.42	0.67
11.875	1.02	1.44	1.99	2.61	3.25
12.000	3.88	4.41	4.87	5.09	5.16
12.125	5.08	4.77	4.42	4.03	3.63
12.250	3.25	2.91	2.64	2.40	2.21
12.375	2.05	1.90	1.78	1.67	1.57
12.500	1.49	1.41	1.33	1.27	1.20
12.625	1.15	1.10	1.05	1.01	0.97
12.750	0.94	0.91	0.89	0.86	0.84
12.875	0.83	0.81	0.79	0.78	0.77
13.000	0.75	0.74	0.73	0.72	0.70
13.125	0.69	0.68	0.67	0.66	0.65
13.250	0.65	0.64	0.63	0.62	0.61
13.375	0.61	0.60	0.59	0.59	0.58
13.500	0.57	0.57	0.56	0.55	0.55
13.625	0.54	0.54	0.53	0.52	0.52
13.750	0.51	0.51	0.50	0.50	0.49
13.875	0.49	0.48	0.48	0.47	0.47
14.000	0.46	0.46	0.45	0.45	0.44
14.125	0.44	0.43	0.43	0.43	0.42
14.250	0.42	0.42	0.42	0.41	0.41
14.375	0.41	0.41	0.40	0.40	0.40
14.500	0.40	0.40	0.40	0.39	0.39
14.625	0.39	0.39	0.39	0.39	0.38
14.750	0.38	0.38	0.38	0.38	0.38
14.875	0.37	0.37	0.37	0.37	0.37
15.000	0.37	0.37	0.36	0.36	0.36
15.125	0.36	0.36	0.35	0.35	0.35
15.250	0.35	0.35	0.35	0.34	0.34
15.375	0.34	0.34	0.34	0.34	0.33
15.500	0.33	0.33	0.33	0.33	0.32
15.625	0.32	0.32	0.32	0.32	0.32
15.750	0.31	0.31	0.31	0.31	0.31
15.875	0.30	0.30	0.30	0.30	0.30
16.000	0.30	0.29	0.29	0.29	0.29
16.125	0.29	0.28	0.28	0.28	0.28
16.250	0.28	0.28	0.28	0.28	0.28
16.375	0.27	0.27	0.27	0.27	0.27
16.500	0.27	0.27	0.27	0.27	0.27
16.625	0.27	0.27	0.27	0.27	0.27
16.750	0.27	0.26	0.26	0.26	0.26
16.875	0.26	0.26	0.26	0.26	0.26

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
17.000	0.26	0.26	0.26	0.26	0.26
17.125	0.26	0.26	0.25	0.25	0.25
17.250	0.25	0.25	0.25	0.25	0.25
17.375	0.25	0.25	0.25	0.25	0.25
17.500	0.25	0.25	0.25	0.24	0.24
17.625	0.24	0.24	0.24	0.24	0.24
17.750	0.24	0.24	0.24	0.24	0.24
17.875	0.24	0.24	0.24	0.23	0.23
18.000	0.23	0.23	0.23	0.23	0.23
18.125	0.23	0.23	0.23	0.23	0.23
18.250	0.23	0.23	0.23	0.22	0.22
18.375	0.22	0.22	0.22	0.22	0.22
18.500	0.22	0.22	0.22	0.22	0.22
18.625	0.22	0.22	0.21	0.21	0.21
18.750	0.21	0.21	0.21	0.21	0.21
18.875	0.21	0.21	0.21	0.21	0.21
19.000	0.21	0.20	0.20	0.20	0.20
19.125	0.20	0.20	0.20	0.20	0.20
19.250	0.20	0.20	0.20	0.20	0.20
19.375	0.19	0.19	0.19	0.19	0.19
19.500	0.19	0.19	0.19	0.19	0.19
19.625	0.19	0.19	0.19	0.18	0.18
19.750	0.18	0.18	0.18	0.18	0.18
19.875	0.18	0.18	0.18	0.18	0.18
20.000	0.18	0.18	0.17	0.17	0.17
20.125	0.17	0.17	0.17	0.17	0.17
20.250	0.17	0.17	0.17	0.17	0.17
20.375	0.17	0.17	0.17	0.17	0.17
20.500	0.17	0.17	0.17	0.17	0.17
20.625	0.17	0.17	0.17	0.17	0.17
20.750	0.17	0.17	0.17	0.17	0.17
20.875	0.17	0.17	0.17	0.17	0.17
21.000	0.17	0.17	0.17	0.17	0.17
21.125	0.16	0.16	0.16	0.16	0.16
21.250	0.16	0.16	0.16	0.16	0.16
21.375	0.16	0.16	0.16	0.16	0.16
21.500	0.16	0.16	0.16	0.16	0.16
21.625	0.16	0.16	0.16	0.16	0.16
21.750	0.16	0.16	0.16	0.16	0.16
21.875	0.16	0.16	0.16	0.16	0.16
22.000	0.16	0.16	0.16	0.16	0.16
22.125	0.16	0.16	0.16	0.16	0.16
22.250	0.16	0.16	0.16	0.16	0.16
22.375	0.16	0.16	0.16	0.16	0.16
22.500	0.16	0.16	0.16	0.16	0.16
22.625	0.16	0.16	0.16	0.16	0.16
22.750	0.16	0.16	0.16	0.16	0.16
22.875	0.16	0.16	0.16	0.16	0.16
23.000	0.16	0.16	0.16	0.16	0.16
23.125	0.16	0.15	0.15	0.15	0.15
23.250	0.15	0.15	0.15	0.15	0.15
23.375	0.15	0.15	0.15	0.15	0.15

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
23.500	0.15	0.15	0.15	0.15	0.15
23.625	0.15	0.15	0.15	0.15	0.15
23.750	0.15	0.15	0.15	0.15	0.15
23.875	0.15	0.15	0.15	0.15	0.15
24.000	0.15	(N/A)	(N/A)	(N/A)	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
6.25
5.63
5.00
4.38
3.75
3.13
2.50
1.88
1.25
0.63
0.00
Flow (Total) (ft³/s)
0.000
5.000
10.000
15.000
20.000
Time (hours)

Storm Event	SCS Type II - 50 yr
Return Event	50 years
Duration	24.000 hours
Depth	4.3 in
Time of Concentration (Composite)	0.288 hours
Area (User Defined)	8.553 acres

Computational Time Increment	0.038 hours
Time to Peak (Computed)	12.087 hours
Flow (Peak, Computed)	12.53 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	12.075 hours
Flow (Peak Interpolated Output)	12.43 ft³/s

Drainage Area

SCS CN (Composite)	67.000
Area (User Defined)	8.553 acres
Maximum Retention (Pervious)	4.9 in
Maximum Retention (Pervious, 20 percent)	1.0 in

Cumulative Runoff

Cumulative Runoff Depth (Pervious)	1.3 in
Runoff Volume (Pervious)	0.960 ac-ft

Hydrograph Volume (Area under Hydrograph curve)

Volume	0.955 ac-ft

SCS Unit Hydrograph Parameters

Time of Concentration (Composite)	0.288 hours
Computational Time Increment	0.038 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	33.67 ft³/s
Unit peak time, Tp	0.192 hours
Unit receding limb, Tr	0.767 hours
Total unit time, Tb	0.959 hours

Storm Event	SCS Type II - 50 yr
Return Event	50 years
Duration	24.000 hours
Depth	4.3 in
Time of Concentration (Composite)	0.288 hours
Area (User Defined)	8.553 acres

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

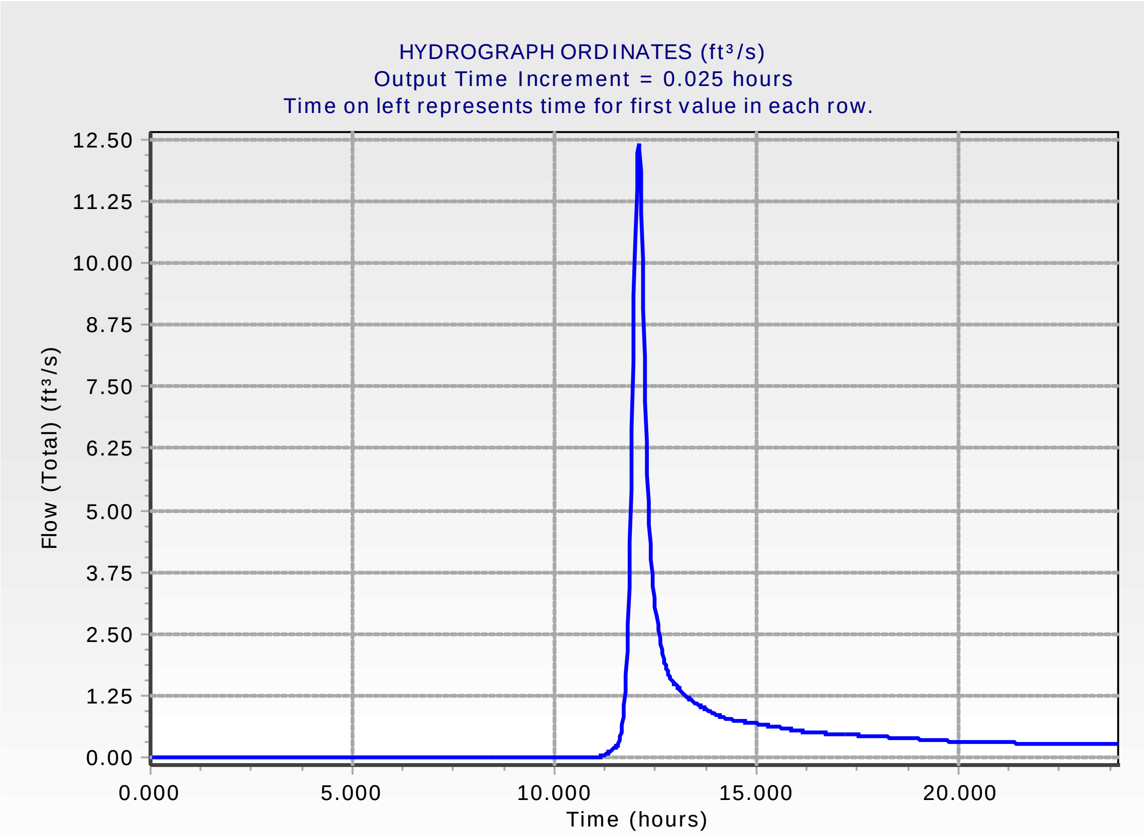
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
10.975	0.00	0.00	0.00	0.00	0.01
11.100	0.01	0.02	0.02	0.03	0.04
11.225	0.04	0.05	0.06	0.08	0.09
11.350	0.10	0.11	0.13	0.15	0.16
11.475	0.18	0.20	0.22	0.25	0.29
11.600	0.34	0.41	0.52	0.65	0.81
11.725	1.05	1.33	1.67	2.14	2.70
11.850	3.42	4.34	5.40	6.66	7.99
11.975	9.34	10.52	11.47	12.22	12.43
12.100	12.31	11.88	11.01	10.07	9.07
12.225	8.10	7.19	6.37	5.73	5.16
12.350	4.71	4.33	4.00	3.71	3.46
12.475	3.24	3.04	2.86	2.70	2.55
12.600	2.42	2.30	2.19	2.09	2.00
12.725	1.92	1.86	1.79	1.74	1.69
12.850	1.65	1.61	1.58	1.54	1.52
12.975	1.49	1.46	1.43	1.41	1.38
13.100	1.36	1.34	1.32	1.30	1.28
13.225	1.26	1.24	1.22	1.21	1.19
13.350	1.18	1.16	1.15	1.14	1.12
13.475	1.11	1.10	1.08	1.07	1.06
13.600	1.04	1.03	1.02	1.01	0.99
13.725	0.98	0.97	0.96	0.95	0.94
13.850	0.93	0.92	0.91	0.90	0.89
13.975	0.88	0.87	0.86	0.85	0.84
14.100	0.83	0.83	0.82	0.81	0.80
14.225	0.80	0.79	0.78	0.78	0.78
14.350	0.77	0.77	0.76	0.76	0.76
14.475	0.75	0.75	0.75	0.74	0.74
14.600	0.74	0.73	0.73	0.73	0.72
14.725	0.72	0.72	0.71	0.71	0.71
14.850	0.70	0.70	0.70	0.69	0.69
14.975	0.69	0.68	0.68	0.68	0.67
15.100	0.67	0.67	0.66	0.66	0.66
15.225	0.65	0.65	0.65	0.64	0.64
15.350	0.63	0.63	0.63	0.62	0.62
15.475	0.62	0.61	0.61	0.61	0.60
15.600	0.60	0.60	0.59	0.59	0.59
15.725	0.58	0.58	0.58	0.57	0.57
15.850	0.56	0.56	0.56	0.55	0.55
15.975	0.55	0.54	0.54	0.54	0.53
16.100	0.53	0.53	0.52	0.52	0.52
16.225	0.52	0.51	0.51	0.51	0.51

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
16.350	0.51	0.50	0.50	0.50	0.50
16.475	0.50	0.50	0.50	0.50	0.49
16.600	0.49	0.49	0.49	0.49	0.49
16.725	0.49	0.49	0.48	0.48	0.48
16.850	0.48	0.48	0.48	0.48	0.48
16.975	0.47	0.47	0.47	0.47	0.47
17.100	0.47	0.47	0.47	0.46	0.46
17.225	0.46	0.46	0.46	0.46	0.46
17.350	0.46	0.45	0.45	0.45	0.45
17.475	0.45	0.45	0.45	0.45	0.44
17.600	0.44	0.44	0.44	0.44	0.44
17.725	0.44	0.44	0.43	0.43	0.43
17.850	0.43	0.43	0.43	0.43	0.43
17.975	0.42	0.42	0.42	0.42	0.42
18.100	0.42	0.42	0.42	0.41	0.41
18.225	0.41	0.41	0.41	0.41	0.41
18.350	0.40	0.40	0.40	0.40	0.40
18.475	0.40	0.40	0.40	0.39	0.39
18.600	0.39	0.39	0.39	0.39	0.39
18.725	0.39	0.38	0.38	0.38	0.38
18.850	0.38	0.38	0.38	0.37	0.37
18.975	0.37	0.37	0.37	0.37	0.37
19.100	0.37	0.36	0.36	0.36	0.36
19.225	0.36	0.36	0.36	0.35	0.35
19.350	0.35	0.35	0.35	0.35	0.35
19.475	0.34	0.34	0.34	0.34	0.34
19.600	0.34	0.34	0.34	0.33	0.33
19.725	0.33	0.33	0.33	0.33	0.33
19.850	0.32	0.32	0.32	0.32	0.32
19.975	0.32	0.32	0.31	0.31	0.31
20.100	0.31	0.31	0.31	0.31	0.31
20.225	0.31	0.30	0.30	0.30	0.30
20.350	0.30	0.30	0.30	0.30	0.30
20.475	0.30	0.30	0.30	0.30	0.30
20.600	0.30	0.30	0.30	0.30	0.30
20.725	0.30	0.30	0.30	0.30	0.30
20.850	0.30	0.30	0.30	0.30	0.30
20.975	0.30	0.30	0.30	0.30	0.30
21.100	0.30	0.29	0.29	0.29	0.29
21.225	0.29	0.29	0.29	0.29	0.29
21.350	0.29	0.29	0.29	0.29	0.29
21.475	0.29	0.29	0.29	0.29	0.29
21.600	0.29	0.29	0.29	0.29	0.29
21.725	0.29	0.29	0.29	0.29	0.29
21.850	0.29	0.29	0.29	0.29	0.29
21.975	0.29	0.29	0.29	0.29	0.29
22.100	0.29	0.29	0.29	0.28	0.28
22.225	0.28	0.28	0.28	0.28	0.28
22.350	0.28	0.28	0.28	0.28	0.28
22.475	0.28	0.28	0.28	0.28	0.28
22.600	0.28	0.28	0.28	0.28	0.28
22.725	0.28	0.28	0.28	0.28	0.28

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
22.850	0.28	0.28	0.28	0.28	0.28
22.975	0.28	0.28	0.28	0.28	0.28
23.100	0.28	0.28	0.28	0.27	0.27
23.225	0.27	0.27	0.27	0.27	0.27
23.350	0.27	0.27	0.27	0.27	0.27
23.475	0.27	0.27	0.27	0.27	0.27
23.600	0.27	0.27	0.27	0.27	0.27
23.725	0.27	0.27	0.27	0.27	0.27
23.850	0.27	0.27	0.27	0.27	0.27
23.975	0.27	0.27	(N/A)	(N/A)	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
Flow (Total) (ft³/s)
12.50
11.25
10.00
8.75
7.50
6.25
5.00
3.75
2.50
1.25
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)

Storm Event	SCS Type II - 100 yr
Return Event	100 years
Duration	24.000 hours
Depth	5.0 in
Time of Concentration (Composite)	0.288 hours
Area (User Defined)	8.553 acres

Computational Time Increment	0.038 hours
Time to Peak (Computed)	12.087 hours
Flow (Peak, Computed)	17.14 ft³/s
Output Increment	0.025 hours
Time to Flow (Peak Interpolated Output)	12.075 hours
Flow (Peak Interpolated Output)	17.05 ft³/s

Drainage Area

SCS CN (Composite)	67.000
Area (User Defined)	8.553 acres
Maximum Retention (Pervious)	4.9 in
Maximum Retention (Pervious, 20 percent)	1.0 in

Cumulative Runoff

Cumulative Runoff Depth (Pervious)	1.8 in
Runoff Volume (Pervious)	1.285 ac-ft

Hydrograph Volume (Area under Hydrograph curve)

Volume	1.279 ac-ft

SCS Unit Hydrograph Parameters

Time of Concentration (Composite)	0.288 hours
Computational Time Increment	0.038 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	33.67 ft³/s
Unit peak time, Tp	0.192 hours
Unit receding limb, Tr	0.767 hours
Total unit time, Tb	0.959 hours

Storm Event	SCS Type II - 100 yr
Return Event	100 years
Duration	24.000 hours
Depth	5.0 in
Time of Concentration (Composite)	0.288 hours
Area (User Defined)	8.553 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

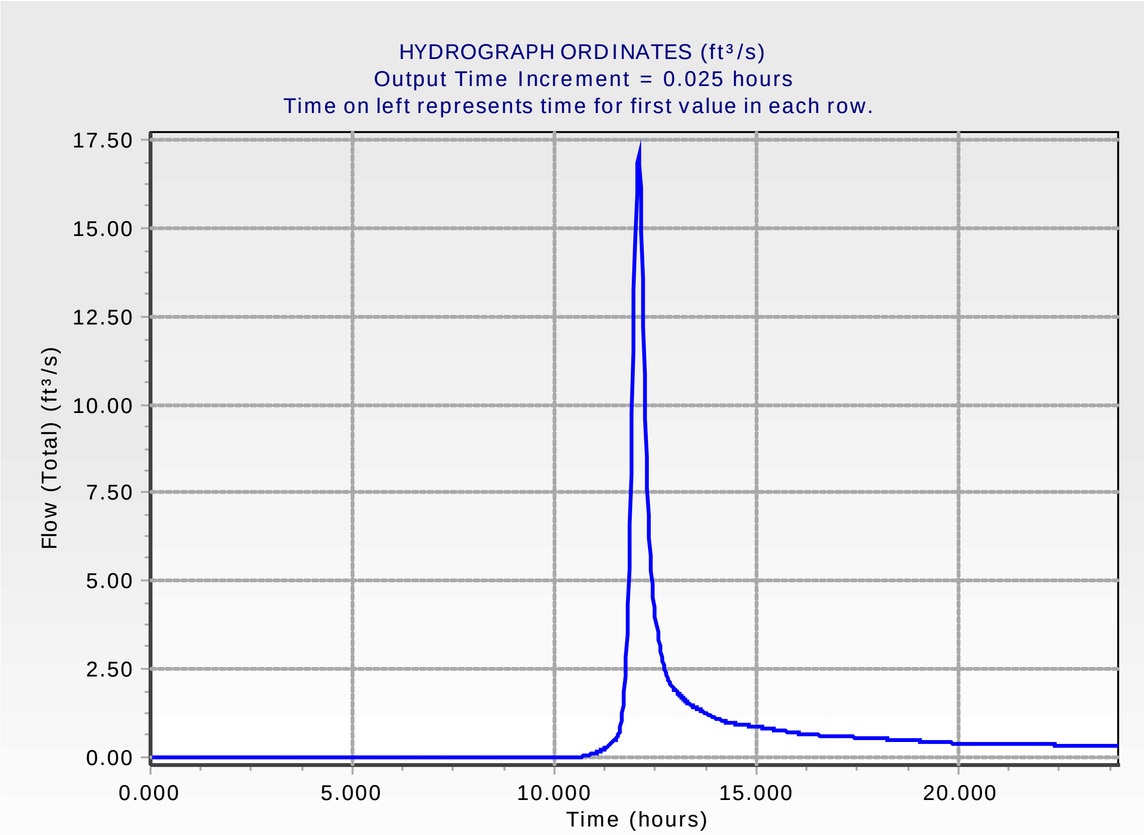
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
10.450	0.00	0.00	0.00	0.00	0.01
10.575	0.01	0.01	0.02	0.02	0.03
10.700	0.03	0.04	0.04	0.05	0.06
10.825	0.06	0.07	0.08	0.09	0.10
10.950	0.11	0.12	0.12	0.14	0.15
11.075	0.16	0.17	0.18	0.20	0.21
11.200	0.22	0.24	0.26	0.28	0.30
11.325	0.32	0.34	0.36	0.39	0.41
11.450	0.44	0.47	0.50	0.54	0.58
11.575	0.65	0.74	0.85	1.02	1.23
11.700	1.50	1.86	2.30	2.82	3.50
11.825	4.31	5.32	6.60	8.04	9.74
11.950	11.51	13.27	14.79	15.97	16.87
12.075	17.05	16.79	16.12	14.89	13.58
12.200	12.19	10.86	9.61	8.50	7.62
12.325	6.86	6.24	5.73	5.27	4.88
12.450	4.55	4.24	3.98	3.74	3.52
12.575	3.33	3.15	2.99	2.84	2.71
12.700	2.59	2.49	2.40	2.32	2.25
12.825	2.19	2.13	2.08	2.03	1.99
12.950	1.95	1.92	1.88	1.85	1.81
13.075	1.78	1.75	1.72	1.69	1.67
13.200	1.64	1.62	1.59	1.57	1.55
13.325	1.53	1.51	1.49	1.48	1.46
13.450	1.44	1.42	1.40	1.39	1.37
13.575	1.35	1.34	1.32	1.30	1.29
13.700	1.27	1.26	1.24	1.23	1.22
13.825	1.20	1.19	1.18	1.16	1.15
13.950	1.14	1.13	1.11	1.10	1.09
14.075	1.08	1.06	1.05	1.04	1.03
14.200	1.02	1.02	1.01	1.00	0.99
14.325	0.99	0.98	0.98	0.97	0.97
14.450	0.96	0.96	0.95	0.95	0.94
14.575	0.94	0.94	0.93	0.93	0.92
14.700	0.92	0.91	0.91	0.91	0.90
14.825	0.90	0.89	0.89	0.88	0.88
14.950	0.88	0.87	0.87	0.86	0.86
15.075	0.85	0.85	0.85	0.84	0.84
15.200	0.83	0.83	0.82	0.82	0.82
15.325	0.81	0.81	0.80	0.80	0.79
15.450	0.79	0.78	0.78	0.77	0.77
15.575	0.77	0.76	0.76	0.75	0.75
15.700	0.74	0.74	0.73	0.73	0.73

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
15.825	0.72	0.72	0.71	0.71	0.70
15.950	0.70	0.69	0.69	0.68	0.68
16.075	0.67	0.67	0.67	0.66	0.66
16.200	0.66	0.65	0.65	0.65	0.64
16.325	0.64	0.64	0.64	0.64	0.64
16.450	0.63	0.63	0.63	0.63	0.63
16.575	0.62	0.62	0.62	0.62	0.62
16.700	0.62	0.62	0.61	0.61	0.61
16.825	0.61	0.61	0.61	0.60	0.60
16.950	0.60	0.60	0.60	0.60	0.59
17.075	0.59	0.59	0.59	0.59	0.59
17.200	0.59	0.58	0.58	0.58	0.58
17.325	0.58	0.58	0.57	0.57	0.57
17.450	0.57	0.57	0.57	0.56	0.56
17.575	0.56	0.56	0.56	0.56	0.55
17.700	0.55	0.55	0.55	0.55	0.55
17.825	0.54	0.54	0.54	0.54	0.54
17.950	0.54	0.54	0.53	0.53	0.53
18.075	0.53	0.53	0.53	0.52	0.52
18.200	0.52	0.52	0.52	0.52	0.51
18.325	0.51	0.51	0.51	0.51	0.51
18.450	0.50	0.50	0.50	0.50	0.50
18.575	0.50	0.49	0.49	0.49	0.49
18.700	0.49	0.48	0.48	0.48	0.48
18.825	0.48	0.48	0.47	0.47	0.47
18.950	0.47	0.47	0.47	0.46	0.46
19.075	0.46	0.46	0.46	0.46	0.45
19.200	0.45	0.45	0.45	0.45	0.45
19.325	0.44	0.44	0.44	0.44	0.44
19.450	0.44	0.43	0.43	0.43	0.43
19.575	0.43	0.42	0.42	0.42	0.42
19.700	0.42	0.42	0.41	0.41	0.41
19.825	0.41	0.41	0.41	0.40	0.40
19.950	0.40	0.40	0.40	0.40	0.39
20.075	0.39	0.39	0.39	0.39	0.39
20.200	0.39	0.38	0.38	0.38	0.38
20.325	0.38	0.38	0.38	0.38	0.38
20.450	0.38	0.38	0.38	0.38	0.38
20.575	0.38	0.38	0.38	0.38	0.38
20.700	0.38	0.37	0.37	0.37	0.37
20.825	0.37	0.37	0.37	0.37	0.37
20.950	0.37	0.37	0.37	0.37	0.37
21.075	0.37	0.37	0.37	0.37	0.37
21.200	0.37	0.37	0.37	0.37	0.37
21.325	0.37	0.37	0.37	0.37	0.37
21.450	0.37	0.37	0.37	0.37	0.36
21.575	0.36	0.36	0.36	0.36	0.36
21.700	0.36	0.36	0.36	0.36	0.36
21.825	0.36	0.36	0.36	0.36	0.36
21.950	0.36	0.36	0.36	0.36	0.36
22.075	0.36	0.36	0.36	0.36	0.36
22.200	0.36	0.36	0.36	0.36	0.36

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
22.325	0.36	0.35	0.35	0.35	0.35
22.450	0.35	0.35	0.35	0.35	0.35
22.575	0.35	0.35	0.35	0.35	0.35
22.700	0.35	0.35	0.35	0.35	0.35
22.825	0.35	0.35	0.35	0.35	0.35
22.950	0.35	0.35	0.35	0.35	0.35
23.075	0.35	0.35	0.34	0.34	0.34
23.200	0.34	0.34	0.34	0.34	0.34
23.325	0.34	0.34	0.34	0.34	0.34
23.450	0.34	0.34	0.34	0.34	0.34
23.575	0.34	0.34	0.34	0.34	0.34
23.700	0.34	0.34	0.34	0.34	0.34
23.825	0.34	0.34	0.34	0.33	0.33
23.950	0.33	0.33	0.33	(N/A)	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
17.50
15.00
12.50
10.00
7.50
5.00
2.50
0.00
Flow (Total) (ft³/s)
0.000
5.000
10.000
15.000
20.000
Time (hours)

Summary for Hydrograph Addition at 'Outlet - POST'

Upstream Link	Upstream Node
Outlet	BASIN
<Catchment to Outflow Node>	POST - AREA 2
<Catchment to Outflow Node>	POST - AREA 3
<Catchment to Outflow Node>	POST - AREA 4
<Catchment to Outflow Node>	POST - AREA 5

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	Outlet	0.005	12.350	0.08
Flow (From)	POST - AREA 2	0.018	12.150	0.14
Flow (From)	POST - AREA 3	0.020	11.925	0.37
Flow (From)	POST - AREA 4	0.042	12.125	0.38
Flow (From)	POST - AREA 5	0.092	12.125	0.67
Flow (In)	Outlet - POST	0.176	12.125	1.30

Summary for Hydrograph Addition at 'Outlet - POST'

Upstream Link	Upstream Node
Outlet	BASIN
<Catchment to Outflow Node>	POST - AREA 2
<Catchment to Outflow Node>	POST - AREA 3
<Catchment to Outflow Node>	POST - AREA 4
<Catchment to Outflow Node>	POST - AREA 5

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	Outlet	0.029	12.250	0.43
Flow (From)	POST - AREA 2	0.047	12.100	0.53
Flow (From)	POST - AREA 3	0.032	11.925	0.60
Flow (From)	POST - AREA 4	0.098	12.125	1.13
Flow (From)	POST - AREA 5	0.247	12.100	2.77
Flow (In)	Outlet - POST	0.452	12.100	4.78

Summary for Hydrograph Addition at 'Outlet - POST'

Upstream Link	Upstream Node
Outlet	BASIN
<Catchment to Outflow Node>	POST - AREA 2
<Catchment to Outflow Node>	POST - AREA 3
<Catchment to Outflow Node>	POST - AREA 4
<Catchment to Outflow Node>	POST - AREA 5

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	Outlet	0.075	12.200	1.15
Flow (From)	POST - AREA 2	0.100	12.100	1.27
Flow (From)	POST - AREA 3	0.051	11.925	0.93
Flow (From)	POST - AREA 4	0.199	12.100	2.47
Flow (From)	POST - AREA 5	0.538	12.075	6.94
Flow (In)	Outlet - POST	0.963	12.075	11.91

Summary for Hydrograph Addition at 'Outlet - POST'

Upstream Link	Upstream Node
Outlet	BASIN
<Catchment to Outflow Node>	POST - AREA 2
<Catchment to Outflow Node>	POST - AREA 3
<Catchment to Outflow Node>	POST - AREA 4
<Catchment to Outflow Node>	POST - AREA 5

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	Outlet	0.103	12.200	1.40
Flow (From)	POST - AREA 2	0.134	12.075	1.73
Flow (From)	POST - AREA 3	0.061	11.925	1.11
Flow (From)	POST - AREA 4	0.261	12.100	3.31
Flow (From)	POST - AREA 5	0.726	12.075	9.62
Flow (In)	Outlet - POST	1.285	12.075	16.26

Summary for Hydrograph Addition at 'Outlet - PRE'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	PRE - AREA 1

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	PRE - AREA 1	0.172	12.125	1.39
Flow (In)	Outlet - PRE	0.172	12.125	1.39

Summary for Hydrograph Addition at 'Outlet - PRE'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	PRE - AREA 1

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	PRE - AREA 1	0.446	12.100	5.16
Flow (In)	Outlet - PRE	0.446	12.100	5.16

Summary for Hydrograph Addition at 'Outlet - PRE'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	PRE - AREA 1

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	PRE - AREA 1	0.955	12.075	12.43
Flow (In)	Outlet - PRE	0.955	12.075	12.43

Summary for Hydrograph Addition at 'Outlet - PRE'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	PRE - AREA 1

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	PRE - AREA 1	1.279	12.075	17.05
Flow (In)	Outlet - PRE	1.279	12.075	17.05

Elevation (ft)	Planimeter (ft^2)	Area (acres)	A1+A2+sqr (A1*A2) (acres)	Volume (ac-ft)	Volume (Total) (ac-ft)
1,801.50	0.0	0.029	0.000	0.000	0.000
1,802.00	0.0	0.035	0.095	0.016	0.016
1,803.00	0.0	0.048	0.123	0.041	0.057
1,804.00	0.0	0.062	0.164	0.055	0.111
1,805.00	0.0	0.077	0.209	0.070	0.181

Requested Pond Water Surface Elevations	
Minimum (Headwater)	1,801.50 ft
Increment (Headwater)	0.25 ft
Maximum (Headwater)	1,805.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice - 1	Forward	TW	1,802.12	1,805.00
Orifice-Circular	Orifice - 2	Forward	TW	1,802.60	1,805.00
Rectangular Weir	Weir - 1	Forward	TW	1,803.58	1,805.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Orifice - 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	1,802.12 ft
Orifice Diameter	3.0 in
Orifice Coefficient	0.600

Structure ID: Weir - 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	1,803.58 ft
Weir Length	3.75 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: Orifice - 2 Structure Type: Orifice-Circular	
Number of Openings	2
Elevation	1,802.60 ft
Orifice Diameter	5.0 in
Orifice Coefficient	0.600

Structure ID: TW Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Infiltration	
Infiltration Method (Computed)	Average Infiltration Rate
Infiltration Rate (Average)	4.9000 in/h

Initial Conditions	
Elevation (Water Surface, Initial)	1,801.50 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.025 hours

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	1.25 ft³/s	Time to Peak (Flow, In)	12.025 hours
Infiltration (Peak)	0.19 ft³/s	Time to Peak (Infiltration)	12.350 hours
Flow (Peak Outlet)	0.08 ft³/s	Time to Peak (Flow, Outlet)	12.350 hours

Elevation (Water Surface, Peak)	1,802.38 ft
Volume (Peak)	0.030 ac-ft

Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	0.081 ac-ft
Volume (Total Infiltration)	0.075 ac-ft
Volume (Total Outlet Outflow)	0.005 ac-ft
Volume (Retained)	0.001 ac-ft
Volume (Unrouted)	0.000 ac-ft
Error (Mass Balance)	0.0 %

Infiltration	
Infiltration Method (Computed)	Average Infiltration Rate
Infiltration Rate (Average)	4.9000 in/h

Initial Conditions	
Elevation (Water Surface, Initial)	1,801.50 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.025 hours

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	2.07 ft³/s	Time to Peak (Flow, In)	12.025 hours
Infiltration (Peak)	0.22 ft³/s	Time to Peak (Infiltration)	12.250 hours
Flow (Peak Outlet)	0.43 ft³/s	Time to Peak (Flow, Outlet)	12.250 hours

Elevation (Water Surface, Peak)	1,802.84 ft
Volume (Peak)	0.049 ac-ft

Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	0.136 ac-ft
Volume (Total Infiltration)	0.106 ac-ft
Volume (Total Outlet Outflow)	0.029 ac-ft
Volume (Retained)	0.001 ac-ft
Volume (Unrouted)	0.000 ac-ft
Error (Mass Balance)	0.0 %

Infiltration

Infiltration Method (Computed)	Average Infiltration Rate
Infiltration Rate (Average)	4.9000 in/h

Initial Conditions

Elevation (Water Surface, Initial)	1,801.50 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.025 hours

Inflow/Outflow Hydrograph Summary

Flow (Peak In)	3.25 ft³/s	Time to Peak (Flow, In)	12.025 hours
Infiltration (Peak)	0.26 ft³/s	Time to Peak (Infiltration)	12.200 hours
Flow (Peak Outlet)	1.15 ft³/s	Time to Peak (Flow, Outlet)	12.200 hours

Elevation (Water Surface, Peak)	1,803.30 ft
Volume (Peak)	0.072 ac-ft

Mass Balance (ac-ft)

Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	0.216 ac-ft
Volume (Total Infiltration)	0.139 ac-ft
Volume (Total Outlet Outflow)	0.075 ac-ft
Volume (Retained)	0.002 ac-ft
Volume (Unrouted)	0.000 ac-ft
Error (Mass Balance)	0.0 %

Infiltration

Infiltration Method (Computed)	Average Infiltration Rate
Infiltration Rate (Average)	4.9000 in/h

Initial Conditions

Elevation (Water Surface, Initial)	1,801.50 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.025 hours

Inflow/Outflow Hydrograph Summary

Flow (Peak In)	3.90 ft³/s	Time to Peak (Flow, In)	12.025 hours
Infiltration (Peak)	0.27 ft³/s	Time to Peak (Infiltration)	12.200 hours
Flow (Peak Outlet)	1.40 ft³/s	Time to Peak (Flow, Outlet)	12.200 hours

Elevation (Water Surface, Peak)	1,803.56 ft
Volume (Peak)	0.085 ac-ft

Mass Balance (ac-ft)

Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	0.262 ac-ft
Volume (Total Infiltration)	0.157 ac-ft
Volume (Total Outlet Outflow)	0.103 ac-ft
Volume (Retained)	0.002 ac-ft
Volume (Unrouted)	0.000 ac-ft
Error (Mass Balance)	0.0 %

Peak Discharge	0.19 ft³/s
Time to Peak	12.350 hours
Hydrograph Volume	0.075 ac-ft

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

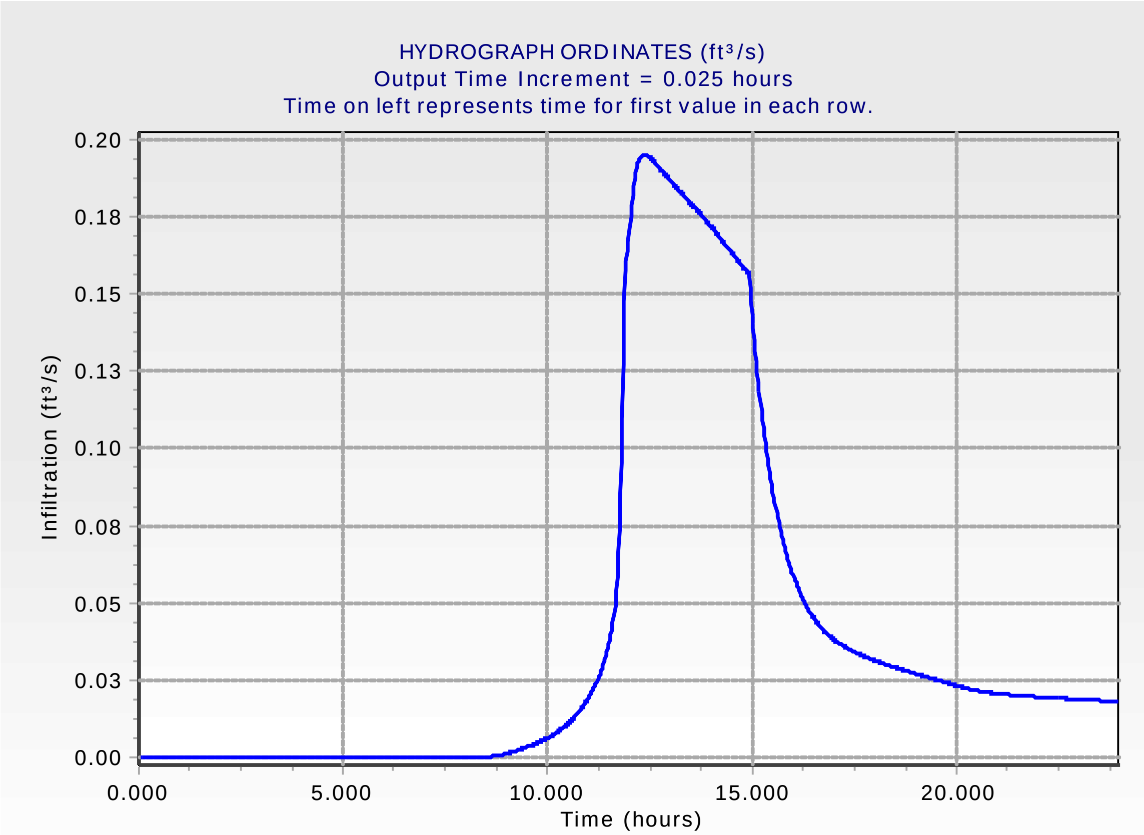
Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
8.925	0.00	0.00	0.00	0.00	0.00
9.050	0.00	0.00	0.00	0.00	0.00
9.175	0.00	0.00	0.00	0.00	0.00
9.300	0.00	0.00	0.00	0.00	0.00
9.425	0.00	0.00	0.00	0.00	0.00
9.550	0.00	0.00	0.00	0.00	0.00
9.675	0.00	0.00	0.00	0.00	0.00
9.800	0.00	0.01	0.01	0.01	0.01
9.925	0.01	0.01	0.01	0.01	0.01
10.050	0.01	0.01	0.01	0.01	0.01
10.175	0.01	0.01	0.01	0.01	0.01
10.300	0.01	0.01	0.01	0.01	0.01
10.425	0.01	0.01	0.01	0.01	0.01
10.550	0.01	0.01	0.01	0.01	0.01
10.675	0.01	0.01	0.01	0.01	0.02
10.800	0.02	0.02	0.02	0.02	0.02
10.925	0.02	0.02	0.02	0.02	0.02
11.050	0.02	0.02	0.02	0.02	0.02
11.175	0.02	0.02	0.03	0.03	0.03
11.300	0.03	0.03	0.03	0.03	0.03
11.425	0.03	0.03	0.04	0.04	0.04
11.550	0.04	0.04	0.04	0.05	0.05
11.675	0.05	0.06	0.07	0.07	0.08
11.800	0.10	0.11	0.13	0.15	0.16
11.925	0.16	0.16	0.17	0.17	0.17
12.050	0.18	0.18	0.19	0.19	0.19
12.175	0.19	0.19	0.19	0.19	0.19
12.300	0.19	0.19	0.19	0.19	0.19
12.425	0.19	0.19	0.19	0.19	0.19
12.550	0.19	0.19	0.19	0.19	0.19
12.675	0.19	0.19	0.19	0.19	0.19
12.800	0.19	0.19	0.19	0.19	0.19
12.925	0.19	0.19	0.19	0.19	0.19
13.050	0.19	0.19	0.19	0.18	0.18
13.175	0.18	0.18	0.18	0.18	0.18
13.300	0.18	0.18	0.18	0.18	0.18
13.425	0.18	0.18	0.18	0.18	0.18
13.550	0.18	0.18	0.18	0.18	0.18
13.675	0.18	0.18	0.18	0.18	0.18
13.800	0.17	0.17	0.17	0.17	0.17
13.925	0.17	0.17	0.17	0.17	0.17
14.050	0.17	0.17	0.17	0.17	0.17
14.175	0.17	0.17	0.17	0.17	0.17
14.300	0.17	0.17	0.17	0.17	0.17
14.425	0.16	0.16	0.16	0.16	0.16
14.550	0.16	0.16	0.16	0.16	0.16
14.675	0.16	0.16	0.16	0.16	0.16
14.800	0.16	0.16	0.16	0.16	0.16

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
14.925	0.16	0.15	0.15	0.14	0.14
15.050	0.14	0.13	0.13	0.12	0.12
15.175	0.12	0.12	0.11	0.11	0.11
15.300	0.10	0.10	0.10	0.10	0.09
15.425	0.09	0.09	0.09	0.09	0.08
15.550	0.08	0.08	0.08	0.08	0.08
15.675	0.07	0.07	0.07	0.07	0.07
15.800	0.07	0.07	0.07	0.06	0.06
15.925	0.06	0.06	0.06	0.06	0.06
16.050	0.06	0.06	0.06	0.05	0.05
16.175	0.05	0.05	0.05	0.05	0.05
16.300	0.05	0.05	0.05	0.05	0.05
16.425	0.05	0.05	0.05	0.05	0.04
16.550	0.04	0.04	0.04	0.04	0.04
16.675	0.04	0.04	0.04	0.04	0.04
16.800	0.04	0.04	0.04	0.04	0.04
16.925	0.04	0.04	0.04	0.04	0.04
17.050	0.04	0.04	0.04	0.04	0.04
17.175	0.04	0.04	0.04	0.04	0.04
17.300	0.04	0.04	0.04	0.03	0.03
17.425	0.03	0.03	0.03	0.03	0.03
17.550	0.03	0.03	0.03	0.03	0.03
17.675	0.03	0.03	0.03	0.03	0.03
17.800	0.03	0.03	0.03	0.03	0.03
17.925	0.03	0.03	0.03	0.03	0.03
18.050	0.03	0.03	0.03	0.03	0.03
18.175	0.03	0.03	0.03	0.03	0.03
18.300	0.03	0.03	0.03	0.03	0.03
18.425	0.03	0.03	0.03	0.03	0.03
18.550	0.03	0.03	0.03	0.03	0.03
18.675	0.03	0.03	0.03	0.03	0.03
18.800	0.03	0.03	0.03	0.03	0.03
18.925	0.03	0.03	0.03	0.03	0.03
19.050	0.03	0.03	0.03	0.03	0.03
19.175	0.03	0.03	0.03	0.03	0.03
19.300	0.03	0.03	0.03	0.03	0.03
19.425	0.03	0.03	0.03	0.03	0.03
19.550	0.02	0.02	0.02	0.02	0.02
19.675	0.02	0.02	0.02	0.02	0.02
19.800	0.02	0.02	0.02	0.02	0.02
19.925	0.02	0.02	0.02	0.02	0.02
20.050	0.02	0.02	0.02	0.02	0.02
20.175	0.02	0.02	0.02	0.02	0.02
20.300	0.02	0.02	0.02	0.02	0.02
20.425	0.02	0.02	0.02	0.02	0.02
20.550	0.02	0.02	0.02	0.02	0.02
20.675	0.02	0.02	0.02	0.02	0.02
20.800	0.02	0.02	0.02	0.02	0.02
20.925	0.02	0.02	0.02	0.02	0.02
21.050	0.02	0.02	0.02	0.02	0.02
21.175	0.02	0.02	0.02	0.02	0.02
21.300	0.02	0.02	0.02	0.02	0.02

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
21.425	0.02	0.02	0.02	0.02	0.02
21.550	0.02	0.02	0.02	0.02	0.02
21.675	0.02	0.02	0.02	0.02	0.02
21.800	0.02	0.02	0.02	0.02	0.02
21.925	0.02	0.02	0.02	0.02	0.02
22.050	0.02	0.02	0.02	0.02	0.02
22.175	0.02	0.02	0.02	0.02	0.02
22.300	0.02	0.02	0.02	0.02	0.02
22.425	0.02	0.02	0.02	0.02	0.02
22.550	0.02	0.02	0.02	0.02	0.02
22.675	0.02	0.02	0.02	0.02	0.02
22.800	0.02	0.02	0.02	0.02	0.02
22.925	0.02	0.02	0.02	0.02	0.02
23.050	0.02	0.02	0.02	0.02	0.02
23.175	0.02	0.02	0.02	0.02	0.02
23.300	0.02	0.02	0.02	0.02	0.02
23.425	0.02	0.02	0.02	0.02	0.02
23.550	0.02	0.02	0.02	0.02	0.02
23.675	0.02	0.02	0.02	0.02	0.02
23.800	0.02	0.02	0.02	0.02	0.02
23.925	0.02	0.02	0.02	0.02	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
0.20
0.18
0.15
0.13
0.10
0.08
0.05
0.03
0.00
Infiltration (ft³/s)
0.000
5.000
10.000
15.000
20.000
Time (hours)

Peak Discharge	0.22 ft³/s
Time to Peak	12.250 hours
Hydrograph Volume	0.106 ac-ft

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

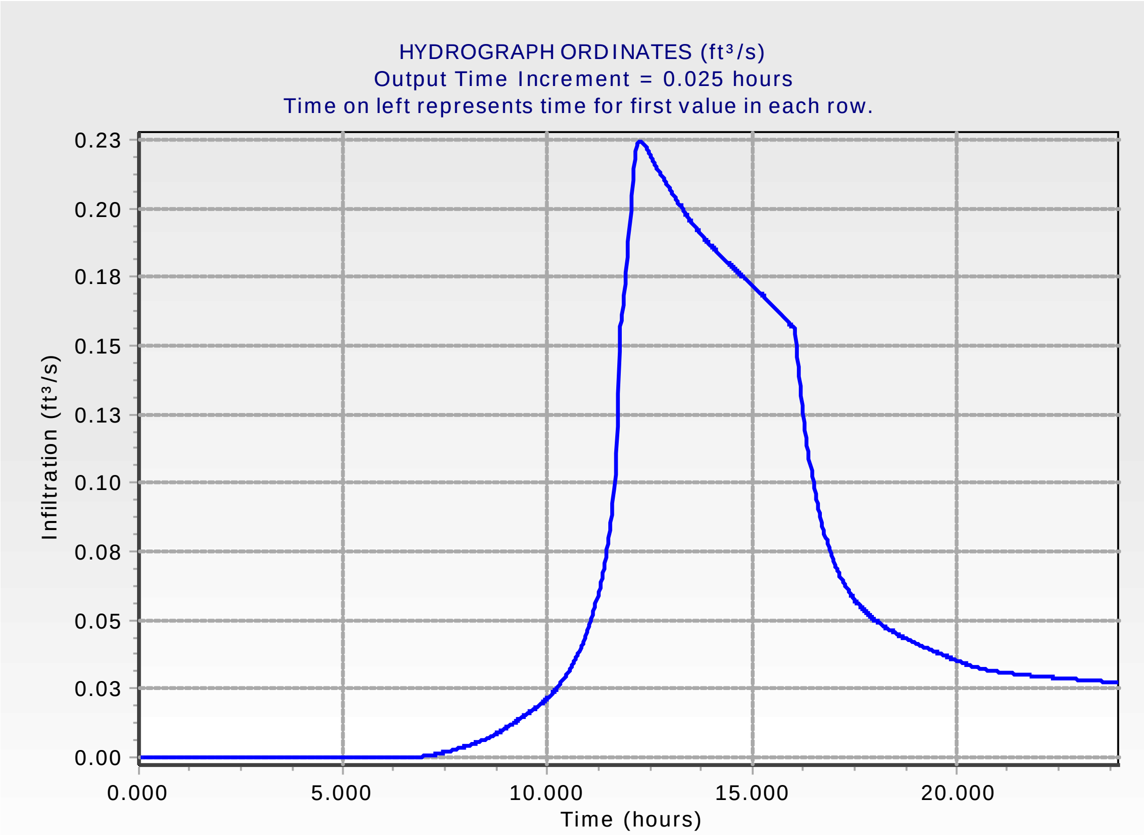
Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
7.225	0.00	0.00	0.00	0.00	0.00
7.350	0.00	0.00	0.00	0.00	0.00
7.475	0.00	0.00	0.00	0.00	0.00
7.600	0.00	0.00	0.00	0.00	0.00
7.725	0.00	0.00	0.00	0.00	0.00
7.850	0.00	0.00	0.00	0.00	0.00
7.975	0.00	0.00	0.00	0.00	0.00
8.100	0.00	0.00	0.00	0.00	0.01
8.225	0.01	0.01	0.01	0.01	0.01
8.350	0.01	0.01	0.01	0.01	0.01
8.475	0.01	0.01	0.01	0.01	0.01
8.600	0.01	0.01	0.01	0.01	0.01
8.725	0.01	0.01	0.01	0.01	0.01
8.850	0.01	0.01	0.01	0.01	0.01
8.975	0.01	0.01	0.01	0.01	0.01
9.100	0.01	0.01	0.01	0.01	0.01
9.225	0.01	0.01	0.01	0.01	0.01
9.350	0.01	0.01	0.01	0.02	0.02
9.475	0.02	0.02	0.02	0.02	0.02
9.600	0.02	0.02	0.02	0.02	0.02
9.725	0.02	0.02	0.02	0.02	0.02
9.850	0.02	0.02	0.02	0.02	0.02
9.975	0.02	0.02	0.02	0.02	0.02
10.100	0.02	0.02	0.02	0.02	0.02
10.225	0.03	0.03	0.03	0.03	0.03
10.350	0.03	0.03	0.03	0.03	0.03
10.475	0.03	0.03	0.03	0.03	0.03
10.600	0.03	0.03	0.04	0.04	0.04
10.725	0.04	0.04	0.04	0.04	0.04
10.850	0.04	0.04	0.04	0.04	0.05
10.975	0.05	0.05	0.05	0.05	0.05
11.100	0.05	0.05	0.05	0.06	0.06
11.225	0.06	0.06	0.06	0.06	0.07
11.350	0.07	0.07	0.07	0.07	0.08
11.475	0.08	0.08	0.08	0.09	0.09
11.600	0.09	0.10	0.10	0.11	0.12
11.725	0.13	0.15	0.16	0.16	0.16
11.850	0.16	0.17	0.17	0.18	0.18
11.975	0.19	0.19	0.20	0.21	0.21
12.100	0.21	0.22	0.22	0.22	0.22
12.225	0.22	0.22	0.22	0.22	0.22
12.350	0.22	0.22	0.22	0.22	0.22
12.475	0.22	0.22	0.22	0.22	0.22
12.600	0.22	0.22	0.22	0.21	0.21
12.725	0.21	0.21	0.21	0.21	0.21
12.850	0.21	0.21	0.21	0.21	0.21
12.975	0.21	0.21	0.21	0.21	0.20
13.100	0.20	0.20	0.20	0.20	0.20

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
13.225	0.20	0.20	0.20	0.20	0.20
13.350	0.20	0.20	0.20	0.20	0.20
13.475	0.20	0.20	0.19	0.19	0.19
13.600	0.19	0.19	0.19	0.19	0.19
13.725	0.19	0.19	0.19	0.19	0.19
13.850	0.19	0.19	0.19	0.19	0.19
13.975	0.19	0.19	0.19	0.19	0.19
14.100	0.18	0.18	0.18	0.18	0.18
14.225	0.18	0.18	0.18	0.18	0.18
14.350	0.18	0.18	0.18	0.18	0.18
14.475	0.18	0.18	0.18	0.18	0.18
14.600	0.18	0.18	0.18	0.18	0.18
14.725	0.18	0.18	0.18	0.17	0.17
14.850	0.17	0.17	0.17	0.17	0.17
14.975	0.17	0.17	0.17	0.17	0.17
15.100	0.17	0.17	0.17	0.17	0.17
15.225	0.17	0.17	0.17	0.17	0.17
15.350	0.17	0.17	0.17	0.17	0.17
15.475	0.16	0.16	0.16	0.16	0.16
15.600	0.16	0.16	0.16	0.16	0.16
15.725	0.16	0.16	0.16	0.16	0.16
15.850	0.16	0.16	0.16	0.16	0.16
15.975	0.16	0.16	0.16	0.15	0.15
16.100	0.15	0.14	0.14	0.14	0.13
16.225	0.13	0.13	0.12	0.12	0.12
16.350	0.11	0.11	0.11	0.11	0.10
16.475	0.10	0.10	0.10	0.10	0.09
16.600	0.09	0.09	0.09	0.09	0.09
16.725	0.08	0.08	0.08	0.08	0.08
16.850	0.08	0.08	0.08	0.07	0.07
16.975	0.07	0.07	0.07	0.07	0.07
17.100	0.07	0.07	0.07	0.07	0.06
17.225	0.06	0.06	0.06	0.06	0.06
17.350	0.06	0.06	0.06	0.06	0.06
17.475	0.06	0.06	0.06	0.06	0.06
17.600	0.06	0.06	0.05	0.05	0.05
17.725	0.05	0.05	0.05	0.05	0.05
17.850	0.05	0.05	0.05	0.05	0.05
17.975	0.05	0.05	0.05	0.05	0.05
18.100	0.05	0.05	0.05	0.05	0.05
18.225	0.05	0.05	0.05	0.05	0.05
18.350	0.05	0.05	0.05	0.05	0.05
18.475	0.05	0.05	0.05	0.04	0.04
18.600	0.04	0.04	0.04	0.04	0.04
18.725	0.04	0.04	0.04	0.04	0.04
18.850	0.04	0.04	0.04	0.04	0.04
18.975	0.04	0.04	0.04	0.04	0.04
19.100	0.04	0.04	0.04	0.04	0.04
19.225	0.04	0.04	0.04	0.04	0.04
19.350	0.04	0.04	0.04	0.04	0.04
19.475	0.04	0.04	0.04	0.04	0.04
19.600	0.04	0.04	0.04	0.04	0.04

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
19.725	0.04	0.04	0.04	0.04	0.04
19.850	0.04	0.04	0.04	0.04	0.04
19.975	0.04	0.04	0.04	0.04	0.03
20.100	0.03	0.03	0.03	0.03	0.03
20.225	0.03	0.03	0.03	0.03	0.03
20.350	0.03	0.03	0.03	0.03	0.03
20.475	0.03	0.03	0.03	0.03	0.03
20.600	0.03	0.03	0.03	0.03	0.03
20.725	0.03	0.03	0.03	0.03	0.03
20.850	0.03	0.03	0.03	0.03	0.03
20.975	0.03	0.03	0.03	0.03	0.03
21.100	0.03	0.03	0.03	0.03	0.03
21.225	0.03	0.03	0.03	0.03	0.03
21.350	0.03	0.03	0.03	0.03	0.03
21.475	0.03	0.03	0.03	0.03	0.03
21.600	0.03	0.03	0.03	0.03	0.03
21.725	0.03	0.03	0.03	0.03	0.03
21.850	0.03	0.03	0.03	0.03	0.03
21.975	0.03	0.03	0.03	0.03	0.03
22.100	0.03	0.03	0.03	0.03	0.03
22.225	0.03	0.03	0.03	0.03	0.03
22.350	0.03	0.03	0.03	0.03	0.03
22.475	0.03	0.03	0.03	0.03	0.03
22.600	0.03	0.03	0.03	0.03	0.03
22.725	0.03	0.03	0.03	0.03	0.03
22.850	0.03	0.03	0.03	0.03	0.03
22.975	0.03	0.03	0.03	0.03	0.03
23.100	0.03	0.03	0.03	0.03	0.03
23.225	0.03	0.03	0.03	0.03	0.03
23.350	0.03	0.03	0.03	0.03	0.03
23.475	0.03	0.03	0.03	0.03	0.03
23.600	0.03	0.03	0.03	0.03	0.03
23.725	0.03	0.03	0.03	0.03	0.03
23.850	0.03	0.03	0.03	0.03	0.03
23.975	0.03	0.03	(N/A)	(N/A)	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
Infiltration (ft³/s)
0.23
0.20
0.18
0.15
0.13
0.10
0.08
0.05
0.03
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)

Peak Discharge	0.26 ft³/s
Time to Peak	12.200 hours
Hydrograph Volume	0.139 ac-ft

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

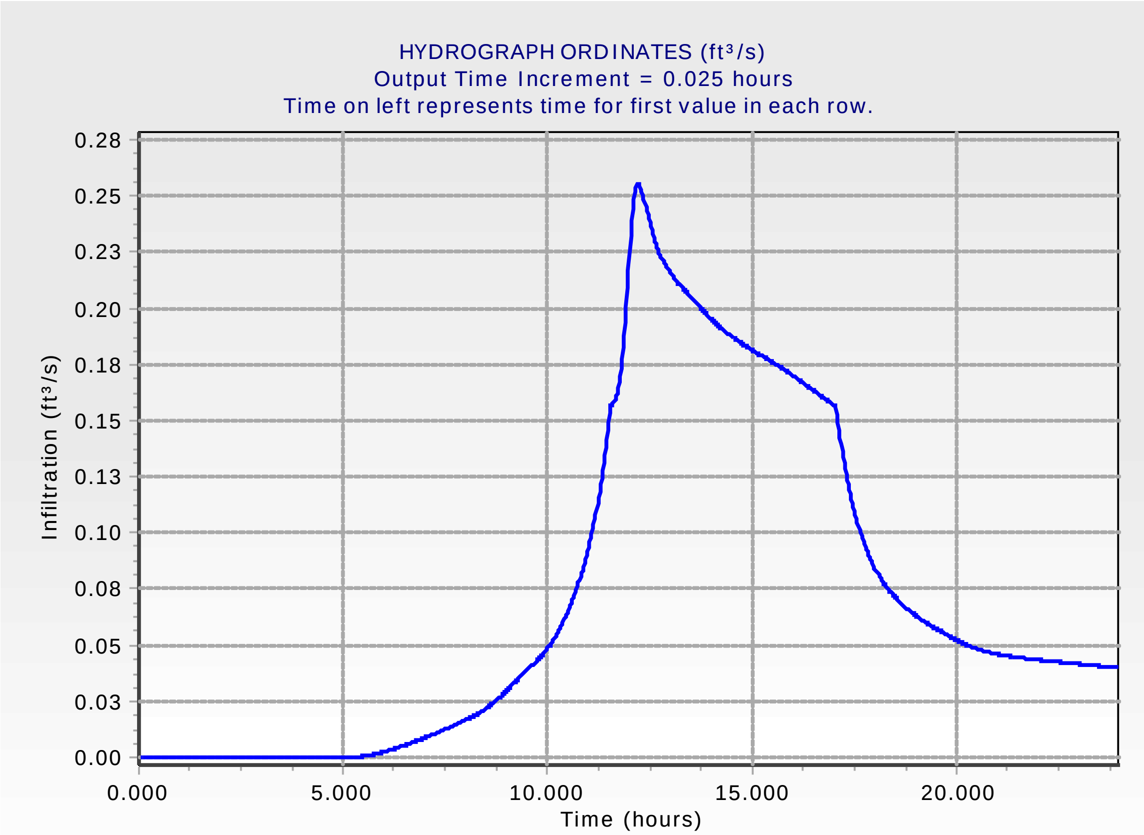
Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
5.675	0.00	0.00	0.00	0.00	0.00
5.800	0.00	0.00	0.00	0.00	0.00
5.925	0.00	0.00	0.00	0.00	0.00
6.050	0.00	0.00	0.00	0.00	0.00
6.175	0.00	0.00	0.00	0.00	0.00
6.300	0.00	0.00	0.00	0.00	0.00
6.425	0.00	0.01	0.01	0.01	0.01
6.550	0.01	0.01	0.01	0.01	0.01
6.675	0.01	0.01	0.01	0.01	0.01
6.800	0.01	0.01	0.01	0.01	0.01
6.925	0.01	0.01	0.01	0.01	0.01
7.050	0.01	0.01	0.01	0.01	0.01
7.175	0.01	0.01	0.01	0.01	0.01
7.300	0.01	0.01	0.01	0.01	0.01
7.425	0.01	0.01	0.01	0.01	0.01
7.550	0.01	0.01	0.01	0.01	0.01
7.675	0.01	0.01	0.01	0.01	0.01
7.800	0.02	0.02	0.02	0.02	0.02
7.925	0.02	0.02	0.02	0.02	0.02
8.050	0.02	0.02	0.02	0.02	0.02
8.175	0.02	0.02	0.02	0.02	0.02
8.300	0.02	0.02	0.02	0.02	0.02
8.425	0.02	0.02	0.02	0.02	0.02
8.550	0.02	0.02	0.02	0.02	0.02
8.675	0.02	0.02	0.03	0.03	0.03
8.800	0.03	0.03	0.03	0.03	0.03
8.925	0.03	0.03	0.03	0.03	0.03
9.050	0.03	0.03	0.03	0.03	0.03
9.175	0.03	0.03	0.03	0.03	0.04
9.300	0.04	0.04	0.04	0.04	0.04
9.425	0.04	0.04	0.04	0.04	0.04
9.550	0.04	0.04	0.04	0.04	0.04
9.675	0.04	0.04	0.04	0.04	0.04
9.800	0.04	0.04	0.05	0.05	0.05
9.925	0.05	0.05	0.05	0.05	0.05
10.050	0.05	0.05	0.05	0.05	0.05
10.175	0.05	0.05	0.06	0.06	0.06
10.300	0.06	0.06	0.06	0.06	0.06
10.425	0.06	0.06	0.06	0.07	0.07
10.550	0.07	0.07	0.07	0.07	0.07
10.675	0.07	0.07	0.08	0.08	0.08
10.800	0.08	0.08	0.08	0.09	0.09
10.925	0.09	0.09	0.09	0.09	0.10
11.050	0.10	0.10	0.10	0.10	0.11
11.175	0.11	0.11	0.11	0.12	0.12
11.300	0.12	0.12	0.13	0.13	0.13
11.425	0.14	0.14	0.15	0.15	0.15
11.550	0.16	0.16	0.16	0.16	0.16

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
11.675	0.16	0.16	0.16	0.17	0.17
11.800	0.17	0.18	0.18	0.19	0.19
11.925	0.20	0.21	0.22	0.22	0.23
12.050	0.24	0.24	0.25	0.25	0.25
12.175	0.26	0.26	0.26	0.25	0.25
12.300	0.25	0.25	0.25	0.25	0.25
12.425	0.24	0.24	0.24	0.24	0.24
12.550	0.23	0.23	0.23	0.23	0.23
12.675	0.23	0.23	0.22	0.22	0.22
12.800	0.22	0.22	0.22	0.22	0.22
12.925	0.22	0.22	0.22	0.22	0.22
13.050	0.21	0.21	0.21	0.21	0.21
13.175	0.21	0.21	0.21	0.21	0.21
13.300	0.21	0.21	0.21	0.21	0.21
13.425	0.21	0.21	0.21	0.20	0.20
13.550	0.20	0.20	0.20	0.20	0.20
13.675	0.20	0.20	0.20	0.20	0.20
13.800	0.20	0.20	0.20	0.20	0.20
13.925	0.20	0.20	0.20	0.20	0.19
14.050	0.19	0.19	0.19	0.19	0.19
14.175	0.19	0.19	0.19	0.19	0.19
14.300	0.19	0.19	0.19	0.19	0.19
14.425	0.19	0.19	0.19	0.19	0.19
14.550	0.19	0.19	0.19	0.19	0.19
14.675	0.19	0.18	0.18	0.18	0.18
14.800	0.18	0.18	0.18	0.18	0.18
14.925	0.18	0.18	0.18	0.18	0.18
15.050	0.18	0.18	0.18	0.18	0.18
15.175	0.18	0.18	0.18	0.18	0.18
15.300	0.18	0.18	0.18	0.18	0.18
15.425	0.18	0.18	0.18	0.18	0.18
15.550	0.18	0.18	0.17	0.17	0.17
15.675	0.17	0.17	0.17	0.17	0.17
15.800	0.17	0.17	0.17	0.17	0.17
15.925	0.17	0.17	0.17	0.17	0.17
16.050	0.17	0.17	0.17	0.17	0.17
16.175	0.17	0.17	0.17	0.17	0.17
16.300	0.17	0.17	0.17	0.17	0.16
16.425	0.16	0.16	0.16	0.16	0.16
16.550	0.16	0.16	0.16	0.16	0.16
16.675	0.16	0.16	0.16	0.16	0.16
16.800	0.16	0.16	0.16	0.16	0.16
16.925	0.16	0.16	0.16	0.16	0.16
17.050	0.16	0.15	0.15	0.15	0.14
17.175	0.14	0.14	0.13	0.13	0.13
17.300	0.13	0.12	0.12	0.12	0.12
17.425	0.12	0.11	0.11	0.11	0.11
17.550	0.11	0.10	0.10	0.10	0.10
17.675	0.10	0.10	0.10	0.09	0.09
17.800	0.09	0.09	0.09	0.09	0.09
17.925	0.09	0.09	0.09	0.08	0.08
18.050	0.08	0.08	0.08	0.08	0.08

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
18.175	0.08	0.08	0.08	0.08	0.08
18.300	0.08	0.07	0.07	0.07	0.07
18.425	0.07	0.07	0.07	0.07	0.07
18.550	0.07	0.07	0.07	0.07	0.07
18.675	0.07	0.07	0.07	0.07	0.07
18.800	0.07	0.07	0.07	0.06	0.06
18.925	0.06	0.06	0.06	0.06	0.06
19.050	0.06	0.06	0.06	0.06	0.06
19.175	0.06	0.06	0.06	0.06	0.06
19.300	0.06	0.06	0.06	0.06	0.06
19.425	0.06	0.06	0.06	0.06	0.06
19.550	0.06	0.06	0.06	0.06	0.06
19.675	0.06	0.06	0.05	0.05	0.05
19.800	0.05	0.05	0.05	0.05	0.05
19.925	0.05	0.05	0.05	0.05	0.05
20.050	0.05	0.05	0.05	0.05	0.05
20.175	0.05	0.05	0.05	0.05	0.05
20.300	0.05	0.05	0.05	0.05	0.05
20.425	0.05	0.05	0.05	0.05	0.05
20.550	0.05	0.05	0.05	0.05	0.05
20.675	0.05	0.05	0.05	0.05	0.05
20.800	0.05	0.05	0.05	0.05	0.05
20.925	0.05	0.05	0.05	0.05	0.05
21.050	0.05	0.05	0.05	0.05	0.05
21.175	0.05	0.05	0.05	0.05	0.05
21.300	0.05	0.04	0.04	0.04	0.04
21.425	0.04	0.04	0.04	0.04	0.04
21.550	0.04	0.04	0.04	0.04	0.04
21.675	0.04	0.04	0.04	0.04	0.04
21.800	0.04	0.04	0.04	0.04	0.04
21.925	0.04	0.04	0.04	0.04	0.04
22.050	0.04	0.04	0.04	0.04	0.04
22.175	0.04	0.04	0.04	0.04	0.04
22.300	0.04	0.04	0.04	0.04	0.04
22.425	0.04	0.04	0.04	0.04	0.04
22.550	0.04	0.04	0.04	0.04	0.04
22.675	0.04	0.04	0.04	0.04	0.04
22.800	0.04	0.04	0.04	0.04	0.04
22.925	0.04	0.04	0.04	0.04	0.04
23.050	0.04	0.04	0.04	0.04	0.04
23.175	0.04	0.04	0.04	0.04	0.04
23.300	0.04	0.04	0.04	0.04	0.04
23.425	0.04	0.04	0.04	0.04	0.04
23.550	0.04	0.04	0.04	0.04	0.04
23.675	0.04	0.04	0.04	0.04	0.04
23.800	0.04	0.04	0.04	0.04	0.04
23.925	0.04	0.04	0.04	0.04	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
Infiltration (ft³/s)
0.28
0.25
0.23
0.20
0.18
0.15
0.13
0.10
0.08
0.05
0.03
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)

Peak Discharge	0.27 ft³/s
Time to Peak	12.200 hours
Hydrograph Volume	0.156 ac-ft

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

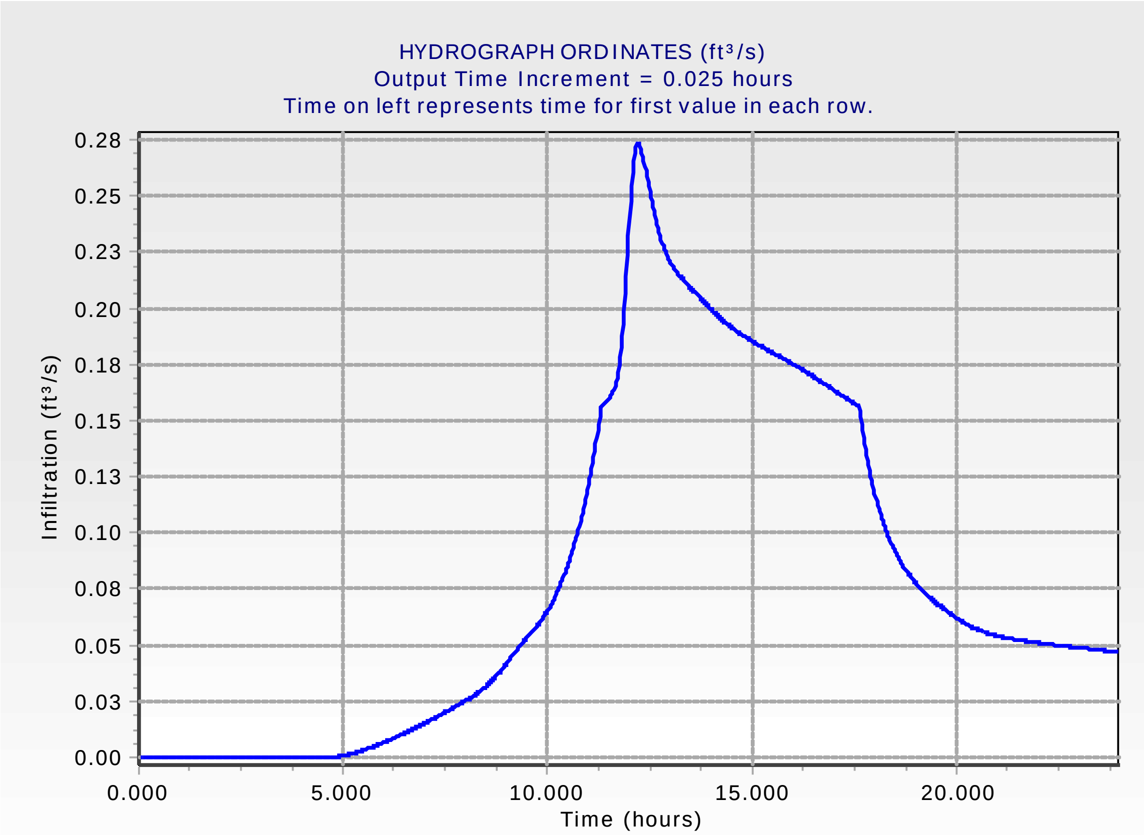
Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
5.075	0.00	0.00	0.00	0.00	0.00
5.200	0.00	0.00	0.00	0.00	0.00
5.325	0.00	0.00	0.00	0.00	0.00
5.450	0.00	0.00	0.00	0.00	0.00
5.575	0.00	0.00	0.00	0.00	0.00
5.700	0.00	0.00	0.00	0.01	0.01
5.825	0.01	0.01	0.01	0.01	0.01
5.950	0.01	0.01	0.01	0.01	0.01
6.075	0.01	0.01	0.01	0.01	0.01
6.200	0.01	0.01	0.01	0.01	0.01
6.325	0.01	0.01	0.01	0.01	0.01
6.450	0.01	0.01	0.01	0.01	0.01
6.575	0.01	0.01	0.01	0.01	0.01
6.700	0.01	0.01	0.01	0.01	0.01
6.825	0.01	0.01	0.01	0.01	0.01
6.950	0.01	0.02	0.02	0.02	0.02
7.075	0.02	0.02	0.02	0.02	0.02
7.200	0.02	0.02	0.02	0.02	0.02
7.325	0.02	0.02	0.02	0.02	0.02
7.450	0.02	0.02	0.02	0.02	0.02
7.575	0.02	0.02	0.02	0.02	0.02
7.700	0.02	0.02	0.02	0.02	0.02
7.825	0.02	0.02	0.02	0.02	0.02
7.950	0.02	0.03	0.03	0.03	0.03
8.075	0.03	0.03	0.03	0.03	0.03
8.200	0.03	0.03	0.03	0.03	0.03
8.325	0.03	0.03	0.03	0.03	0.03
8.450	0.03	0.03	0.03	0.03	0.03
8.575	0.03	0.03	0.03	0.03	0.03
8.700	0.04	0.04	0.04	0.04	0.04
8.825	0.04	0.04	0.04	0.04	0.04
8.950	0.04	0.04	0.04	0.04	0.04
9.075	0.04	0.04	0.05	0.05	0.05
9.200	0.05	0.05	0.05	0.05	0.05
9.325	0.05	0.05	0.05	0.05	0.05
9.450	0.05	0.05	0.05	0.05	0.05
9.575	0.06	0.06	0.06	0.06	0.06
9.700	0.06	0.06	0.06	0.06	0.06
9.825	0.06	0.06	0.06	0.06	0.06
9.950	0.06	0.06	0.07	0.07	0.07
10.075	0.07	0.07	0.07	0.07	0.07
10.200	0.07	0.07	0.07	0.08	0.08
10.325	0.08	0.08	0.08	0.08	0.08
10.450	0.08	0.08	0.09	0.09	0.09
10.575	0.09	0.09	0.09	0.09	0.10
10.700	0.10	0.10	0.10	0.10	0.10
10.825	0.11	0.11	0.11	0.11	0.11
10.950	0.12	0.12	0.12	0.12	0.13

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
11.075	0.13	0.13	0.13	0.14	0.14
11.200	0.14	0.15	0.15	0.15	0.16
11.325	0.16	0.16	0.16	0.16	0.16
11.450	0.16	0.16	0.16	0.16	0.16
11.575	0.16	0.16	0.16	0.17	0.17
11.700	0.17	0.17	0.17	0.18	0.18
11.825	0.19	0.19	0.20	0.21	0.21
11.950	0.22	0.23	0.24	0.25	0.25
12.075	0.26	0.27	0.27	0.27	0.27
12.200	0.27	0.27	0.27	0.27	0.27
12.325	0.27	0.27	0.26	0.26	0.26
12.450	0.26	0.25	0.25	0.25	0.25
12.575	0.25	0.24	0.24	0.24	0.24
12.700	0.24	0.23	0.23	0.23	0.23
12.825	0.23	0.23	0.23	0.22	0.22
12.950	0.22	0.22	0.22	0.22	0.22
13.075	0.22	0.22	0.22	0.22	0.22
13.200	0.22	0.21	0.21	0.21	0.21
13.325	0.21	0.21	0.21	0.21	0.21
13.450	0.21	0.21	0.21	0.21	0.21
13.575	0.21	0.21	0.21	0.21	0.21
13.700	0.21	0.20	0.20	0.20	0.20
13.825	0.20	0.20	0.20	0.20	0.20
13.950	0.20	0.20	0.20	0.20	0.20
14.075	0.20	0.20	0.20	0.20	0.20
14.200	0.20	0.20	0.20	0.19	0.19
14.325	0.19	0.19	0.19	0.19	0.19
14.450	0.19	0.19	0.19	0.19	0.19
14.575	0.19	0.19	0.19	0.19	0.19
14.700	0.19	0.19	0.19	0.19	0.19
14.825	0.19	0.19	0.19	0.19	0.19
14.950	0.19	0.19	0.19	0.19	0.18
15.075	0.18	0.18	0.18	0.18	0.18
15.200	0.18	0.18	0.18	0.18	0.18
15.325	0.18	0.18	0.18	0.18	0.18
15.450	0.18	0.18	0.18	0.18	0.18
15.575	0.18	0.18	0.18	0.18	0.18
15.700	0.18	0.18	0.18	0.18	0.18
15.825	0.18	0.18	0.18	0.18	0.18
15.950	0.18	0.18	0.18	0.17	0.17
16.075	0.17	0.17	0.17	0.17	0.17
16.200	0.17	0.17	0.17	0.17	0.17
16.325	0.17	0.17	0.17	0.17	0.17
16.450	0.17	0.17	0.17	0.17	0.17
16.575	0.17	0.17	0.17	0.17	0.17
16.700	0.17	0.17	0.17	0.17	0.17
16.825	0.17	0.17	0.16	0.16	0.16
16.950	0.16	0.16	0.16	0.16	0.16
17.075	0.16	0.16	0.16	0.16	0.16
17.200	0.16	0.16	0.16	0.16	0.16
17.325	0.16	0.16	0.16	0.16	0.16
17.450	0.16	0.16	0.16	0.16	0.16

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

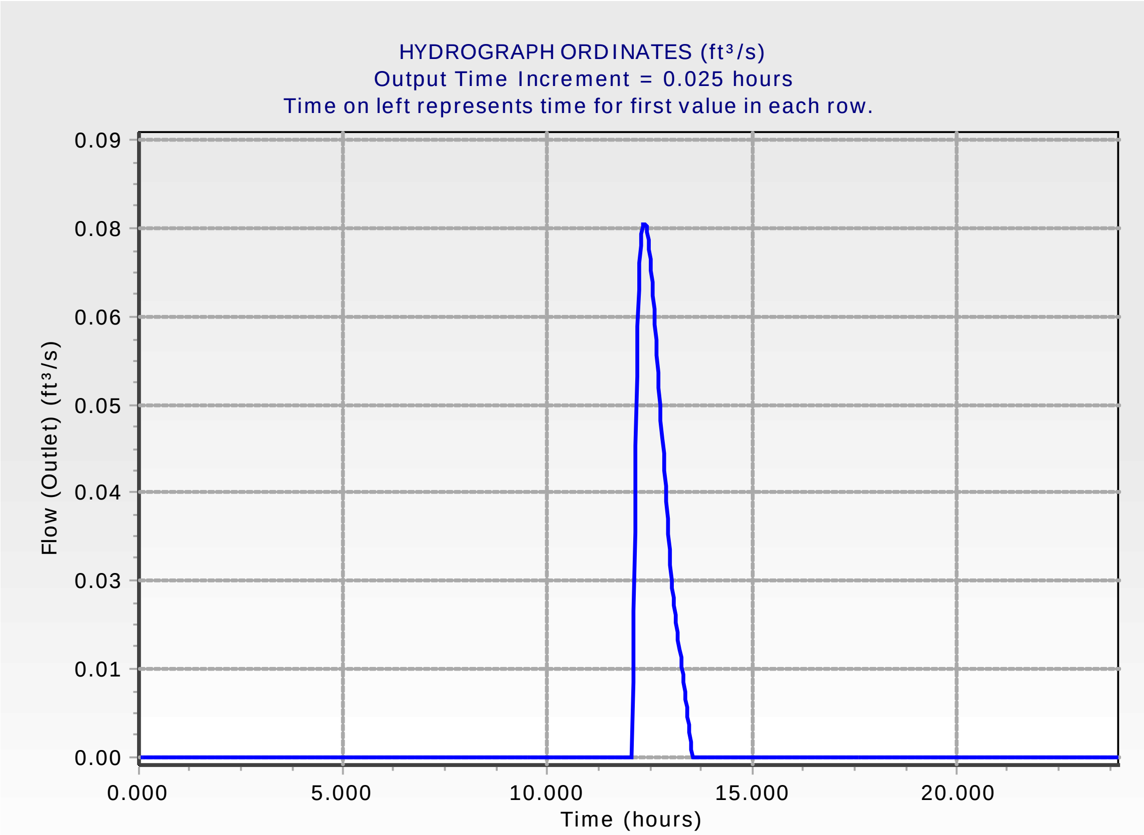
Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
17.575	0.16	0.16	0.15	0.15	0.15
17.700	0.15	0.14	0.14	0.14	0.13
17.825	0.13	0.13	0.13	0.13	0.12
17.950	0.12	0.12	0.12	0.12	0.11
18.075	0.11	0.11	0.11	0.11	0.11
18.200	0.11	0.10	0.10	0.10	0.10
18.325	0.10	0.10	0.10	0.10	0.09
18.450	0.09	0.09	0.09	0.09	0.09
18.575	0.09	0.09	0.09	0.09	0.09
18.700	0.09	0.08	0.08	0.08	0.08
18.825	0.08	0.08	0.08	0.08	0.08
18.950	0.08	0.08	0.08	0.08	0.08
19.075	0.08	0.08	0.08	0.07	0.07
19.200	0.07	0.07	0.07	0.07	0.07
19.325	0.07	0.07	0.07	0.07	0.07
19.450	0.07	0.07	0.07	0.07	0.07
19.575	0.07	0.07	0.07	0.07	0.07
19.700	0.07	0.07	0.07	0.06	0.06
19.825	0.06	0.06	0.06	0.06	0.06
19.950	0.06	0.06	0.06	0.06	0.06
20.075	0.06	0.06	0.06	0.06	0.06
20.200	0.06	0.06	0.06	0.06	0.06
20.325	0.06	0.06	0.06	0.06	0.06
20.450	0.06	0.06	0.06	0.06	0.06
20.575	0.06	0.06	0.06	0.06	0.06
20.700	0.06	0.06	0.06	0.06	0.06
20.825	0.05	0.05	0.05	0.05	0.05
20.950	0.05	0.05	0.05	0.05	0.05
21.075	0.05	0.05	0.05	0.05	0.05
21.200	0.05	0.05	0.05	0.05	0.05
21.325	0.05	0.05	0.05	0.05	0.05
21.450	0.05	0.05	0.05	0.05	0.05
21.575	0.05	0.05	0.05	0.05	0.05
21.700	0.05	0.05	0.05	0.05	0.05
21.825	0.05	0.05	0.05	0.05	0.05
21.950	0.05	0.05	0.05	0.05	0.05
22.075	0.05	0.05	0.05	0.05	0.05
22.200	0.05	0.05	0.05	0.05	0.05
22.325	0.05	0.05	0.05	0.05	0.05
22.450	0.05	0.05	0.05	0.05	0.05
22.575	0.05	0.05	0.05	0.05	0.05
22.700	0.05	0.05	0.05	0.05	0.05
22.825	0.05	0.05	0.05	0.05	0.05
22.950	0.05	0.05	0.05	0.05	0.05
23.075	0.05	0.05	0.05	0.05	0.05
23.200	0.05	0.05	0.05	0.05	0.05
23.325	0.05	0.05	0.05	0.05	0.05
23.450	0.05	0.05	0.05	0.05	0.05
23.575	0.05	0.05	0.05	0.05	0.05
23.700	0.05	0.05	0.05	0.05	0.05
23.825	0.05	0.05	0.05	0.05	0.05
23.950	0.05	0.05	0.05	(N/A)	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
0.28
0.25
0.23
0.20
0.18
0.15
0.13
0.10
0.08
0.05
0.03
0.00
Infiltration (ft³/s)
0.000
5.000
10.000
15.000
20.000
Time (hours)

Peak Discharge	0.08 ft³/s
Time to Peak	12.350 hours
Hydrograph Volume	0.005 ac-ft

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

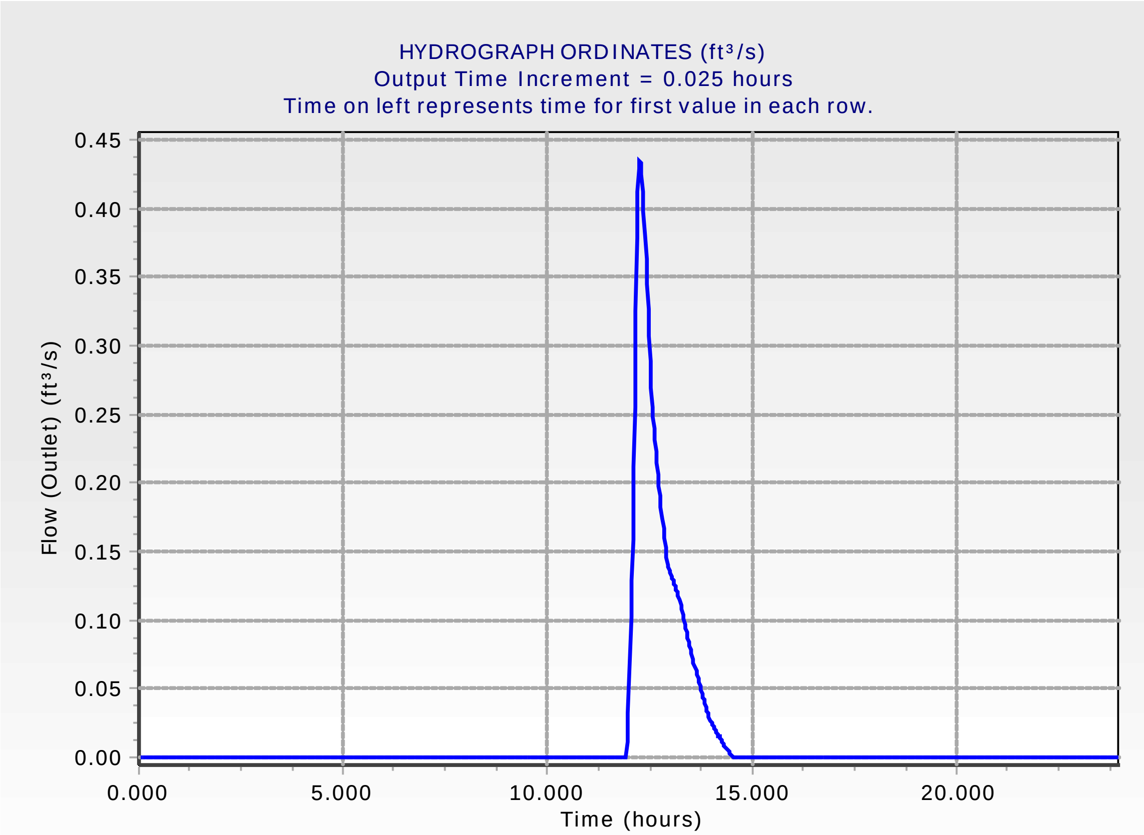
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
12.050	0.00	0.01	0.02	0.03	0.04
12.175	0.05	0.06	0.07	0.07	0.07
12.300	0.07	0.08	0.08	0.08	0.08
12.425	0.07	0.07	0.07	0.07	0.07
12.550	0.07	0.07	0.06	0.06	0.06
12.675	0.06	0.05	0.05	0.05	0.05
12.800	0.05	0.04	0.04	0.04	0.04
12.925	0.03	0.03	0.03	0.03	0.03
13.050	0.02	0.02	0.02	0.02	0.02
13.175	0.02	0.02	0.02	0.01	0.01
13.300	0.01	0.01	0.01	0.01	0.01
13.425	0.01	0.00	0.00	0.00	0.00
13.550	0.00	(N/A)	(N/A)	(N/A)	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
Flow (Outlet) (ft³/s)
0.09
0.08
0.06
0.05
0.04
0.03
0.01
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)

Peak Discharge	0.43 ft^3/s
Time to Peak	12.250 hours
Hydrograph Volume	0.029 ac-ft

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

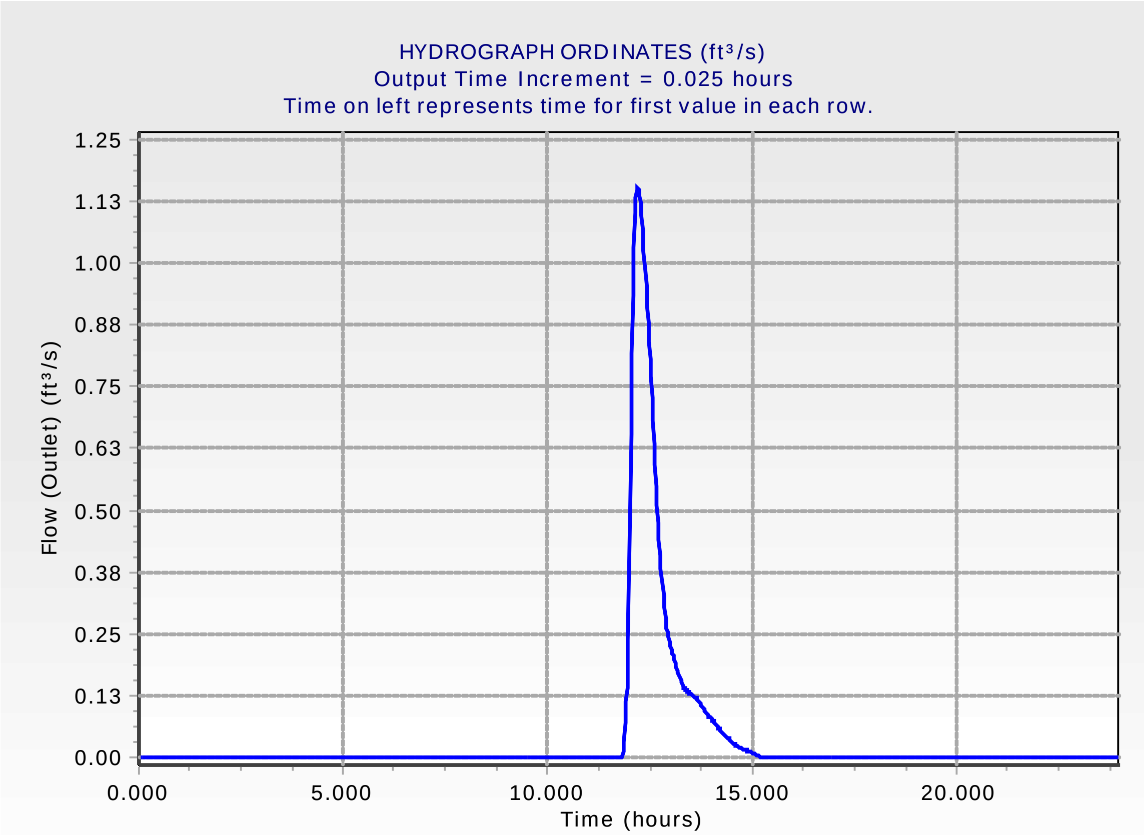
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
11.925	0.00	0.01	0.03	0.07	0.10
12.050	0.13	0.16	0.21	0.25	0.33
12.175	0.38	0.41	0.43	0.43	0.43
12.300	0.42	0.41	0.40	0.38	0.36
12.425	0.34	0.33	0.31	0.29	0.27
12.550	0.26	0.25	0.24	0.23	0.22
12.675	0.21	0.21	0.20	0.19	0.18
12.800	0.17	0.17	0.16	0.15	0.15
12.925	0.14	0.14	0.14	0.13	0.13
13.050	0.13	0.13	0.13	0.12	0.12
13.175	0.12	0.12	0.11	0.11	0.11
13.300	0.10	0.10	0.10	0.09	0.09
13.425	0.09	0.08	0.08	0.08	0.08
13.550	0.07	0.07	0.07	0.06	0.06
13.675	0.06	0.05	0.05	0.05	0.05
13.800	0.04	0.04	0.04	0.04	0.03
13.925	0.03	0.03	0.03	0.02	0.02
14.050	0.02	0.02	0.02	0.02	0.02
14.175	0.02	0.01	0.01	0.01	0.01
14.300	0.01	0.01	0.01	0.01	0.01
14.425	0.00	0.00	0.00	0.00	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
Flow (Outlet) (ft³/s)
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)

Peak Discharge	1.15 ft^3/s
Time to Peak	12.200 hours
Hydrograph Volume	0.075 ac-ft

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

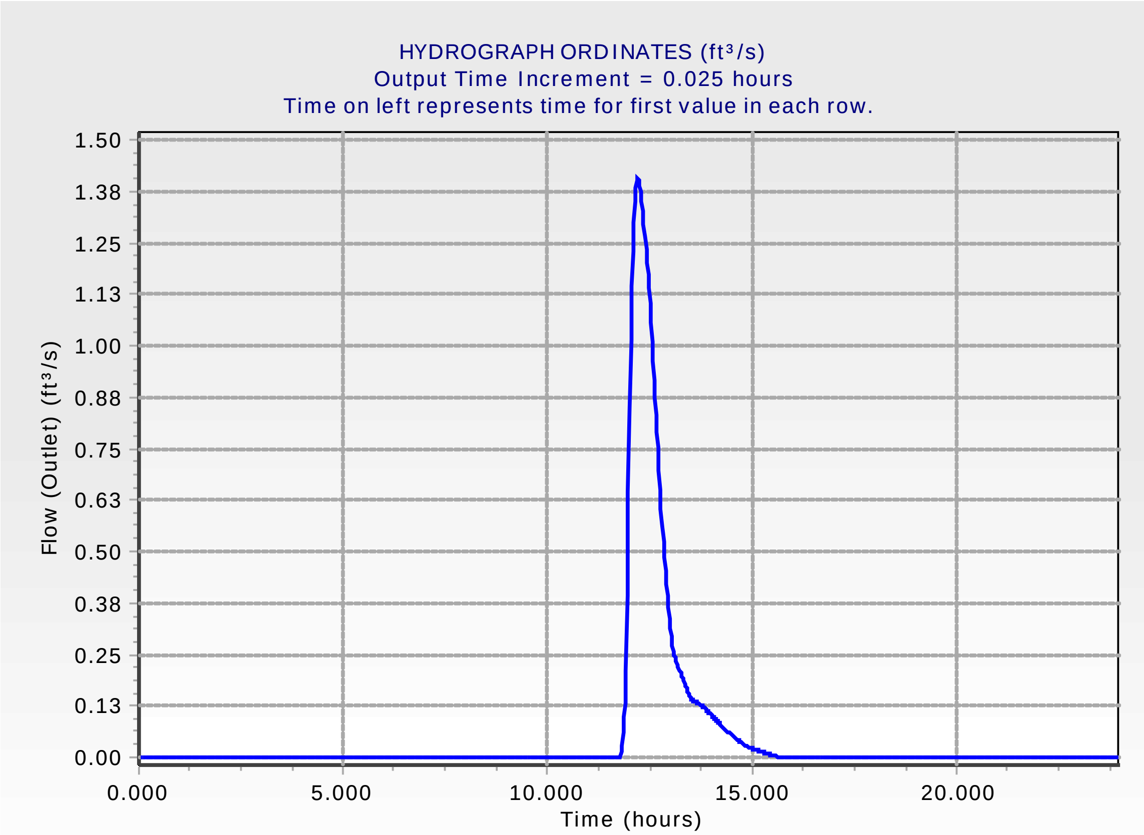
Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
11.825	0.00	0.01	0.03	0.07	0.11
11.950	0.14	0.24	0.44	0.66	0.82
12.075	0.94	1.03	1.10	1.13	1.15
12.200	1.15	1.15	1.14	1.12	1.10
12.325	1.07	1.03	0.99	0.95	0.92
12.450	0.88	0.84	0.81	0.77	0.73
12.575	0.68	0.63	0.59	0.55	0.51
12.700	0.47	0.44	0.41	0.38	0.35
12.825	0.33	0.30	0.28	0.26	0.25
12.950	0.24	0.24	0.23	0.22	0.21
13.075	0.20	0.20	0.19	0.18	0.18
13.200	0.17	0.16	0.16	0.15	0.14
13.325	0.14	0.14	0.14	0.14	0.13
13.450	0.13	0.13	0.13	0.13	0.13
13.575	0.12	0.12	0.12	0.12	0.11
13.700	0.11	0.11	0.11	0.10	0.10
13.825	0.10	0.09	0.09	0.09	0.09
13.950	0.08	0.08	0.08	0.07	0.07
14.075	0.07	0.07	0.06	0.06	0.06
14.200	0.06	0.05	0.05	0.05	0.05
14.325	0.05	0.04	0.04	0.04	0.04
14.450	0.04	0.03	0.03	0.03	0.03
14.575	0.03	0.02	0.02	0.02	0.02
14.700	0.02	0.02	0.02	0.02	0.02
14.825	0.02	0.01	0.01	0.01	0.01
14.950	0.01	0.01	0.01	0.01	0.01
15.075	0.01	0.01	0.00	0.00	0.00
15.200	0.00	0.00	(N/A)	(N/A)	(N/A)


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
Flow (Outlet) (ft³/s)
1.25
1.13
1.00
0.88
0.75
0.63
0.50
0.38
0.25
0.13
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)

Peak Discharge	1.40 ft³/s
Time to Peak	12.200 hours
Hydrograph Volume	0.103 ac-ft

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
11.775	0.00	0.01	0.03	0.06	0.10
11.900	0.13	0.21	0.39	0.65	0.85
12.025	1.01	1.14	1.23	1.30	1.35
12.150	1.38	1.40	1.40	1.40	1.39
12.275	1.37	1.35	1.33	1.30	1.27
12.400	1.23	1.20	1.17	1.14	1.10
12.525	1.06	1.01	0.96	0.92	0.87
12.650	0.83	0.79	0.75	0.70	0.65
12.775	0.60	0.56	0.52	0.49	0.45
12.900	0.42	0.39	0.36	0.34	0.32
13.025	0.29	0.27	0.26	0.25	0.24
13.150	0.23	0.23	0.22	0.21	0.21
13.275	0.20	0.19	0.19	0.18	0.17
13.400	0.17	0.16	0.15	0.15	0.14
13.525	0.14	0.14	0.14	0.14	0.13
13.650	0.13	0.13	0.13	0.13	0.13
13.775	0.12	0.12	0.12	0.12	0.12
13.900	0.11	0.11	0.11	0.11	0.10
14.025	0.10	0.10	0.10	0.09	0.09
14.150	0.09	0.08	0.08	0.08	0.08
14.275	0.07	0.07	0.07	0.07	0.07
14.400	0.06	0.06	0.06	0.06	0.05
14.525	0.05	0.05	0.05	0.05	0.04
14.650	0.04	0.04	0.04	0.04	0.04
14.775	0.03	0.03	0.03	0.03	0.03
14.900	0.03	0.02	0.02	0.02	0.02
15.025	0.02	0.02	0.02	0.02	0.02
15.150	0.02	0.02	0.01	0.01	0.01
15.275	0.01	0.01	0.01	0.01	0.01
15.400	0.01	0.01	0.01	0.01	0.00
15.525	0.00	0.00	0.00	0.00	0.00


HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.025 hours
Time on left represents time for first value in each row.
1.50
1.38
1.25
1.13
1.00
0.88
0.75
0.63
0.50
0.38
0.25
0.13
0.00
Flow (Outlet) (ft³/s)
0.000
5.000
10.000
15.000
20.000
Time (hours)

Index

APPENDIX C – HYDRAULIC AND STABILITY CALCULATIONS

Worksheet for Swale 1 - 10-Year

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.069	
Channel Slope	0.15000	ft/ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	2.07	ft³/s

Results

Normal Depth	0.26	ft
Flow Area	0.73	ft²
Wetted Perimeter	3.65	ft
Hydraulic Radius	0.20	ft
Top Width	3.57	ft
Critical Depth	0.28	ft
Critical Slope	0.11967	ft/ft
Velocity	2.84	ft/s
Velocity Head	0.13	ft
Specific Energy	0.39	ft
Froude Number	1.11	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.26	ft
Critical Depth	0.28	ft
Channel Slope	0.15000	ft/ft
Critical Slope	0.11967	ft/ft

Worksheet for Swale 1 - 100-Year

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.069	
Channel Slope	0.15000	ft/ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	3.90	ft³/s

Results

Normal Depth	0.37	ft
Flow Area	1.14	ft²
Wetted Perimeter	4.32	ft
Hydraulic Radius	0.26	ft
Top Width	4.20	ft
Critical Depth	0.40	ft
Critical Slope	0.10891	ft/ft
Velocity	3.43	ft/s
Velocity Head	0.18	ft
Specific Energy	0.55	ft
Froude Number	1.16	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.37	ft
Critical Depth	0.40	ft
Channel Slope	0.15000	ft/ft
Critical Slope	0.10891	ft/ft

Worksheet for Swale 2 - 10-Year

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.069	
Channel Slope	0.10000	ft/ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	0.53	ft³/s

Results

Normal Depth	0.14	ft
Flow Area	0.33	ft²
Wetted Perimeter	2.86	ft
Hydraulic Radius	0.11	ft
Top Width	2.82	ft
Critical Depth	0.12	ft
Critical Slope	0.14966	ft/ft
Velocity	1.61	ft/s
Velocity Head	0.04	ft
Specific Energy	0.18	ft
Froude Number	0.83	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.14	ft
Critical Depth	0.12	ft
Channel Slope	0.10000	ft/ft
Critical Slope	0.14966	ft/ft

Worksheet for Swale 2 - 100-Year

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.069	
Channel Slope	0.10000	ft/ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	1.73	ft³/s

Results

Normal Depth	0.26	ft
Flow Area	0.74	ft²
Wetted Perimeter	3.67	ft
Hydraulic Radius	0.20	ft
Top Width	3.59	ft
Critical Depth	0.25	ft
Critical Slope	0.12302	ft/ft
Velocity	2.34	ft/s
Velocity Head	0.09	ft
Specific Energy	0.35	ft
Froude Number	0.91	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.26	ft
Critical Depth	0.25	ft
Channel Slope	0.10000	ft/ft
Critical Slope	0.12302	ft/ft

Worksheet for Swale 3 - 10-Year

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.069	
Channel Slope	0.02000	ft/ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	1.13	ft³/s

Results

Normal Depth	0.32	ft
Flow Area	0.97	ft²
Wetted Perimeter	4.05	ft
Hydraulic Radius	0.24	ft
Top Width	3.95	ft
Critical Depth	0.19	ft
Critical Slope	0.13167	ft/ft
Velocity	1.17	ft/s
Velocity Head	0.02	ft
Specific Energy	0.35	ft
Froude Number	0.42	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.32	ft
Critical Depth	0.19	ft
Channel Slope	0.02000	ft/ft
Critical Slope	0.13167	ft/ft

Worksheet for Swale 3 - 100-Year

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.069	
Channel Slope	0.02000	ft/ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	2.84	ft³/s

Results

Normal Depth	0.52	ft
Flow Area	1.87	ft²
Wetted Perimeter	5.31	ft
Hydraulic Radius	0.35	ft
Top Width	5.14	ft
Critical Depth	0.33	ft
Critical Slope	0.11409	ft/ft
Velocity	1.52	ft/s
Velocity Head	0.04	ft
Specific Energy	0.56	ft
Froude Number	0.44	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.52	ft
Critical Depth	0.33	ft
Channel Slope	0.02000	ft/ft
Critical Slope	0.11409	ft/ft

Worksheet for Swale 4 - 10-Year

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.00500	ft/ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	1.13	ft^3/s

Results

Normal Depth	0.30	ft
Flow Area	0.87	ft^2
Wetted Perimeter	3.90	ft
Hydraulic Radius	0.22	ft
Top Width	3.81	ft
Critical Depth	0.19	ft
Critical Slope	0.02489	ft/ft
Velocity	1.29	ft/s
Velocity Head	0.03	ft
Specific Energy	0.33	ft
Froude Number	0.48	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.30	ft
Critical Depth	0.19	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.02489	ft/ft

Worksheet for Swale 4 - 100-Year

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.00500	ft/ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	3.31	ft^3/s

Results

Normal Depth	0.53	ft
Flow Area	1.89	ft^2
Wetted Perimeter	5.33	ft
Hydraulic Radius	0.35	ft
Top Width	5.16	ft
Critical Depth	0.36	ft
Critical Slope	0.02109	ft/ft
Velocity	1.75	ft/s
Velocity Head	0.05	ft
Specific Energy	0.57	ft
Froude Number	0.51	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.53	ft
Critical Depth	0.36	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.02109	ft/ft

Worksheet for Swale 5 - 10-Year

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.02900	ft/ft
Left Side Slope	333.00	ft/ft (H:V)
Right Side Slope	45.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	1.13	ft^3/s

Results

Normal Depth	0.07	ft
Flow Area	1.16	ft^2
Wetted Perimeter	29.69	ft
Hydraulic Radius	0.04	ft
Top Width	29.69	ft
Critical Depth	0.07	ft
Critical Slope	0.03937	ft/ft
Velocity	0.97	ft/s
Velocity Head	0.01	ft
Specific Energy	0.09	ft
Froude Number	0.87	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.07	ft
Critical Depth	0.07	ft
Channel Slope	0.02900	ft/ft
Critical Slope	0.03937	ft/ft

Worksheet for Swale 5 - 100-Year

Project Description

Friction Method	Manning Formula	
Solve For	Normal Depth	

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.02900	ft/ft
Left Side Slope	333.00	ft/ft (H:V)
Right Side Slope	45.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	2.84	ft³/s

Results

Normal Depth	0.11	ft
Flow Area	2.32	ft²
Wetted Perimeter	41.93	ft
Hydraulic Radius	0.06	ft
Top Width	41.93	ft
Critical Depth	0.10	ft
Critical Slope	0.03484	ft/ft
Velocity	1.22	ft/s
Velocity Head	0.02	ft
Specific Energy	0.13	ft
Froude Number	0.92	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.11	ft
Critical Depth	0.10	ft
Channel Slope	0.02900	ft/ft
Critical Slope	0.03484	ft/ft

Worksheet for Swale 5 - WQF

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.150	
Channel Slope	0.02900	ft/ft
Left Side Slope	333.00	ft/ft (H:V)
Right Side Slope	45.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	0.19	ft³/s

Results

Normal Depth	0.07	ft
Flow Area	1.02	ft²
Wetted Perimeter	27.83	ft
Hydraulic Radius	0.04	ft
Top Width	27.83	ft
Critical Depth	0.03	ft
Critical Slope	1.24921	ft/ft
Velocity	0.19	ft/s
Velocity Head	0.00	ft
Specific Energy	0.07	ft
Froude Number	0.17	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.07	ft
Critical Depth	0.03	ft
Channel Slope	0.02900	ft/ft
Critical Slope	1.24921	ft/ft

Worksheet for Swale 6 - 10-Year

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.069	
Channel Slope	0.25400	ft/ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	1.13	ft³/s

Results

Normal Depth	0.16	ft
Flow Area	0.40	ft²
Wetted Perimeter	3.02	ft
Hydraulic Radius	0.13	ft
Top Width	2.97	ft
Critical Depth	0.19	ft
Critical Slope	0.13170	ft/ft
Velocity	2.82	ft/s
Velocity Head	0.12	ft
Specific Energy	0.28	ft
Froude Number	1.35	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.16	ft
Critical Depth	0.19	ft
Channel Slope	0.25400	ft/ft
Critical Slope	0.13170	ft/ft

Worksheet for Swale 6 - 100-Year

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.069	
Channel Slope	0.25400	ft/ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	3.31	ft³/s

Results

Normal Depth	0.29	ft
Flow Area	0.84	ft²
Wetted Perimeter	3.85	ft
Hydraulic Radius	0.22	ft
Top Width	3.75	ft
Critical Depth	0.36	ft
Critical Slope	0.11154	ft/ft
Velocity	3.94	ft/s
Velocity Head	0.24	ft
Specific Energy	0.53	ft
Froude Number	1.47	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.29	ft
Critical Depth	0.36	ft
Channel Slope	0.25400	ft/ft
Critical Slope	0.11154	ft/ft

Worksheet for Emergency Spillway

Project Description

Solve For	Discharge

Input Data

Headwater Elevation		1804.25	ft
Crest Elevation		1804.00	ft
Tailwater Elevation		1800.30	ft
Crest Surface Type	Gravel		
Crest Breadth		3.00	ft
Crest Length		3.00	ft

Results

Discharge	0.98	ft³/s
Headwater Height Above Crest	0.25	ft
Tailwater Height Above Crest	-3.70	ft
Weir Coefficient	2.61	US
Submergence Factor	1.00	
Adjusted Weir Coefficient	2.61	US
Flow Area	0.75	ft²
Velocity	1.30	ft/s
Wetted Perimeter	3.50	ft
Top Width	3.00	ft

Channel Stability Calculations

Swale	10-Year Swale Flow (cfs)	10-Year Swale Depth (ft)	10-Year Swale Peak Velocity (fps)	Maximum Channel Slope (%)	Channel Shear Stress*
1	2.07	0.26	2.84	15.0%	2.43
2	0.53	0.14	1.64	10.0%	0.87
3	1.13	0.32	1.15	2.0%	0.39
4	1.13	0.30	1.29	0.5%	0.09
5	1.13	0.07	0.96	2.9%	0.13
6	1.13	0.16	2.82	25.4%	4.60

*Channel Stress = Depth (ft) X Slope (ft/ft) X Unit weight of water (lb/ft3)

Spillway Stablity Calculations

Swale	100-Year Swale Flow (cfs)	100-Year Swale Depth (ft)	100-Year Swale Peak Velocity (fps)	Maximum Channel Slope (%)	Channel Shear Stress*
Spillway	0.98	0.25	3.94	25.4%	4.60

*Spillway Stress = Depth (ft) X Slope (ft/ft) X Unit weight of water (lb/ft3)

Culvert Calculator Report
Drainline A - 10-Year

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	1,804.30	ft	Headwater Depth/Height	0.36	
Computed Headwater Eleva	1,802.62	ft	Discharge	2.07	cfs
Inlet Control HW Elev.	1,802.58	ft	Tailwater Elevation	0.00	ft
Outlet Control HW Elev.	1,802.62	ft	Control Type	Entrance Control	

Grades					
Upstream Invert	1,801.91	ft	Downstream Invert	1,801.50	ft
Length	41.00	ft	Constructed Slope	0.010000	ft/ft

Hydraulic Profile					
Profile	S2		Depth, Downstream	0.39	ft
Slope Type	Steep		Normal Depth	0.39	ft
Flow Regime	Supercritical		Critical Depth	0.50	ft
Velocity Downstream	4.75	ft/s	Critical Slope	0.003821	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.012	
Section Material	Corrugated HDPE (Smooth Interior)		Span	2.00	ft
Section Size	24 inch		Rise	2.00	ft
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	1,802.62	ft	Upstream Velocity Head	0.18	ft
Ke	0.20		Entrance Loss	0.04	ft

Inlet Control Properties					
Inlet Control HW Elev.	1,802.58	ft	Flow Control	N/A	
Inlet Type	Groove end projecting		Area Full	3.1	ft²
K	0.00450		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	3	
C	0.03170		Equation Form	1	
Y	0.69000				

Culvert Calculator Report
Drainline A - 25-Year

Solve For: Headwater Elevation

Culvert Summary

Allowable HW Elevation	1,804.30	ft	Headwater Depth/Height	0.41	
Computed Headwater Eleva	1,802.73	ft	Discharge	2.73	cfs
Inlet Control HW Elev.	1,802.69	ft	Tailwater Elevation	0.00	ft
Outlet Control HW Elev.	1,802.73	ft	Control Type	Entrance Control	

Grades

Upstream Invert	1,801.91	ft	Downstream Invert	1,801.50	ft
Length	41.00	ft	Constructed Slope	0.010000	ft/ft

Hydraulic Profile

Profile	S2		Depth, Downstream	0.45	ft
Slope Type	Steep		Normal Depth	0.45	ft
Flow Regime	Supercritical		Critical Depth	0.58	ft
Velocity Downstream	5.10	ft/s	Critical Slope	0.003798	ft/ft

Section

Section Shape	Circular		Mannings Coefficient	0.012	
Section Material	Corrugated HDPE (Smooth Interior)		Span	2.00	ft
Section Size	24 inch		Rise	2.00	ft
Number Sections	1				

Outlet Control Properties

Outlet Control HW Elev.	1,802.73	ft	Upstream Velocity Head	0.21	ft
Ke	0.20		Entrance Loss	0.04	ft

Inlet Control Properties

Inlet Control HW Elev.	1,802.69	ft	Flow Control	N/A	
Inlet Type	Groove end projecting		Area Full	3.1	ft²
K	0.00450		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	3	
C	0.03170		Equation Form	1	
Y	0.69000				

Culvert Calculator Report
Drainline A - 100-Year

Solve For: Headwater Elevation

Culvert Summary

Allowable HW Elevation	1,804.30	ft	Headwater Depth/Height	0.50	
Computed Headwater Eleva	1,802.91	ft	Discharge	3.90	cfs
Inlet Control HW Elev.	1,802.85	ft	Tailwater Elevation	0.00	ft
Outlet Control HW Elev.	1,802.91	ft	Control Type	Entrance Control	

Grades

Upstream Invert	1,801.91	ft	Downstream Invert	1,801.50	ft
Length	41.00	ft	Constructed Slope	0.010000	ft/ft

Hydraulic Profile

Profile	S2		Depth, Downstream	0.55	ft
Slope Type	Steep		Normal Depth	0.54	ft
Flow Regime	Supercritical		Critical Depth	0.69	ft
Velocity Downstream	5.59	ft/s	Critical Slope	0.003819	ft/ft

Section

Section Shape	Circular		Mannings Coefficient	0.012	
Section Material	Corrugated HDPE (Smooth Interior)		Span	2.00	ft
Section Size	24 inch		Rise	2.00	ft
Number Sections	1				

Outlet Control Properties

Outlet Control HW Elev.	1,802.91	ft	Upstream Velocity Head	0.25	ft
Ke	0.20		Entrance Loss	0.05	ft

Inlet Control Properties

Inlet Control HW Elev.	1,802.85	ft	Flow Control	N/A	
Inlet Type	Groove end projecting		Area Full	3.1	ft²
K	0.00450		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	3	
C	0.03170		Equation Form	1	
Y	0.69000				

Culvert Calculator Report
Drainline B - 10-Year

Solve For: Headwater Elevation

Culvert Summary

Allowable HW Elevation	1,799.40	ft	Headwater Depth/Height	0.25	
Computed Headwater Eleva	1,795.63	ft	Discharge	0.53	cfs
Inlet Control HW Elev.	1,795.61	ft	Tailwater Elevation	0.00	ft
Outlet Control HW Elev.	1,795.63	ft	Control Type	Entrance Control	

Grades

Upstream Invert	1,795.25	ft	Downstream Invert	1,794.50	ft
Length	75.00	ft	Constructed Slope	0.010000	ft/ft

Hydraulic Profile

Profile	S2		Depth, Downstream	0.22	ft
Slope Type	Steep		Normal Depth	0.22	ft
Flow Regime	Supercritical		Critical Depth	0.27	ft
Velocity Downstream	3.29	ft/s	Critical Slope	0.004362	ft/ft

Section

Section Shape	Circular		Mannings Coefficient	0.012	
Section Material	Corrugated HDPE (Smooth Interior)		Span	1.50	ft
Section Size	18 inch		Rise	1.50	ft
Number Sections	1				

Outlet Control Properties

Outlet Control HW Elev.	1,795.63	ft	Upstream Velocity Head	0.09	ft
Ke	0.20		Entrance Loss	0.02	ft

Inlet Control Properties

Inlet Control HW Elev.	1,795.61	ft	Flow Control	N/A	
Inlet Type	Groove end projecting		Area Full	1.8	ft²
K	0.00450		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	3	
C	0.03170		Equation Form	1	
Y	0.69000				

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Culvert Calculator Report
Drainline B - 25-Year

Solve For: Headwater Elevation

Culvert Summary

Allowable HW Elevation	1,799.40	ft	Headwater Depth/Height	0.33	
Computed Headwater Eleva	1,795.75	ft	Discharge	0.89	cfs
Inlet Control HW Elev.	1,795.72	ft	Tailwater Elevation	0.00	ft
Outlet Control HW Elev.	1,795.75	ft	Control Type	Entrance Control	

Grades

Upstream Invert	1,795.25	ft	Downstream Invert	1,794.50	ft
Length	75.00	ft	Constructed Slope	0.010000	ft/ft

Hydraulic Profile

Profile	S2		Depth, Downstream	0.28	ft
Slope Type	Steep		Normal Depth	0.28	ft
Flow Regime	Supercritical		Critical Depth	0.35	ft
Velocity Downstream	3.83	ft/s	Critical Slope	0.004226	ft/ft

Section

Section Shape	Circular		Mannings Coefficient	0.012	
Section Material	Corrugated HDPE (Smooth Interior)		Span	1.50	ft
Section Size	18 inch		Rise	1.50	ft
Number Sections	1				

Outlet Control Properties

Outlet Control HW Elev.	1,795.75	ft	Upstream Velocity Head	0.12	ft
Ke	0.20		Entrance Loss	0.02	ft

Inlet Control Properties

Inlet Control HW Elev.	1,795.72	ft	Flow Control	N/A	
Inlet Type	Groove end projecting		Area Full	1.8	ft²
K	0.00450		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	3	
C	0.03170		Equation Form	1	
Y	0.69000				

Culvert Calculator Report
Drainline B - 100-Year

Solve For: Headwater Elevation

Culvert Summary

Allowable HW Elevation	1,799.40	ft	Headwater Depth/Height	0.47	
Computed Headwater Eleva	1,795.96	ft	Discharge	1.73	cfs
Inlet Control HW Elev.	1,795.92	ft	Tailwater Elevation	0.00	ft
Outlet Control HW Elev.	1,795.96	ft	Control Type	Entrance Control	

Grades

Upstream Invert	1,795.25	ft	Downstream Invert	1,794.50	ft
Length	75.00	ft	Constructed Slope	0.010000	ft/ft

Hydraulic Profile

Profile	S2		Depth, Downstream	0.40	ft
Slope Type	Steep		Normal Depth	0.40	ft
Flow Regime	Supercritical		Critical Depth	0.49	ft
Velocity Downstream	4.65	ft/s	Critical Slope	0.004190	ft/ft

Section

Section Shape	Circular		Mannings Coefficient	0.012	
Section Material	Corrugated HDPE (Smooth Interior)		Span	1.50	ft
Section Size	18 inch		Rise	1.50	ft
Number Sections	1				

Outlet Control Properties

Outlet Control HW Elev.	1,795.96	ft	Upstream Velocity Head	0.18	ft
Ke	0.20		Entrance Loss	0.04	ft

Inlet Control Properties

Inlet Control HW Elev.	1,795.92	ft	Flow Control	N/A	
Inlet Type	Groove end projecting		Area Full	1.8	ft²
K	0.00450		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	3	
C	0.03170		Equation Form	1	
Y	0.69000				

Culvert Calculator Report
Drainline C - 10-Year

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	1,802.00	ft	Headwater Depth/Height	0.27	
Computed Headwater Eleva	1,800.95	ft	Discharge	0.59	cfs
Inlet Control HW Elev.	1,800.93	ft	Tailwater Elevation	0.00	ft
Outlet Control HW Elev.	1,800.95	ft	Control Type	Entrance Control	

Grades					
Upstream Invert	1,800.55	ft	Downstream Invert	1,800.30	ft
Length	25.00	ft	Constructed Slope	0.010000	ft/ft

Hydraulic Profile					
Profile	S2		Depth, Downstream	0.23	ft
Slope Type	Steep		Normal Depth	0.23	ft
Flow Regime	Supercritical		Critical Depth	0.28	ft
Velocity Downstream	3.39	ft/s	Critical Slope	0.004330	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.012	
Section Material	Corrugated HDPE (Smooth Interior)		Span	1.50	ft
Section Size	18 inch		Rise	1.50	ft
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	1,800.95	ft	Upstream Velocity Head	0.10	ft
Ke	0.20		Entrance Loss	0.02	ft

Inlet Control Properties					
Inlet Control HW Elev.	1,800.93	ft	Flow Control	N/A	
Inlet Type	Groove end projecting		Area Full	1.8	ft²
K	0.00450		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	3	
C	0.03170		Equation Form	1	
Y	0.69000				

Culvert Calculator Report
Drainline C - 25-Year

Solve For: Headwater Elevation

Culvert Summary

Allowable HW Elevation	1,802.00	ft	Headwater Depth/Height	0.35	
Computed Headwater Eleva	1,801.08	ft	Discharge	0.99	cfs
Inlet Control HW Elev.	1,801.05	ft	Tailwater Elevation	0.00	ft
Outlet Control HW Elev.	1,801.08	ft	Control Type	Entrance Control	

Grades

Upstream Invert	1,800.55	ft	Downstream Invert	1,800.30	ft
Length	25.00	ft	Constructed Slope	0.010000	ft/ft

Hydraulic Profile

Profile	S2		Depth, Downstream	0.30	ft
Slope Type	Steep		Normal Depth	0.30	ft
Flow Regime	Supercritical		Critical Depth	0.37	ft
Velocity Downstream	3.94	ft/s	Critical Slope	0.004208	ft/ft

Section

Section Shape	Circular		Mannings Coefficient	0.012	
Section Material	Corrugated HDPE (Smooth Interior)		Span	1.50	ft
Section Size	18 inch		Rise	1.50	ft
Number Sections	1				

Outlet Control Properties

Outlet Control HW Elev.	1,801.08	ft	Upstream Velocity Head	0.13	ft
Ke	0.20		Entrance Loss	0.03	ft

Inlet Control Properties

Inlet Control HW Elev.	1,801.05	ft	Flow Control	N/A	
Inlet Type	Groove end projecting		Area Full	1.8	ft²
K	0.00450		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	3	
C	0.03170		Equation Form	1	
Y	0.69000				

Culvert Calculator Report
Drainline C - 100-Year

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	1,802.00	ft	Headwater Depth/Height	0.49	
Computed Headwater Eleva	1,801.28	ft	Discharge	1.82	cfs
Inlet Control HW Elev.	1,801.24	ft	Tailwater Elevation	0.00	ft
Outlet Control HW Elev.	1,801.28	ft	Control Type	Entrance Control	

Grades					
Upstream Invert	1,800.55	ft	Downstream Invert	1,800.30	ft
Length	25.00	ft	Constructed Slope	0.010000	ft/ft

Hydraulic Profile					
Profile	S2		Depth, Downstream	0.41	ft
Slope Type	Steep		Normal Depth	0.41	ft
Flow Regime	Supercritical		Critical Depth	0.51	ft
Velocity Downstream	4.62	ft/s	Critical Slope	0.004196	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.012	
Section Material	Corrugated HDPE (Smooth Interior)		Span	1.50	ft
Section Size	18 inch		Rise	1.50	ft
Number Sections	1				

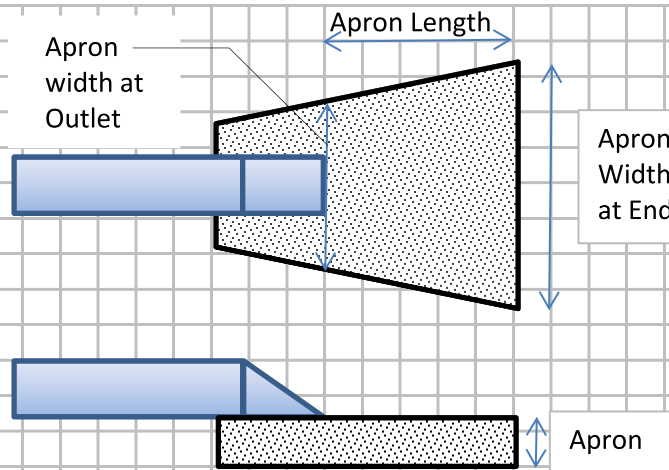
Outlet Control Properties					
Outlet Control HW Elev.	1,801.28	ft	Upstream Velocity Head	0.19	ft
Ke	0.20		Entrance Loss	0.04	ft

Inlet Control Properties					
Inlet Control HW Elev.	1,801.24	ft	Flow Control	N/A	
Inlet Type	Groove end projecting		Area Full	1.8	ft²
K	0.00450		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	3	
C	0.03170		Equation Form	1	
Y	0.69000				

Client	NU / PSNH	Page	1 of
Project	Northern Pass	Date 04/20/15	Made By J. Sirhall
	Transition Station #1		Checked By
	Outlet Protection - Riprap Sizing		Preliminary Final

Source:

New Hamshire Stormwater Manual, Volume 2
Post-Construction Best Management
Practices Selection & Design, Dec 2008,



Apron Width at Outlet:	Width =	3 x Pipe Dia. (or width of channel)	
Apron Length:	Length=	(1.8 x Q) / (Dia. X1.5) + 7 x Dia.	if Tw depth is < 1/2 dia.
	Length=	(3.0 x Q) / (Dia. 1.5) + 7 x Dia.	if Tw depth is >= 1/2 dia.
Apron Width at End:	Width = 3 x Dia + Apron Length		if Tw depth is < 1/2 dia.
	Width = 3 x Dia + 0.4 x Apron Length		if Tw depth is >= 1/2 dia.
	or apron width = channel width if a well defined channel exists		
Rock Riprap:	Media Diameter =	(0.2 x Q ^4/3) / Tw x Dia	
	Depth = 6" or 1.5 x largest stone dia.		

Design Element	DL-A	DL-B	DL-C
Design Storm (YR)	25-yr	25-yr	25-yr
Defined Channel (yes/no)	Yes	Yes	No
Channel Width (ft)	2	2	N/A
Pipe Dia (in)	24	18	18
Tail Water (ft)	0.46	0.28	0.32
	TW<0.5D	TW<0.5D	TW<0.5D
Flow (Q), cfs	2.73	0.89	0.99
Apron Width (outlet) ft	4.5	4.5	4.5
Apron Length, ft	15.64	11.21	11.29
Apron Width (end) ft	21.638	15.712	15.79
Apron Width, (channel), ft	2	2	N/A
Median Stone dia. (D50), inches	6	6	6
Apron Depth, inches	18	18	18

APPENDIX D – NH DES WORKSHEETS

Groundwater Recharge Volume (GRV) Calculation

	ac	Area of HSG A soil that was replaced by impervious cover	0.40"
	ac	Area of HSG B soil that was replaced by impervious cover	0.25"
0.21	ac	Area of HSG C soil that was replaced by impervious cover	0.10"
	ac	Area of HSG D soil or impervious cover that was replaced by impervious cover	0.0"
0.10	inches	Rd = weighted groundwater recharge depth	
0.021	ac-in	GRV = AI * Rd	
76	cf	GRV conversion (ac-in x 43,560 sf/ac x 1ft/12”)	

Provide calculations below showing that the project meets the groundwater recharge requirements (Env-Wq 1507.04):

Refer to Infiltration Basin Calculation Sheet for storage (recharge) volume.

INFILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.05)

Type/Node Name: **Infiltration Basin**

Enter the type of infiltration practice (e.g., trench) and the node name in the drainage analysis, if applicable

Yes		Have you reviewed Env-Wq 1508.05(a) to ensure that infiltration is allowed?	
0.86	ac	A = Area draining to the practice	
0.09	ac	A_I = Impervious area draining to the practice	
0.10	decimal	I = percent impervious area draining to the practice, in decimal form	
0.14	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.12	ac-in	WQV= 1” x Rv x A	
450	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12”)	
113	cf	25% x WQV (check calc for sediment forebay volume)	
Sediment Forebay		Method of pretreatment? (not required for clean or roof runoff)	
317	cf	V_{SED} = sediment forebay volume, if used for pretreatment	← **≥ 25%WQV**
873	cf	V = volume[1] (attach a stage-storage table)	← **≥ WQV**
1,247	sf	A_{SA} = surface area of the bottom of the pond	
4.90	iph	I_{DESIGN} = design infiltration rate[2]	
1.7	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	← **≤ 72-hrs**
1,801.50	feet	E_{BTM} = elevation of the bottom of the practice	
1,796.20	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
1,796.50	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
5.30	feet	D_{SHWT} = separation from SHWT[3]	← **≥ *** [3]
5.0	feet	D_{ROCK} = separation from bedrock[3]	← **≥ *** [3]
	ft	D_T = depth of trench, if trench proposed	← **4 - 10 ft**
	Yes/No	If a trench or underground system is proposed, observation well provided	
		If a trench is proposed, material in trench	
sand or pea gravel		If a basin is proposed, basin floor material	
Yes	Yes/No	If a basin is proposed, the perimeter should be curvilinear.	
3.0	:1	If a basin is proposed, pond side slopes	← **≥3:1**
1,802.84	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
1,803.30	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
1,805.00	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?	← **yes**
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← **yes**

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. See NH Stormwater Manual, Vol.2, Ch.2-4, for guidance on determining the infiltration rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.

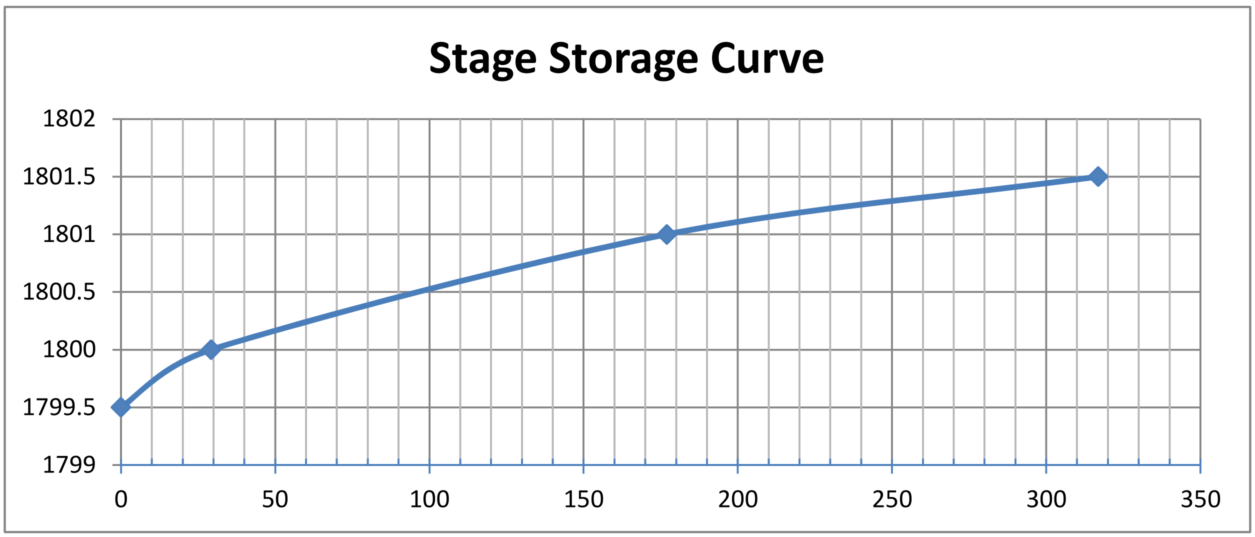
Designer's Notes:

Client	Eversource		Page	of
Project	Northern Pass	Date 04/02/15	Made By	J. Sirhall
	Transition Station #3		Checked By	
	Basin Sediment Forebay - Stage-Storage Table		Preliminary	Final

Stage/Storage Table

ELEV (FT.)	AREA (S.F.)	AVERAGE AREA (S.F.)	DIFFERENCE IN ELEVATION (FT.)	STORAGE VOLUME		
				INCREMENTAL	TOTAL (CF)	Total Ac-Ft
1799.5	36			0	0	0
1800	81	58.5	0.5	29	29	0.0007
1801	214.5	147.75	1	148	177	0.0041
1801.5	302.5	191.75	1.5	288	317	0.0073

Stage Storage Curve

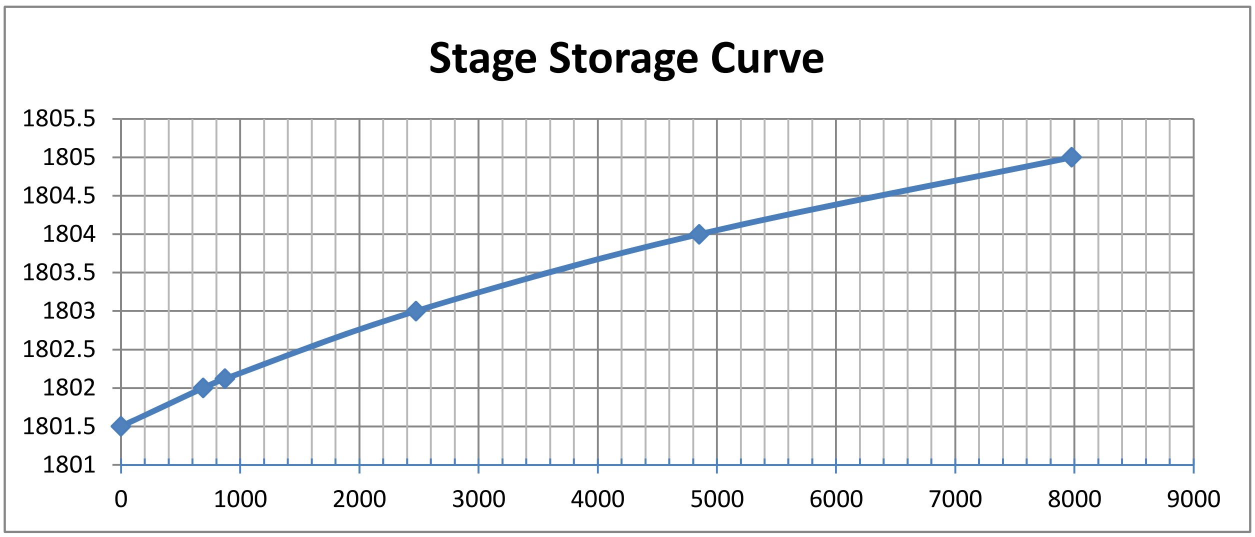


Client	*Eversource*			Page	of
Project	*Northern Pass*	Date	04/02/15	Made By	*J. Sirhall*
	Transition Station #3			Checked By	
	Infiltration Basin - Stage-Storage Table			Preliminary	Final

Stage/Storage Table

ELEV (FT.)	AREA (S.F.)	AVERAGE AREA (S.F.)	DIFFERENCE IN ELEVATION (FT.)	STORAGE VOLUME		
				INCREMENTAL	TOTAL (CF)	Total Ac-Ft
1801.5	1247			0	0	0
1802	1506	1376.5	0.5	688	688	0.0158
1802.12	1571	1538.5	0.12	185	873	0.0200
1803	2068	1819.5	0.88	1601	2474	0.0568
1804	2686	2377	1	2377	4851	0.1114
1805	3361	2466	2.88	7102	7975	0.1831

Stage Storage Curve



TREATMENT SWALE DESIGN CRITERIA (Env-Wq 1508.07)

Node Name: **Treatment Swale 5**

Enter the node name in the drainage analysis (e.g., reach TS 5), if applicable

Yes	Yes/No	Have you reviewed the restrictions on unlined swales outlined in Env-Wq 1508.07(b)?	
No	Yes/No	Is the system lined?	
1.09	ac	A = Area draining to the practice	
0.12	ac	A_I = Impervious area draining to the practice	
6.0	minutes	T_c = Time of Concentration	
0.11	decimal	I = percent impervious area draining to the practice, in decimal form	
0.15	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.16	ac-in	WQV= 1" x Rv x A	
590	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
1	inches	P = amount of rainfall. For WQF in NH, P = 1".	
0.15	inches	Q = water quality depth. Q = WQV/A	
84	unitless	CN = unit peak discharge curve number. CN =1000/(10+5P+10Q–10*[Q^2 + 1.25*Q*P]$^{0.5}$)	
1.92	inches	S = potential maximum retention. S = (1000/CN) - 10	
0.385	inches	Ia = initial abstraction. Ia = 0.2S	
840	cfs/mi^2/in	qu = unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III	
0.21	cfs	WQF = q_u x WQV. Conversion: to convert "cfs/mi^2/in * ac-in" to "cfs" multiply by 1mi^2/640ac	
107.00	feet	L = swale length [1]	← **≥ 100'**
2.00	feet	w = bottom of the swale width[2]	← **0 - 8 feet** [2]
N/A*	feet	E_{SHWT} = elevation of SHWT. If none found, use the lowest elev. of test pit	
1,793.39	feet	E_{BTM} = elevation of the bottom of the practice	← **≥ E_{SHWT}**
333.0	:1	SS_{RIGHT} = right Side slope	← **≥3:1**
45.0	:1	SS_{LEFT} = left Side slope	← **≥3:1**
0.029	ft/ft	S = slope of swale in decimal form[3]	← **0.005 - .05**
0.9	inches	d = flow depth in swale at WQF (attach stage-discharge table)[4]	← **≤ 4"**
0.15	unitless	d must be < 4", therefore Manning's n = 0.15	
1.19	ft^2	Cross-sectional area check (assume trapezoidal channel)	
30.04	feet	Check wetted perimeter	
0.23	cfs	WQF_{check}.[5] ← **WQF_{check} = WQF**	
9%		Percent difference between WQF_{check} and WQF [5]	← **+/- 10%**
10	minutes	HRT = hydraulic residence time during the WQF	← **≥ 10 min**
1,793.43	ft	Peak elevation of the 10-year storm event	
1,793.99	ft	Elevation of the top of the swale	
YES	Yes/No	10 peak elevation ≤ the top of swale	← **yes**

1. Any portion of the swale that is in a roadside ditch shall not count towards the swale length.
2. Widths up to 16' allowed if a dividing berm or structure is used such that neither width is more than 8'.
3. If > 0.02 (2%) then check dams are required. No additional detention time is credited for check dams.
4. If a detention structure is used immediately upstream of the swale, the flow depth in the swale shall be no greater than 4" during the peak of the 2-yr storm, 24-hour storm event.
5. The WQF_{check} & WQF should be near equal (within 10%) to confirm that you have selected the correct depth off the stage-discharge table. If the depth is not accurate the HRT will be incorrect.

Designer's Notes: * Elevation of bottom of the practice (Ebtm) is equal to existing grade, therefore Ebtm is greater than or equal to Elevation of SHWT (Eshwt)

Depth	Q	Area	Veloc	Wp
(ft)	(cfs)	(sqft)	(ft/s)	(ft)
0.06	0.116	0.705	0.16	23.17
0.11	0.659	2.595	0.25	44.34
0.17	1.870	5.670	0.33	65.51
0.22	3.950	9.931	0.40	86.67
0.28	7.076	15.38	0.46	107.84
0.34	11.41	22.01	0.52	129.01
0.39	17.12	29.83	0.57	150.18
0.45	24.34	38.83	0.63	171.35
0.50	33.20	49.02	0.68	192.52
0.56	43.86	60.39	0.73	213.69

BURNS McDONNELL	Client *Eversource*	Page *1* of *1*	
	Project *Northern Pass*	Date	Made By
	Transition Station #3		Checked By
	Impervious Area Summary	Preliminary	Final

BMP: Infiltration Basin

A_I = Impervious area draining to the practice = 0.09 ac

(Contributing watersheds: Post Area 1)

0.08 ac	Asphalt Pavement
0.01 ac	Station (roof tops and concrete foundation)
0.09 ac	**TOTAL Impervious Area Contributing to BMP: Infiltration Basin**

BMP: Treatment Swale

A_I = Impervious area draining to the practice = 0.12 ac

(Contributing watersheds: Post Area 2, Post Area 3)

0.12 ac	Asphalt Pavement
0.12 ac	**TOTAL Impervious Area Contributing to BMP: Treatment Swale**

APPENDIX E – OPERATIONS AND MAINTENANCE PLAN

Northern Pass Transmission Project
Transition Station #3

Stormwater System Operations and Maintenance Plan

General Overview
Eversource has established an operations and maintenance (O&M) plan for the station post-construction stormwater management system in accordance with the New Hampshire Department of Environmental Services Stormwater Manual (2008) and will be implemented upon completion of construction as outlined below. Any required post construction stormwater management permits will be obtained and implemented by Eversource.

The station is located on Eversource owned property on Wiswell Road, Clarksville, NH 03592

Purpose & Goals
The purpose of this O&M Plan is to provide guidance for the implementation and documentation process of the station site stormwater management system to help conform with the corresponding regulatory agency approvals and permits. The guidance provided herein is the minimum required. The primary goal is to inform all the property managers about how the system operates and what maintenance items are necessary to protect the downstream storm drain system and waters. The secondary goal is to provide a practical, efficient means of maintenance planning and record keeping to verify permit compliance.

Responsible Parties
Eversource will be responsible for implementing the O&M Plan.

Eversource
13 Legends Drive
Hooksett, NH 03106

Maintenance Logs and Checklists
Eversource will keep a record of all maintenance procedures performed, date of inspection/ cleanings, etc. Copies of inspection reports and maintenance records shall be kept on site.

Forms
The following forms will be developed for annual maintenance. Copies of the forms will be kept on-site as part of the Post-Construction Stormwater Management Plan.

- Annual Checklist
- Quarterly Checklist
- Monthly Checklist

Training
Responsible operations and maintenance workers and contractors will be trained with a basic description of the purpose and function of the onsite stormwater management system as well as safety protocol and procedures, with annual up-dates, to provide that the workers tasked with

maintaining the station site do so in accordance with the approved permit conditions. All workers that have maintenance duties will be adequately informed of their responsibilities. All sub-contractors (Vactor, landscaping, snowplowing, etc.) will be informed of special requirements and responsibilities.

<u>Stormwater Management System</u>
The onsite stormwater management system has several components that are shown on the Site Development Plans and they perform various functions in conveying and treating stormwater runoff. Refer to the Site Development Plans for locations and details for each of the stormwater system components. Regular operations and maintenance is critical to the long term success of the stormwater management system components. The stormwater system components are:

<u>Stormwater Swales:</u>
Onsite stormwater swales collect and convey stormwater runoff and are either lined with vegetation or riprap. The following is recommended for regular maintenance twice annually unless otherwise noted:

- Inspect for erosion, sediment accumulation, vegetation loss, and presence of invasive species.
- Perform periodic mowing; frequency depends on location and type of grass. Do not cut shorter than Water Quality Flow depth (maximum 4-inches).
- Remove debris and accumulated sediment, based on inspection.
- Removal of woody vegetation from embankments.
- Repair eroded areas, remove invasive species and dead vegetation, and reseed with applicable grass mix as warranted by inspection.
- For riprap lined swales, inspect and repair for erosion, displaced riprap, and remove accumulated sediment.
- Periodic mowing of vegetated swales.

<u>Culverts:</u>
Culverts convey stormwater runoff under driveways and consists of an open pipe end upstream and a flared end section downstream. It is typical that stormwater swales are located both upstream and downstream of the culvert and may have riprap outlet protection. The following is recommended for regular maintenance twice annually unless otherwise noted:

- Remove any accumulated sediment and debris in the culvert and also at the upstream and downstream ends that may be restricting flow though.
- Inspect and repair any damage and deterioration to the upstream and downstream swales and outlet protection.

<u>Underdrains:</u>
Onsite underdrains are located outside the station perimeter fence adjacent to earthwork cut areas of the site and in earthen slope benches. These underdrains discharge to culvert crossing under access road. Cleanouts are provided on the underdrains to provide access. The following is recommended for regular maintenance twice annually unless otherwise noted:

- Remove any accumulated sediment and debris in the underdrains through the cleanouts and outlets.
- Inspect and Repair any damage and deterioration to the outlet protection and downstream areas.

Storm Drainage System:
Onsite storm drainage system including conveyance pipes and flared end sections convey stormwater. The following is recommended for regular maintenance twice annually unless otherwise noted:

- Remove any accumulated sediment or debris at the outfalls.
- Inspect and repair any damage and deterioration to the conveyance pipes and riprap outlet protection.

Outfalls:
Storm drainage outfalls are the point stormwater discharges from pipe outlets and consist of a flared end section and riprap outlet protection. The following is recommended for regular maintenance twice annually unless otherwise noted:

- Remove any accumulated sediment or debris at the outfalls.
- Inspect and repair any damage and deterioration to riprap outlet protection.

Infiltration Basin:
The infiltration basin attenuates stormwater, provides water quality and groundwater recharge and consists of numerous components including a sediment forebay, outlet control structure, trash rack, outlet pipe, emergency spillway, anti-seep collar, etc. The following is recommended for regular maintenance twice annually unless otherwise noted:

- Remove any trash and debris.
- Periodic mowing of embankments.
- Removal of woody vegetation from embankments.
- Removal of debris from outlet structures. Removal of accumulated sediment.
- Inspection and repair of embankments, outlet structures, and appurtenances.
- Inspect for erosion, sediment accumulation, vegetation loss, and presence of invasive species
- Inspection of infiltration basin components at least twice annually, and following any rainfall event exceeding 2.5 inches in a 24 hour period, with maintenance or rehabilitation conducted as warranted by such inspection.
- Inspection of pretreatment measures at least twice annually and removal of accumulated sediment as warranted by inspection, but no less than once annually.

Station Yard Stone:
The station yard stone within the station yard can become compacted and eroded over time. The following is recommended for regular maintenance twice annually unless otherwise noted:

- Inspect for and repair any erosion in the yard, on access roads, and at the perimeter of the gravel areas.
- As the gravel areas become compacted, scrape off top layer to subgrade elevation and install new gravel surfacing layer at design elevation and pitch.

Spill Control

Eversource will have a spill control program. That program will be updated annually and incorporated into the employee-training program.

Disposal:

For all removed sediment, debris, trash, etc. from the stormwater management system during operations and maintenance shall be disposed of properly and legally by a New Hampshire Licensed hauler. Road sand may be reused for winter sanding, but may not be stored on-site.

Pesticides:

Northern Pass anticipates that vegetation management activities will be performed by Eversource. Work will be performed in accordance with Eversource's vegetation management program, which currently employs only mechanical means for controlling vegetation within the Eversource rights of way. Eversource does not currently plan to use herbicides as part of its vegetation management program, and as indicated in the Northern Pass application for a Presidential Permit (at page 52), all vegetation management and maintenance will be carried out in accordance with the New Hampshire Division of Forest and Lands Best Management Practice for utility maintenance. Herbicides will not be used before or during construction of the Northern Pass.

* * * * *

APPENDIX F – FEMA FLOOD INSURANCE RATE MAP

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0220D

FIRM

FLOOD INSURANCE RATE MAP

COOS COUNTY, NEW HAMPSHIRE

(ALL JURISDICTIONS)

PANEL 220 OF 1300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARKSVILLE, TOWN OF	330184	0220	D
PITTSBURG, TOWN OF	330186	0220	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 33007C0220D

EFFECTIVE DATE FEBRUARY 20, 2013

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

APPENDIX G – SOIL SURVEY REPORTS (BY OTHERS)

Northern Pass Transmission Project

Soil Survey Report for Transition Stations, Substation Expansions, and Converter Terminal

Prepared For:
Northern Pass Transmission, LLC

Submitted On:
February 6, 2015

Prepared By:
Normandeau Associates, Inc.
25 Nashua Road
Bedford, NH 03110

www.normandeau.com

Summary

Limitations to development within the Station 2 site include steep slopes and wetlands. Generally the soils are deep within the site with the exception of Test Pit 7 where weathered bedrock was encountered at 36 inches. Proposed access routes should be designed to ensure sheet flow drainage across the route to minimize concentration of spring runoff.

4.3 Station 3, Clarksville South

Overview

The review included Transition Station 3, a wooded parcel located off Wiswell Road, and a proposed 2,300 foot underground route from the Transition Station southeast to Route 145, where the corridor would then be located within the road right-of-way.

The Transition Station site is wooded with evidence that selective cutting has occurred within the last 5-10 years. The underground corridor is dominated by early successional forest, except in the vicinity of Route 145, which is an old hayfield.

The field review of the Transition Station site was conducted on July 22, 2014. Field observations were made using borings dug by hand with an auger and tile spade and test pits dug by an excavator. Detailed observations were made to either bedrock or to 60 inches, where feasible. A total of 27 test pits dug by an excavator were evenly distributed across the site and located with a Trimble® GPS.

The review of the underground corridor focused on confirming the NRCS medium intensity soil survey (Soil Survey Staff 2014) and locating shallow to bedrock soils (Appendix C). Three wetland crossings, previously delineated by Normandeau, were reviewed to provide more detail on the soils in these areas. Shallow test pits with a spade and probes for bedrock were completed along the proposed corridor on September 10, 2014. The results of the survey are provided on a base map in Appendix D. Observations were recorded and located with a Trimble® GPS.

Soil Mapping Results

Transition Station

The proposed site is located on the south side slope of a hill (See Appendix D). The final survey area was about 5 acres in size. Approaching from Wiswell Road, the site is initially moderately steep, slopes of 15 to 25%, with small sections of steeper slopes ranging from of 25 to 35% that extend to the east and west. The site becomes gently sloping (slopes 3 to 8%) as one progresses south. The site has been cutover in the past with small clearings dominated by a mix of shrubs and grasses. Tree cover is moderately dense in areas of bedrock and steep slopes.

Seven map units were identified within the site with a range of slope phases. All are formed within glacial till parent material. Table 4-3 summarizes the map units and their physical characteristics identified within the project site. Detailed information on each map unit, including slope phase, is provided in Appendix A.

Table 4-3. Station 3, Clarksville South, Summary of Soil Physical Characteristics

Map Unit	Hydrologic Group	Seasonal Water Table (SWT) Depth[1] (Inches)	Depth to Bedrock (Inches)	Drainage Class[2]	Ksat (in/hr)	Limitations
61-Tunbridge-Lyman-Rock Outcrop Complex	C/A/D	>40	0-40	W,SE	0.6-6.0	Rock
99-Tunbridge, very stony	C	>40	20-40	W	0.6-6.0	Rock
123-Telos, very stony	C	<15	>60	SP	0.02-2.0	
161-Lyman-Tunbridge-Rock Outcrop Complex	A/D/C	>40	0-40	SE,W	0.6-6.0	Rock
399- Rock Outcrop	Unknown	Variable	0-10	Unknown	Unknown	Rock
567-Howland, very stony	C	>15 to <40	>60	MW	0.06-2.0	
590-Cabot, very stony	D	Surface to 12	>60	P	0.06-0.2	P[2]

1. Seasonal water table ranges are provided from the NRCS. On-site conditions are expected to fall within these ranges based on test pit observations.
2. Drainage Classes:
   P- poorly drained; SP- somewhat poorly drained; MW- moderately well drained
   WD- well drained; SE- somewhat excessively drained; E- excessively drained.

Tunbridge fine sandy loam and Lyman loam are bedrock controlled soils. Tunbridge soils are moderately deep with bedrock within 40 inches of the soil surface. Lyman soils are shallow with bedrock within 20 inches of the soil surface. Bedrock outcrops were mapped within both map units. Complexes were mapped in those areas where differentiating the individual map units was too difficult.

Plaisted silt loam is very deep, well drained soil that has formed in dense glacial till. Howland silt loam is very deep, moderately well drained soil found at lower hillslope positions.

Telos silt loam is somewhat poorly drained with a seasonal water table within 15 inches of the soil surface due to the presence of dense lodgement till. Cabot, very stony, silt loam is poorly drained with dense lodgement till in the substratum. Free water is commonly at or near the surface to result in hydric conditions.

Northern Underground Segment at Transition Station 3

Normandeau reviewed and refined the NRCS Coos County Soil Survey mapping within the project corridor to identify areas of shallow to bedrock soils and hydric soils (Appendix D). The NRCS mapped the project area at a scale of 1:24,000, in which the smallest soil delineation ranges from 3 to 5 acres in size, whereby small areas of contrasting soils may not be shown due to limitations of scale. The NRCS mapped the soils as soil complexes with two map units within the area of the corridor: Tunbridge-Lyman-Rock outcrop complex, 61D (15 to 25% slope) and 61E (25 to 35% slope); and Tunbridge-Plaisted-Lyman complex, 560C (8 to 15% slope) and 560D (15 to 25 % slope).

The proposed underground segment descends from the Transition Station along the east side of a hill into a narrow valley where it crosses Pond Brook, an associated emergent wetland, and a tributary to Pond Brook. The route then ascends towards Route 145, crossing an early successional field where rock outcrops and a spring (a well is located downslope of the corridor) with shrub wetlands were noted. The corridor is primarily gently sloping, slopes 3 to 8%, with small areas of moderately steep slope ranging from 15 to 25%.

The review determined that Tunbridge-Lyman-Rock Outcrop complex is the dominant map unit within the corridor, rather than Tunbridge-Plaisted-Lyman complex mapped by the NRCS. Various slope phases were noted ranging from B slopes (3 to 8%) to D slopes (15 to 25%), but were not broken. Bedrock outcrops were located where observed. Moderately well drained, deep (>40 inches to bedrock) Howland silt loam was observed within the lower portion of the side slope west of the delineated Pond Brook wetland. Howland soils were also observed in the mowed field west of Route 145.

Three proposed wetland crossings were reviewed to assess the appropriate soil map unit designations. Starting with the western most wetland, which is an emergent wetland associated with Pond Brook, the soils are very poorly drained Wonsqueak muck in which the organic layer ranges from 16 to 51 inches in depth (Soil Survey Staff 2014b). The second wetland is a narrow wetland within the corridor of an intermittent tributary of Pond Brook. The soils are shallow to bedrock, poorly drained soils, resembling eroded poorly drained Cabot silt loam.

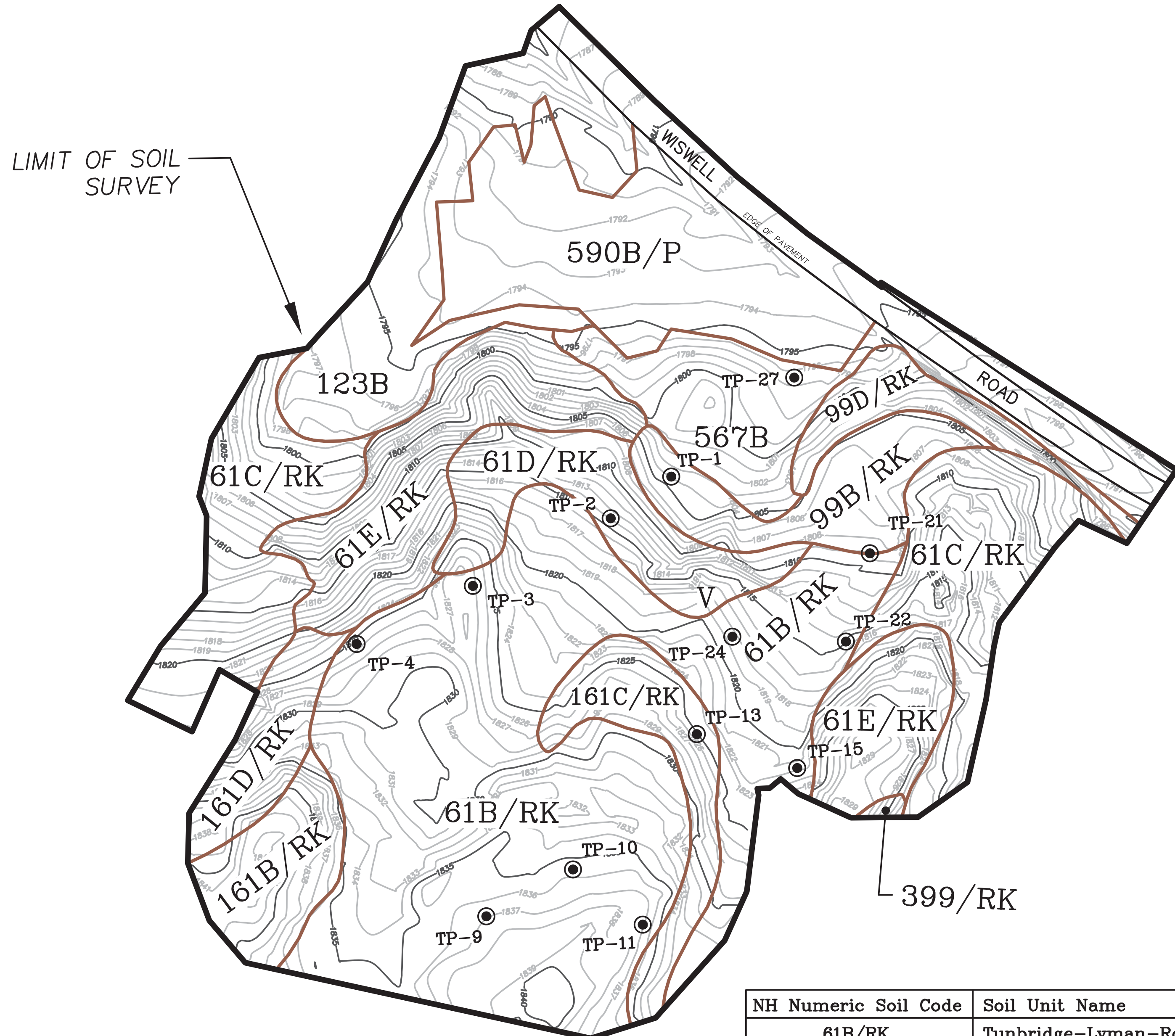
The third wetland crossing is a spring containing poorly drained, shallow to bedrock soils associated with a shrub wetland. These soils appear to be an eroded, poorly drained Cabot. An inclusion of very poorly drained soils with bedrock at 20 to 40 inches was observed at the eastern end of this wetland.

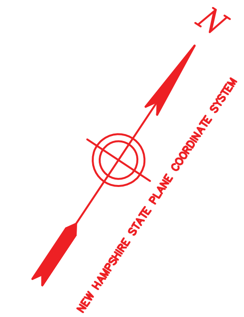
The NRCS map unit description for 61D, Tunbridge-Lyman-Rock Outcrop complex, slope 15 to 25% is provided in Appendix C. Inclusions of dissimilar soils that may occur within the project area include well drained Plaisted, moderately well drained Howland, very poorly drained Wonsqueak, and shallow to bedrock poorly to very poorly drained soils.

Summary

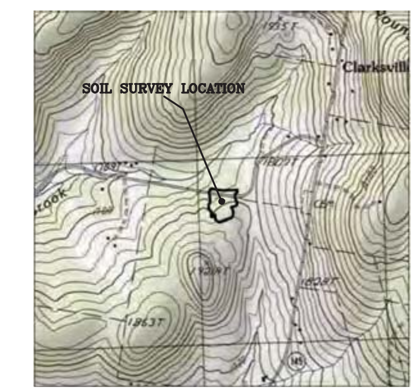
Limitations to development within the South Clarksville Transition Station site include wetlands, steep slopes, shallow to bedrock conditions and shallow to moderately shallow dense lodgement till. Proposed access routes should be designed to ensure sheet flow drainage across the route to minimize concentration of spring runoff.

The review of the underground segment confirmed NRCS mapping of Tunbridge-Lyman-Rock Outcrop complex. Areas mapped as Tunbridge-Plaisted-Lyman were found to be more accurately mapped as Tunbridge-Lyman-Rock Outcrop complex, as the soils are primarily shallow to bedrock, ranging from exposed bedrock to 20 inches deep, with inclusions of moderately (20 to 40 inches) deep soils. Inclusions of deeper soils (>60 inches) were observed upslope of the Pond Brook wetland crossing and in the field adjacent to Route 145. Proposed wetland crossings will encounter deep, very poorly drained soils as well as shallow to bedrock, poorly drained soils.





STATE OF MAINE
JENNIFER WEST
NO. 215
CERTIFIED SOIL SCIENTIST



LOCUS MAP
1:10,000

NOTES

1. BASEMAP PROVIDED BY COLER & COLANTONIO INC.; LOCUS BASEMAP PROVIDED BY USGS & ESRI.

2. THIS MAP PRODUCT IS WITHIN THE TECHNICAL STANDARDS OF THE NATIONAL COOPERATIVE SOIL SURVEY. IT IS A SPECIAL PURPOSE PRODUCT, INTENDED FOR USE IN SHOWING LIMITATIONS TO DEVELOPMENT OF ROADS, SHALLOW EXCAVATIONS AND PLANNING SITE DESIGN FOR STORMWATER RUNOFF & EROSION CONTROL. IT WAS PRODUCED BY A CERTIFIED SOIL SCIENTIST AND IS NOT A PRODUCT OF THE USDA NATURAL RESOURCES CONSERVATION SERVICE. THERE IS A NARRATIVE REPORT THAT ACCOMPANIES THIS MAP, WHICH PROVIDES METHODOLOGY, MAP UNIT DESCRIPTIONS & INTERPRETATIONS.

3. PREPARED FOR NORTHERN PASS TRANSMISSION PROJECT. PREPARED BY NORMANDEAU ASSOCIATES INC.

4. FIELD WORK COMPLETED BY NORMANDEAU ASSOCIATES INC., JENNIFER WEST (MECSS 215), CERTIFIED SOIL SCIENTIST ON JULY 22, 2014.

LEGEND

- Soil Survey Boundary
- Soil Boundary
- 345 — Index Contour
- 343 — Intermediate Contour
- Road

NH Numeric Soil Code	Soil Unit Name	Soil Slope %	Hyd. Group
61B/RK	Tunbridge-Lyman-Rock Outcrop Complex	3-8	C/A/D
61C/RK	Tunbridge-Lyman-Rock Outcrop Complex	8-15	C/A/D
61D/RK	Tunbridge-Lyman-Rock Outcrop Complex	15-25	C/A/D
61E/RK	Tunbridge-Lyman-Rock Outcrop Complex	25-50	C/A/D
99B/RK	Tunbridge, very stony	3-8	C
99D/RK	Tunbridge, very stony	15-25	C
123B	Telos, very stony	3-8	C
161B/RK	Tunbridge-Lyman-Rock Outcrop Complex	3-8	A/D/C
161C/RK	Tunbridge-Lyman-Rock Outcrop Complex	8-15	A/D/C
161D/RK	Tunbridge-Lyman-Rock Outcrop Complex	15-25	A/D/C
399/RK	Rock Outcrop	1-45	unknown
567B	Howland silt loam, very stony	3-8	C
590B/P	Cabot gravelly silt loam, very stony	1-8	D
V	Rock Outcrop	NA	NA

Transition Station #3
Clarksville, NH

SOIL SURVEY OVERVIEW

Date: 02.02.15 Project No.: 21812.204 Scale: 1"=100'

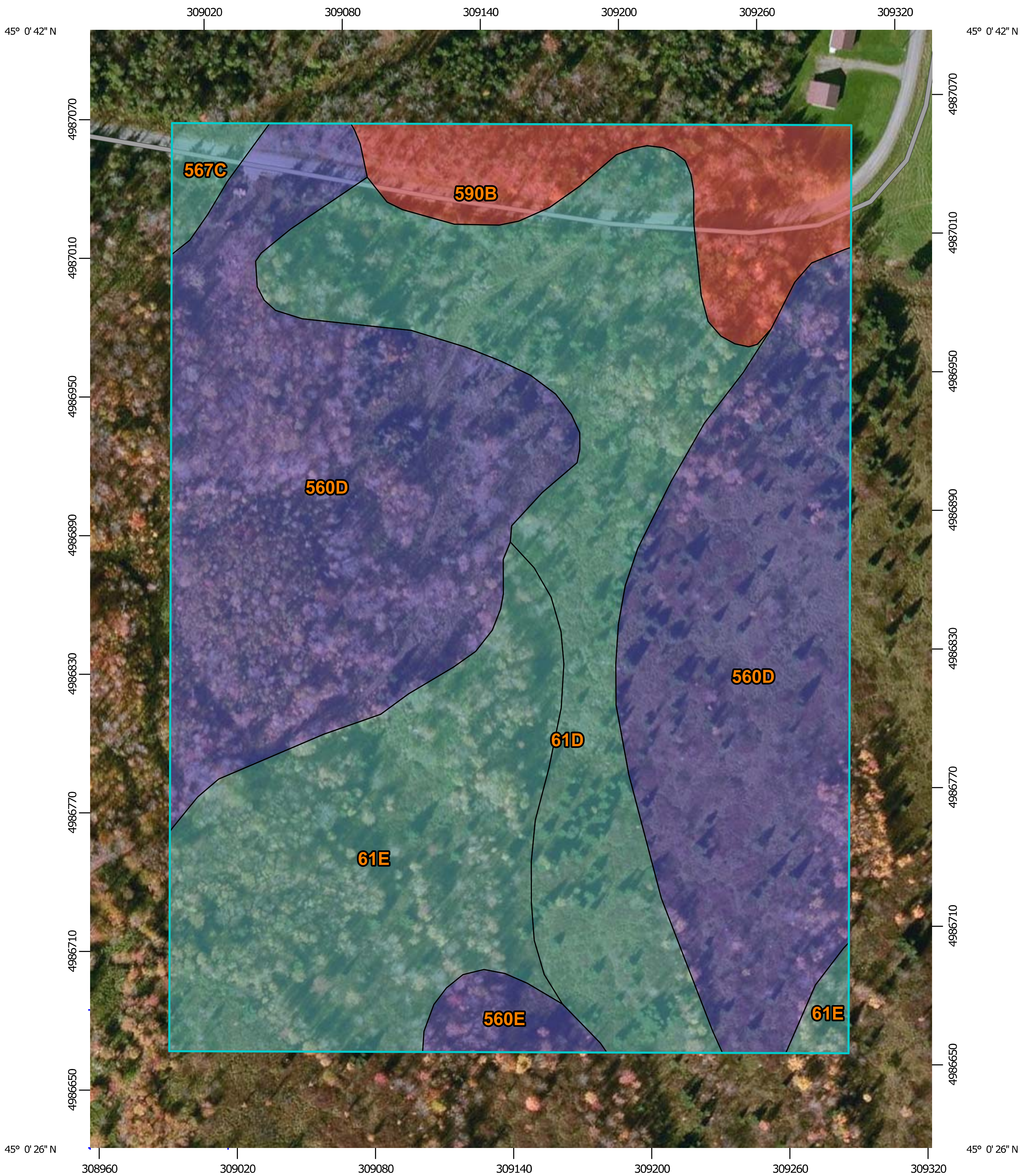
NORMANDEAU environmental consultants

THE NORTHERN PASS | NORTHERN PASS LLC

No.	Document/Draft Name	Ini.	Date
1	C:\Npass\DWG\NP_TransitionSites_SOIL_020215	JCB	02.02.15

SHEET 1 OF 1

Hydrologic Soil Group—Coos County Area, New Hampshire
(AOI-NPTT3)



Map Scale: 1:2,360 if printed on A portrait (8.5" x 11") sheet.

Meters: 0 30 60 120 180

Feet: 0 100 200 400 600

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 1:24,000.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
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: Coos County Area, New Hampshire
Survey Area Data: Version 20, Sep 15, 2014

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

Date(s) aerial images were photographed: Aug 19, 2010—Jul 16, 2011

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

Hydrologic Soil Group— Summary by Map Unit — Coos County Area, New Hampshire (NH607)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
61D	Tunbridge-Lyman-Rock outcrop complex, 15 to 25 percent slopes	C	6.6	22.5%
61E	Tunbridge-Lyman-Rock outcrop complex, 25 to 60 percent slopes	C	5.8	19.9%
560D	Tunbridge-Plaisted-Lyman complex, 15 to 25 percent slopes	B	13.8	46.9%
560E	Tunbridge-Plaisted-Lyman complex, 25 to 35 percent slopes	B	0.5	1.7%
567C	Howland silt loam, 8 to 15 percent slopes, very stony	C	0.3	1.1%
590B	Cabot silt loam, 0 to 8 percent slopes, very stony	D	2.4	8.0%
Totals for Area of Interest			**29.4**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

APPENDIX H – GEOTECHNICAL REPORT (BY OTHERS)

Geotechnical Engineering Report

Transition Station #3 Project
Northern Pass Transmission Line
Clarksville, New Hampshire

December 9, 2016
QS Project No. 16004

Prepared for:
PAR Electrical Contractors, Inc.
60 Fuller Road
Chicopee, Massachusetts 01020

Prepared by:
Quanta Subsurface
307 W. Main Street
Radford, Virginia 24141

QUANTA SUBSURFACE
Engineering + Construction

December 9, 2016

PAR Electrical Contractors, Inc.
60 Fuller Road
Chicopee, Massachusetts 01020

Attention: Ms. Stephanie Labbe
Project Manager

Re: Geotechnical Exploration Report
Transition Station #3 – Northern Pass Transmission Line
Clarksville, New Hampshire
QS Project No. 16004

Dear Ms. Labbe,

The purpose of this report is to present the results of the subsurface exploration program and geotechnical engineering analyses undertaken by Quanta Subsurface (QS) associated with the above referenced project. Our services were provided in general accordance with QS's proposal dated August 22, 2016 as approved by PAR Electrical Contractors' (PAR) Limited Notice to Proceed (LNTP) #4 dated August 26, 2016. The attached report presents our understanding of the project, the findings of the subsurface exploration program, and our geotechnical conclusions and recommendations.

Sincerely,

Quanta Subsurface

STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER
JAY T. McGINNIS
No. 14656
LICENSED
12/9/16

Sean Kearney, P.G.
Project Engineering Geologist

J.T. McGinnis, P.E.
Geotechnical Department Manager

307 W. Main Street • Radford, VA 24141 • P 866.278.9782

TABLE OF CONTENTS

FIGURES

APPENDICES

EXECUTIVE SUMMARY

This Executive Summary is provided as a brief overview of our geotechnical engineering conclusions and recommendations for the project and is not intended to replace more detailed information contained elsewhere in this report. As an overview, this summary inherently omits details that could be very important to the proper application of the provided geotechnical design recommendations. This report should be read in its entirety.

- QS's geotechnical field exploration program consisted of eleven (11) Standard Penetration Test (SPT) borings, drilled to a maximum depth of approximately 22 feet, and associate laboratory testing at the Transition Station #3 site.
- Two infiltration test borings (INF) were conducted to characterize the subsurface conditions to a depth of approximately 5 feet below the planned basin bottom. Following completion of each INF test boring, field infiltration tests were performed at each location.
- The subsurface conditions encountered at the site generally included a layer of topsoil and/or existing fill material underlain by a thin layer of residual soil and its parent bedrock. A test boring performed by others within the project site reported similar conditions as those encountered during the exploration program presented herein with the exception that the thin layer of soil was described as glacial till deposits.
- Bedrock was encountered above the planned finished elevations. Thus, difficult excavation techniques that may include blasting will be required to develop the project site grades as currently planned.
- Groundwater was not encountered at any of the Quanta Subsurface test borings prior to initiation of rock coring.
- Due to shallow bedrock, drilled shafts or spread foundations (with or without rock anchors) are recommended for support of the bus support/pole structures
- Controlled structural fill and/or the onsite soils or bedrock will provide suitable support for the transformer pad design to transmit an approximate uniform bearing pressure of up to 500 psf and structures supported by shallow foundation designed with a maximum allowable bearing pressure of 3,000 psf.
- The onsite soils will generally have a low shrink-swell potential. Accordingly, no design modifications relative to the potential for shrink-swell soils are recommended.
- Frost depth should be anticipated to be 4 feet below the lowest adjacent grade.
- A Seismic Site Class Definition of "C" is recommended for design.
- Laboratory corrosivity testing performed on samples collected from the site indicated that the soils are non-aggressive.
- Planned cut and fill slopes are anticipated to have a factor of safety (FoS) of 1.5 or greater for global stability.

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1.0 PROJECT INFORMATION

The Northern Pass project consists of a 192-mile long transmission line that will convey 1,090 megawatts of energy from hydroelectric facilities in Canada to New England via a corridor than traverses north-to-south through New Hampshire (see Site Vicinity Map – Figure 1). In addition to construction of new transmission line, the project also includes the construction of three (3) new substations and six (6) new transition stations along the corridor. In general, the new transition stations (designated Transition Stations #1 through #6) are located along the northern and central portions of the corridor while the three new substations (designated Franklin Substation, Deerfield Substation and Scobie Pond Substation) are located along the southern portion of the corridor. The information presented herein is for the Transition Station #3 located approximately 1 mile east-northeast of Clarksville, New Hampshire (see Site Location Map - Figure 2).

The Transition Station #3 site is currently an undeveloped and partially-wooded parcel situated immediately south of Wiswell Road. The proposed station pad will have an approximate 180-foot by 140-foot footprint. Within the transition station footprint, the ground surface elevations generally range from 1818 feet to 1836 feet. Maximum cuts and fills of approximately 15 feet and 5 feet, respectively, will be required to develop the planned finished grade elevation of approximately 1820 feet. Development will include construction of cut slopes along the south, east and west sides of the site, an infiltration basin to the north of the transition station pad, and a gravel-covered access road that will provide access to the station from Wiswell Road. All slopes are currently planned with a 3 (Horizontal) to 1 (Vertical) configuration, and no retaining walls are planned.

New structures within the transition station footprint are anticipated to consist of a transformer pad, a bus support structure, and possibly a single-story structure designed to house electrical equipment. Quanta Subsurface (QS) has assumed the following regarding loading and foundation support of the new structures: 1) the bus structure will require deep foundation support to resist shear and overturning loads, 2) the transformer pad will consist of slab-on-grade support designed for a maximum bearing pressure of 500 psf, and 3) single-story structures designed to house equipment will be lightly loaded with shallow foundation support.

2.0 PROVIDED DOCUMENTS AND PREVIOUS EXPLORATION DATA

Multiple documents were provided to QS by PAR Electrical Contractors (PAR) for consideration during our geotechnical exploration and engineering evaluation. The provided geotechnical report documents were developed by others and presented information at various locations along the transmission line corridor. Upon review of the provided data, one document provided test boring data within the Transition Station #3 footprint as well as in its general vicinity. Also, one document provided GIS information containing general surficial and bedrock geology information in the area of the Transition Station #3 site. The specific documents included as reference by QS herein are listed below.

- Haley & Aldrich, Inc.; *Geotechnical Data Report – Clarksville – Stewartstown Underground Route: Northern Pass Transmission Project*; February 13, 2014.
- Terracon Consultants Inc.; *Report of Expected Geotechnical Conditions*: Northern Pass Project; July 10, 2015.

Upon review of the data provided in the Haley & Aldrich 2014 report, one test boring (designated Boring No. A) was advanced within the Transition Station #3 footprint; a copy of this boring is provided for informational purposes in Appendix A. Qualification of the data obtained by Haley & Aldrich can be found in the report listed above. The respective location of the Haley & Aldrich test boring, as approximated from the location indicated in the provided 2014 geotechnical data report, is shown on Figure 3 (Boring Location Plan).

Although not specifically used in development of the recommendations presented in Section 6.0 of this report, other selected information from the two documents noted above was used as reference in support of the site specific data obtained by QS. Specific citations are noted below.

3.0 PURPOSE AND SCOPE OF SERVICE

QS's scope of work was developed based on information provided by PAR that included requested field investigations for civil works from Burns & McDonnell (*Subsurface Exploration and Geotechnical Engineering Report: Technical Guidelines*; Northern Pass Transmission Stations, New Hampshire, provided to QS on July 11, 2016) as well as requested investigations for planned structures from others. The purposes of our involvement on Transition Station #3 phase of the project were as follows: 1) provide general descriptions of the subsurface conditions encountered at the transition station site; 2) provide geotechnical design parameters for use by others in analysis and design of site grading and permanent slopes; 3) provide geotechnical foundation design recommendations for support of the transition station structures; and 4) comment on geotechnical aspects of the proposed construction. In order to accomplish the above objectives, QS undertook the following scope of services:

1) reviewed available subsurface and geologic information relative to the project site;
2) supervised a subsurface exploration program consisting of eleven (11) geotechnical borings within the area of the proposed transition station;
3) procured field infiltration testing services at two (2) locations within the proposed infiltration basin;
4) supervised a laboratory testing program on selected soil and rock samples obtained during the drilling program;
5) evaluated the findings of the test borings and laboratory tests relative to foundation support of planned structures and other geotechnical aspects of the project;

6) and prepared this written report summarizing our services for the project, providing descriptions of the subsurface conditions encountered, laboratory test results, and design recommendations, as well as geotechnical considerations for construction. Copies of the QS boring logs, QS rock core photographs, laboratory test results, infiltration test results, and summary of geotechnical design parameters are provided in Appendices B through F.

QS's scope of services did not include a survey of boring locations and elevations, quantity estimates, preparation of plans or specifications, infiltration/retention basin design, blasting recommendations, identification of environmental impacts or aspects related to the project and/or site, or other services not specified above.

4.0 EXPLORATION AND TESTING PROCEDURES

4.1 SUBSURFACE EXPLORATION

QS's geotechnical field exploration program consisted of eleven (11) Standard Penetration Test (SPT) borings performed at the approximate locations shown on the attached Boring Location Plan (see Figure 3) and summarized in Table 1 below. The test boring locations were staked in the field by others using surveying methods; ground surface elevations at the boring locations were derived from topographic data included within an ACAD site plan document (labeled *NPTT304-C101 Geotech.dwg*) using latitude and longitude data provided by PAR.

Table 1 - As-Drilled SPT Borehole Depths and Coordinates

Boring Designation	Total Depth (ft)	Ground Surface Elevation (ft)	Latitude	Longitude
BH 301	3.0	1808.0	45.01070000	-71.42108056
BH 302	12.0	1814.4	45.01043611	-71.42113611
BH 303	15.0	1831.0	45.01032500	-71.42143611
BH 304	7.0	1823.1	45.01017778	-71.42191111
BH 305	15.0	1833.0	45.00992222	-71.42143889
BH 306	20.0	1832.9	45.00972778	-71.42162778
BH 307	6.0	1836.7	45.00988333	-71.42112500
BH 308	18.0	1841.7	45.00967778	-71.42181944
BH 309	22.0	1838.0	45.00969167	-71.42128333
INF 301	5.0	1801.0	45.01058333	-71.42157778
INF 302	4.1	1800.3	45.01062500	-71.42144722

Note: Elevations information is NAVD88

Test borings were performed by S.W. Cole Engineering, Inc. (S.W. Cole) utilizing a CME 850 drill rig equipped with a 140-lb automatic drop hammer falling 30 inches. The drilling methods utilized for this investigation consisted of solid stem augers, hollow stem augers, and rotary drive and wash. Standard penetration testing was performed in general accordance with ASTM D1586 and pocket penetrometer testing (where applicable) was conducted at approximate 2-foot intervals to a depth of 10 feet and at 5-foot intervals thereafter. The number of hammer blows required to advance the sample for successive 6-inch intervals is recorded, and the total number of blows required to drive the sampler from 6 to 18 inches is referred to as the SPT "N-value". The N-value provides a general indication of in-situ soil density/consistency and has been correlated with certain engineering properties of soils. Soil samples were collected with a standard split-spoon sampler (2-in OD) and in bulk samples from auger cuttings for laboratory testing.

In some soils it is not always practical to drive a split-spoon sampler the full four consecutive 6-inch increments. Whenever more than 50 blows are required to drive the sampler over a 6-inch increment, or the sampler is observed not to penetrate after 50 blows, the condition is referred to as split-spoon refusal. The SPT N-value for split-spoon refusal conditions is typically estimated as greater than 100 blows per foot (bpf). Where the sampler is observed not to penetrate after 50 blows, the N-value is reported as 50/0. Otherwise, the depth of penetration after 50 blows is reported in inches (i.e. 50/5, 50/2, etc.).

The test borings were extended to the planned termination depth or auger refusal, whichever was encountered first. At select locations, the boring was advanced beyond auger refusal using double tube rock-coring techniques in accordance with ASTM D2113.

The subsurface materials encountered at each boring location were visually classified by QS personnel in the field. Soil samples were visually classified in accordance with ASTM D2488. The rock core was visually classified for lithology and parameters were collected for weathering, intact rock strength, rock mass discontinuities, core recovery, and Rock Quality Designation (RQD) for each run. In addition to visual classification of the materials in the field, the boring logs incorporate both driller and field inspector observations and comments as well as modifications based on laboratory test results. QS's boring logs and associated rock core photographs are presented in Appendix B and C, respectively. SPT samples were collected in Ziploc bags and bulk samples were collected in 5-gallon buckets. The rock core samples were placed in wood core boxes and photographed.

4.2 LABORATORY TESTING

QS selected various bulk, SPT, and rock core samples for laboratory testing. Laboratory testing on soil samples was performed by S.W. Cole in their Londonderry and Manchester laboratories or via subcontract with Absolute Resource Associates (sulfate and chloride testing). Laboratory testing on rock core samples was performed by GeoTesting Express in their Acton, Massachusetts laboratory. Table 2 provides a summary of the laboratory testing performed for the Transition Station #3 site. A summary of the laboratory testing results and accompanying laboratory test data reports are provided in Appendix D.

Table 2 – Laboratory Test Summary

Test	ASTM	No. of Test Performed
Moisture Content	D2216	18
Organic Content of Soil	D2794	3
Sieve Analysis	D422	2
Percent Passing No. 200 Sieve	D1140	8
Atterberg Limits	D4318	4
Modified Proctor	D1557	2
Unconfined Comp. Strength of Rock	D7102	3
pH of Soil	G51	2
Soluble Chloride	--	2
Soluble Sulfate	--	2
Resistivity	G187	2

4.3 FIELD INFILTRATION TESTING

Two infiltration (INF) test borings were conducted (designated INF 301 and INF 302) to auger refusal encountered approximately 3 to 4 feet below the planned basin bottom. Each boring was sampled continuously (every 2 feet) from ground surface to termination depth. Following completion of each INF test boring, an offset borehole was drilled and PVC casing was installed to a depth of approximately 2 feet below the bottom of the basin for field infiltration testing. At some time following completion of drilling, field infiltration tests were performed by S.W. Cole. The results of S.W. Cole's field infiltration tests are provided in Appendix E. The installation, preparation, and testing procedures followed were in general accordance with Table 2-3 of the *New Hampshire Department of Environmental Services Stormwater Manual*, Volume 2 (2008).

5.0 GEOLOGY AND SUBSURFACE CONDITIONS

5.1 GENERAL

The overburden soils at the project site are derived from several episodes of advancing and retreating glacial ice. Subsurface materials encountered within the borings are consistent with the geologic setting of the area. The following sections describe the regional geology and site specific subsurface conditions.

5.2 REGIONAL GEOLOGY

The surficial geology of the White Mountains in New Hampshire is derived from the erosional and depositional processes of the continental and mountain glaciers of the Wisconsin Glacial Episode during the late Pleistocene Epoch. The dominant glacial soils that are found in this region are glacial till, glaciofluvial/outwash deposits, and glacio-lacustrine deposits. Younger post glacial deposits formed from the numerous rivers, streams, and lakes that dominate the landscape; these include alluvium and stream terrace deposits. The surficial soil in the area of the Transition Station #3 site is mapped as ablation till (Figure 3; Terracon, 2015).

Bedrock in the White Mountains are comprised of folded and faulted Paleozoic sedimentary and volcanic rocks that have been regionally metamorphosed and intruded by large and small bodies of plutonic rocks. The grade of metamorphism ranges from the chlorite zone at one extreme to the sillimanite zone at the other (Billings, 1980). The majority of the rocks mapped in this region consist of schist, phyllites, limestone, and quartzite. As shown in Figure 4 (Regional Geology Map), extrapolation of information provided in the *Geologic Map and Structure Sections of the Dixville Quadrangle* (1963) indicates that bedrock underlying the Transition Station #3 site consist of the Waits River Formation described as phyllite and micaceous quartzite.

5.3 SITE SUBSURFACE CONDITIONS

The subsurface conditions encountered in the test borings generally included a layer of topsoil and/or existing fill material underlain by a thin layer of residual soil and its parent bedrock. The test boring performed by Haley & Aldrich within the Transition Station #3 site (boring no. A) reported similar conditions as those encountered in QS's test borings with the exception that the thin layer of soil was described as glacial till deposits; the soil was described as very dense sand and silty sand and the bedrock was described as calcareous phyllite (Haley & Aldrich, 2014). A summary of the subsurface materials encountered in the QS exploration described herein is provided below and in Table 3, and specific data are shown on the boring logs provided in Appendix B.

<u>Topsoil</u>
Material described as topsoil was encountered at the ground surface at eight (8) of the test boring locations. The thickness of the topsoil ranged from approximately 0.5 to 1 foot where encountered. The sampled topsoil was described as lean CLAY (CL) and SILT (ML) with trace organics and varying amounts of sand. Laboratory testing was not performed to determine the organic content or horticultural properties of the topsoil. Therefore, the term "topsoil" is not intended to indicate suitability for landscaping and/or other purposes.

<u>Existing Fill</u>
Existing fill material was encountered in boring BH 303 to a depth of about 6 feet below the existing ground surface. The sampled fill material was described as silty SAND (SM) with trace organics and gravel. Field N-values obtained within the existing fill material ranged from 4 to 46 blows per foot (bpf) indicting that the material exhibited a density that ranged from loose to dense.

Residual Soil

Residual soil, formed by the in-place weathering of the parent bedrock immediately beneath it, was encountered in each test boring. A residual soil is formed in-situ and is made up of rock particles weathered from the bedrock below; it is therefore chemically similar to that bedrock. Encountered residual soils were predominately described silty SAND (SM) and SILT (ML) with varying amounts of sand; a limited amount of residual soil was described as lean CLAY (CL). Field N-values obtained within the residual soil material ranged from 2 to 38 bpf with a typical N-value of greater than 15 bpf.

Bedrock

Bedrock and/or auger refusal was encountered in each test boring. Auger refusal occurs when materials are encountered that cannot be penetrated by a soil auger or roller bit and is normally indicative of hard or very dense material, such as debris within fill, boulders, rock lenses, pinnacles, or the bedrock surface. In test borings BH 301 and INF 302, bedrock was not sampled; however, based on the soil conditions and depths to bedrock encountered in adjacent borings within the site, QS anticipates that the auger refusal conditions encountered in BH 301 and INF 302 are indicative of the bedrock surface.

Two different rock types were identified in the test borings: 1) thinly foliated, fine to medium grained PHYLLITE with occasional quartz infillings and 2) medium to coarse grained QUARTZITE. The first bedrock unit is described as fresh to moderately weathered, thinly foliated, fine to medium grained with an aphanitic matrix, very weak to strong, PHYLLITE with occasional quartz infillings. The second unit is described as fresh to highly weathered, medium to coarse grained, very strong, QUARTZITE. Both units exhibited a weathered zone transitioning from completely or highly weathered to fresh or slightly weathered. Where encountered, the thickness of the completely or highly weathered upper bedrock zone generally ranged from 1 to 5 feet thick.

Groundwater

Groundwater was not encountered at any of the QS test borings prior to initiation of rock coring. Although groundwater was encountered on the Haley & Aldrich boring A, we anticipate that the water level measurements shown were the result of the coring operation performed in the borehole and not a measurement of stabilized groundwater. Fluctuations in subsurface water levels and soil moisture should be anticipated with changes in precipitation, run-off and moisture.

Table 3 – Encountered Subsurface Conditions Summary

Boring No.	Ground Elevation (ft)	Depth to Groundwater[1] (ft)	Boring Termination Condition	Depth (ft)	Material Origin	Encountered Material	Field N-Value[2]
BH 301	1808.0	N.E.	AR	0 - 1	Topsoil	CL	-
				1 - 3	Residual	ML	20
BH 302	1814.4	N.E.	BT	0 - 1	Fill	CL	4
				1 - 6	Residual	SM	20 - 27
				6 - 15	Bedrock	CW Phyllite	46 - 76

Table 3 – Encountered Subsurface Conditions Summary (cont)

Boring No.	Ground Elevation (ft)	Depth to Groundwater[1] (ft)	Boring Termination Condition	Depth (ft)	Material Origin	Encountered Material	Field N-Value[2]
BH 303	1831.0	N.E.	BT	0 - 2	Fill	SM	4
				2 - 6		SM	19 - 46
				6 – 10.5	Residual	SM	14 - 38
				10.5 - 15	Bedrock	HW Phyllite	50/5”
BH 304	1823.1	N.E.	AR	0 - 0.5	Topsoil	CL	-
				0.5 - 2	Residual	SM	3
				2 - 4.5		SM	18
				4.5 - 7	Bedrock	HW Phyllite	50/6”
BH 305	1833.0	N.E.	CT	0 -1	Topsoil	CL	-
				1 - 2	Residual	CL	13
				2 - 12	Bedrock	HW Quartzite	50/6”
				12 - 15		F to SW Quartzite	-
BH 306	1832.9	N.E.	CT	0 – 0.5	Topsoil	CL	-
				0.5 - 2	Residual	ML	2
				2 - 10		ML	15 - 25
				10 - 15	Bedrock	HW Phyllite	-
				15 - 20		F to SW Phylitte	-
BH 307	1836.7	N.E.	AR	0 - 0.5	Topsoil	CL	-
				0.5 - 2.5	Residual	SM	7
				2.5 - 6	Bedrock	CW Phyllite	50 - 50/1”
BH 308	1841.7	N.E.	CT	0 - 2	Residual	ML	8
				2 - 4.5		ML	26
				4.5 - 8	Bedrock	CW to HW Phyllite	40 - 50/6”
				8 - 18		SW to MW Phyllite	-
BH 309	1838.0	N.E.	CT	0 - 0.5	Topsoil	ML	-
				0.5 - 2	Residual	ML	3
				2 - 6		SM/ML	27 - 50/6”
				6 - 7	Bedrock	CW to HW Phyllite	50/1”
				7 - 22		F to MW Phyllite	-
INF 301	1801.0	N.E.	AR	0 - 0.5	Topsoil	ML	-
				0.5 - 2	Residual	SM	4
				2 - 4.5		SM	18
				4.5 - 5	Bedrock	HW Phyllite	50/5”
INF 302	1800.3	N.E.	AR	0 - 0.5	Topsoil	ML	-
				0.5 - 4.1	Residual	ML	10 - 18

[1] Reported groundwater levels were measured at completion of drilling.
[2] Field N-Value is an uncorrected blow count value measured in the field
BT = Boring Termination (at or near the planned depth)
AR = Auger or Roller Bit Refusal
CT = Rock Coring Termination

6.0 DESIGN AND CONSTRUCTION RECOMMENDATIONS

6.1 GENERAL

The following sections present our geotechnical recommendations for design and construction of the transition station. In general, the subsurface conditions encountered at the site are suitable for the proposed construction with considerations presented in the following subsections. However, excavation of bedrock will be required to develop a planned finished grade of 1820 feet.

6.2 SITE PREPARATION

Before proceeding with construction, any topsoil, roots, foundation remnants, pavements, and any other deleterious non-soil materials should be stripped or removed from the proposed construction area. During the clearing and stripping operations, positive surface drainage should be maintained to prevent the accumulation of water.

After stripping, areas intended to support new fill, gravel roadways, slabs, and foundations should be carefully evaluated by an experienced geotechnical engineer or engineering geologist. Where noted on the borings logs and where located within 3 to 4 feet of new fill, roadways, slabs, and foundations, soils that exhibit SPT N-values of 6 bpf or less should be removed and replaced with controlled structural fill placed in accordance with recommendations presented in Section 6.3. The geotechnical engineer/geologist may also require scarification and compaction (per Section 6.3) of the upper 6 inches of the exposed surface and/or proofrolling of the subgrade with a 20- to 30-ton loaded dump truck or other pneumatic tired vehicle of similar size and weight. Proofrolling should be performed during a time of good weather and not while the site is wet, frozen, or severely desiccated. The purpose of the proofrolling is to locate soft, weak, or excessively wet soils present at the time of construction and provide an opportunity for the geotechnical engineer/geologist to locate inconsistencies intermediate of the boring locations.

Depending on how the near surface materials respond during proofrolling operations, some in-place densification, undercutting, or in-place stabilization may be required. The extent of densification, undercutting and/or in-place stabilization required across the site can best be determined by a geotechnical engineer/geologist at the time of construction. Once the areas where new fill placement is planned have been properly prepared, at-grade construction may proceed.

6.3 CONTROLLED STRUCTURAL FILL

The majority of the project site will require excavation/cut to achieve the planned finished grades. Where required, controlled structural fill may consist of the non-organic, on-site residual soils. Based on laboratory testing on bulk samples obtained from other transition stations and substations sites along the transmission line corridor, we anticipate that off-site borrow material will consist of sandy silt, silty sand, or sand with a USCS classification of ML, SM or SP. Other materials may be suitable for use as controlled structural fill and should be individually evaluated by the geotechnical engineer; in general the structural fill should have a USCS classification of CL, ML, SM, or SC. Controlled structural fill should be free of boulders, organic matter, debris, or other deleterious materials and should have a maximum particle size no greater than 3 inches.

Fill materials should be placed in horizontal lifts with a maximum height of 8 inches loose measure. New fill should be adequately keyed into stripped and scarified subgrade soils and should, where applicable, be benched into the existing slopes. During fill operations, positive surface drainage should be maintained to prevent the accumulation of water. We recommend that structural fill (soil and crushed stone) be compacted to a minimum of 95 percent of the maximum dry density and within two (2) percentage points of the optimum moisture content determined by the modified Proctor density test (ASTM D 1557). In confined areas such as utility trenches, portable compaction equipment and thin lifts of 3 to 4 inches may be required to achieve specified degrees of compaction. Each lift of fill should be tested in order to confirm that the recommended degree of compaction is attained.

6.4 SLOPE STABILITY

6.4.1 General

We recommend that cut and fill slopes have a minimum factor of safety of 1.3 for global stability. Proposed structures on the Transition Station #3 site should be located a minimum distance of 10 feet and 15 feet from the crest and toe of slopes, respectively. In addition, we recommend that roadways be designed with a minimum setback of 5 feet from both the crest and toe of slopes.

Drainage from nearby structures and/or surface runoff should be directed away from the crest and toe of both planned cut and fill slopes. We note that diversion of surface water away from the slope crest and face is critical to reducing the potential of surface erosion and shallow failures. For erosion protection, a protective cover of grass or other vegetation should be established on permanent soil slopes as soon as possible.

6.4.2 New Slope Stability

New slopes constructed to develop the planned finished grade of the transition station pad will generally consist of cut slopes up to 25 feet high and fill slopes less than 10 feet high. Both cut and fill slopes will have a configuration of 3 (Horizontal) to 1 (Vertical). We anticipate that the planned cut and fill slopes will exhibit a factor of safety (FoS) of 1.5 or greater for global stability if constructed in accordance with the recommendations presented herein.

6.5 GROUNDWATER CONDITIONS

6.5.1 General

Based on the data obtained during our exploration program, we generally anticipate that groundwater will not be encountered during expected earthwork or shallow foundation excavations at the site. However, we do anticipate perched groundwater existing immediately above bedrock.

6.5.2 Infiltration Basin Estimated Seasonal High Water Table (ESHWT)

Borings INF 301 and INF 302 were performed to characterize the subsurface conditions to a depth of approximately 5 feet below the planned infiltration basin bottom and provide information necessary to estimate the seasonal high water table within the basin footprint. Subsurface data recorded in the infiltration test borings are shown on the respective logs included in

Appendix B, and the results of infiltration test performed immediately adjacent to each boring are provided in Appendix E. Table 4 below presents a summary of the interpreted ESHWT at each infiltration test location as well as pertinent information required for design of the basins.

Table 4 – Infiltration Basin Summary Information

Description	Boring INF 301	Boring INF 302
Infiltration Planned Bottom Elev. (ft)	1801.5	1801.5
Encountered Very Dense/Very Hard Soil Elev. (ft)	N.E.	N.E.
Encountered Bedrock Elev. (ft)	1797	1796
Encountered Groundwater Elev. (ft)	N.E.	N.E.
Highest Elevation of Observed Redox Features	N.E.	N.E.
USDA Textural Class (with 5 ft of Basin Bottom)	Fine Sandy Loam	Fine Sandy Loam
Estimated Seasonal High Water Table (ESHWT) Elev. (ft)	Below 1796	Below 1796
Infiltration Test Elevation (ft)	1798	1798
Average Infiltration Rate at Test Elevation (in/hr)	18.0	9.9

Notes:
1) Borings generally extended about 5 feet below the planned depth of each respective basin unless where refusal and/or bedrock was encountered.
2) N.E. = Not Encountered
3) Very Dense/Very Hard Soil is defined as material exhibiting an SPT N-Value of greater than 50 blows per foot (bpf).
4) Noted elevations are estimates and should be considered approximate.
5) The average infiltration rate presented is based on field measurements; a factor of safety has not been applied.

6.6 GEOTECHNICAL DESIGN STRENGTH PARAMETERS

Recommended geotechnical strength parameters are provided for the subsurface conditions encountered in each test boring (not including infiltration test borings) in Appendix F. The recommended strength parameters for soil and completely or highly weathered bedrock (CWR or HWR) were developed based on consideration of lab test results and established correlations with SPT data.

For bedrock described as moderately weathered or better, parameters in the form of equivalent Mohr-Coulomb parameters were developed and are recommended for strength properties of the rock mass. The equivalent Mohr-Coulomb strength properties were developed based on fitting an average linear relationship to the curve generated by solving for the Generalized Hoek-Brown failure criterion over an estimated range of minor principal stress values (Hoek et. al, 2002). The range of minor principal stresses was assumed as that common to a typical slope of up to 25 feet in height. The computer program RocLab (developed by Rocscience Inc.) was used to the estimate rock mass equivalent Mohr-Coulomb strength properties provided in Appendix F.

6.7 FOUNDATION DESIGN AND CONSTRUCTION

6.7.1 General

Foundation support for the bus support structure (including ancillary pole structures) would typically require deep foundations to resist shear and overturning loads. However, subsurface conditions encountered in borings BH 305, BH 306, and BH 307 indicate that excavation through bedrock will be required to achieve the planned finished grade of the transition station pad. As a result, foundations for the bus structure and ancillary pole are anticipated to bear on or within highly to slightly weathered bedrock. Driven and helical pile support is not suitable for subgrades consisting of rock. We recommend that foundations for the bus support structure and ancillary poles consist of either drilled shafts or spread foundations (with or without rock anchors) at the Transition Station #3 site.

The transformer pad and equipment support buildings (if planned) may be supported on slab-on-grades and shallow foundations, respectively, bearing on approved residual soils, bedrock, or new controlled structural fill material placed in accordance with recommendations provided herein. Recommendations relative to drilled shaft and shallow foundation design and construction are provided in the following subsections.

6.7.2 Drilled Shaft Foundations (Bus Support Structure)

Based on the bedrock conditions encountered in borings BH 305, BH 306, and BH 307 below an elevation of 1820 feet, we recommend the allowable axial values and the associated LPILE (lateral) parameters shown in Tables 5 and 6, respectively, be used for design of drilled shaft foundations. Total settlement of drilled shaft foundations designed per the recommendations provided below is estimated to be less than ½ inch.

Table 5 – Recommended Drilled Shaft Axial Design Parameters

Sublayer Description	Sublayer Depth (ft)		Material Description	Allowable Skin Friction (Comp.) (psf)	Allowable Skin Friction (Uplift) (psf)	Allowable End Bearing (psf)
	Top	Bottom				
Bedrock	0	3	HW to F Quartzite & Phyllite	IGNORE		
	3+	-	SW to F Quartzite & Phyllite	9,300	7,800	100,000

Notes:

1) Ultimate skin friction and end bearing capacities determined per methods prescribed in FHWA GEC 10: *Drilled Shaft: Construction Procedures and LRFD Design Methods* (2010).
2) Allowable capacities for skin (comp), skin (uplift), and end-bearing determined by applying a factor of safety of 2.5, 3.0 and 3.0, respectively.

Table 6 – Recommended Drilled Shaft Lateral (LPILE) Design Parameters

Sublayer Description	Sublayer Depth (ft)		Material Description	Effective Unit Weight (pcf)	Effective Friction Angle (deg)	Soil Modulus Constant (k) (pci)	Unconfined Comp. Strength (psi)	m_i	Poisson's Ratio	Geologic Strength Index (GSI)	Rock Mass Modulus (psi)
	Top	Bot.									
Bedrock	0	3	HW to F Quartzite & Phyllite	150	-	-	1,000	7	0.30	20	25,100
	3+	-	SW to F Quartzite & Phyllite	175	-	-	4,000	7	0.25	50	845,000

Note:
1) Use of the Massive Rock constitutive model provided in LPILE2016 is recommended for each sublayer.

<u>Additional Drilled Shaft Design Recommendations</u>

- Due to strain incompatibilities, drilled shaft design based entirely on skin friction or end bearing is recommended.
- A minimum shaft length (below the ground surface) of 5 feet is recommended.
- A minimum shaft diameter of 30 inches is recommended.
- Should multiple shaft foundations be required, the minimum center-to-center spacing should be three (3) times the shaft diameter.

6.7.3 Drilled Shaft Construction

We recommend that the proposed drilled shaft construction equipment, methods, procedure and planned quality control testing and inspection during construction be reviewed by a qualified geotechnical engineer prior to the start of shaft construction. The ability of a drilled shaft to provide the end bearing resistances and associated settlements described herein is directly related to the construction methods and procedures used to provide a clean shaft bottom condition. Drilled shaft excavation and clean out methods shall result in bases/bottoms that are free of loose, soft, or disturbed material. Cleaning of the shaft excavations shall result in a maximum of 1 inch of loose, soft, or disturbed material on the shaft bottom at the time of concrete placement. Should concrete placement within the shaft not occur immediately following excavation and clean out, the shaft bottom shall be re-verified to confirm that it is free of loose, soft, or disturbed material prior to concrete placement. Inspection of the installation methods and materials by an individual qualified and experience in drilled shaft construction is recommended.

Placement of concrete via free-fall methods is acceptable assuming placement is directed vertically downward avoiding impact with reinforcement and that the height of groundwater on the bottom of the shaft does not exceed 3 inches at the time of placement. Should the level of water at the bottom of the excavation not be maintained at less than 3 inches, concrete placement via tremmie methods will be required.

6.7.4 Shallow Foundations (Bus Support Structure, Transformer Pad, and Equip. Bldgs)

Bus Support Structure

As an alternative to drilled shafts, shallow foundations with or without anchors may be used to support the bus support structure and/or ancillary poles. The shallow foundations may bear directly on a minimum 4-inch thick layer of compacted crushed stone placed directly overtop an approved bedrock surface. The purpose of the 4-inch thick compacted crushed layer is to provide a level bearing surface for the cast-in-place foundation. We recommend that shallow foundations bearing on bedrock subgrades be design for a maximum allowable bearing pressure of 20 kips per square foot (ksf).

To resist uplift and overturning forces and reduce the potential size of a concrete foundation, rock anchors may be utilized in conjunction with shallow foundations. We recommend that rock anchors be designed in accordance with recommendations provided in the Post Tension Institute's (PTI) *Recommendations for Prestressed Rock and Soil Anchors* (2016). Rock anchors should be designed using an ultimate bond stress of 150 pounds per square inch (psi), and with a proof-testing program developed and implemented during construction.

Transformer Pad

Where planned (vicinity of boring BH 305 and BH 306), we anticipate that excavation required to develop planned final grades will result in the transformer pad bearing on weathered or hard bedrock. An approved subgrade consisting of weathered or hard bedrock will provide suitable support for a transformer pad designed to impart an approximate uniform bearing pressure of up to 500 pounds per square foot (psf). We recommend that a layer of compacted crushed stone with a minimum thickness of 4 inches be placed directly over top the bedrock surface to provide a level bearing surface for the slab. The maximum total settlement induced by the transformer slab loads is anticipated to be negligible.

Single-Story Equipment Structures

Should single-story buildings be required to house equipment operated at the transition station, they may be supported on shallow foundations bearing on approved residual soils, bedrock, or new controlled, structural fill material placed in accordance with recommendations provided herein. We recommend that building foundations be designed for a maximum allowable bearing pressure of 3,000 psf for foundations bearing on approved subgrades. To reduce the possibility of localized shear failures, spread and strip footings should be a minimum of 3-feet and 1.5-feet wide, respectively.

For single-story structures designed for a maximum allowable bearing pressure of 3,000 psf on approved residual soil or new controlled structural fill, total settlements of about ½ inch with differential settlements of 1/2 to 2/3 the total estimated settlement are anticipated. For foundations bearing on bedrock, we anticipate that total settlements will be less than ½ inch. Settlements induced by shallow foundation loads should occur soon after the load is applied.

6.7.5 Shrink-Swell and Frost Depth Considerations

Based on the soil materials observed in the test boring samples and the laboratory test results, the on-site soils will generally have a low shrink-swell potential. Accordingly, we do not recommend any foundation design modifications relative to the potential for shrink swell soils.

Frost depth should be anticipated to be 4 feet below the lowest adjacent grade. Therefore, utilities that are susceptible to frost action and building foundations bearing on soil subgrades should bear a minimum of 4 feet below adjacent grades.

6.7.6 Shallow Foundation Construction

All foundation subgrades should be observed, evaluated, and verified for the design bearing pressure by a representative of the geotechnical engineer after excavation and prior to reinforcement steel placement. If low density/consistency soils are encountered at the foundation subgrade during construction, localized undercutting and/or in-place stabilization of foundation subgrades may be required. Loose and/or fractured bedrock material resulting from the excavation process shall be removed from the foundation subgrade to expose intact bedrock. The actual need for, and extent of, undercutting or in-place stabilization should be based on field observations made by a representative of the geotechnical engineer at the time of construction.

Excavations for footings should be made in such a way as to provide bearing surfaces that are firm and free of loose, soft, wet, or otherwise disturbed soils. Foundation concrete should not be placed on frozen or saturated subgrades. If such materials are allowed to remain below foundations, settlements will increase. Foundation excavations should be concreted as soon as practical after they are excavated. If an excavation is left open for an extended period, a thin mat of lean concrete should be placed over the bottom to minimize damage to the bearing surface from weather or construction activities. Water should not be allowed to pond in any excavation.

6.8 EARTHQUAKE CONSIDERATIONS

6.8.1 Seismic Site Class Definition

The following recommendations are based Chapter 20 of the ASCE 7-10. ASCE 7-10 provides a methodology for interpretation of SPT resistance values (N-values) to determine a Site Class Definition; however, this method requires averaging N-values over the top 100 feet of the subsurface profile. We note that the test borings for this project were extended to a maximum depth of about 22 feet below existing site grades.

The available subsurface data from our exploration indicates an N-value range of about 2 to greater than 100 bpf within the upper 22 feet below existing site grades. In general accordance with ASCE 7-10 and considering the boring data and planned grading, we recommend that a Site Class Definition “C” be used for design.

6.8.2 Liquefaction

Liquefaction of saturated, fine grained sands and silty sands is not anticipated to be a design concern for the Transition Station #3 site.

6.9 PAVEMENT DESIGN

The following pavement design recommendations were developed considering recommendations presented in the 1993 *AASHTO Guide for Design of Pavement Structures* and the project owner's (Eversource) minimum pavement standards for the project. The following assumptions were made in development of the following pavement design recommendations.

- a minimum subgrade design CBR value of 5
- assumed traffic type and volume consisting of a limited number of cars (light single axel vehicles) and HS-20 semi-trailer vehicles that impart less than 50,000 equivalent single axel loads (ESALs) over the design life of the roadway
- subgrade soils supporting pavements are evaluated and prepared in accordance with recommendations presented herein

Based on these assumptions and considering the client specified minimum pavement section, we recommend using the following asphalt pavement section.

Pavement Section	Minimum Layer Compacted Thickness (in)
Asphalt Surface	4
Subbase Course (Compacted Crushed Stone Aggregate)	8

Controlled structural fill underlying pavements shall be placed in accordance with the controlled structural fill recommendations presented in Section 6.3 of this report. In addition, all pavement subgrades should be proofrolled as described in Section 6.3 of this report and evaluated by a geotechnical engineer prior to the subbase course placement. Asphalt and aggregate course material and placement shall be in accordance with requirements stipulated in the New Hampshire Department of Transportation's 2016 *Standard Specifications for Road and Bridge Construction* manual.

6.10 KARST GEOLOGY

Karst topography occurs from the dissolution of soluble bedrock (such as limestone, dolomite, or gypsum) which creates karst features (sinkholes and caves) within the subsurface. Karst conditions were not encountered during the exploration reported herein. Karst features/conditions are not anticipated to be a design or construction concern for the Transition Station #3 site.

6.11 CORROSION CONSIDERATIONS

Samples obtained from borings BH 304 and BH 309 were tested in the laboratory to determine pH, water soluble sulfate and chloride, and resistivity. The results of the lab tests are summarized in Table 7 below.

Table 7 – Laboratory Corrosivity Test Results

Boring No.	Sample Type & Depth (ft)	pH	Chloride (ug/g)	Sulfate (ug/g)	Electrical Resistivity (ohm-cm)
BH 304	SS (4 6.5)	6.0	< 5.5	11	31,000
BH 309	BULK (1 - 6)	7.5	< 5.4	20	26,000

SS = Split-Spoon Sample

In general, soils that exhibit a resistivity of greater than 5,000 ohm-cm are considered non-aggressive (FHWA, 2010). Therefore, based on the results of the laboratory test performed on samples collected from the Transition Station #3, the onsite soil should be considered as non-aggressive. Laboratory tests performed on samples collected at other transition and substation sites to date have yielded similar non-aggressive results. However, should the borrow source used to develop portions of the Transition Station #3 site originate from a location other than one of the transition or substation sites, corrosivity testing on representative soil samples from the source is recommended prior to onsite delivery to confirm that it is non-aggressive.

6.12 EXCAVATION CONDITIONS

Based on the test boring data and planned finished grades, difficult excavation conditions (i.e. excavation of weathered bedrock and hard bedrock) will be encountered during the site development. Table 8 below provides a summary of locations (including Haley & Aldrich's Boring No. A) where weathered and/or hard bedrock were encountered near or above the planned finished grades. Based on the summary information presented in Table 8, excavation into hard bedrock to achieve planned finished grades in the vicinity of BH 305 and BH 307 is expected to require blasting for rock removal. Should blasting be implemented to facilitate excavation to planned finished grades, care should be taken to no over-blast or damage the bedrock subgrade supporting planned structures.

Table 8 – Boring Locations Where Rock Was Encountered Near or Above the Planned Finished Elevation

Boring No.	Boring Elevation	Planned Finished Elevation (ft)	Min. Excavation Depth (ft)	Depth To CWR/HWR (ft)	Depth to Hard Bedrock (ft)
H&A No. A	1823.5	1820	3.5	2.3	9.2
BH 305	1833.0	1820	13.0	2.0	12.0
BH 306	1832.9	1820	12.9	10.0	15.0
BH 307	1836.7	1820	16.7	2.5	6.0
BH 308	1841.7	1832	9.7	4.5	8.0
BH 309	1838.0	1832	6.0	6.0	7.0

CWR = Completely Weathered Bedrock
HWR = Highly Weathered Bedrock

7.0 LIMITATIONS

This report has been prepared for the exclusive use of PAR Electrical Contractors, Inc. or their agent, for specific application to the Transition Station #3 project near Clarksville, New Hampshire. The conclusions and recommendations presented herein are based on design information furnished to us, the data obtained from the previously described subsurface exploration programs, and generally accepted geotechnical engineering practice. The conclusions and recommendations do not reflect variations in subsurface conditions which could exist intermediate of the boring locations or in unexplored areas of the site. Should such variations become apparent during construction, it will be necessary to re-evaluate our conclusions and recommendations based upon on-site observations of the conditions.

The soil and rock descriptions/classifications and the strata breaks shown on the boring logs attached to this report are based primarily on visual observation and should be considered approximate. Regardless of the thoroughness of a subsurface exploration, there is the possibility that conditions between borings will differ from those at the boring locations, that conditions are not as anticipated by the designers, or that the construction process has altered the soil conditions. Therefore, experienced geotechnical engineers or engineering geologists should evaluate earthwork and foundation construction to verify that the conditions anticipated in design actually exist.

In the event that changes are made in the design or location of the project, the recommendations presented in the report shall not be considered valid unless the changes are reviewed by Quanta Subsurface and conclusions of this report modified and/or verified in writing. If this report is copied or transmitted to a third party, it must be copied or transmitted in its entirety, including text, attachments, and enclosures. Interpretations based on only a part of this report may not be valid.

8.0 REFERENCES

- Haley & Aldrich, Inc.; *Geotechnical Data Report – Clarksville – Stewartstown Underground Route: Northern Pass Transmission Project*; February 13, 2014.
- Hoek, E, Carranza-Torres, C. and B. Corkum; Hoek-Brown Failure Criteria – 2002 Edition; 2002.
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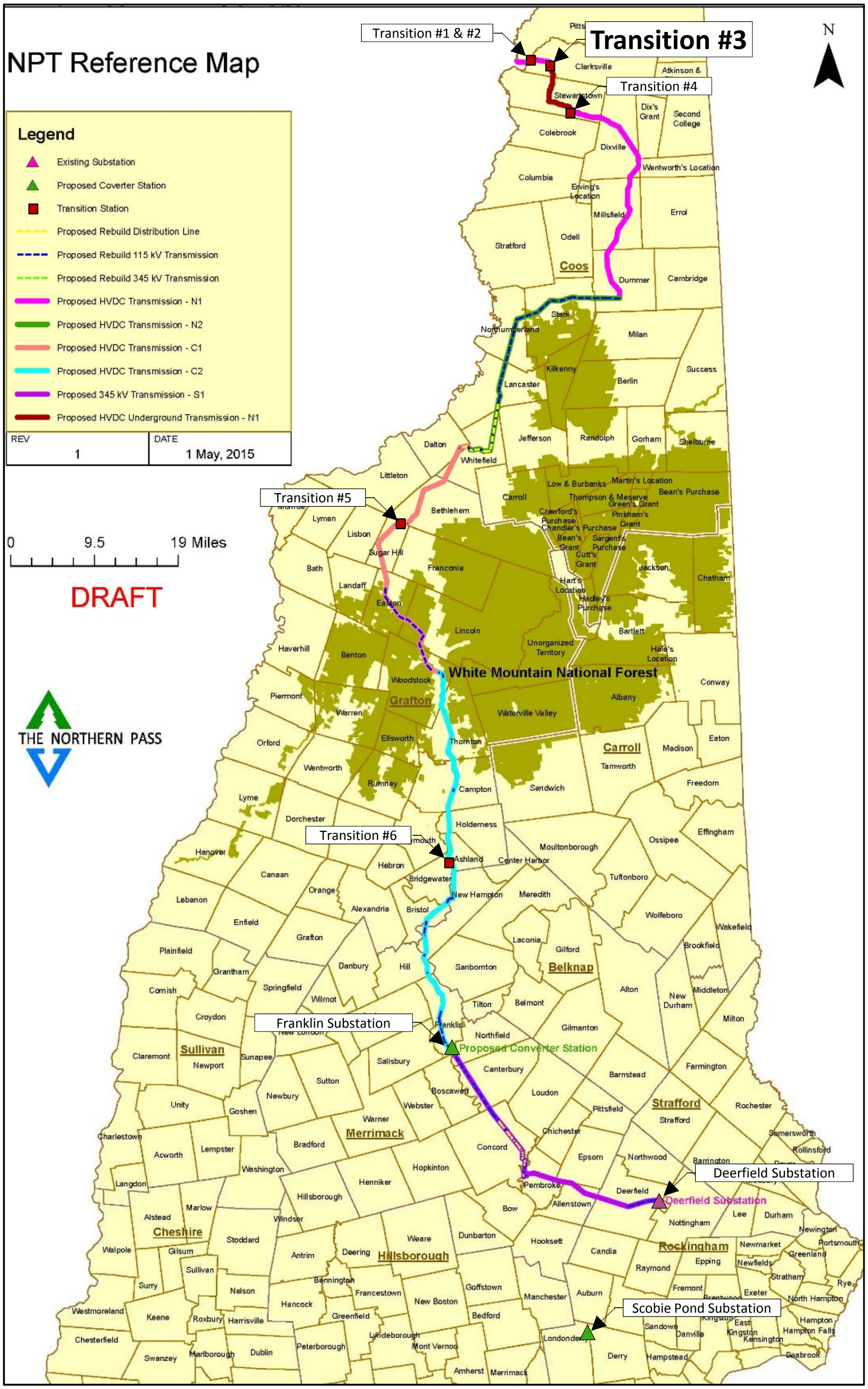
Figures



Project No.: 16004 Date: December 2016

Figure 1
Site Vicinity Location Plan

QUANTA SUBSURFACE
Engineering – Construction

Northern Pass TL – Transition Station #3
Geotechnical Investigation

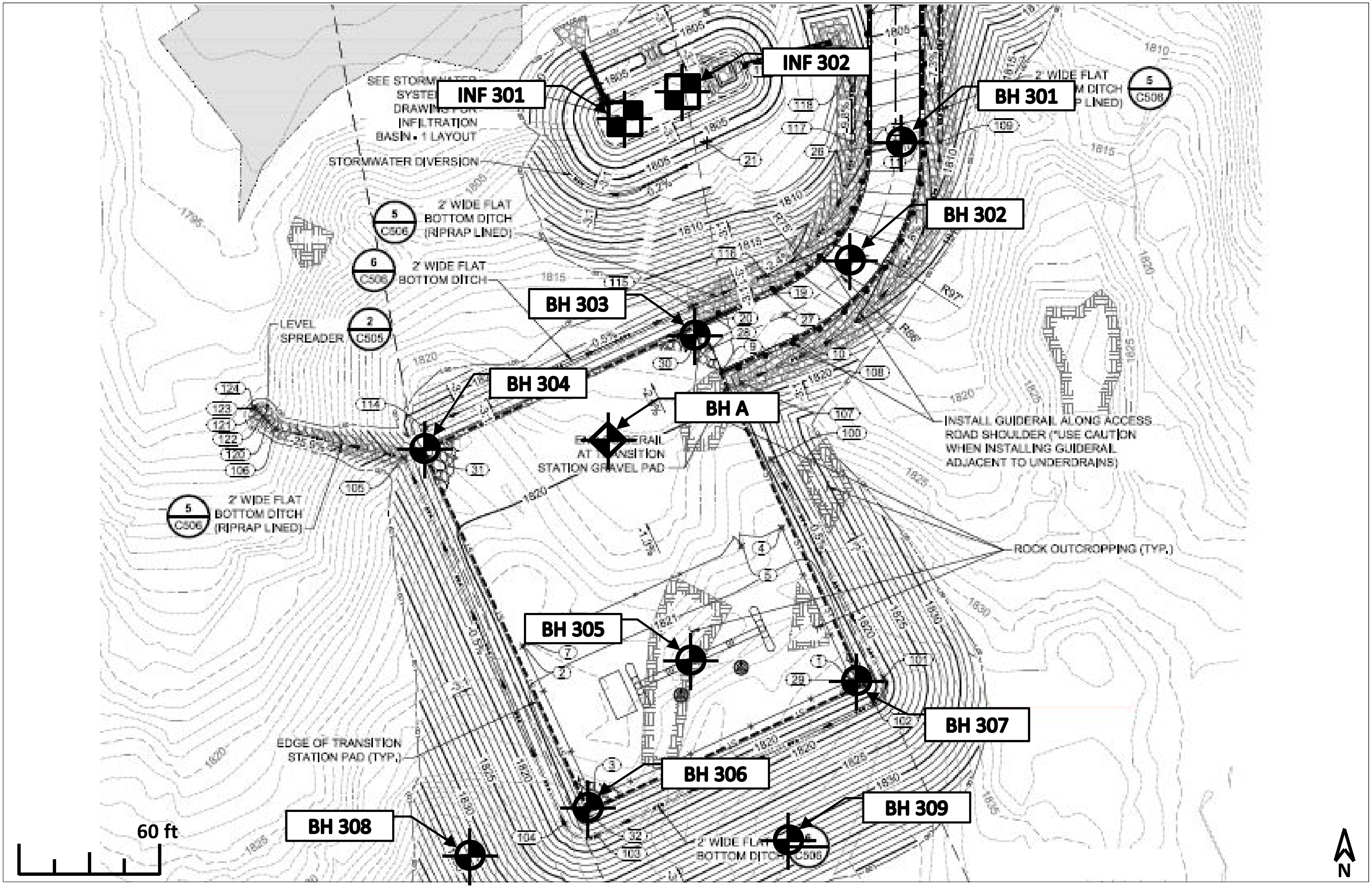
Base Map: Google Earth, 2016.

Project No.: 16004 Date: December 2016

Figure 2
Site Vicinity Map

QUANTA SUBSURFACE
Engineering – Construction

Northern Pass TL – Transition Station #3
Geotechnical Investigation



Base Map: Transition Station #3: NPTT304-C101 Geotech.dwg

Quanta Subsurface Boring Location, August/September 2016

Haley & Aldrich, Inc. Boring Location, February 2014

Quanta Subsurface Infiltration Location, August/September 2016

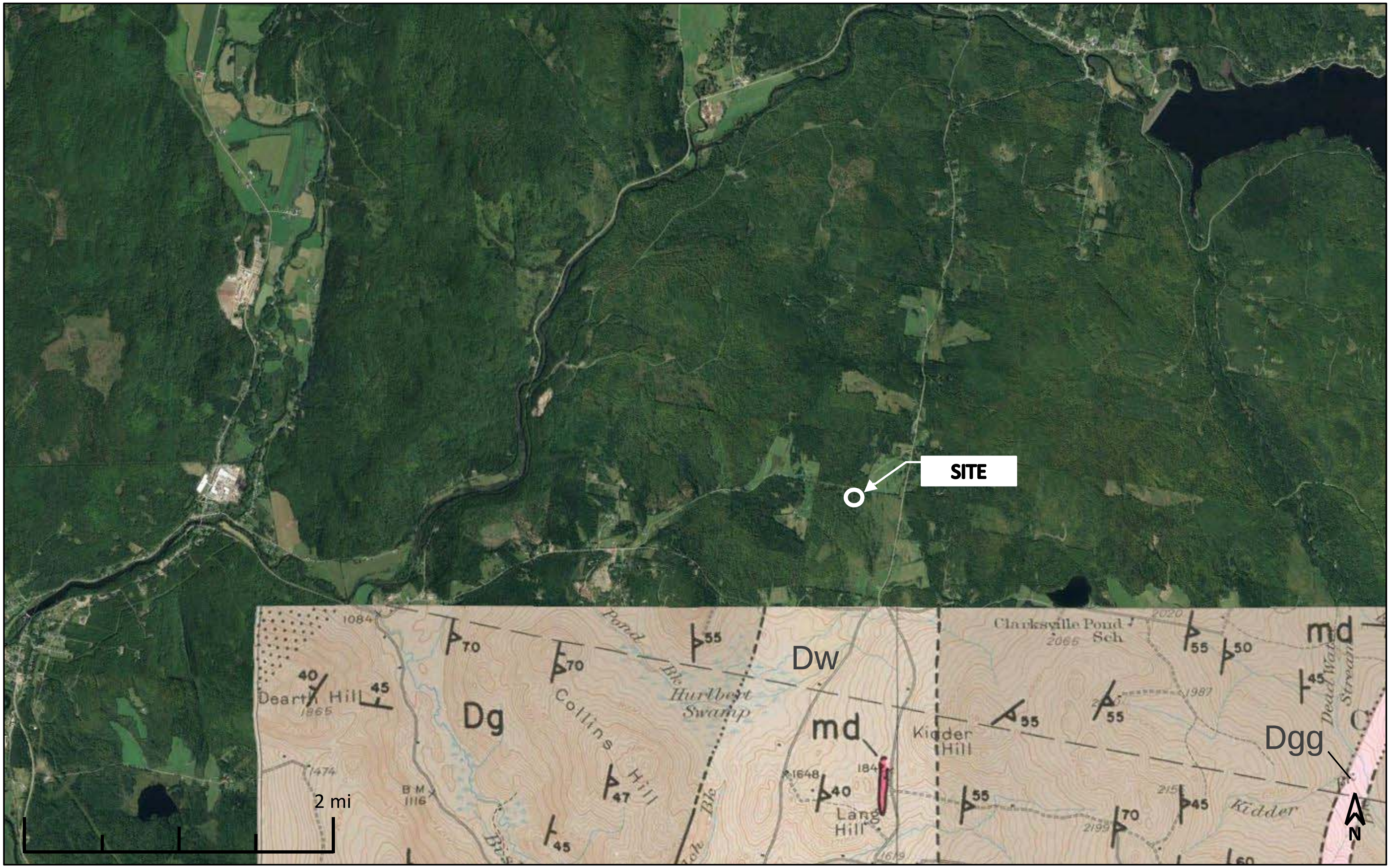
Figure 3

Boring Location Map

Project No.: 16004 Date: December 2016

QUANTA SUBSURFACE Engineering – Construction

Northern Pass TL – Transition Station #3
Geotechnical Investigation



Base Map: New Hampshire Department of Resources and Economic Development, *Geologic Map and Structure Sections of the Dixville Quadrangle New Hampshire (Plate 1)*

Legend:

Dg	**Gile Mountain Formation – Phyllite/Micaceous Quartzite/Schist**
Dw	**Waits River Formation – Phyllite/Micaceous Quartzite**
Dgg	**Gile Mountain Formation – Greenstone and Amphibolite Lenses**
md	**Epidote Amphibolite/Amphibolite**

Figure 4

Bedrock Geologic Map

Project No.: 16004

Date: December 2016

QUANTA SUBSURFACE

Engineering – Construction

Northern Pass TL – Transition Station #3
Geotechnical Investigation

Appendix A
H&A Boring Logs

HALEY & ALDRICH

TEST BORING REPORT

Boring No. A

Project	NORTHERN PASS, PITTSBURG-CLARKSVILLE-STEWARTSTOWN, NEW HAMPSHIRE
Client	BURNS & MCDONNELL
Contractor	NEW HAMPSHIRE BORING, INC.

File No.	40460-004
Sheet No.	1 of 2
Start	October 29, 2013
Finish	October 30, 2013
Driller	W. Hoeckele
H&A Rep.	S. Shay
Elevation	1823.5 (est.)
Datum	NAVD 88
Location	See Plan

	Casing	Sampler	Barrel
Type	HW	S	NX
Inside Diameter (in.)	4.0	1 3/8	2.0
Hammer Weight (lb)	300	140	-
Hammer Fall (in.)	24	30	-

Drilling Equipment and Procedures

Rig Make & Model: Diedrich D-50 Track
Bit Type: Roller Bit
Drill Mud: Polymer
Casing: HW Drive to 3.3 ft, NW Spin 14.9 ft
Hoist/Hammer: Winch Safety Hammer
PID Make & Model: None

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	2 7	S1 8	0.0 1.0	1822.5 1.0	SM	Loose dark brown silty SAND (SM), mps 9 mm, no structure, no odor, moist, trace roots, disturbed -TOPSOIL/FILL-				25	30	45				
	31 35	S1A 8	1.0 2.0		SP-SM	Dense gray-brown poorly graded SAND with silt and gravel (SP-SM), mps 2.6 cm, no structure, no odor, moist -GLACIAL TILL DEPOSITS-	5	10	20	20	35	10				
	73 100/3"	S2 7	2.0 2.8	1821.2 2.3	SM	Very dense dark gray-brown silty SAND with gravel (SM), mps 2 cm, no structure, no odor, moist, possible residual soil from weathered rock in spoon tip TOP OF WEATHERED BEDROCK 2.3 FT SEE CORE BORING REPORT FOR ROCK DETAILS	5	20	10	20	15	30				
5																
10																
15																

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
10/30/2013	07:55	16	3.3	13.2	12.2
10/30/2013	13:00	5 min	3.3	17.6	11.4

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Samples 3S, 3C

Boring No. A

Field Tests:
Dilatancy: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

***Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**
Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

H&A-TEST BORING-07-1 NO OVERBURDEN HA-LIB09-BOS_ECG.GLB HA-TB+CORE+WELL-07-1.GDT \\MAN\COMMON\40460_NORTHERN PASS\FIELD\GINT LOGS\2013-1030-HAI-TEST_CORE BORINGS.GPJ Jan 28, 14

HALEY & ALDRICH

CORE BORING REPORT

SEE TEST BORING REPORT FOR OVERBURDEN DETAILS

Depth (ft)	Drilling Rate (min./ft)	Run No.	Run Depth (ft)	Recovery/RQD in.	Recovery/RQD %	Weathering	Elev./Depth (ft)	Visual Description and Remarks
	3		4.0 9.0	0	0	High to complete		No recovery
5	1							
	2							
	2							
	4							
	4	S3	9.0 9.2				1814.5 9.0	Completely weathered rock. Very dense gray-brown completely weathered rock. Fissile rock fabric present. Note: SPT attempt 9.0 - 9.2 ft (100/2").
10	5	C1	9.2 13.2	26 0	54 0	Moder-ate	1814.3 9.2	TOP OF BEDROCK 9.2 FT Moderately hard, moderately weathered, dark gray, aphanitic matrix with coarse grained quartz inclusions, CALCAREOUS PHYLLITE. Foliation extremely thin to thin, dipping at moderate angles. Joints at low angles at quartz zones, rough, stepped, discolored, open. Graphitic, fissile especially at bottom of core, 75 - 100 gallons water loss during drilling. Graphitic/metallic film on mud tub wash water. Core barrel jammed at 13.2 ft. Increased RPM for last 1 inch of core run. Note: SPT attempt 13.2 ft (100/0").
	10							
	7							
	4	C2	13.2 15.2	16 13	67 54	Slight		Hard, slightly weathered, gray, aphanitic CALCAREOUS PHYLLITE. Foliation extremely thin to thin, dipping at moderate angles. Joint dipping at low angles, rough, stepped, slightly discolored, open, quartz as secondary mineralization. Note: Advanced NW spin casing to 14.9 ft.
	4							
15	7	C3	15.2 17.6	24 13	83 45	Slight		Similar to C2 above except slight foliation confined to top 0.8 ft of core, grading to planar bedding with frequent drill breaks parallel to bedding. Low water loss C3.
	8							
	10/0.4'						1805.9 17.6	BOTTOM OF EXPLORATION 17.6 FT
20								
25								
30								

Appendix B
QS Boring Logs

Quanta Subsurface
4308 N Barker RD
Spokane Valley, WA 99027
Telephone: 509-892-9409

BORING NUMBER BH 301

CLIENT PAR Electrical Contractors
PROJECT NAME Northern Pass TL - Transition Station #3
PROJECT NUMBER 16004
PROJECT LOCATION Clarksville, New Hampshire

DATE STARTED 9/2/16 **COMPLETED** 9/2/16
GROUND ELEVATION 1808.0 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR SW Cole
LATITUDE 45.0107 **LONGITUDE** -71.42108056
DRILLING METHOD Hollow Stem Auger
DRILLING EQUIPMENT CME 850 **SPT HAMMER** Automatic
LOGGED BY S. Laing **CHECKED BY** J.T. McGinnis
GROUND WATER LEVEL:
NOTES
AT TIME OF DRILLING Not Encountered

ELEV (ft)	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	GRAPHIC LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
	0						TOPSOIL: Sandy Lean CLAY (CL), little fine gravel, trace organics, moderate brown, wet, firm				
		SPT 1	75	2-4-16-23 (20)			RESIDUAL: Sandy SILT (ML), little fine gravel, dark yellowish brown to moderate gray, wet, very stiff, fine grained sand, angular				
1805											

Auger Refusal at 3.0 feet
Bottom of Borehole at 3.0 feet

GEOTECH BH COLUMNS - DF STD US LAB E-M.GDT - 12/9/16 12:00 - C:\USERS\JTMCGINNIS\DOCUMENTS\16004 GINT\16004 NORTHERN PASS TRANSITION 3.GPJ

Quanta Subsurface
4308 N Barker RD
Spokane Valley, WA 99027
Telephone: 509-892-9409

BORING NUMBER BH 302

CLIENT PAR Electrical Contractors
PROJECT NAME Northern Pass TL - Transition Station #3
PROJECT NUMBER 16004
PROJECT LOCATION Clarksville, New Hampshire

DATE STARTED 9/2/16 **COMPLETED** 9/2/16
GROUND ELEVATION 1814.4 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR SW Cole
LATITUDE 45.01043611 **LONGITUDE** -71.42113611
DRILLING METHOD Hollow Stem Auger
DRILLING EQUIPMENT CME 850 **SPT HAMMER** Automatic
LOGGED BY S. Laing **CHECKED BY** J.T. McGinnis
GROUND WATER LEVEL:
NOTES
AT TIME OF DRILLING Not Encountered

ELEV (ft)	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	GRAPHIC LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
	0	SPT 1	54	1-1-3-8 (4)			TOPSOIL: Lean CLAY with sand (CL), trace silt, trace organics, olive brown, moist, soft	30.5			
							RESIDUAL: Silty SAND (SM), little fine gravel, dark yellowish brown, moist, medium dense, fine grained sand, subrounded				
		SPT 2	58	10-12-15-4 (27)			- moderate yellowish brown from 3 to 6 feet	12.1			45.1
1810	5	SPT 3	75	8-9-11-20 (20)							
		SPT 4	63	26-24-32-41 (56)			BEDROCK: Completely weathered (V), thinly foliated, moderate gray, fine to coarse, extremely weak (R0) to very weak (R1), very poor, PHYLLITE, partial iron staining				
1805	10	SPT 5	83	27-18-28-50 (46)			- iron staining increases from 8 to 12 feet				
		SPT 6	75	40-44-32-28 (76)							

Bottom of Borehole at 12.0 feet

GEOTECH BH COLUMNS - DF STD US LAB E-M.GDT - 12/9/16 12:00 - C:\USERS\JTMCGINNIS\DOCUMENTS\16004 GINT\16004 NORTHERN PASS TRANSITION 3.GPJ

QUANTA SUBSURFACE Engineering + Construction

Quanta Subsurface
4308 N Barker RD
Spokane Valley, WA 99027
Telephone: 509-892-9409

BORING NUMBER BH 303

CLIENT PAR Electrical Contractors

PROJECT NAME Northern Pass TL - Transition Station #3

PROJECT NUMBER 16004

PROJECT LOCATION Clarksville, New Hampshire

DATE STARTED 9/6/16 **COMPLETED** 9/6/16

GROUND ELEVATION 1818.2 ft **HOLE SIZE** 6"

DRILLING CONTRACTOR SW Cole

LATITUDE 45.010325 **LONGITUDE** -71.42143611

DRILLING METHOD Hollow Stem Auger

DRILLING EQUIPMENT CME 850 **SPT HAMMER** Automatic

LOGGED BY S.Tiger **CHECKED BY** J.T. McGinnis

GROUND WATER LEVEL:

NOTES

AT TIME OF DRILLING Not Encountered

ELEV (ft)	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	GRAPHIC LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)	REMARKS
	0	SPT 1	75	1-2-2-2 (4)			FILL: Silty SAND (SM), little organics, brownish gray, moist, very loose, fine to medium grained sand, subangular					Organic Content: 6.5% at 1 feet
1815		SPT 2	75	4-5-14-21 (19)			Silty SAND (SM), trace organics, trace fine gravel, moderate red, moist, medium dense to dense, fine to coarse grained sand, subangular				13.0	Organic Content: 5.3% at 3 feet
	5	SPT 3	100	17-17-29-27 (46)								Organic Content: 3.2% at 5 feet
		SPT 4	75	19-19-19-20 (38)			RESIDUAL: Silty SAND (SM), little fine to coarse gravel, moderate red, moist, dense to medium dense, fine to medium grained sand, subangular	17.4				
1810		SPT 5	100	5-5-9-12 (14)				22.6			22.6	
	10	SPT 6	45	7-50/5"			BEDROCK: Highly weathered (IV), thinly foliated, moderate red, fine to medium, very weak (R1), very poor, PHYLLITE					
1805												The auger broke off at 15 feet; SPT test at 15 feet was not performed.
	15											

Bottom of Borehole at 15.0 feet

BORING NUMBER BH 304

QUANTA SUBSURFACE
Engineering + Construction
Quanta Subsurface
4308 N Barker RD
Spokane Valley, WA 99027
Telephone: 509-892-9409

CLIENT PAR Electrical Contractors
PROJECT NAME Northern Pass TL - Transition Station #3
PROJECT NUMBER 16004
PROJECT LOCATION Clarksville, New Hampshire
DATE STARTED 9/2/16 **COMPLETED** 9/2/16
GROUND ELEVATION 1823.1 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR SW Cole
LATITUDE 45.01017778 **LONGITUDE** -71.42191111
DRILLING METHOD Hollow Stem Auger
DRILLING EQUIPMENT CME 850 **SPT HAMMER** Automatic
LOGGED BY S. Laing **CHECKED BY** J.T. McGinnis
GROUND WATER LEVEL:
NOTES
AT TIME OF DRILLING Not Encountered

ELEV (ft)	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	GRAPHIC LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)	REMARKS
	0						TOPSOIL: Lean CLAY with sand (CL), trace organics, moderate brown, moist, soft, fine grained sand					
		SPT 1	58	1-1-2-1 (3)			RESIDUAL: Silty SAND (SM), little fine gravel, yellowish brown, moist, very loose to dense, fine to coarse grained sand, angular - weak relict rock structure visible (derived from Phyllite)	24.1				
1820		SPT 2	33	3-4-14-16 (18)				17.9	33	NP	25.5	
	5	SPT 3	67	18-50/6"			BEDROCK: Highly weathered (IV), thinly foliated, gray, fine to coarse, very weak (R1), very poor, PHYLLITE					Combined Sample SS3 & SS4: % fines = 28.8% Resistivity = 31,000 ohm-cm pH = 6.0
		SPT 4	100	50/6"								

Auger Refusal at 7.0 feet
Bottom of Borehole at 7.0 feet

GEOTECH BH COLUMNS - DF STD US LAB E-M.GDT - 12/9/16 12:00 - C:\USERS\JTMCGINNIS\DOCUMENTS\16004 GINT\16004 NORTHERN PASS TRANSITION 3.GPJ

Quanta Subsurface
4308 N Barker RD
Spokane Valley, WA 99027
Telephone: 509-892-9409

BORING NUMBER BH 305

CLIENT PAR Electrical Contractors
PROJECT NAME Northern Pass TL - Transition Station #3
PROJECT NUMBER 16004
PROJECT LOCATION Clarksville, New Hampshire
DATE STARTED 9/7/16 **COMPLETED** 9/7/16
GROUND ELEVATION 1833.0 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR SW Cole
LATITUDE 45.00992222 **LONGITUDE** -71.42143889
DRILLING METHOD Hollow Stem Auger/Wet Rotary
DRILLING EQUIPMENT CME 850 **SPT HAMMER** Automatic
LOGGED BY S.Tiger **CHECKED BY** J.T. McGinnis
GROUND WATER LEVEL:
NOTES
AT TIME OF DRILLING Not Encountered

ELEV (ft)	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	GRAPHIC LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)	REMARKS
	0	SPT 1	75	15-6-7-9 (13)			TOPSOIL: Lean CLAY with sand (CL), trace organics, moderate brown, dry, fine grained sand	10.7				
							RESIDUAL: Lean CLAY with sand (CL), moderate brown, dry, stiff, fine grained sand					
1830		SPT 2	100	50/6"			BEDROCK: Highly weathered (IV), greenish gray, fine to coarse, very weak (R1), very poor, QUARTZITE, relict rock structure and quartz fragments, micaceous					
	5	SPT 3	100	30-50/6"								
1825							Auger Refusal at 5 feet Begin Roller Bit at 5 feet Highly weathered (IV), greenish gray, fine to coarse, very weak (R1) to medium weak (R2), very poor, QUARTZITE, relict rock structure and quartz fragments, micaceous					Roller-bit from 5 to 12 feet
1820	10	RC 1	97 (97)				Roller Bit Refusal at 12 feet Begin Coring at 12 feet Fresh (I) to slightly weathered (II), greenish gray, medium grained to coarse grained, very strong (R5), excellent, QUARTZITE, chlorite alteration and pyrite mineralization, micaceous - Fe oxidation and pitting 13.7 feet					UCS at 12.4 feet: 19,325 psi
	15											

Bottom of Borehole at 15.0 feet

GEOTECH BH COLUMNS - DF STD US LAB E-M.GDT - 12/9/16 12:00 - C:\USERS\JTMCGINNIS\DOCUMENTS\16004 GINT\16004 NORTHERN PASS TRANSITION 3.GPJ

QUANTA SUBSURFACE Engineering + Construction

Quanta Subsurface
4308 N Barker RD
Spokane Valley, WA 99027
Telephone: 509-892-9409

BORING NUMBER BH 306

CLIENT PAR Electrical Contractors
PROJECT NAME Northern Pass TL - Transition Station #3
PROJECT NUMBER 16004
PROJECT LOCATION Clarksville, New Hampshire
DATE STARTED 9/7/16 **COMPLETED** 9/7/16
GROUND ELEVATION 1832.9 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR SW Cole
LATITUDE 45.00972778 **LONGITUDE** -71.42162778
DRILLING METHOD Hollow Stem Auger
DRILLING EQUIPMENT CME 850 **SPT HAMMER** Automatic
LOGGED BY S.Tiger **CHECKED BY** J.T. McGinnis
GROUND WATER LEVEL:
NOTES
AT TIME OF DRILLING Not Encountered

ELEV (ft)	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	GRAPHIC LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)	REMARKS
	0	SPT 1	50	1-1-1-5 (2)			TOPSOIL: Lean CLAY with sand (CL), trace organics, trace silt, trace fine gravel, grayish brown, moist, soft, fine grained sand RESIDUAL: SILT with sand (ML), trace clay, grayish brown, moist, soft, fine to medium grained sand	33.2				A bulk sample was obtained from 1 to 10 feet. w% = 16.1% LL = 17; PI = NP % fines = 53.6%
1830		SPT 2	75	10-11-14-15 (25)			Sandy SILT (ML), trace fine gravel, grayish blue, moist, very stiff, fine to medium grained sand					
	5	SPT 3	83	7-10-10-9 (20)				12.8				
		SPT 4	100	8-7-8-9 (15)			- stiff from 6 to 8 feet					
1825		SPT 5	50	11-12-10-50 (22)			- weathered phyllite in shoe of SPT sampler					
	10						Auger Refusal at 10 feet Begin Roller Bit at 10 feet BEDROCK: Highly weathered (IV), dark gray, fine grained to medium grained, medium strong (R3) to medium weak (R2), very poor, PHYLLITE					Roller-bit from 10 to 15 feet
1820	15	RC 1	57 (40)				Roller Bit Refusal at 15 feet Begin Coring at 15 feet Slightly weathered (II) to moderately weathered (III), thinly foliated, dark gray, fine grained to medium grained, medium weak (R2) to medium strong (R3), poor, PHYLLITE - core loss from 16.4 to 17.5 feet					
1815	20	RC 2	80 (73)				Fresh (I) to slightly weathered (II), thinly foliated, dark gray, fine grained to medium grained, medium strong (R3) to strong (R4), fair, PHYLLITE					UCS at 17.7 feet: 5,369 psi

Bottom of Borehole at 20.0 feet

GEOTECH BH COLUMNS - DF STD US LAB E-M.GDT - 12/9/16 12:00 - C:\USERS\JTMCGINNIS\DOCUMENTS\16004 GINT\16004 NORTHERN PASS TRANSITION 3.GPJ

Quanta Subsurface
4308 N Barker RD
Spokane Valley, WA 99027
Telephone: 509-892-9409

BORING NUMBER BH 307

CLIENT PAR Electrical Contractors
PROJECT NAME Northern Pass TL - Transition Station #3
PROJECT NUMBER 16004
PROJECT LOCATION Clarksville, New Hampshire
DATE STARTED 9/7/16 **COMPLETED** 9/7/16
GROUND ELEVATION 1836.7 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR SW Cole
LATITUDE 45.00988333 **LONGITUDE** -71.421125
DRILLING METHOD Hollow Stem Auger
DRILLING EQUIPMENT CME 850 **SPT HAMMER** Automatic
LOGGED BY S.Tiger **CHECKED BY** J.T. McGinnis
GROUND WATER LEVEL:
NOTES
AT TIME OF DRILLING Not Encountered

ELEV (ft)	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	GRAPHIC LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
	0						TOPSOIL: Lean CLAY with sand (CL), trace organics, trace silt, grayish brown, moist, soft, fine to medium grained sand				
1835		SPT 1	75	1-1-6-3 (7)			RESIDUAL: Silty SAND (SM), trace organics, moderate red, moist, loose, fine to medium grained sand, subangular	21.6	32	NP	18.2
		SPT 2	100	4-22-28-26 (50)			BEDROCK: Completely weathered (V) to highly weathered (IV), moderate red, fine to coarse, extremely weak (R0) to very weak (R1), very poor, PHYLLITE				
	5	SPT 3	100	24-50/1"							

Auger Refusal at 6.0 feet
Bottom of Borehole at 6.0 feet

BORING NUMBER BH 308

Quanta Subsurface
4308 N Barker RD
Spokane Valley, WA 99027
Telephone: 509-892-9409

CLIENT PAR Electrical Contractors
PROJECT NAME Northern Pass TL - Transition Station #3
PROJECT NUMBER 16004
PROJECT LOCATION Clarksville, New Hampshire

DATE STARTED 9/6/16 **COMPLETED** 9/6/16
GROUND ELEVATION 1841.7 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR SW Cole
LATITUDE 45.00967778 **LONGITUDE** -71.42181944
DRILLING METHOD Hollow Stem Auger
DRILLING EQUIPMENT CME 850 **SPT HAMMER** Automatic
LOGGED BY S.Tiger **CHECKED BY** J.T. McGinnis
GROUND WATER LEVEL:
NOTES
AT TIME OF DRILLING Not Encountered

ELEV (ft)	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	GRAPHIC LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
	0	SPT 1	75	4-4-4-4 (8)			RESIDUAL: SILT with sand (ML), little gravel, moderate red, moist, medium stiff to very stiff, subrounded	17.2			
1840		SPT 2	75	5-11-15-12 (26)				8.8			
	5	SPT 3	67	11-37-50/6"			BEDROCK: Completely weathered (V) to highly weathered (IV), moderate red, fine to medium, extremely weak (R0) to very weak (R1), very poor, PHYLLITE				
1835		SPT 4	50	17-17-23-50 (40)							
	10	RC 1	60 (0)				Auger Refusal at 8 feet Begin Coring at 8 feet Slightly weathered (II) to moderately weathered (III), thinly foliated, dark gray, fine to medium, medium weak (R2), poor, PHYLLITE, core loss from 8 to 10 feet				
1830											
	15	RC 2	40 (40)				Slightly weathered (II) to moderately weathered (III), thinly foliated, dark gray, fine to medium, medium weak (R2) to medium strong (R3), poor, PHYLLITE, Fe oxidation and pyrite, core loss from 16 to 18 feet				
1825											

Bottom of Borehole at 18.0 feet

GEOTECH BH COLUMNS - DF STD US LAB E-M.GDT - 12/9/16 12:00 - C:\USERS\JTMCGINNIS\DOCUMENTS\16004 GINT\16004 NORTHERN PASS TRANSITION 3.GPJ

BORING NUMBER BH 309

QUANTA SUBSURFACE Engineering + Construction
Quanta Subsurface
4308 N Barker RD
Spokane Valley, WA 99027
Telephone: 509-892-9409

CLIENT PAR Electrical Contractors
PROJECT NAME Northern Pass TL - Transition Station #3
PROJECT NUMBER 16004
PROJECT LOCATION Clarksville, New Hampshire
DATE STARTED 9/7/16 **COMPLETED** 9/7/16
GROUND ELEVATION 1838.0 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR SW Cole
LATITUDE 45.00969167 **LONGITUDE** -71.42128333
DRILLING METHOD Hollow Stem Auger
DRILLING EQUIPMENT CME 850 **SPT HAMMER** Automatic
LOGGED BY S.Tiger **CHECKED BY** J.T. McGinnis
GROUND WATER LEVEL:
NOTES
AT TIME OF DRILLING Not Encountered

ELEV (ft)	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	GRAPHIC LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)	REMARKS
	0	SPT 1	38	1-1-2-3 (3)			TOPSOIL: SILT with sand (ML), trace organics, brownish gray, moist, soft, fine to medium grained sand RESIDUAL: SILT (ML), trace fine gravel, olive gray, dry, soft, subangular	33.9				A bulk sample was obtained from 1 to 6 feet. w% = 8.4% LL = 24; PI = NP % fines = 33.4% Resistivity = 26,000 ohm-cm pH = 7.5
1835		SPT 2	100	17-50/6"			Silty SAND (SM), olive gray, dry, very dense, fine to coarse grained, fine to coarse grained gravel, subangular					
	5	SPT 3	92	11-15-12-13 (27)			SILT (ML), trace clay, brownish gray, dry, very stiff	10.6				4" casing set at 5 feet
		SPT 4	100	33-50/1"			BEDROCK: Completely weathered (V) to highly weathered (IV), brownish gray, fine grained to medium grained, extremely weak (R0) to very weak (R1), PHYLLITE Roller Bit Refusal at 7 feet Begin Coring at 7 feet					
1830	10	RC 1	88 (74)				Fresh (I) to slightly weathered (II), grayish black, fine grained to medium grained, strong (R4), fair, PHYLLITE - dark gray from 12 to 14.2 feet					UCS at 11.1 feet: 7,491 psi
1825	15	RC 2	92 (82)				Fresh (I) to slightly weathered (II), thinly foliated, dark gray, fine grained to medium grained, strong (R4), fair, PHYLLITE					
1820	20	RC 3	86 (66)				Fresh (I) to moderately weathered (III), thinly foliated, grayish black, fine grained to medium grained, strong (R4), fair, PHYLLITE, with pyrite mineralization, pitted from 19.7 to 20.3 feet					

Bottom of Borehole at 22.0 feet

GEOTECH BH COLUMNS - DF STD US LAB E-M.GDT - 12/9/16 12:00 - C:\USERS\JTMCGINNIS\DOCUMENTS\16004 GINT\16004 NORTHERN PASS TRANSITION 3.GPJ

Quanta Subsurface
4308 N Barker RD
Spokane Valley, WA 99027
Telephone: 509-892-9409

BORING NUMBER INF 301

CLIENT PAR Electrical Contractors
PROJECT NAME Northern Pass TL - Transition Station #3
PROJECT NUMBER 16004
PROJECT LOCATION Clarksville, New Hampshire

DATE STARTED 9/7/16 **COMPLETED** 9/7/16
GROUND ELEVATION 1801.0 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR SW Cole
LATITUDE 45.01058333 **LONGITUDE** -71.42157778
DRILLING METHOD Hollow Stem Auger
DRILLING EQUIPMENT CME 850 **SPT HAMMER** Automatic
LOGGED BY S. Laing **CHECKED BY** J.T. McGinnis
GROUND WATER LEVEL:
NOTES
AT TIME OF DRILLING Not Encountered

ELEV (ft)	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	GRAPHIC LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)	REMARKS
	0						TOPSOIL: SILT (ML), trace organics, trace fine to medium sand, brownish gray, moist					Infiltration test casing installed in an adjacent borehole to a depth of approximately 3 feet.
1800		SPT 1	71	2-2-2-4 (4)			RESIDUAL: Silty SAND (SM), little fine to coarse gravel, yellowish brown, moist, fine to coarse grained sand					
		SPT 2	83	7-7-11-8 (18)			- fragments of highly weathered phylittle from 2.5 to 5 feet	11.8			36.4	The ESHWT is at a depth below 5 feet.
	5	SPT 3	100	2-50/5"			BEDROCK: Highly weathered (IV), thinly foliated, gray, fine to medium, very weak (R1), very poor, PHYLLITE, relict rock fabric present, consistency of sandy silt					

Auger Refusal at 5.0 feet
Bottom of Borehole at 5.0 feet

GEOTECH BH COLUMNS - DF STD US LAB E-M.GDT - 12/9/16 12:00 - C:\USERS\JTMCGINNIS\DOCUMENTS\16004 GINT\16004 NORTHERN PASS TRANSITION 3.GPJ

Quanta Subsurface
4308 N Barker RD
Spokane Valley, WA 99027
Telephone: 509-892-9409

BORING NUMBER INF 302

CLIENT PAR Electrical Contractors

PROJECT NAME Northern Pass TL - Transition Station #3

PROJECT NUMBER 16004

PROJECT LOCATION Clarksville, New Hampshire

DATE STARTED 9/7/16 **COMPLETED** 9/7/16

GROUND ELEVATION 1800.3 ft **HOLE SIZE** 6"

DRILLING CONTRACTOR SW Cole

LATITUDE 45.010625 **LONGITUDE** -71.42144722

DRILLING METHOD Hollow Stem Auger

DRILLING EQUIPMENT CME 850 **SPT HAMMER** Automatic

LOGGED BY S.Tiger **CHECKED BY** J.T. McGinnis

GROUND WATER LEVEL:

NOTES

AT TIME OF DRILLING Not Encountered

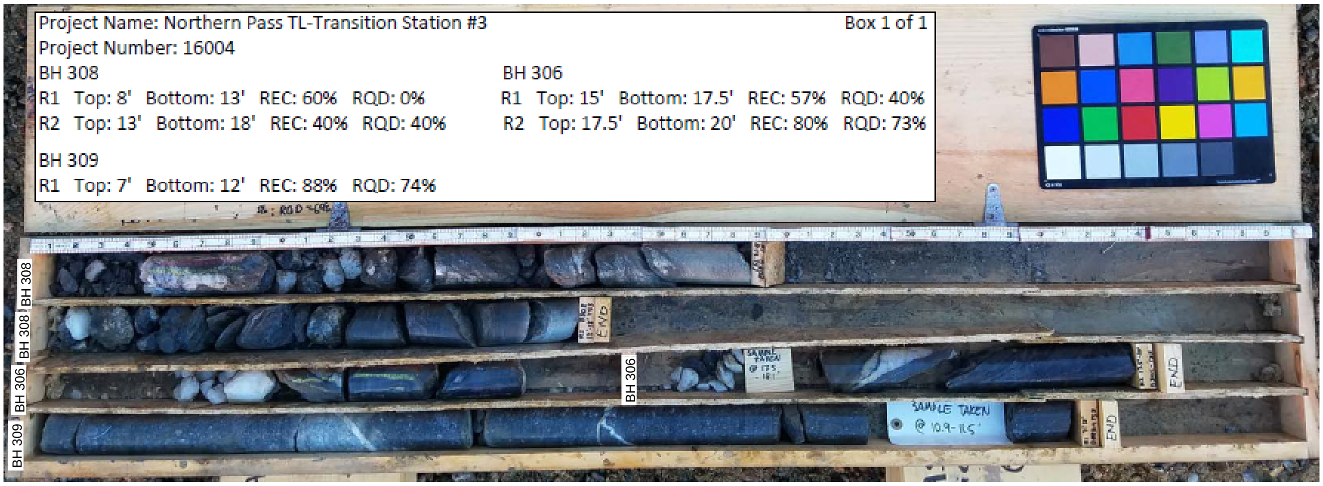
ELEV (ft)	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	GRAPHIC LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)	REMARKS
1800	0						TOPSOIL: SILT with sand (ML), little organics, brownish gray, moist, fine to medium grained					Infiltration test casing installed in an adjacent borehole to a depth of approximately 3 feet.
		SPT 1	54	1-3-7-6 (10)			RESIDUAL: Sandy SILT (ML), little fine to coarse gravel, reddish brown, moist, fine to medium grained, relict rock structure					
		SPT 2	75	7-9-9-4 (18)				15.2			54.7	The ESHWT is at a depth below 4.1 feet.

Auger Refusal at 4.1 feet
Bottom of Borehole at 4.1 feet

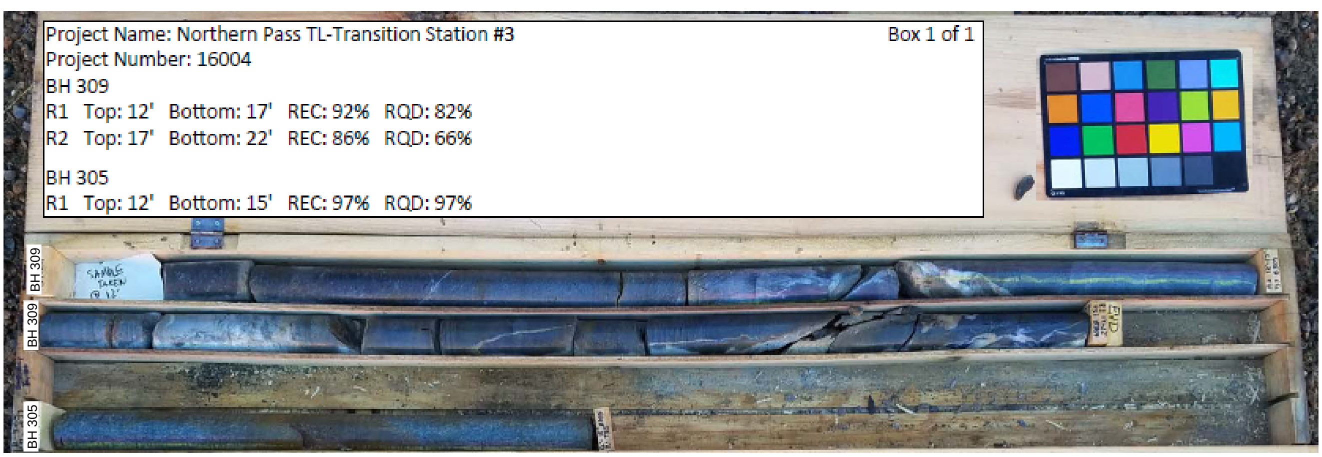
GEOTECH BH COLUMNS - DF STD US LAB E-M.GDT - 12/9/16 12:00 - C:\USERS\JTMCGINNIS\DOCUMENTS\16004 GINT\16004 NORTHERN PASS TRANSITION 3.GPJ

Appendix C
QS Rock Core Photographs

BH 306, BH 308 and BH 309 Rock Core Photos



BH 309 and BH 305 Rock Core Photos



Appendix D
QS Laboratory Test Results

QUANTA SUBSURFACE
Engineering + Construction

SUMMARY OF LAB TESTING RESULTS

NORTHERN PASS TRANSMISSION LINE PROJECT

TRANSITION STATION #3

PROJECT NO.: 16004

SAMPLE INFORMATION			LAB TEST RESULTS																
BOREHOLE No.	FIELD SAMPLE ID	DEPTH (ft)	MOISTURE CONTENT (ASTM D2216) (%)	ORGANIC CONTENT OF SOIL (ASTM D2794) (%)	Sieve Analysis (ASTM D422) % Gravel	% Sand	% Silt	% Clay	% PASSING NO. 200 SEIVE (ASTM D1140)	ATTERBERG LIMITS (ASTM D4318) LL	PL	PI	MODIFIED PROCTOR (ASTM D1557) Max. Dry Density (pcf)	Optimum Moisture Content (%)	UNCONFINED COMPRESSIVE STRENGTH OF ROCK (ASTM D7102) (psi)	SOIL CHEMISTRY SO_4 (ASTM D516)	CHLORIDE (ASTM D512)	pH (ASTM G51)	RESISTIVITY (AASHTO T288) (ohm-cm)
BH 302	S1	0-2	30.5																
BH 302	S3	4-6	12.1						45.1										
BH 303	S1	0-2		6.5															
BH 303	S2	2-4		5.3					13.0										
BH 303	S3	4-6		3.2															
BH 303	S4	6-8	17.4																
BH 303	S5	8-10	22.6						22.6										
BH 304	S1	0-2	24.1																
BH 304	S2	2-4	17.9						25.5	33	NP	NP							
BH 304	S3 & S4	4-6.5'							28.8							11[A]	< 5.5[A]	6.0	31,000
BH 305	S1	0-2	10.7																
BH 305	R1	12.2-12.6													19,325[B]				
BH 306	S1	0-2	33.2																
BH 306	BULK	1-10	16.1						53.6	17	NP	NP	131.0[C]	9.1[C]					
BH 306	S3	4-6	12.8																
BH 306	R2	17.5-17.9													5,369[B]				
BH 307	S1	0-2	21.6						18.2	32	NP	NP							
BH 308	S1	0-2	17.2																
BH 308	S2	2-4	8.8																
BH 309	S1	0-2	33.9																
BH 309	BULK	1-6	8.4						33.4	24	NP	NP	126.7[C]	8.9[C]		20[A]	< 5.4[A]	7.5	26,000
BH 309	S3	4-6	10.6																
BH 309	R1	10.9-11.3													7,491[B]				
INF 301	S2	2-4	11.8		15.7	47.9	32.4	4.0											
INF 302	S2	2-4	15.2		11.0	34.3	45.7	9.0											

NOTES:

General - Testing performed by S.W. Cole unless otherwise noted.

A - Testing performed by Absolute Resource Associates as a subcontractor to S.W. Cole.

B - Testing performed by GeoTesting.

C - Reported maximum dry density and optimum moisture based on corrected values.

S.W.COLE ENGINEERING, INC.

Report of Moisture Content of Soil and Rock

ASTM D2216-10

Project Name:	Northern Pass Transmission Line	**Project Number:**	16-0600
Project Location:	Various, NH	**Lab ID:**	15097S - 15109S
Client:	Quanta Subsurface	**Date Received:**	09/20/16
Material Description:	Multiple	**Date Completed:**	09/30/16
Material Source:	Transition Station 3	**Tested By:**	BLG

Lab ID	Nominal Maximum Aggregate Size	Material Description	Moisture Content
15097S	⅜"	TS-3, BH-302, S1, 0-2'	30.5%
15098S	⅜"	TS-3, BH-302, S3, 4-6'	12.1%
15102S	⅜"	TS-3, BH-303, S4, 6-8'	17.4%
15103S	⅜"	TS-3, BH-303, S5, 8-10'	22.6%
15104S	⅜"	TS-3, BH-304, S1, 0-2'	24.1%
15105S	⅜"	TS-3, BH-304, S2, 2-4'	17.9%
15106S	⅜"	TS-3, BH-305, S1, 0-2'	10.7%
15107S	⅜"	TS-3, BH-306, S1, 0-2'	33.2%
15108S	⅜"	TS-3, BH-306, 1-10'	16.1%
15109S	⅜"	TS-3, BH-306, S3, 4-6'	12.8%

Comments:

Reviewed By: CBM

Report of Moisture Content of Soil and Rock

ASTM D2216-10

Project Name:	Northern Pass Transmission Line	**Project Number:**	16-0600
Project Location:	Various, NH	**Lab ID:**	15110S - 15117S
Client:	Quanta Subsurface	**Date Received:**	09/20/16
Material Description:	Multiple	**Date Completed:**	09/30/16
Material Source:	Transition Station 3	**Tested By:**	BLG

Lab ID	Nominal Maximum Aggregate Size	Material Description	Moisture Content
15110S	⅜"	TS-3, BH-307, S1, 0-2'	21.6%
15111S	⅜"	TS-3, BH-308, S1, 0-2'	17.2%
15112S	⅜"	TS-3, BH-308, S2, 2-4'	8.8%
15113S	⅜"	TS-3, BH-309, S1, 0-2'	33.9%
15114S	⅜"	BULK - BH-309, 1-6'	8.4%
15115S	⅜"	TS-3, BH-309, S3, 4-6'	10.6%
15116S	⅜"	TS-3, INF-301, S2, 2-4'	11.8%
15117S	⅜"	TS-3, INF-302, S2, 2-4'	15.2%

Comments:

Reviewed By: CBM

S.W.COLE ENGINEERING, INC.

Percent Finer than No. 200 ASTM D1140

Project Number: 16-0600
Project Name: Northern Pass Transmission

Sample ID	Sample Source	Client Sample Description	% Passing # 200
15098S	TS-3, BH-302, S3, 4-6'	SM	45.1
15100S	TS-3, BH-303, S2, 2-4'	SM	13.0
15103S	TS-3, BH-303, S5, 8-10'	SC	22.6
15105S	TS-3, BH-304, S2, 2-4'	SM	25.5
15108S	TS-3, BH-306, 1-10'	Bulk	53.6

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S.W.COLE ENGINEERING, INC.

Percent Finer than No. 200 ASTM D1140

Project Number: 16-0600
Project Name: Northern Pass Transmission

Sample ID:	15110S
Sample Source:	TS-3, BH-307, S1, 0-2'
Client Sample Description:	SM
% Passing # 200:	18.2
Sample ID:	15114S
Sample Source:	TS-3, BH-309, 1-6'
Client Sample Description:	BULK
% Passing # 200:	33.4

CBM

Percent Finer than No. 200 ASTM D1143

Project Number: 16-0600
Project Name: Northern Pass Transmission Line

Sample ID:	15214S
Sample Source:	TS-3, BH-309, BULK, 1-6'
Client Sample Description:	SM
% Passing # 200:	36.8
Sample ID:	15215S
Sample Source:	TS-3, BH-304, SS3, SS4
Client Sample Description:	SM
% Passing # 200:	28.8

S.W.COLE ENGINEERING, INC.

Report of Loss on Ignition Ash & Organic Content

ASTM D2974-07a and ASTM D4972-01 (07)

Project Name:	Northern Pass Transmission	**Project Number:**	16-0600
Project Location:	Various NH	**Lab ID:**	15099S
Client:	Quanta Subsurface	**Date Received:**	09/20/16
Material Description:	SM	**Date Completed:**	09/27/16
Material Source:	TS-3, BH-303, S1, 0-2'	**Tested By:**	BLG

Organic Content	**6.5%**
Ash Content	93.5%
Furnace Temperature	440°

Comments:

Reviewed By: CBM

S.W.COLE ENGINEERING, INC.

Report of Loss on Ignition Ash & Organic Content

ASTM D2974-07a and ASTM D4972-01 (07)

Project Name:	Northern Pass Transmission	**Project Number:**	16-0600
Project Location:	Various NH	**Lab ID:**	15100S
Client:	Quanta Subsurface	**Date Received:**	09/20/16
Material Description:	SM	**Date Completed:**	09/30/16
Material Source:	TS-3, BH-303, S2, 2-4'	**Tested By:**	BLG

Organic Content	**5.3%**
Ash Content	94.7%
Furnace Temperature	440°

Comments:

Reviewed By: CBM

10 Centre Road, Somersworth, NH 03878-2926 ● P: (603) 692.0088 ● F: (603) 692.0044 ● E: infosomersworth@swcole.com

Report of Loss on Ignition Ash & Organic Content

ASTM D2974-07a and ASTM D4972-01 (07)

Project Name:	Northern Pass Transmission	**Project Number:**	16-0600
Project Location:	Various NH	**Lab ID:**	15101S
Client:	Quanta Subsurface	**Date Received:**	09/20/16
Material Description:	SM	**Date Completed:**	09/27/16
Material Source:	TS-3, BH-303, S3, 4-6'	**Tested By:**	BLG

Organic Content	**3.2%**
Ash Content	96.8%
Furnace Temperature	440°

Comments:

Reviewed By: CBM

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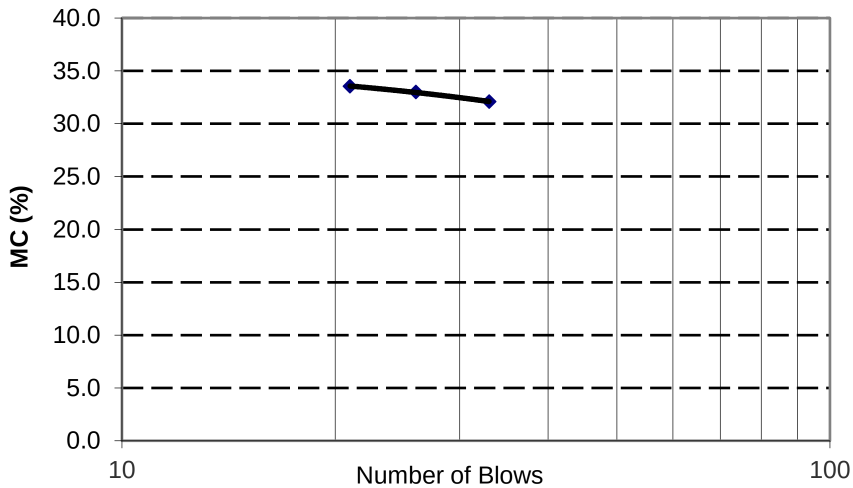
Report of Atterberg Limits

ASTM D4318-10 - Method A

Project Name:	Northern Pass Transmission Line	**Project Number:**	16-0600
Project Location:	Various NH	**Lab ID:**	15105S
Client:	Quanta Subsurface	**Date Received:**	09/20/16
Material Description:	ML	**Date Completed:**	10/05/16
Material Source:	TS-3, BH-304, S2, 2-4'	**Tested By:**	BLG

Liquid Limit	**33**
Plastic Limit	
Plasticity Index	**Non-Plastic**

LIQUID LIMIT CURVE



Material Retained On the No. 40 Sieve: 55%

As-received Moisture Content: 18%

Comments:

Reviewed By: CBM

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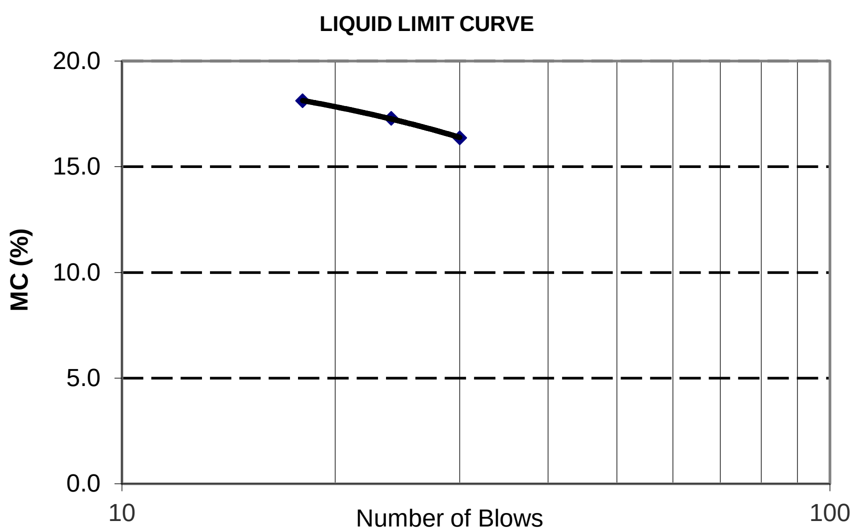
Report of Atterberg Limits

ASTM D4318-10 - Method A

Project Name:	Northern Pass Transmission Line	**Project Number:**	16-0600
Project Location:	Various NH	**Lab ID:**	15108S
Client:	Quanta Subsurface	**Date Received:**	09/20/16
Material Description:	BULK	**Date Completed:**	10/05/16
Material Source:	TS-3, BH-306, 1-10' BULK	**Tested By:**	BLG

Liquid Limit	**17**
Plastic Limit	
Plasticity Index	**Non-Plastic**



Material Retained On the No. 40 Sieve: 35%

As-received Moisture Content: 16%

Comments:

Reviewed By: CBM

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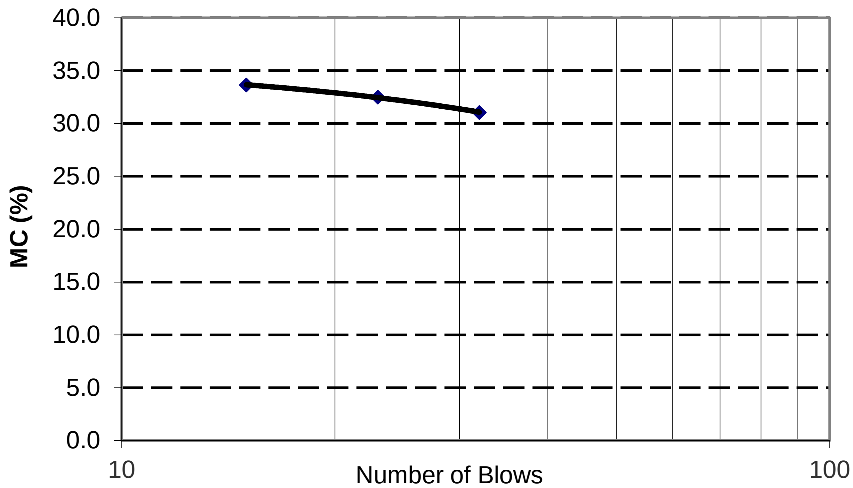
Report of Atterberg Limits

ASTM D4318-10 - Method A

Project Name:	Northern Pass Transmission Line	**Project Number:**	16-0600
Project Location:	Various NH	**Lab ID:**	15110S
Client:	Quanta Subsurface	**Date Received:**	09/20/16
Material Description:	ML	**Date Completed:**	10/05/16
Material Source:	TS-3, BH-307, S1, 0-2'	**Tested By:**	BLG

Liquid Limit	**32**
Plastic Limit	
Plasticity Index	**Non-Plastic**

LIQUID LIMIT CURVE



Material Retained On the No. 40 Sieve: 45%

As-received Moisture Content: 22%

Comments:

CBM

Reviewed By: ______________________

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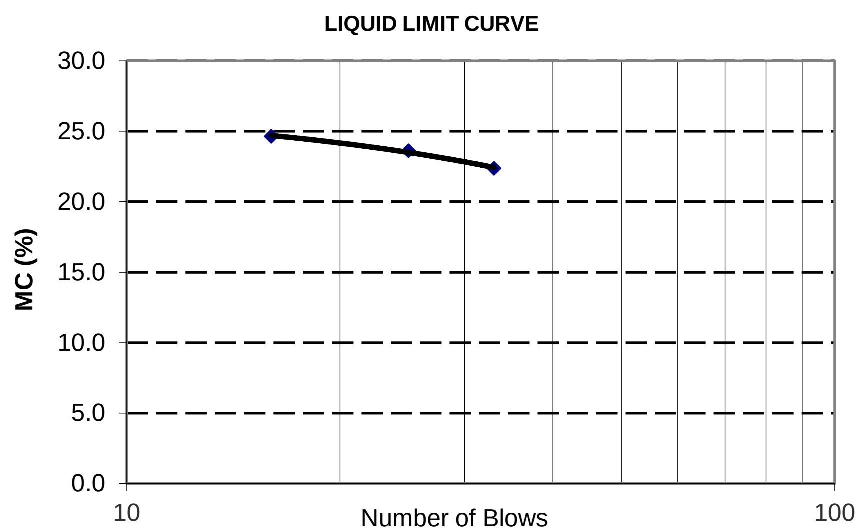
Report of Atterberg Limits

ASTM D4318-10 - Method A

Project Name:	Northern Pass Transmission Line	**Project Number:**	16-0600
Project Location:	Various NH	**Lab ID:**	15114S
Client:	Quanta Subsurface	**Date Received:**	09/20/16
Material Description:	BULK	**Date Completed:**	10/05/16
Material Source:	TS-3, BH-309, 1-6' BULK	**Tested By:**	BLG

Liquid Limit	**24**
Plastic Limit	
Plasticity Index	**Non-Plastic**



Material Retained On the No. 40 Sieve: 34%

As-received Moisture Content: 8%

Comments:

Reviewed By: CBM

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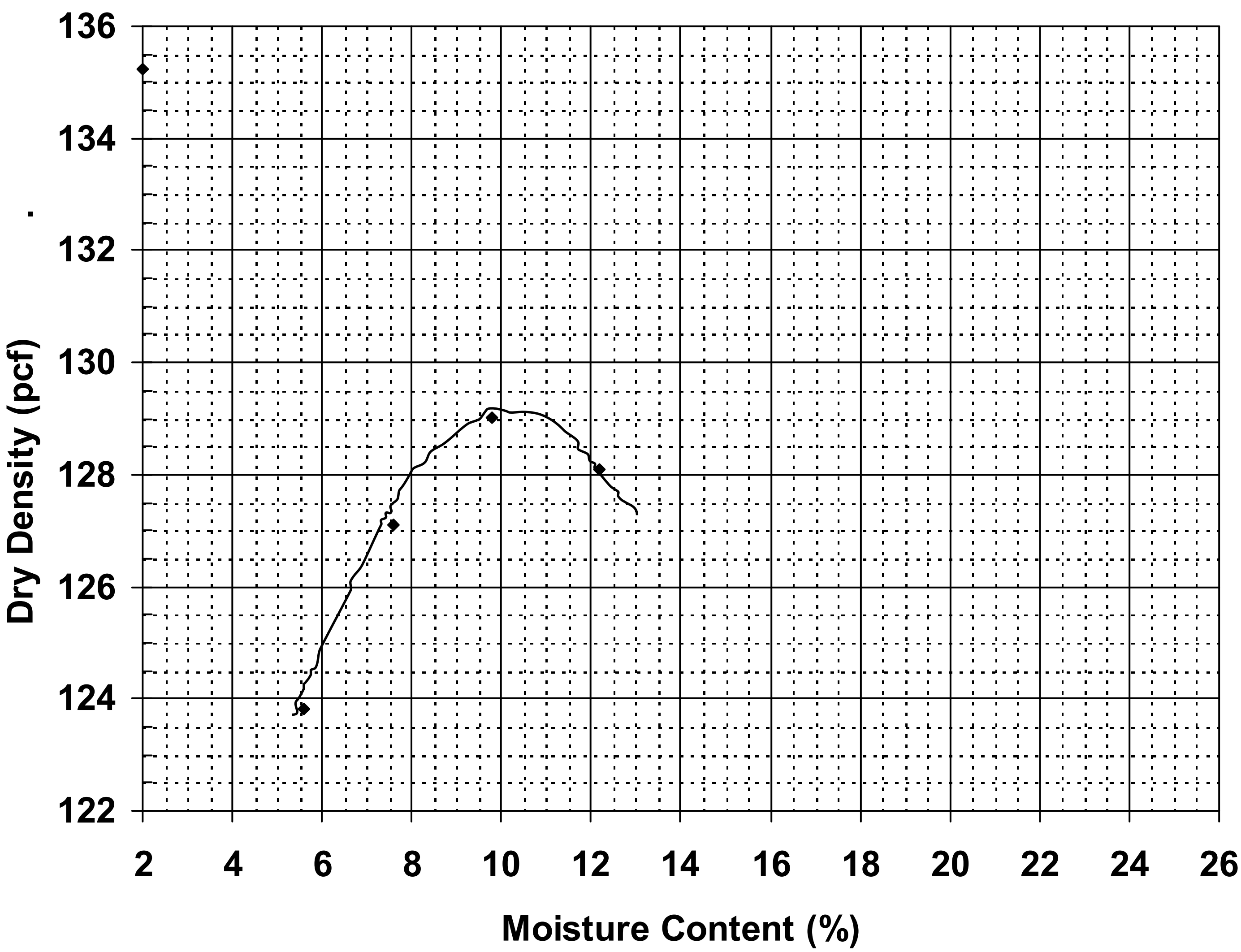
Report of Moisture-Density

Method ASTM D-1557 MODIFIED   Procedure A

Project Name	VARIOUS NH - NORTHERN PASS TRANSMISSION LINE - LABORATORY TESTING SERVICES	Project Number	16-0600
Client	SWCOLE EXPLORATIONS, LLC	Lab ID	15108S
Material Type	BULK	Date Received	9/20/2016
Material Source	TS-3, BH-306, 1-10' BULK	Date Completed	10/3/2016
		Tested By	BRADLEY GERSCHWILER

Moisture-Density Relationship Curve



Maximum Dry Density (pcf)	129
Optimum Moisture Content (%)	9.8
Percent Oversized	8.4%

Corrected Dry Density (pcf)	**131**
Corrected Moisture Content (%)	**9.1**

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Comments

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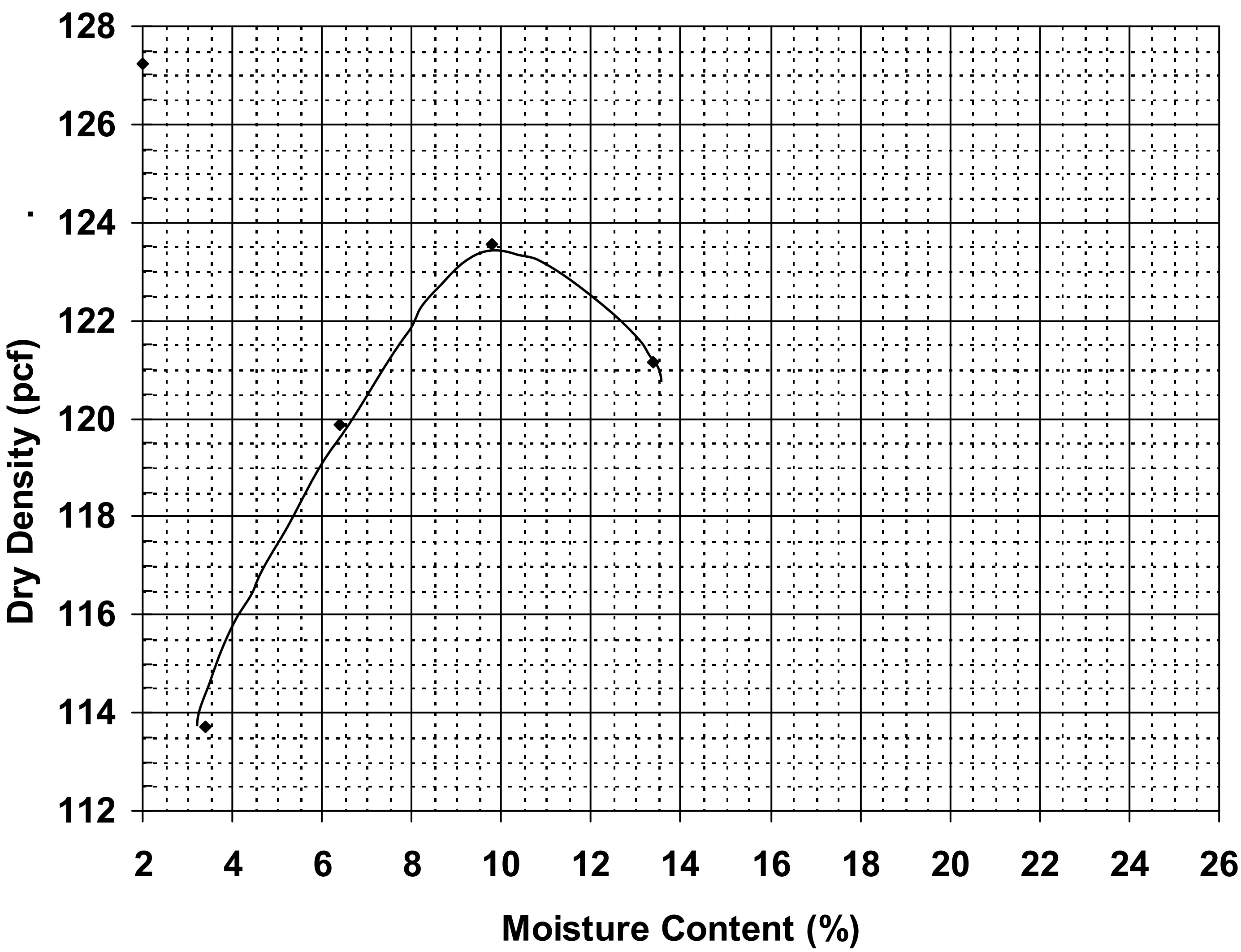
Report of Moisture-Density

Method ASTM D-1557 MODIFIED Procedure A

Project Name	VARIOUS NH - NORTHERN PASS TRANSMISSION LINE - LABORATORY TESTING SERVICES	Project Number	16-0600
Client	SWCOLE EXPLORATIONS, LLC	Lab ID	15114S
Material Type	BULK	Date Received	9/20/2016
Material Source	TS-3, BH-309, 1-6' BULK	Date Completed	9/30/2016
		Tested By	BRADLEY GERSCHWILER

Moisture-Density Relationship Curve



Maximum Dry Density (pcf)	123.6
Optimum Moisture Content (%)	9.8
Percent Oversized	11.6%

Corrected Dry Density (pcf)	**126.7**
Corrected Moisture Content (%)	**8.9**

CBM

Comments

10 Centre Road, Somersworth, NH 03878-2926 • Tel (603) 692-0088 • Fax (603) 692-0044 • www.swcole.com

S.W.COLE ENGINEERING, INC.

Report of Hydrometer

ASTM D422-63 (07)

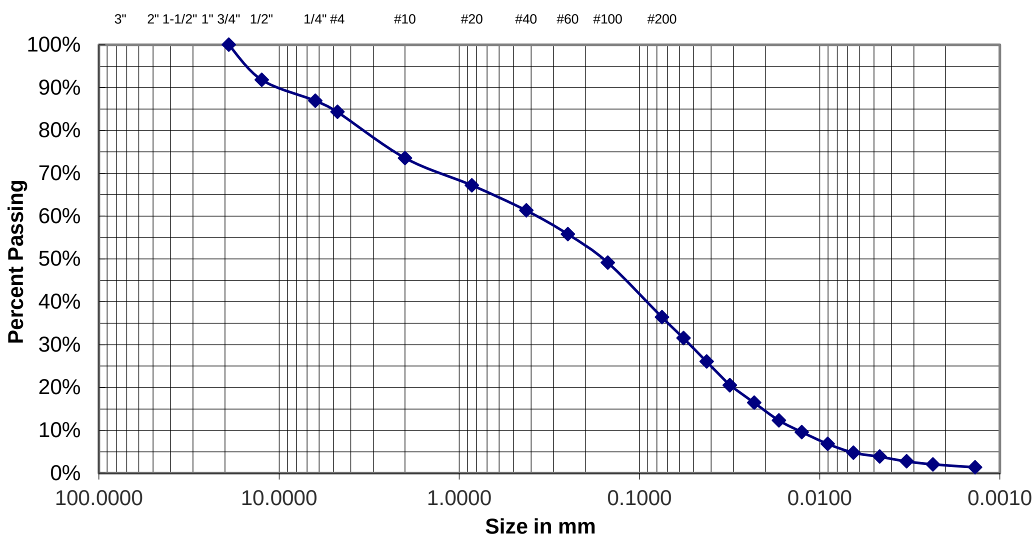
Project Name:	Northern Pass Transmission Line	**Project Number:**	16-0600
Project Location:	Various, NH	**Lab ID:**	15116S
Client:	Quanta Subsurface	**Date Received:**	9/20/2016
Material Description:	0	**Date Completed:**	10/3/2016
Material Source:	TS-3. INF-301, S2, 2-4'	**Tested By:**	BLG

Sieve Analysis

Sieve Size	Standard Designation (mm)	Amount Passing (%)	Specification (name)
3"	76	**100**	
2"	50	**100**	
1½"	38.1	**100**	
1"	25	**100**	
¾"	19	**100**	
½"	12.5	**92**	
¼"	6.3	**87**	
No. 4	4.75	**84**	
No. 10	2	**74**	
No. 20	0.85	**67**	
No. 40	0.425	**61**	
No. 60	0.25	**56**	
No. 100	0.15	**49**	
No. 200	0.075	**36.4**	
	0.02		

Hydrometer Analysis

Particle Size (mm)	Amount Passing (%)
0.05696	**31.5**
0.04241	**26.0**
0.03157	**20.5**
0.03157	**20.5**
0.02310	**16.4**
0.01686	**12.3**
0.01255	**9.6**
0.00904	**6.8**
0.00651	**4.8**
0.00465	**3.8**
0.00329	**2.7**
0.00235	**2.1**
0.00137	**1.4**



Particle Distribution:				
	Gravel (3" - No. 4)	**15.7%**	Fines (0.074 -0.005)	**32.4%**
	Sand (No. 4 - No. 200)	**47.9%**	Clay (<0.005)	**4.0%**

CBM

Comments:

Reviewed By

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S.W.COLE ENGINEERING, INC.

Report of Hydrometer

ASTM D422-63 (07)

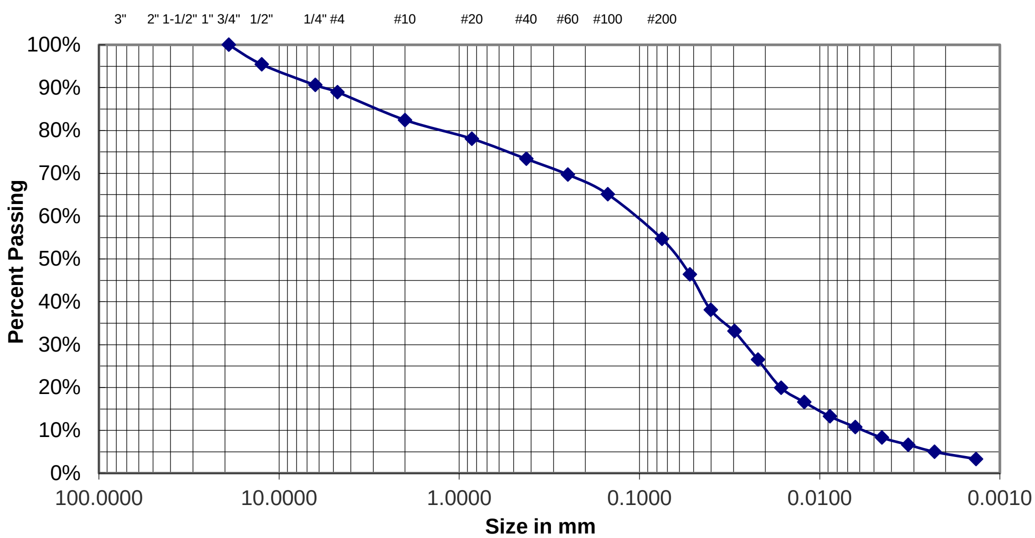
Project Name:	Northern Pass Transmission Line	**Project Number:**	16-0600
Project Location:	Various, NH	**Lab ID:**	15117S
Client:	Quanta Subsurface	**Date Received:**	9/20/2016
Material Description:	0	**Date Completed:**	10/3/2016
Material Source:	TS-3. INF-302, S2, 2-4'	**Tested By:**	BLG

Sieve Analysis

Sieve Size	Standard Designation (mm)	Amount Passing (%)	Specification (name)
3"	76	**100**	
2"	50	**100**	
1½"	38.1	**100**	
1"	25	**100**	
¾"	19	**100**	
½"	12.5	**95**	
¼"	6.3	**91**	
No. 4	4.75	**89**	
No. 10	2	**82**	
No. 20	0.85	**78**	
No. 40	0.425	**73**	
No. 60	0.25	**70**	
No. 100	0.15	**65**	
No. 200	0.075	**54.7**	
	0.02		

Hydrometer Analysis

Particle Size (mm)	Amount Passing (%)
0.05245	**46.4**
0.04028	**38.1**
0.02969	**33.2**
0.02969	**33.2**
0.02202	**26.5**
0.01633	**19.9**
0.01217	**16.6**
0.00878	**13.3**
0.00635	**10.8**
0.00452	**8.3**
0.00323	**6.6**
0.00230	**5.0**
0.00136	**3.3**



Particle Distribution:	Gravel (3" - No. 4)	**11.0%**	Fines (0.074 -0.005)	**45.7%**
	Sand (No. 4 - No. 200)	**34.3%**	Clay (<0.005)	**9.0%**

Comments:

CBM

Reviewed By

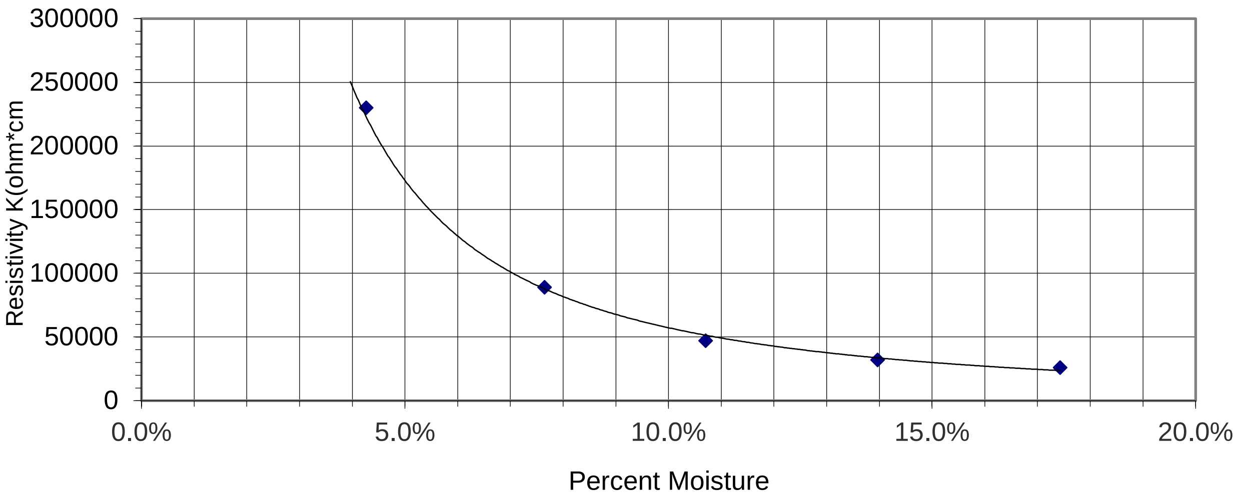
Report of Soil Resistivity

AASHTO T288

Project Name:	Northern Pass Transmission Line	**Project Number:**	16-0600
Project Location:	Various, NH	**Lab ID:**	15214S
Client:	SWCOLE Explorations, LLC	**Date Received:**	10/17/16
Material Description:	SM	**Date Completed:**	10/27/16
Material Source:	TS-3, BH-309, BULK, 1-6'	**Tested By:**	BLG

Minimum Soil Resistivity 26,000 ohm-cm

Soil Temperature 20.5 °C



Comments:

Reviewed By: CBM

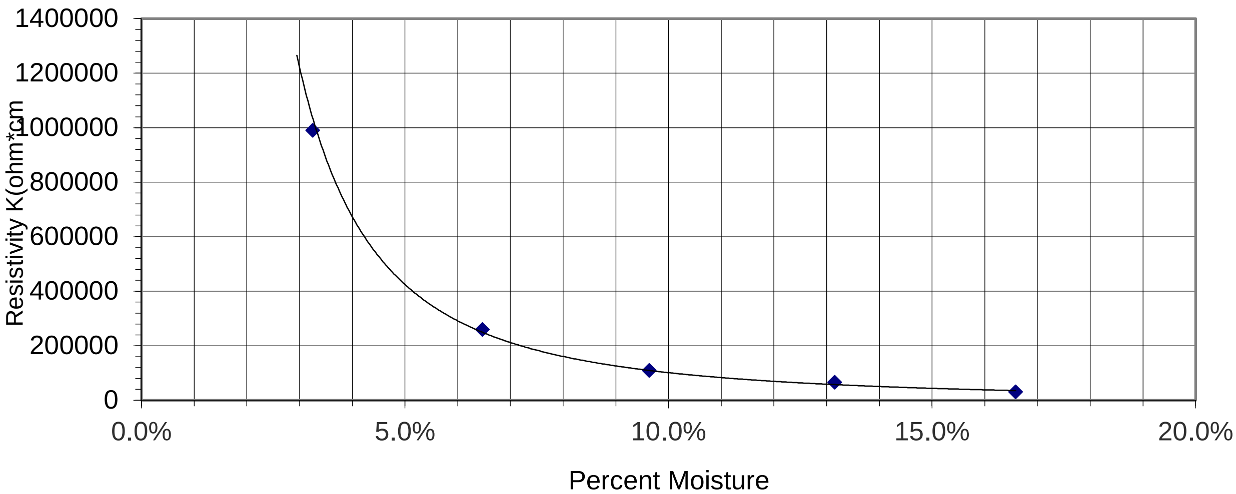
Report of Soil Resistivity

AASHTO T288

Project Name:	Northern Pass Transmission Line	**Project Number:**	16-0600
Project Location:	Various, NH	**Lab ID:**	15215S
Client:	SWCOLE Explorations, LLC	**Date Received:**	10/17/16
Material Description:	SM	**Date Completed:**	10/27/16
Material Source:	TS-3, BH-304, SS-3 & SS-4	**Tested By:**	BLG

Minimum Soil Resistivity 31,000 ohm-cm

Soil Temperature 20.5 °C



Comments:

Reviewed By: CBM

Project ID: NPT 16-0600
Job ID: 38207

Sample#: 38207-001
Sample ID: BH-204, 5-10'
Matrix: Solid   Percent Dry: 90.9% Results expressed on a dry weight basis.
Sampled: 10/17/16 11:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Analysis Time	Reference
Chloride	< 5.5	5.5	ug/g	1	JZL		1602921	10/25/16	15:21	E300.0A
Sulfate	**7.8**	5.5	ug/g	1	JZL		1602921	10/25/16	15:21	E300.0A
pH	**6.3**		pH	1	APA		1602861	10/21/16	4:15	SW9045C

Sample#: 38207-002
Sample ID: MF-201, 5-10'
Matrix: Solid   Percent Dry: 91.8% Results expressed on a dry weight basis.
Sampled: 10/17/16 11:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Analysis Time	Reference
Chloride	< 5.5	5.5	ug/g	1	JZL		1602921	10/25/16	15:38	E300.0A
Sulfate	**21**	5.5	ug/g	1	JZL		1602921	10/25/16	15:38	E300.0A
pH	**7.0**		pH	1	APA		1602861	10/21/16	4:20	SW9045C

Sample#: 38207-003
Sample ID: BH-309, 1-6'
Matrix: Solid   Percent Dry: 92.9% Results expressed on a dry weight basis.
Sampled: 10/17/16 11:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Analysis Time	Reference
Chloride	< 5.4	5.4	ug/g	1	JZL		1602921	10/25/16	15:54	E300.0A
Sulfate	**20**	5.4	ug/g	1	JZL		1602921	10/25/16	15:54	E300.0A
pH	**7.5**		pH	1	APA		1602861	10/21/16	4:25	SW9045C

Sample#: 38207-004
Sample ID: BH-304, 4-6.5'
Matrix: Solid   Percent Dry: 91.4% Results expressed on a dry weight basis.
Sampled: 10/17/16 11:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Analysis Time	Reference
Chloride	< 5.5	5.5	ug/g	1	JZL		1602921	10/25/16	16:11	E300.0A
Sulfate	**11**	5.5	ug/g	1	JZL		1602921	10/25/16	16:11	E300.0A
pH	**6.0**		pH	1	APA		1602861	10/21/16	4:30	SW9045C

Sample#: 38207-005
Sample ID: BH-404, 1-10'
Matrix: Solid   Percent Dry: 92.9% Results expressed on a dry weight basis.
Sampled: 10/17/16 11:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Analysis Time	Reference
Chloride	< 5.4	5.4	ug/g	1	JZL		1602921	10/25/16	16:27	E300.0A
Sulfate	< 5.4	5.4	ug/g	1	JZL		1602921	10/25/16	16:27	E300.0A
pH	**6.2**		pH	1	APA		1602861	10/21/16	4:35	SW9045C

Absolute Resource associates

Project ID: NPT 16-0600

Job ID: 38207

Sample#: 38207-006
Sample ID: BH-405, 2-4.75'
Matrix: Solid Percent Dry: 91% Results expressed on a dry weight basis.
Sampled: 10/17/16 11:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Analysis Time	Reference
Chloride	< 5.5	5.5	ug/g	1	JZL		1602921	10/25/16	16:44	E300.0A
Sulfate	**13**	5.5	ug/g	1	JZL		1602921	10/25/16	16:44	E300.0A
pH	**5.3**		pH	1	APA		1602861	10/21/16	4:40	SW9045C

Sample#: 38207-007
Sample ID: BH-902, 5-10'
Matrix: Solid Percent Dry: 96.9% Results expressed on a dry weight basis.
Sampled: 10/17/16 11:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Analysis Time	Reference
Chloride	< 5.2	5.2	ug/g	1	JZL		1602921	10/25/16	17:00	E300.0A
Sulfate	**11**	5.2	ug/g	1	JZL		1602921	10/25/16	17:00	E300.0A
pH	**5.6**		pH	1	APA		1602861	10/21/16	4:45	SW9045C

Sample#: 38207-008
Sample ID: BH-905, 5-10'
Matrix: Solid Percent Dry: 97.1% Results expressed on a dry weight basis.
Sampled: 10/17/16 11:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Analysis Time	Reference
Chloride	< 5.2	5.2	ug/g	1	JZL		1602921	10/25/16	17:16	E300.0A
Sulfate	**8.1**	5.2	ug/g	1	JZL		1602921	10/25/16	17:16	E300.0A
pH	**5.4**		pH	1	APA		1602861	10/21/16	4:50	SW9045C

Client: Quanta Subsurface			
Project: Northern Pass - Transition #3 Substation			
Location: Clarksville, NH		Project No:	GTX-305375
Boring ID: ---	Sample Type: ---	Tested By:	daa/rlc
Sample ID: ---	Test Date: 09/30/16	Checked By:	jsc
Depth : ---	Test Id: 392852		

Bulk Density and Compressive Strength of Rock Core Specimens by ASTM D7012 Method C

Boring ID	Sample Number	Depth	Bulk Density, pcf	Compressive strength, psi	Failure Type	Meets ASTM D4543	Note(s)
BH-305	R1	12.22-12.6 ft	177	19325	1	Yes	---
BH-306	R2	17.5-17.87 ft	174	5369	3	No	2,*
BH-309	R1	10.9-11.28 ft	175	7491	1	Yes	---

Notes: Density determined on core samples by measuring dimensions and weight and then calculating.

All specimens tested at the approximate as-received moisture content and at standard laboratory temperature.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure; 3 = Intact Material and Discontinuity Failure (See attached photographs)

1: Best effort end preparation. See Tolerance report for details.
2: The as-received core did not meet the ASTM side straightness tolerance due to irregularities in the sample as cored.
3: Specimen L/D < 2.
4: The as-received core did not meet the ASTM minimum diameter tolerance of 1.875 inches.
5: Specimen diameter is less than 10 times maximum particle size.
6: Specimen diameter is less than 6 times maximum particle size.

*Because the indicated tested specimens did not meet the ASTM D4543 standard tolerances, the results reported here may differ from those for a test specimen within tolerances.

Client:	Quanta Subsurface	Test Date:	9/30/2016
Project Name:	Nothern Pass - Transition #3 Substation	Tested By:	rlc
Project Location:	Clarksville, NH	Checked By:	jsc
GTX #:	305375		
Boring ID:	BH-305		
Sample ID:	R1		
Depth:	12.22-12.6 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY

	1	2	Average		
Specimen Length, in:	4.33	4.33	4.33		
Specimen Diameter, in:	1.98	1.98	1.98		
Specimen Mass, g:	622.26				
Bulk Density, lb/ft^3	177			**Minimum Diameter Tolerence Met?**	YES
Length to Diameter Ratio:	2.2			**Length to Diameter Ratio Tolerance Met?**	YES

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:

Is the maximum gap ≤ 0.02 in.? YES

Maximum difference must be < 0.020 in.

Straightness Tolerance Met? YES

END FLATNESS AND PARALLELISM (Procedure FP1)

END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00010	-0.00020	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00010	0.00000
Diameter 2, in (rotated 90^o)	0.00000	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010

Difference between max and min readings, in:

0° = 0.00020 90° = 0.00010

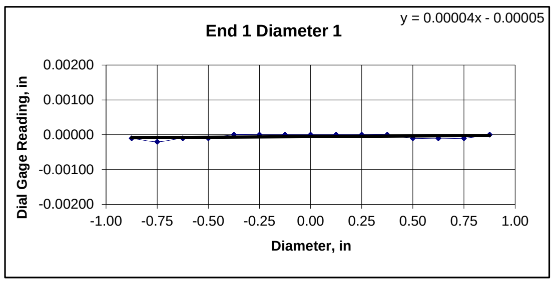
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	0.00000	0.00000	0.00000
Diameter 2, in (rotated 90^o)	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

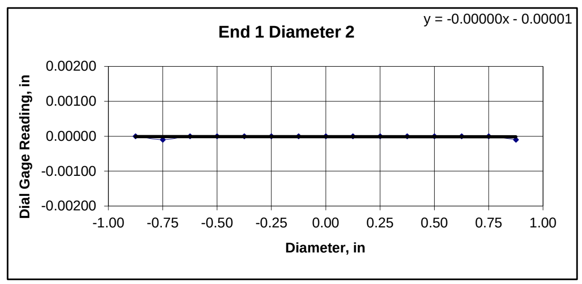
Difference between max and min readings, in:

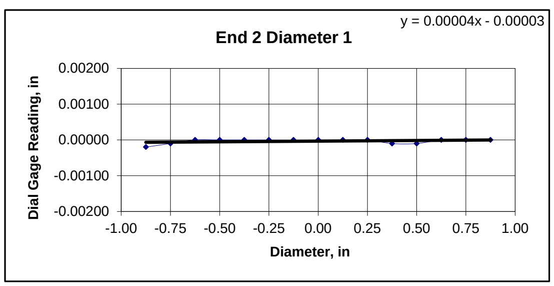
0° = 0.0002 90° = 0.0001

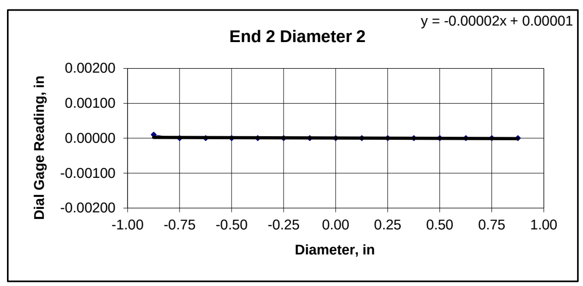
Maximum difference must be < 0.0020 in. Difference = ± 0.00010

Flatness Tolerance Met? YES









DIAMETER 1

End 1:
Slope of Best Fit Line 0.00004
Angle of Best Fit Line: 0.00229

End 2:
Slope of Best Fit Line 0.00004
Angle of Best Fit Line: 0.00229

Maximum Angular Difference: 0.00000

Parallelism Tolerance Met? YES
Spherically Seated

DIAMETER 2

End 1:
Slope of Best Fit Line 0.00000
Angle of Best Fit Line: 0.00000

End 2:
Slope of Best Fit Line 0.00002
Angle of Best Fit Line: 0.00115

Maximum Angular Difference: 0.00115

Parallelism Tolerance Met? YES
Spherically Seated

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00020	1.980	0.00010	0.006	YES
Diameter 2, in (rotated 90^o)	0.00010	1.980	0.00005	0.003	YES
END 2					
Diameter 1, in	0.00020	1.980	0.00010	0.006	YES
Diameter 2, in (rotated 90^o)	0.00010	1.980	0.00005	0.003	YES

Maximum angle of departure must be ≤ 0.25°

Perpendicularity Tolerance Met? YES

Client:	Quanta Subsurface
Project Name:	Nothern Pass - Transition #3 Substation
Project Location:	Clarksville, NH
GTX #:	305375
Test Date:	9/30/2016
Tested By:	rlc
Checked By:	jsc
Boring ID:	BH-305
Sample ID:	R1
Depth, ft:	12.22-12.6

After cutting and grinding

After break

GeoTesting EXPRESS

Client:	Quanta Subsurface	Test Date:	9/29/2016
Project Name:	Northern Pass - Transition #3 Substation	Tested By:	daa/rlc
Project Location:	Clarksville, NH	Checked By:	jsc
GTX #:	305375		
Boring ID:	BH-306		
Sample ID:	R2		
Depth:	17.5-17.87 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	4.45	4.45	4.45
Specimen Diameter, in:	1.98	1.99	1.99
Specimen Mass, g:	629.72		
Bulk Density, lb/ft^3	174	**Minimum Diameter Tolerence Met?**	YES
Length to Diameter Ratio:	2.2	**Length to Diameter Ratio Tolerance Met?**	YES

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:

Is the maximum gap $\leq$ 0.02 in.? NO

Maximum difference must be < 0.020 in.

Straightness Tolerance Met? NO

END FLATNESS AND PARALLELISM (Procedure FP1)

END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00020	-0.00020	-0.00020	-0.00020	-0.00020	-0.00020	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010
Diameter 2, in (rotated 90^o)	-0.00020	-0.00020	-0.00010	-0.00020	-0.00020	-0.00020	-0.00010	0.00000	0.00000	-0.00020	-0.00020	-0.00020	-0.00010	0.00000	0.00000

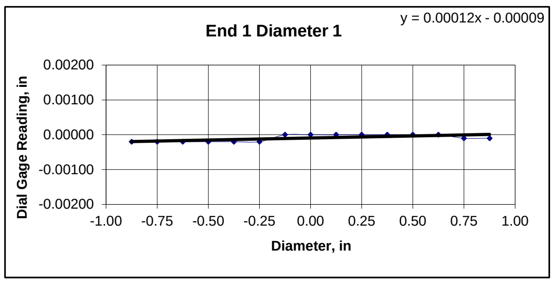
Difference between max and min readings, in:
0° = 0.00020 90° = 0.00020

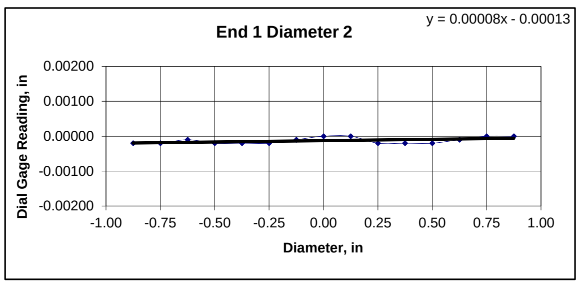
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00000	0.00000	0.00000	0.00010	0.00020	0.00020	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00020	0.00020
Diameter 2, in (rotated 90^o)	-0.00010	-0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00000	0.00000	0.00010	0.00020	0.00030	0.00020	0.00010	0.00000

Difference between max and min readings, in:
0° = 0.0002 90° = 0.0004

Maximum difference must be < 0.0020 in. Difference = $\pm$ 0.00020

Flatness Tolerance Met? YES





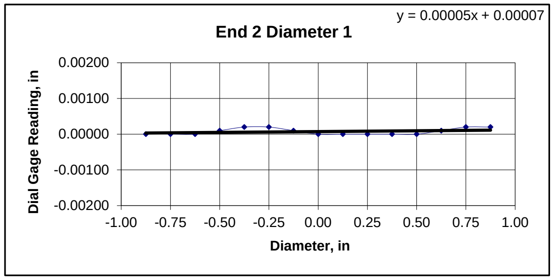
DIAMETER 1

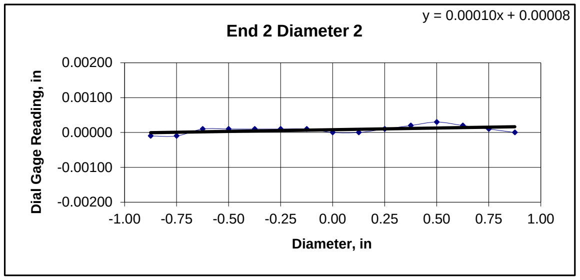
End 1:
Slope of Best Fit Line 0.00012
Angle of Best Fit Line: 0.00688

End 2:
Slope of Best Fit Line 0.00005
Angle of Best Fit Line: 0.00286

Maximum Angular Difference: 0.00401

Parallelism Tolerance Met? YES
Spherically Seated





DIAMETER 2

End 1:
Slope of Best Fit Line 0.00008
Angle of Best Fit Line: 0.00458

End 2:
Slope of Best Fit Line 0.00010
Angle of Best Fit Line: 0.00573

Maximum Angular Difference: 0.00115

Parallelism Tolerance Met? YES
Spherically Seated

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00020	1.985	0.00010	0.006	YES
Diameter 2, in (rotated 90^o)	0.00020	1.985	0.00010	0.006	YES
END 2					
Diameter 1, in	0.00020	1.985	0.00010	0.006	YES
Diameter 2, in (rotated 90^o)	0.00040	1.985	0.00020	0.012	YES

Maximum angle of departure must be $\leq$ 0.25°

Perpendicularity Tolerance Met? YES

Client:	Quanta Subsurface
Project Name:	Nothern Pass - Transition #3 Substation
Project Location:	Clarksville, NH
GTX #:	305375
Test Date:	9/29/2016
Tested By:	daa/rlc
Checked By:	jsc
Boring ID:	BH-306
Sample ID:	R2
Depth, ft:	17.5-17.87

After cutting and grinding

After break

Client:	Quanta Subsurface	Test Date:	9/30/2016
Project Name:	Nothern Pass - Transition #3 Substation	Tested By:	rlc
Project Location:	Clarksville, NH	Checked By:	jsc
GTX #:	305375		
Boring ID:	BH-309		
Sample ID:	R1		
Depth:	10.9-11.28 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY

	1	2	Average		
Specimen Length, in:	4.50	4.50	4.50		
Specimen Diameter, in:	1.99	1.99	1.99		
Specimen Mass, g:	644.26				
Bulk Density, lb/ft^3	175			**Minimum Diameter Tolerence Met?**	YES
Length to Diameter Ratio:	2.3			**Length to Diameter Ratio Tolerance Met?**	YES

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:

Is the maximum gap $\leq$ 0.02 in.? YES

Maximum difference must be < 0.020 in.

Straightness Tolerance Met? YES

END FLATNESS AND PARALLELISM (Procedure FP1)

END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00000	-0.00010	-0.00010	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Diameter 2, in (rotated 90°)	-0.00010	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010

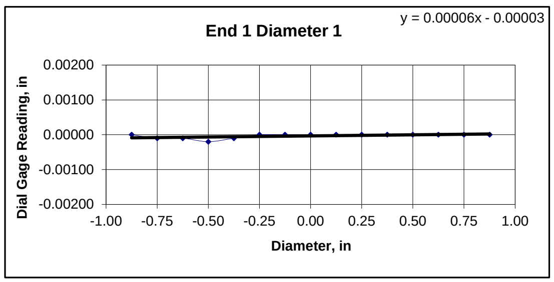
Difference between max and min readings, in:
0° = 0.00020 90° = 0.00020

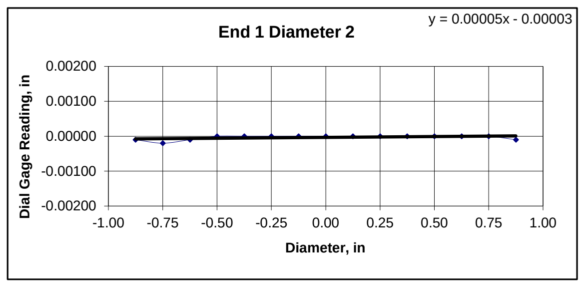
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00020	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Diameter 2, in (rotated 90°)	0.00040	0.00030	0.00020	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00010	0.00010

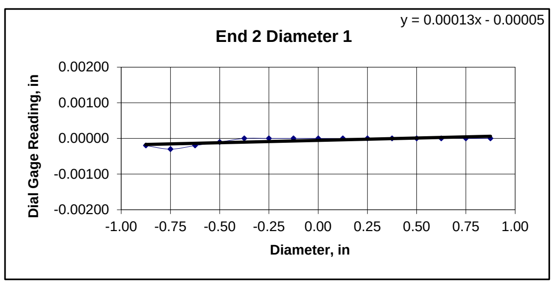
Difference between max and min readings, in:
0° = 0.0003 90° = 0.0004

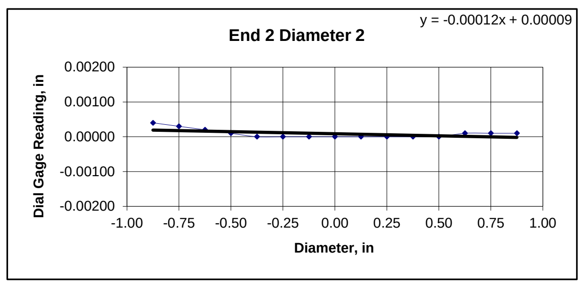
Maximum difference must be < 0.0020 in. Difference = $\pm$ 0.00020

Flatness Tolerance Met? YES









DIAMETER 1

End 1:

Slope of Best Fit Line	0.00006
Angle of Best Fit Line:	0.00344

End 2:

Slope of Best Fit Line	0.00013
Angle of Best Fit Line:	0.00745

Maximum Angular Difference: 0.00401

Parallelism Tolerance Met? YES
Spherically Seated

DIAMETER 2

End 1:

Slope of Best Fit Line	0.00005
Angle of Best Fit Line:	0.00286

End 2:

Slope of Best Fit Line	0.00012
Angle of Best Fit Line:	0.00688

Maximum Angular Difference: 0.00401

Parallelism Tolerance Met? YES
Spherically Seated

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00020	1.990	0.00010	0.006	YES
Diameter 2, in (rotated 90°)	0.00020	1.990	0.00010	0.006	YES
END 2					
Diameter 1, in	0.00030	1.990	0.00015	0.009	YES
Diameter 2, in (rotated 90°)	0.00040	1.990	0.00020	0.012	YES

Maximum angle of departure must be $\leq$ 0.25°

Perpendicularity Tolerance Met? YES

Client:	Quanta Subsurface
Project Name:	Nothern Pass - Transition #3 Substation
Project Location:	Clarksville, NH
GTX #:	305375
Test Date:	9/30/2016
Tested By:	rlc
Checked By:	jsc
Boring ID:	BH-309
Sample ID:	R1
Depth, ft:	10.9-11.28

After cutting and grinding

After break

Appendix E
Infiltration Field Test Results

S.W.COLE ENGINEERING, INC.

Borehole Infiltration Test

Project Name:	Northern Pass	Test Date:	9/21/2016
Project No.:	16-0600	Tested By:	NMC
Client:	Quanta Subsurface	Reviewed By:	CBM
Test Location:	INF-301, Transition Station #3		

Trial #1		Trial #2		Trial #3		Trial #4	
Time Elapsed (min)	Depth to Water (ft)	Time Elapsed (min)	Depth to Water (ft)	Time Elapsed (min)	Depth to Water (ft)	Time Elapsed (min)	Depth to Water (ft)
0	2.0	0	2.2	0	3.1	0	3.1
2	2.1	2	2.2	2	3.2	2	3.2
4	2.2	4	2.3	4	3.2	4	3.3
6	2.3	6	2.4	6	3.3	6	3.4
8	2.4	8	2.5	8	3.3	8	3.4
10	2.5	10	2.6	10	3.4	10	3.5
15	2.8	15	2.7	15	3.5	15	3.5
20	3.0	20	2.9	20	3.7	20	3.6
25	3.1	25	3.0	25	3.8	25	3.6
30	3.3	30	3.2	30	3.9	30	3.7
35	3.4	35	3.4	35	4.0	35	3.7
40	3.5	40	3.5	40	4.2	40	3.8
45	3.6	45	3.6	45	4.2	45	3.8
50	3.7	50	3.8	50	4.3	50	3.9
55	3.8	55	3.9	55	4.4	55	3.9
60	3.9	60	4.0	60	4.5	60	4.0
(ft/hr)	1.9	(ft/hr)	1.8	(ft/hr)	1.4	(ft/hr)	0.9
(in/hr)	22.8	(in/hr)	21.6	(in/hr)	16.8	(in/hr)	10.8

Test Summary

Average Infiltration Rate (in/hr)	**18.0**
Pre-Soak Performed 9/19/2016 6:02 pm	
Hole Depth from Top of Casing (ft)	4.9
Casing Stick-up from Ground Surface (ft)	2.3
Pre-Infiltration Test Water Depth (ft)	no water

Notes:

1) Testing was performed in accordance with guidelines presented in the Nhew Hampshire Stormwater Manual (Vol 2; Table 2-3).

2) The Average Infiltration Rate (in/hr) presented is based on field measurements; a safety factor has not been applied.

Borehole Infiltration Test

S.W.COLE ENGINEERING, INC.

Project Name:	Northern Pass	Test Date:	9/21/2016
Project No.:	16-0600	Tested By:	NMC
Client:	Quanta Subsurface	Reviewed By:	CBM
Test Location:	INF-302, Transition Station #3		

Trial #1		Trial #2		Trial #3		Trial #4	
Time Elapsed (min)	Depth to Water (ft)	Time Elapsed (min)	Depth to Water (ft)	Time Elapsed (min)	Depth to Water (ft)	Time Elapsed (min)	Depth to Water (ft)
0	2.1	0	1.9	0	2.4	0	3.1
2	2.2	2	2.0	2	2.4	2	-
4	2.2	4	2.1	4	2.4	4	-
6	2.3	6	2.1	6	2.5	6	-
8	2.3	8	2.1	8	2.5	8	-
10	2.3	10	2.1	10	2.5	10	3.3
15	2.4	15	2.2	15	2.6	15	3.3
20	2.5	20	2.3	20	2.7	20	3.4
25	2.6	25	2.4	25	2.7	25	3.4
30	2.7	30	2.5	30	2.8	30	3.5
35	2.7	35	2.6	35	2.8	35	3.5
40	2.9	40	2.6	40	2.9	40	3.5
45	2.9	45	2.7	45	3.0	45	3.6
50	2.9	50	2.8	50	3.0	50	3.6
55	3.0	55	2.8	55	3.1	55	3.7
60	3.1	60	2.9	60	3.1	60	3.7
(ft/hr)	1.0	(ft/hr)	1.0	(ft/hr)	0.7	(ft/hr)	0.6
(in/hr)	12.0	(in/hr)	12.0	(in/hr)	8.4	(in/hr)	7.2

Test Summary

Average Infiltration Rate (in/hr)	**9.9**
Pre-Soak Performed 9/19/2016 6:08 pm	
Hole Depth from Top of Casing (ft)	4.6
Casing Stick-up from Ground Surface (ft)	1.8
Pre-Infiltration Test Water Depth (ft)	no water

Notes:

1) Testing was performed in accordance with guidelines presented in the Nhew Hampshire Stormwater Manual (Vol 2; Table 2-3).

2) The Average Infiltration Rate (in/hr) presented is based on field measurements; a safety factor has not been applied.

Appendix F
Summary of Geotechnical Design Parameters

Summary of Geotechnical Design Parameters
Transition Station #3

Boring BH 301

Sublayer Description	Sublayer Depth (ft)		Material Description	Average N_{60}	Effective Unit Weight (pcf)	Soil Friction Angle (deg)	Soil Undrained Strength (psf)	Bedrock (Rock Mass Equivalent Mohr-Coulomb Fit)	
	Top	Bot.						Friction Angle (deg)	Cohesion (psf)
Topsoil	0	1	REMOVE AND REPLACE WITH CONTROLLED STRUCTURAL FIL						
Residual	1	3	ML	25	120	31	-	-	-

Boring BH 302

Sublayer Description	Sublayer Depth (ft)		Material Description	Average N_{60}	Effective Unit Weight (pcf)	Soil Friction Angle (deg)	Soil Undrained Strength (psf)	Bedrock (Rock Mass Equivalent Mohr-Coulomb Fit)	
	Top	Bot.						Friction Angle (deg)	Cohesion (psf)
Topsoil	0	1	REMOVE AND REPLACE WITH CONTROLLED STRUCTURAL FILL						
Residual	1	6	SM	29	125	34	-	-	-
Bedrock	6	12	CW Phyllite	74	140	43	-	-	-

Boring BH 303

Sublayer Description	Sublayer Depth (ft)		Material Description	Average N_{60}	Effective Unit Weight (pcf)	Soil Friction Angle (deg)	Soil Undrained Strength (psf)	Bedrock (Rock Mass Equivalent Mohr-Coulomb Fit)	
	Top	Bot.						Friction Angle (deg)	Cohesion (psf)
Fill	0	2	REMOVE AND REPLACE WITH CONTROLLED STRUCTURAL FILL						
	2	6	SM	24	120	33	-	-	-
Residual	6	8	SM	48	130	38	-	-	-
	8	11	SM	18	115	32	-	-	-
Bedrock	11	15	HW[1] Phyllite	100+	150	45	-	-	-

Boring BH 304

Sublayer Description	Sublayer Depth (ft)		Material Description	Average N_{60}	Effective Unit Weight (pcf)	Soil Friction Angle (deg)	Soil Undrained Strength (psf)	Bedrock (Rock Mass Equivalent Mohr-Coulomb Fit)	
	Top	Bot.						Friction Angle (deg)	Cohesion (psf)
Topsoil	0	0.5	REMOVE AND REPLACE WITH CONTROLLED STRUCTURAL FILL						
Residual	0.5	2							
	2	5.5	SM	23	120	33	-	-	-
Bedrock	5.5	7	HW[1] Phyllite	100+	150	45	-	-	-

Summary of Geotechnical Design Parameters (cont)
Transition Station #3

Boring BH 305

Sublayer Description	Sublayer Depth (ft)		Material Description	Average N_{60}	Effective Unit Weight (pcf)	Soil Friction Angle (deg)	Soil Undrained Strength (psf)	Bedrock (Rock Mass Equivalent Mohr-Coulomb Fit)	
	Top	Bot.						Friction Angle (deg)	Cohesion (psf)
Topsoil	0	1	REMOVE AND REPLACE WITH CONTROLLED STRUCTURAL FILL						
Residual	1	2	CL	16	115	-	2000	-	-
Bedrock	2	12	HW Quartzite	100+	150	45	-	-	-
	12	15	F to SW[1] Quartzite	-	175	-	-	66.3	8,500

1 Assumed UCS = 10,000 psi; GSI = 50 (excellent rock)

Boring BH 306

Sublayer Description	Sublayer Depth (ft)		Material Description	Average N_{60}	Effective Unit Weight (pcf)	Soil Friction Angle (deg)	Soil Undrained Strength (psf)	Bedrock (Rock Mass Equivalent Mohr-Coulomb Fit)	
	Top	Bot.						Friction Angle (deg)	Cohesion (psf)
Topsoil	0	0.5	REMOVE AND REPLACE WITH CONTROLLED STRUCTURAL FILL						
Residual	1	2							
	2	10	ML	26	120	31	-	-	-
Bedrock	10	15	HW Phyllite	100+	150	45	-	-	-
	15	20	F to SW[1] Phyllite	-	175	-	-	52.1	3,100

1 Assumed UCS = 4000 psi; GSI = 40 (poor to fair rock)

Boring BH 307

Sublayer Description	Sublayer Depth (ft)		Material Description	Average N_{60}	Effective Unit Weight (pcf)	Soil Friction Angle (deg)	Soil Undrained Strength (psf)	Bedrock (Rock Mass Equivalent Mohr-Coulomb Fit)	
	Top	Bot.						Friction Angle (deg)	Cohesion (psf)
Topsoil	0	0.5	REMOVE AND REPLACE WITH CONTROLLED STRUCTURAL FILL						
Residual	0.5	2.5	SM	9	110	29	-	-	-
Bedrock	2.5	6	CW Phyllite	63	135	42	-	-	-

Summary of Geotechnical Design Parameters (cont)
Transition Station #3

Boring BH 308

Sublayer Description	Sublayer Depth (ft)		Material Description	Average N_{60}	Effective Unit Weight (pcf)	Soil Friction Angle (deg)	Soil Undrained Strength (psf)	Bedrock (Rock Mass Equivalent Mohr-Coulomb Fit)	
	Top	Bot.						Friction Angle (deg)	Cohesion (psf)
Residual	0	2	ML	10	110	28	-	-	-
	2	4.5	ML	33	125	32	-	-	-
Bedrock	4.5	8	CW Phyllite	50+	130	35	-	-	-
	8	13	SW to MW[1] Phyllite	-	170	-	-	45.2	1,300
	13	18	SW to MW[1] Phyllite	-	175	-	-	52.1	3,100

1 Assumed UCS = 4000 psi; GSI = 20 (very poor rock)
2 Assumed UCS = 4000 psi; GSI = 40 (poor rock)

Boring BH 309

Sublayer Description	Sublayer Depth (ft)		Material Description	Average N_{60}	Effective Unit Weight (pcf)	Soil Friction Angle (deg)	Soil Undrained Strength (psf)	Bedrock (Rock Mass Equivalent Mohr-Coulomb Fit)	
	Top	Bot.						Friction Angle (deg)	Cohesion (psf)
Topsoil	0	0.5	REMOVE AND REPLACE WITH CONTROLLED STRUCTURAL FILL						
Residual	0.5	2							
	2	6	SM/ML	34	125	33	-	-	-
Bedrock	6	7	CW[1] Phyllite	100+	150	45	-	-	-
	7	22	F to MW[1] Phyllite	-	175	-	-	52.1	3,100

1 Assumed UCS = 4000 psi; GSI = 40 (fair to good rock)

Controlled Structural Fill

Sublayer Description	Sublayer Depth (ft)		Material Description	Average N_{60}	Effective Unit Weight (pcf)	Soil Friction Angle (deg)	Soil Undrained Strength (psf)	Bedrock (Rock Mass Equivalent Mohr-Coulomb Fit)	
	Top	Bot.						Friction Angle (deg)	Cohesion (psf)
Structural Fill	-	-	SM/ML	-	125	30	-	-	-

INFILTRATION FEASIBILITY REPORT

Transition Station #3
Clarksville, NH
December 15, 2016

TABLE OF CONTENTS:

The project proposes one system that requires infiltration to function property. This system is identified on the plans as Infiltration Basin-1.

I. Location of the practice

Infiltration Basin-1 is located at the northwestern side of the proposed station access road.

II. Existing topography at the location of the practice

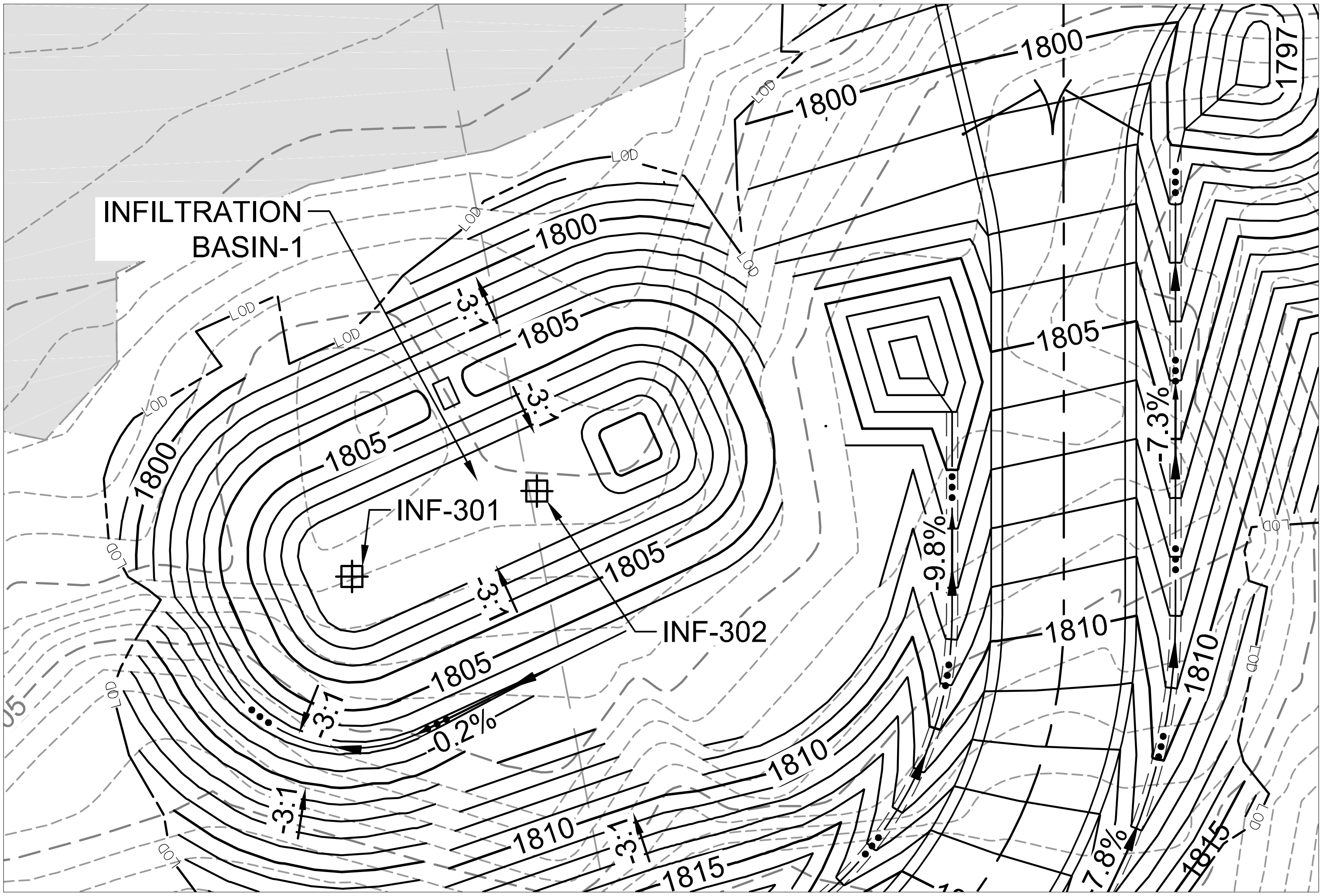
The existing topography within the area of the infiltration basin varies in slope from about 2% to 15% with a forested cover.

III. Test pit or boring locations

In accordance with Env-Wq 1504.12(c), NHDES requires that a minimum number of test pits or borings be dug or drilled in the location of the system, depending on the size of the proposed system.

Infiltration Basin-1 is 1250 square feet in area. Two borehole infiltration tests were performed in the location of this practice. The test locations, identified as INF-301 and INF-302, are shown on the attached boring location plan.

TRANSITION STATION #3
INFILTRATION BASIN
BORING LOCATION PLAN



PROPOSED LEGEND:

1805	MAJOR CONTOUR
	MINOR CONTOUR
	BOREHOLE INFILTRATION TEST LOCATION

EXISTING LEGEND:

385	MAJOR CONTOUR
381	MINOR CONTOUR

0 30' 60'

SCALE IN FEET

NOTES:

1. BACKGROUND INFORMATION TAKEN FROM "EXISTING CONDITIONS PLAN" FOR TRANSITION STATION #3, WISWELL ROAD, CLARKSVILLE, NH. PREPARED BY CHA, CONSULTING, INC. DATED AUGUST 26, 2014. LAST REVISED OCTOBER 14, 2014. WETLAND FLAGS SHOWN ARE BASED ON LOCATIONS PROVIDED BY NORMANDEAU, WETLAND FLAGS WERE DELINEATED BY NORMANDEAU IN 2013.
2. NEW HAMPSHIRE STATE PLANE COORDINATE SYSTEM
   HORIZONTAL DATUM - NAD83
   VERTICAL DATUM - NAVD88
3. PROPOSED CONTOURS AND SPOT ELEVATIONS INDICATED REFER TO TOP OF FINISH SURFACE.
4. ALL FILL AND CUT SLOPES ARE 3-FT HORIZONTAL TO 1-FT VERTICAL (3:1) UNLESS NOTED OTHERWISE.

IV. Seasonal high water table (SHWT) and bedrock elevations

The following borehole test data was collected on September 7, 2016.

Infiltration Basin-1:

Bottom of Basin Elevation = 1801.5

INF-201: Existing Surface Elevation of Borehole = 1801.0
SHWT = not encountered
BEDROCK = 1796.5
Deepest Elevation of Borehole = 1796.0 (Auger Refusal)

INF-202: Existing Surface Elevation of Borehole = 1800.3
SHWT = not encountered
BEDROCK = 1796.2 (Auger Refusal)
Deepest Elevation of Borehole = 1796.2 (Auger Refusal)

V. Profile descriptions

Refer to attached boring logs for soil profile descriptions at INF-301 and INF-302 boreholes.

BORING NUMBER INF 301

Quanta Subsurface
4308 N Barker RD
Spokane Valley, WA 99027
Telephone: 509-892-9409

CLIENT PAR Electrical Contractors
PROJECT NAME Northern Pass TL - Transition Station #3
PROJECT NUMBER 16004
PROJECT LOCATION Clarksville, New Hampshire
DATE STARTED 9/7/16 **COMPLETED** 9/7/16
GROUND ELEVATION 1801.0 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR SW Cole
LATITUDE 45.01058333 **LONGITUDE** -71.42157778
DRILLING METHOD Hollow Stem Auger
DRILLING EQUIPMENT CME 850 **SPT HAMMER** Automatic
LOGGED BY S. Laing **CHECKED BY** J.T. McGinnis
GROUND WATER LEVEL:
NOTES
▽ **AT TIME OF DRILLING** Not Encountered

ELEV (ft)	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	GRAPHIC LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)	REMARKS
	0						TOPSOIL: SILT (ML), trace organics, trace fine to medium sand, brownish gray, moist					Infiltration test casing installed in an adjacent borehole to a depth of approximately 3 feet.
1800		SPT 1	71	2-2-2-4 (4)			RESIDUAL: Silty SAND (SM), little fine to coarse gravel, yellowish brown, moist, fine to coarse grained sand					
		SPT 2	83	7-7-11-8 (18)			- fragments of highly weathered phylittle from 2.5 to 5 feet	11.8			36.4	The ESHWT is at a depth below 5 feet.
	5	SPT 3	100	2-50/5"			BEDROCK: Highly weathered (IV), thinly foliated, gray, fine to medium, very weak (R1), very poor, PHYLLITE, relict rock fabric present, consistency of sandy silt					

Auger Refusal at 5.0 feet
Bottom of Borehole at 5.0 feet

GEOTECH BH COLUMNS - DF STD US LAB E-M.GDT - 12/9/16 12:00 - C:\USERS\JTMCGINNIS\DOCUMENTS\16004 GINT\16004 NORTHERN PASS TRANSITION 3.GPJ

BORING NUMBER INF 302

QUANTA SUBSURFACE Engineering + Construction
Quanta Subsurface
4308 N Barker RD
Spokane Valley, WA 99027
Telephone: 509-892-9409

CLIENT PAR Electrical Contractors
PROJECT NAME Northern Pass TL - Transition Station #3
PROJECT NUMBER 16004
PROJECT LOCATION Clarksville, New Hampshire

DATE STARTED 9/7/16 **COMPLETED** 9/7/16
GROUND ELEVATION 1800.3 ft **HOLE SIZE** 6"
DRILLING CONTRACTOR SW Cole
LATITUDE 45.010625 **LONGITUDE** -71.42144722
DRILLING METHOD Hollow Stem Auger
DRILLING EQUIPMENT CME 850 **SPT HAMMER** Automatic
LOGGED BY S.Tiger **CHECKED BY** J.T. McGinnis
GROUND WATER LEVEL:
NOTES
AT TIME OF DRILLING Not Encountered

ELEV (ft)	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	GRAPHIC LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT	ATTERBERG LIMITS PLASTICITY INDEX	FINES CONTENT (%)	REMARKS
1800	0						TOPSOIL: SILT with sand (ML), little organics, brownish gray, moist, fine to medium grained					Infiltration test casing installed in an adjacent borehole to a depth of approximately 3 feet.
		SPT 1	54	1-3-7-6 (10)			RESIDUAL: Sandy SILT (ML), little fine to coarse gravel, reddish brown, moist, fine to medium grained, relict rock structure					
		SPT 2	75	7-9-9-4 (18)				15.2			54.7	The ESHWT is at a depth below 4.1 feet.

Auger Refusal at 4.1 feet
Bottom of Borehole at 4.1 feet

GEOTECH BH COLUMNS - DF STD US LAB E-M.GDT - 12/9/16 12:00 - C:\USERS\JTMCGINNIS\DOCUMENTS\16004 GINT\16004 NORTHERN PASS TRANSITION 3.GPJ

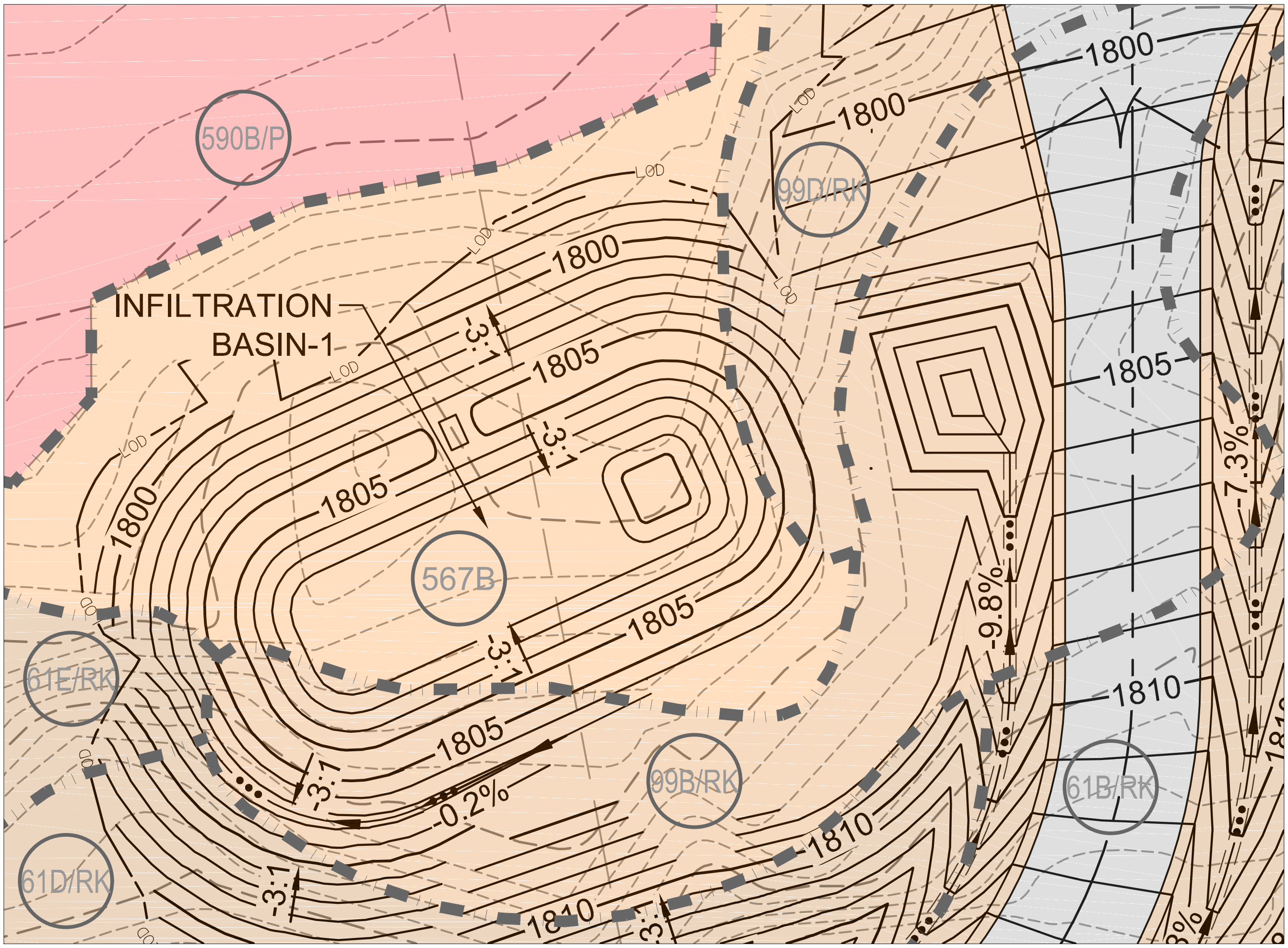
VI. Soil plan in the area of the proposed practice

Refer to attached plans for a delineation of soil series near Infiltration Basin-1, as determined by a soil survey report prepared by Normandeau Associates, Inc. The report is entitled “Northern Pass Transmission Project, Soil Survey Report for Transition Stations, Substation Expansions and Converter Terminal” dated February 6, 2015.

THE NORTHERN PASS

TRANSITION STATION #3
INFILTRATION BASIN
SOIL SERIES PLAN

NORTH



SOIL LEGEND:

	APPROXIMATE SOIL BOUNDARY
567B	HOWLAND SILT LOAM VERY STONY 3 TO 8 PERCENT SLOPES, HSG C
99B	TURNBRIDGE VERY STONY 3 TO 8 PERCENT SLOPES, HSG C
99D	TURNBRIDGE VERY STONY 15 TO 25 PERCENT SLOPES, HSG C
61B/RK	TURNBRIDGE-LYMAN COMPLEX ROCK OUTCROP COMPLEX 3 TO 8 PERCENT SLOPES, HSG C/A/D
61D/RK	TURNBRIDGE-LYMAN COMPLEX ROCK OUTCROP COMPLEX 15 TO 25 PERCENT SLOPES, HSG C/A/D
61E/RK	TURNBRIDGE-LYMAN COMPLEX ROCK OUTCROP COMPLEX 25 TO 50 PERCENT SLOPES, HSG C/A/D
590B/P	CABOT GRAVELLY SILT LOAM VERY STONY 3 TO 8 PERCENT SLOPES, HSG D

NOTES:

1. SOIL INFORMATION TAKEN FROM "NORTHERN PASS TRANSMISSION PROJECT, SOIL SURVEY REPORT FOR TRANSITION STATIONS, SUBSTATION EXPANSIONS, AND CONVERTER TERMINAL" PREPARED BY NORMANDEAU ENVIRONMENTAL CONSULTANTS, DATED FEBRUARY 6, 2015.
2. NEW HAMPSHIRE STATE PLANE COORDINATE SYSTEM
   HORIZONTAL DATUM - NAD83
   VERTICAL DATUM - NAVD88
3. PROPOSED CONTOURS AND SPOT ELEVATIONS INDICATED REFER TO TOP OF FINISH SURFACE.
4. ALL FILL AND CUT SLOPES ARE 3-FT HORIZONTAL TO 1-FT VERTICAL (3:1) UNLESS NOTED OTHERWISE.

0 30' 60'

SCALE IN FEET

VII. Summary of Field Testing data used to determine the infiltration rate

The infiltration rate for Infiltration Basin was determined using the Field Measurement method described in Env-Wq 1504.13.

The Ksat was measured with a Borehole Infiltration Test.

INF-301: The average Ksat of the tests was 18.0 inches per hour.
INF-302: The average Ksat of the tests was 9.9 inches per hour.

After applying a factor of safety, the design rate used in the drainage analysis is 4.9 inches per hour.

Refer to attached field infiltration test results for additional information.

S.W.COLE ENGINEERING, INC.

Borehole Infiltration Test

Project Name:	Northern Pass	Test Date:	9/21/2016
Project No.:	16-0600	Tested By:	NMC
Client:	Quanta Subsurface	Reviewed By:	CBM
Test Location:	INF-301, Transition Station #3		

Trial #1		Trial #2		Trial #3		Trial #4	
Time Elapsed (min)	Depth to Water (ft)	Time Elapsed (min)	Depth to Water (ft)	Time Elapsed (min)	Depth to Water (ft)	Time Elapsed (min)	Depth to Water (ft)
0	2.0	0	2.2	0	3.1	0	3.1
2	2.1	2	2.2	2	3.2	2	3.2
4	2.2	4	2.3	4	3.2	4	3.3
6	2.3	6	2.4	6	3.3	6	3.4
8	2.4	8	2.5	8	3.3	8	3.4
10	2.5	10	2.6	10	3.4	10	3.5
15	2.8	15	2.7	15	3.5	15	3.5
20	3.0	20	2.9	20	3.7	20	3.6
25	3.1	25	3.0	25	3.8	25	3.6
30	3.3	30	3.2	30	3.9	30	3.7
35	3.4	35	3.4	35	4.0	35	3.7
40	3.5	40	3.5	40	4.2	40	3.8
45	3.6	45	3.6	45	4.2	45	3.8
50	3.7	50	3.8	50	4.3	50	3.9
55	3.8	55	3.9	55	4.4	55	3.9
60	3.9	60	4.0	60	4.5	60	4.0
(ft/hr)	1.9	(ft/hr)	1.8	(ft/hr)	1.4	(ft/hr)	0.9
(in/hr)	22.8	(in/hr)	21.6	(in/hr)	16.8	(in/hr)	10.8

Test Summary

Average Infiltration Rate (in/hr)	**18.0**
Pre-Soak Performed 9/19/2016 6:02 pm	
Hole Depth from Top of Casing (ft)	4.9
Casing Stick-up from Ground Surface (ft)	2.3
Pre-Infiltration Test Water Depth (ft)	no water

Notes:

1) Testing was performed in accordance with guidelines presented in the Nhew Hampshire Stormwater Manual (Vol 2; Table 2-3).

2) The Average Infiltration Rate (in/hr) presented is based on field measurements; a safety factor has not been applied.

Borehole Infiltration Test

S.W.COLE ENGINEERING, INC.

Project Name:	Northern Pass	Test Date:	9/21/2016
Project No.:	16-0600	Tested By:	NMC
Client:	Quanta Subsurface	Reviewed By:	CBM
Test Location:	INF-302, Transition Station #3		

Trial #1		Trial #2		Trial #3		Trial #4	
Time Elapsed (min)	Depth to Water (ft)	Time Elapsed (min)	Depth to Water (ft)	Time Elapsed (min)	Depth to Water (ft)	Time Elapsed (min)	Depth to Water (ft)
0	2.1	0	1.9	0	2.4	0	3.1
2	2.2	2	2.0	2	2.4	2	-
4	2.2	4	2.1	4	2.4	4	-
6	2.3	6	2.1	6	2.5	6	-
8	2.3	8	2.1	8	2.5	8	-
10	2.3	10	2.1	10	2.5	10	3.3
15	2.4	15	2.2	15	2.6	15	3.3
20	2.5	20	2.3	20	2.7	20	3.4
25	2.6	25	2.4	25	2.7	25	3.4
30	2.7	30	2.5	30	2.8	30	3.5
35	2.7	35	2.6	35	2.8	35	3.5
40	2.9	40	2.6	40	2.9	40	3.5
45	2.9	45	2.7	45	3.0	45	3.6
50	2.9	50	2.8	50	3.0	50	3.6
55	3.0	55	2.8	55	3.1	55	3.7
60	3.1	60	2.9	60	3.1	60	3.7
(ft/hr)	1.0	(ft/hr)	1.0	(ft/hr)	0.7	(ft/hr)	0.6
(in/hr)	12.0	(in/hr)	12.0	(in/hr)	8.4	(in/hr)	7.2

Test Summary

Average Infiltration Rate (in/hr)	**9.9**
Pre-Soak Performed 9/19/2016 6:08 pm	
Hole Depth from Top of Casing (ft)	4.6
Casing Stick-up from Ground Surface (ft)	1.8
Pre-Infiltration Test Water Depth (ft)	no water

Notes:

1) Testing was performed in accordance with guidelines presented in the Nhew Hampshire Stormwater Manual (Vol 2; Table 2-3).

2) The Average Infiltration Rate (in/hr) presented is based on field measurements; a safety factor has not been applied.

APPENDIX I – WETLAND DELINEATION REPORT (BY OTHERS)

WETLANDS REPORT INFORMATION INCLUDED UNDER SEPARATE COVER

APPENDIX J – POLLUTANT LOADING CALCULATIONS

Condition	Point of Analysis (PoA) Number	Sub-Area Number	Area Description	Land Use	BMP	Is the Impervious Area Disconnected in accordance with Chapter 6, Volume 1 of the NH Stormwater Manual or is the BMP an Infiltration BMP designed in accordance with Alteration of Terrain regulations (Env-Wq 1500)?	Pervious Undisturbed (i.e, forest, meadow, etc.)	Pervious Disturbed (i.e. lawn or other area that will be fertilized regularly)	Pervious Pavement that filters and infiltrates all stormwater (no underdrains)	Pervious Disturbed Other	Description of Pervious Disturbed Other	Pervious Total	Pervious Pavement that filters but does not infiltrate all stormwater (has underdrains)	Impervious Roof	Impervious Road	Impervious Parking and Drives	Impervious Sidewalks	Impervious Surface Water	Impervious Other	Description of Impervious Other	Impervious Total (prior to Disconnection or Infiltration BMP Credit)	Total Area	Composite % Impervious (without disconnection or Infiltration credit)	Composite % Impervious (with disconnection or Infiltration credit)
							Acres	Acres	Acres	Acres		Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres		Acres	Acres		
Pre-Development	Pre-1	Pre-1	Pre-Dev Watershed Map Area 1	Forest/Rural Open		NO	8.50	0.00	0.00	0.00		8.50	0.00	0.00	0.05	0.00	0.00	0.00	0.00		0.05	8.55	0.63%	0.63%
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Pre-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		

Condition	Point of Analysis (PoA) Number	Sub-Area Number	Area Description	Land Use	BMP	Is the Impervious Area Disconnected in accordance with Chapter 6, Volume 1 of the NH Stormwater Manual or is the BMP an Infiltration BMP designed in accordance with Alteration of Terrain regulations (Env-Wq 1500)?	Pervious Undisturbed (i.e, forest, meadow, etc.)	Pervious Disturbed (i.e. lawn or other area that will be fertilized annually)	Pervious Pavement that filters and infiltrates all stormwater (no underdrains)	Pervious Disturbed Other	Description of Pervious Disturbed Other	Pervious Total	Pervious Pavement that filters but does not infiltrate all stormwater (has underdrains)	Impervious Roof	Impervious Road	Impervious Parking and Drives	Impervious Sidewalks	Impervious Surface Water	Impervious Other	Description of Impervious Other	Impervious Total (Prior to Disconnection or Infiltration BMP Credit)	Total Area	Composite % Impervious (without disconnection or Infiltration credit)	Composite % Impervious (with disconnection or Infiltration credit)
							Acres	Acres	Acres	Acres		Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres		Acres	Acres		
Post-Development	Post-1	Post-1	Post-Dev Watershed Map Area 1	Forest/Rural Open	Infiltration Basin 1	YES	0.00	0.00	0.57	0.14	meadow/grass, not fertilized	0.71	0.00	0.01	0.08	0.00	0.00	0.06	0.00		0.15	0.86	17.54%	0.00%
Post-Development	Post-2	Post-2	Post-Dev Watershed Map Area 2	Forest/Rural Open		NO	0.68	0.00	0.00	0.21	meadow/grass, not fertilized	0.89	0.00	0.00	0.01	0.00	0.00	0.00	0.00		0.01	0.90	1.11%	1.11%
Post-Development	Post-3	Post-3	Post-Dev Watershed Map Area 3	Forest/Rural Open	Vegetated Swale	YES	0.00	0.00	0.00	0.07	meadow/grass, not fertilized	0.07	0.00	0.00	0.13	0.00	0.00	0.00	0.00		0.13	0.20	65.00%	0.00%
Post-Development	Post-4	Post-4	Post-Dev Watershed Map Area 4	Forest/Rural Open		NO	0.85	0.00	0.00	0.70	meadow/grass, not fertilized	1.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	1.55	0.00%	0.00%
Post-Development	Post-5	Post-5	Post-Dev Watershed Map Area 5	Forest/Rural Open		NO	4.70	0.00	0.00	0.34	meadow/grass, not fertilized	5.04	0.00	0.00	0.02	0.00	0.00	0.00	0.00		0.02	5.06	0.40%	0.40%
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Post-Development						NO	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		

Date (MM/DD/YYYY):	**11/16/2016**	
Project Name:	**Transition Station #3**	
Town/City:	**Clarksville, Coos County**	
Impacted Surface Waters:	**Upper Connecticut River**	
Applicant:	**Northern Pass Transmission, LLC.**	
DES File #:		

Average Annual Precipitation P	**40.20**	**inches**
Fraction of Annual Runoff events that produce runoff	**0.90**	**(usually 0.9)**

ONLY INPUT VALUES IN BLUE SHADED CELLS

Credit for Using Low Nutrient Fertilizer: If there are managed turf areas under post development conditions that are to be fertilized annually, reductions in post development nutrient (TP and TN) loadings can be realized by by providing enforceable documents (i.e., deed restrictions) requiring land owners to use low nutrient fertilizer. To get low nutrient fertilizer pollutant reductions input the proposed reduced fertilizer application rates for post development development for TP and TN in the table below. Low nutrient fertilizers must have application rates less than the standard fertilizer application rate shown in the table. Then input the percent of each land use in each post development sub-area that is managed turf that is fertilzed annually.

	Fertilizer Reduction Calculator	
	TP	**TN**
STANDARD FERTILIZER APPLICATION RATE (lbs/acre/year)	15.0	150.0
PROPOSED REDUCED FERTILIZER APPLICATION RATES FOR POST-DEVELOPMENT (lbs/acre/year)	**0.0**	**44.0**
INITIAL PERCENT REDUCTION	100.0%	70.7%
PERCENT OF CITIZENS THAT WILL COMPLY WITH REDUCED APPLICATION RATES	50%	50%
PERCENT OF APPLIED FERTILIZER THAT IS LOST TO RUNOFF OR PERCOLATION	10%	10%
FINAL PERCENT FERTILIZER REDUCTION WITH COMPLIANCE AND RUNOFF RATES APPLIED (%FR)	**5.0%**	**3.5%**
MINIMUM ASSUMED EMC = EMC_{MIN} (mg/L)	0.11	1.74

Used to reduce EMCs for Post TP and Post TN for each land use in each Sub Area depending on perce of area that is managed turf that is fertilized annually

PRE-DEVELOPMENT CONDITIONS

	Area	Impervious Area
Total Area (All Sub-Areas) (acres)	**8.55**	**0.05**

POST-DEVELOPMENT CONDITIONS

	Area	Impervious Area	Area Fertilized Annually
Total Area (All Sub-Areas) (acres)	**8.57**	**0.03**	**0.00**

Insert information for 1st sub-area below

Sub_Area_ID	**Pre-1**	
Point of Analysis (PoA) Number	**Pre-1**	
Total Area for Sub-Area (acres)	**8.55**	**0.05**

Sub_Area_ID	**Post-1**		
Point of Analysis (PoA) Number	**Post-1**		
Total Area in Sub-Area (acres)	**0.86**	**0.00**	**0.00**

Land Use	**Area**	**Ia**
	(acres)	(% Impervious)
From HWG		
Residential Roof	0.00	0.00%
Commercial Roof	0.00	0.00%
Commercial/Res Parking	0.00	0.00%
Residential Street	0.00	0.00%
Urban Highway	0.00	0.00%
Lawns	0.00	0.00%
Driveway	0.00	0.00%
Residential (general)	0.00	0.00%
Commercial (general)	0.00	0.00%
Industrial (general)	0.00	0.00%
From CDM		
Agriculture and Pasture	0.00	0.00%
Commercial	0.00	0.00%
Forest/Rural Open	8.55	0.63%
Highway	0.00	0.00%
Industrial	0.00	0.00%
Medium Density Residential	0.00	0.00%
Urban Open	0.00	0.00%
Water/Wetland	0.00	0.00%

Land Use	**Total Area for each Land Use**	**Ia**	**Percent of Area that is managed turf (i.e., fertilized annually)**	**Post-TP EMC**	**Post-TN EMC**
	(acres)	(% Impervious)	%	mg/L	mg/L
From HWG					
Residential Roof	0.00	0.00%	0.0%	0.11	1.50
Commercial Roof	0.00	0.00%	0.0%	0.14	2.10
Commercial/Res Parking	0.00	0.00%	0.0%	0.15	1.90
Residential Street	0.00	0.00%	0.0%	0.55	1.40
Urban Highway	0.00	0.00%	0.0%	0.32	3.00
Lawns	0.00	0.00%	0.0%	2.10	9.10
Driveway	0.00	0.00%	0.0%	0.56	2.10
Residential (general)	0.00	0.00%	0.0%	0.40	2.20
Commercial (general)	0.00	0.00%	0.0%	0.20	2.00
Industrial (general)	0.00	0.00%	0.0%	0.40	2.50
From CDM					
Agriculture and Pasture	0.00	0.00%	0.0%	0.37	5.98
Commercial	0.00	0.00%	0.0%	0.33	2.97
Forest/Rural Open	0.86	0.00%	0.0%	0.11	1.74
Highway	0.00	0.00%	0.0%	0.43	2.65
Industrial	0.00	0.00%	0.0%	0.32	3.97
Medium Density Residential	0.00	0.00%	0.0%	0.52	5.15
Urban Open	0.00	0.00%	0.0%	0.11	1.74
Water/Wetland	0.00	0.00%	0.0%	0.08	1.38

Insert information for 2nd sub-area below

Sub_Area_ID		
Point of Analysis (PoA) Number		
Total Area for Sub-Area (acres)	**0.00**	**0.00**

Land Use	**Area** (acres)	**Ia** (% Impervious)
From HWG		
Residential Roof	0.00	0.00%
Commercial Roof	0.00	0.00%
Commercial/Res Parking	0.00	0.00%
Residential Street	0.00	0.00%
Urban Highway	0.00	0.00%
Lawns	0.00	0.00%
Driveway	0.00	0.00%
Residential (general)	0.00	0.00%
Commercial (general)	0.00	0.00%
Industrial (general)	0.00	0.00%
From CDM		
Agriculture and Pasture	0.00	0.00%
Commercial	0.00	0.00%
Forest/Rural Open	0.00	0.00%
Highway	0.00	0.00%
Industrial	0.00	0.00%
Medium Density Residential	0.00	0.00%
Urban Open	0.00	0.00%
Water/Wetland	0.00	0.00%

Sub_Area_ID	**Post-2**		
Point of Analysis (PoA) Number	**Post-2**		
Total Area in Sub-Area (acres)	**0.90**	**0.01**	**0.00**

Land Use	**Area** (acres)	**Ia** (% Impervious)	**Percent of Area that is managed turf (i.e., fertilized annually)** %	**Post-TP EMC** mg/L	**Post-TN EMC** mg/L
From HWG					
Residential Roof	0.00	0.00%	0.0%	0.11	1.50
Commercial Roof	0.00	0.00%	0.0%	0.14	2.10
Commercial/Res Parking	0.00	0.00%	0.0%	0.15	1.90
Residential Street	0.00	0.00%	0.0%	0.55	1.40
Urban Highway	0.00	0.00%	0.0%	0.32	3.00
Lawns	0.00	0.00%	0.0%	2.10	9.10
Driveway	0.00	0.00%	0.0%	0.56	2.10
Residential (general)	0.00	0.00%	0.0%	0.40	2.20
Commercial (general)	0.00	0.00%	0.0%	0.20	2.00
Industrial (general)	0.00	0.00%	0.0%	0.40	2.50
From CDM					
Agriculture and Pasture	0.00	0.00%	0.0%	0.37	5.98
Commercial	0.00	0.00%	0.0%	0.33	2.97
Forest/Rural Open	0.90	1.11%	0.0%	0.11	1.74
Highway	0.00	0.00%	0.0%	0.43	2.65
Industrial	0.00	0.00%	0.0%	0.32	3.97
Medium Density Residential	0.00	0.00%	0.0%	0.52	5.15
Urban Open	0.00	0.00%	0.0%	0.11	1.74
Water/Wetland	0.00	0.00%	0.0%	0.08	1.38

Insert information for 3rd sub-area below

Sub_Area_ID		
Point of Analysis (PoA) Number		
Total Area for Sub-Area (acres)	**0.00**	**0.00**

Land Use	**Area** (acres)	**Ia** (% Impervious)
From HWG		
Residential Roof	0.00	0.00%
Commercial Roof	0.00	0.00%
Commercial/Res Parking	0.00	0.00%
Residential Street	0.00	0.00%
Urban Highway	0.00	0.00%
Lawns	0.00	0.00%
Driveway	0.00	0.00%
Residential (general)	0.00	0.00%
Commercial (general)	0.00	0.00%
Industrial (general)	0.00	0.00%
From CDM		
Agriculture and Pasture	0.00	0.00%
Commercial	0.00	0.00%
Forest/Rural Open	0.00	0.00%
Highway	0.00	0.00%
Industrial	0.00	0.00%
Medium Density Residential	0.00	0.00%
Urban Open	0.00	0.00%
Water/Wetland	0.00	0.00%

Sub_Area_ID	**Post-3**		
Point of Analysis (PoA) Number	**Post-3**		
Total Area in Sub-Area (acres)	**0.20**	**0.00**	**0.00**

Land Use	**Area** (acres)	**Ia** (% Impervious)	**Percent of Area that is managed turf (i.e., fertilized annually)** %	**Post-TP EMC** mg/L	**Post-TN EMC** mg/L
From HWG					
Residential Roof	0.00	0.00%	0.0%	0.11	1.50
Commercial Roof	0.00	0.00%	0.0%	0.14	2.10
Commercial/Res Parking	0.00	0.00%	0.0%	0.15	1.90
Residential Street	0.00	0.00%	0.0%	0.55	1.40
Urban Highway	0.00	0.00%	0.0%	0.32	3.00
Lawns	0.00	0.00%	0.0%	2.10	9.10
Driveway	0.00	0.00%	0.0%	0.56	2.10
Residential (general)	0.00	0.00%	0.0%	0.40	2.20
Commercial (general)	0.00	0.00%	0.0%	0.20	2.00
Industrial (general)	0.00	0.00%	0.0%	0.40	2.50
From CDM					
Agriculture and Pasture	0.00	0.00%	0.0%	0.37	5.98
Commercial	0.00	0.00%	0.0%	0.33	2.97
Forest/Rural Open	0.20	0.00%	0.0%	0.11	1.74
Highway	0.00	0.00%	0.0%	0.43	2.65
Industrial	0.00	0.00%	0.0%	0.32	3.97
Medium Density Residential	0.00	0.00%	0.0%	0.52	5.15
Urban Open	0.00	0.00%	0.0%	0.11	1.74
Water/Wetland	0.00	0.00%	0.0%	0.08	1.38

Insert information for 4th sub-area below

Sub_Area_ID		
Point of Analysis (PoA) Number		
Total Area for Sub-Area (acres)	**0.00**	**0.00**

Land Use	**Area**	**Ia**
	(acres)	(% Impervious)
From HWG		
Residential Roof	0.00	0.00%
Commercial Roof	0.00	0.00%
Commercial/Res Parking	0.00	0.00%
Residential Street	0.00	0.00%
Urban Highway	0.00	0.00%
Lawns	0.00	0.00%
Driveway	0.00	0.00%
Residential (general)	0.00	0.00%
Commercial (general)	0.00	0.00%
Industrial (general)	0.00	0.00%
From CDM		
Agriculture and Pasture	0.00	0.00%
Commercial	0.00	0.00%
Forest/Rural Open	0.00	0.00%
Highway	0.00	0.00%
Industrial	0.00	0.00%
Medium Density Residential	0.00	0.00%
Urban Open	0.00	0.00%
Water/Wetland	0.00	0.00%

Sub_Area_ID	**Post-4**		
Point of Analysis (PoA) Number	**Post-4**		
Total Area in Sub-Area (acres)	**1.55**	**0.00**	**0.00**

Land Use	**Area**	**Ia**	**Percent of Area that is managed turf (i.e., fertilized annually)**	**Post-TP EMC**	**Post-TN EMC**
	(acres)	(% Impervious)	%	mg/L	mg/L
From HWG					
Residential Roof	0.00	0.00%	0.0%	0.11	1.50
Commercial Roof	0.00	0.00%	0.0%	0.14	2.10
Commercial/Res Parking	0.00	0.00%	0.0%	0.15	1.90
Residential Street	0.00	0.00%	0.0%	0.55	1.40
Urban Highway	0.00	0.00%	0.0%	0.32	3.00
Lawns	0.00	0.00%	0.0%	2.10	9.10
Driveway	0.00	0.00%	0.0%	0.56	2.10
Residential (general)	0.00	0.00%	0.0%	0.40	2.20
Commercial (general)	0.00	0.00%	0.0%	0.20	2.00
Industrial (general)	0.00	0.00%	0.0%	0.40	2.50
From CDM					
Agriculture and Pasture	0.00	0.00%	0.0%	0.37	5.98
Commercial	0.00	0.00%	0.0%	0.33	2.97
Forest/Rural Open	1.55	0.00%	0.0%	0.11	1.74
Highway	0.00	0.00%	0.0%	0.43	2.65
Industrial	0.00	0.00%	0.0%	0.32	3.97
Medium Density Residential	0.00	0.00%	0.0%	0.52	5.15
Urban Open	0.00	0.00%	0.0%	0.11	1.74
Water/Wetland	0.00	0.00%	0.0%	0.08	1.38

Insert information for 5th sub-area below

Sub_Area_ID		
Point of Analysis (PoA) Number		
Total Area for Sub-Area (acres)	**0.00**	**0.00**

Land Use	**Area**	**Ia**
	(acres)	(% Impervious)
From HWG		
Residential Roof	0.00	0.00%
Commercial Roof	0.00	0.00%
Commercial/Res Parking	0.00	0.00%
Residential Street	0.00	0.00%
Urban Highway	0.00	0.00%
Lawns	0.00	0.00%
Driveway	0.00	0.00%
Residential (general)	0.00	0.00%
Commercial (general)	0.00	0.00%
Industrial (general)	0.00	0.00%
From CDM		
Agriculture and Pasture	0.00	0.00%
Commercial	0.00	0.00%
Forest/Rural Open	0.00	0.00%
Highway	0.00	0.00%
Industrial	0.00	0.00%
Medium Density Residential	0.00	0.00%
Urban Open	0.00	0.00%
Water/Wetland	0.00	0.00%

Sub_Area_ID	**Post-5**		
Point of Analysis (PoA) Number	**Post-5**		
Total Area in Sub-Area (acres)	**5.06**	**0.02**	**0.00**

Land Use	**Area**	**Ia**	**Percent of Area that is managed turf (i.e., fertilized annually)**	**Post-TP EMC**	**Post-TN EMC**
	(acres)	(% Impervious)	%	mg/L	mg/L
From HWG					
Residential Roof	0.00	0.00%	0.0%	0.11	1.50
Commercial Roof	0.00	0.00%	0.0%	0.14	2.10
Commercial/Res Parking	0.00	0.00%	0.0%	0.15	1.90
Residential Street	0.00	0.00%	0.0%	0.55	1.40
Urban Highway	0.00	0.00%	0.0%	0.32	3.00
Lawns	0.00	0.00%	0.0%	2.10	9.10
Driveway	0.00	0.00%	0.0%	0.56	2.10
Residential (general)	0.00	0.00%	0.0%	0.40	2.20
Commercial (general)	0.00	0.00%	0.0%	0.20	2.00
Industrial (general)	0.00	0.00%	0.0%	0.40	2.50
From CDM					
Agriculture and Pasture	0.00	0.00%	0.0%	0.37	5.98
Commercial	0.00	0.00%	0.0%	0.33	2.97
Forest/Rural Open	5.06	0.40%	0.0%	0.11	1.74
Highway	0.00	0.00%	0.0%	0.43	2.65
Industrial	0.00	0.00%	0.0%	0.32	3.97
Medium Density Residential	0.00	0.00%	0.0%	0.52	5.15
Urban Open	0.00	0.00%	0.0%	0.11	1.74
Water/Wetland	0.00	0.00%	0.0%	0.08	1.38

Insert information for 6th sub-area below

Sub_Area_ID

Sub_Area_ID

Date (MM/DD/YYYY): 11/16/2016
Project Name: Transition Station #3
Town/City: Clarksville, Coos County
Impacted Surface Waters: Upper Connecticut River
Applicant: Northern Pass Transmission, LLC.
DES File #:

ONLY CHANGE VALUES SHADED IN BLUE

PRE DEVELOPMENT

Sub-Area	INPUT BMP DESCRIPTIONS		TSS	TP	TN
Pre-1			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%

INPUT OVERALL REMOVAL EFFICIENCIES (%) FOR TSS, TP, TN

POST DEVELOPMENT

Sub-Area	INPUT BMP DESCRIPTIONS		TSS	TP	TN
Post-1	Infiltration Basin 1 (> 75 ft from surface water)		90%	65%	60%
Post-2			0%	0%	0%
Post-3	Vegetated Swale		65%	20%	25%
Post-4			0%	0%	0%
Post-5			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%
0.00			0%	0%	0%

INPUT OVERALL REMOVAL EFFICIENCIES (%) FOR TSS, TP, TN

OVERALL SUMMARY

Date (MM/DD/YYYY): 11/16/2016
Project Name: Transition Station #3
Town/City: Clarksville, Coos County
Impacted Surface Waters: Upper Connecticut River
Applicant: Northern Pass Transmission, LLC.
DES File #:

TOTAL PRE -DEVELOPMENT (PRE-DEV) AREA (ACRES) =	8.55
TOTAL PRE-DEV EFFECTIVE IMPERVIOUS AREA (ACRES) =	0.05
TOTAL PRE-DEV PERCENT EFFECTIVE IMPERVIOUS (%) =	0.6%
TOTAL POST DEVELOPMENT (POST-DEV) AREA (ACRES) =	8.57
TOTAL POST-DEV EFFECTIVE IMPERVIOUS AREA (ACRES) =	0.03
TOTAL POST-DEV PERCENT EFFECTIVE IMPERVIOUS (%) =	0.4%
TOTAL POST-DEV AREA THAT IS FERTILIZED ANNUALLY (ACRES) =	0.00
TOTAL POST-DEV PERCENT OF AREA THAT IS FERTILIZED ANNUALLY (%) =	0.0%

	TSS (LBS/YR)	TP (LBS/YR)	TN (LBS/YR)
PRE DEVELOPMENT LOADS (NO BMPS)	198.6	0.4	6.8
PRE DEVELOPMENT LOADS (WITH BMPS)	198.6	0.4	6.8
PRE DEVELOPMENT LOAD REDUCTION DUE TO BMPS	0.0	0.0	0.0
PROPOSED PERCENT REDUCTION IN FERTILIZER APPLICATION RATE	NA	5.0%	3.5%
POST DEVELOPMENT LOADS (NO BMPS)	190.0	0.4	6.5
POST DEVELOPMENT LOADS (WITH BMPS)	171.1	0.4	6.1
POST DEVELOPMENT LOAD REDUCTION DUE TO BMPS	18.9	0.0	0.4
POST DEVELOPMENT - PRE DEVELOPMENT (SHOULD BE 0 OR NEGATIVE)	-27.5	0.0	-0.7
% DIFFERENCE FROM PRE DEVELOMENT LOADS (SHOULD BE 0 OR NEGATIVE)	-13.9%	-10.7%	-10.3%
TOTAL REMOVAL EFFICIENCY NEEDED TO MEET PRE-DEVELOPMENT LOAD	-4.6%	-4.6%	-4.6%

Date (MM/DD/YYYY): 11/16/2016
Project Name: Transition Station #3
Town/City: Clarksville, Coos County
Impacted Surface Waters: Upper Connecticut River
Applicant: Northern Pass Transmission, LLC.
DES File #:

TOTAL POST DEVELOPMENT - PRE DEVELOPMENT (SHOULD BE 0 OR NEGATIVE) (lbs/yr)	-27.5
% DIFFERENCE FROM PRE DEVELOMENT LOADS (SHOULD BE 0 OR NEGATIVE)	-13.9%
TOTAL REMOVAL EFFICIENCY NEEDED TO MEET PRE-DEVELOPMENT LOAD	-4.6%
CURRENTLY PROPOSED REMOVAL EFFICIENCY	9.9%
REMAINING REMOVAL EFFICIENCY NECESSARY TO MEET PRE-DEVELOPMENT LOAD	-14.5%

PRE-DEVELOPMENT

PRE OR POST - DEV	SUB-AREA	POINT OF ANALYSIS NUMBER	AREA (acres)	Effective Impervious Area (acres)	Area Fertilized Annually (acres)	POLLUTANT	PERCENT REDUCTION IN FERTILIZER APPLICATION RATE	BMPS	LOAD (NO BMPS) (lbs/yr)	LOAD (WITH BMPS) (lbs/yr)	LOAD REDUCTION DUE TO BMPS (lbs/yr)	PERCENT REMOVAL
PRE	Pre-1	Pre-1	8.55	0.05	NA	TSS	NA		198.6	198.6	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TSS	NA		0.0	0.0	0.0	0.0%
		TOTAL	8.55	0.05				TOTAL	198.6	198.6	0.0	0.0%

Date (MM/DD/YYYY): 11/16/2016
Project Name: Transition Station #3
Town/City: Clarksville, Coos County
Impacted Surface Waters: Upper Connecticut River
Applicant: Northern Pass Transmission, LLC.
DES File #:

TOTAL POST DEVELOPMENT - PRE DEVELOPMENT (SHOULD BE 0 OR NEGATIVE) (lbs/yr)	-27.5
% DIFFERENCE FROM PRE DEVELOMENT LOADS (SHOULD BE 0 OR NEGATIVE)	-13.9%
TOTAL REMOVAL EFFICIENCY NEEDED TO MEET PRE-DEVELOPMENT LOAD	-4.6%
CURRENTLY PROPOSED REMOVAL EFFICIENCY	9.9%
REMAINING REMOVAL EFFICIENCY NECESSARY TO MEET PRE-DEVELOPMENT LOAD	-14.5%

POST-DEVELOPMENT

PRE OR POST - DEV	SUB-AREA	POINT OF ANALYSIS NUMBER	AREA (acres)	Effective Impervious Area (acres)	Area Fertilized Annually (acres)	POLLUTANT	PERCENT REDUCTION IN FERTILIZER APPLICATION RATE	BMPS	LOAD (NO BMPS) (lbs/yr)	LOAD (WITH BMPS) (lbs/yr)	LOAD REDUCTION DUE TO BMPS (lbs/yr)	PERCENT REMOVAL
POST	Post-1	Post-1	0.86	0.00	0.00	TSS	NA	Infiltration Basin 1 (> 75 ft from surface water)	18.0	1.8	16.2	90.0%
POST	Post-2	Post-2	0.90	0.01	0.00	TSS	NA		22.5	22.5	0.0	0.0%
POST	Post-3	Post-3	0.20	0.00	0.00	TSS	NA	Vegetated Swale	4.2	1.5	2.7	65.0%
POST	Post-4	Post-4	1.55	0.00	0.00	TSS	NA		32.3	32.3	0.0	0.0%
POST	Post-5	Post-5	5.06	0.02	0.00	TSS	NA		113.0	113.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TSS	NA		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TSS	NA		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TSS	NA		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TSS	NA		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TSS	NA		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TSS	NA		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TSS	NA		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TSS	NA		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TSS	NA		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TSS	NA		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TSS	NA		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TSS	NA		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TSS	NA		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TSS	NA		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TSS	NA		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TSS	NA		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TSS	NA		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TSS	NA		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TSS	NA		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TSS	NA		0.0	0.0	0.0	0.0%
		TOTAL	8.57	0.03	0.00			TOTAL	190.0	171.1	18.9	9.9%

Date (MM/DD/YYYY): 11/16/2016
Project Name: Transition Station #3
Town/City: Clarksville, Coos County
Impacted Surface Waters: Upper Connecticut River
Applicant: Northern Pass Transmission, LLC.
DES File #:

TOTAL POST DEVELOPMENT - PRE DEVELOPMENT (SHOULD BE 0 OR NEGATIVE) (lbs/yr)	0.0
% DIFFERENCE FROM PRE DEVELOMENT LOADS (SHOULD BE 0 OR NEGATIVE)	-10.7%
TOTAL REMOVAL EFFICIENCY NEEDED TO MEET PRE-DEVELOPMENT LOAD	-4.6%
CURRENTLY PROPOSED REMOVAL EFFICIENCY	6.6%
REMAINING REMOVAL EFFICIENCY NECESSARY TO MEET PRE-DEVELOPMENT LOAD	-11.1%

PRE-DEVELOPMENT

PRE OR POST - DEV	SUB-AREA	POINT OF ANALYSIS NUMBER	AREA (acres)	Effective Impervious Area (acres)	Area Fertilized Annually (acres)	POLLUTANT	PERCENT REDUCTION IN FERTILIZER APPLICATION RATE	BMPS	LOAD (NO BMPS) (lbs/yr)	LOAD (WITH BMPS) (lbs/yr)	LOAD REDUCTION DUE TO BMPS (lbs/yr)	PERCENT REMOVAL
PRE	Pre-1	Pre-1	8.55	0.05	NA	TP	NA		0.4	0.4	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TP	NA		0.0	0.0	0.0	0.0%
		TOTAL	8.55	0.05				TOTAL	0.4	0.4	0.0	0.0%

Date (MM/DD/YYYY): 11/16/2016
Project Name: Transition Station #3
Town/City: Clarksville, Coos County
Impacted Surface Waters: Upper Connecticut River
Applicant: Northern Pass Transmission, LLC.
DES File #:

POST-DEVELOPMENT

PRE OR POST - DEV	SUB-AREA	POINT OF ANALYSIS NUMBER	AREA (acres)	Effective Impervious Area (acres)	Area Fertilized Annually (acres)	POLLUTANT	PERCENT REDUCTION IN FERTILIZER APPLICATION RATE	BMPS	LOAD (NO BMPS) (lbs/yr)	LOAD (WITH BMPS) (lbs/yr)	LOAD REDUCTION DUE TO BMPS (lbs/yr)	PERCENT REMOVAL
POST	Post-1	Post-1	0.86	0.00	0.00	TP	5.0%	Infiltration Basin 1 (> 75 ft from surface water)	0.0	0.0	0.0	65.0%
POST	Post-2	Post-2	0.90	0.01	0.00	TP	5.0%		0.0	0.0	0.0	0.0%
POST	Post-3	Post-3	0.20	0.00	0.00	TP	5.0%	Vegetated Swale	0.0	0.0	0.0	20.0%
POST	Post-4	Post-4	1.55	0.00	0.00	TP	5.0%		0.1	0.1	0.0	0.0%
POST	Post-5	Post-5	5.06	0.02	0.00	TP	5.0%		0.2	0.2	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TP	5.0%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TP	5.0%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TP	5.0%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TP	5.0%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TP	5.0%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TP	5.0%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TP	5.0%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TP	5.0%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TP	5.0%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TP	5.0%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TP	5.0%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TP	5.0%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TP	5.0%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TP	5.0%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TP	5.0%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TP	5.0%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TP	5.0%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TP	5.0%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TP	5.0%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TP	5.0%		0.0	0.0	0.0	0.0%
		TOTAL	8.57	0.03	0.00			TOTAL	0.4	0.4	0.0	6.6%

Date (MM/DD/YYYY): 11/16/2016
Project Name: Transition Station #3
Town/City: Clarksville, Coos County
Impacted Surface Waters: Upper Connecticut River
Applicant: Northern Pass Transmission, LLC.
DES File #:

TOTAL POST DEVELOPMENT - PRE DEVELOPMENT (SHOULD BE 0 OR NEGATIVE) (lbs/yr)	-0.7
% DIFFERENCE FROM PRE DEVELOMENT LOADS (SHOULD BE 0 OR NEGATIVE)	-10.3%
TOTAL REMOVAL EFFICIENCY NEEDED TO MEET PRE-DEVELOPMENT LOAD	-4.6%
CURRENTLY PROPOSED REMOVAL EFFICIENCY	6.2%
REMAINING REMOVAL EFFICIENCY NECESSARY TO MEET PRE-DEVELOPMENT LOAD	-10.8%

PRE-DEVELOPMENT

PRE OR POST - DEV	SUB-AREA	POINT OF ANALYSIS NUMBER	AREA (acres)	Effective Impervious Area (acres)	Area Fertilized Annually (acres)	POLLUTANT	PERCENT REDUCTION IN FERTILIZER APPLICATION RATE	BMPS	LOAD (NO BMPS) (lbs/yr)	LOAD (WITH BMPS) (lbs/yr)	LOAD REDUCTION DUE TO BMPS (lbs/yr)	PERCENT REMOVAL
PRE	Pre-1	Pre-1	8.55	0.05	NA	TN	NA		6.8	6.8	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
PRE	0.00		0.00	0.00	NA	TN	NA		0.0	0.0	0.0	0.0%
		TOTAL	8.55	0.05				TOTAL	6.8	6.8	0.0	0.0%

Date (MM/DD/YYYY): 11/16/2016
Project Name: Transition Station #3
Town/City: Clarksville, Coos County
Impacted Surface Waters: Upper Connecticut River
Applicant: Northern Pass Transmission, LLC.
DES File #:

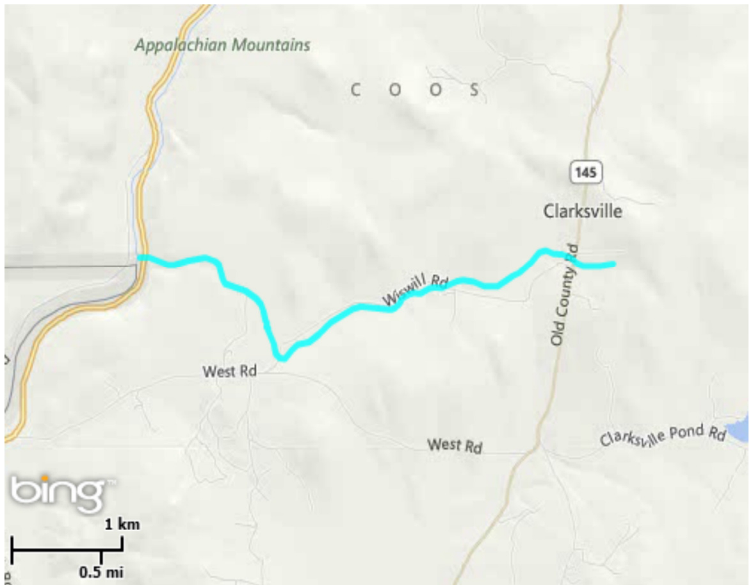
POST-DEVELOPMENT

PRE OR POST - DEV	SUB-AREA	POINT OF ANALYSIS NUMBER	AREA (acres)	Effective Impervious Area (acres)	Area Fertilized Annually (acres)	POLLUTANT	PERCENT REDUCTION IN FERTILIZER APPLICATION RATE	BMPS	LOAD (NO BMPS) (lbs/yr)	LOAD (WITH BMPS) (lbs/yr)	LOAD REDUCTION DUE TO BMPS (lbs/yr)	PERCENT REMOVAL
POST	Post-1	Post-1	0.86	0.00	0.00	TN	3.5%	Infiltration Basin 1 (> 75 ft from surface water)	0.6	0.2	0.4	60.0%
POST	Post-2	Post-2	0.90	0.01	0.00	TN	3.5%		0.8	0.8	0.0	0.0%
POST	Post-3	Post-3	0.20	0.00	0.00	TN	3.5%	Vegetated Swale	0.1	0.1	0.0	25.0%
POST	Post-4	Post-4	1.55	0.00	0.00	TN	3.5%		1.1	1.1	0.0	0.0%
POST	Post-5	Post-5	5.06	0.02	0.00	TN	3.5%		3.9	3.9	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TN	3.5%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TN	3.5%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TN	3.5%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TN	3.5%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TN	3.5%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TN	3.5%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TN	3.5%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TN	3.5%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TN	3.5%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TN	3.5%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TN	3.5%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TN	3.5%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TN	3.5%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TN	3.5%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TN	3.5%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TN	3.5%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TN	3.5%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TN	3.5%		0.0	0.0	0.0	0.0%
POST	0.00		0.00	0.00	0.00	TN	3.5%		0.0	0.0	0.0	0.0%
		TOTAL	8.57	0.03	0.00			TOTAL	6.5	6.1	0.4	6.2%

Return to home page

On This Page
- Water Quality Assessment Status
- Causes of Impairment
- Probable Sources Contributing to Impairments
- TMDLs That Apply to This Waterbody

2008 Waterbody Report for Favreau Brook



Click on the waterbody for an interactive map

State: New Hampshire
Waterbody ID: NHRIV801010203-06
Location: 010801010203, Favreau Brook, Unknown Fishery
State Waterbody Type: River
EPA Waterbody Type: Rivers and Streams
Water Size: 3.23
Units: miles
Watershed Name: Upper Connecticut

Waterbody History Report

Data are also available for these years: 2010 2006 2004 2002

Features
- About This Database (Integrated Report)
- Assessing Water Quality (Questions and Answers)
- Integrated Reporting Guidance
- Previous National Water Quality Reports
- EnviroMapper for Water
- AskWATERS
- EPA WATERS Homepage
- Exchange Network
- Assessment Database
- Statewide Statistical Surveys
- *How's My Waterway* Local Search tool
- Pollution Categories Summary Document
- Nitrogen and Phosphorus Pollution Data Access Tool (NPDAT)

Water Quality Assessment Status for Reporting Year 2008

The overall status of this waterbody is Impaired.

Description of this table

Designated Use	Designated Use Group	Status
Aquatic Life	Fish, Shellfish, And Wildlife Protection And Propagation	Not Assessed
Drinking Water After Adequate Treatment	Public Water Supply	Good

Fish Consumption	Aquatic Life Harvesting	Impaired
Primary Contact Recreation	Recreation	Not Assessed
Secondary Contact Recreation	Recreation	Not Assessed
Wildlife	Fish, Shellfish, And Wildlife Protection And Propagation	Not Assessed

Causes of Impairment for Reporting Year 2008

Description of this table

Cause of Impairment	Cause of Impairment Group	Designated Use (s)	State TMDL Development Status
Mercury	Mercury	Fish Consumption	TMDL completed

Probable Sources Contributing to Impairment for Reporting Year 2008

Description of this table

Probable Source	Probable Source Group	Cause(s) of Impairment
Atmospheric Deposition - Toxics	Atmospheric Deposition	Mercury

TMDLs That Apply to this waterbody

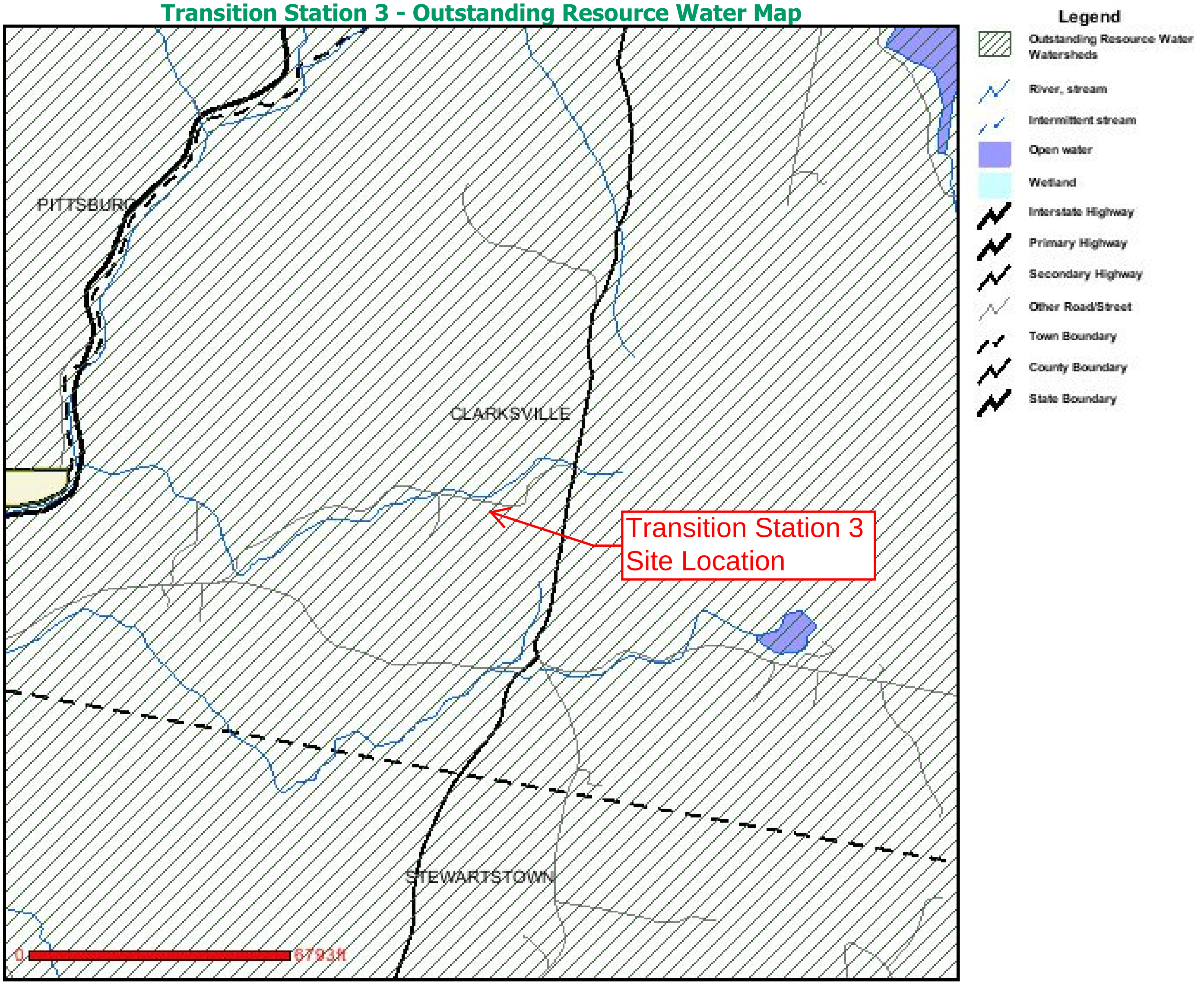
Description of this table

TMDL Document Name	TMDL Date	TMDL Pollutant Description	TMDL Pollutant Source Type	Cause(s) of Impairment Addressed
Ne Regional Mercury Tmdl	Dec-20-2007	Mercury	Nonpoint Source	Mercury

New Hampshire Department of Environmental Services

OneStop Program GIS

Transition Station 3 - Outstanding Resource Water Map



Map Scale = 1 : 51718 (1" = 0.8 miles or 4310 feet)

The information contained in the OneStop Program GIS is the best available according to the procedures and standards of each of the contributing programs and of the GIS. The different programs are regularly maintaining the information in their databases. As a result, the GIS may not always provide access to all existing information, and it may occasionally contain unintentional inaccuracies. The Department can not be responsible for the misuse or misinterpretation of the information presented by this system.

Map prepared 7/15/2015 9:23:42 AM

Developed in cooperation with NH GRANIT

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