WELLS 2, 3, AND 4 WATER TREATMENT PLANT

Stormwater Report
Town of Sharon, Massachusetts

October 18, 2023

ENVIRONMENTAL PARTNERS
— An Apex Company —

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MEMORANDUM

Date: October 2023

To Josh Philibert, Conservation Administrator
Town of Sharon Conservation Commission
219 Massapoag Avenue
Sharon, MA 02067

Joseph Garber, Chair
Town of Sharon Zoning Board of Appeals
90 South Main Street
Sharon, MA 02067

From Adam Kran, P.E., Senior Project Manager, Environmental Partners

CC Eric Hooper, PE, Superintendent, Department of Public Works, Town of Sharon
Rob Terpstra, Supervisor, Water Division, Town of Sharon
Peter O'Cain, PE, Town Engineer, Town of Sharon
File

Subject **Wells 2, 3, & 4 Water Treatment Plant**
Town of Sharon, Massachusetts
Stormwater Report

Environmental Partners Group, LLC (EP) prepared this stormwater report on behalf of the Town of Sharon Department of Public Works (Town) for the proposed Wells 2, 3, & 4 Water Treatment Plant (WTP) project. This report has been prepared in accordance with the requirements of 310 CMR 10.00 and 310 CMR 21.00; the Sharon Code: the Sharon Zoning Bylaw, Chapter 230 Stormwater Management; Chapter 262 Wetlands Protection; and the guidelines of the Massachusetts Stormwater Handbook and Stormwater Standards.

PROJECT OVERVIEW

The Town proposes to construct a new WTP for Wells 2, 3, and 4 for the removal of iron, manganese, and per- and polyfluoroalkyl substances (PFAS). The WTP will be located on 15 Tree Lane (Town parcel ID 101-010-000) and will be sized to treat water from Wells 2, 3, and 4. Refer to Table 1 below for the average and maximum flows for each well that were used in the WTP design.

Table 1 – Well 2, 3, and 4 Flows

Well	Average Flow (gpm)	Maximum Flow (gpm)
Well 2	226	326
Well 3	183	264
Well 4	480	694

The site is owned by the Town of Sharon and is a predominately undeveloped, wooded area. The Town's existing Well 4 infrastructure is located immediately southeast of the proposed WTP facility.

The proposed project includes an approximately 7,500 square foot single-story (with below grade pipe gallery and water tanks) pre-engineered metal building (approximately 50 foot wide by 150 foot long), two stormwater infiltration basins, an access driveway capable of accommodating Town utility vehicles, fire trucks, and chemical delivery vehicles, and a smaller gravel driveway for basement access off of the existing Well 4 access driveway. The paved area around the building includes four parking spaces, including one ADA accessible space. All disturbed areas not paved or topped with gravel shall receive a final loam and seed cover to prevent erosion.

The project also includes a raw water main from Well 3 to Well 2 with a directionally drilled crossing of Beaver Brook, a combined raw water main from Well 2 to the WTP along Moose Hill Parkway, a raw water main from Well 4 to the WTP, and repaving of the existing access drive to Well 4. Disturbances to the wetland buffer zones will largely be within the previously disturbed right of way and will be minimized and mitigated to the maximum extent practicable.

DESIGN PLANS

A set of design plans are provided within Attachment N of this stormwater report. The contents of the design plans include:

- Cover Sheet
- Drawing Index and General Notes (Sheet G-1)
- WTP site and Moose Hill Parkway existing conditions (Sheets V-1 through V-5)
- Civil General Notes and Legend (Sheet C-1)
- WTP Demolition, Sediment and Erosion Control Plan (Sheet C-2)
- WTP Site Layout Plan, including the flood zone, wetland, and riverfront boundaries, the 50-foot "No Disturb" wetland buffer zone, the 75- and 100-foot wetland buffer zones, and the 100 and 200 foot riverfront areas, and stormwater facilities (Sheet C-3)
- WTP Grading and Drainage Plan (Sheet C-4)
- WTP Utilities Plan (Sheet C-5)
- WTP Paving Plan (Sheet C-6)
- Civil Details including site features, utility installation, erosion control measures, and stormwater best management practices (BMPs) (Sheets CD-1 through CD-8)

- Landscape Plans and Planting Palette (Sheets L-0 through L-2)
- Water Main Plans (Sheets W-1 through W-4)
- Water Main Installation Details (Sheets WD-1 through WD-3)

PROJECT NEED AND BACKGROUND

Located in Boston Harbor Basin, Wells 2, 3, and 4 are public water supply sources with a combined Massachusetts Department of Environmental Protection (MassDEP) issued maximum daily withdrawal rate of 1.85 million gallons per day (MGD); however, the Town is only authorized to pump an annual average of 1.28 MGD from these sources. The Town is currently experiencing water quality challenges with all three sources limiting the operational flexibility of their water supply system. In recent years, the Town maintained finished water quality by operating Wells 2 and 3 well below their permitted capacity and relying on Well 4 to meet system demands.

In the past two years, Well 2 water quality samples have exceeded the Secondary Maximum Contaminant Level (SMCL) of 0.3 mg/L for iron and 0.05 mg/L for manganese. Well 3 water quality samples have exceeded the SMCL for manganese. Additionally, the Massachusetts Department of Environmental Protection (MassDEP) released updated regulations for per- and polyfluoroalkyl substances (PFAS) compliance requirements for public water systems on October 2, 2020. These new regulations establish a Maximum Containment Level (MCL) of 20 parts per trillion (ppt) for the sum of six different PFAS compounds (PFOA, PFOS, PFNA, PFHxS, PFHpA, PFDA), also known as PFAS6.

In accordance with the new regulations, the Town of Sharon began sampling for PFAS in accordance with 310 CMR 22.07G. The results of the initial testing indicated a PFAS6 concentration of 88.8 ppt, which is above the Massachusetts PFAS6 maximum contaminant level (MCL) of 20 ppt. Since the initial testing, Well 2 raw water levels climbed and began to exceed the MCL. The Town installed temporary PFAS treatment at Well 4 to maintain operation of their largest water supply and removed Well 2 from service. Based on the results of recent sampling, the Town is detecting increasing PFAS6 concentrations at Well 3.

In March 2023, the United States Environmental Protection Agency (USEPA) released a proposal for a National Primary Drinking Water Regulation (NPDWR) to establish enforceable MCLs for two PFAS compounds (PFOA and PFOS) and an enforceable hazard index for four PFAS compounds. Based on PFAS testing results since 2021, Well 3 raw water has levels of PFOA that may exceed the proposed USEPA MCL. The proposed WTP for the treatment of Wells 2, 3, and 4 will help the Town reliably meet water quality standards and water demands with their existing sources.

INTRODUCTION

The contents included in this cover letter satisfy the submittal requirements of the Town of Sharon Stormwater Management Bylaw §230-16 Subsection C. Each section below correlates directly with the Massachusetts Department of Environmental Protection (MassDEP) Checklist for Stormwater Report and the Town of Sharon stormwater report requirements.

Existing Topography and Landscape

Water Treatment Plant (Well 4)

The proposed WTP facility is located within a 7.6 acre Town-owned lot at 15 Tree lane (Town parcel ID 101-010-000) on a currently wooded slope. The parcel is partially developed, containing both the Well 4 and Well 1 sites, with approximately 0.46 acres of impervious area. The Town's existing Well 4 infrastructure is located immediately southeast of the proposed WTP facility and the existing Well 1 infrastructure is located in the southeast corner of the lot, with Beaver Brook crossing the lot. The project site is abutted by Tree Lane to the west, a residential property, woodlands and wetlands to the north, the MBTA railroad tracks to the east, and Depot Street and the MBTA station to the south.

The portion of the parcel to be developed is currently an undeveloped, steeply wooded area. In June 2022 and February 2023, Zenith Land Surveyors (ZLS) surveyed the existing conditions of the Well 4 site as well as the existing conditions along Moose Hill Parkway spanning from the Well 2 site to the Well 4 site. The existing grades at the proposed WTP site slope from the northwest down to the wetlands in the southeast. All elevations presented in this memorandum are based on North American Vertical Datum 1988 (NAVD88).

The existing conditions plan prepared by ZLS shows a high point at elevation 242 in the north corner of the site, with a relatively steep slope down to the wetlands associated with Beaver Brook at elevation 205. There is a secondary high point in the northeast corner of the site. The existing Well 4 infrastructure is located at an approximate elevation of 215. There are existing culvert headwalls at approximate elevations 200 to 206 on the southwest portion of the parcel draining into Beaver Brook. Currently, stormwater on the portion of the site proposed to be developed sheet flows from high points in the northern side of the site and from Tree Lane towards the wetlands in the south.

Tree Lane currently serves as the Town's primary access to the existing Well 4 infrastructure. A private access road intersects the south portion of Tree Lane to provide access for authorized town employees eastward to the Well 4 infrastructure on the site. Access to the proposed WTP will be supported by a paved driveway north of this existing access driveway. The existing access driveway will be repaved to full depth as part of the project and will be utilized for access to the rear of the proposed WTP.

Wells 2 and 3

The existing Well 2 infrastructure is located on the Town owned parcel at 0 Moose Hill Street with parcel ID 100-33 (58.7 acres) with its access driveway located opposite of 85 Moose Hill Parkway. The Well Station includes two existing pump station buildings, a chemical storage building, and a paved access driveway. The site abuts the Massachusetts Audubon Moose Hill Wildlife Sanctuary and residences along Moose Hill Parkway to the west and along Depot Road to the north. The parcel abuts the Providence/Stoughton railway corridor to the east and the Well 3 parcel (Parcel ID 80-27) to the south. The parcel has wooded areas with steep slopes to the west and wetlands and riverfront area running through the center.

The existing Well 3 infrastructure is located on the Town owned parcel with parcel ID 80-27 (49.4 acres) at the end of Farnham Road. The parcel is partially cleared for the Farnham Road Composting Area. The Well Station includes a pump station building, a chemical storage building, and a paved access driveway. The parcel abuts Beaver Brook to the north-west and contains wetlands and riverfront area. The parcel abuts the Providence/Stoughton railway corridor to the east, and residences along Sandy Ridge Circle to the south. The Well 3 site is relatively flat, gently sloping to the west. Well Stations 2 and 3 are separated by Beaver Brook and its neighboring wetlands.

Existing Stormwater Conditions

Water Treatment Plant Site (Well 4)

The existing undeveloped WTP site has no stormwater management controls. Stormwater runoff flows via sheet flow from high points on the northwestern corner of the site, eventually forming shallow channelized flow in several natural swales, flowing down to the wetlands in the southeast.

Wells 2 and 3

The existing Well Stations 2 and 3 have minimal stormwater management controls. Stormwater runoff flows via sheet flow across both sites and collects within wetland areas adjacent to the sites. No additional impervious area is proposed at Wells 2 and 3. Therefore this stormwater report was prepared for the WTP development at Well 4 only.

Existing Soil Conditions and Time of Concentrations

Water Treatment Plant Site (Well 4)

Ground cover types at the proposed WTP site were determined by visual inspection and Natural Resources Conservation Service (NRCS) Soil Survey data. The proposed WTP site is classified as Hinckley loamy sand, soil group 253D, as shown on the NRCS Soil Map included in Attachment L. This soil group is classified as Hydrologic Soil Group (HSG) “A”.

Soil borings were advanced in the vicinity of the proposed treatment plant building and test pits were completed in the proposed location of the stormwater infiltration basins. See Attachment D for a summary of the geotechnical investigation completed in March 2023 and Attachment E for the test pit logs completed in July 2023. A summary of the test pit results is included under Stormwater Standard 2 below.

There are two pre-development sub-catchment areas (refer to Attachment B, Figure SW-1). The existing time of concentration (TOC) for each sub-catchment area is 6 minutes. A summary of the pre-development sub-catchment area properties is provided in subsequent sections.

Proposed Topographic, Landscape, and Soil Changes

Water Treatment Plant (Well 4)

The proposed WTP requires site clearing and new impervious cover including the WTP building, concrete sidewalk, access driveway, parking area, and equipment pads. Clearing and grading were minimized to the maximum extent practical. Table 2 summarizes impervious area at the WTP site.

Table 2 – Summary of New Impervious Area at WTP Site

Area	Total Site Area (sf)	Total Existing Impervious Area (sf)	Proposed Impervious Area Increase (sf)
WTP Site (Parcel ID 101-010-000)	332,329	20,029	19,496

The proposed WTP finished floor elevation is 226.0 feet. The paved driveway area between Tree Lane and the WTP will pitch towards Tree Lane, following the existing slope of Tree Lane of ± 6.5% at the proposed driveway entrance. A deep sump catch basin will be located on both sides of the driveway entrance. The paved driveway area surrounding the WTP will pitch northwest, away from the WTP towards two deep sump catch basins.

In order to limit impacts due to grading, and reduce the site footprint and visibility from Tree Lane, retaining walls will surround the access driveway except for along the building. Slopes on graded, landscaped, or unpaved areas shall not exceed 3:1 (H:V). All disturbed areas not paved or topped with gravel shall receive a final loam and seed cover to prevent erosion.

Proposed Treatment Methods and Drainage Patterns

Stormwater Best Management Practices

Runoff from new impervious areas at the WTP site will sheet flow to catch basins with four foot sumps and hoods and be conveyed into hydrodynamic stormwater separators before entering stormwater infiltration basins. Runoff from the rooftop will be conveyed by downspouts onto the paved areas and a concrete drainage channel, captured by catch basins, and conveyed through hydrodynamic stormwater separators before entering stormwater infiltration basins. The two stormwater infiltration basins are sized to capture the 100-yr, 24-hr storm runoff volumes without overtopping and to include at least 1 foot of freeboard at the peak of the storm event. The proposed stormwater facilities provide groundwater recharge, attenuate the peak discharge, and provide total suspended solids (TSS) removal in accordance with the Massachusetts Stormwater Standards and the Town of Sharon zoning bylaws.

CHECKLIST FOR STORMWATER REPORT

The MassDEP Checklist for Stormwater Report is included in Attachment A. The MassDEP Checklist has been stamped and signed by a certified Professional Engineer in the State of Massachusetts. The stormwater checklist and additional information provided below were developed for the proposed WTP site, considered new development. As discussed above, no changes to existing stormwater controls are proposed at Wells 2 and 3 or along Moose Hill Parkway.

Standard 1: No Untreated Discharges or Erosion to Wetlands

No new untreated discharges are proposed from the WTP Site. Stormwater will be captured by catch basins and conveyed to hydrodynamic stormwater separators for pretreatment before entering two stormwater infiltration basins. Stormwater BMPs have been designed so there is no erosion or scour to the nearby wetlands. There is no increase in peak discharge or velocities from pre-development to post-development conditions.

Standard 2: Peak Rate Attenuation

Stormwater Model Data

Stormwater models were developed for this project using the NRCS (SCS) TR-20 model within HydroCAD Modeling Software. The project area includes two pre-development sub-catchment areas and eight post-development sub-catchment areas. Ground cover areas were calculated for each sub-catchment and entered into the model; see Attachment B for pre-development and post-development drainage area figures.

Precipitation for the 1-yr, 2-yr, 10-yr, 25-yr, and 100-yr frequency 24-hr design storms were determined from the "Extreme Precipitation in New York and New England" website (precip.eas.cornell.edu). The website is a project with joint collaboration between the NRCC and NRCS and uses a more conservative 100-yr frequency 24-hr storm rainfall depth than NOAA Atlas 14. HydroCAD reports for the 1-yr, 2-yr, 10-yr, 25-yr, and 100-yr frequency 24-hr design storms are included in Attachment C.

Ground cover types were determined by visual inspection and NRCS Soil Survey data. The entirety of the proposed disturbance area on the WTP site is classified as HSG A by the NRCS Soil Survey data. Soil borings were conducted in the vicinity of the proposed treatment plant building. Test pits for infiltration tests were completed in proximity to the proposed west (1P) and east (2P) stormwater infiltration basins to verify in situ soil conditions; refer to Table 3 below for a summary of the results. Evidence of seasonal high groundwater was not encountered in either of the test pits. See Attachment D for a summary of the geotechnical investigation completed in March 2023 and Attachment E for the test pit reports completed in July 2023.

Table 3 - Summary of Test Pit Results

Test Pit	Location	Soil Type	Bottom Elevation	Groundwater Encountered
Test Pit 1	West Infiltration Basin (1P)	Fine Sand	206.5	No
Test Pit 2	East Infiltration Basin (2P)	Coarse Sand and Gravel	207.5	No

Based on the NRCS Soil Survey classification of sandy, HSG A soils, and the in situ conditions observed during the test pits, EP selected the design exfiltration Rawls rates of 8.27 inches per hour (in/hr) for the stormwater infiltration basins.

Stormwater Model Results

The stormwater model results indicate that the proposed peak runoff rates were less than the pre-development peak runoff rates for the 1-yr, 2-yr, 10-yr, 25-yr, and 100-yr 24-hr storm events. This finding confirms the proposed project meets and exceeds Massachusetts Stormwater Handbook Standard 2 in its entirety. Table 4 shows the results from the stormwater modeling. Further, the total volume of stormwater discharged from the site decreases for all storms analyzed.

Table 4 - Summary of Peak Discharge Rates and Volumes Off Site

Storm Event	Discharge Rate (cfs)		Discharge Volume (cf)	
	Pre-Develop Conditions	Post-Develop Conditions	Pre-Develop Conditions	Post-Develop Conditions
1-yr, 24-hr	0.15	0.00	525	80
2-yr, 24-hr	0.24	0.02	790	218
10-yr, 24-hr	0.56	0.20	1,811	959
25-yr, 24-hr	0.85	0.49	3,279	1,801
100-yr, 24-hr	1.70	1.24	8,213	4,007

Standard 3: Stormwater Recharge

Stormwater will be recharged in the stormwater infiltration basins. Recharge calculations are provided in Attachment F, and conservatively assume recharge will only occur in the bottom of the stormwater infiltration basins. The stormwater infiltration basins provide the Required Recharge Volume for this project, and will drain within the required 72 hours. Groundwater is not expected to affect recharge as groundwater was not encountered during the test pit investigations; the test pits were terminated 8 and 10 feet below the proposed stormwater infiltration basin bottoms. The test pits were discontinued because the sandy conditions did not allow a deeper evacuation.

Standard 4: Water Quality

Required Water Quality Volume

According to the Massachusetts Stormwater Handbook it is required that the stormwater management system provide 80% TSS removal from new impervious areas. The treatment volume for this project is 1-inch of runoff over the new impervious area because it is located within a Zone II Wellhead Protection area. Required Water Quality Volume calculations are provided in Attachment G. The calculations show the proposed stormwater infiltration basins are sized appropriately to treat this volume; therefore, this project meets and exceeds the Required Water Quality Volume requirements.

TSS Removal

Deep sump catch basins with hoods and hydrodynamic stormwater separators will provide pretreatment prior to stormwater entering the stormwater infiltration basins. Volume 2, Chapter 2 of the Massachusetts Stormwater Handbook states that infiltration basins provide 80% TSS removal provided they are combined with adequate pretreatment. Consequently, this project meets and exceeds the 80% TSS removal requirement. TSS removal calculations are provided in Attachment G.

Standard 5: Land Uses with Higher Potential Pollutant Loads

The site is not considered a Land Use With Higher Potential Pollutant Loads (LUHPPL); therefore Standard 5 is not applicable.

Standard 6: Critical Areas

Stormwater discharges within the Zone I, Zone II, or Interim Wellhead Protection Area

Standard 6 is applicable as the stormwater infiltration basins are located within the Well 4 Zone I limit, in order to adequately capture, treat, and infiltrate stormwater runoff. The location of the WTP is essential to the operation of the public water supply. Pretreatment by deep sump catch basins and hydrodynamic stormwater separators provides 80% TSS removal prior to discharge to the stormwater infiltration basins. As defined under Standard 3 and Standard 4, all stormwater infiltration basins meet recharge, water quality volume, and 44% pretreatment TSS removal requirements as well as Chapter 230 of the Town bylaw requirements. The bylaws require that stormwater shall be treated to remove 80% of the TSS prior to discharge to vegetated surface infiltration areas or to stormwater infiltration structures.

Stormwater discharges to Outstanding Resource Waters (ORW) or Special Resource Waters (SRW)

The project is not located within the limits of an Outstanding Resource Water or Special Resource Water.

Stormwater discharges to an Area of Critical Environmental Concern (ACEC)

The project is not located within the limits of an Area of Critical Environmental Concern.

Standard 7: Redevelopment

The project is a new development project and is subject to all of the applicable Stormwater Management Standards.

Standard 8: Construction Period Controls

Construction period stormwater management controls are described in the Stormwater Operations and Maintenance (O&M) Plan included in Attachment H.

A draft Construction Period Stormwater Pollution Prevention and Erosion and Sedimentation Control Plan (SWPPP) has been included in this Stormwater Report included in Attachment K. The project Contractor(s) will be required to register the project on the EPA's Central Data Exchange portal prior to any land disturbance, in accordance with the EPA's latest Construction General Permit. Erosion controls including filter sock with silt fence, limit of work fence, and a stabilized construction exit are shown on the plans.

Standard 9: Operation and Maintenance Plan

The Post-Development O&M Plan is included in the Stormwater O&M Plan provided in Attachment H. The O&M Plan includes the name of the stormwater management system owners, the party responsible for operation and maintenance, a schedule for implementation of routine and non-routine maintenance tasks, and a maintenance log form.

Standard 10: Illicit Discharges to Drainage System

The Long-Term Pollution Prevention Plan, provided in Attachment I, includes measures to prevent illicit discharges. An Illicit Discharge Compliance Statement is provided in Attachment J.

LOCAL STORMWATER MANAGEMENT STANDARDS

Sharon Conservation Commission Regulations

The Sharon Conservation Commission regulations require calculations to be supplied for 1, 10, 25, and 100-year interval storms, including methodology and information sources, demonstrating no increase in peak run-off for a 10-year frequency storm between pre-development and post-development conditions. The regulations require a map indicating all drainage sub-basins used in the calculations. The calculations described in Standard 2 with accompanying HydroCAD reports provided in Attachment C and the Stormwater Figures included in Attachment B satisfy this requirement.

Projects within the Town's Groundwater Resources Protection Districts may not decrease total recharge, nor introduce constituents into surface or groundwater other than those normally found in the effluent of appropriately treated domestic sewage, or in concentration which cause the Safe Drinking Water Standards, as set by the Commonwealth of Massachusetts or the federal Environmental Protection Agency, to be exceeded. The calculations referenced in Standard 3 and included in Attachment F satisfy the recharge requirement. The site will not introduce new constituents into surface or groundwater.

Sharon Zoning Bylaws

Within the Water Resource Protection District (WRPD), the Town of Sharon Zoning Bylaws Chapter 230 require that site design shall result in no increase in the peak rate of stormwater runoff for the 10-year frequency storm event. Site design shall also result in no increase in the total volume of stormwater runoff for the 1-year frequency storm event. These requirements are satisfied by Standard 2.

The bylaws also require that prior to discharge to vegetated surface infiltration areas or to stormwater infiltration structures, stormwater shall be treated to remove 80% of the TSS and shall be treated to remove petroleum-based contaminants. All runoff from newly paved surfaces is treated by deep sump catch basins and hydrodynamic stormwater separators before discharge to the stormwater infiltration basins. Roof runoff is discharged to paved areas and a concrete drainage channel and collected by deep sump catch basins and treated in hydrodynamic stormwater separators prior to discharge for infiltration.

The stormwater design meets the Stormwater Management Performance Standards within the zoning bylaw's General Regulations section with the exception of a ten-foot-wide access road around the basin rims and discharging the roof water in separate facilities. Due to site constraints associated with limiting the project footprint to minimize the impact to abutting properties, there is inadequate area to meet these items. The proposed site design provides adequate access to each basin from the proposed paved access drives. For the northern basin, a grass path is provided to access the basin from the driveway above. In addition, by allowing roof runoff to discharge to either basin, there is no need to clear additional space for a third infiltration area.

Sharon Stormwater Bylaws

The Project requires an NPDES Construction General Permit due to its disturbance of over one acre of land. The Town of Sharon Stormwater Bylaws require a Stormwater Pollution Prevention Plan (SWPPP) with its application for a stormwater permit. A draft SWPPP is included in Attachment K as part of Standard 8 compliance, and this draft SWPPP will be finalized by the contractor once selected.

ATTACHMENTS

A. Checklist for Stormwater Report
B. Stormwater Figures
C. HydroCAD Calculation Reports
D. Geotechnical Investigation and Construction Recommendations
E. Test Pit Reports
F. Recharge Calculations
G. Water Quality Calculations
H. Operation and Maintenance Plan
I. Long Term Pollution Prevention Plan
J. Illicit Discharge Statement
K. Stormwater Pollution Prevention Plan
L. NRCS Soil Report
M. Pipe Sizing Calculations

ATTACHMENT A

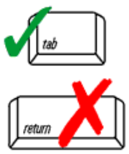
Checklist For Stormwater Report

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

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



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

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

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

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

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

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

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

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature

COMMONWEALTH OF MASSACHUSETTS
ADAM S
KRAN
CIVIL
No. 51849
REGISTERED
PROFESSIONAL ENGINEER
10/18/23

Adam Kran, PE 10/16/2023
Signature and Date

Checklist

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

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist (continued)

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

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

Standard 1: No New Untreated Discharges

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

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☒ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☒ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

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

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

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

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☒ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

  ☒ is within the Zone II or Interim Wellhead Protection Area

  ☐ is near or to other critical areas

  ☒ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)

  ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

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

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☒ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☒ Critical areas and BMPs are identified in the Stormwater Report.

Checklist (continued)

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

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

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

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

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☐ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

Checklist (continued)

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

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☒ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☐ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☒ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☒ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

ATTACHMENT B

Stormwater Figures

NOTES:

1. THE AREA SHOWN ON THIS PLAN IS LOCATED WITHIN THE ZONE II WATER SUPPLY PROTECTION AREA.

ENVIRONMENTAL PARTNERS — An Apex Company

MARK	DATE	DESCRIPTION

Scale	1" = 20'
Date	OCTOBER 2023
Job No.	245-2103
Designed by	JDH
Drawn by	JDH
Checked by	MPA
Approved by	ASK

THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING

WELLS 2, 3, AND 4 WATER TREATMENT PLANT
TOWN OF SHARON, MA

STORMWATER PLAN
EXISTING CONDITIONS

FOR PERMITTING

Sheet No.

SW-1

Drawing file: I:\Sharon, MA\245\245-2103 Well 4 PFAS Treatment System\05 Final Design\Drawings\CAD\03.X Civil Sheets.dwg Plot Date: Oct 17,2023-12:51pm

NOTES:

1. THE AREA SHOWN ON THIS PLAN IS LOCATED WITHIN THE ZONE II WATER SUPPLY PROTECTION AREA.

ENVIRONMENTAL PARTNERS — An Apex Company

MARK	DATE	DESCRIPTION		
			Scale	1" = 20'
			Date	OCTOBER 2023
			Job No.	245-2103
			Designed by	JDH
			Drawn by	JDH
			Checked by	MPA
			Approved by	ASK

THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING

WELLS 2, 3, AND 4 WATER TREATMENT PLANT
TOWN OF SHARON, MA

STORMWATER PLAN
PROPOSED CONDITIONS

FOR PERMITTING

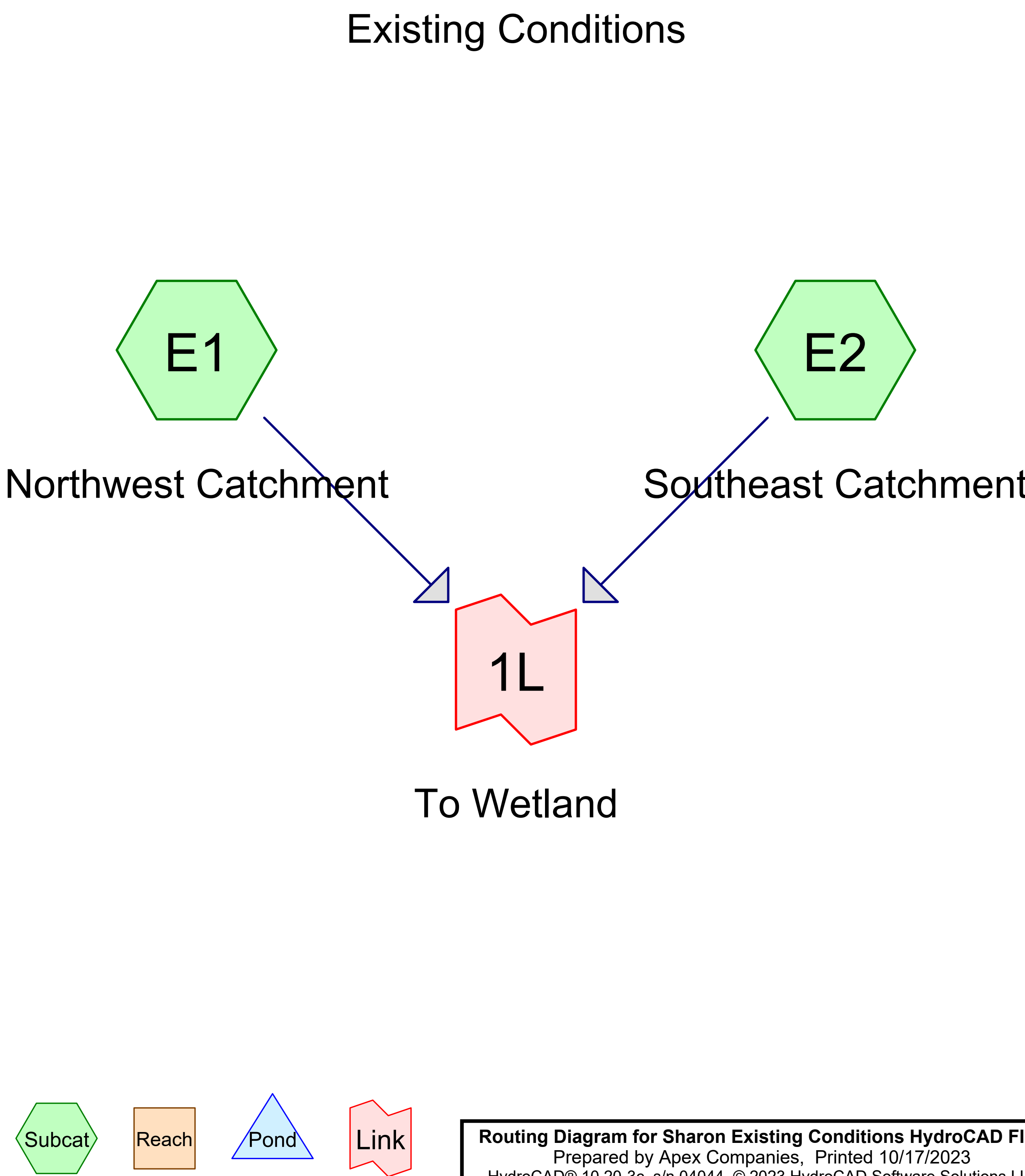
Sheet No.

SW-2

Drawing file: I:\Sharon, MA-245\245-2103 Well 4 PFAS Treatment System\05 Final Design\Drawings\CAD\03.X Civil Sheets.dwg Plot Date: Oct 17,2023-1:27pm

ATTACHMENT C

HydroCAD Calculation Reports



Routing Diagram for Sharon Existing Conditions HydroCAD FINAL
Prepared by Apex Companies, Printed 10/17/2023
HydroCAD® 10.20-3c s/n 04044 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-year	Type III 24-hr		Default	24.00	1	2.72	2
2	2-year	Type III 24-hr		Default	24.00	1	3.27	2
3	10-year	Type III 24-hr		Default	24.00	1	4.96	2
4	25-year	Type III 24-hr		Default	24.00	1	6.30	2
5	100-year	Type III 24-hr		Default	24.00	1	9.07	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
2,754	96	Gravel surface, HSG A (E1, E2)
4,070	98	Impervious, HSG A (E1, E2)
48,144	30	Woods, Good, HSG A (E1, E2)
9,677	32	Woods/grass comb., Good, HSG A (E1, E2)
64,645	**37**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
64,645	HSG A	E1, E2
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
64,645		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	S N
2,754	0	0	0	0	2,754	Gravel surface	
4,070	0	0	0	0	4,070	Impervious	
48,144	0	0	0	0	48,144	Woods, Good	
9,677	0	0	0	0	9,677	Woods/grass comb., Good	
64,645	**0**	**0**	**0**	**0**	**64,645**	**TOTAL AREA**	

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

Subcatchment E1: Northwest Catchment Runoff Area=9,740 sf 37.13% Impervious Runoff Depth=0.65"
Tc=6.0 min CN=72 Runoff=0.15 cfs 525 cf

Subcatchment E2: Southeast Catchment Runoff Area=54,905 sf 0.83% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=31 Runoff=0.00 cfs 0 cf

Link 1L: To Wetland Inflow=0.15 cfs 525 cf
Primary=0.15 cfs 525 cf

Total Runoff Area = 64,645 sf Runoff Volume = 525 cf Average Runoff Depth = 0.10"
93.70% Pervious = 60,575 sf 6.30% Impervious = 4,070 sf

Summary for Subcatchment E1: Northwest Catchment

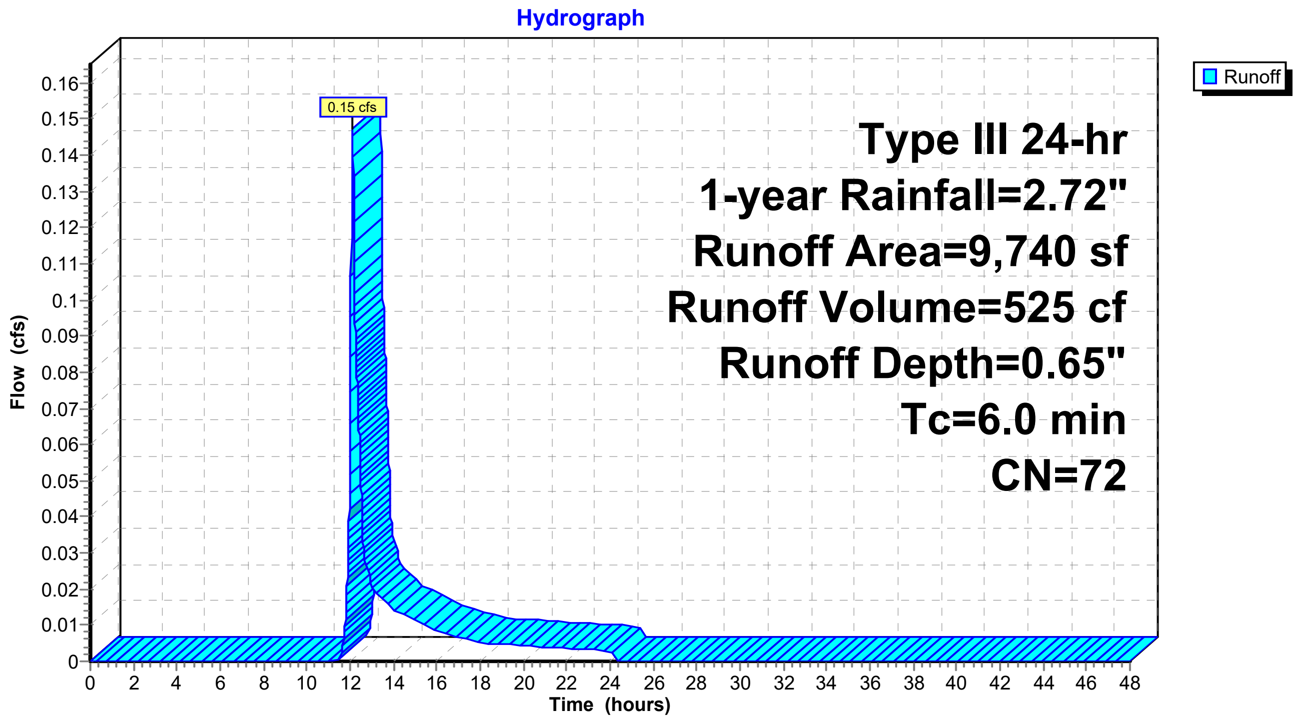
Runoff = 0.15 cfs @ 12.10 hrs, Volume= 525 cf, Depth= 0.65"
Routed to Link 1L : To Wetland

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-year Rainfall=2.72"

	Area (sf)	CN	Description
	1,300	30	Woods, Good, HSG A
	2,439	32	Woods/grass comb., Good, HSG A
*	3,616	98	Impervious, HSG A
	2,385	96	Gravel surface, HSG A
	9,740	72	Weighted Average
	6,124		62.87% Pervious Area
	3,616		37.13% Impervious Area

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

Subcatchment E1: Northwest Catchment



Summary for Subcatchment E2: Southeast Catchment

[45] Hint: Runoff=Zero

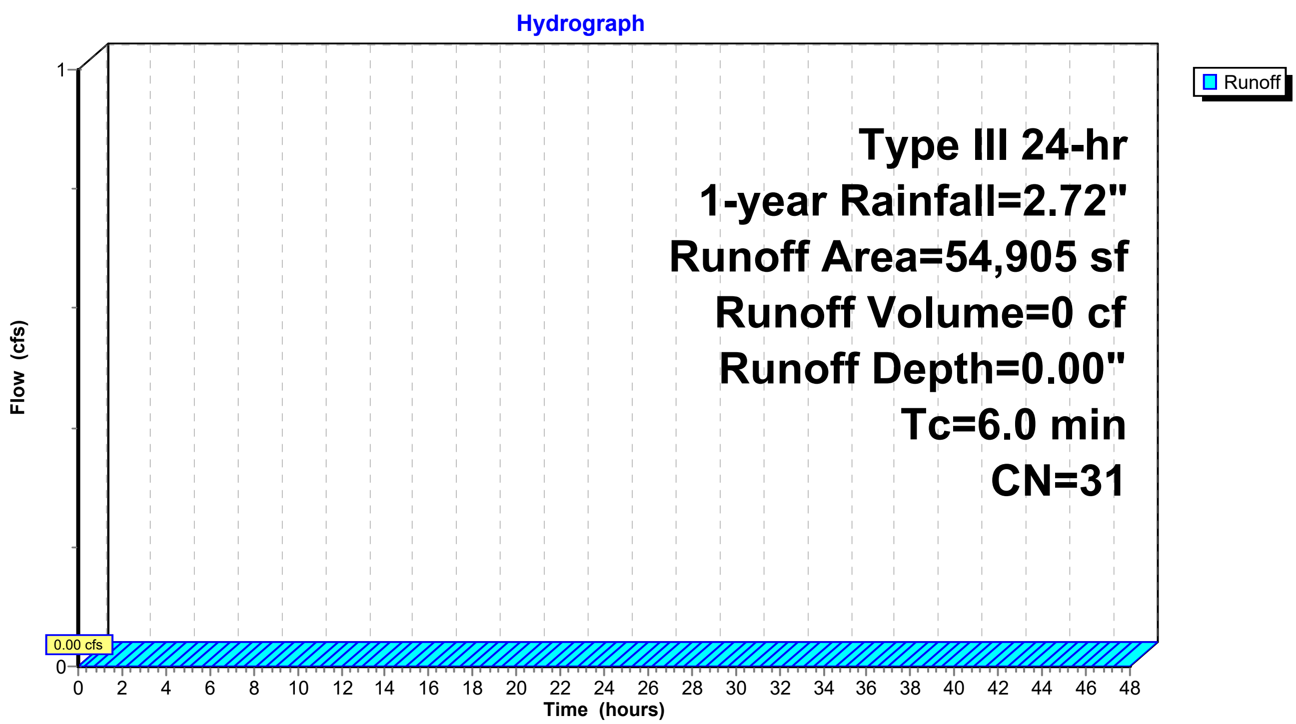
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Link 1L : To Wetland

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-year Rainfall=2.72"

	Area (sf)	CN	Description
	369	96	Gravel surface, HSG A
	7,238	32	Woods/grass comb., Good, HSG A
	46,844	30	Woods, Good, HSG A
*	454	98	Impervious, HSG A
	54,905	31	Weighted Average
	54,451		99.17% Pervious Area
	454		0.83% Impervious Area

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

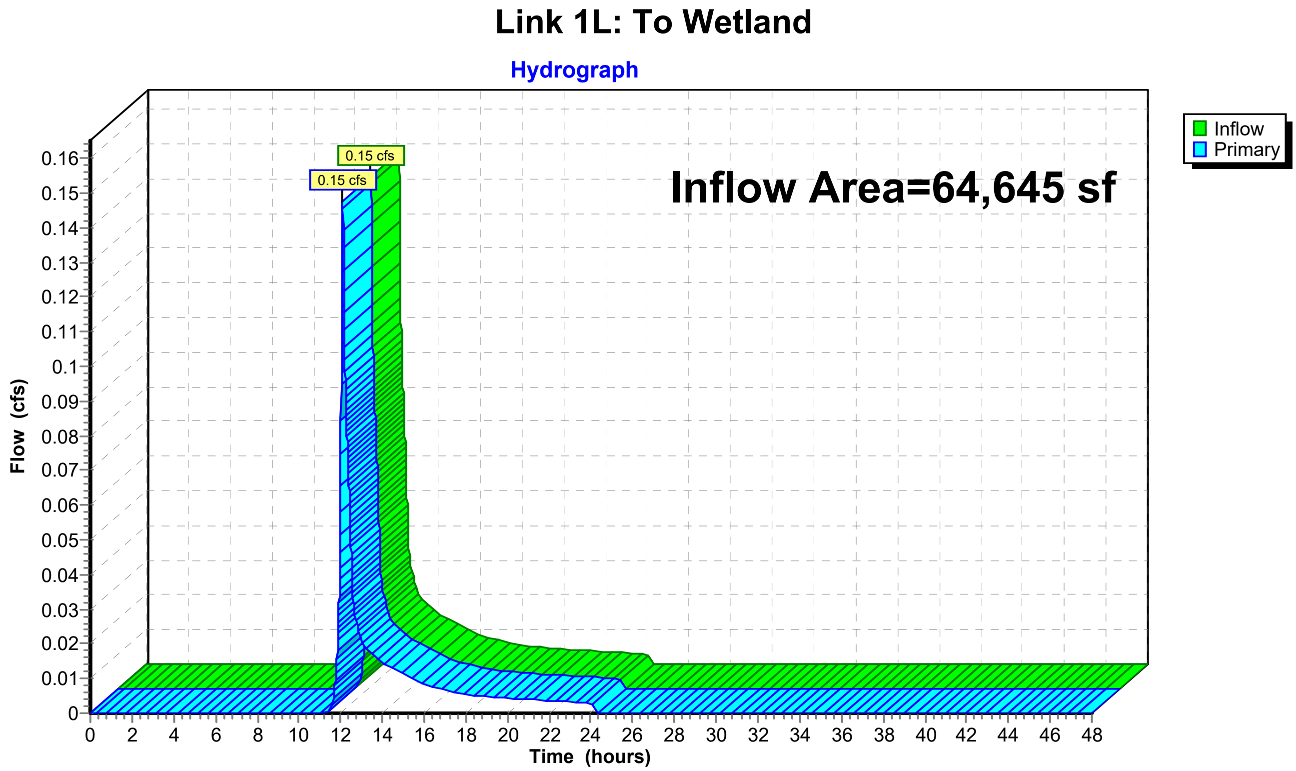
Subcatchment E2: Southeast Catchment



Summary for Link 1L: To Wetland

Inflow Area = 64,645 sf, 6.30% Impervious, Inflow Depth = 0.10" for 1-year event
Inflow = 0.15 cfs @ 12.10 hrs, Volume= 525 cf
Primary = 0.15 cfs @ 12.10 hrs, Volume= 525 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs



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

SubcatchmentE1: Northwest Catchment Runoff Area=9,740 sf 37.13% Impervious Runoff Depth=0.97"
Tc=6.0 min CN=72 Runoff=0.24 cfs 790 cf

SubcatchmentE2: Southeast Catchment Runoff Area=54,905 sf 0.83% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=31 Runoff=0.00 cfs 0 cf

Link 1L: To Wetland Inflow=0.24 cfs 790 cf
Primary=0.24 cfs 790 cf

Total Runoff Area = 64,645 sf Runoff Volume = 790 cf Average Runoff Depth = 0.15"
93.70% Pervious = 60,575 sf 6.30% Impervious = 4,070 sf

Summary for Subcatchment E1: Northwest Catchment

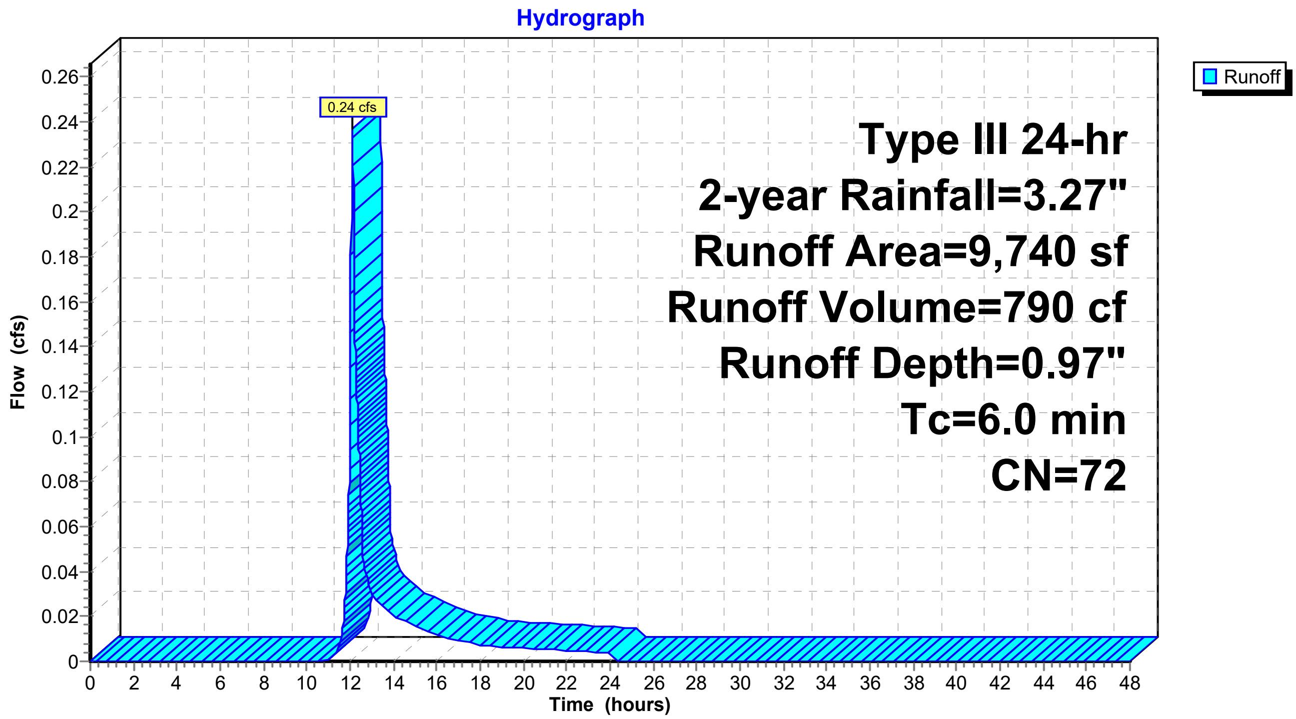
Runoff = 0.24 cfs @ 12.10 hrs, Volume= 790 cf, Depth= 0.97"
Routed to Link 1L : To Wetland

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.27"

	Area (sf)	CN	Description
	1,300	30	Woods, Good, HSG A
	2,439	32	Woods/grass comb., Good, HSG A
*	3,616	98	Impervious, HSG A
	2,385	96	Gravel surface, HSG A
	9,740	72	Weighted Average
	6,124		62.87% Pervious Area
	3,616		37.13% Impervious Area

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

Subcatchment E1: Northwest Catchment



Summary for Subcatchment E2: Southeast Catchment

[45] Hint: Runoff=Zero

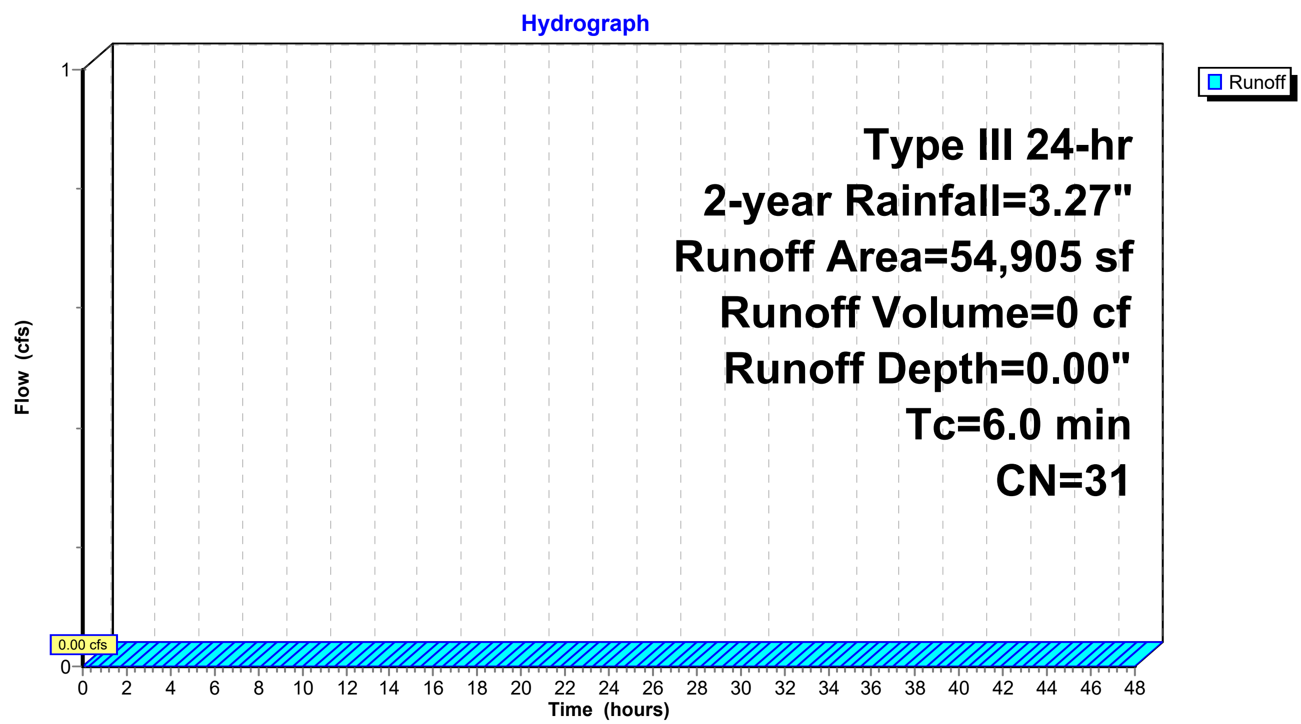
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Link 1L : To Wetland

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.27"

	Area (sf)	CN	Description
	369	96	Gravel surface, HSG A
	7,238	32	Woods/grass comb., Good, HSG A
	46,844	30	Woods, Good, HSG A
*	454	98	Impervious, HSG A
	54,905	31	Weighted Average
	54,451		99.17% Pervious Area
	454		0.83% Impervious Area

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

Subcatchment E2: Southeast Catchment

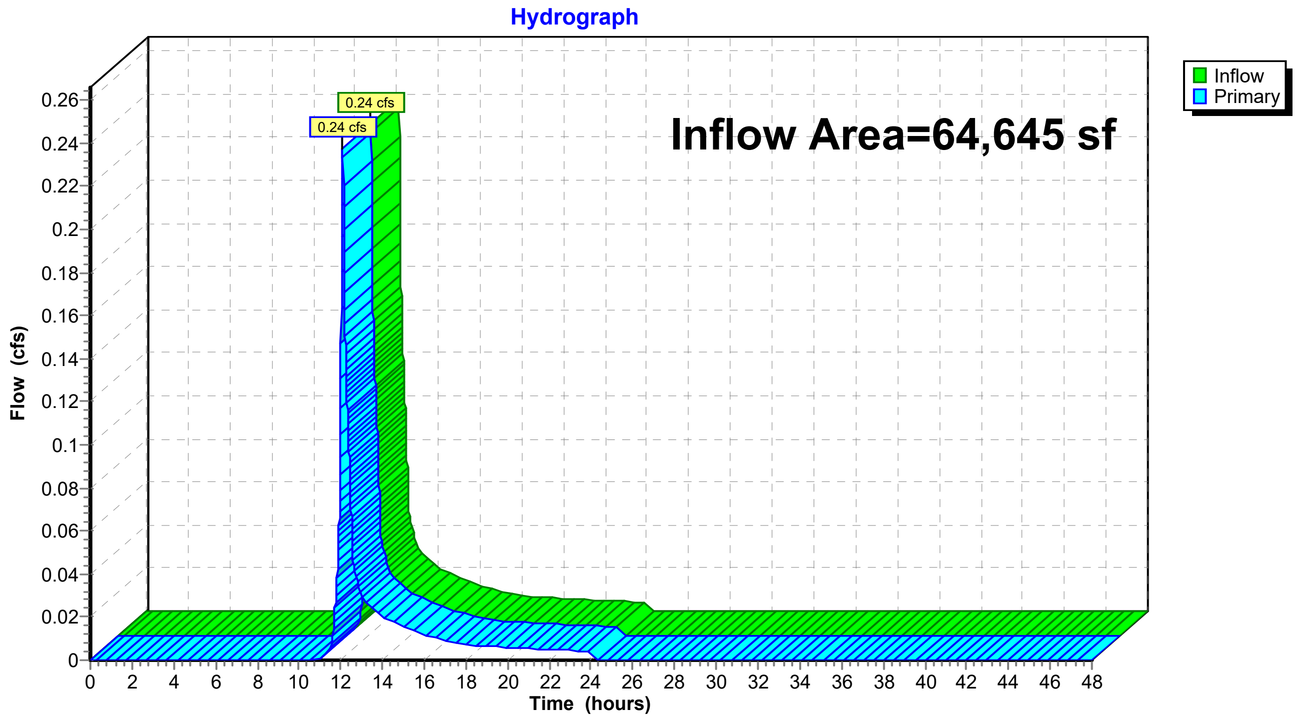


Summary for Link 1L: To Wetland

Inflow Area = 64,645 sf, 6.30% Impervious, Inflow Depth = 0.15" for 2-year event
Inflow = 0.24 cfs @ 12.10 hrs, Volume= 790 cf
Primary = 0.24 cfs @ 12.10 hrs, Volume= 790 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 1L: To Wetland



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

Subcatchment E1: Northwest Catchment Runoff Area=9,740 sf 37.13% Impervious Runoff Depth=2.17"
Tc=6.0 min CN=72 Runoff=0.56 cfs 1,759 cf

Subcatchment E2: Southeast Catchment Runoff Area=54,905 sf 0.83% Impervious Runoff Depth=0.01"
Tc=6.0 min CN=31 Runoff=0.00 cfs 52 cf

Link 1L: To Wetland Inflow=0.56 cfs 1,811 cf
Primary=0.56 cfs 1,811 cf

Total Runoff Area = 64,645 sf Runoff Volume = 1,811 cf Average Runoff Depth = 0.34"
93.70% Pervious = 60,575 sf 6.30% Impervious = 4,070 sf

Summary for Subcatchment E1: Northwest Catchment

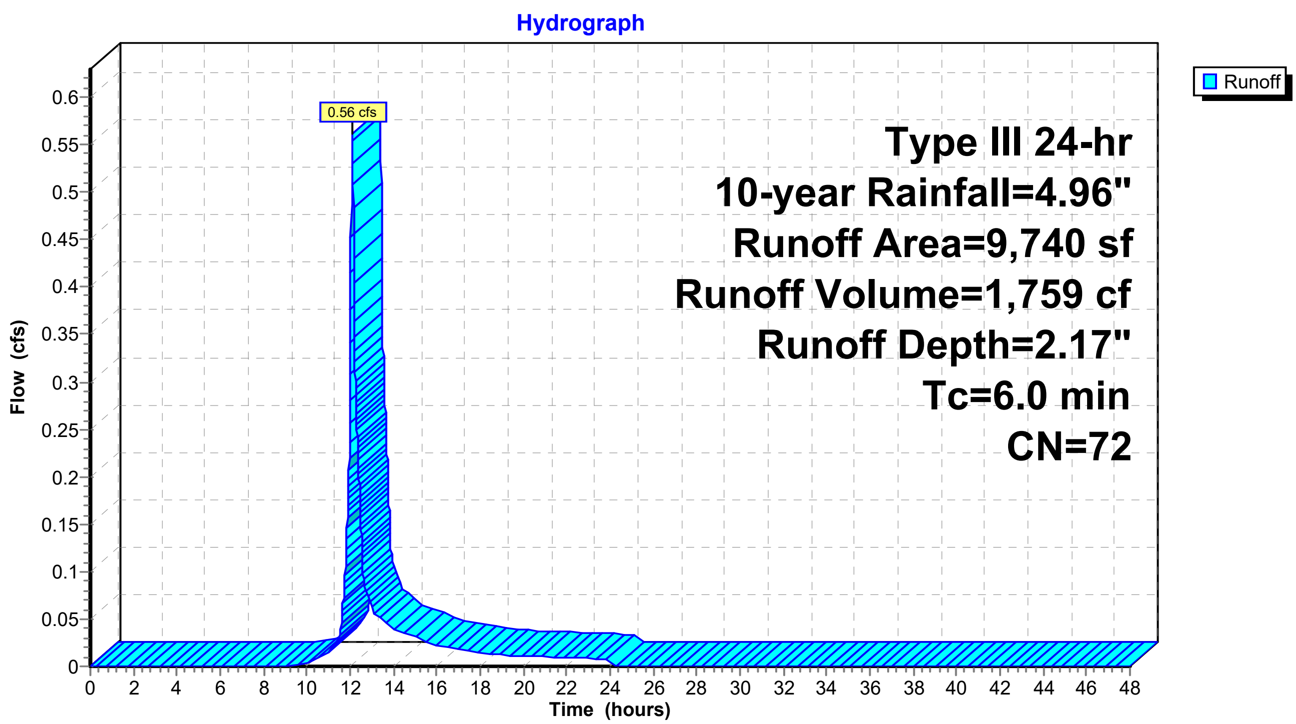
Runoff = 0.56 cfs @ 12.09 hrs, Volume= 1,759 cf, Depth= 2.17"
Routed to Link 1L : To Wetland

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.96"

	Area (sf)	CN	Description
	1,300	30	Woods, Good, HSG A
	2,439	32	Woods/grass comb., Good, HSG A
*	3,616	98	Impervious, HSG A
	2,385	96	Gravel surface, HSG A
	9,740	72	Weighted Average
	6,124		62.87% Pervious Area
	3,616		37.13% Impervious Area

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

Subcatchment E1: Northwest Catchment



Summary for Subcatchment E2: Southeast Catchment

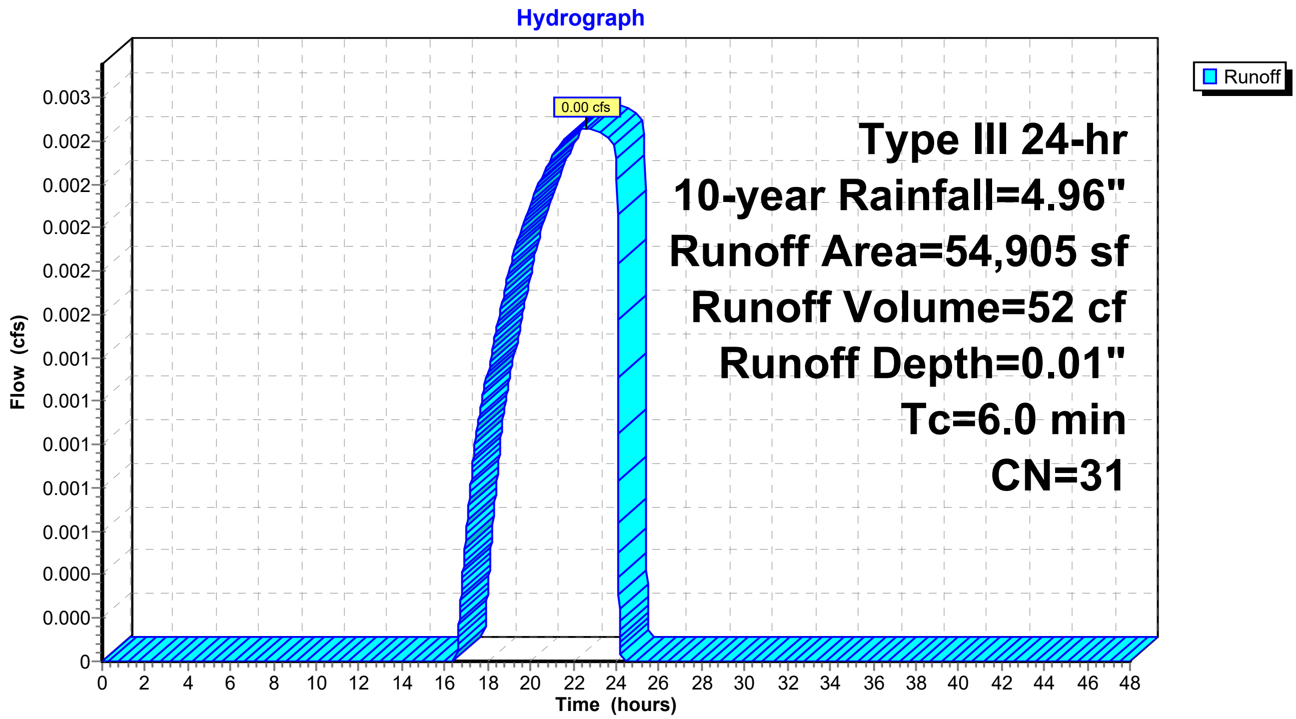
Runoff = 0.00 cfs @ 22.62 hrs, Volume= 52 cf, Depth= 0.01"
Routed to Link 1L : To Wetland

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.96"

	Area (sf)	CN	Description
	369	96	Gravel surface, HSG A
	7,238	32	Woods/grass comb., Good, HSG A
	46,844	30	Woods, Good, HSG A
*	454	98	Impervious, HSG A
	54,905	31	Weighted Average
	54,451		99.17% Pervious Area
	454		0.83% Impervious Area

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

Subcatchment E2: Southeast Catchment

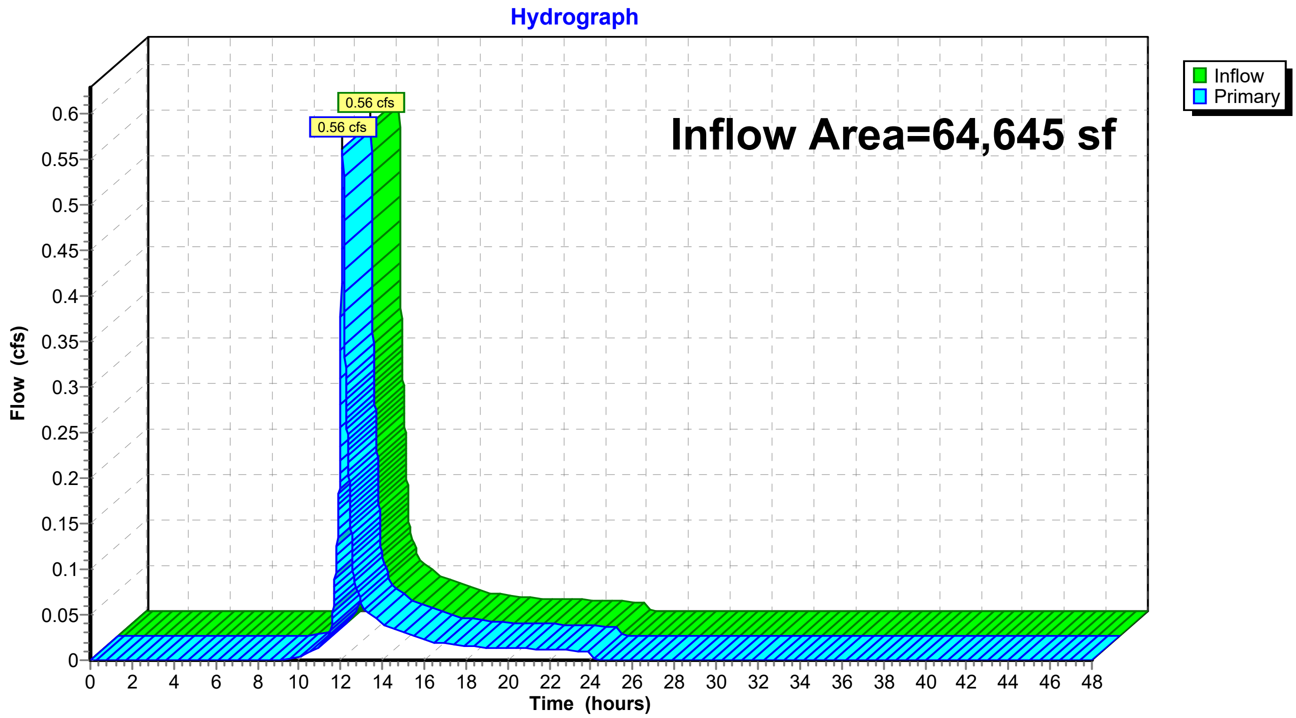


Summary for Link 1L: To Wetland

Inflow Area = 64,645 sf, 6.30% Impervious, Inflow Depth = 0.34" for 10-year event
Inflow = 0.56 cfs @ 12.09 hrs, Volume= 1,811 cf
Primary = 0.56 cfs @ 12.09 hrs, Volume= 1,811 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 1L: To Wetland



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

SubcatchmentE1: Northwest Catchment Runoff Area=9,740 sf 37.13% Impervious Runoff Depth=3.24"
Tc=6.0 min CN=72 Runoff=0.85 cfs 2,630 cf

SubcatchmentE2: Southeast Catchment Runoff Area=54,905 sf 0.83% Impervious Runoff Depth=0.14"
Tc=6.0 min CN=31 Runoff=0.02 cfs 648 cf

Link 1L: To Wetland Inflow=0.85 cfs 3,279 cf
Primary=0.85 cfs 3,279 cf

Total Runoff Area = 64,645 sf Runoff Volume = 3,279 cf Average Runoff Depth = 0.61"
93.70% Pervious = 60,575 sf 6.30% Impervious = 4,070 sf

Summary for Subcatchment E1: Northwest Catchment

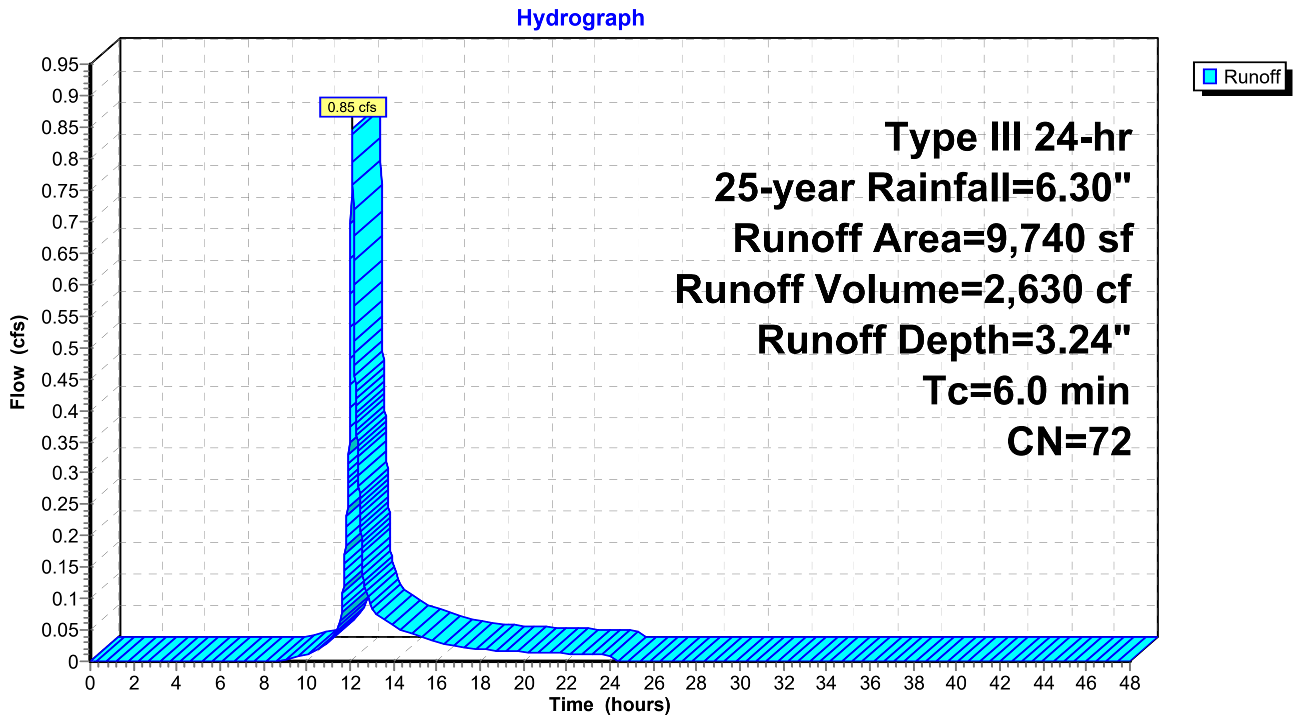
Runoff = 0.85 cfs @ 12.09 hrs, Volume= 2,630 cf, Depth= 3.24"
Routed to Link 1L : To Wetland

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.30"

	Area (sf)	CN	Description
	1,300	30	Woods, Good, HSG A
	2,439	32	Woods/grass comb., Good, HSG A
*	3,616	98	Impervious, HSG A
	2,385	96	Gravel surface, HSG A
	9,740	72	Weighted Average
	6,124		62.87% Pervious Area
	3,616		37.13% Impervious Area

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

Subcatchment E1: Northwest Catchment



Summary for Subcatchment E2: Southeast Catchment

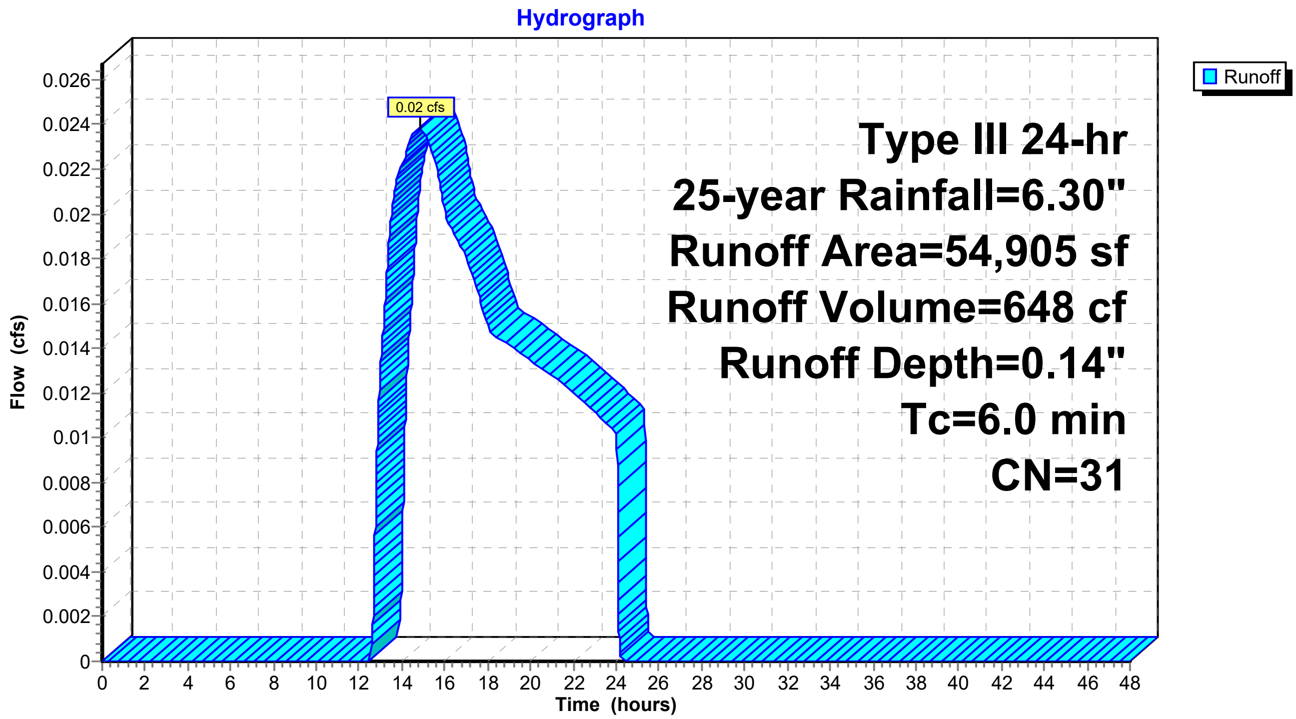
Runoff = 0.02 cfs @ 14.82 hrs, Volume= 648 cf, Depth= 0.14"
Routed to Link 1L : To Wetland

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.30"

	Area (sf)	CN	Description
	369	96	Gravel surface, HSG A
	7,238	32	Woods/grass comb., Good, HSG A
	46,844	30	Woods, Good, HSG A
*	454	98	Impervious, HSG A
	54,905	31	Weighted Average
	54,451		99.17% Pervious Area
	454		0.83% Impervious Area

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

Subcatchment E2: Southeast Catchment

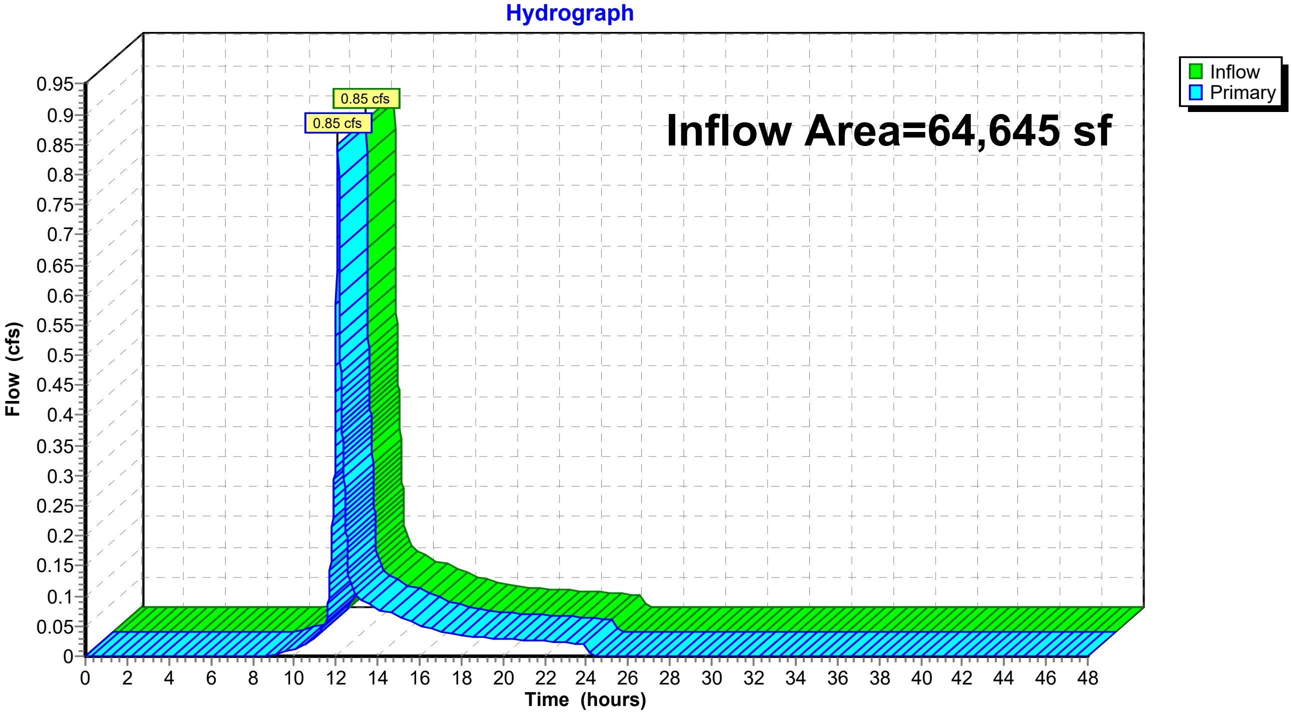


Summary for Link 1L: To Wetland

Inflow Area = 64,645 sf, 6.30% Impervious, Inflow Depth = 0.61" for 25-year event
Inflow = 0.85 cfs @ 12.09 hrs, Volume= 3,279 cf
Primary = 0.85 cfs @ 12.09 hrs, Volume= 3,279 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 1L: To Wetland



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

SubcatchmentE1: Northwest Catchment Runoff Area=9,740 sf 37.13% Impervious Runoff Depth=5.64"
Tc=6.0 min CN=72 Runoff=1.48 cfs 4,582 cf

SubcatchmentE2: Southeast Catchment Runoff Area=54,905 sf 0.83% Impervious Runoff Depth=0.79"
Tc=6.0 min CN=31 Runoff=0.45 cfs 3,631 cf

Link 1L: To Wetland Inflow=1.70 cfs 8,213 cf
Primary=1.70 cfs 8,213 cf

Total Runoff Area = 64,645 sf Runoff Volume = 8,213 cf Average Runoff Depth = 1.52"
93.70% Pervious = 60,575 sf 6.30% Impervious = 4,070 sf

Summary for Subcatchment E1: Northwest Catchment

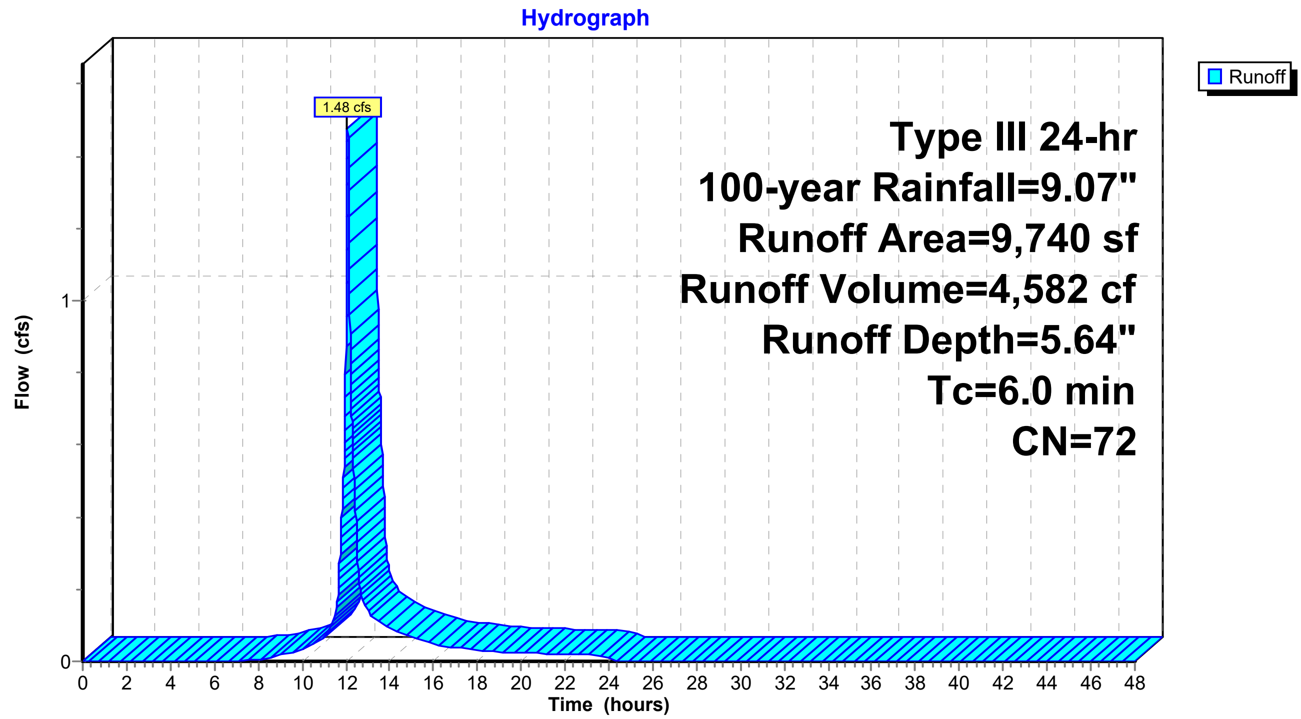
Runoff = 1.48 cfs @ 12.09 hrs, Volume= 4,582 cf, Depth= 5.64"
Routed to Link 1L : To Wetland

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=9.07"

	Area (sf)	CN	Description
	1,300	30	Woods, Good, HSG A
	2,439	32	Woods/grass comb., Good, HSG A
*	3,616	98	Impervious, HSG A
	2,385	96	Gravel surface, HSG A
	9,740	72	Weighted Average
	6,124		62.87% Pervious Area
	3,616		37.13% Impervious Area

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

Subcatchment E1: Northwest Catchment



Summary for Subcatchment E2: Southeast Catchment

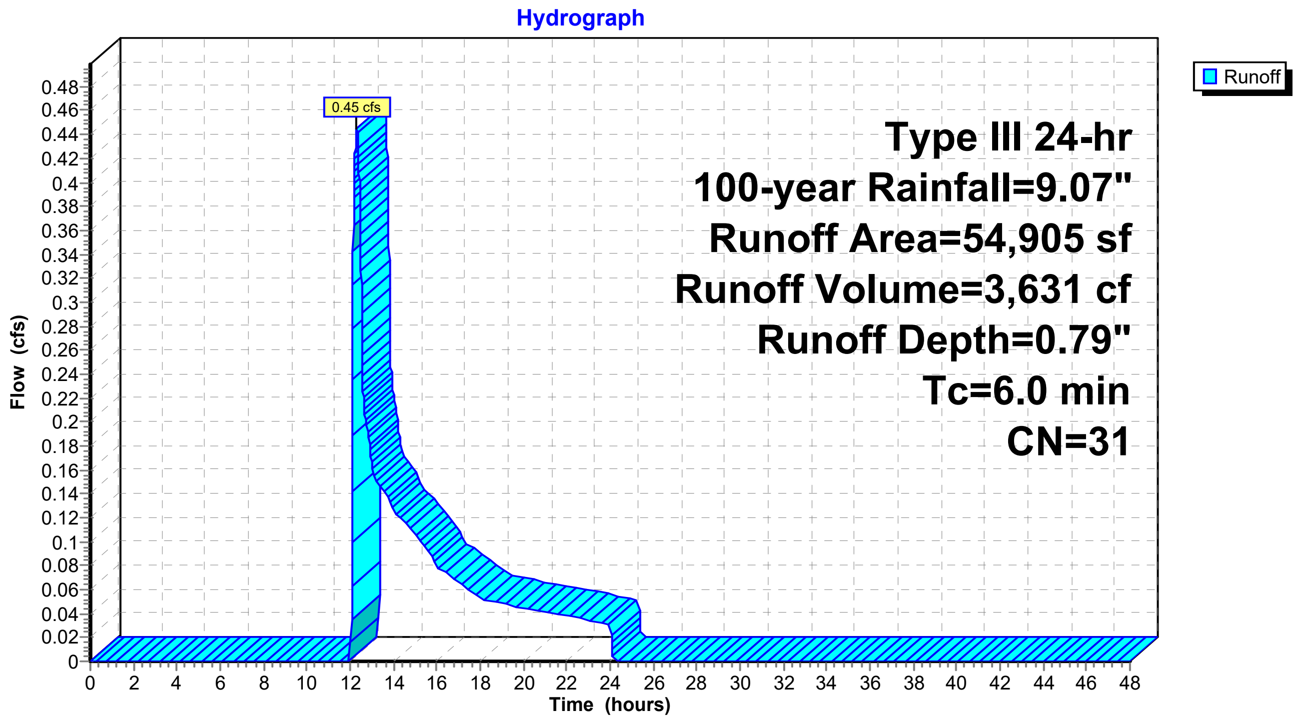
Runoff = 0.45 cfs @ 12.31 hrs, Volume= 3,631 cf, Depth= 0.79"
Routed to Link 1L : To Wetland

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=9.07"

	Area (sf)	CN	Description
	369	96	Gravel surface, HSG A
	7,238	32	Woods/grass comb., Good, HSG A
	46,844	30	Woods, Good, HSG A
*	454	98	Impervious, HSG A
	54,905	31	Weighted Average
	54,451		99.17% Pervious Area
	454		0.83% Impervious Area

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

Subcatchment E2: Southeast Catchment

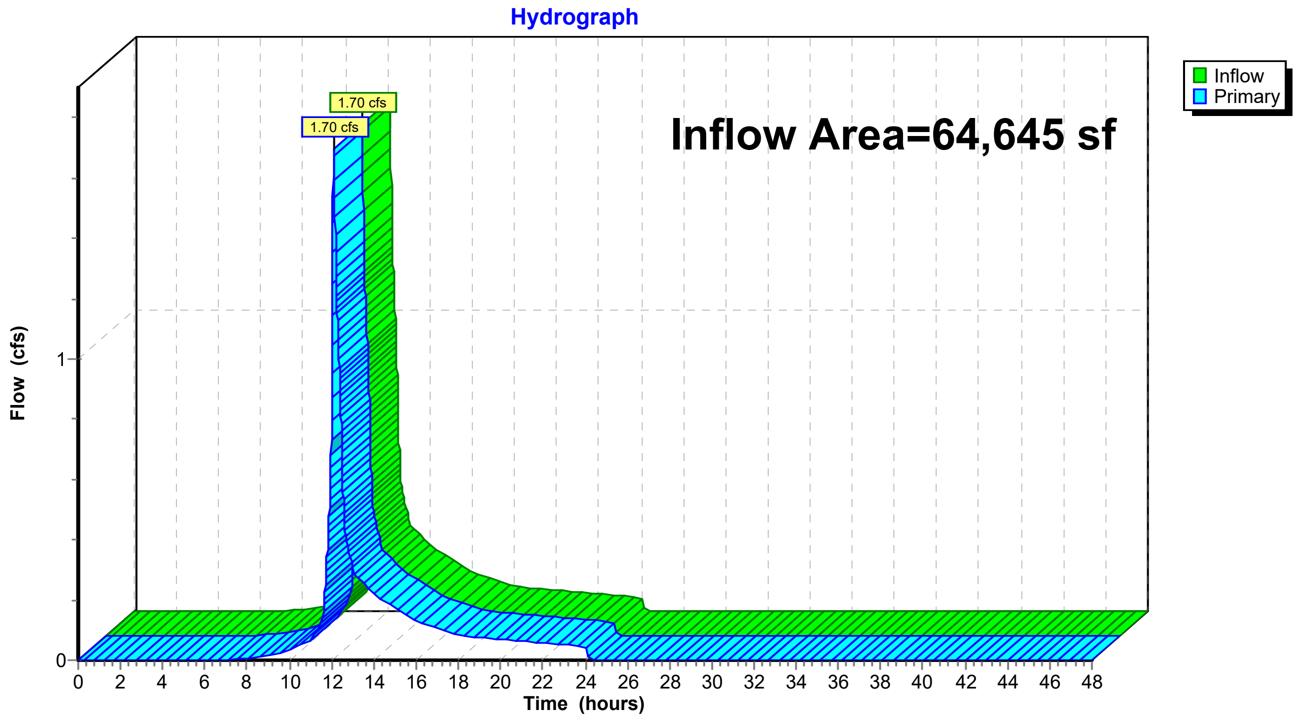


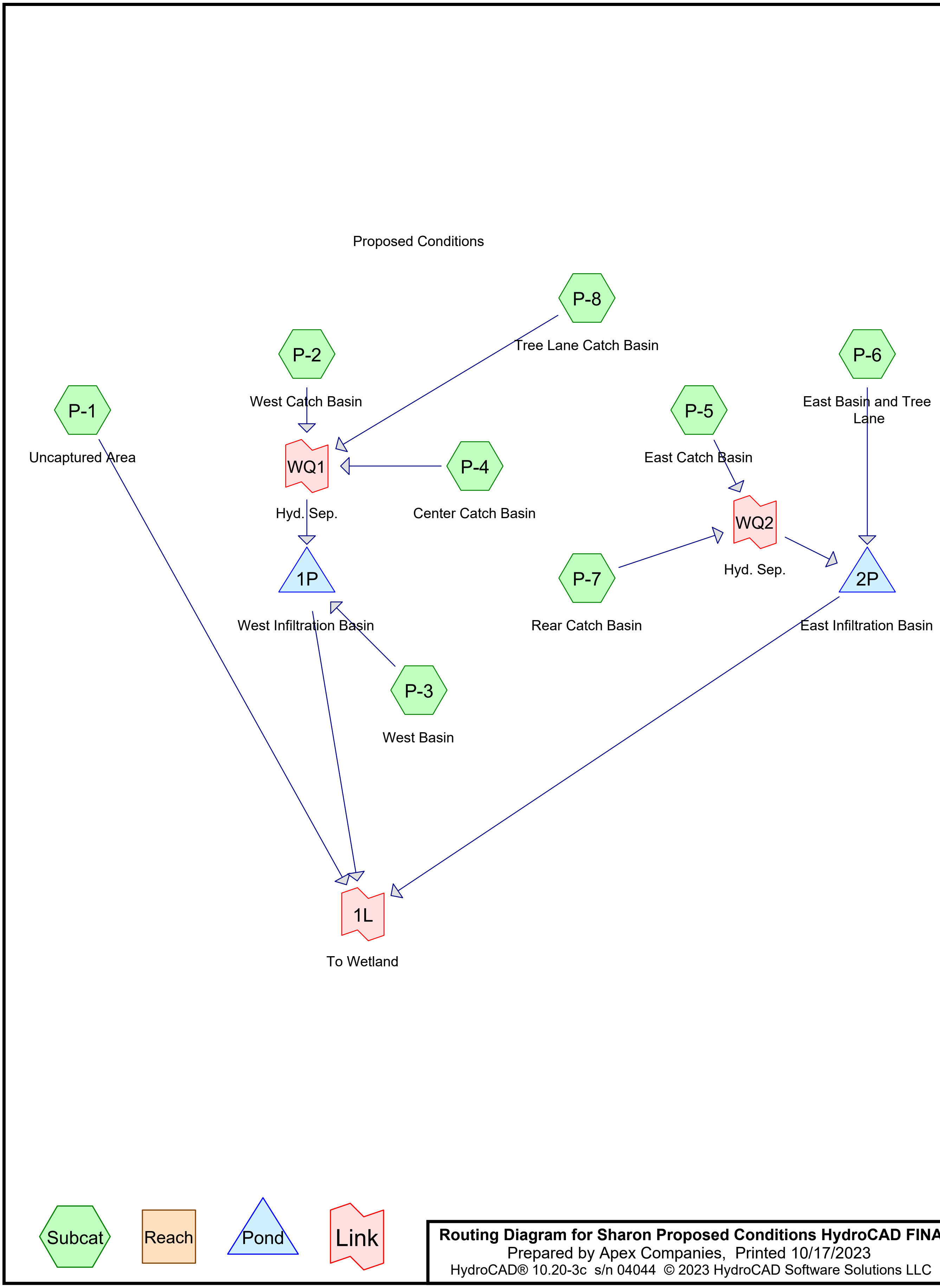
Summary for Link 1L: To Wetland

Inflow Area =	64,645 sf,	6.30% Impervious,	Inflow Depth = 1.52"	for 100-year event
Inflow =	1.70 cfs @	12.11 hrs, Volume=	8,213 cf	
Primary =	1.70 cfs @	12.11 hrs, Volume=	8,213 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 1L: To Wetland





Routing Diagram for Sharon Proposed Conditions HydroCAD FINAL
Prepared by Apex Companies, Printed 10/17/2023
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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-year	Type III 24-hr		Default	24.00	1	2.72	2
2	2-year	Type III 24-hr		Default	24.00	1	3.27	2
3	10-year	Type III 24-hr		Default	24.00	1	4.96	2
4	25-year	Type III 24-hr		Default	24.00	1	6.30	2
5	100-year	Type III 24-hr		Default	24.00	1	9.07	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
7,998	39	>75% Grass cover, Good, HSG A (P-3, P-6)
3,504	76	Gravel roads, HSG A (P-1, P-4, P-5, P-7, P-8)
648	96	Gravel surface, HSG A (P-1)
15,109	98	Impervious, HSG A (P-1, P-2, P-3, P-4, P-5, P-6, P-8)
12,262	39	Pasture/grassland/range, Good, HSG A (P-1)
353	98	Paved parking, HSG A (P-7)
7,701	98	Roofs, HSG A (P-4, P-7)
13,109	30	Woods, Good, HSG A (P-6, P-8)
3,962	32	Woods/grass comb., Good, HSG A (P-6, P-8)
64,646	**60**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
64,646	HSG A	P-1, P-2, P-3, P-4, P-5, P-6, P-7, P-8
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
64,646		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
7,998	0	0	0	0	7,998	>75% Grass cover, Good
3,504	0	0	0	0	3,504	Gravel roads
648	0	0	0	0	648	Gravel surface
15,109	0	0	0	0	15,109	Impervious
12,262	0	0	0	0	12,262	Pasture/grassland/range, Good
353	0	0	0	0	353	Paved parking
7,701	0	0	0	0	7,701	Roofs
13,109	0	0	0	0	13,109	Woods, Good
3,962	0	0	0	0	3,962	Woods/grass comb., Good
64,646	**0**	**0**	**0**	**0**	**64,646**	**TOTAL AREA**

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

Subcatchment P-1: Uncaptured Area Runoff Area=15,766 sf 14.06% Impervious Runoff Depth=0.06"
Tc=6.0 min CN=51 Runoff=0.00 cfs 80 cf

Subcatchment P-2: West Catch Basin Runoff Area=1,022 sf 100.00% Impervious Runoff Depth=2.49"
Tc=6.0 min CN=98 Runoff=0.06 cfs 212 cf

Subcatchment P-3: West Basin Runoff Area=4,509 sf 9.12% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=44 Runoff=0.00 cfs 1 cf

Subcatchment P-4: Center Catch Basin Runoff Area=9,679 sf 89.53% Impervious Runoff Depth=2.28"
Tc=6.0 min CN=96 Runoff=0.56 cfs 1,836 cf

Subcatchment P-5: East Catch Basin Runoff Area=4,803 sf 74.45% Impervious Runoff Depth=1.90"
Tc=6.0 min CN=92 Runoff=0.24 cfs 760 cf

Subcatchment P-6: East Basin and Tree Runoff Area=18,107 sf 1.30% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=33 Runoff=0.00 cfs 0 cf

Subcatchment P-7: Rear Catch Basin Runoff Area=4,816 sf 87.27% Impervious Runoff Depth=2.18"
Tc=6.0 min CN=95 Runoff=0.27 cfs 874 cf

Subcatchment P-8: Tree Lane Catch Basin Runoff Area=5,944 sf 47.66% Impervious Runoff Depth=0.32"
Tc=6.0 min CN=63 Runoff=0.03 cfs 159 cf

Pond 1P: West Infiltration Basin Peak Elev=214.38' Storage=364 cf Inflow=0.64 cfs 2,209 cf
Discarded=0.20 cfs 2,209 cf Primary=0.00 cfs 0 cf Outflow=0.20 cfs 2,209 cf

Pond 2P: East Infiltration Basin Peak Elev=216.71' Storage=388 cf Inflow=0.51 cfs 1,633 cf
Discarded=0.12 cfs 1,633 cf Primary=0.00 cfs 0 cf Outflow=0.12 cfs 1,633 cf

Link 1L: To Wetland Inflow=0.00 cfs 80 cf
Primary=0.00 cfs 80 cf

Link WQ1: Hyd. Sep. Inflow=0.64 cfs 2,208 cf
Primary=0.64 cfs 2,208 cf

Link WQ2: Hyd. Sep. Inflow=0.51 cfs 1,633 cf
Primary=0.51 cfs 1,633 cf

Total Runoff Area = 64,646 sf Runoff Volume = 3,923 cf Average Runoff Depth = 0.73"
64.17% Pervious = 41,483 sf 35.83% Impervious = 23,163 sf

Summary for Subcatchment P-1: Uncaptured Area

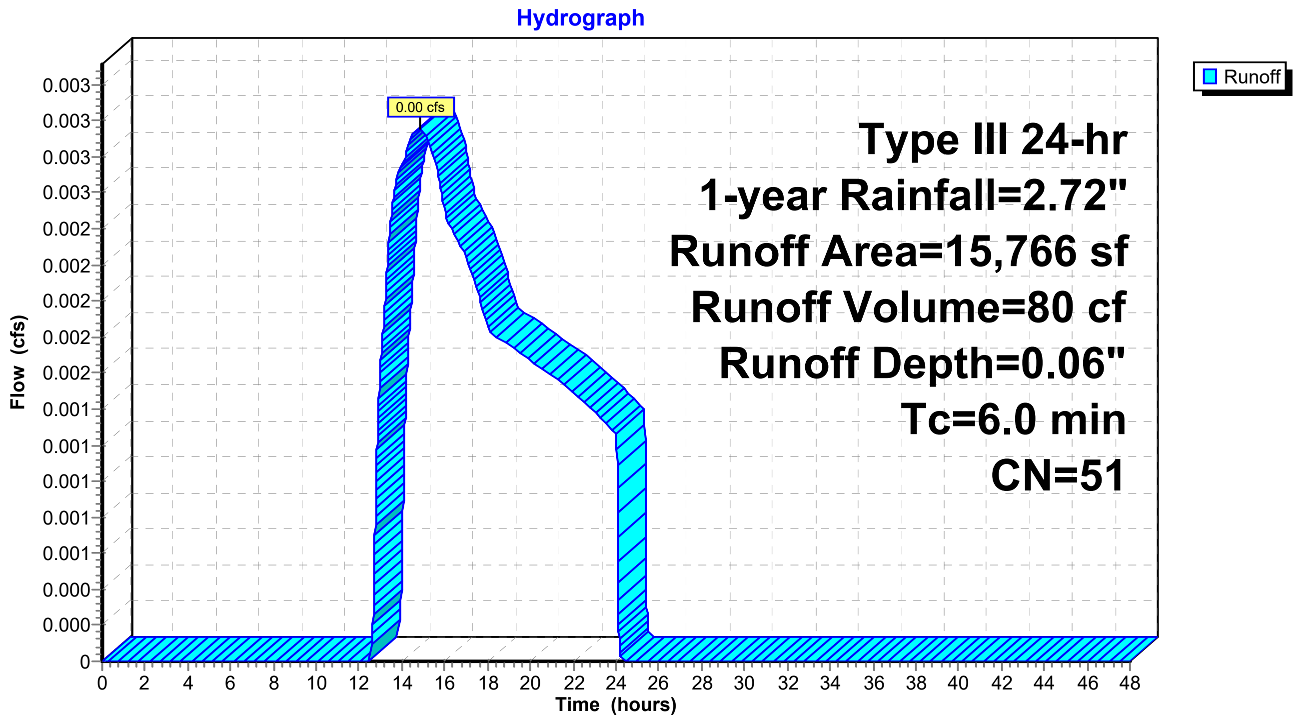
Runoff = 0.00 cfs @ 14.82 hrs, Volume= 80 cf, Depth= 0.06"
Routed to Link 1L : To Wetland

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-year Rainfall=2.72"

	Area (sf)	CN	Description
	640	76	Gravel roads, HSG A
	12,262	39	Pasture/grassland/range, Good, HSG A
*	2,216	98	Impervious, HSG A
	648	96	Gravel surface, HSG A
	15,766	51	Weighted Average
	13,550		85.94% Pervious Area
	2,216		14.06% Impervious Area

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

Subcatchment P-1: Uncaptured Area



Summary for Subcatchment P-2: West Catch Basin

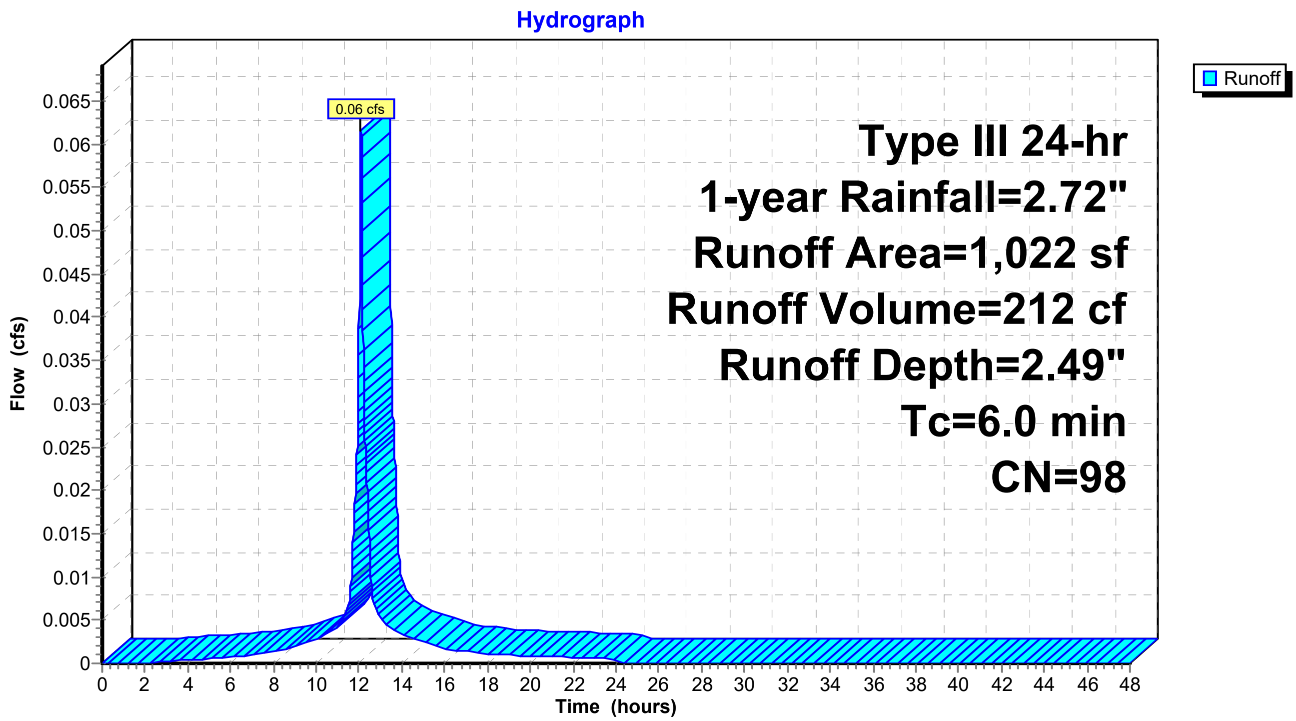
Runoff = 0.06 cfs @ 12.08 hrs, Volume= 212 cf, Depth= 2.49"
Routed to Link WQ1 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-year Rainfall=2.72"

	Area (sf)	CN	Description
*	1,022	98	Impervious, HSG A
	1,022		100.00% Impervious Area

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

Subcatchment P-2: West Catch Basin



Summary for Subcatchment P-3: West Basin

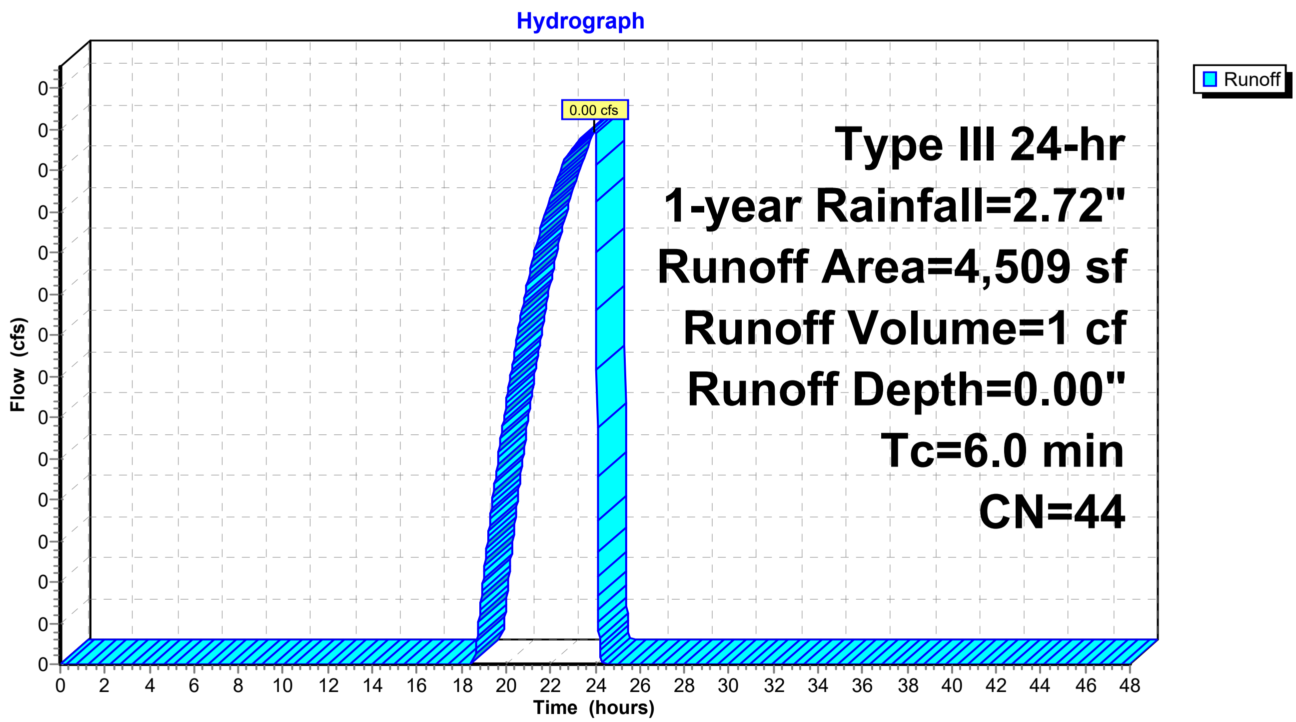
Runoff = 0.00 cfs @ 23.98 hrs, Volume= 1 cf, Depth= 0.00"
Routed to Pond 1P : West Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-year Rainfall=2.72"

	Area (sf)	CN	Description
*	411	98	Impervious, HSG A
	4,098	39	>75% Grass cover, Good, HSG A
	4,509	44	Weighted Average
	4,098		90.88% Pervious Area
	411		9.12% Impervious Area

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

Subcatchment P-3: West Basin



Summary for Subcatchment P-4: Center Catch Basin

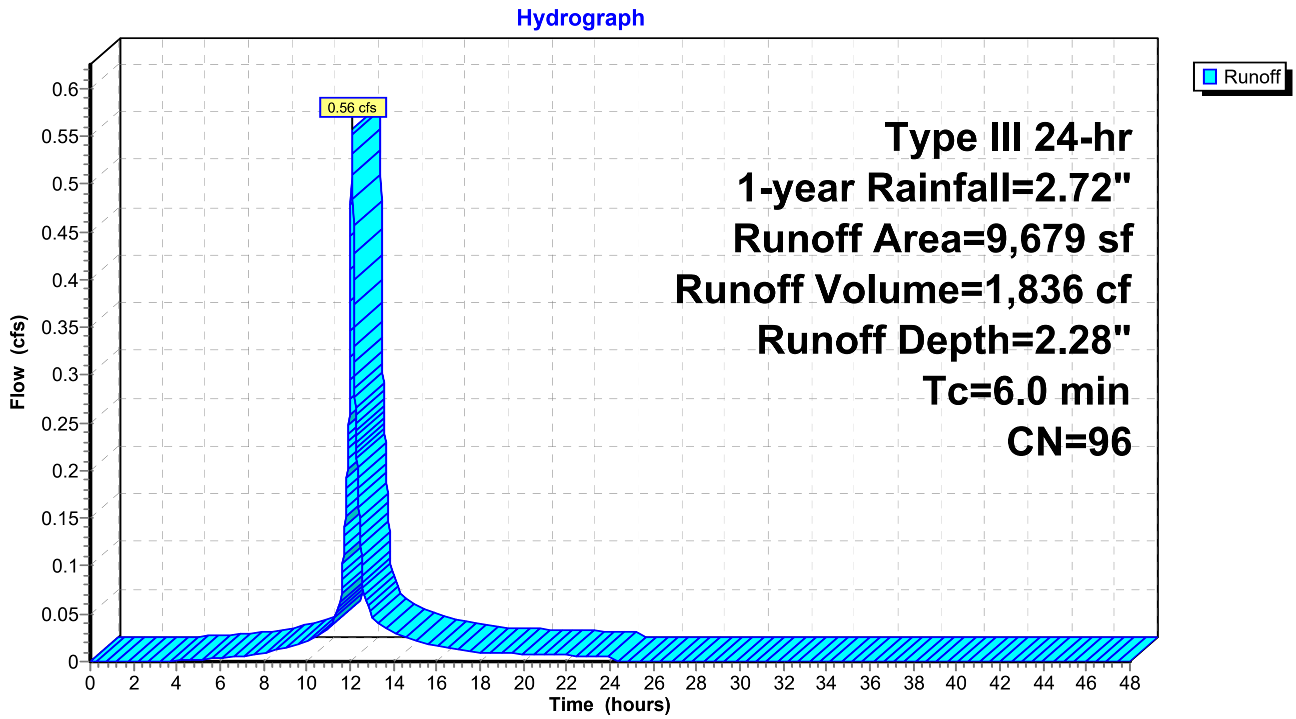
Runoff = 0.56 cfs @ 12.08 hrs, Volume= 1,836 cf, Depth= 2.28"
Routed to Link WQ1 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-year Rainfall=2.72"

	Area (sf)	CN	Description
*	4,815	98	Impervious, HSG A
	1,013	76	Gravel roads, HSG A
	3,851	98	Roofs, HSG A
	9,679	96	Weighted Average
	1,013		10.47% Pervious Area
	8,666		89.53% Impervious Area

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

Subcatchment P-4: Center Catch Basin



Summary for Subcatchment P-5: East Catch Basin

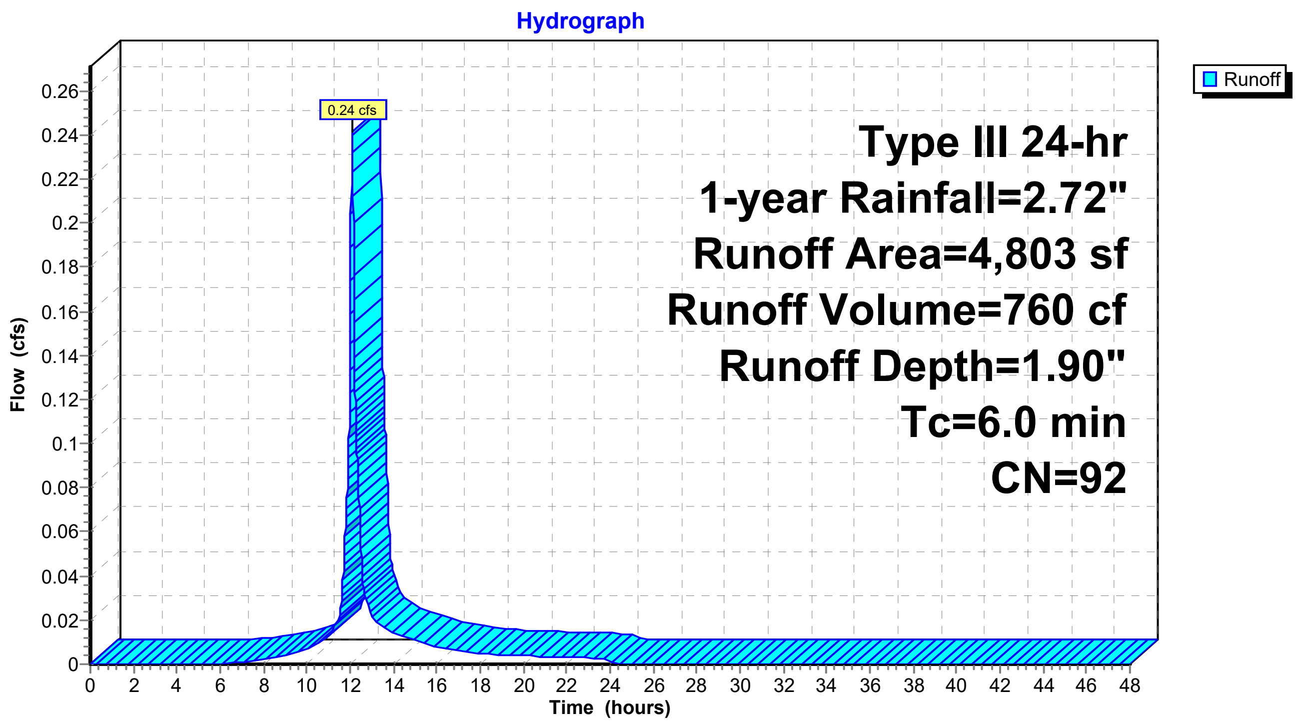
Runoff = 0.24 cfs @ 12.09 hrs, Volume= 760 cf, Depth= 1.90"
Routed to Link WQ2 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-year Rainfall=2.72"

	Area (sf)	CN	Description
	1,227	76	Gravel roads, HSG A
*	3,576	98	Impervious, HSG A
	4,803	92	Weighted Average
	1,227		25.55% Pervious Area
	3,576		74.45% Impervious Area

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

Subcatchment P-5: East Catch Basin



Summary for Subcatchment P-6: East Basin and Tree Lane

[45] Hint: Runoff=Zero

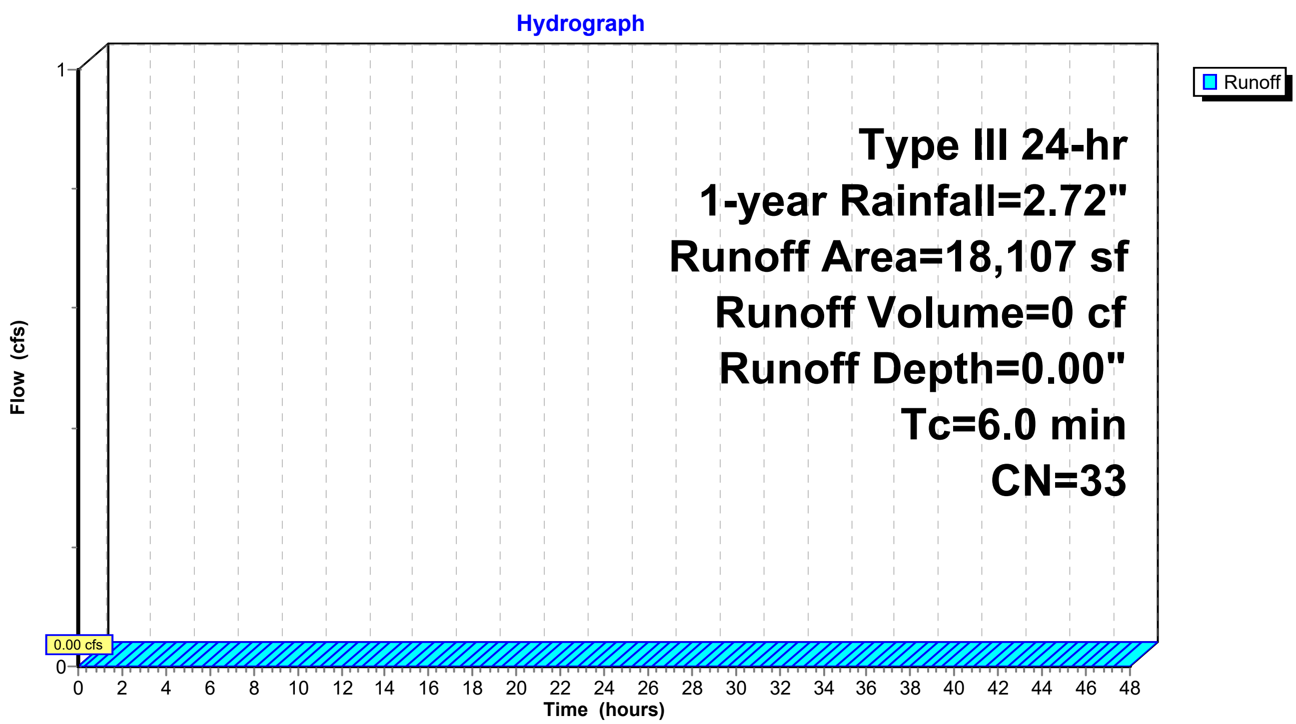
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond 2P : East Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-year Rainfall=2.72"

	Area (sf)	CN	Description
	2,301	32	Woods/grass comb., Good, HSG A
	11,670	30	Woods, Good, HSG A
	3,900	39	>75% Grass cover, Good, HSG A
*	236	98	Impervious, HSG A
	18,107	33	Weighted Average
	17,871		98.70% Pervious Area
	236		1.30% Impervious Area

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

Subcatchment P-6: East Basin and Tree Lane



Summary for Subcatchment P-7: Rear Catch Basin

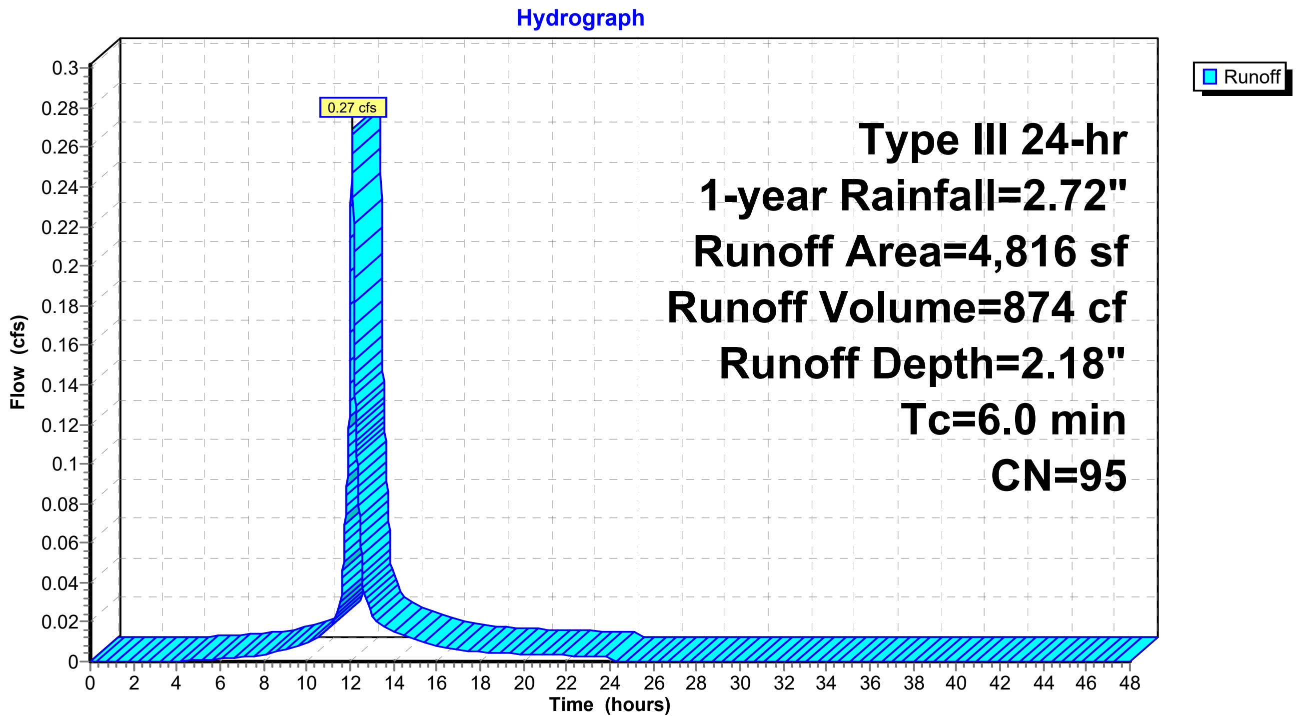
Runoff = 0.27 cfs @ 12.08 hrs, Volume= 874 cf, Depth= 2.18"
Routed to Link WQ2 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-year Rainfall=2.72"

Area (sf)	CN	Description
3,850	98	Roofs, HSG A
353	98	Paved parking, HSG A
613	76	Gravel roads, HSG A
4,816	95	Weighted Average
613		12.73% Pervious Area
4,203		87.27% Impervious Area

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

Subcatchment P-7: Rear Catch Basin



Summary for Subcatchment P-8: Tree Lane Catch Basin

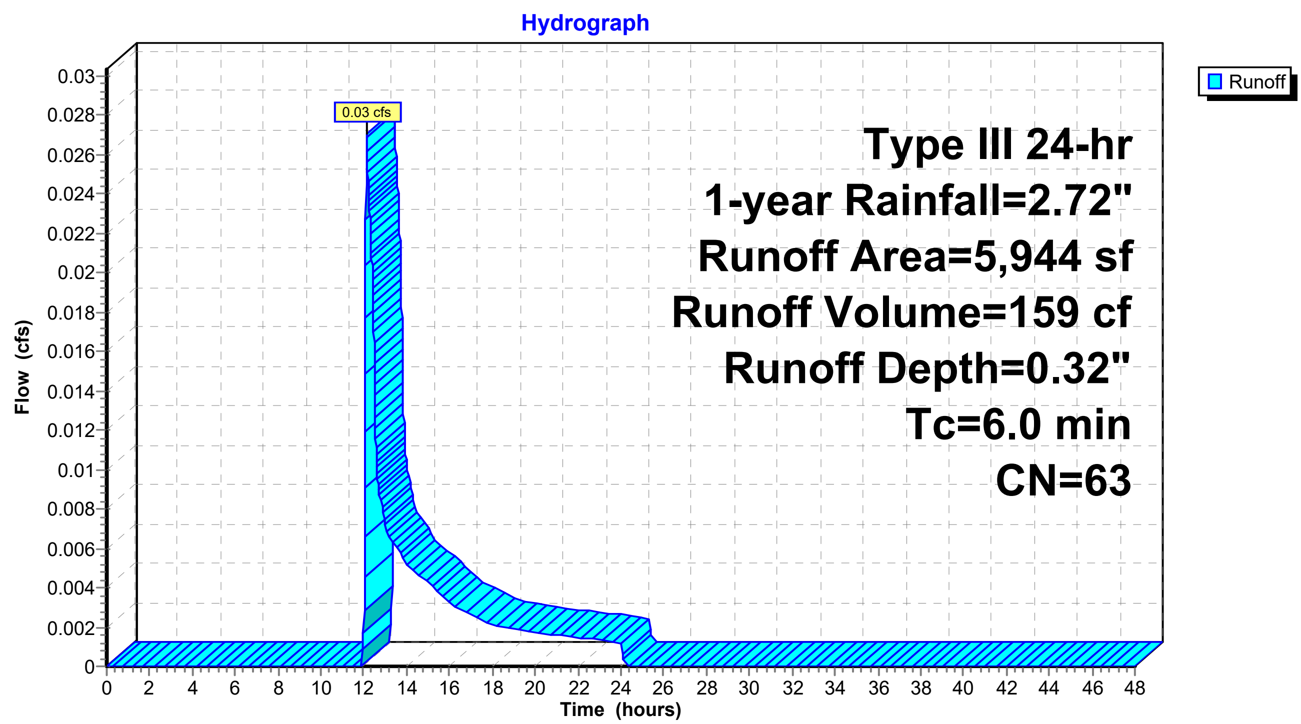
Runoff = 0.03 cfs @ 12.13 hrs, Volume= 159 cf, Depth= 0.32"
Routed to Link WQ1 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-year Rainfall=2.72"

	Area (sf)	CN	Description
	1,439	30	Woods, Good, HSG A
*	2,833	98	Impervious, HSG A
	1,661	32	Woods/grass comb., Good, HSG A
	11	76	Gravel roads, HSG A
	5,944	63	Weighted Average
	3,111		52.34% Pervious Area
	2,833		47.66% Impervious Area

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

Subcatchment P-8: Tree Lane Catch Basin



Summary for Pond 1P: West Infiltration Basin

Inflow Area = 21,154 sf, 61.13% Impervious, Inflow Depth = 1.25" for 1-year event
Inflow = 0.64 cfs @ 12.09 hrs, Volume= 2,209 cf
Outflow = 0.20 cfs @ 12.40 hrs, Volume= 2,209 cf, Atten= 68%, Lag= 19.1 min
Discarded = 0.20 cfs @ 12.40 hrs, Volume= 2,209 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 1L : To Wetland

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 214.38' @ 12.40 hrs Surf.Area= 1,067 sf Storage= 364 cf

Plug-Flow detention time= 8.8 min calculated for 2,208 cf (100% of inflow)
Center-of-Mass det. time= 8.8 min (796.6 - 787.8)

Volume	Invert	Avail.Storage	Storage Description
#1	214.00'	9,120 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

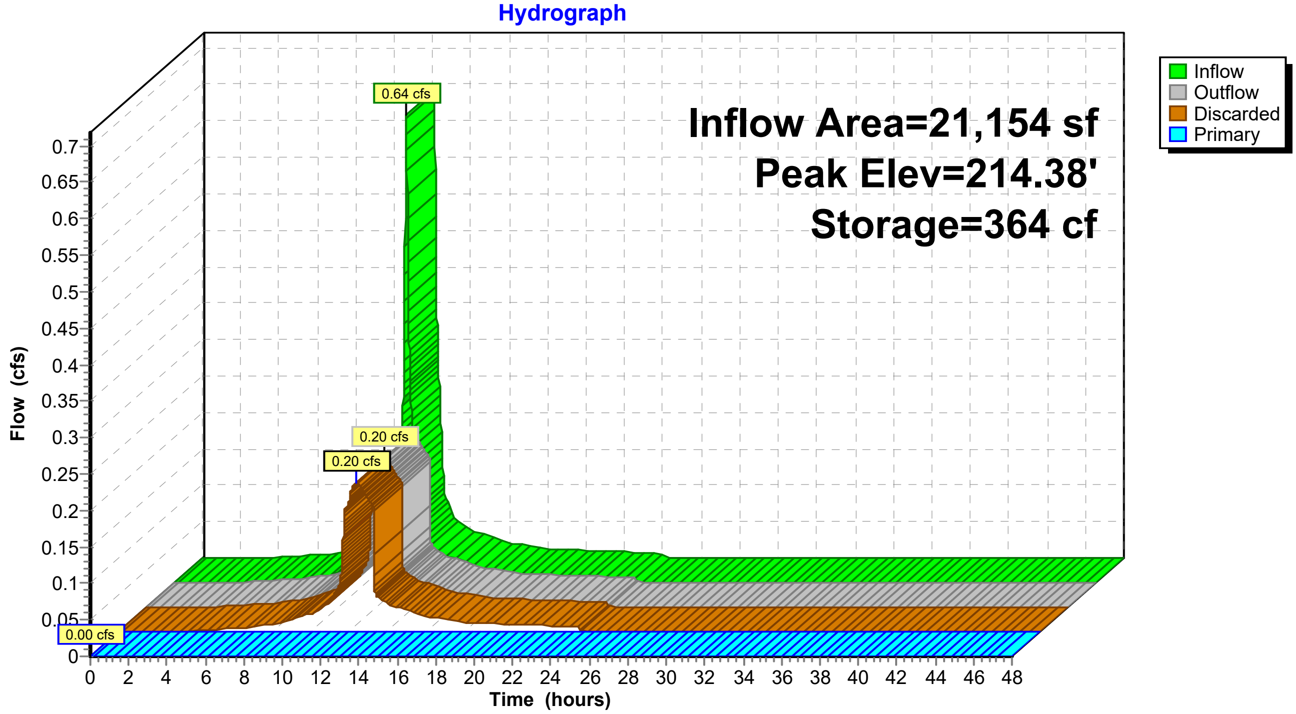
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
214.00	875	151.0	0	0	875
215.00	1,429	188.0	1,141	1,141	1,887
216.00	2,020	207.0	1,716	2,857	2,516
217.00	2,668	225.0	2,336	5,193	3,172
218.00	3,412	249.0	3,032	8,226	4,108
218.25	3,746	254.0	894	9,120	4,317

Device	Routing	Invert	Outlet Devices
#1	Discarded	214.00'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	217.75'	**6.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.20 cfs @ 12.40 hrs HW=214.38' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=214.00' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: West Infiltration Basin



Summary for Pond 2P: East Infiltration Basin

Inflow Area = 27,726 sf, 28.91% Impervious, Inflow Depth = 0.71" for 1-year event
Inflow = 0.51 cfs @ 12.09 hrs, Volume= 1,633 cf
Outflow = 0.12 cfs @ 12.47 hrs, Volume= 1,633 cf, Atten= 76%, Lag= 23.3 min
Discarded = 0.12 cfs @ 12.47 hrs, Volume= 1,633 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 1L : To Wetland

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 216.71' @ 12.47 hrs Surf.Area= 649 sf Storage= 388 cf

Plug-Flow detention time= 18.7 min calculated for 1,633 cf (100% of inflow)
Center-of-Mass det. time= 18.7 min (813.0 - 794.3)

Volume	Invert	Avail.Storage	Storage Description
#1	216.00'	4,959 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

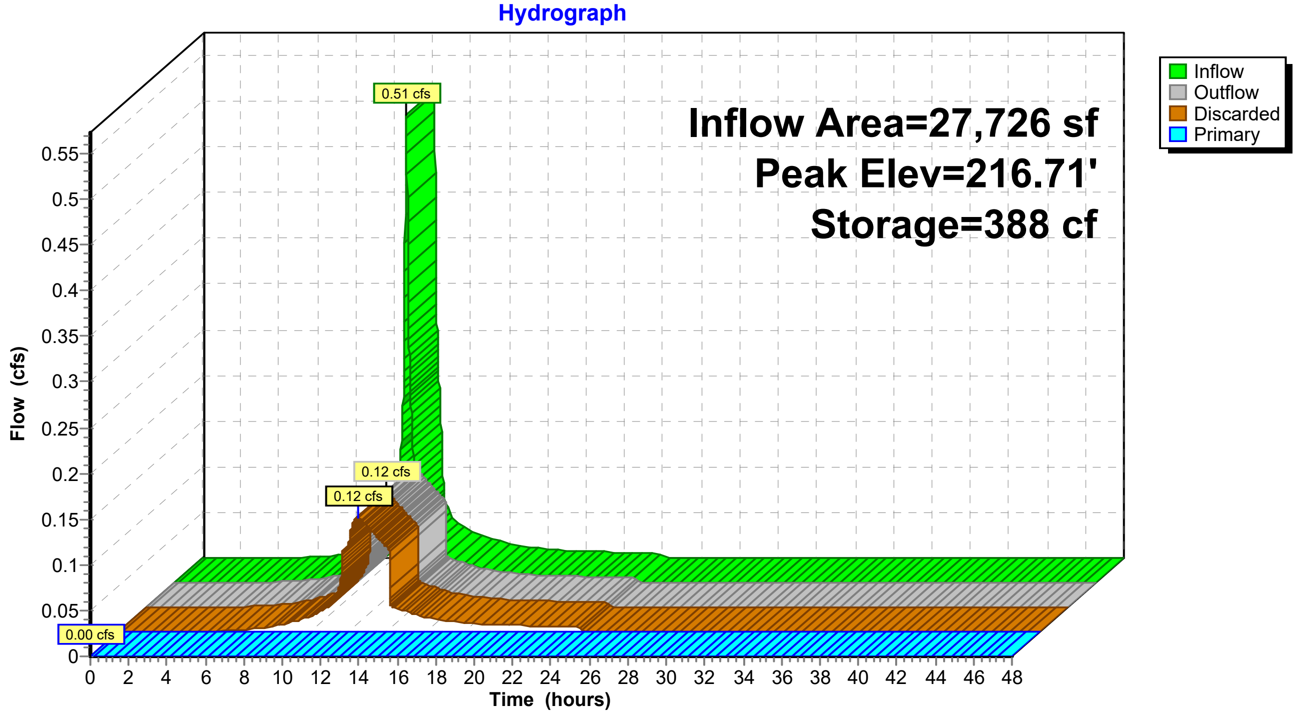
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
216.00	458	84.0	0	0	458
217.00	739	103.0	593	593	756
218.00	1,075	122.0	902	1,495	1,114
219.00	1,468	140.0	1,266	2,761	1,512
220.00	1,918	159.0	1,688	4,449	1,988
220.25	2,164	169.0	510	4,959	2,252

Device	Routing	Invert	Outlet Devices
#1	Discarded	216.00'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	219.75'	**6.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.12 cfs @ 12.47 hrs HW=216.71' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=216.00' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

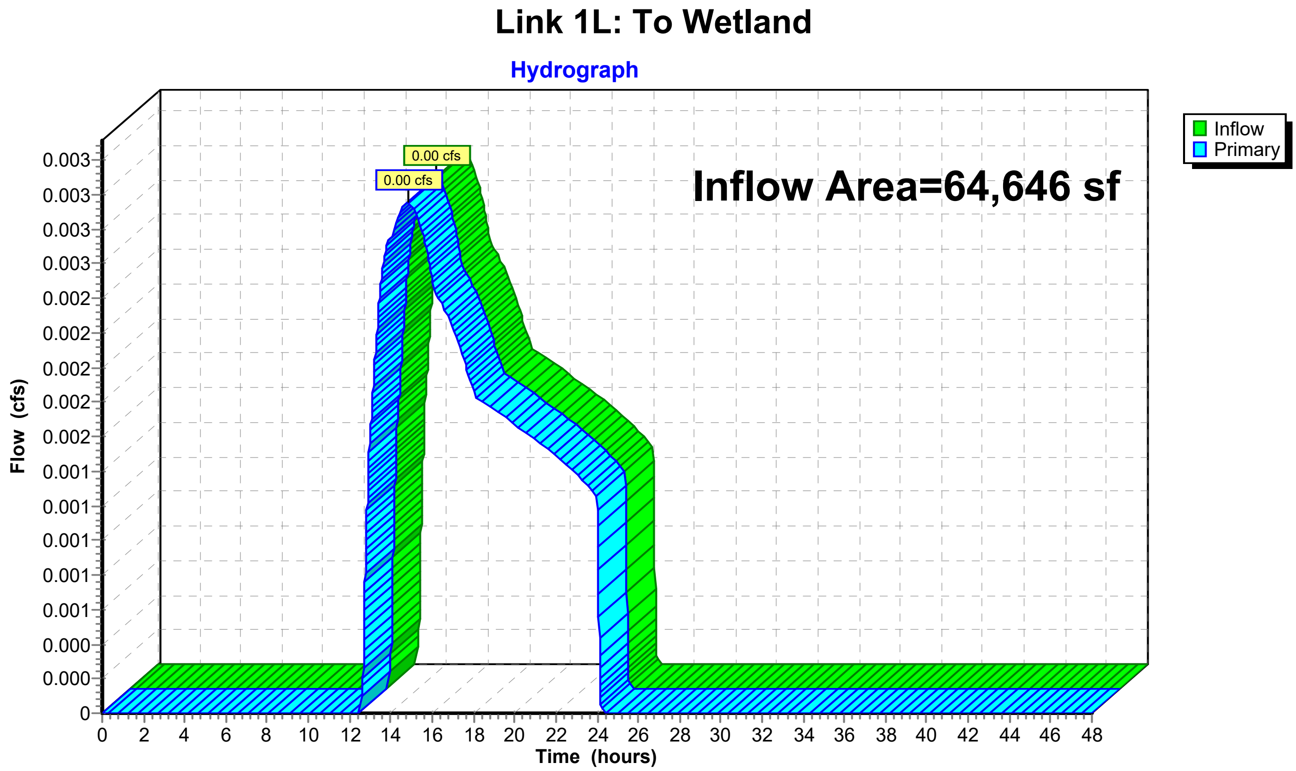
Pond 2P: East Infiltration Basin



Summary for Link 1L: To Wetland

Inflow Area = 64,646 sf, 35.83% Impervious, Inflow Depth = 0.01" for 1-year event
Inflow = 0.00 cfs @ 14.82 hrs, Volume= 80 cf
Primary = 0.00 cfs @ 14.82 hrs, Volume= 80 cf, Atten= 0%, Lag= 0.0 min

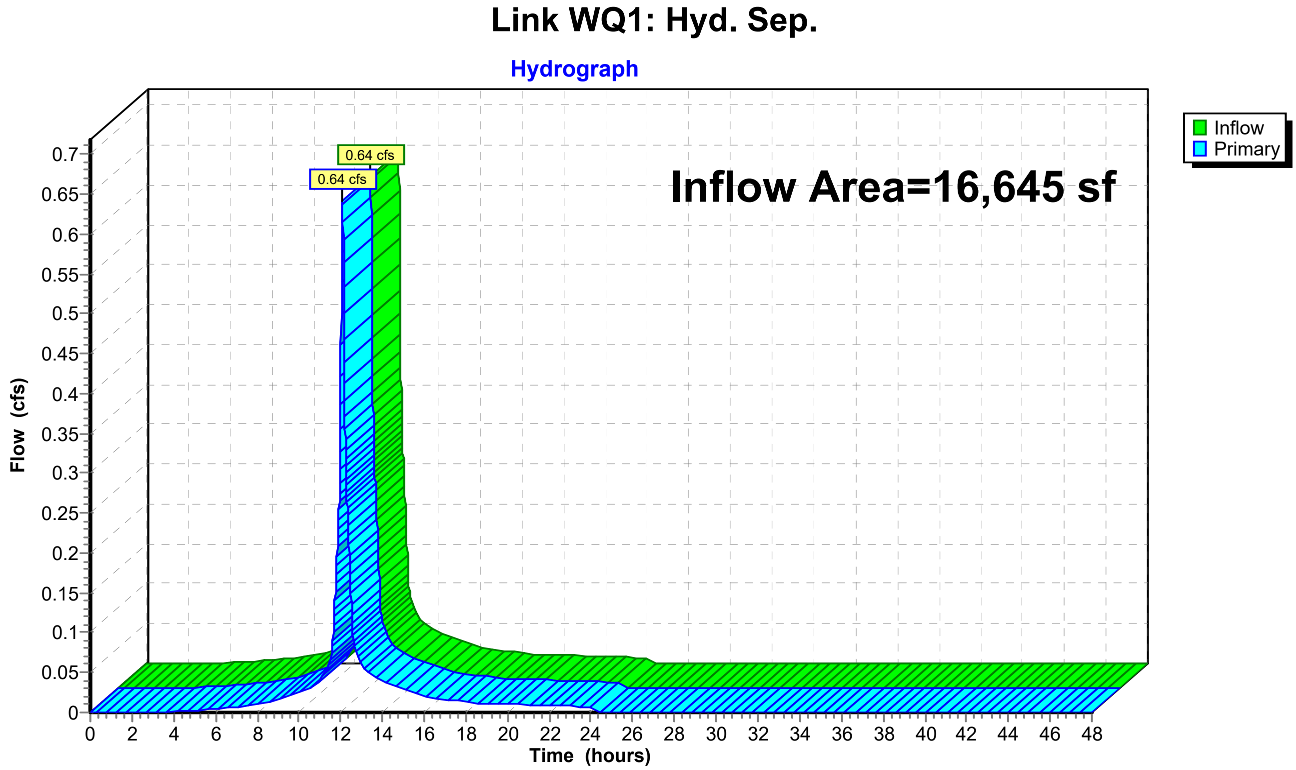
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs



Summary for Link WQ1: Hyd. Sep.

Inflow Area = 16,645 sf, 75.22% Impervious, Inflow Depth = 1.59" for 1-year event
Inflow = 0.64 cfs @ 12.09 hrs, Volume= 2,208 cf
Primary = 0.64 cfs @ 12.09 hrs, Volume= 2,208 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 1P : West Infiltration Basin

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

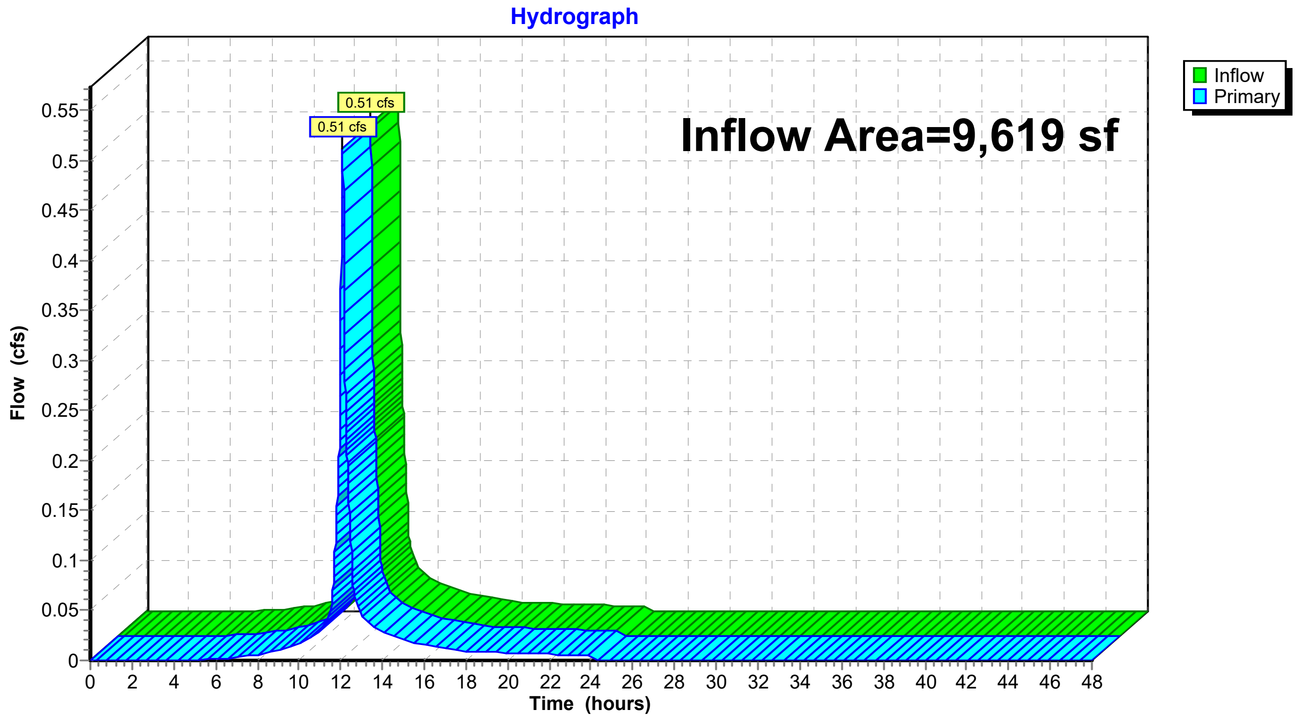


Summary for Link WQ2: Hyd. Sep.

Inflow Area = 9,619 sf, 80.87% Impervious, Inflow Depth = 2.04" for 1-year event
Inflow = 0.51 cfs @ 12.09 hrs, Volume= 1,633 cf
Primary = 0.51 cfs @ 12.09 hrs, Volume= 1,633 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 2P : East Infiltration Basin

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link WQ2: Hyd. Sep.



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

SubcatchmentP-1: Uncaptured Area Runoff Area=15,766 sf 14.06% Impervious Runoff Depth=0.17"
Tc=6.0 min CN=51 Runoff=0.02 cfs 218 cf

SubcatchmentP-2: West Catch Basin Runoff Area=1,022 sf 100.00% Impervious Runoff Depth=3.04"
Tc=6.0 min CN=98 Runoff=0.07 cfs 259 cf

SubcatchmentP-3: West Basin Runoff Area=4,509 sf 9.12% Impervious Runoff Depth=0.04"
Tc=6.0 min CN=44 Runoff=0.00 cfs 15 cf

SubcatchmentP-4: Center Catch Basin Runoff Area=9,679 sf 89.53% Impervious Runoff Depth=2.82"
Tc=6.0 min CN=96 Runoff=0.68 cfs 2,273 cf

SubcatchmentP-5: East Catch Basin Runoff Area=4,803 sf 74.45% Impervious Runoff Depth=2.42"
Tc=6.0 min CN=92 Runoff=0.30 cfs 967 cf

SubcatchmentP-6: East Basin and Tree Runoff Area=18,107 sf 1.30% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=33 Runoff=0.00 cfs 0 cf

SubcatchmentP-7: Rear Catch Basin Runoff Area=4,816 sf 87.27% Impervious Runoff Depth=2.71"
Tc=6.0 min CN=95 Runoff=0.33 cfs 1,089 cf

SubcatchmentP-8: Tree Lane Catch Basin Runoff Area=5,944 sf 47.66% Impervious Runoff Depth=0.55"
Tc=6.0 min CN=63 Runoff=0.06 cfs 273 cf

Pond 1P: West Infiltration Basin Peak Elev=214.55' Storage=557 cf Inflow=0.82 cfs 2,819 cf
Discarded=0.22 cfs 2,819 cf Primary=0.00 cfs 0 cf Outflow=0.22 cfs 2,819 cf

Pond 2P: East Infiltration Basin Peak Elev=216.93' Storage=542 cf Inflow=0.64 cfs 2,056 cf
Discarded=0.14 cfs 2,056 cf Primary=0.00 cfs 0 cf Outflow=0.14 cfs 2,056 cf

Link 1L: To Wetland Inflow=0.02 cfs 218 cf
Primary=0.02 cfs 218 cf

Link WQ1: Hyd. Sep. Inflow=0.82 cfs 2,805 cf
Primary=0.82 cfs 2,805 cf

Link WQ2: Hyd. Sep. Inflow=0.64 cfs 2,056 cf
Primary=0.64 cfs 2,056 cf

Total Runoff Area = 64,646 sf Runoff Volume = 5,094 cf Average Runoff Depth = 0.95"
64.17% Pervious = 41,483 sf 35.83% Impervious = 23,163 sf

Summary for Subcatchment P-1: Uncaptured Area

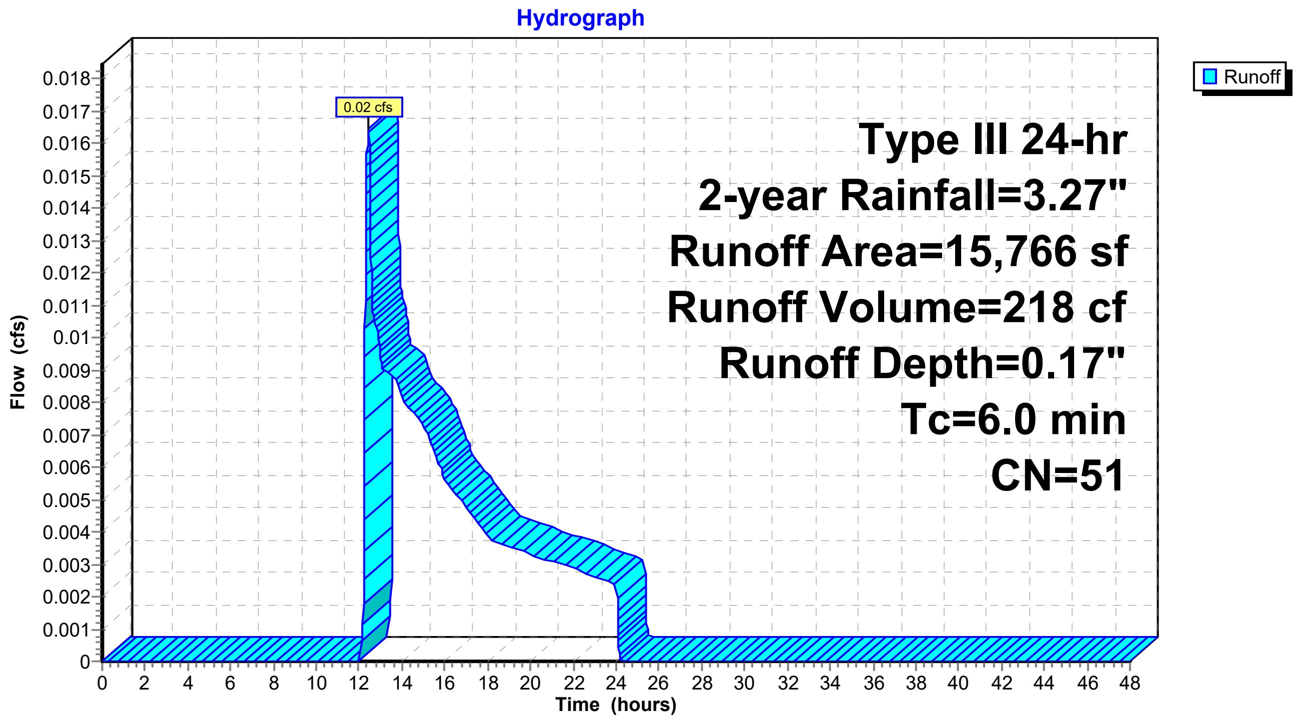
Runoff = 0.02 cfs @ 12.42 hrs, Volume= 218 cf, Depth= 0.17"
Routed to Link 1L : To Wetland

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.27"

	Area (sf)	CN	Description
	640	76	Gravel roads, HSG A
	12,262	39	Pasture/grassland/range, Good, HSG A
*	2,216	98	Impervious, HSG A
	648	96	Gravel surface, HSG A
	15,766	51	Weighted Average
	13,550		85.94% Pervious Area
	2,216		14.06% Impervious Area

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

Subcatchment P-1: Uncaptured Area



Summary for Subcatchment P-2: West Catch Basin

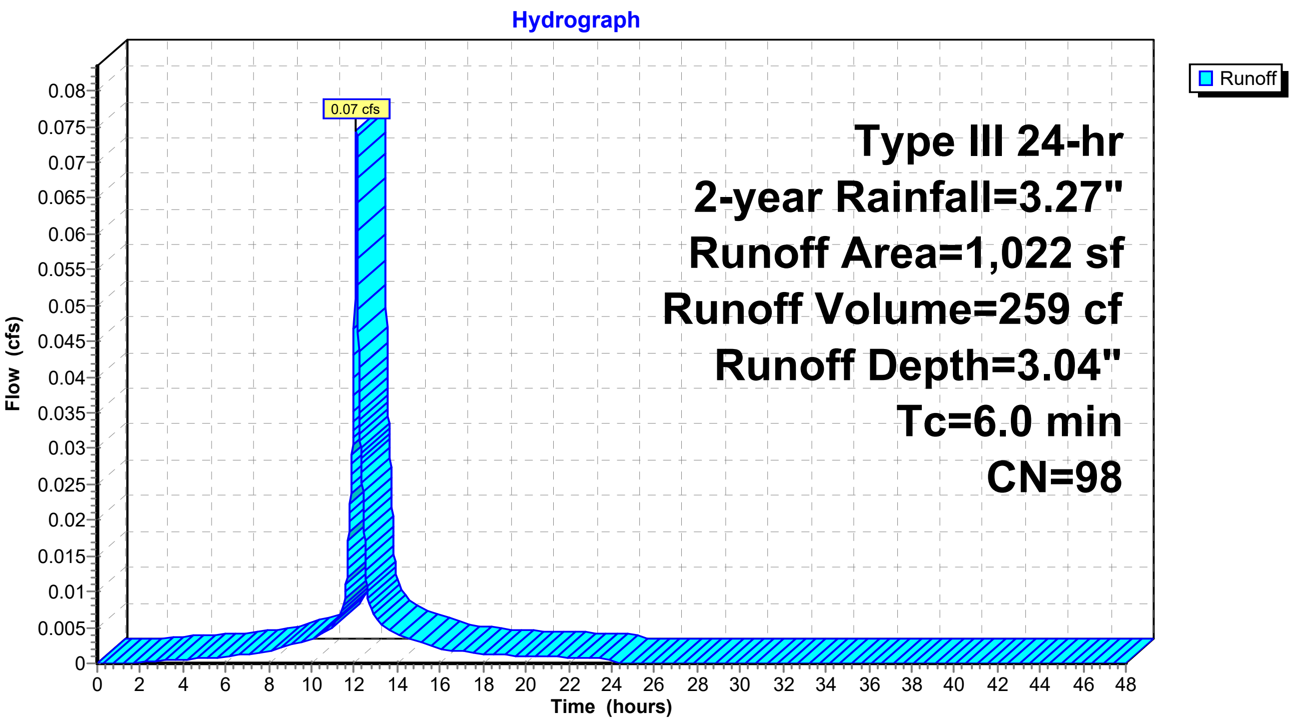
Runoff = 0.07 cfs @ 12.08 hrs, Volume= 259 cf, Depth= 3.04"
Routed to Link WQ1 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.27"

	Area (sf)	CN	Description
*	1,022	98	Impervious, HSG A
	1,022		100.00% Impervious Area

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

Subcatchment P-2: West Catch Basin



Summary for Subcatchment P-3: West Basin

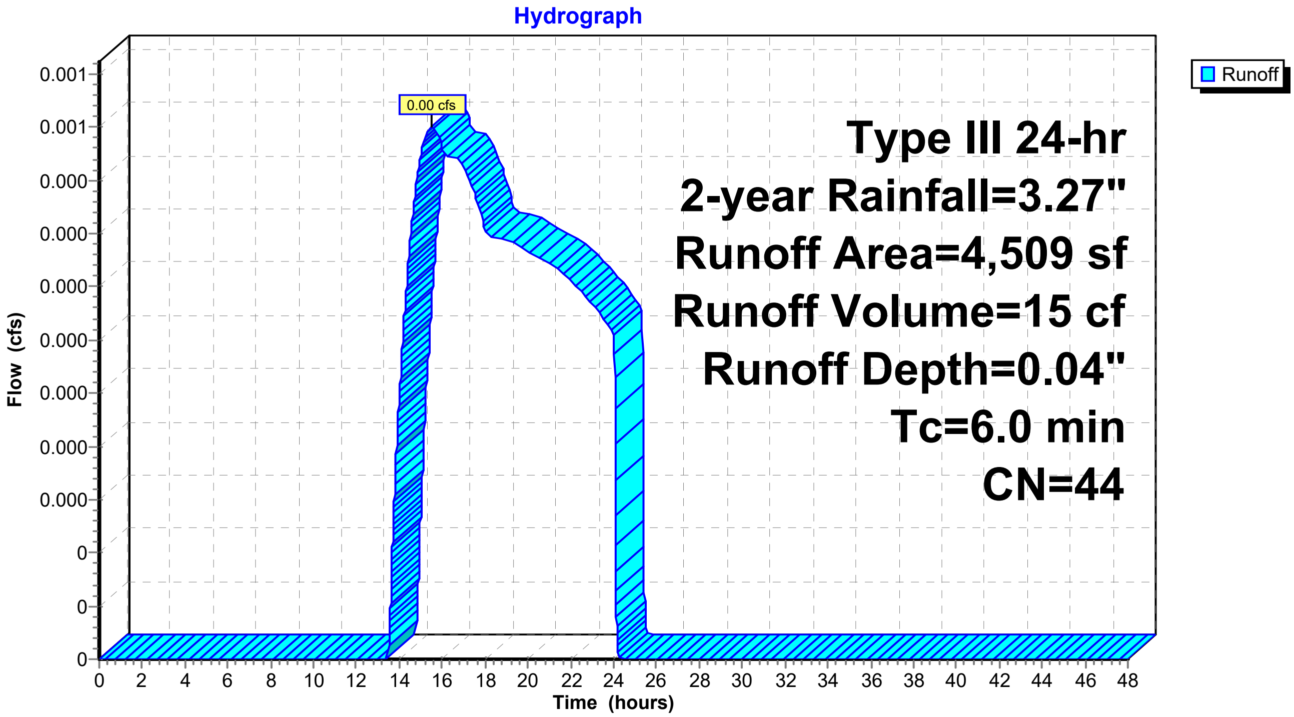
Runoff = 0.00 cfs @ 15.50 hrs, Volume= 15 cf, Depth= 0.04"
Routed to Pond 1P : West Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.27"

	Area (sf)	CN	Description
*	411	98	Impervious, HSG A
	4,098	39	>75% Grass cover, Good, HSG A
	4,509	44	Weighted Average
	4,098		90.88% Pervious Area
	411		9.12% Impervious Area

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

Subcatchment P-3: West Basin



Summary for Subcatchment P-4: Center Catch Basin

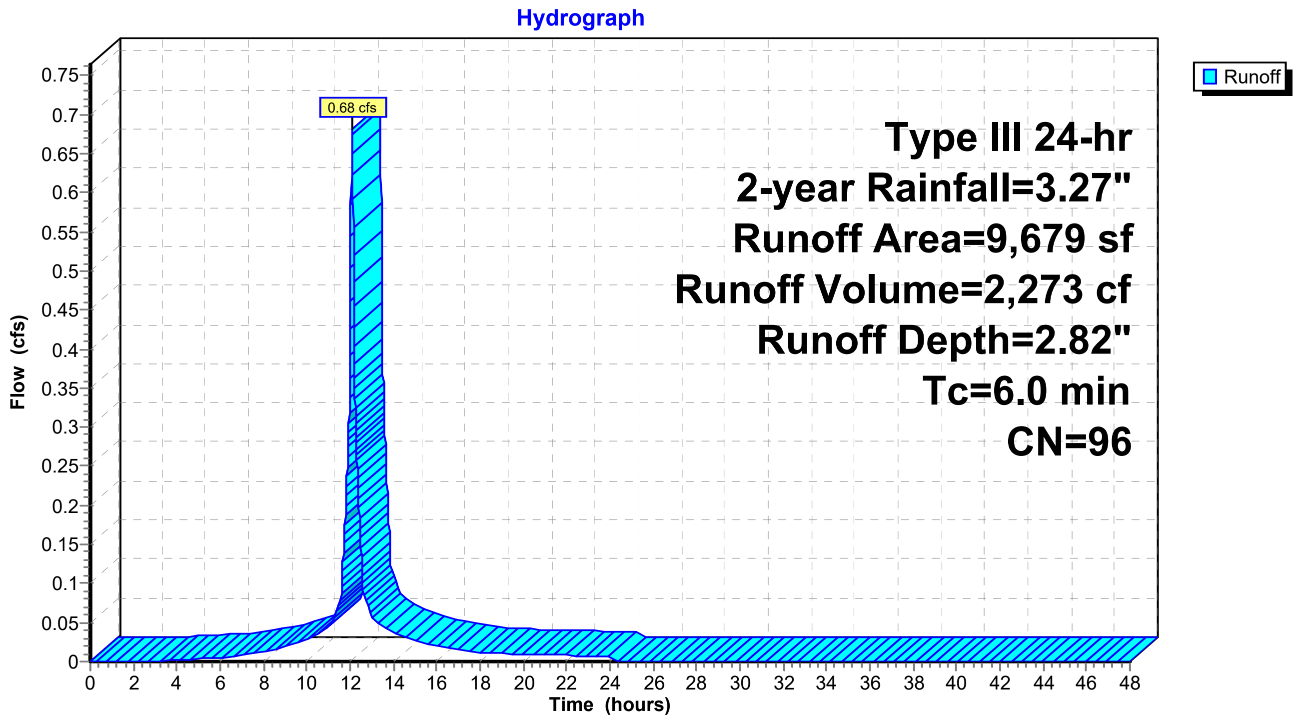
Runoff = 0.68 cfs @ 12.08 hrs, Volume= 2,273 cf, Depth= 2.82"
Routed to Link WQ1 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.27"

	Area (sf)	CN	Description
*	4,815	98	Impervious, HSG A
	1,013	76	Gravel roads, HSG A
	3,851	98	Roofs, HSG A
	9,679	96	Weighted Average
	1,013		10.47% Pervious Area
	8,666		89.53% Impervious Area

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

Subcatchment P-4: Center Catch Basin



Summary for Subcatchment P-5: East Catch Basin

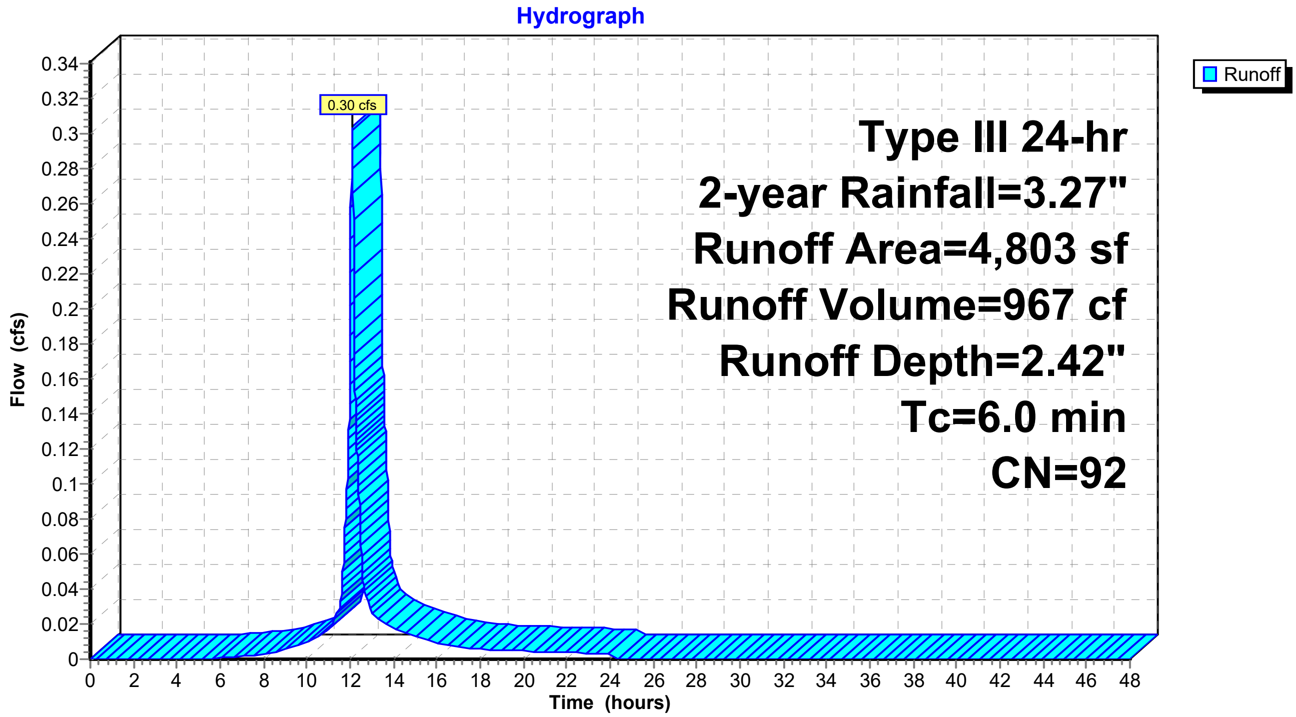
Runoff = 0.30 cfs @ 12.09 hrs, Volume= 967 cf, Depth= 2.42"
Routed to Link WQ2 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.27"

	Area (sf)	CN	Description
	1,227	76	Gravel roads, HSG A
*	3,576	98	Impervious, HSG A
	4,803	92	Weighted Average
	1,227		25.55% Pervious Area
	3,576		74.45% Impervious Area

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

Subcatchment P-5: East Catch Basin



Summary for Subcatchment P-6: East Basin and Tree Lane

[45] Hint: Runoff=Zero

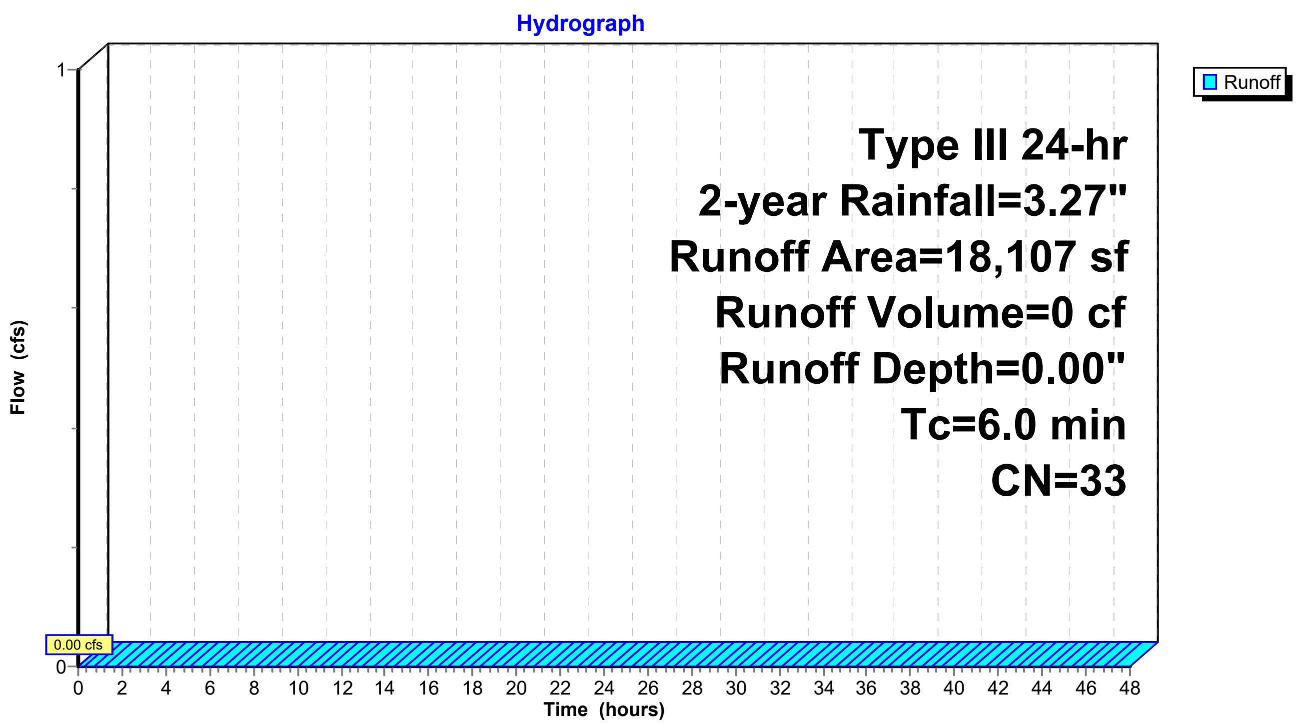
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond 2P : East Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.27"

	Area (sf)	CN	Description
	2,301	32	Woods/grass comb., Good, HSG A
	11,670	30	Woods, Good, HSG A
	3,900	39	>75% Grass cover, Good, HSG A
*	236	98	Impervious, HSG A
	18,107	33	Weighted Average
	17,871		98.70% Pervious Area
	236		1.30% Impervious Area

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

Subcatchment P-6: East Basin and Tree Lane



Summary for Subcatchment P-7: Rear Catch Basin

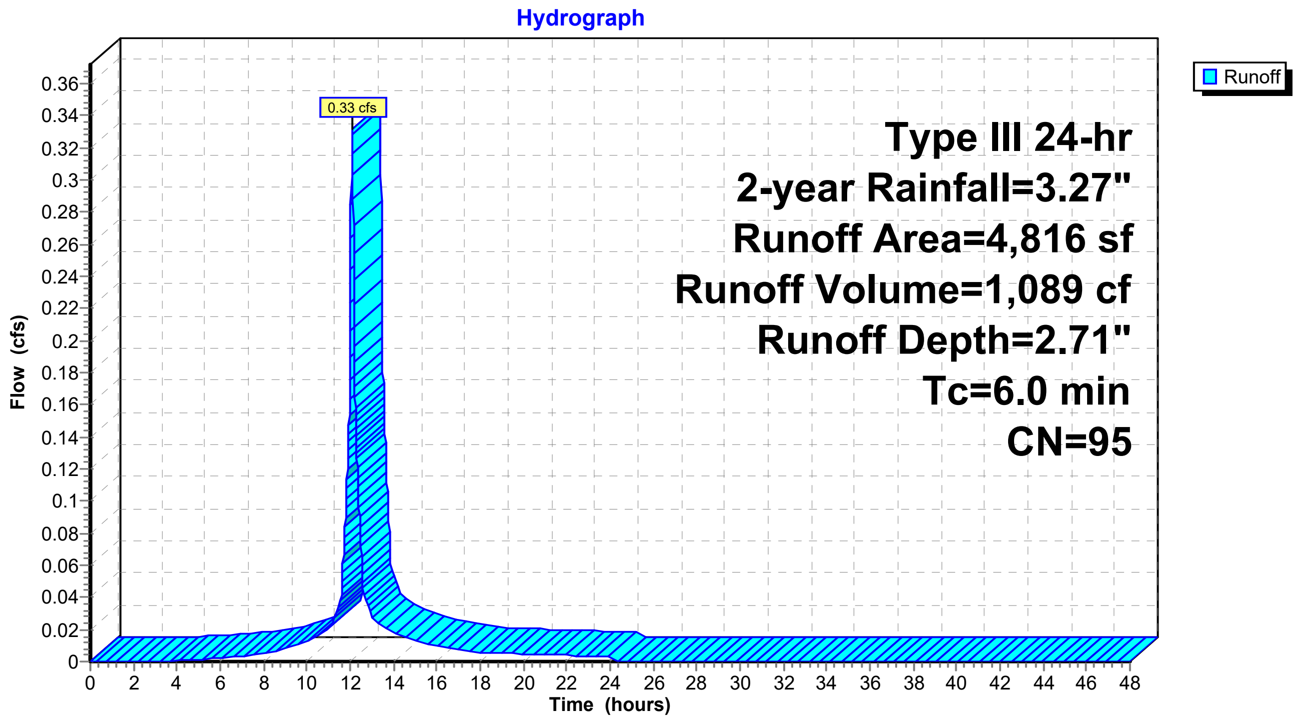
Runoff = 0.33 cfs @ 12.08 hrs, Volume= 1,089 cf, Depth= 2.71"
Routed to Link WQ2 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.27"

Area (sf)	CN	Description
3,850	98	Roofs, HSG A
353	98	Paved parking, HSG A
613	76	Gravel roads, HSG A
4,816	95	Weighted Average
613		12.73% Pervious Area
4,203		87.27% Impervious Area

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

Subcatchment P-7: Rear Catch Basin



Summary for Subcatchment P-8: Tree Lane Catch Basin

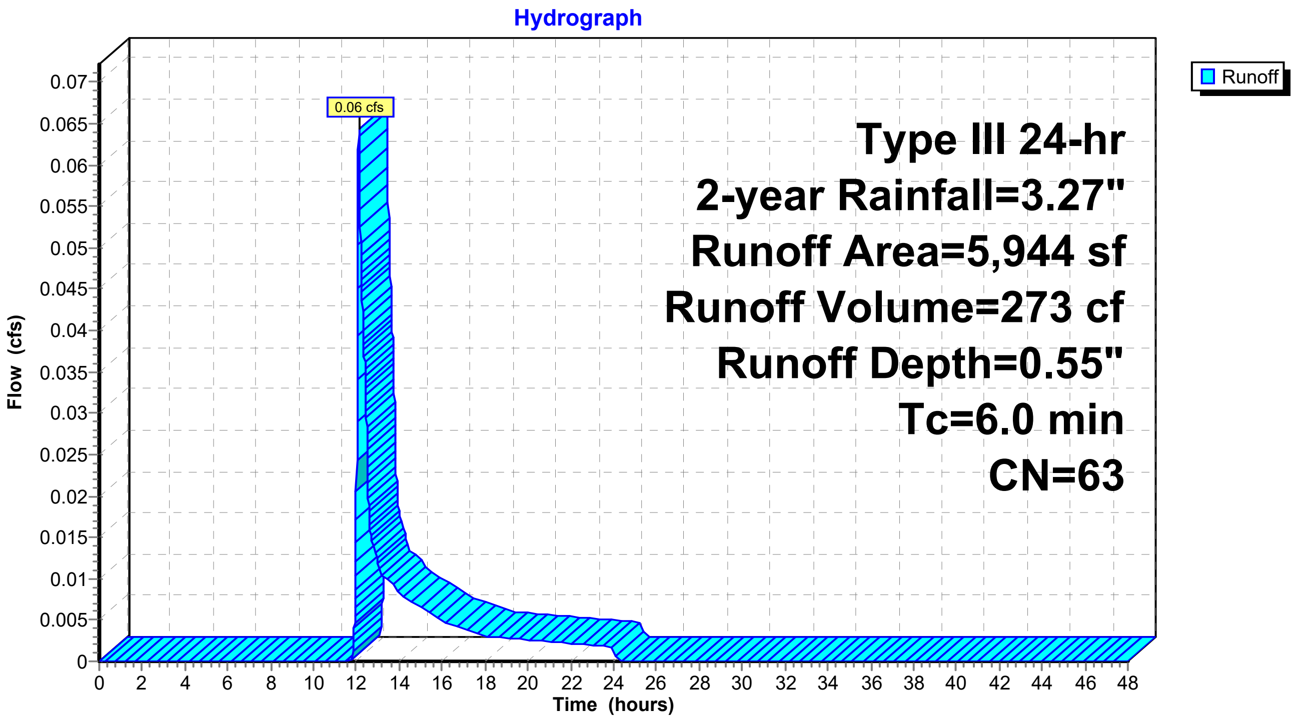
Runoff = 0.06 cfs @ 12.11 hrs, Volume= 273 cf, Depth= 0.55"
Routed to Link WQ1 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.27"

	Area (sf)	CN	Description
	1,439	30	Woods, Good, HSG A
*	2,833	98	Impervious, HSG A
	1,661	32	Woods/grass comb., Good, HSG A
	11	76	Gravel roads, HSG A
	5,944	63	Weighted Average
	3,111		52.34% Pervious Area
	2,833		47.66% Impervious Area

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

Subcatchment P-8: Tree Lane Catch Basin



Summary for Pond 1P: West Infiltration Basin

Inflow Area = 21,154 sf, 61.13% Impervious, Inflow Depth = 1.60" for 2-year event
Inflow = 0.82 cfs @ 12.09 hrs, Volume= 2,819 cf
Outflow = 0.22 cfs @ 12.45 hrs, Volume= 2,819 cf, Atten= 73%, Lag= 21.9 min
Discarded = 0.22 cfs @ 12.45 hrs, Volume= 2,819 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 1L : To Wetland

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 214.55' @ 12.45 hrs Surf.Area= 1,162 sf Storage= 557 cf

Plug-Flow detention time= 13.3 min calculated for 2,819 cf (100% of inflow)
Center-of-Mass det. time= 13.3 min (799.3 - 786.1)

Volume	Invert	Avail.Storage	Storage Description
#1	214.00'	9,120 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

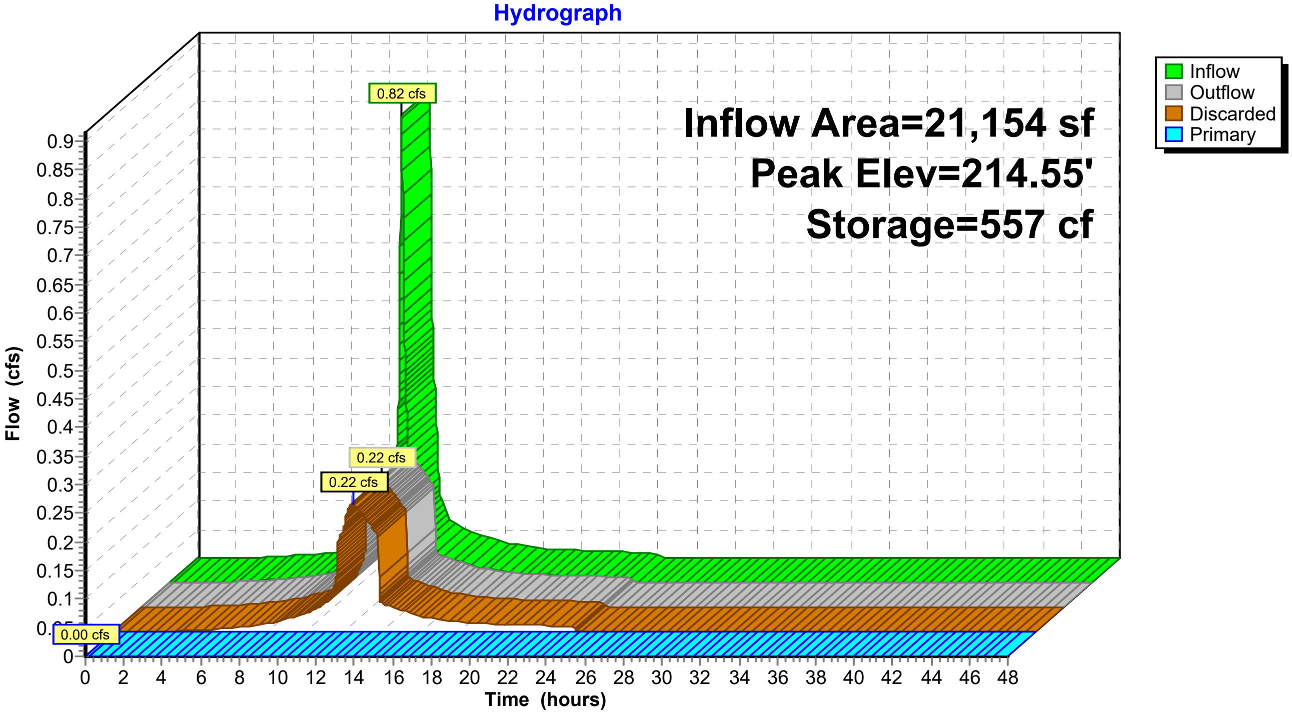
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
214.00	875	151.0	0	0	875
215.00	1,429	188.0	1,141	1,141	1,887
216.00	2,020	207.0	1,716	2,857	2,516
217.00	2,668	225.0	2,336	5,193	3,172
218.00	3,412	249.0	3,032	8,226	4,108
218.25	3,746	254.0	894	9,120	4,317

Device	Routing	Invert	Outlet Devices
#1	Discarded	214.00'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	217.75'	**6.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.22 cfs @ 12.45 hrs HW=214.55' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.22 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=214.00' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: West Infiltration Basin



Summary for Pond 2P: East Infiltration Basin

Inflow Area = 27,726 sf, 28.91% Impervious, Inflow Depth = 0.89" for 2-year event
Inflow = 0.64 cfs @ 12.08 hrs, Volume= 2,056 cf
Outflow = 0.14 cfs @ 12.50 hrs, Volume= 2,056 cf, Atten= 78%, Lag= 24.9 min
Discarded = 0.14 cfs @ 12.50 hrs, Volume= 2,056 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 1L : To Wetland

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 216.93' @ 12.50 hrs Surf.Area= 717 sf Storage= 542 cf

Plug-Flow detention time= 25.2 min calculated for 2,056 cf (100% of inflow)
Center-of-Mass det. time= 25.2 min (813.3 - 788.2)

Volume	Invert	Avail.Storage	Storage Description
#1	216.00'	4,959 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

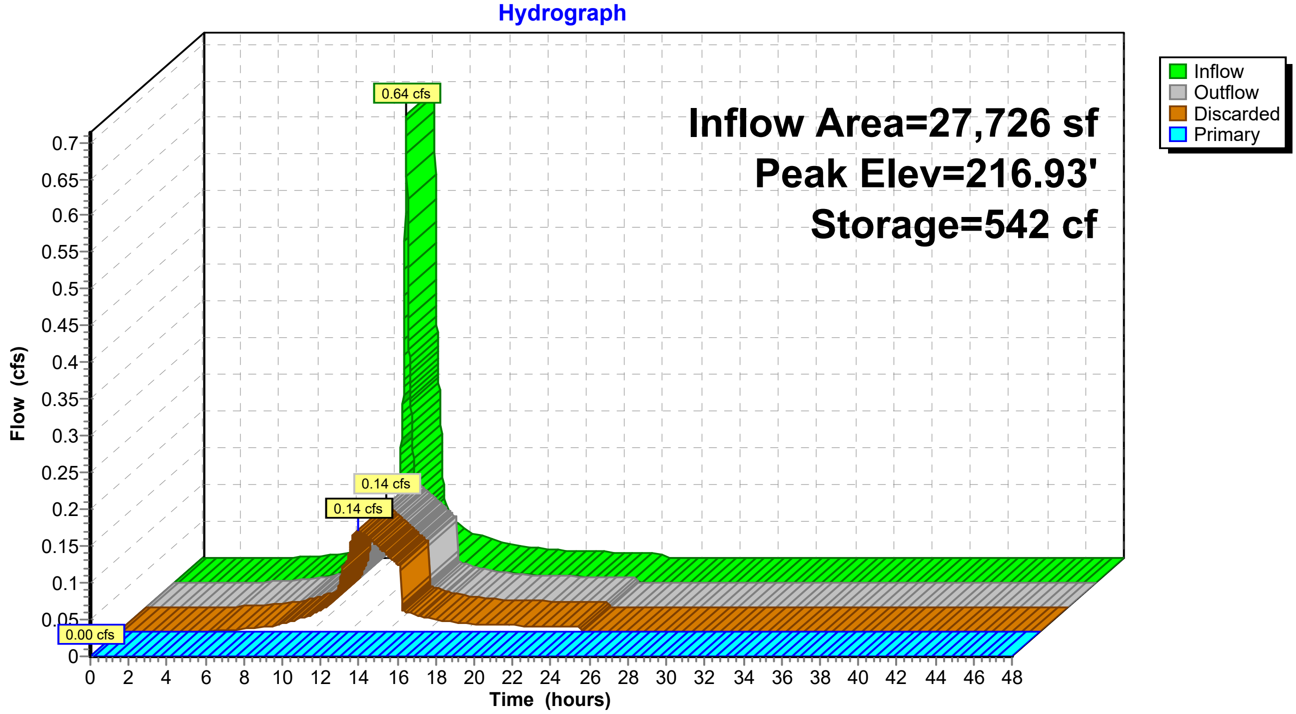
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
216.00	458	84.0	0	0	458
217.00	739	103.0	593	593	756
218.00	1,075	122.0	902	1,495	1,114
219.00	1,468	140.0	1,266	2,761	1,512
220.00	1,918	159.0	1,688	4,449	1,988
220.25	2,164	169.0	510	4,959	2,252

Device	Routing	Invert	Outlet Devices
#1	Discarded	216.00'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	219.75'	**6.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.14 cfs @ 12.50 hrs HW=216.93' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=216.00' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: East Infiltration Basin

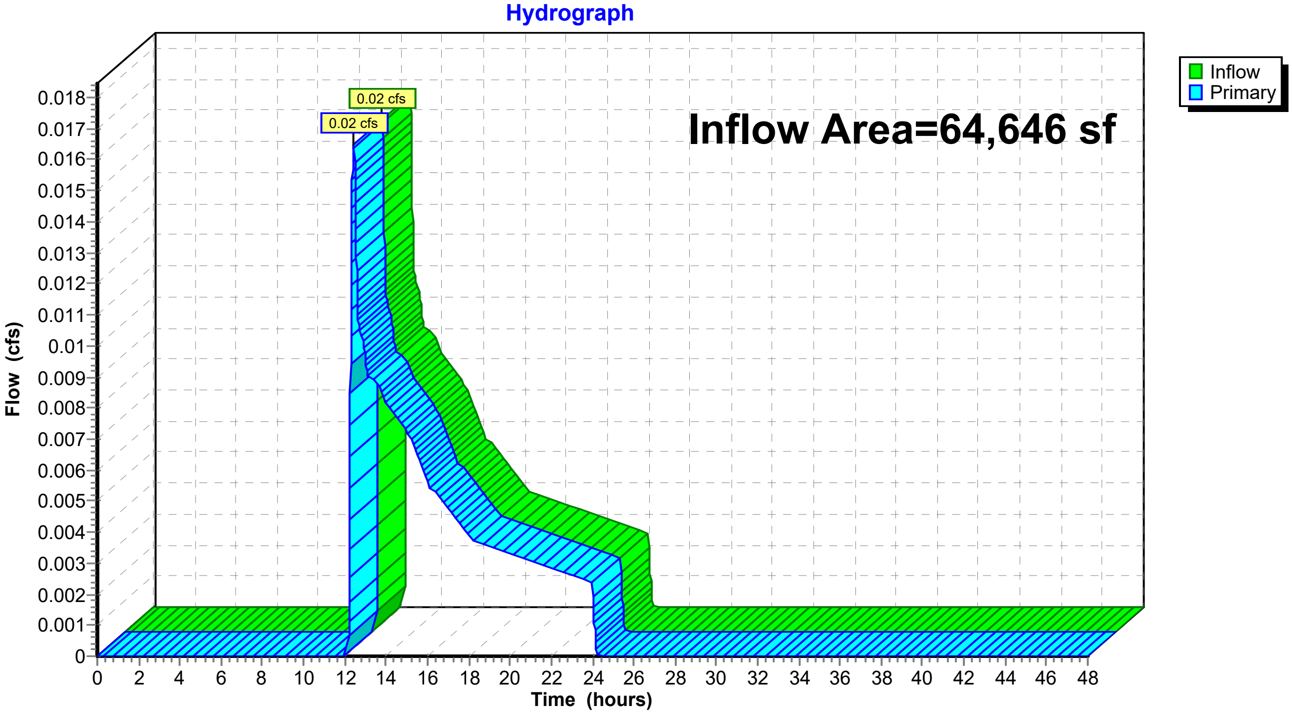


Summary for Link 1L: To Wetland

Inflow Area = 64,646 sf, 35.83% Impervious, Inflow Depth = 0.04" for 2-year event
Inflow = 0.02 cfs @ 12.42 hrs, Volume= 218 cf
Primary = 0.02 cfs @ 12.42 hrs, Volume= 218 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 1L: To Wetland

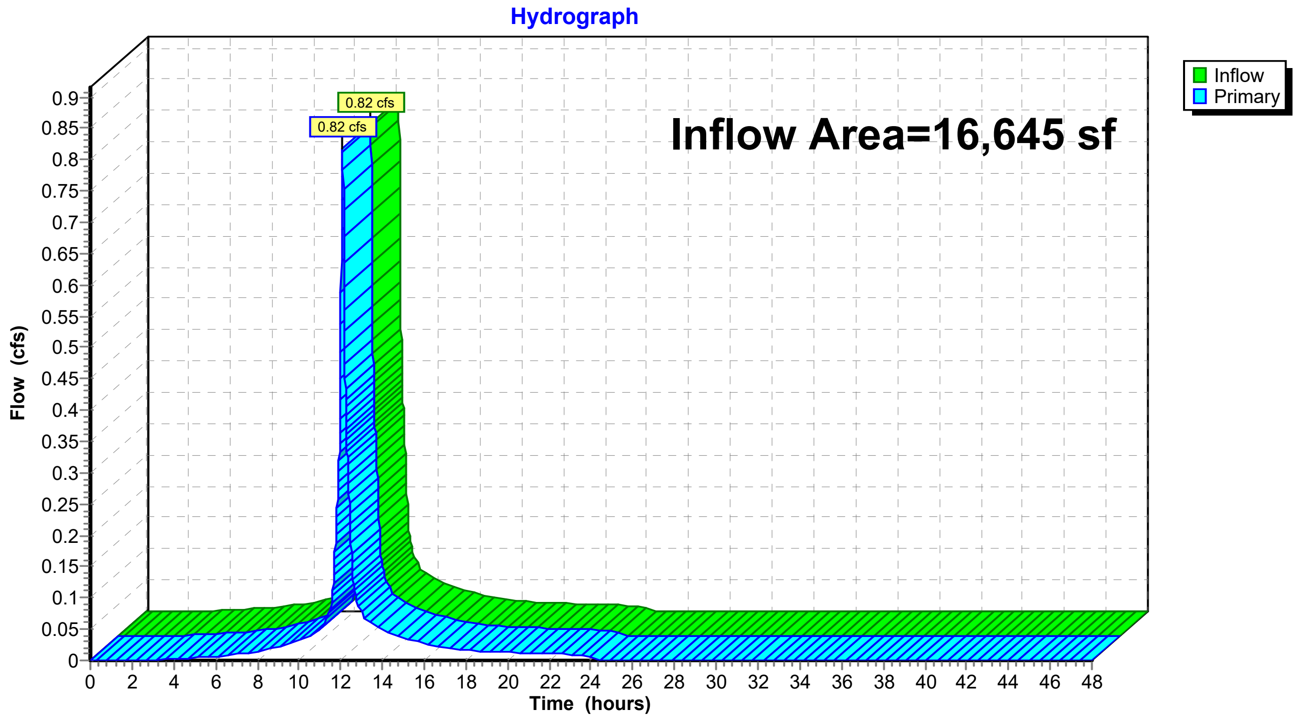


Summary for Link WQ1: Hyd. Sep.

Inflow Area = 16,645 sf, 75.22% Impervious, Inflow Depth = 2.02" for 2-year event
Inflow = 0.82 cfs @ 12.09 hrs, Volume= 2,805 cf
Primary = 0.82 cfs @ 12.09 hrs, Volume= 2,805 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 1P : West Infiltration Basin

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

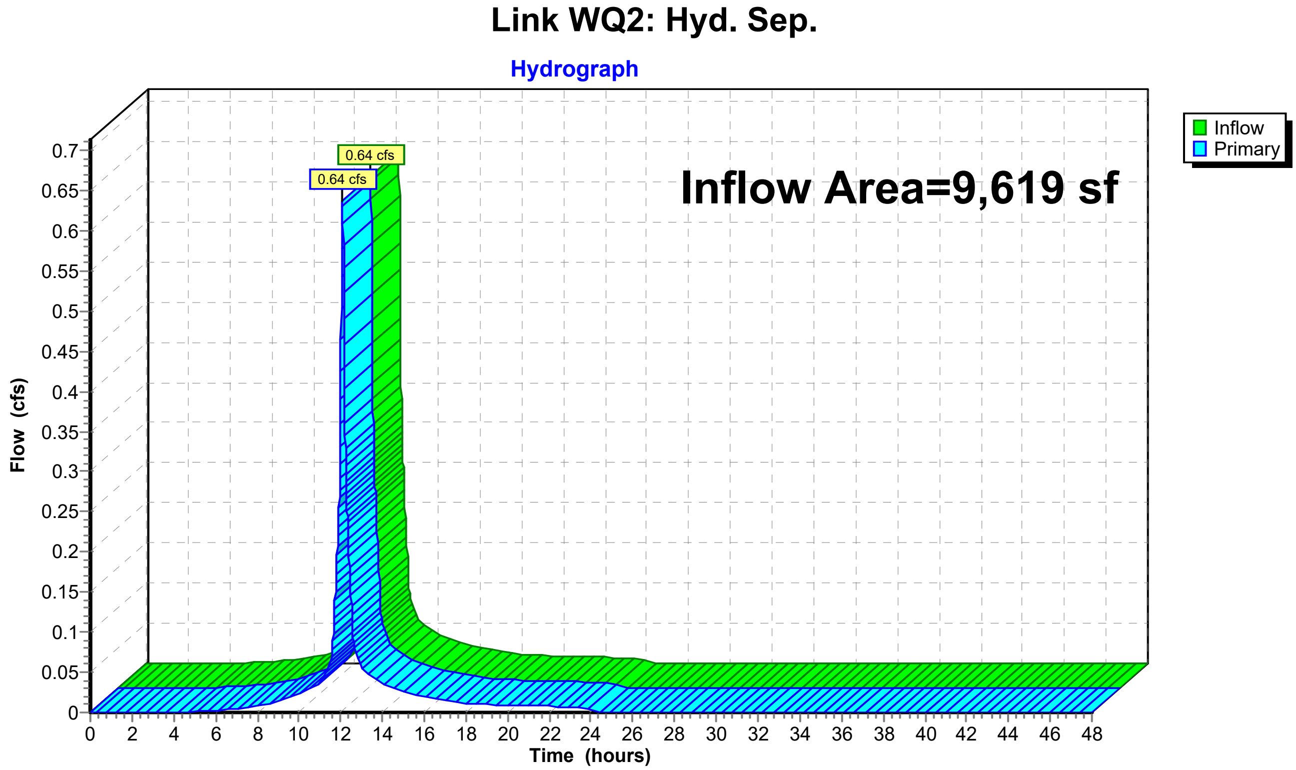
Link WQ1: Hyd. Sep.



Summary for Link WQ2: Hyd. Sep.

Inflow Area = 9,619 sf, 80.87% Impervious, Inflow Depth = 2.57" for 2-year event
Inflow = 0.64 cfs @ 12.08 hrs, Volume= 2,056 cf
Primary = 0.64 cfs @ 12.08 hrs, Volume= 2,056 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 2P : East Infiltration Basin

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs



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

SubcatchmentP-1: Uncaptured Area Runoff Area=15,766 sf 14.06% Impervious Runoff Depth=0.73"
Tc=6.0 min CN=51 Runoff=0.20 cfs 959 cf

SubcatchmentP-2: West Catch Basin Runoff Area=1,022 sf 100.00% Impervious Runoff Depth=4.72"
Tc=6.0 min CN=98 Runoff=0.11 cfs 402 cf

SubcatchmentP-3: West Basin Runoff Area=4,509 sf 9.12% Impervious Runoff Depth=0.39"
Tc=6.0 min CN=44 Runoff=0.02 cfs 145 cf

SubcatchmentP-4: Center Catch Basin Runoff Area=9,679 sf 89.53% Impervious Runoff Depth=4.49"
Tc=6.0 min CN=96 Runoff=1.06 cfs 3,624 cf

SubcatchmentP-5: East Catch Basin Runoff Area=4,803 sf 74.45% Impervious Runoff Depth=4.05"
Tc=6.0 min CN=92 Runoff=0.50 cfs 1,621 cf

SubcatchmentP-6: East Basin and Tree Runoff Area=18,107 sf 1.30% Impervious Runoff Depth=0.04"
Tc=6.0 min CN=33 Runoff=0.00 cfs 58 cf

SubcatchmentP-7: Rear Catch Basin Runoff Area=4,816 sf 87.27% Impervious Runoff Depth=4.38"
Tc=6.0 min CN=95 Runoff=0.52 cfs 1,758 cf

SubcatchmentP-8: Tree Lane Catch Basin Runoff Area=5,944 sf 47.66% Impervious Runoff Depth=1.48"
Tc=6.0 min CN=63 Runoff=0.22 cfs 735 cf

Pond 1P: West Infiltration Basin Peak Elev=215.09' Storage=1,274 cf Inflow=1.40 cfs 4,906 cf
Discarded=0.28 cfs 4,906 cf Primary=0.00 cfs 0 cf Outflow=0.28 cfs 4,906 cf

Pond 2P: East Infiltration Basin Peak Elev=217.54' Storage=1,039 cf Inflow=1.02 cfs 3,436 cf
Discarded=0.17 cfs 3,436 cf Primary=0.00 cfs 0 cf Outflow=0.17 cfs 3,436 cf

Link 1L: To Wetland Inflow=0.20 cfs 959 cf
Primary=0.20 cfs 959 cf

Link WQ1: Hyd. Sep. Inflow=1.39 cfs 4,761 cf
Primary=1.39 cfs 4,761 cf

Link WQ2: Hyd. Sep. Inflow=1.02 cfs 3,379 cf
Primary=1.02 cfs 3,379 cf

Total Runoff Area = 64,646 sf Runoff Volume = 9,301 cf Average Runoff Depth = 1.73"
64.17% Pervious = 41,483 sf 35.83% Impervious = 23,163 sf

Summary for Subcatchment P-1: Uncaptured Area

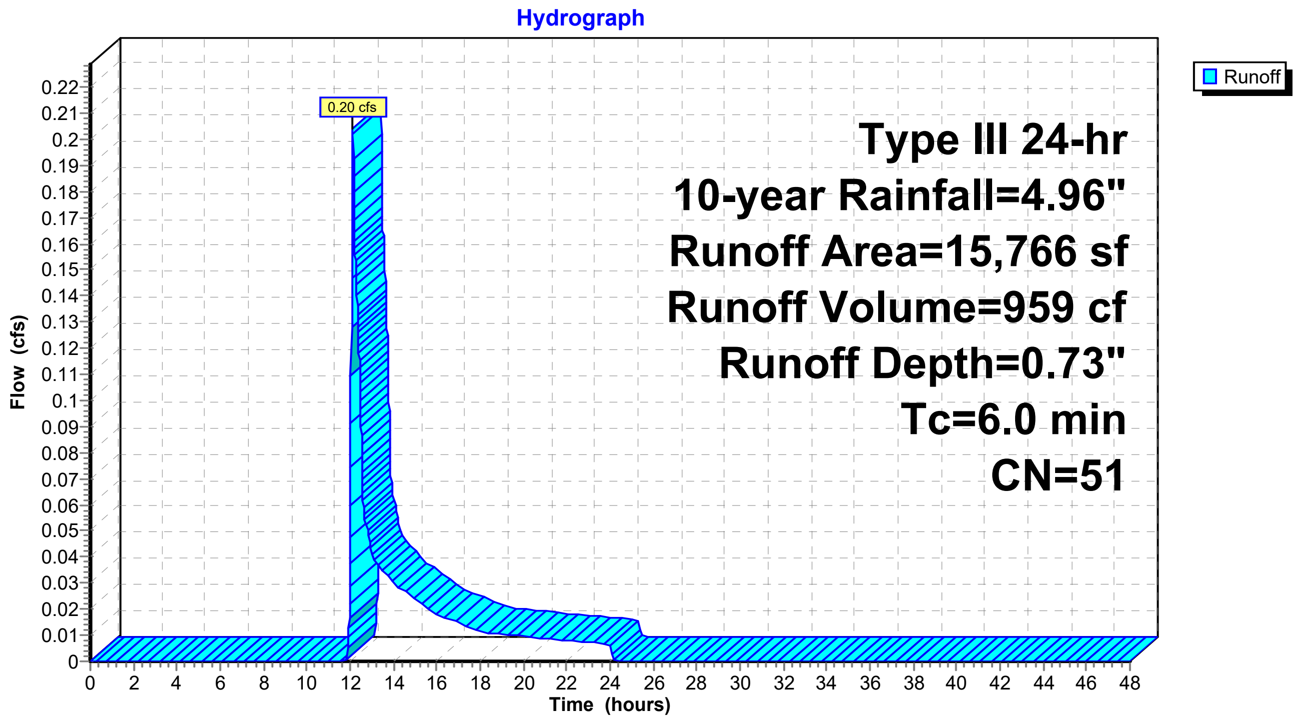
Runoff = 0.20 cfs @ 12.12 hrs, Volume= 959 cf, Depth= 0.73"
Routed to Link 1L : To Wetland

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.96"

	Area (sf)	CN	Description
	640	76	Gravel roads, HSG A
	12,262	39	Pasture/grassland/range, Good, HSG A
*	2,216	98	Impervious, HSG A
	648	96	Gravel surface, HSG A
	15,766	51	Weighted Average
	13,550		85.94% Pervious Area
	2,216		14.06% Impervious Area

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

Subcatchment P-1: Uncaptured Area



Summary for Subcatchment P-2: West Catch Basin

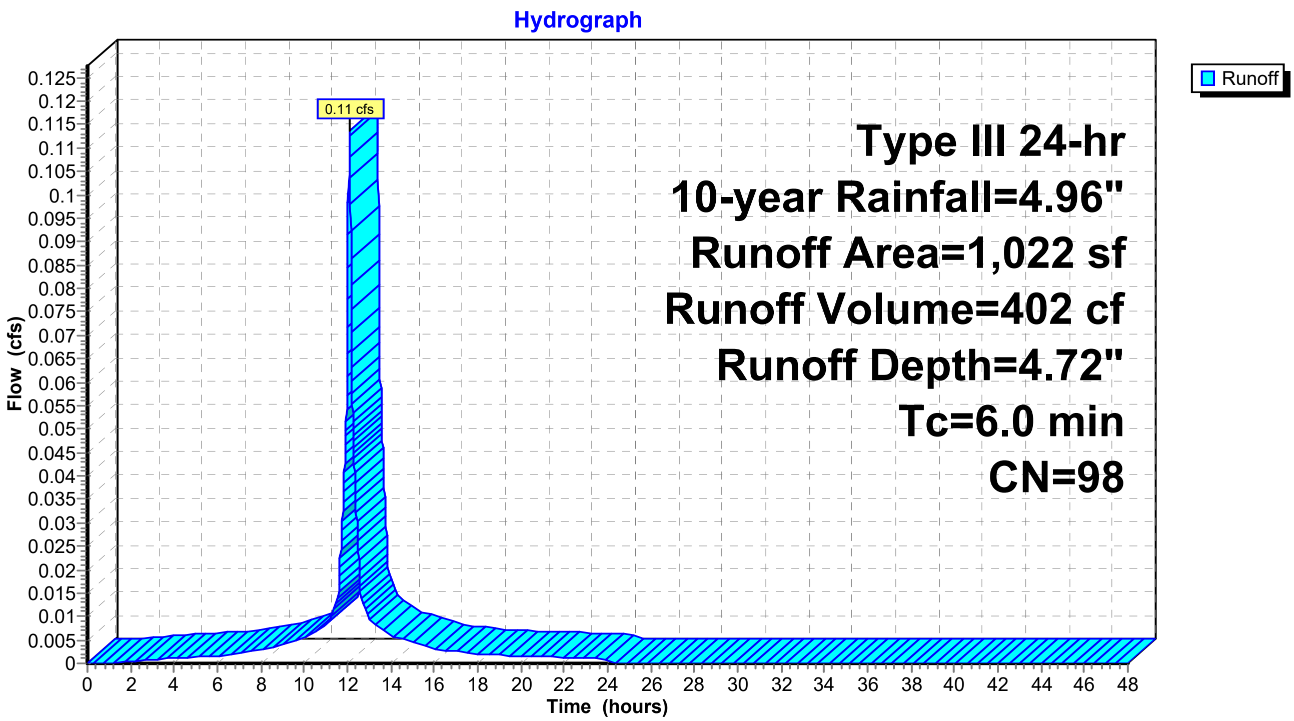
Runoff = 0.11 cfs @ 12.08 hrs, Volume= 402 cf, Depth= 4.72"
Routed to Link WQ1 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.96"

	Area (sf)	CN	Description
*	1,022	98	Impervious, HSG A
	1,022		100.00% Impervious Area

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

Subcatchment P-2: West Catch Basin



Summary for Subcatchment P-3: West Basin

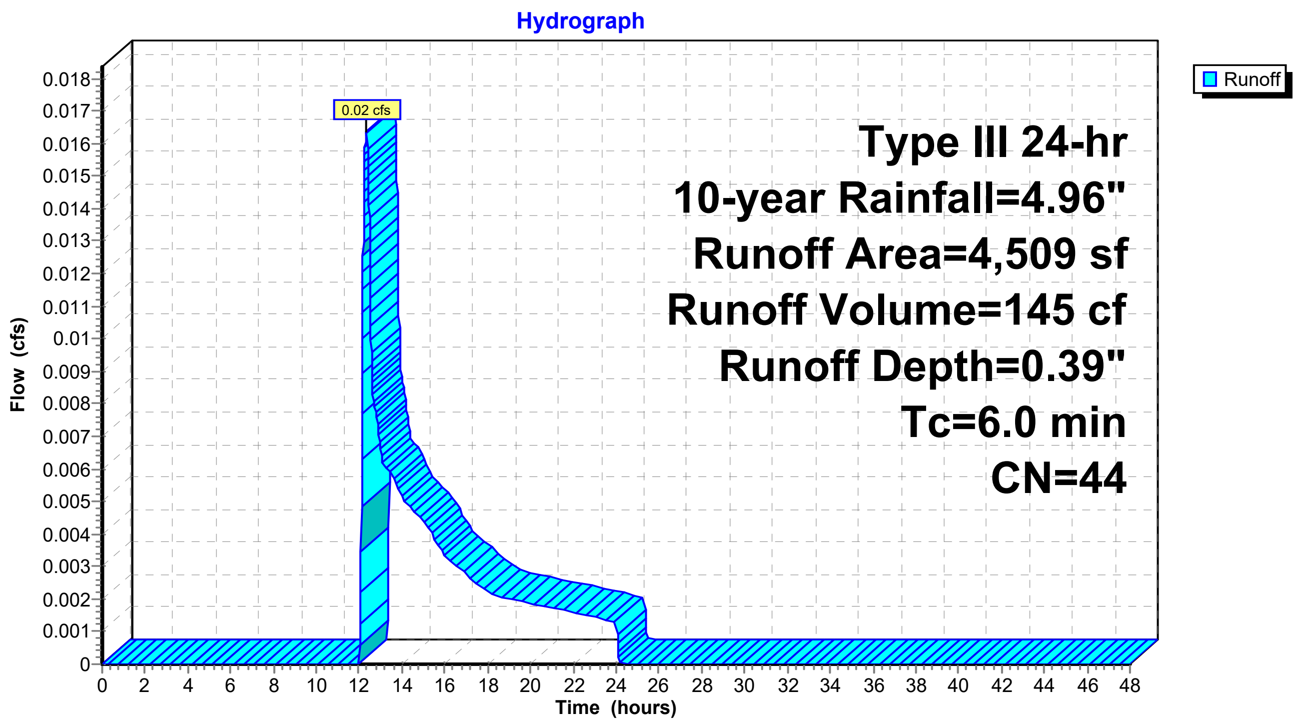
Runoff = 0.02 cfs @ 12.34 hrs, Volume= 145 cf, Depth= 0.39"
Routed to Pond 1P : West Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.96"

	Area (sf)	CN	Description
*	411	98	Impervious, HSG A
	4,098	39	>75% Grass cover, Good, HSG A
	4,509	44	Weighted Average
	4,098		90.88% Pervious Area
	411		9.12% Impervious Area

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

Subcatchment P-3: West Basin



Summary for Subcatchment P-4: Center Catch Basin

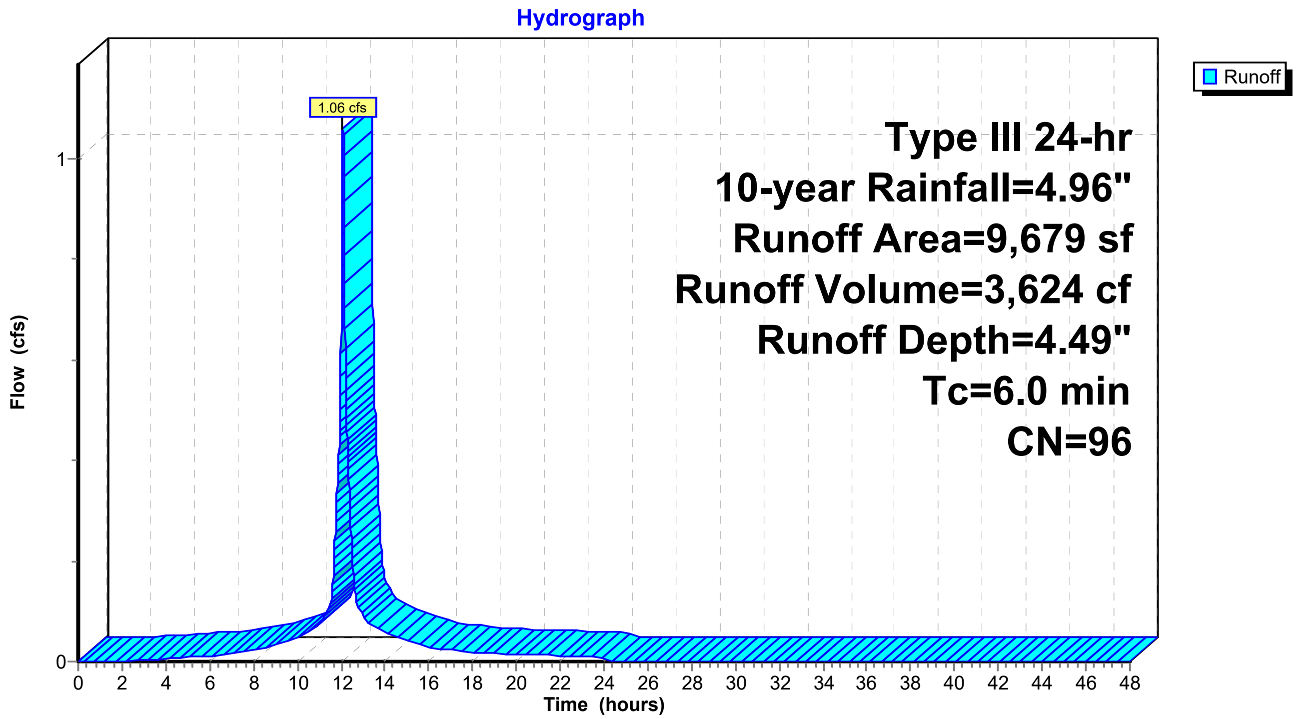
Runoff = 1.06 cfs @ 12.08 hrs, Volume= 3,624 cf, Depth= 4.49"
Routed to Link WQ1 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.96"

	Area (sf)	CN	Description
*	4,815	98	Impervious, HSG A
	1,013	76	Gravel roads, HSG A
	3,851	98	Roofs, HSG A
	9,679	96	Weighted Average
	1,013		10.47% Pervious Area
	8,666		89.53% Impervious Area

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

Subcatchment P-4: Center Catch Basin



Summary for Subcatchment P-5: East Catch Basin

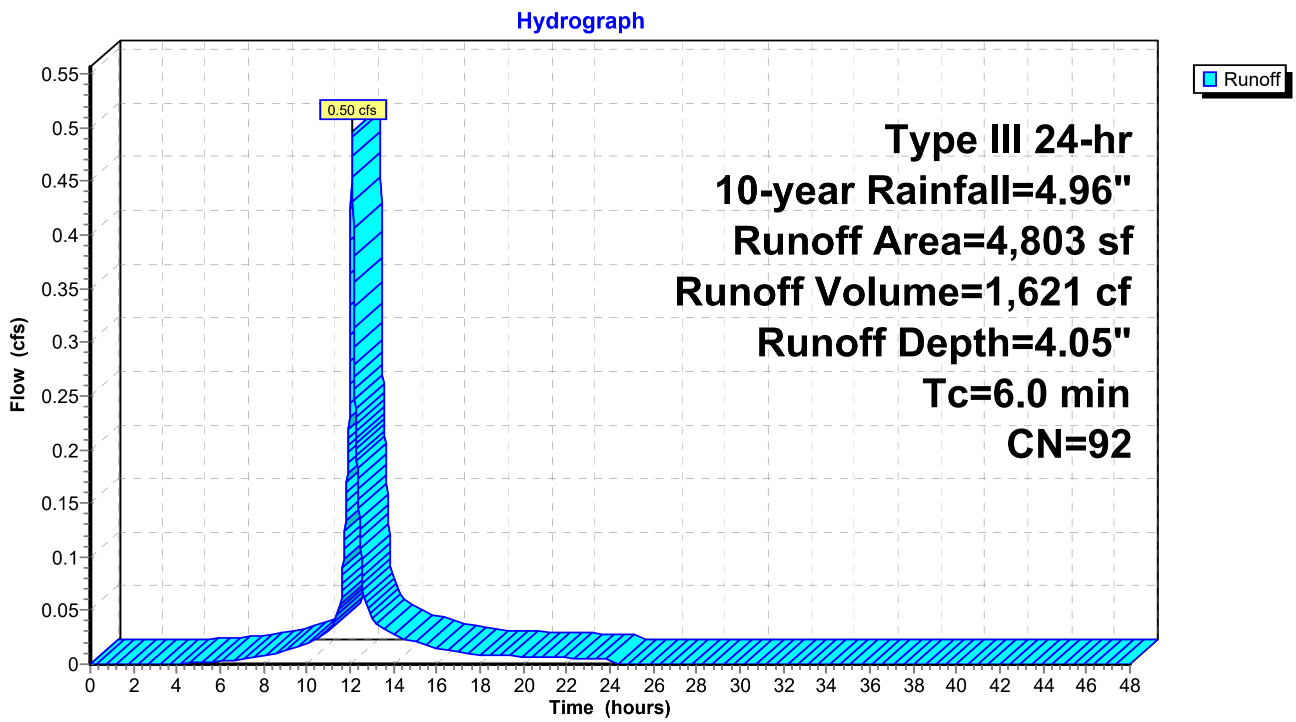
Runoff = 0.50 cfs @ 12.08 hrs, Volume= 1,621 cf, Depth= 4.05"
Routed to Link WQ2 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.96"

	Area (sf)	CN	Description
	1,227	76	Gravel roads, HSG A
*	3,576	98	Impervious, HSG A
	4,803	92	Weighted Average
	1,227		25.55% Pervious Area
	3,576		74.45% Impervious Area

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

Subcatchment P-5: East Catch Basin



Summary for Subcatchment P-6: East Basin and Tree Lane

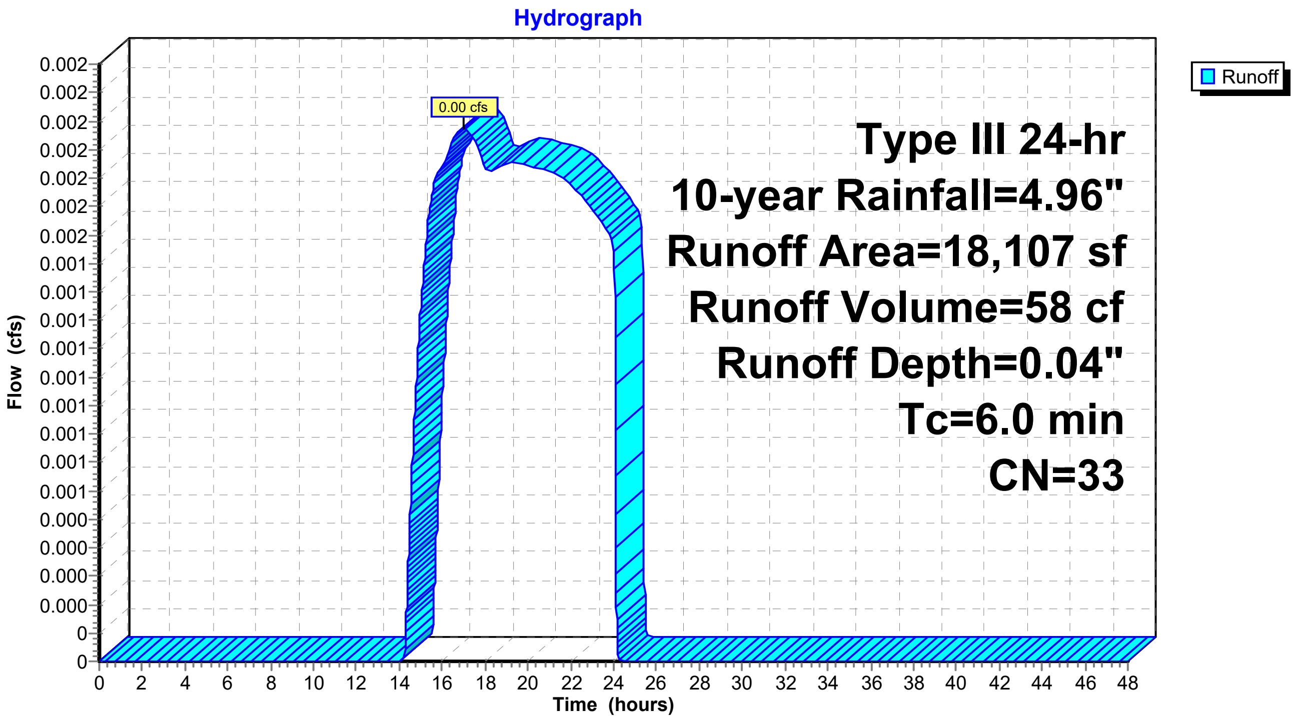
Runoff = 0.00 cfs @ 17.02 hrs, Volume= 58 cf, Depth= 0.04"
Routed to Pond 2P : East Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.96"

	Area (sf)	CN	Description
	2,301	32	Woods/grass comb., Good, HSG A
	11,670	30	Woods, Good, HSG A
	3,900	39	>75% Grass cover, Good, HSG A
*	236	98	Impervious, HSG A
	18,107	33	Weighted Average
	17,871		98.70% Pervious Area
	236		1.30% Impervious Area

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

Subcatchment P-6: East Basin and Tree Lane



Summary for Subcatchment P-7: Rear Catch Basin

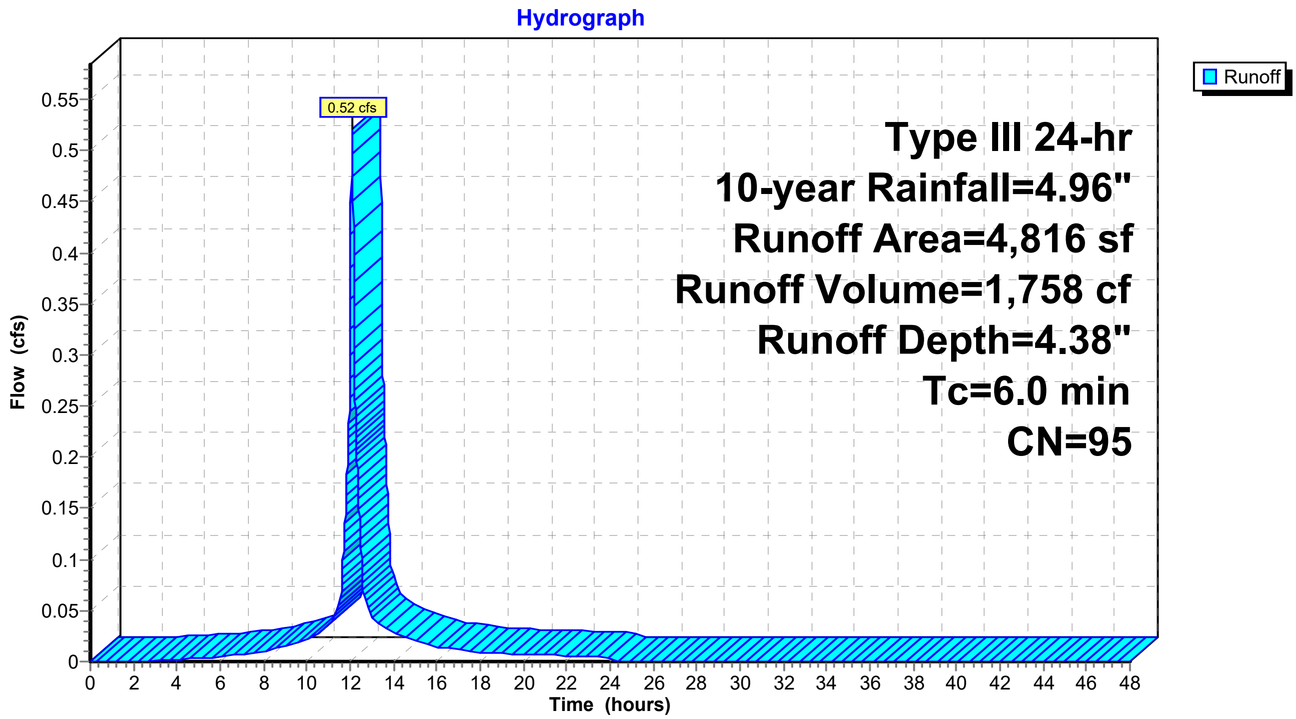
Runoff = 0.52 cfs @ 12.08 hrs, Volume= 1,758 cf, Depth= 4.38"
Routed to Link WQ2 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.96"

Area (sf)	CN	Description
3,850	98	Roofs, HSG A
353	98	Paved parking, HSG A
613	76	Gravel roads, HSG A
4,816	95	Weighted Average
613		12.73% Pervious Area
4,203		87.27% Impervious Area

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

Subcatchment P-7: Rear Catch Basin



Summary for Subcatchment P-8: Tree Lane Catch Basin

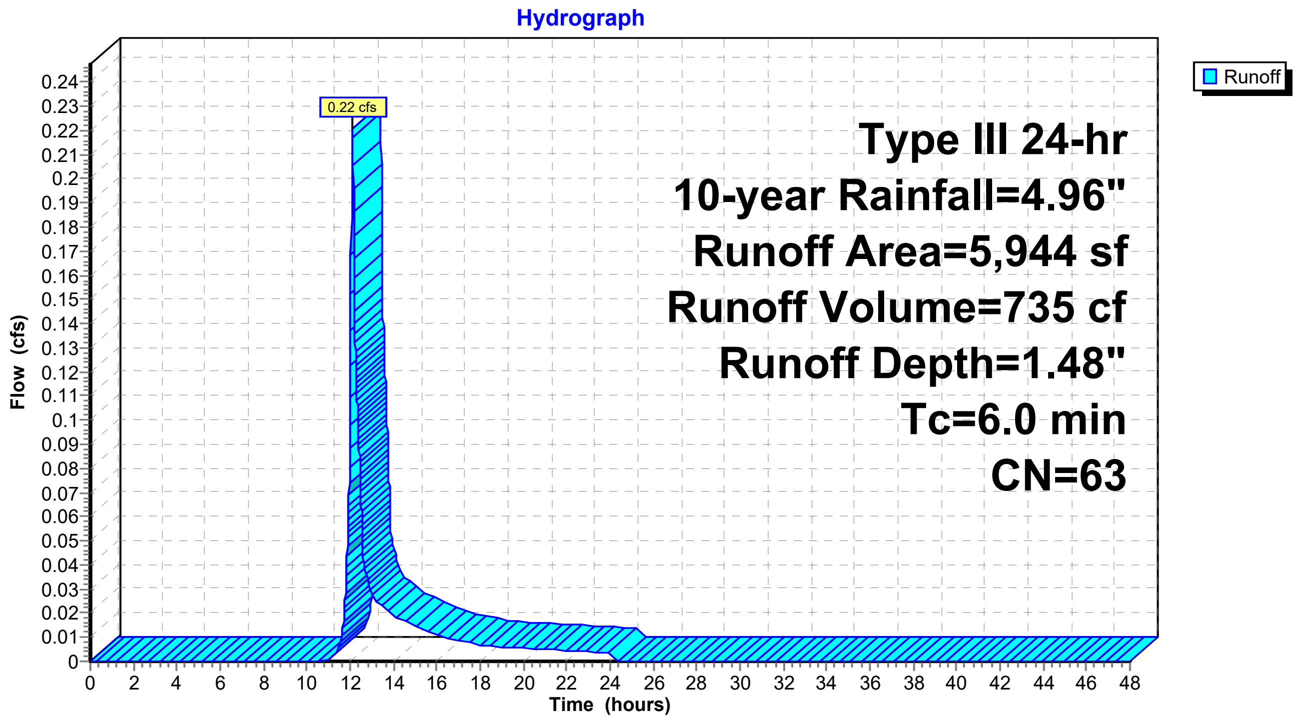
Runoff = 0.22 cfs @ 12.10 hrs, Volume= 735 cf, Depth= 1.48"
Routed to Link WQ1 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.96"

	Area (sf)	CN	Description
	1,439	30	Woods, Good, HSG A
*	2,833	98	Impervious, HSG A
	1,661	32	Woods/grass comb., Good, HSG A
	11	76	Gravel roads, HSG A
	5,944	63	Weighted Average
	3,111		52.34% Pervious Area
	2,833		47.66% Impervious Area

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

Subcatchment P-8: Tree Lane Catch Basin



Summary for Pond 1P: West Infiltration Basin

Inflow Area = 21,154 sf, 61.13% Impervious, Inflow Depth = 2.78" for 10-year event
Inflow = 1.40 cfs @ 12.09 hrs, Volume= 4,906 cf
Outflow = 0.28 cfs @ 12.53 hrs, Volume= 4,906 cf, Atten= 80%, Lag= 26.5 min
Discarded = 0.28 cfs @ 12.53 hrs, Volume= 4,906 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 1L : To Wetland

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 215.09' @ 12.53 hrs Surf.Area= 1,479 sf Storage= 1,274 cf

Plug-Flow detention time= 29.1 min calculated for 4,905 cf (100% of inflow)
Center-of-Mass det. time= 29.1 min (811.9 - 782.7)

Volume	Invert	Avail.Storage	Storage Description
#1	214.00'	9,120 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

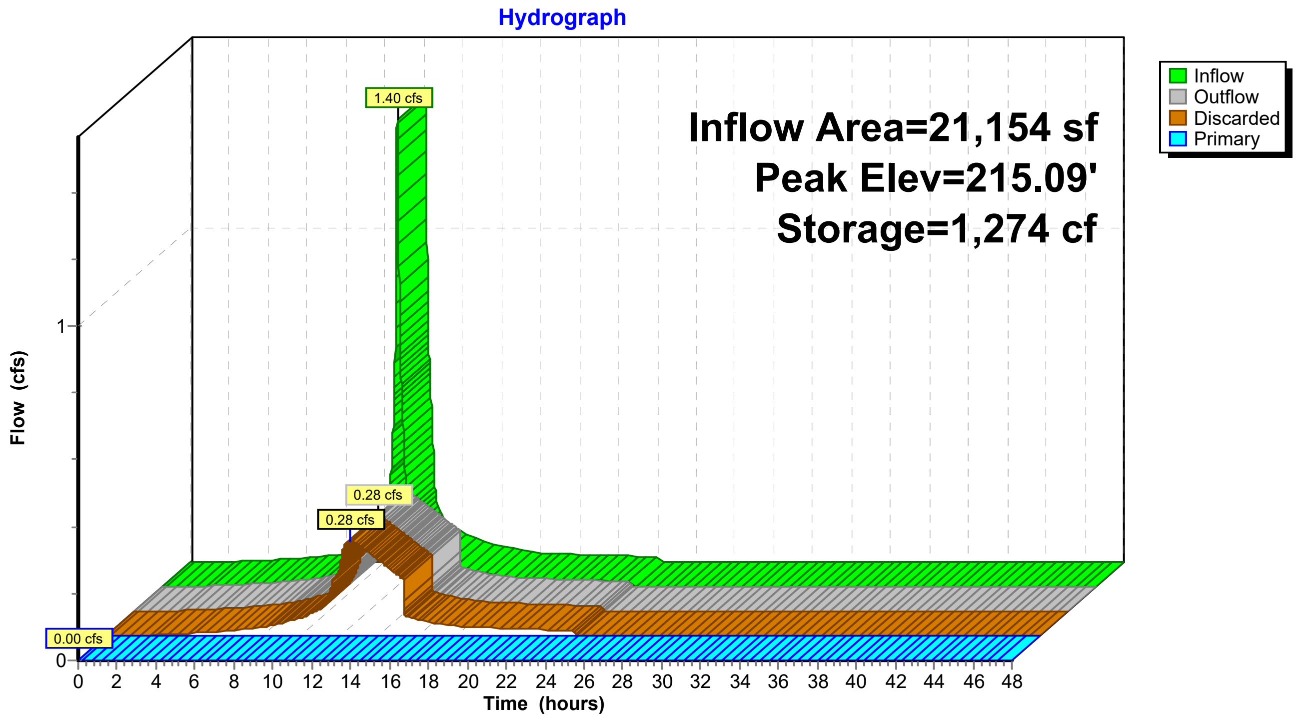
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
214.00	875	151.0	0	0	875
215.00	1,429	188.0	1,141	1,141	1,887
216.00	2,020	207.0	1,716	2,857	2,516
217.00	2,668	225.0	2,336	5,193	3,172
218.00	3,412	249.0	3,032	8,226	4,108
218.25	3,746	254.0	894	9,120	4,317

Device	Routing	Invert	Outlet Devices
#1	Discarded	214.00'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	217.75'	**6.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.28 cfs @ 12.53 hrs HW=215.09' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.28 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=214.00' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: West Infiltration Basin



Summary for Pond 2P: East Infiltration Basin

Inflow Area = 27,726 sf, 28.91% Impervious, Inflow Depth = 1.49" for 10-year event
Inflow = 1.02 cfs @ 12.08 hrs, Volume= 3,436 cf
Outflow = 0.17 cfs @ 12.54 hrs, Volume= 3,436 cf, Atten= 83%, Lag= 27.5 min
Discarded = 0.17 cfs @ 12.54 hrs, Volume= 3,436 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 1L : To Wetland

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 217.54' @ 12.54 hrs Surf.Area= 913 sf Storage= 1,039 cf

Plug-Flow detention time= 42.8 min calculated for 3,436 cf (100% of inflow)
Center-of-Mass det. time= 42.8 min (824.6 - 781.8)

Volume	Invert	Avail.Storage	Storage Description
#1	216.00'	4,959 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

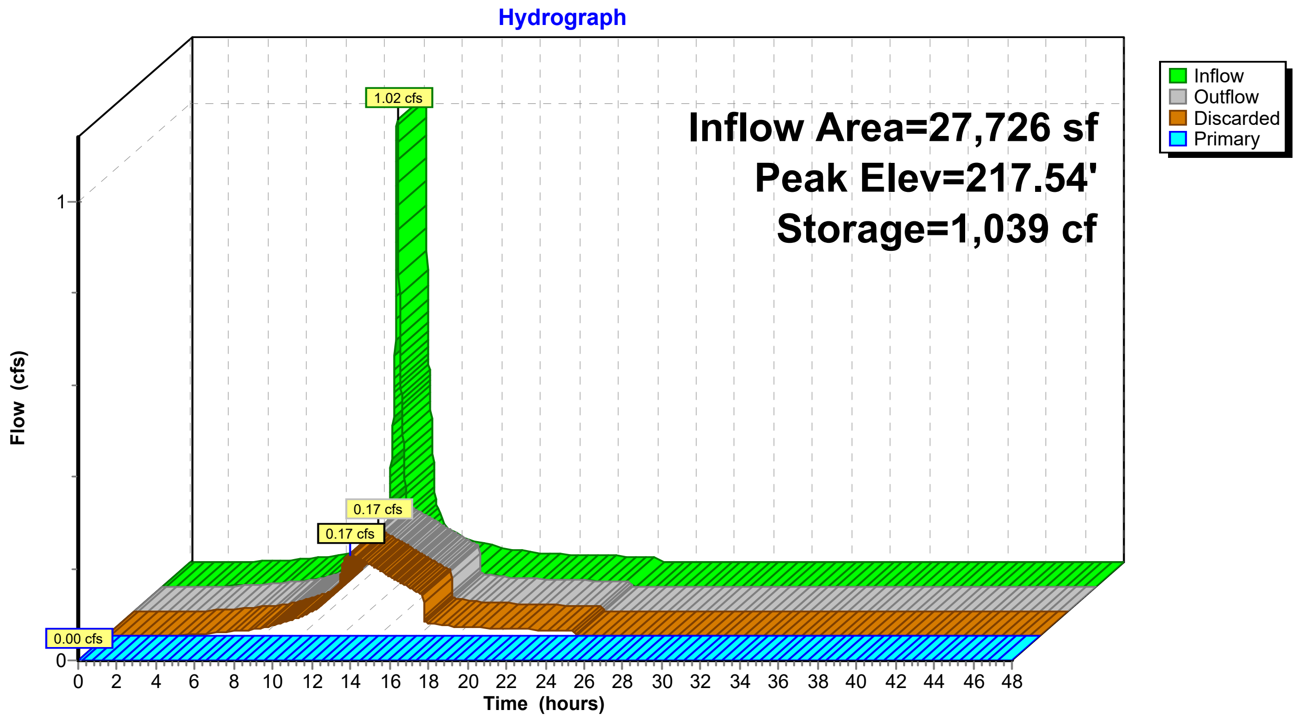
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
216.00	458	84.0	0	0	458
217.00	739	103.0	593	593	756
218.00	1,075	122.0	902	1,495	1,114
219.00	1,468	140.0	1,266	2,761	1,512
220.00	1,918	159.0	1,688	4,449	1,988
220.25	2,164	169.0	510	4,959	2,252

Device	Routing	Invert	Outlet Devices
#1	Discarded	216.00'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	219.75'	**6.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.17 cfs @ 12.54 hrs HW=217.54' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.17 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=216.00' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: East Infiltration Basin

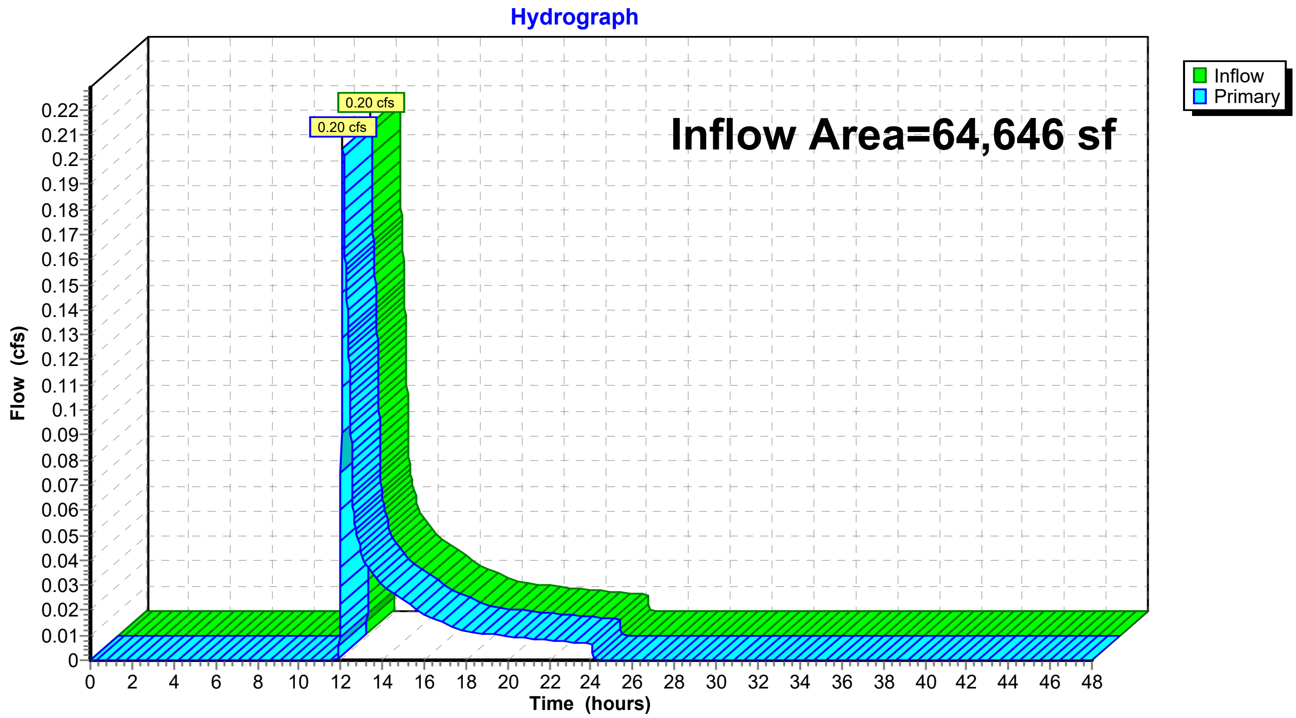


Summary for Link 1L: To Wetland

Inflow Area = 64,646 sf, 35.83% Impervious, Inflow Depth = 0.18" for 10-year event
Inflow = 0.20 cfs @ 12.12 hrs, Volume= 959 cf
Primary = 0.20 cfs @ 12.12 hrs, Volume= 959 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

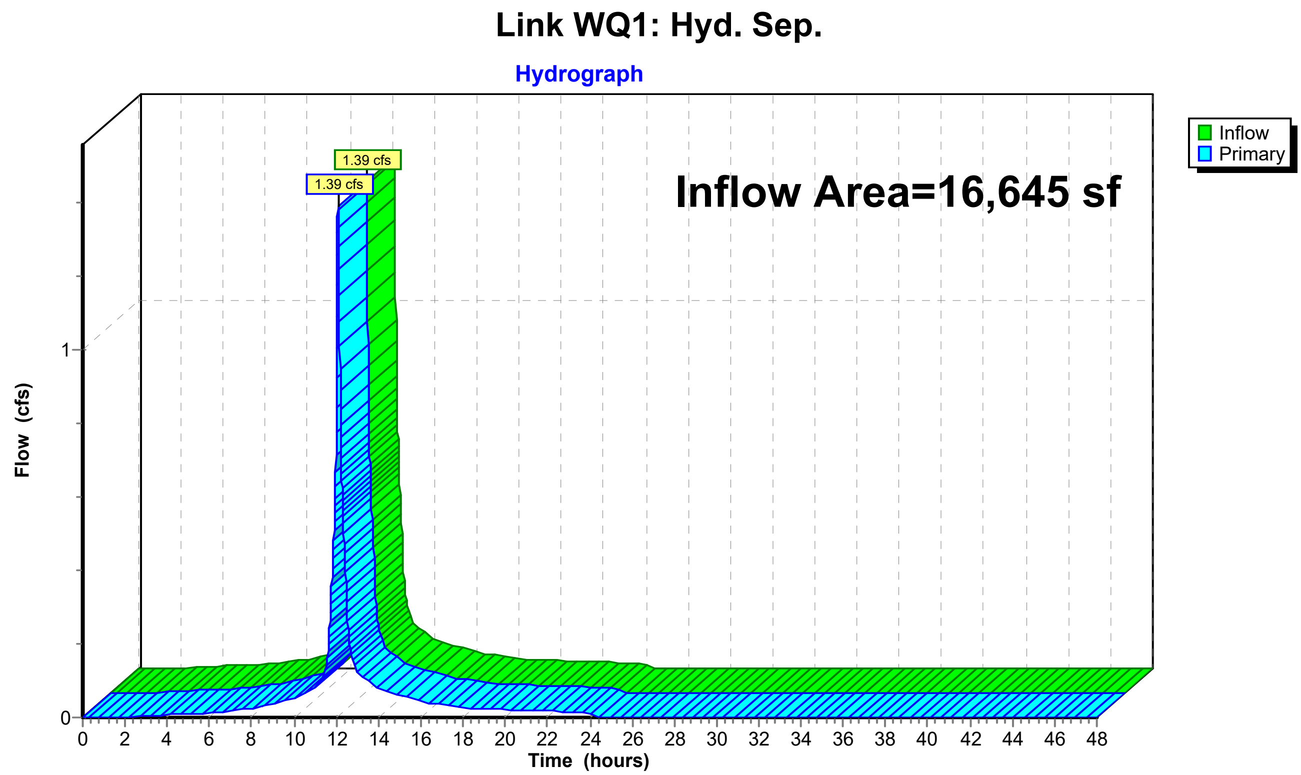
Link 1L: To Wetland



Summary for Link WQ1: Hyd. Sep.

Inflow Area = 16,645 sf, 75.22% Impervious, Inflow Depth = 3.43" for 10-year event
Inflow = 1.39 cfs @ 12.09 hrs, Volume= 4,761 cf
Primary = 1.39 cfs @ 12.09 hrs, Volume= 4,761 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 1P : West Infiltration Basin

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

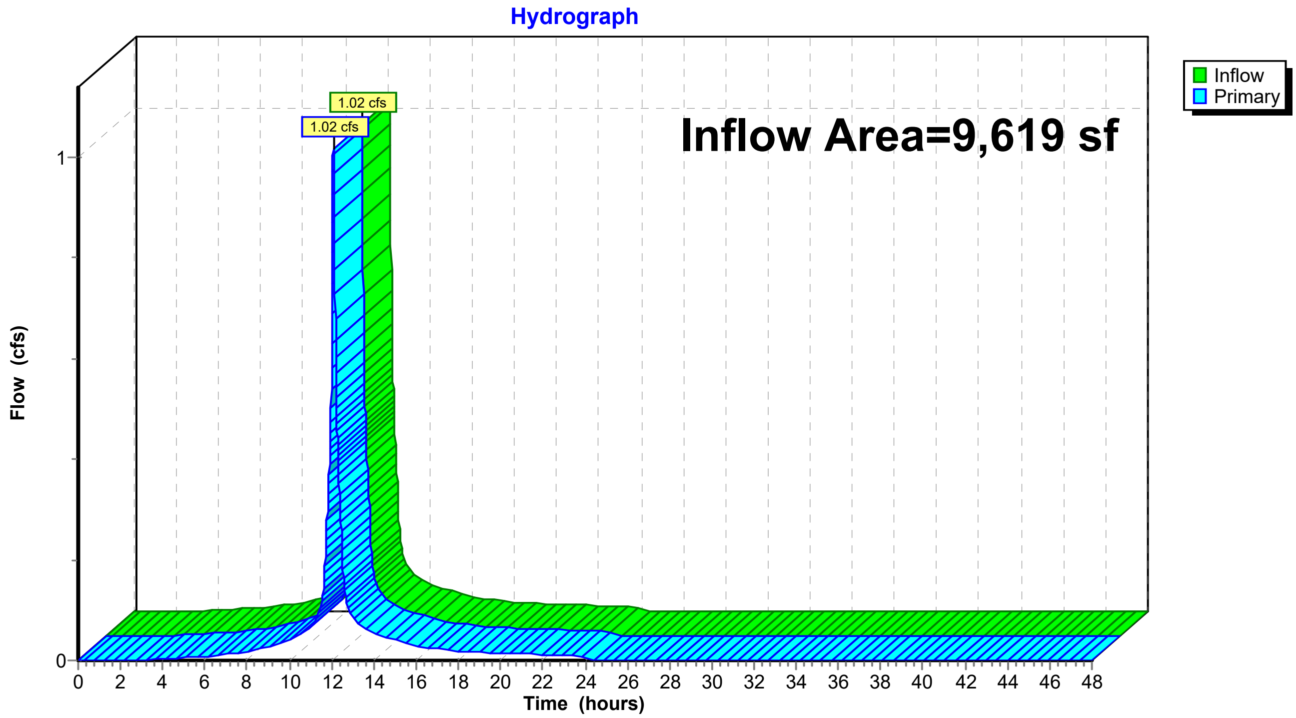


Summary for Link WQ2: Hyd. Sep.

Inflow Area = 9,619 sf, 80.87% Impervious, Inflow Depth = 4.22" for 10-year event
Inflow = 1.02 cfs @ 12.08 hrs, Volume= 3,379 cf
Primary = 1.02 cfs @ 12.08 hrs, Volume= 3,379 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 2P : East Infiltration Basin

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link WQ2: Hyd. Sep.



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

SubcatchmentP-1: Uncaptured Area Runoff Area=15,766 sf 14.06% Impervious Runoff Depth=1.37"
Tc=6.0 min CN=51 Runoff=0.49 cfs 1,801 cf

SubcatchmentP-2: West Catch Basin Runoff Area=1,022 sf 100.00% Impervious Runoff Depth=6.06"
Tc=6.0 min CN=98 Runoff=0.14 cfs 516 cf

SubcatchmentP-3: West Basin Runoff Area=4,509 sf 9.12% Impervious Runoff Depth=0.86"
Tc=6.0 min CN=44 Runoff=0.06 cfs 321 cf

SubcatchmentP-4: Center Catch Basin Runoff Area=9,679 sf 89.53% Impervious Runoff Depth=5.83"
Tc=6.0 min CN=96 Runoff=1.36 cfs 4,699 cf

SubcatchmentP-5: East Catch Basin Runoff Area=4,803 sf 74.45% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=92 Runoff=0.65 cfs 2,147 cf

SubcatchmentP-6: East Basin and Tree Runoff Area=18,107 sf 1.30% Impervious Runoff Depth=0.22"
Tc=6.0 min CN=33 Runoff=0.01 cfs 336 cf

SubcatchmentP-7: Rear Catch Basin Runoff Area=4,816 sf 87.27% Impervious Runoff Depth=5.71"
Tc=6.0 min CN=95 Runoff=0.67 cfs 2,291 cf

SubcatchmentP-8: Tree Lane Catch Basin Runoff Area=5,944 sf 47.66% Impervious Runoff Depth=2.39"
Tc=6.0 min CN=63 Runoff=0.37 cfs 1,183 cf

Pond 1P: West Infiltration Basin Peak Elev=215.52' Storage=1,959 cf Inflow=1.93 cfs 6,720 cf
Discarded=0.33 cfs 6,720 cf Primary=0.00 cfs 0 cf Outflow=0.33 cfs 6,720 cf

Pond 2P: East Infiltration Basin Peak Elev=217.98' Storage=1,470 cf Inflow=1.32 cfs 4,774 cf
Discarded=0.20 cfs 4,774 cf Primary=0.00 cfs 0 cf Outflow=0.20 cfs 4,774 cf

Link 1L: To Wetland Inflow=0.49 cfs 1,801 cf
Primary=0.49 cfs 1,801 cf

Link WQ1: Hyd. Sep. Inflow=1.87 cfs 6,399 cf
Primary=1.87 cfs 6,399 cf

Link WQ2: Hyd. Sep. Inflow=1.32 cfs 4,439 cf
Primary=1.32 cfs 4,439 cf

Total Runoff Area = 64,646 sf Runoff Volume = 13,295 cf Average Runoff Depth = 2.47"
64.17% Pervious = 41,483 sf 35.83% Impervious = 23,163 sf

Summary for Subcatchment P-1: Uncaptured Area

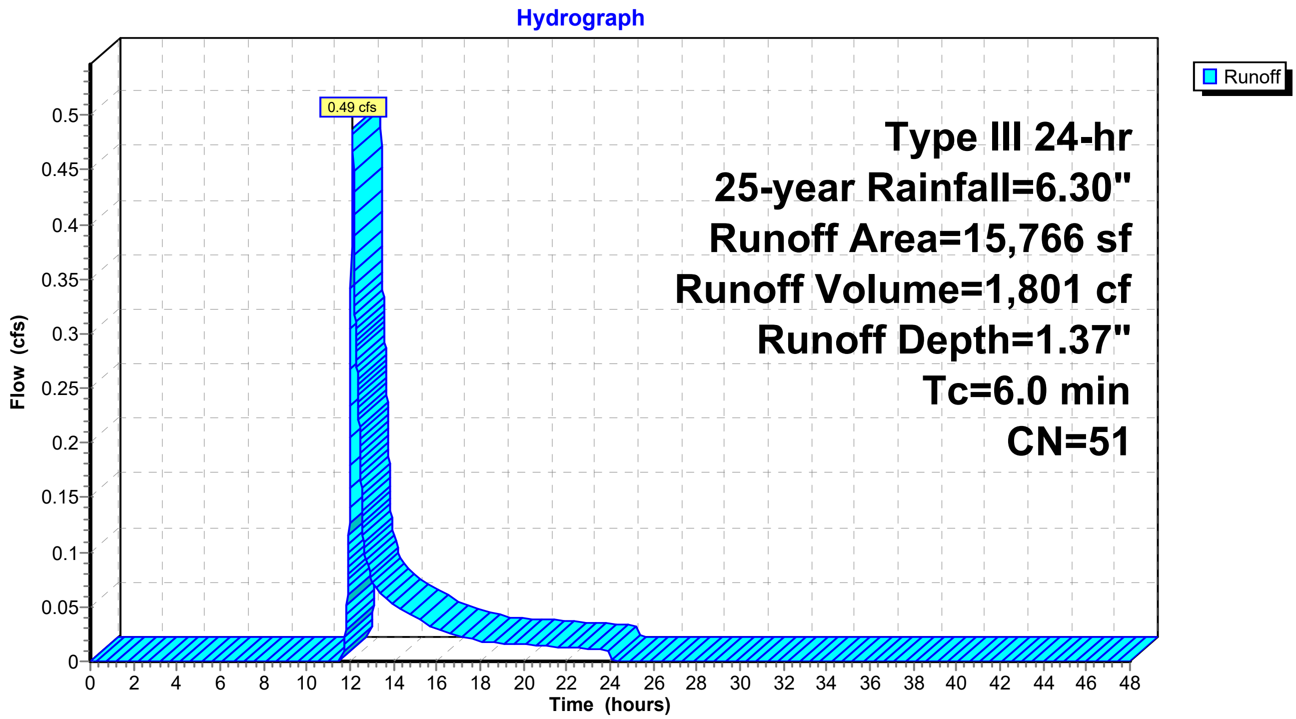
Runoff = 0.49 cfs @ 12.10 hrs, Volume= 1,801 cf, Depth= 1.37"
Routed to Link 1L : To Wetland

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.30"

	Area (sf)	CN	Description
	640	76	Gravel roads, HSG A
	12,262	39	Pasture/grassland/range, Good, HSG A
*	2,216	98	Impervious, HSG A
	648	96	Gravel surface, HSG A
	15,766	51	Weighted Average
	13,550		85.94% Pervious Area
	2,216		14.06% Impervious Area

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

Subcatchment P-1: Uncaptured Area



Summary for Subcatchment P-2: West Catch Basin

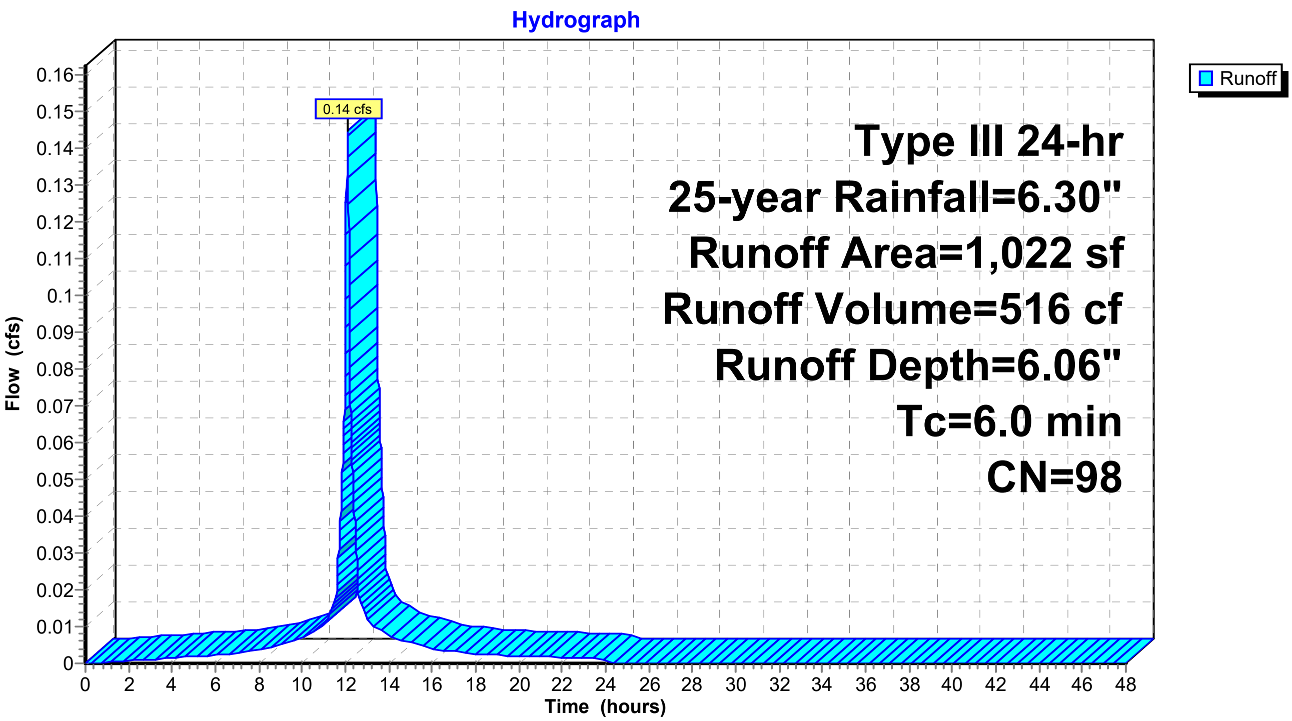
Runoff = 0.14 cfs @ 12.08 hrs, Volume= 516 cf, Depth= 6.06"
Routed to Link WQ1 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.30"

	Area (sf)	CN	Description
*	1,022	98	Impervious, HSG A
	1,022		100.00% Impervious Area

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

Subcatchment P-2: West Catch Basin



Summary for Subcatchment P-3: West Basin

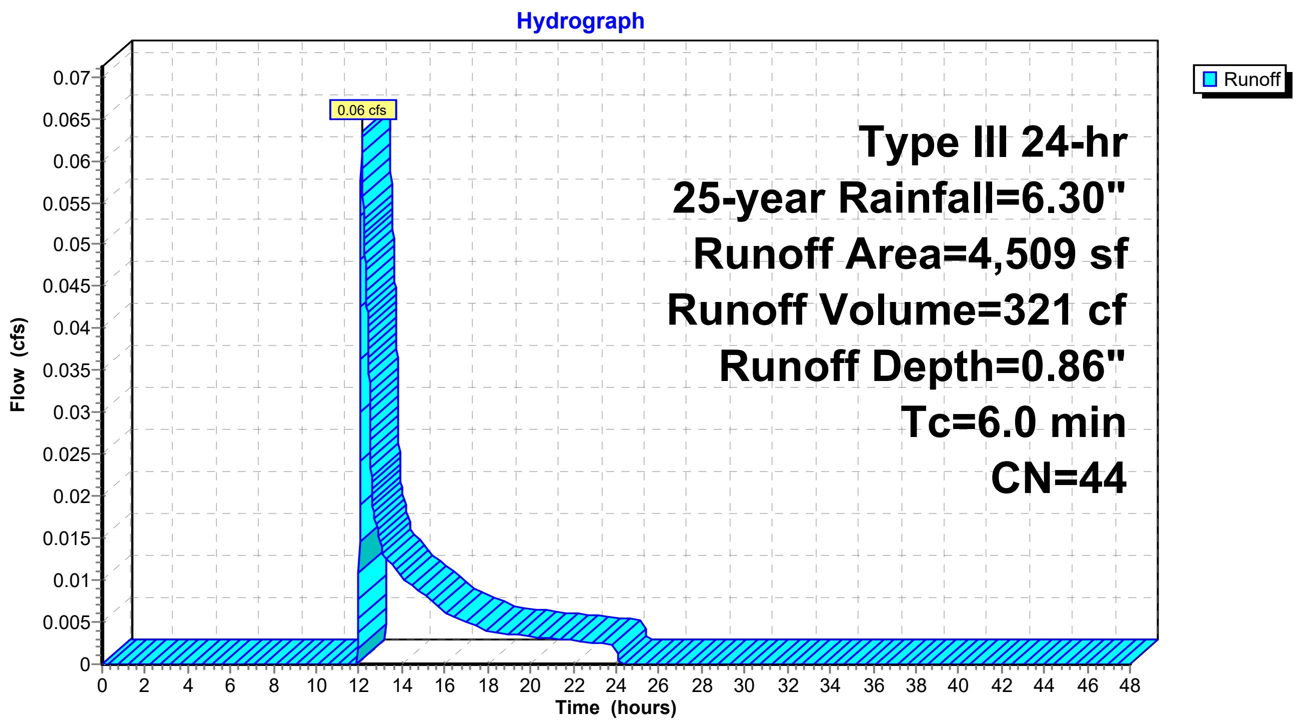
Runoff = 0.06 cfs @ 12.12 hrs, Volume= 321 cf, Depth= 0.86"
Routed to Pond 1P : West Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.30"

	Area (sf)	CN	Description
*	411	98	Impervious, HSG A
	4,098	39	>75% Grass cover, Good, HSG A
	4,509	44	Weighted Average
	4,098		90.88% Pervious Area
	411		9.12% Impervious Area

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

Subcatchment P-3: West Basin



Summary for Subcatchment P-4: Center Catch Basin

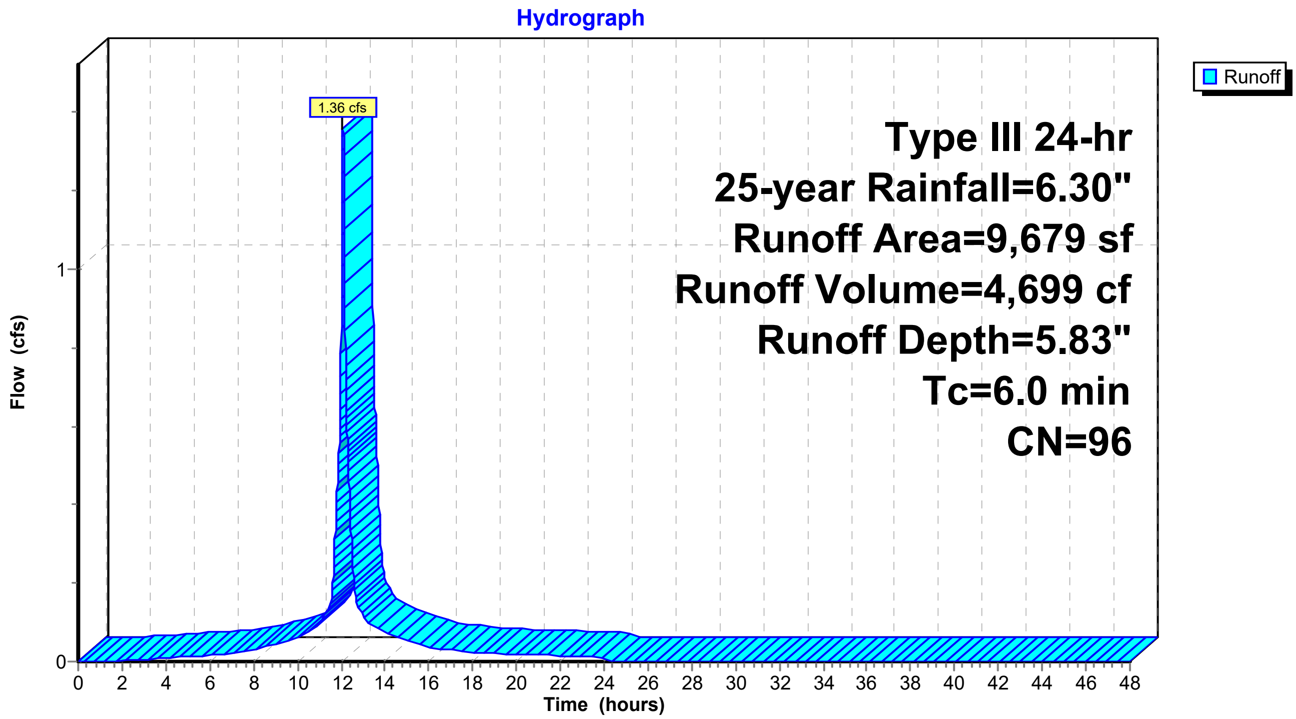
Runoff = 1.36 cfs @ 12.08 hrs, Volume= 4,699 cf, Depth= 5.83"
Routed to Link WQ1 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.30"

	Area (sf)	CN	Description
*	4,815	98	Impervious, HSG A
	1,013	76	Gravel roads, HSG A
	3,851	98	Roofs, HSG A
	9,679	96	Weighted Average
	1,013		10.47% Pervious Area
	8,666		89.53% Impervious Area

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

Subcatchment P-4: Center Catch Basin



Summary for Subcatchment P-5: East Catch Basin

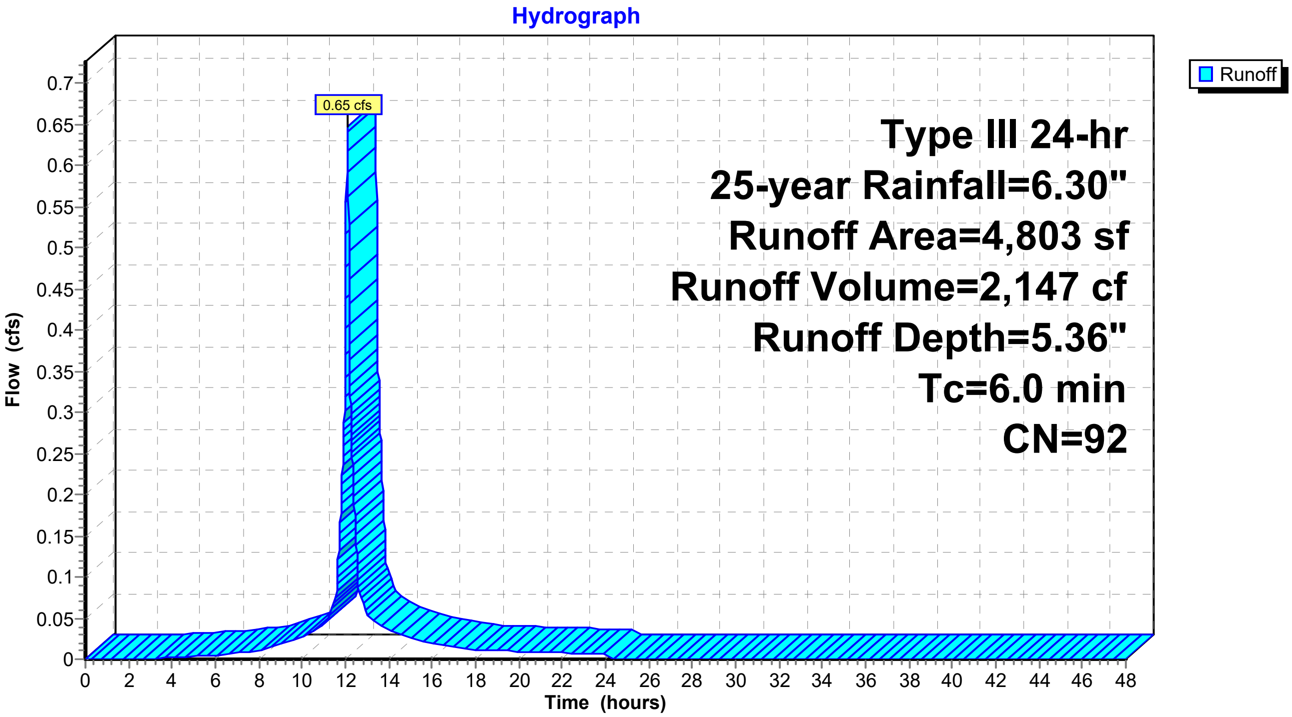
Runoff = 0.65 cfs @ 12.08 hrs, Volume= 2,147 cf, Depth= 5.36"
Routed to Link WQ2 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.30"

	Area (sf)	CN	Description
	1,227	76	Gravel roads, HSG A
*	3,576	98	Impervious, HSG A
	4,803	92	Weighted Average
	1,227		25.55% Pervious Area
	3,576		74.45% Impervious Area

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

Subcatchment P-5: East Catch Basin



Summary for Subcatchment P-6: East Basin and Tree Lane

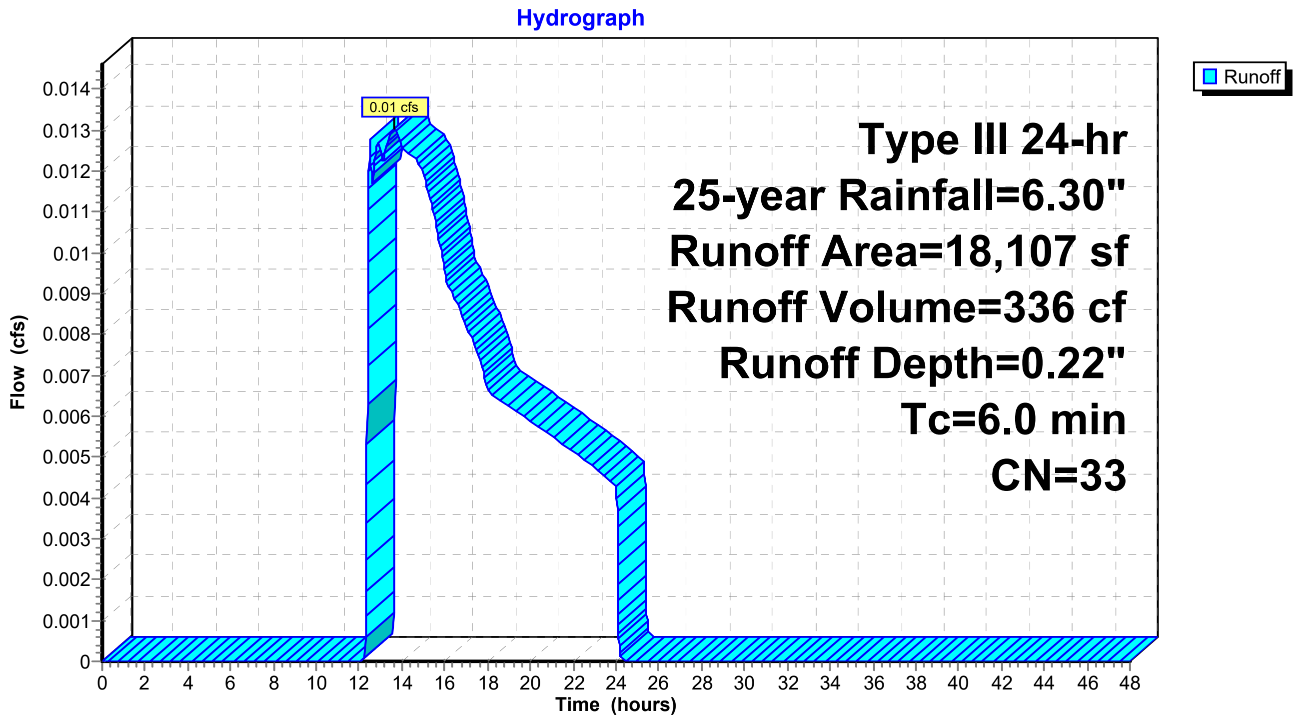
Runoff = 0.01 cfs @ 13.62 hrs, Volume= 336 cf, Depth= 0.22"
Routed to Pond 2P : East Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.30"

	Area (sf)	CN	Description
	2,301	32	Woods/grass comb., Good, HSG A
	11,670	30	Woods, Good, HSG A
	3,900	39	>75% Grass cover, Good, HSG A
*	236	98	Impervious, HSG A
	18,107	33	Weighted Average
	17,871		98.70% Pervious Area
	236		1.30% Impervious Area

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

Subcatchment P-6: East Basin and Tree Lane



Summary for Subcatchment P-7: Rear Catch Basin

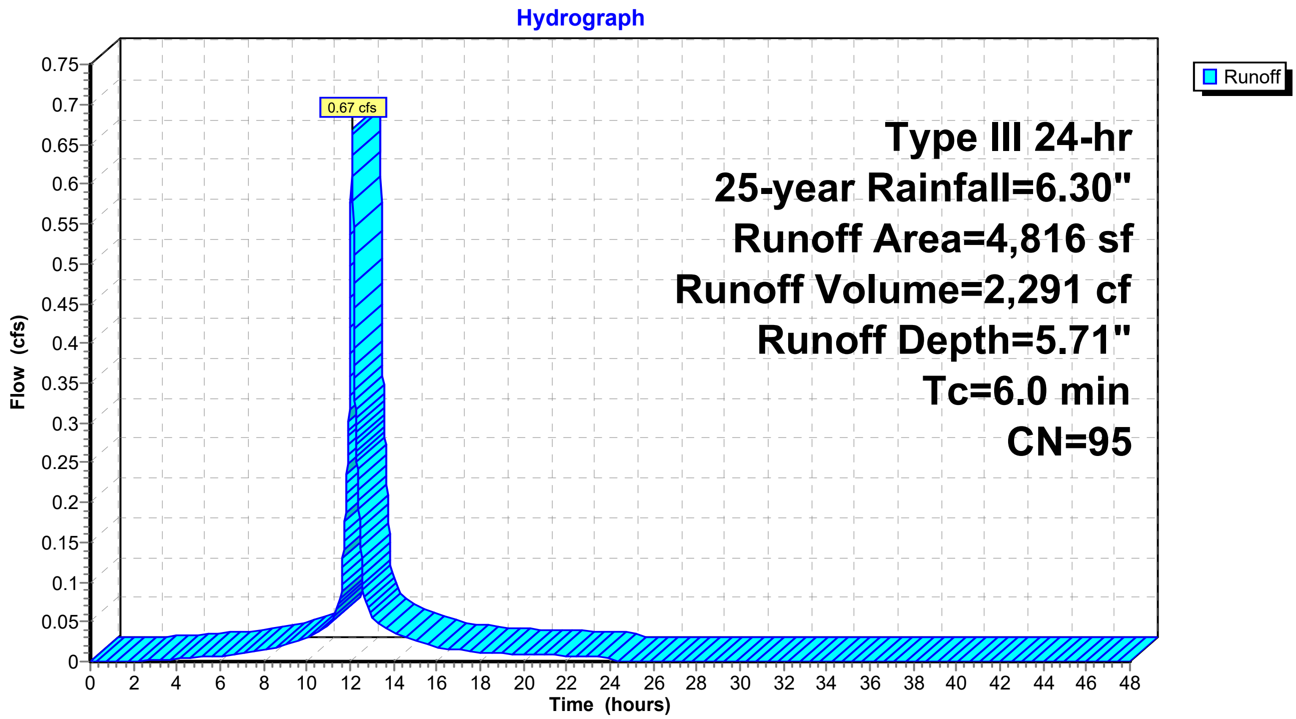
Runoff = 0.67 cfs @ 12.08 hrs, Volume= 2,291 cf, Depth= 5.71"
Routed to Link WQ2 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.30"

Area (sf)	CN	Description
3,850	98	Roofs, HSG A
353	98	Paved parking, HSG A
613	76	Gravel roads, HSG A
4,816	95	Weighted Average
613		12.73% Pervious Area
4,203		87.27% Impervious Area

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

Subcatchment P-7: Rear Catch Basin



Summary for Subcatchment P-8: Tree Lane Catch Basin

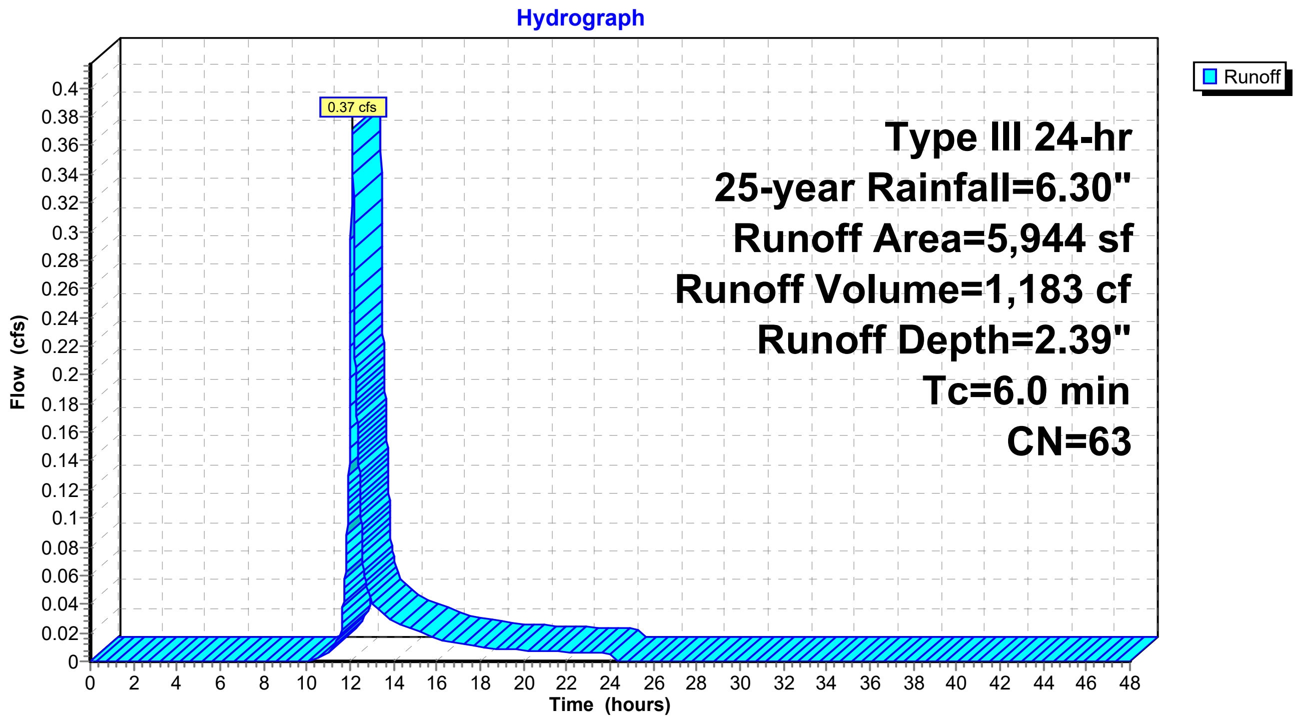
Runoff = 0.37 cfs @ 12.09 hrs, Volume= 1,183 cf, Depth= 2.39"
Routed to Link WQ1 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.30"

	Area (sf)	CN	Description
	1,439	30	Woods, Good, HSG A
*	2,833	98	Impervious, HSG A
	1,661	32	Woods/grass comb., Good, HSG A
	11	76	Gravel roads, HSG A
	5,944	63	Weighted Average
	3,111		52.34% Pervious Area
	2,833		47.66% Impervious Area

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

Subcatchment P-8: Tree Lane Catch Basin



Summary for Pond 1P: West Infiltration Basin

Inflow Area = 21,154 sf, 61.13% Impervious, Inflow Depth = 3.81" for 25-year event
Inflow = 1.93 cfs @ 12.09 hrs, Volume= 6,720 cf
Outflow = 0.33 cfs @ 12.56 hrs, Volume= 6,720 cf, Atten= 83%, Lag= 28.5 min
Discarded = 0.33 cfs @ 12.56 hrs, Volume= 6,720 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 1L : To Wetland

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 215.52' @ 12.56 hrs Surf.Area= 1,723 sf Storage= 1,959 cf

Plug-Flow detention time= 42.8 min calculated for 6,719 cf (100% of inflow)
Center-of-Mass det. time= 42.8 min (823.4 - 780.5)

Volume	Invert	Avail.Storage	Storage Description
#1	214.00'	9,120 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

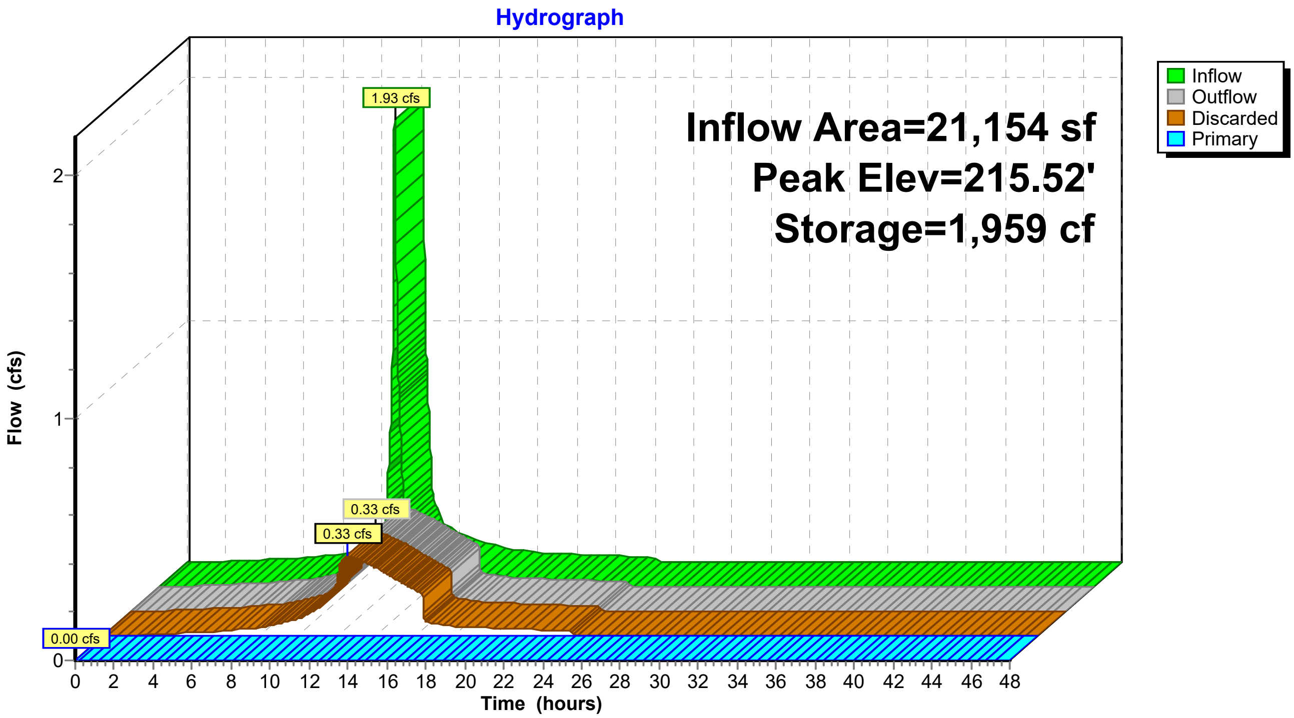
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
214.00	875	151.0	0	0	875
215.00	1,429	188.0	1,141	1,141	1,887
216.00	2,020	207.0	1,716	2,857	2,516
217.00	2,668	225.0	2,336	5,193	3,172
218.00	3,412	249.0	3,032	8,226	4,108
218.25	3,746	254.0	894	9,120	4,317

Device	Routing	Invert	Outlet Devices
#1	Discarded	214.00'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	217.75'	**6.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.33 cfs @ 12.56 hrs HW=215.52' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=214.00' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: West Infiltration Basin



Summary for Pond 2P: East Infiltration Basin

Inflow Area = 27,726 sf, 28.91% Impervious, Inflow Depth = 2.07" for 25-year event
Inflow = 1.32 cfs @ 12.08 hrs, Volume= 4,774 cf
Outflow = 0.20 cfs @ 12.58 hrs, Volume= 4,774 cf, Atten= 85%, Lag= 29.6 min
Discarded = 0.20 cfs @ 12.58 hrs, Volume= 4,774 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 1L : To Wetland

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 217.98' @ 12.58 hrs Surf.Area= 1,067 sf Storage= 1,470 cf

Plug-Flow detention time= 56.9 min calculated for 4,773 cf (100% of inflow)
Center-of-Mass det. time= 56.9 min (843.5 - 786.6)

Volume	Invert	Avail.Storage	Storage Description
#1	216.00'	4,959 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

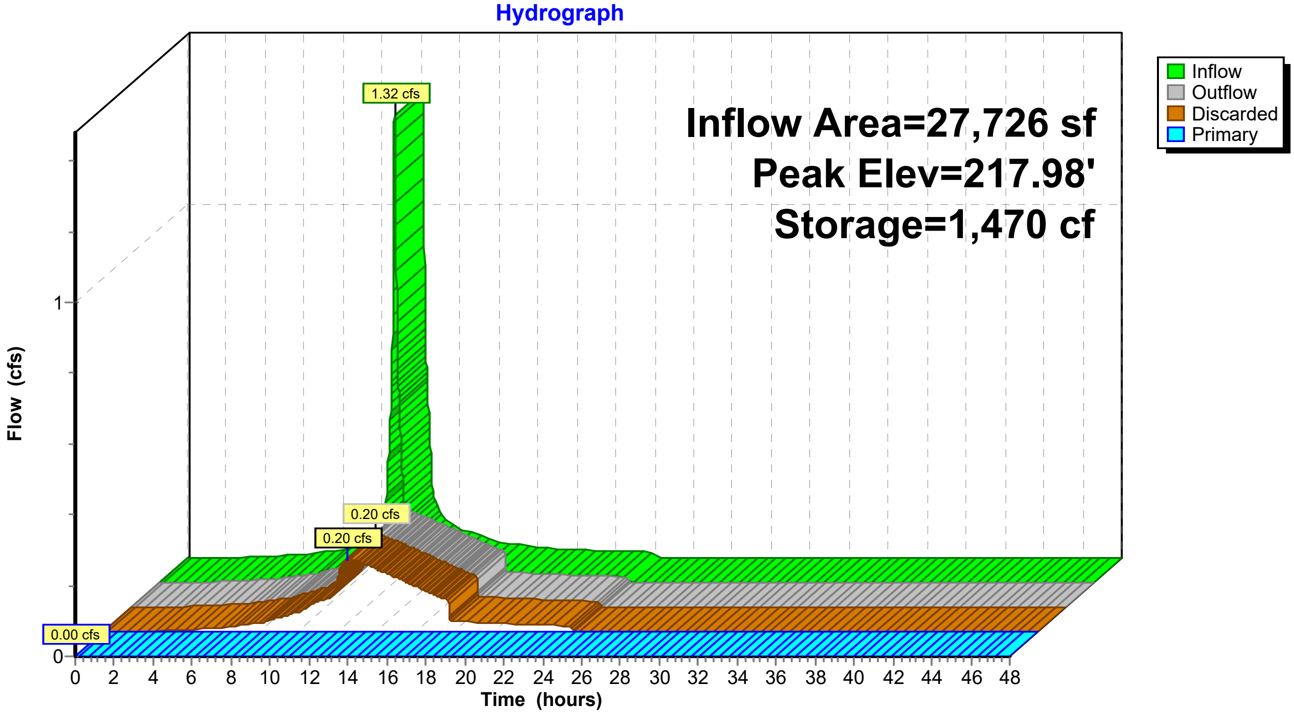
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
216.00	458	84.0	0	0	458
217.00	739	103.0	593	593	756
218.00	1,075	122.0	902	1,495	1,114
219.00	1,468	140.0	1,266	2,761	1,512
220.00	1,918	159.0	1,688	4,449	1,988
220.25	2,164	169.0	510	4,959	2,252

Device	Routing	Invert	Outlet Devices
#1	Discarded	216.00'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	219.75'	**6.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.20 cfs @ 12.58 hrs HW=217.98' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=216.00' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: East Infiltration Basin

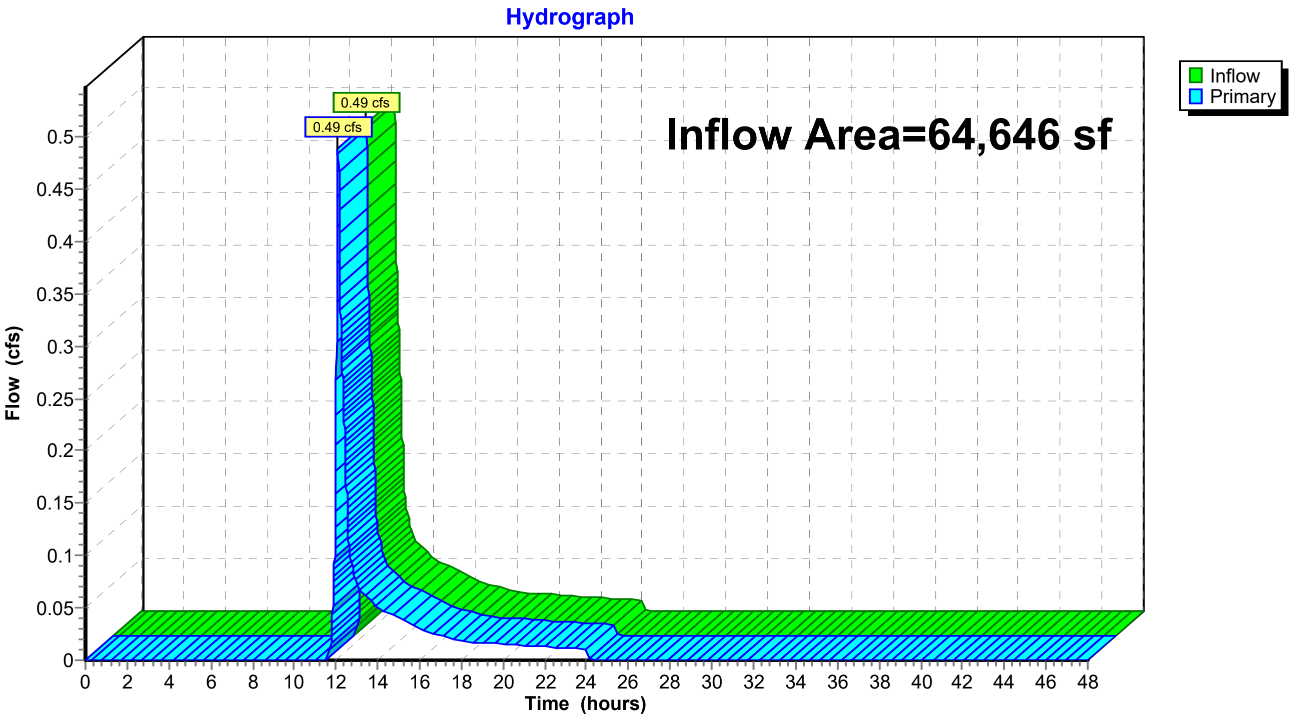


Summary for Link 1L: To Wetland

Inflow Area = 64,646 sf, 35.83% Impervious, Inflow Depth = 0.33" for 25-year event
Inflow = 0.49 cfs @ 12.10 hrs, Volume= 1,801 cf
Primary = 0.49 cfs @ 12.10 hrs, Volume= 1,801 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

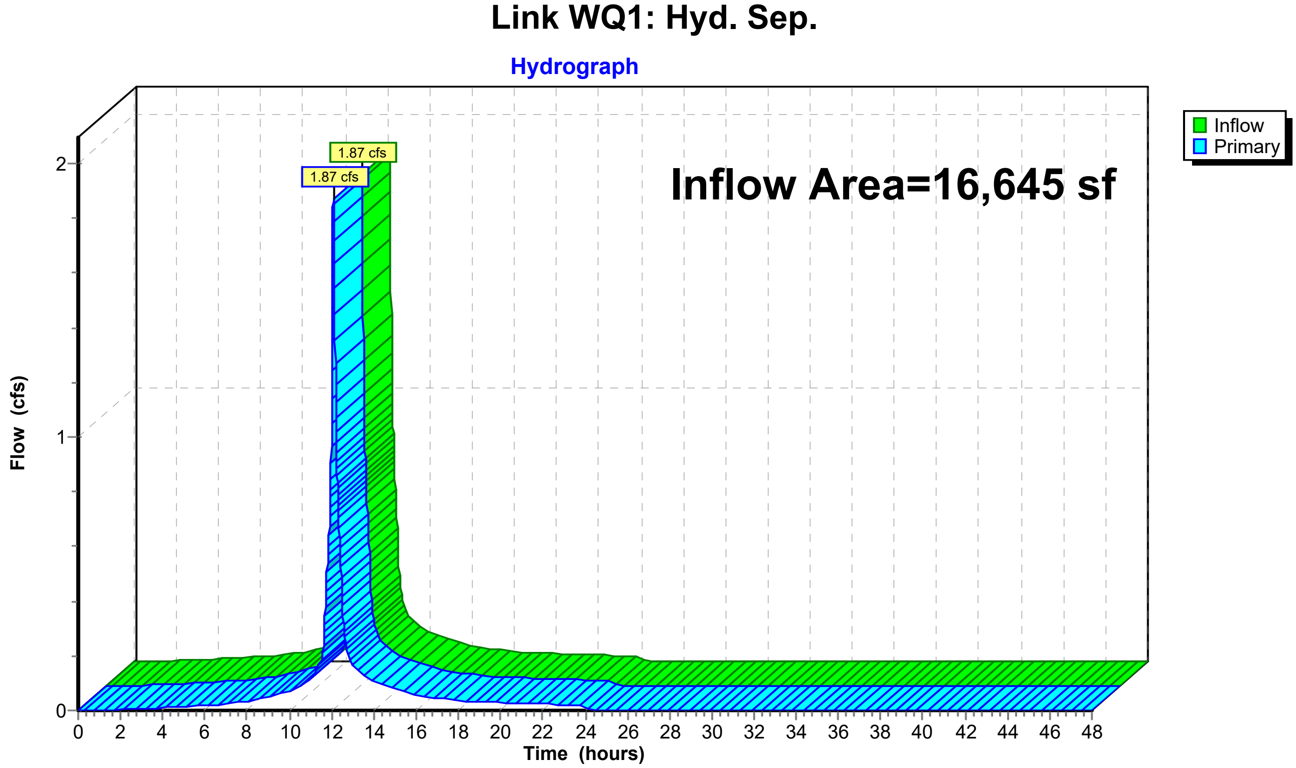
Link 1L: To Wetland



Summary for Link WQ1: Hyd. Sep.

Inflow Area = 16,645 sf, 75.22% Impervious, Inflow Depth = 4.61" for 25-year event
Inflow = 1.87 cfs @ 12.09 hrs, Volume= 6,399 cf
Primary = 1.87 cfs @ 12.09 hrs, Volume= 6,399 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 1P : West Infiltration Basin

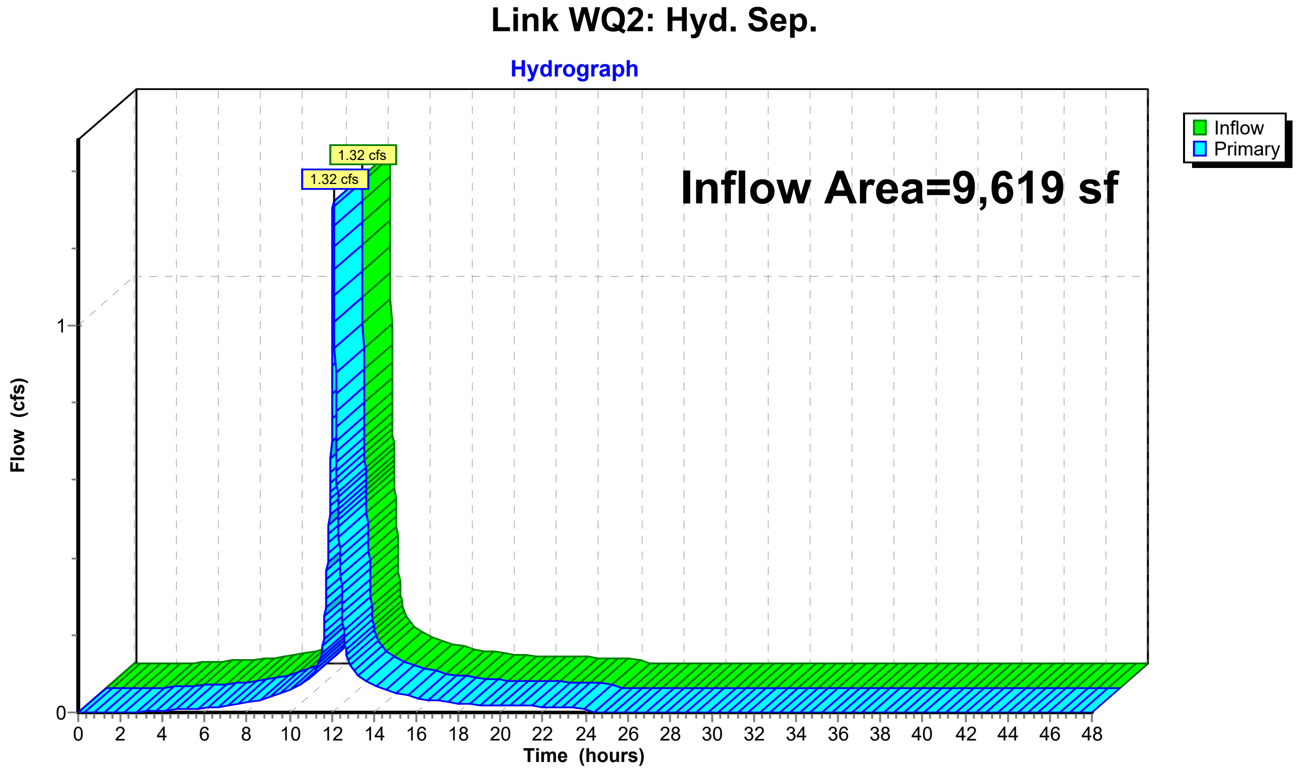
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs



Summary for Link WQ2: Hyd. Sep.

Inflow Area = 9,619 sf, 80.87% Impervious, Inflow Depth = 5.54" for 25-year event
Inflow = 1.32 cfs @ 12.08 hrs, Volume= 4,439 cf
Primary = 1.32 cfs @ 12.08 hrs, Volume= 4,439 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 2P : East Infiltration Basin

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs



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

SubcatchmentP-1: Uncaptured Area Runoff Area=15,766 sf 14.06% Impervious Runoff Depth=3.05"
Tc=6.0 min CN=51 Runoff=1.24 cfs 4,007 cf

SubcatchmentP-2: West Catch Basin Runoff Area=1,022 sf 100.00% Impervious Runoff Depth=8.83"
Tc=6.0 min CN=98 Runoff=0.21 cfs 752 cf

SubcatchmentP-3: West Basin Runoff Area=4,509 sf 9.12% Impervious Runoff Depth=2.21"
Tc=6.0 min CN=44 Runoff=0.24 cfs 831 cf

SubcatchmentP-4: Center Catch Basin Runoff Area=9,679 sf 89.53% Impervious Runoff Depth=8.59"
Tc=6.0 min CN=96 Runoff=1.97 cfs 6,927 cf

SubcatchmentP-5: East Catch Basin Runoff Area=4,803 sf 74.45% Impervious Runoff Depth=8.10"
Tc=6.0 min CN=92 Runoff=0.96 cfs 3,244 cf

SubcatchmentP-6: East Basin and Tree Runoff Area=18,107 sf 1.30% Impervious Runoff Depth=0.99"
Tc=6.0 min CN=33 Runoff=0.23 cfs 1,496 cf

SubcatchmentP-7: Rear Catch Basin Runoff Area=4,816 sf 87.27% Impervious Runoff Depth=8.47"
Tc=6.0 min CN=95 Runoff=0.98 cfs 3,398 cf

SubcatchmentP-8: Tree Lane Catch Basin Runoff Area=5,944 sf 47.66% Impervious Runoff Depth=4.53"
Tc=6.0 min CN=63 Runoff=0.72 cfs 2,243 cf

Pond 1P: West Infiltration Basin Peak Elev=216.36' Storage=3,630 cf Inflow=3.13 cfs 10,753 cf
Discarded=0.43 cfs 10,753 cf Primary=0.00 cfs 0 cf Outflow=0.43 cfs 10,753 cf

Pond 2P: East Infiltration Basin Peak Elev=219.00' Storage=2,758 cf Inflow=2.10 cfs 8,138 cf
Discarded=0.28 cfs 8,138 cf Primary=0.00 cfs 0 cf Outflow=0.28 cfs 8,138 cf

Link 1L: To Wetland Inflow=1.24 cfs 4,007 cf
Primary=1.24 cfs 4,007 cf

Link WQ1: Hyd. Sep. Inflow=2.90 cfs 9,922 cf
Primary=2.90 cfs 9,922 cf

Link WQ2: Hyd. Sep. Inflow=1.93 cfs 6,642 cf
Primary=1.93 cfs 6,642 cf

Total Runoff Area = 64,646 sf Runoff Volume = 22,897 cf Average Runoff Depth = 4.25"
64.17% Pervious = 41,483 sf 35.83% Impervious = 23,163 sf

Summary for Subcatchment P-1: Uncaptured Area

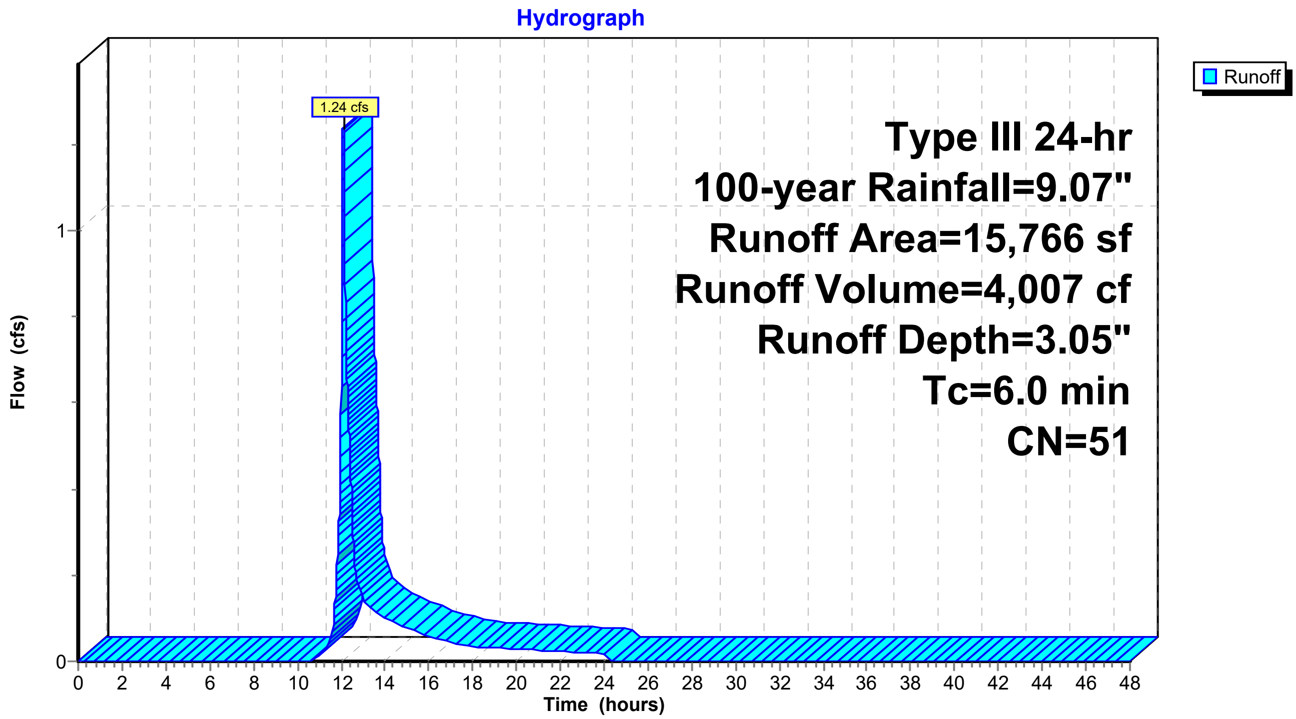
Runoff = 1.24 cfs @ 12.10 hrs, Volume= 4,007 cf, Depth= 3.05"
Routed to Link 1L : To Wetland

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=9.07"

	Area (sf)	CN	Description
	640	76	Gravel roads, HSG A
	12,262	39	Pasture/grassland/range, Good, HSG A
*	2,216	98	Impervious, HSG A
	648	96	Gravel surface, HSG A
	15,766	51	Weighted Average
	13,550		85.94% Pervious Area
	2,216		14.06% Impervious Area

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

Subcatchment P-1: Uncaptured Area



Summary for Subcatchment P-2: West Catch Basin

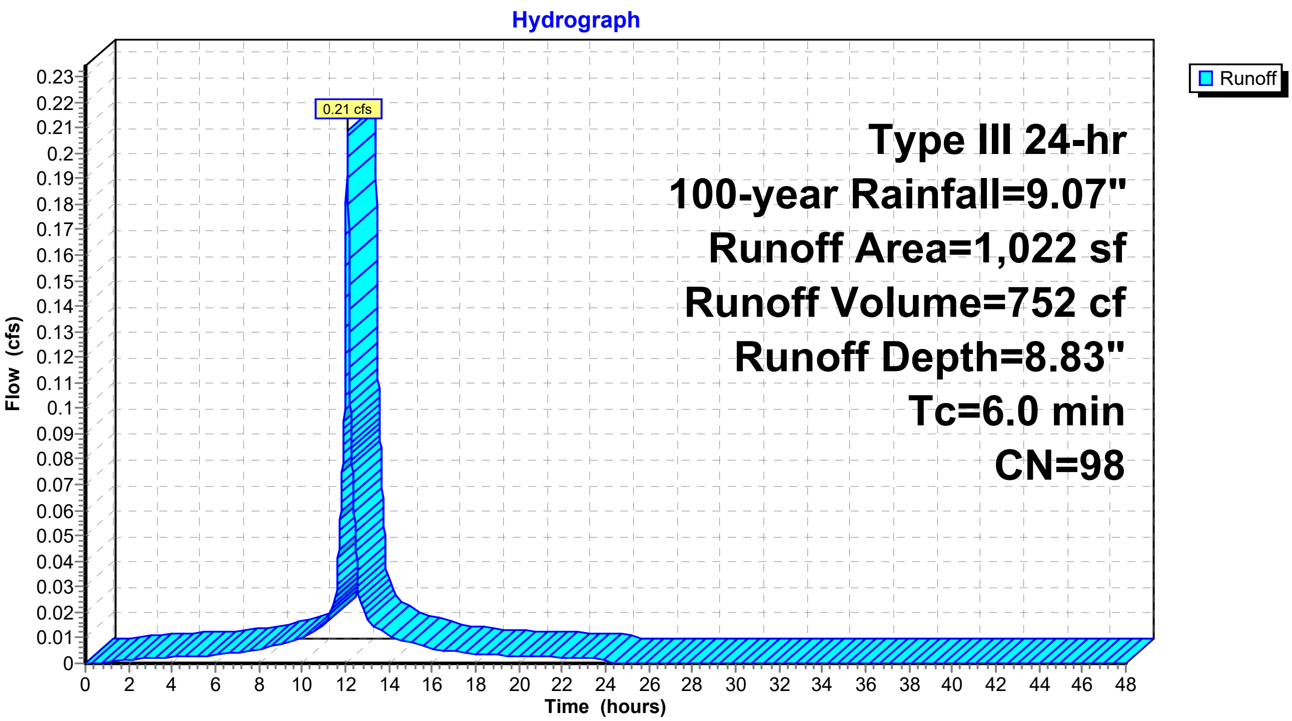
Runoff = 0.21 cfs @ 12.08 hrs, Volume= 752 cf, Depth= 8.83"
Routed to Link WQ1 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=9.07"

	Area (sf)	CN	Description
*	1,022	98	Impervious, HSG A
	1,022		100.00% Impervious Area

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

Subcatchment P-2: West Catch Basin



Summary for Subcatchment P-3: West Basin

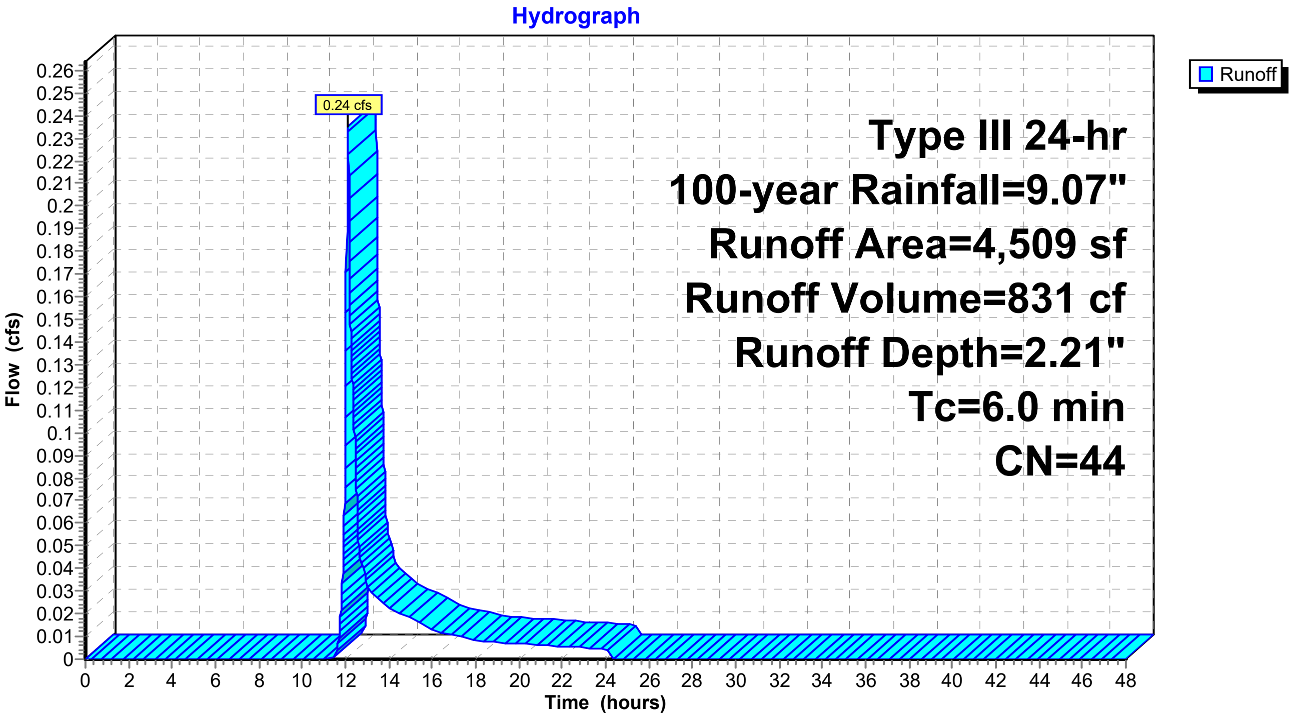
Runoff = 0.24 cfs @ 12.10 hrs, Volume= 831 cf, Depth= 2.21"
Routed to Pond 1P : West Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=9.07"

	Area (sf)	CN	Description
*	411	98	Impervious, HSG A
	4,098	39	>75% Grass cover, Good, HSG A
	4,509	44	Weighted Average
	4,098		90.88% Pervious Area
	411		9.12% Impervious Area

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

Subcatchment P-3: West Basin



Summary for Subcatchment P-4: Center Catch Basin

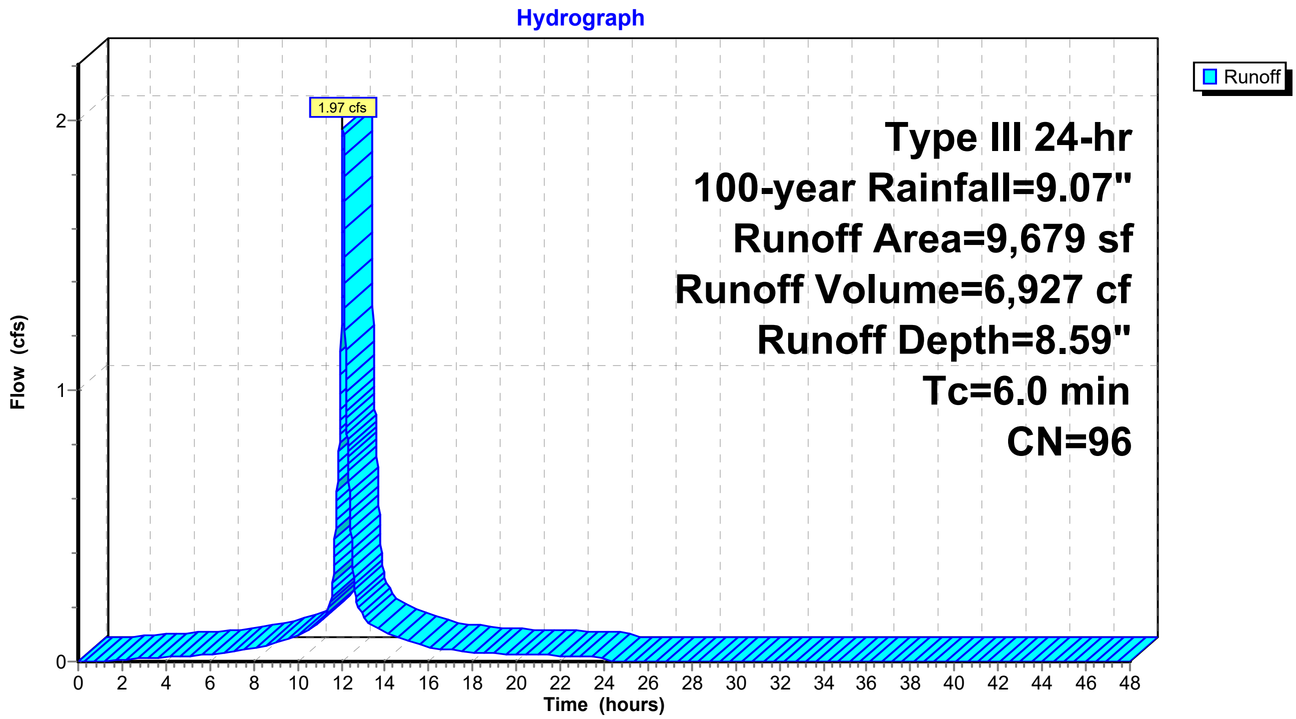
Runoff = 1.97 cfs @ 12.08 hrs, Volume= 6,927 cf, Depth= 8.59"
Routed to Link WQ1 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=9.07"

	Area (sf)	CN	Description
*	4,815	98	Impervious, HSG A
	1,013	76	Gravel roads, HSG A
	3,851	98	Roofs, HSG A
	9,679	96	Weighted Average
	1,013		10.47% Pervious Area
	8,666		89.53% Impervious Area

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

Subcatchment P-4: Center Catch Basin



Summary for Subcatchment P-5: East Catch Basin

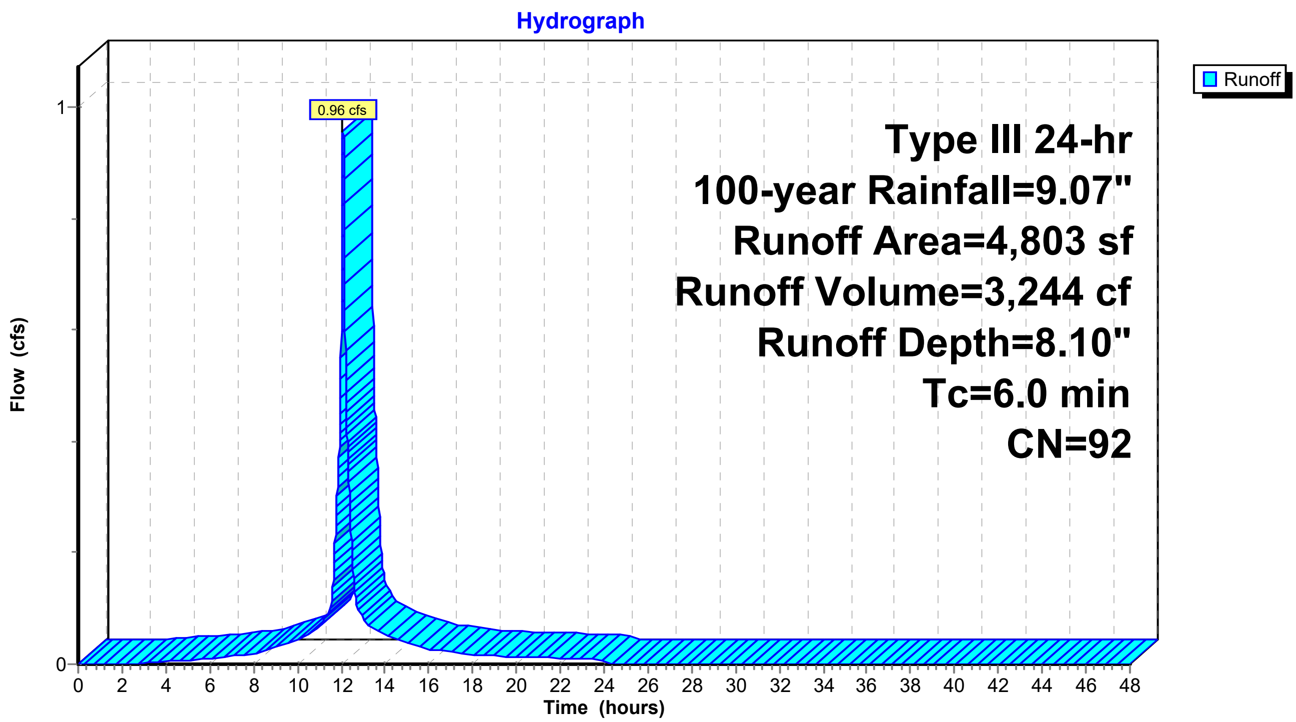
Runoff = 0.96 cfs @ 12.08 hrs, Volume= 3,244 cf, Depth= 8.10"
Routed to Link WQ2 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=9.07"

	Area (sf)	CN	Description
	1,227	76	Gravel roads, HSG A
*	3,576	98	Impervious, HSG A
	4,803	92	Weighted Average
	1,227		25.55% Pervious Area
	3,576		74.45% Impervious Area

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

Subcatchment P-5: East Catch Basin



Summary for Subcatchment P-6: East Basin and Tree Lane

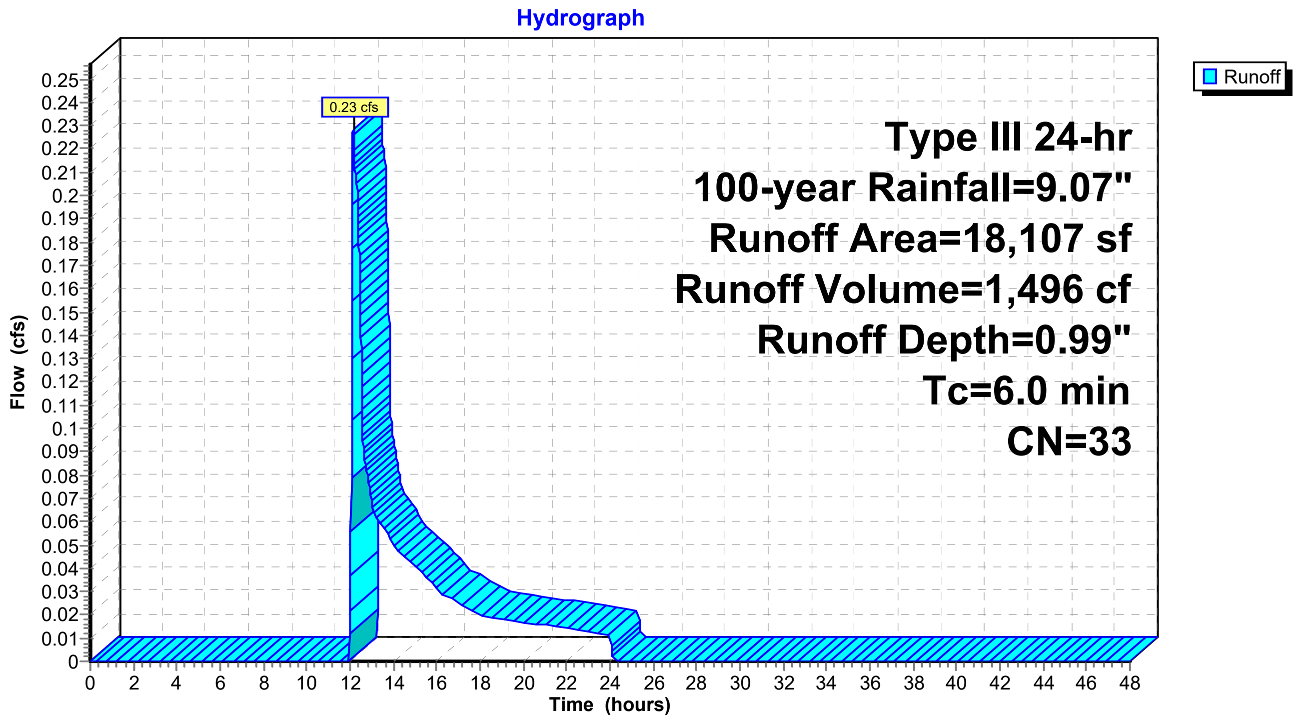
Runoff = 0.23 cfs @ 12.14 hrs, Volume= 1,496 cf, Depth= 0.99"
Routed to Pond 2P : East Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=9.07"

	Area (sf)	CN	Description
	2,301	32	Woods/grass comb., Good, HSG A
	11,670	30	Woods, Good, HSG A
	3,900	39	>75% Grass cover, Good, HSG A
*	236	98	Impervious, HSG A
	18,107	33	Weighted Average
	17,871		98.70% Pervious Area
	236		1.30% Impervious Area

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

Subcatchment P-6: East Basin and Tree Lane



Summary for Subcatchment P-7: Rear Catch Basin

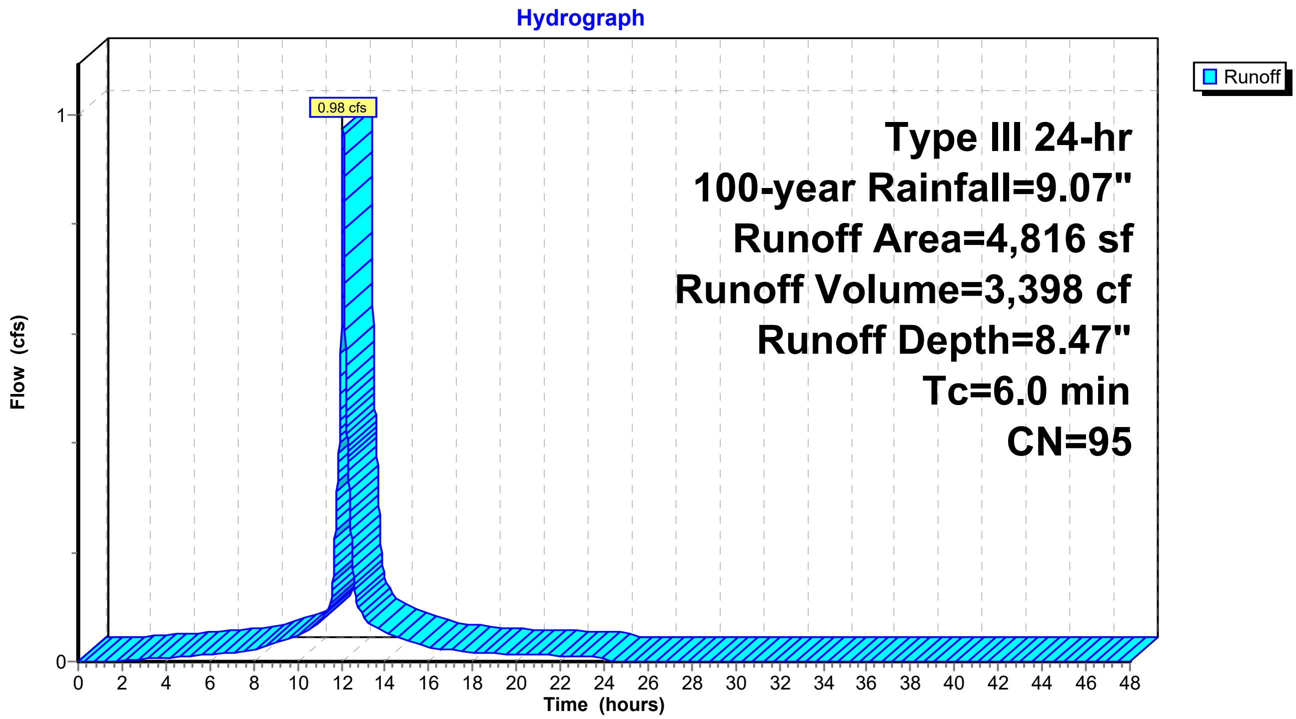
Runoff = 0.98 cfs @ 12.08 hrs, Volume= 3,398 cf, Depth= 8.47"
Routed to Link WQ2 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=9.07"

Area (sf)	CN	Description
3,850	98	Roofs, HSG A
353	98	Paved parking, HSG A
613	76	Gravel roads, HSG A
4,816	95	Weighted Average
613		12.73% Pervious Area
4,203		87.27% Impervious Area

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

Subcatchment P-7: Rear Catch Basin



Summary for Subcatchment P-8: Tree Lane Catch Basin

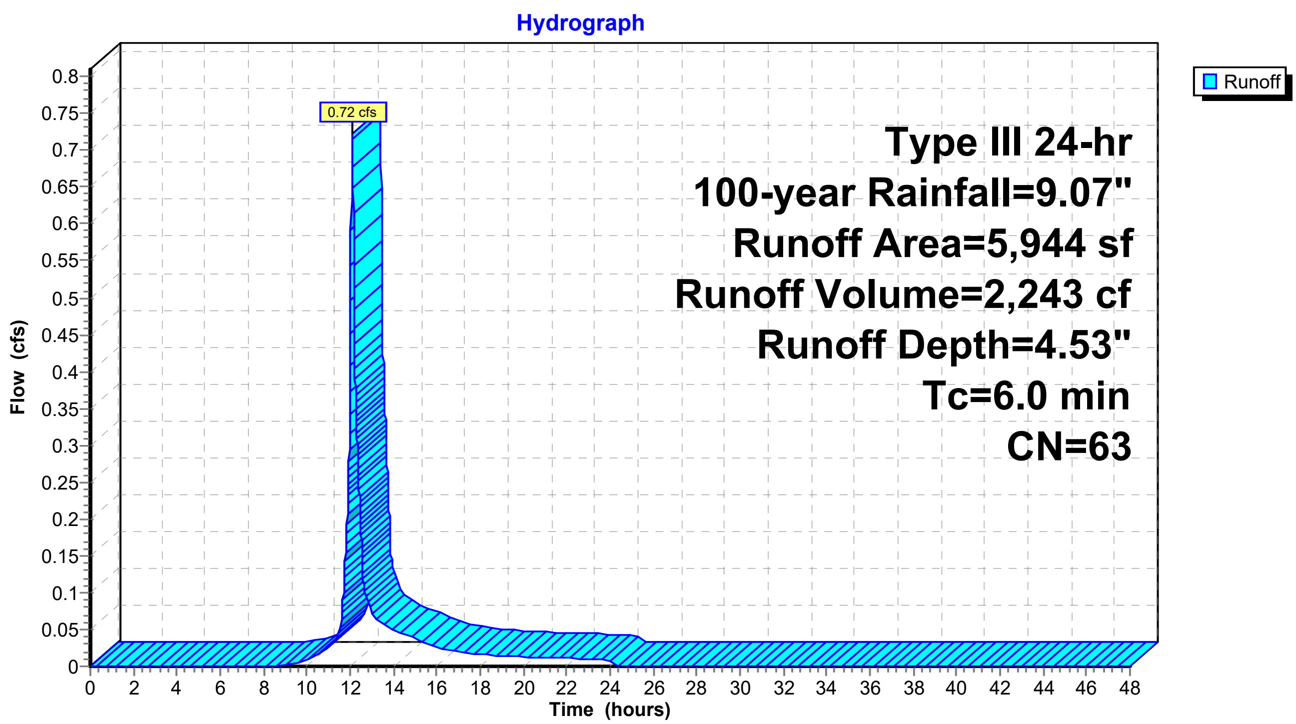
Runoff = 0.72 cfs @ 12.09 hrs, Volume= 2,243 cf, Depth= 4.53"
Routed to Link WQ1 : Hyd. Sep.

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=9.07"

	Area (sf)	CN	Description
	1,439	30	Woods, Good, HSG A
*	2,833	98	Impervious, HSG A
	1,661	32	Woods/grass comb., Good, HSG A
	11	76	Gravel roads, HSG A
	5,944	63	Weighted Average
	3,111		52.34% Pervious Area
	2,833		47.66% Impervious Area

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

Subcatchment P-8: Tree Lane Catch Basin



Summary for Pond 1P: West Infiltration Basin

Inflow Area = 21,154 sf, 61.13% Impervious, Inflow Depth = 6.10" for 100-year event
Inflow = 3.13 cfs @ 12.09 hrs, Volume= 10,753 cf
Outflow = 0.43 cfs @ 12.63 hrs, Volume= 10,753 cf, Atten= 86%, Lag= 32.3 min
Discarded = 0.43 cfs @ 12.63 hrs, Volume= 10,753 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 1L : To Wetland

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 216.36' @ 12.63 hrs Surf.Area= 2,245 sf Storage= 3,630 cf

Plug-Flow detention time= 70.8 min calculated for 10,751 cf (100% of inflow)
Center-of-Mass det. time= 70.8 min (847.5 - 776.7)

Volume	Invert	Avail.Storage	Storage Description
#1	214.00'	9,120 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

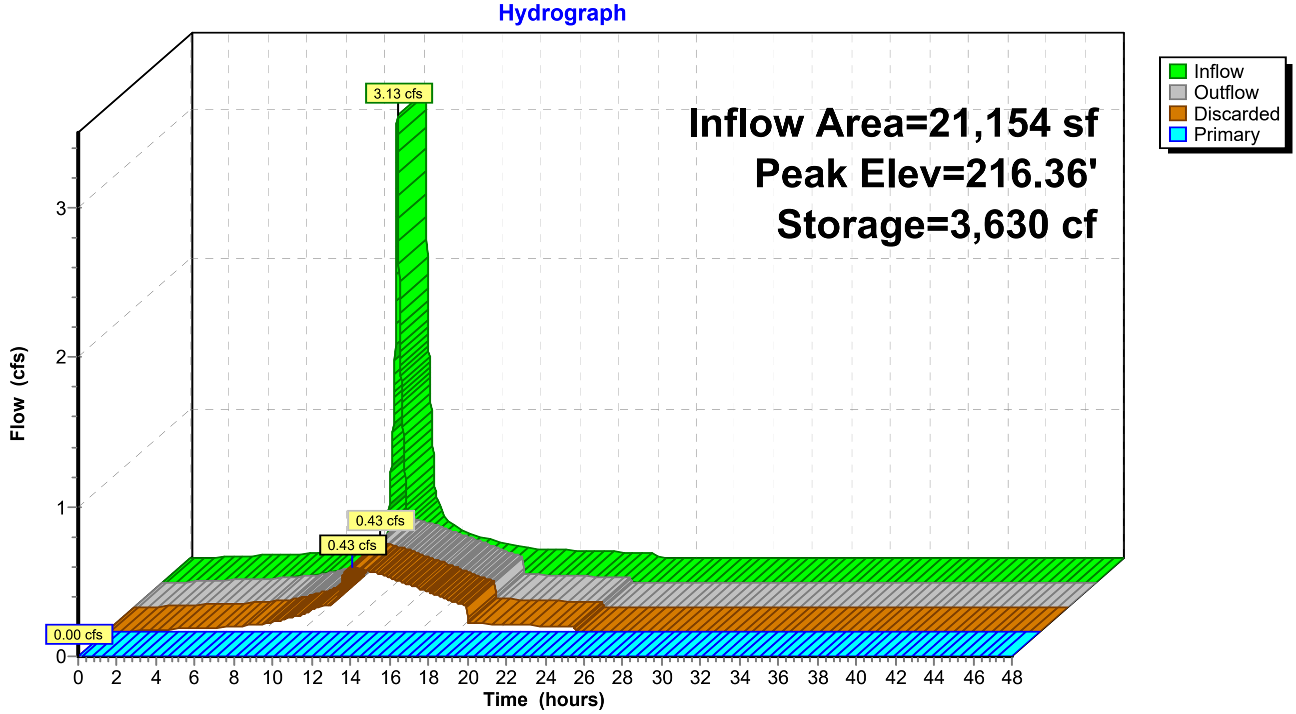
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
214.00	875	151.0	0	0	875
215.00	1,429	188.0	1,141	1,141	1,887
216.00	2,020	207.0	1,716	2,857	2,516
217.00	2,668	225.0	2,336	5,193	3,172
218.00	3,412	249.0	3,032	8,226	4,108
218.25	3,746	254.0	894	9,120	4,317

Device	Routing	Invert	Outlet Devices
#1	Discarded	214.00'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	217.75'	**6.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.43 cfs @ 12.63 hrs HW=216.36' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.43 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=214.00' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: West Infiltration Basin



Summary for Pond 2P: East Infiltration Basin

Inflow Area = 27,726 sf, 28.91% Impervious, Inflow Depth = 3.52" for 100-year event
Inflow = 2.10 cfs @ 12.09 hrs, Volume= 8,138 cf
Outflow = 0.28 cfs @ 12.79 hrs, Volume= 8,138 cf, Atten= 87%, Lag= 42.0 min
Discarded = 0.28 cfs @ 12.79 hrs, Volume= 8,138 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 1L : To Wetland

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 219.00' @ 12.79 hrs Surf.Area= 1,467 sf Storage= 2,758 cf

Plug-Flow detention time= 92.7 min calculated for 8,136 cf (100% of inflow)
Center-of-Mass det. time= 92.7 min (884.1 - 791.5)

Volume	Invert	Avail.Storage	Storage Description
#1	216.00'	4,959 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

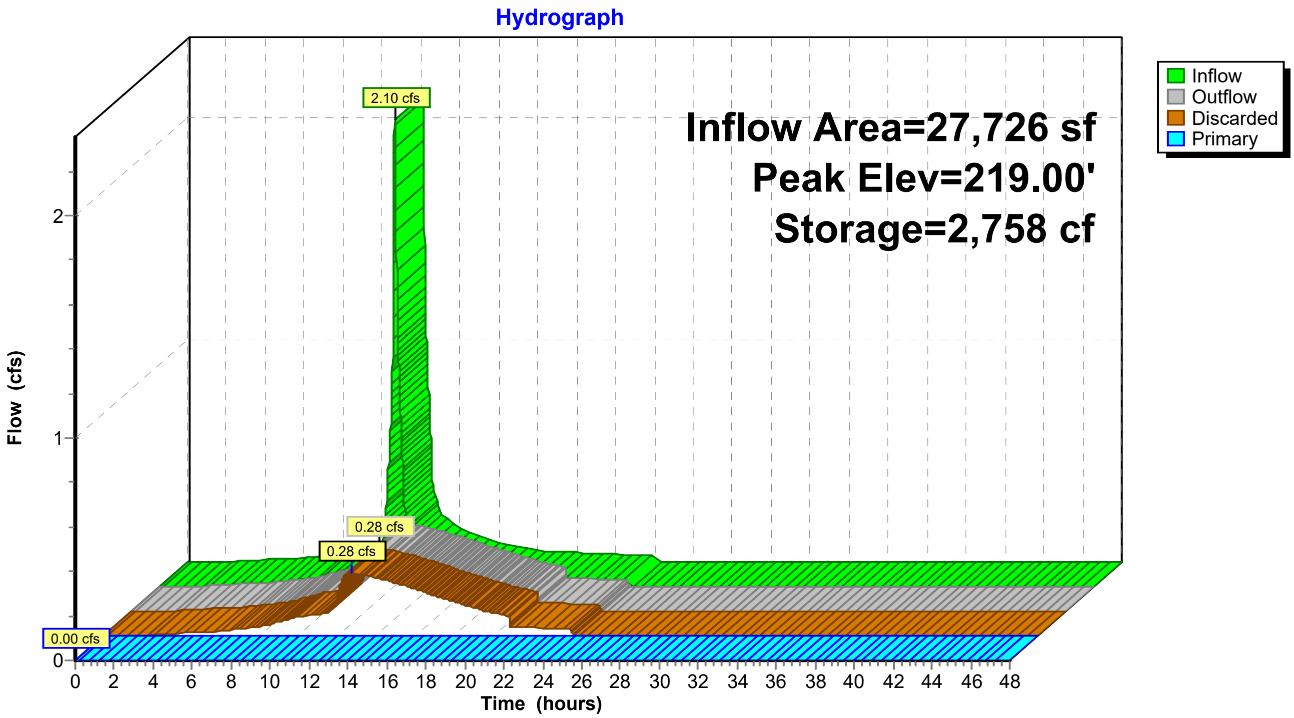
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
216.00	458	84.0	0	0	458
217.00	739	103.0	593	593	756
218.00	1,075	122.0	902	1,495	1,114
219.00	1,468	140.0	1,266	2,761	1,512
220.00	1,918	159.0	1,688	4,449	1,988
220.25	2,164	169.0	510	4,959	2,252

Device	Routing	Invert	Outlet Devices
#1	Discarded	216.00'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	219.75'	**6.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.28 cfs @ 12.79 hrs HW=219.00' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.28 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=216.00' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: East Infiltration Basin

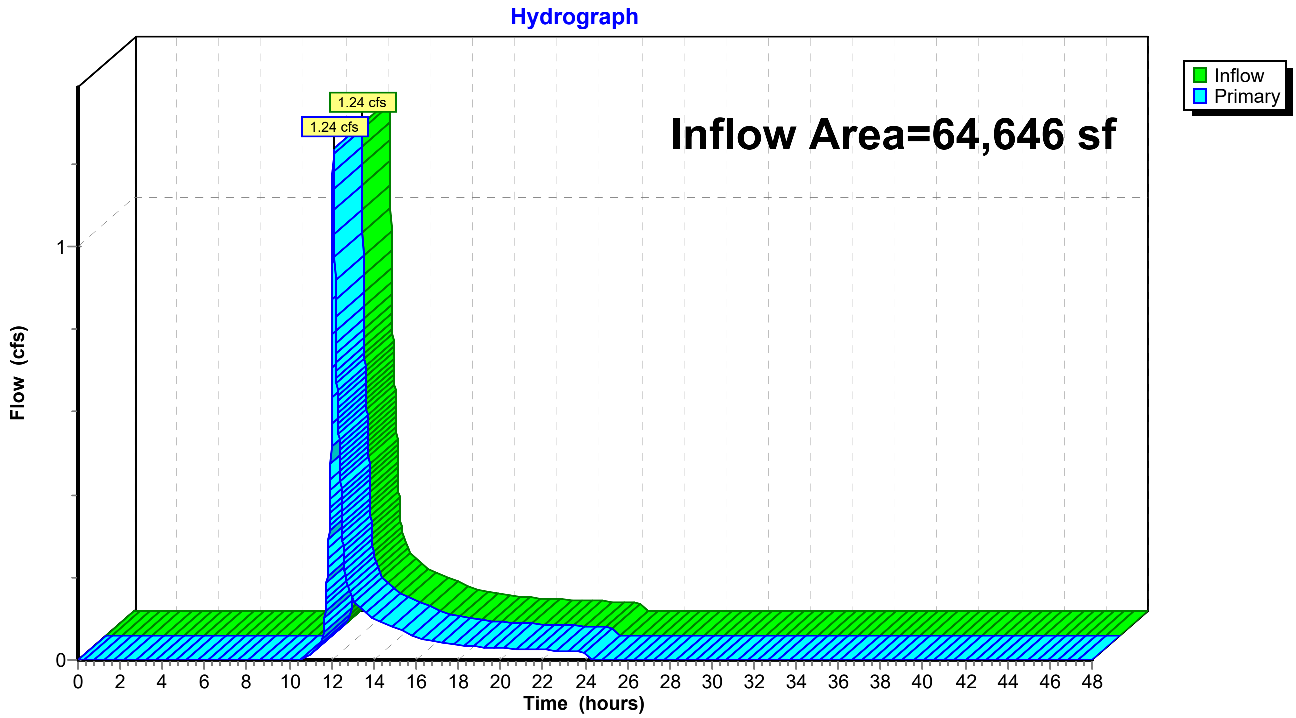


Summary for Link 1L: To Wetland

Inflow Area = 64,646 sf, 35.83% Impervious, Inflow Depth = 0.74" for 100-year event
Inflow = 1.24 cfs @ 12.10 hrs, Volume= 4,007 cf
Primary = 1.24 cfs @ 12.10 hrs, Volume= 4,007 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

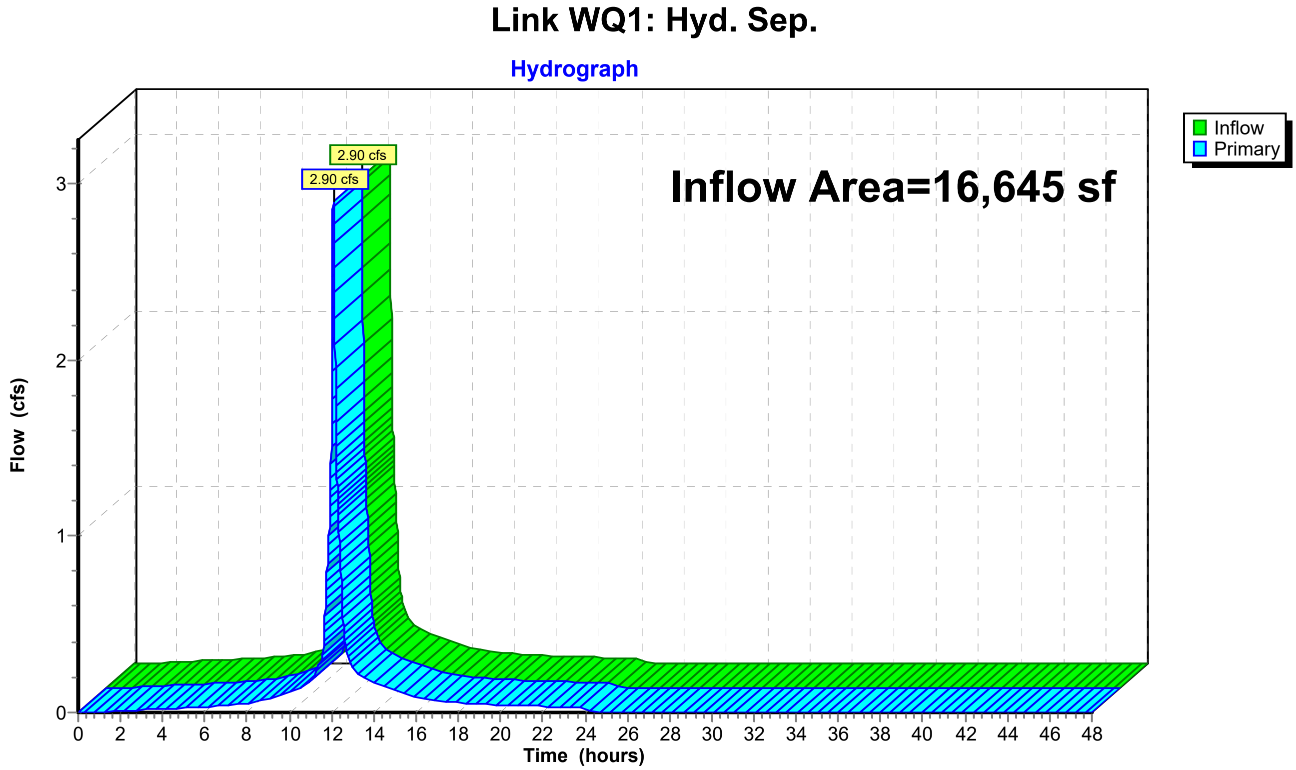
Link 1L: To Wetland



Summary for Link WQ1: Hyd. Sep.

Inflow Area = 16,645 sf, 75.22% Impervious, Inflow Depth = 7.15" for 100-year event
Inflow = 2.90 cfs @ 12.09 hrs, Volume= 9,922 cf
Primary = 2.90 cfs @ 12.09 hrs, Volume= 9,922 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 1P : West Infiltration Basin

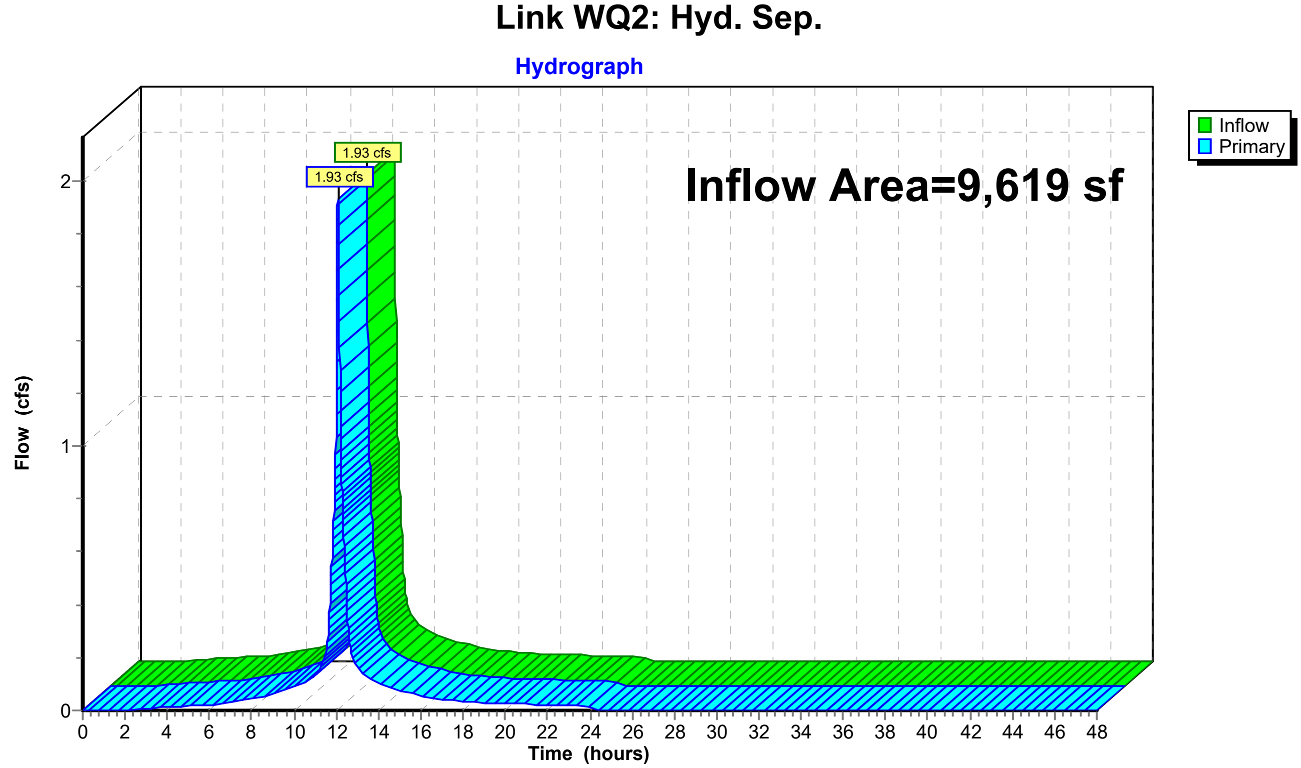
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs



Summary for Link WQ2: Hyd. Sep.

Inflow Area = 9,619 sf, 80.87% Impervious, Inflow Depth = 8.29" for 100-year event
Inflow = 1.93 cfs @ 12.08 hrs, Volume= 6,642 cf
Primary = 1.93 cfs @ 12.08 hrs, Volume= 6,642 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 2P : East Infiltration Basin

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

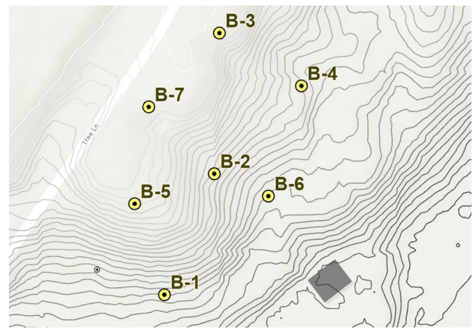


ATTACHMENT D

Geotechnical Investigation

BORING LOG

Project: Well 4 PFAS Treatment System
Location: Tree Lane, Sharon MA
Client: Town of Sharon
Driller: Northern Drilling Service
Drilling Methods: Drive & Wash
Weather: 30°F, rain
Performed By: AET Date: 2/21/23
Checked By: Date:



Boring Locus Map

Boring No: B-1
Location: S corner of proposed building
Approx. Ground Elevation: 217.8'
Approx. Groundwater Elevation: 208.7'
Date/Time of Groundwater Elevation: 2/21 10AM
Datum: NAVD 83
Project No. R245.2103

Depth (feet)	Sample No.	Rec./ Pen. (inch)	Blow Counts per 6 inch	Soil Description	Stratum Change Depth (feet)	Note
0-2	B-1 0-2	5/24	2 1 4 5	0-3" Medium, dark brown, moist, ORGANIC SOIL 3-5" Medium, yellow brown, moist, POORLY GRADED SAND with silt	Soil Sand	1
2-4	N/A	N/A	N/A	No Sample Collected		
4-6	B-1 4-6	7/24	3 14 12 5	0-3" Medium dense, brown, moist, POORLY GRADED GRAVEL 3-7" Very stiff, light brown, moist, SANDY SILT	Gravel Silt	
6-9	N/A	N/A	N/A	No Sample Collected		
9-11	B-1 9-11	11/24	5 8 9 11	Very stiff, light brown, moist, SILT with few fine sand, lightly laminated		
11-14	N/A	N/A	N/A	No Sample Collected		
14-16	B-1 14-16	11/24	6 8 12 10	0-6" Same as above 6-8" Very stiff, light brown, moist, SILT 8-11" Very stiff, light brown, moist, fine SAND WITH SILT	Sand with Silt	
16-18	N/A	N/A	N/A	No Sample Collected		
18-20	B-1 18-20	15/24	5 6 6 6	Stiff, light brown, wet, SILT	Silt	
20-22	B-1 20-22	18/24	9 6 7 7	0-8" Stiff, light brown, wet, SILT with few fine sand 8-18" Stiff, light brown, wet, SILT		

NOTES:

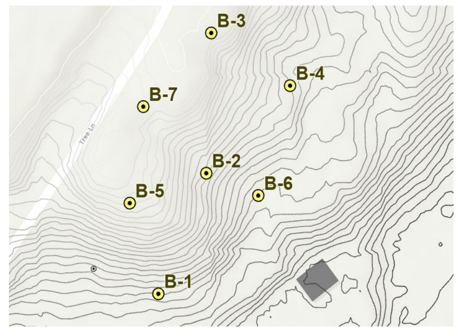
1. Depth to water measured at 9.1ft below ground surface with water level meter

LEGEND

Trace - Approximately <5%	Few - Approximately 6% to 15%	
Little - Approximately 16% to 30%	Some - Approximately 31% to 49%	
0-4 Coarse Soil N Value - Very Loose	5-10 Coarse Soil N Value - Loose	11-29 Coarse Soil N Value - Medium Dense
30-49 Coarse Soil N Value - Dense	>50 Coarse Soil N Value - Very Dense	
0-3 Fine Soil N Value - Very Soft	3-4 Fine Soil N Value - Soft	5-8 Fine Soil N Value - Medium
9-15 Fine Soil N Value - Stiff	16-30 Fine Soil N Value - Very Stiff	>30 Fine Soil N Value - Hard

BORING LOG

Project: Well 4 PFAS Treatment System
Location: Tree Lane, Sharon MA
Client: Town of Sharon
Driller: Northern Drilling Service
Drilling Methods: Drive & Wash
Weather: 30°F, rain
Performed By: AET Date: 2/21/23
Checked By: Date:



Boring Locus Map

Boring No: B-1
Location: S corner of proposed building
Approx. Ground Elevation: 217.8'
Approx. Groundwater Elevation: 208.7'
Date/Time of Groundwater Elevation: 2/21 10AM
Datum: NAVD 83
Project No. R245.2103

Depth (feet)	Sample No.	Rec./ Pen. (inch)	Blow Counts per 6 inch	Soil Description	Stratum Change Depth (feet)	Note
22-24	B-1 22-24	18/24	9 9 12 14	Very stiff, light brown, wet, SILT with trace fine sand	Silt	
24-26	N/A	3/24	10 11 11 7	Same as Above with 1" colored red		
26-28	B-1 26-28	18/24	12 13 14 16	Same as Above		
28-30	B-1 28-30	15/24	8 9 11 10	Same as Above		2

BORING TERMINATED AT A PREDETERMINED DEPTH OF 30FEET

NOTES:

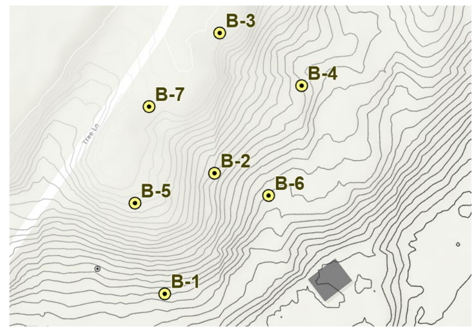
2. Boring ended at a predetermined depth of 30 feet below ground surface

LEGEND

Trace - Approximately <5%	Few - Approximately 6% to 15%	
Little - Approximately 16% to 30%	Some - Approximately 31% to 49%	
0-4 Coarse Soil N Value - Very Loose	5-10 Coarse Soil N Value - Loose	11-29 Coarse Soil N Value - Medium Dense
30-49 Coarse Soil N Value - Dense	>50 Coarse Soil N Value - Very Dense	
0-3 Fine Soil N Value - Very Soft	3-4 Fine Soil N Value - Soft	5-8 Fine Soil N Value - Medium
9-15 Fine Soil N Value - Stiff	16-30 Fine Soil N Value - Very Stiff	>30 Fine Soil N Value - Hard

BORING LOG

Project: Well 4 PFAS Treatment System
Location: Tree Lane, Sharon MA
Client: Town of Sharon
Driller: Northern Drilling Service
Drilling Methods: Drive & Wash
Weather: 30°F, rain
Performed By: AET　　Date: 2/21/23
Checked By:　　Date:



Boring Locus Map

Boring No: B-2
Location: Center of proposed building
Approx. Ground Elevation: 225.1'
Approx. Groundwater Elevation: 200.1'
Date/Time of Groundwater Elevation: 2/24 8AM
Datum: NAVD 83
Project No. R245.2103

Depth (feet)	Sample No.	Rec./ Pen. (inch)	Blow Counts per 6 inch	Soil Description	Stratum Change Depth (feet)	Note
0-2	B-2 0-2	18/24	1 1 1 1	0-8" Very soft, dark brown, moist, ORGANIC SOIL 8-18" Very loose, yellow brown, moist, POORLY GRADED SAND with few gravel and silt	Soil Sand	
2-4	N/A	N/A	N/A	No Sample Collected		
4-6	B-2 4-6	8/24	9 9 7 6	Medium dense, brown, wet, POORLY GRADED GRAVEL with few sand	Gravel	
6-9	N/A	N/A	N/A	No Sample Collected		
9-11	B-2 9-11	11/24	20 18 16 13	Dense, grey, wet, POORLY GRADED GRAVEL with little sand and trace silt		
11-14	N/A	N/A	N/A	No Sample Collected	Sand	
14-16	B-2 14-16	11/24	11 10 11 12	Medium dense, light brown, moist, POORLY GRADED SAND with little silt		
16-18	N/A	N/A	N/A	No Sample Collected	Silty Sand	
18-20	B-2 18-20	10.5/24	12 17 17 16	Dense, light brown, moist, SILTY SAND		
20-22	B-2 20-22	14/24	8 12 12 8	Very stiff, light brown, moist, SANDY SILT	Sandy Silt	

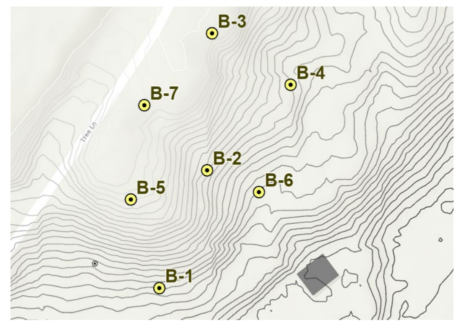
NOTES:

LEGEND

Trace - Approximately <5%	Few - Approximately 6% to 15%	
Little - Approximately 16% to 30%	Some - Approximately 31% to 49%	
0-4 Coarse Soil N Value - Very Loose	5-10 Coarse Soil N Value - Loose	11-29 Coarse Soil N Value - Medium Dense
30-49 Coarse Soil N Value - Dense	>50 Coarse Soil N Value - Very Dense	
0-3 Fine Soil N Value - Very Soft	3-4 Fine Soil N Value - Soft	5-8 Fine Soil N Value - Medium
9-15 Fine Soil N Value - Stiff	16-30 Fine Soil N Value - Very Stiff	>30 Fine Soil N Value - Hard

BORING LOG

Project: Well 4 PFAS Treatment System
Location: Tree Lane, Sharon MA
Client: Town of Sharon
Driller: Northern Drilling Service
Drilling Methods: Drive & Wash
Weather: 30°F, rain
Performed By: AET Date: 2/21/23
Checked By: Date:



Boring Locus Map

Boring No: B-2
Location: Center of proposed building
Approx. Ground Elevation: 225.1'
Approx. Groundwater Elevation: 200.1'
Date/Time of Groundwater Elevation: 2/24 8AM
Datum: NAVD 83
Project No. R245.2103

Depth (feet)	Sample No.	Rec./ Pen. (inch)	Blow Counts per 6 inch	Soil Description	Stratum Change Depth (feet)	Note
22-24	B-2 22-24	12/24	9 12 14 17	Same as Above	Sandy Silt	
24-26	N/A	12/24	8 8 9 7	Same as Above		1
26-28	B-2 26-28	18.5/24	12 6 9 8	Same as Above		
28-30	B-2 28-30	12.5/24	5 6 7 7	Same as Above		2, 3

BORING TERMINATED AT A PREDETERMINED DEPTH OF 30FEET

NOTES:
1. Water level measured 25 feet below ground surface with water level meter in well

2. Boring ended at a predetermined depth of 30 feet below ground surface

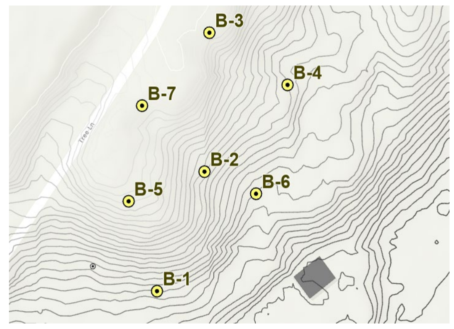
3. Well set in boring with screen from 25 to 30 feet below ground surface

LEGEND

Trace - Approximately <5%	Few - Approximately 6% to 15%	
Little - Approximately 16% to 30%	Some - Approximately 31% to 49%	
0-4 Coarse Soil N Value - Very Loose	5-10 Coarse Soil N Value - Loose	11-29 Coarse Soil N Value - Medium Dense
30-49 Coarse Soil N Value - Dense	>50 Coarse Soil N Value - Very Dense	
0-3 Fine Soil N Value - Very Soft	3-4 Fine Soil N Value - Soft	5-8 Fine Soil N Value - Medium
9-15 Fine Soil N Value - Stiff	16-30 Fine Soil N Value - Very Stiff	>30 Fine Soil N Value - Hard

BORING LOG

Project: Well 4 PFAS Treatment System
Location: Tree Lane, Sharon MA
Client: Town of Sharon
Driller: Northern Drilling Service
Drilling Methods: Drive & Wash
Weather: 30°F, sleeting/snowing
Performed By: AET Date: 2/23/23
Checked By: Date:



Boring Locus Map

Boring No: B-3
Location: N corner of proposed building
Approx. Ground Elevation: 239.5'
Approx. Groundwater Elevation: 222.5'
Date/Time of Groundwater Elevation: 2/23 11AM
Datum: NAVD 83
Project No. R245.2103

Depth (feet)	Sample No.	Rec./ Pen. (inch)	Blow Counts per 6 inch	Soil Description	Stratum Change Depth (feet)	Note
0-2	B-3 0-2	3/24	4 6 6 5	0-2" Stiff, dark brown, moist, ORGANIC SOIL 2-3" Medium dense, yellow/brown, moist, POORLY GRADED SAND, with medium to coarse sand and few silt Rock fragment in tip	Soil	
2-4	N/A	N/A	N/A	No Sample Collected	Sand	
4-6	B-3 4-6	3/24	5 10 12 3	Medium dense, brown, wet, POORLY GRADED SAND, with trace gravel and few silt		
6-9	N/A	N/A	N/A	No Sample Collected		
9-11	B-3 9-11	4/24	14 16 11 8	Same as Above		1
11-14	N/A	N/A	N/A	No Sample Collected		
14-16	B-3 14-16	9/24	5 5 6 6	Same as Above		
16-19	N/A	N/A	N/A	No Sample Collected		2
19-21	B-3 19-21	8/24	5 4 4 6	Same as Above		

NOTES:

1. Boulder encountered. Drilling continued 2ft away

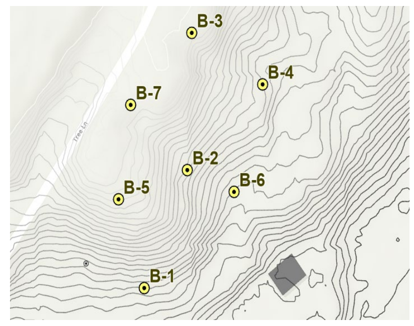
2. Depth to water measured at 17ft below ground surface with water level meter

LEGEND

Trace - Approximately <5%	Few - Approximately 6% to 15%	
Little - Approximately 16% to 30%	Some - Approximately 31% to 49%	
0-4 Coarse Soil N Value - Very Loose	5-10 Coarse Soil N Value - Loose	11-29 Coarse Soil N Value - Medium Dense
30-49 Coarse Soil N Value - Dense	>50 Coarse Soil N Value - Very Dense	
0-3 Fine Soil N Value - Very Soft	3-4 Fine Soil N Value - Soft	5-8 Fine Soil N Value - Medium
9-15 Fine Soil N Value - Stiff	16-30 Fine Soil N Value - Very Stiff	>30 Fine Soil N Value - Hard

BORING LOG

Project: Well 4 PFAS Treatment System
Location: Tree Lane, Sharon MA
Client: Town of Sharon
Driller: Northern Drilling Service
Drilling Methods: Drive & Wash
Weather: 30°F, sleeting/snowing
Performed By: AET Date: 2/23/23
Checked By: Date:



Boring Locus Map

Boring No: B-3
Location: N corner of proposed building
Approx. Ground Elevation: 239.5'
Approx. Groundwater Elevation: 222.5'
Date/Time of Groundwater Elevation: 2/23 11AM
Datum: NAVD 83
Project No. R245.2103

Depth (feet)	Sample No.	Rec./ Pen. (inch)	Blow Counts per 6 inch	Soil Description	Stratum Change Depth (feet)	Note
21-24	N/A	N/A	N/A	No Sample Collected	Sand	
24-26	B-3 24-26	7/24	8 7 9 9	Same as Above		
26-29	N/A	N/A	N/A	No Sample Collected		
29-31	B-3 29-31	5/24	7 8 10 10	Same as Above		
31-34	N/A	N/A	N/A	No Sample Collected		
34-36	B-3 34-36	6/24	10 11 14 15	Very stiff, brown, wet, SILT, with little sand	Silt	
36-39	N/A	N/A	N/A	No Sample Collected		
39-41	B-3 39-41	12/24	5 5 6 8	Stiff, brown, wet, SILT		3

BORING TERMINATED AT A PREDETERMINED DEPTH OF 41FEET

NOTES:

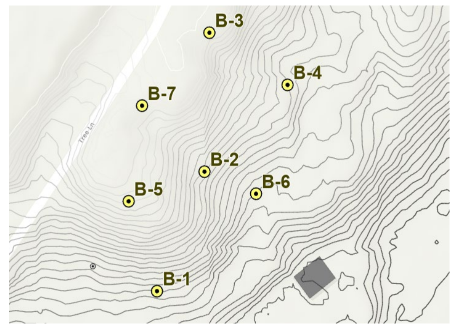
3. Boring ended at a predetermined depth of 41 feet below ground surface

LEGEND

Trace - Approximately <5%	Few - Approximately 6% to 15%	
Little - Approximately 16% to 30%	Some - Approximately 31% to 49%	
0-4 Coarse Soil N Value - Very Loose	5-10 Coarse Soil N Value - Loose	11-29 Coarse Soil N Value - Medium Dense
30-49 Coarse Soil N Value - Dense	>50 Coarse Soil N Value - Very Dense	
0-3 Fine Soil N Value - Very Soft	3-4 Fine Soil N Value - Soft	5-8 Fine Soil N Value - Medium
9-15 Fine Soil N Value - Stiff	16-30 Fine Soil N Value - Very Stiff	>30 Fine Soil N Value - Hard

BORING LOG

Project: Well 4 PFAS Treatment System
Location: Tree Lane, Sharon MA
Client: Town of Sharon
Driller: Northern Drilling Service
Drilling Methods: Drive & Wash
Weather: 30°F, clear
Performed By: AET Date: 2/22/23
Checked By: Date:



Boring Locus Map

Boring No: B-4
Location: NE corner of proposed building
Approx. Ground Elevation: 222.5'
Approx. Groundwater Elevation: 203.5'
Date/Time of Groundwater Elevation: 2/22 1PM
Datum: NAVD 83
Project No. R245.2103

Depth (feet)	Sample No.	Rec./ Pen. (inch)	Blow Counts per 6 inch	Soil Description	Stratum Change Depth (feet)	Note
0-2	B-4 0-2	12/24	1 1 3 4	0-3" Soft, dark brown, moist, ORGANIC SOIL 3-12" Very loose, brown lightening downward, moist, POORLY GRADED SAND with little gravel and little silt	Soil	
2-4	N/A	N/A	N/A	No Sample Collected		
4-6	B-4 4-6	11/24	8 8 6 5	Medium dense, brown, wet, POORLY GRADED SAND, with trace silt and few gravel	Sand	
6-9	N/A	N/A	N/A	No Sample Collected		
9-11	B-4 9-11	3/24	6 5 4 3	Loose, brown, wet, POORLY GRADED GRAVEL, few coarse sand		1
11-14	N/A	N/A	N/A	No Sample Collected	Gravel	
14-16	B-4 14-16	2/24	6 5 5 5	Same as Above		
16-19	N/A	N/A	N/A	No Sample Collected		
19-21	B-4 19-21	2/24	168 50 13 25	Very dense, brown, wet, POORLY GRADED SAND, with some gravel and trace silt	Sand	2 3

NOTES:
1. 2in split spoon had no recovery. Drillers re-pounded a 3in split spoon at same interval to collect sample

2. Depth to water measured at 19.2ft below ground surface with water level meter

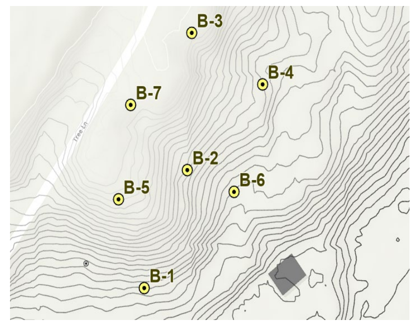
3. Boulder encountered and bent split spoon

LEGEND

Trace - Approximately <5%	Few - Approximately 6% to 15%	
Little - Approximately 16% to 30%	Some - Approximately 31% to 49%	
0-4 Coarse Soil N Value - Very Loose	5-10 Coarse Soil N Value - Loose	11-29 Coarse Soil N Value - Medium Dense
30-49 Coarse Soil N Value - Dense	>50 Coarse Soil N Value - Very Dense	
0-3 Fine Soil N Value - Very Soft	3-4 Fine Soil N Value - Soft	5-8 Fine Soil N Value - Medium
9-15 Fine Soil N Value - Stiff	16-30 Fine Soil N Value - Very Stiff	>30 Fine Soil N Value - Hard

BORING LOG

Project: Well 4 PFAS Treatment System
Location: Tree Lane, Sharon MA
Client: Town of Sharon
Driller: Northern Drilling Service
Drilling Methods: Drive & Wash
Weather: 30°F, clear
Performed By: AET Date: 2/22/23
Checked By: Date:



Boring Locus Map

Boring No: B-4
Location: NE corner of proposed building
Approx. Ground Elevation: 222.5'
Approx. Groundwater Elevation: 203.5'
Date/Time of Groundwater Elevation: 2/22 1PM
Datum: NAVD 83
Project No. R245.2103

Depth (feet)	Sample No.	Rec./ Pen. (inch)	Blow Counts per 6 inch	Soil Description	Stratum Change Depth (feet)	Note
21-23	B-4 21-23	4/24	9 9 12 14	Medium dense, brown, wet, POORLY GRADED SAND, with some gravel and trace silt	Sand	4
23-24	N/A	N/A	N/A	No Sample Collected		
24-26	B-4 24-26	8/24	7 8 7 8	Medium dense, brown, wet, SILTY SAND	Silty Sand	
26-29	N/A	N/A	N/A	No Sample Collected		
29-31	B-4 29-31	11/24	6 7 7 8	Same as Above		
31-34	N/A	N/A	N/A	No Sample Collected		
34-36	B-4 34-36	8/24	8 8 13 16	Same as Above		5
36-39	N/A	N/A	N/A	No Sample Collected		
39-41	B-4 39-41	21/24	4 6 7 10	0-10" Same as Above 10-21" Stiff, brown, wet, SILT	Silt	6

BORING TERMINATED AT A PREDETERMINED DEPTH OF 41FEET

NOTES:
4. Boulder encountered
5. 2in split spoon had no recovery. Drillers re-pounded a 3in split spoon at same interval to collect sample

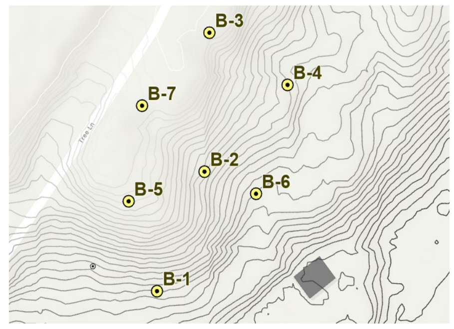
6. Boring ended at a predetermined depth of 41 feet below ground surface

LEGEND

Trace - Approximately <5%	Few - Approximately 6% to 15%	
Little - Approximately 16% to 30%	Some - Approximately 31% to 49%	
0-4 Coarse Soil N Value - Very Loose	5-10 Coarse Soil N Value - Loose	11-29 Coarse Soil N Value - Medium Dense
30-49 Coarse Soil N Value - Dense	>50 Coarse Soil N Value - Very Dense	
0-3 Fine Soil N Value - Very Soft	3-4 Fine Soil N Value - Soft	5-8 Fine Soil N Value - Medium
9-15 Fine Soil N Value - Stiff	16-30 Fine Soil N Value - Very Stiff	>30 Fine Soil N Value - Hard

BORING LOG

Project: Well 4 PFAS Treatment System
Location: Tree Lane, Sharon MA
Client: Town of Sharon
Driller: Northern Drilling Service
Drilling Methods: Drive & Wash
Weather: 30°F, sleeting/snowing
Performed By: AET Date: 2/24/23
Checked By: Date:



Boring Locus Map

Boring No: B-5
Location: SW corner of proposed building
Approx. Ground Elevation: 235.1'
Approx. Groundwater Elevation: 214.1'
Date/Time of Groundwater Elevation: 2/24 10AM
Datum: NAVD 83
Project No. R245.2103

Depth (feet)	Sample No.	Rec./ Pen. (inch)	Blow Counts per 6 inch	Soil Description	Stratum Change Depth (feet)	Note
0-2	B-5 0-2	13/24	2 1 3 7	0-2" Soft, dark brown, moist, ORGANIC SOIL 2-13" Very loose, yellow/brown, moist, POORLY GRADED SAND, with trace gravel, and few silt	Soil / Sand	
2-4	N/A	N/A	N/A	No Sample Collected	Sand	
4-6	B-5 4-6	4/24	10 10 9 5	Medium dense, brown, wet, POORLY GRADED GRAVEL, with little sand and trace silt	Gravel	
6-9	N/A	N/A	N/A	No Sample Collected	Gravel	
9-11	B-5 9-11	5/24	9 6 5 4	Medium dense, brown, wet, POORLY GRADED GRAVEL, with some sand and little silt	Gravel	1
11-14	N/A	N/A	N/A	No Sample Collected	Silt	
14-16	B-5 14-16	8/24	6 7 6 6	Stiff, brown, moist, SILT	Silt	
16-19	N/A	N/A	N/A	No Sample Collected	Silt	
19-21	B-5 19-21	13/24	6 5 7 7	Same as Above	Silt	2

NOTES:

1. 2in split spoon had no recovery. Drillers re-pounded a 3in split spoon at same interval to collect sample

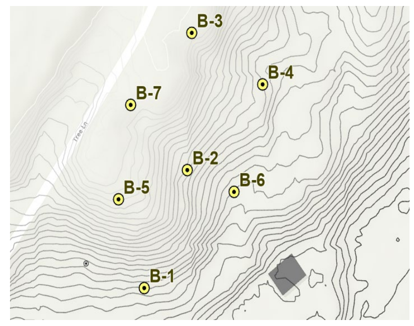
2. Depth to water measured at 21ft below ground surface with water level meter

LEGEND

Trace - Approximately <5%	Few - Approximately 6% to 15%	
Little - Approximately 16% to 30%	Some - Approximately 31% to 49%	
0-4 Coarse Soil N Value - Very Loose	5-10 Coarse Soil N Value - Loose	11-29 Coarse Soil N Value - Medium Dense
30-49 Coarse Soil N Value - Dense	>50 Coarse Soil N Value - Very Dense	
0-3 Fine Soil N Value - Very Soft	3-4 Fine Soil N Value - Soft	5-8 Fine Soil N Value - Medium
9-15 Fine Soil N Value - Stiff	16-30 Fine Soil N Value - Very Stiff	>30 Fine Soil N Value - Hard

BORING LOG

Project: Well 4 PFAS Treatment System
Location: Tree Lane, Sharon MA
Client: Town of Sharon
Driller: Northern Drilling Service
Drilling Methods: Drive & Wash
Weather: 30°F, sleeting/snowing
Performed By: AET Date: 2/24/23
Checked By: Date:



Boring Locus Map

Boring No: B-5
Location: SW corner of proposed building
Approx. Ground Elevation: 235.1'
Approx. Groundwater Elevation: 214.1'
Date/Time of Groundwater Elevation: 2/24 10AM
Datum: NAVD 83
Project No. R245.2103

Depth (feet)	Sample No.	Rec./ Pen. (inch)	Blow Counts per 6 inch	Soil Description	Stratum Change Depth (feet)	Note
21-24	N/A	N/A	N/A	No Sample Collected		
24-26	B-5 24-26	13/24	7 7 9 6	Same as Above, except very stiff		
26-29	N/A	N/A	N/A	No Sample Collected		
29-31	B-5 29-31	14/24	9 10 10 10	Same as Above	Silt	
31-34	N/A	N/A	N/A	No Sample Collected		
34-36	B-5 34-36	18/24	3 3 4 5	Same as Above, except medium		
36-39	N/A	N/A	N/A	No Sample Collected		
39-41	B-5 39-41	19/24	8 11 12 12	Same as Above, except very stiff		3

BORING TERMINATED AT A PREDETERMINED DEPTH OF 41FEET

NOTES:

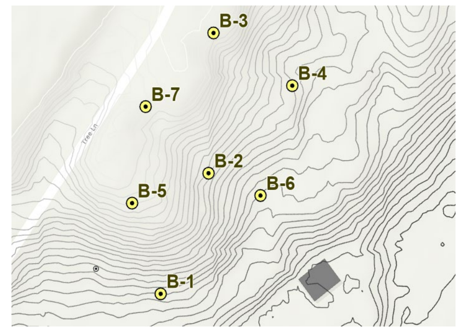
3. Boring ended at a predetermined depth of 41 feet below ground surface

LEGEND

Trace - Approximately <5%	Few - Approximately 6% to 15%	
Little - Approximately 16% to 30%	Some - Approximately 31% to 49%	
0-4 Coarse Soil N Value - Very Loose	5-10 Coarse Soil N Value - Loose	11-29 Coarse Soil N Value - Medium Dense
30-49 Coarse Soil N Value - Dense	>50 Coarse Soil N Value - Very Dense	
0-3 Fine Soil N Value - Very Soft	3-4 Fine Soil N Value - Soft	5-8 Fine Soil N Value - Medium
9-15 Fine Soil N Value - Stiff	16-30 Fine Soil N Value - Very Stiff	>30 Fine Soil N Value - Hard

BORING LOG

Project: Well 4 PFAS Treatment System
Location: Tree Lane, Sharon MA
Client: Town of Sharon
Driller: Northern Drilling Service
Drilling Methods: Drive & Wash
Weather: 30°F, clear
Performed By: AET Date: 2/22/23
Checked By: Date:



Boring Locus Map

Boring No: B-6
Location: Bottom middle of proposed building
Approx. Ground Elevation: 217.5'
Approx. Groundwater Elevation: 208.5'
Date/Time of Groundwater Elevation: 2/22 11AM
Datum: NAVD 83
Project No. R245.2103

Depth (feet)	Sample No.	Rec./ Pen. (inch)	Blow Counts per 6 inch	Soil Description	Stratum Change Depth (feet)	Note
0-2	B-6 0-2	7/24	3 2 3 2	0-4" Medium, dark brown, moist, ORGANIC SOIL	Soil	
				4-7" Loose, yellow/brown, moist, POORLY GRADED SAND with few gravel and trace silt	Sand	
2-4	N/A	N/A	N/A	No Sample Collected		
4-6	B-6 4-6	11/24	4 3 5 14	Medium, yellow/brown, moist, SILT with little fine sand and trace gravel Rock fragment in tip	Silt	
6-9	N/A	N/A	N/A	No Sample Collected		1
9-11	B-6 9-11	2/24	5 3 5 9	Loose, brown, wet, POORLY GRADED GRAVEL with trace medium to coarse sand	Gravel	
11-14	N/A	N/A	N/A	No Sample Collected		
14-16	B-6 14-16	10/24	12 9 9 8	Medium dense, brown, wet, SILTY SAND	Silty Sand	2
16-19	N/A	N/A	N/A	No Sample Collected		
19-21	B-6 19-21	13/24	4 6 7 7	Stiff, brown, wet, SILT	Silt	3

BORING ENDED AT A PREDETERMINED DEPTH OF 21 FEET

NOTES:
1. Depth to water measured at 9ft below ground surface with water level meter
2. 2in split spoon had no recovery. Drillers re-pounded a 3in split spoon at same interval to collect sample

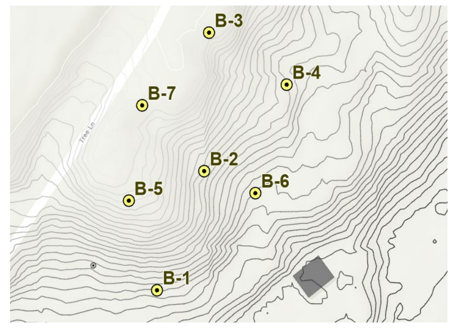
3. Boring ended at a predetermined depth of 21 feet below ground surface

LEGEND

Trace - Approximately <5%	Few - Approximately 6% to 15%	
Little - Approximately 16% to 30%	Some - Approximately 31% to 49%	
0-4 Coarse Soil N Value - Very Loose	5-10 Coarse Soil N Value - Loose	11-29 Coarse Soil N Value - Medium Dense
30-49 Coarse Soil N Value - Dense	>50 Coarse Soil N Value - Very Dense	
0-3 Fine Soil N Value - Very Soft	3-4 Fine Soil N Value - Soft	5-8 Fine Soil N Value - Medium
9-15 Fine Soil N Value - Stiff	16-30 Fine Soil N Value - Very Stiff	>30 Fine Soil N Value - Hard

BORING LOG

Project: Well 4 PFAS Treatment System
Location: Tree Lane, Sharon MA
Client: Town of Sharon
Driller: Northern Drilling Service
Drilling Methods: Drive & Wash
Weather: 30°F, sleeting/snowing
Performed By: AET Date: 2/23/23
Checked By: Date:



Boring Locus Map

Boring No: B-7
Location: Top middle of proposed building
Approx. Ground Elevation: 239.0'
Approx. Groundwater Elevation: Approx. 230.0'
Date/Time of Groundwater Elevation: 2/23 2PM
Datum: NAVD 83
Project No. R245.2103

Depth (feet)	Sample No.	Rec./ Pen. (inch)	Blow Counts per 6 inch	Soil Description	Stratum Change Depth (feet)	Note
0-2	B-7 0-2	13/24	2 2 3 9	0-3" Medium, dark brown, moist, ORGANIC SOIL	Soil	1
				3-13" Medium, yellow/brown, moist, SILT, with trace gravel and trace silt	Silt	
2-4	N/A	N/A	N/A	No Sample Collected		
4-6	B-7 4-6	5/24	9 13 11 5	Medium dense, brown, moist, POORLY GRADED SAND, with few gravel and few silt	Sand	
6-9	N/A	N/A	N/A	No Sample Collected		
9-11	B-7 9-11	5/24	5 5 7 9	Medium dense, brown, moist, POORLY GRADED SAND, with trace gravel, and few silt		
11-14	N/A	N/A	N/A	No Sample Collected	Sandy Silt	
14-16	B-7 14-16	12/24	8 7 6 6	Stiff, brown, moist, SANDY SILT		
16-19	N/A	N/A	N/A	No Sample Collected	Silt	
19-21	B-7 19-21	10/24	6 5 6 6	Stiff, brown, moist, SILT, with few sand		2

BORING ENDED AT A PREDETERMINED DEPTH OF 21 FEET

NOTES:
1. Depth to water measured at 9ft below ground surface with water level meter - however water was added to hole during drilling process which raised the water table. Undisturbed water table is likely lower than 9 feet

2. Boring ended at a predetermined depth of 21 feet below ground surface

LEGEND

Trace - Approximately <5%	Few - Approximately 6% to 15%	
Little - Approximately 16% to 30%	Some - Approximately 31% to 49%	
0-4 Coarse Soil N Value - Very Loose	5-10 Coarse Soil N Value - Loose	11-29 Coarse Soil N Value - Medium Dens
30-49 Coarse Soil N Value - Dense	>50 Coarse Soil N Value - Very Dense	
0-3 Fine Soil N Value - Very Soft	3-4 Fine Soil N Value - Soft	5-8 Fine Soil N Value - Medium
9-15 Fine Soil N Value - Stiff	16-30 Fine Soil N Value - Very Stiff	>30 Fine Soil N Value - Hard

ATTACHMENT E

Test Pit Reports

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

Town of Sharon
Owner Name

Tree Lane
Street Address

Map/Lot #

Sharon
City

MA
State

Zip Code

B. Site Information

1. (Check one) ☐ New Construction ☐ Upgrade

2. Soil Survey

Source

Soil Map Unit

Soil Series

Landform

Soil Limitations

Soil Parent material

3. Surficial Geological Report

Year Published/Source

Map Unit

Description of Geologic Map Unit:

4. Flood Rate Insurance Map Within a regulatory floodway? ☐ Yes ☒ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☐ Yes ☒ No If yes, MassGIS Wetland Data Layer:

Wetland Type

7. Current Water Resource Conditions (USGS):

Month/Day/ Year

Range: ☐ Above Normal ☒ Normal ☐ Below Normal

8. Other references reviewed:
(Zone II, IWPA, Zone A, EEA Data Portal, etc.)

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: 1 (Hole #) | 7/20/23 (Date) | 10AM (Time) | 75, sunny (Weather) | ______ (Latitude) | ______ (Longitude)

1. Land Use: Undeveloped (e.g., woodland, agricultural field, vacant lot, etc.) | Wooded (Vegetation) | None15 (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 15 (Slope (%))

Description of Location: Off Tree Lane, Sharon

2. Soil Parent Material: Sand | ______ (Landform) | ______ (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body ______ feet | Drainage Way ______ feet | Wetlands 150 feet

Property Line >100 feet | Drinking Water Well >100 feet | Other ______ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: ______ Depth to Weeping in Hole ______ Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-9"	A	Loam		None	Cnc : Dpl:						
9-32"	Bw	Loamy Sand		None	Cnc : Dpl:						
32-120"	C	Fine Sand		None	Cnc : Dpl:		0	0	Loose	Dry	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:
No groundwater observed

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: 2 (Hole #) | 7/20/23 (Date) | 10:15 (Time) | 75, Sunny (Weather) | ______ (Latitude) | ______ (Longitude)

1. Land Use: Undeveloped (e.g., woodland, agricultural field, vacant lot, etc.) | Wooded (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 15 (Slope (%))

   Description of Location: Off Tree Lane, Sharon

2. Soil Parent Material: Sand | ______ (Landform) | ______ (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body >100 feet | Drainage Way >100 feet | Wetlands >100 feet

   Property Line >100 feet | Drinking Water Well >100 feet | Other ______ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No   If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No   If yes: ______ Depth to Weeping in Hole ______ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-11"	A	Loam		None	Cnc : Dpl:						
11-20"	Bw	Loamy Sand		None	Cnc : Dpl:						
20-96"	C	Coarse sand and gravel		None	Cnc : Dpl:		75	25	Loose	Dry	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:
Hole collapsed due to loose sand, no groundwtaer observed

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used (Choose one): Obs. Hole #1 Obs. Hole #2

	Obs. Hole #1	Obs. Hole #2
☐ Depth to soil redoximorphic features	_____ inches	_____ inches
☐ Depth to observed standing water in observation hole	_____ inches	_____ inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

Index Well Number ______ Reading Date ______

$S_h = S_c – [S_r \times (OW_c – OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude O, A, and E Horizons)? Upper boundary: 20 inches Lower boundary: 32 inches

c. If no, at what depth was impervious material observed? Upper boundary: ______ inches Lower boundary: ______ inches

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

	9/13/23
Signature of Soil Evaluator	Date
Scott Turner. PE	
Typed or Printed Name of Soil Evaluator / License #	Expiration Date of License
Name of Approving Authority Witness	Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:

ATTACHMENT F

Recharge Calculations

WELLS 2, 3, AND 4 WATER TREATMENT PLANT
15 TREE LANE
SHARON, MA 02067
OCTOBER, 2023

MA DEP Standard 3: Recharge Volume Calculations

Required Recharge Volume - A Soils (0.60 in.)	
Existing Site Impervious Area (ac)	0.157
Proposed Site Impervious Area (ac)	0.627
Proposed Increase in Site Impervious Area (ac)	0.470
Recharge Volume Required (cf)	**1,024**
Required Recharge Volume - B Soils (0.35 in.)	
Existing Site Impervious Area (ac)	0.000
Proposed Site Impervious Area (ac)	0.000
Proposed Increase in Site Impervious Area (ac)	0.000
Recharge Volume Required (cf)	**0**
Required Recharge Volume - C Soils (0.25 in.)	
Existing Site Impervious Area (ac)	0.000
Proposed Site Impervious Area (ac)	0.000
Proposed Increase in Site Impervious Area (ac)	0.000
Recharge Volume Required (cf)	**0**
Required Recharge Volume - D Soils (0.10 in.)	
Existing Site Impervious Area (ac)	0.000
Proposed Site Impervious Area (ac)	0.000
Proposed Increase in Site Impervious Area (ac)	0.000
Recharge Volume Required (cf)	**0**
Total Recharge Volume Required (cf)	**1,024**
Recharge Volume Adjustment Factor	
Impervious Area Directed to Infiltration BMP (ac)	**0.547**
%Impervious Directed to Infiltration BMP	87%
Adjustment Factor	1.15
Adjusted Total Recharge Volume Required (cf)	**1,175**
Provided Recharge Volume*	
P1	8,226
P2	4,449
Total Recharge Volume Provided (cf)	**12,675**

*Volume provided below lowest outlet in cubic feet (cf)

WELLS 2, 3, AND 4 WATER TREATMENT PLANT
15 TREE LANE
SHARON, MA 02067
OCTOBER, 2023

MA DEP Standard 3: Drawdown Time Calculations

Drawdown Time - P1	
Volume below outlet pipe (Rv) (cf)	8,226
Soil Type	Sand - A
Infiltration rate (K)*	8.27
Bottom Area (sf)	875
Drawdown time (Hours)*	13.6

Drawdown Time - P2	
Volume below outlet pipe (Rv) (cf)	4,449
Soil Type	Sand - A
Infiltration rate (K)*	8.27
Bottom Area (sf)	458
Drawdown time (Hours)**	14.1

*Infiltration Rates taken from Rawls Table
**Drawdown time = Rv / (K) x (bottom area)

ATTACHMENT G

Water Quality Calculations

WELLS 2, 3, AND 4 WATER TREATMENT PLANT
15 TREE LANE
SHARON, MA 02067
OCTOBER, 2023

MA DEP Standard 4: Water Quality Volume Calculations

Water Quality Volume Required	
Water Quality Volume runoff (in.)*	1.0
Total Post Development Impervious Area (sf)	27,313
Required Water Quality Volume (cf)	2,276

*Water Quality volume runoff is equal to 1.0 inch of runoff times the total impervious area of the post development project site.

Water Quality Volume Provided*	
P1	8,226
P2	4,449
Total Provided Water Quality Volume (cf)	12,675

*Volume provided below lowest outlet pipe in cubic feet (cf)

WELLS 2, 3, AND 4 WATER TREATMENT PLANT
15 TREE LANE
SHARON, MA 02067
OCTOBER, 2023

MA DEP Standard 4: Water Quality Volume Calculations
Hydrodynamic Separators

Water Quality Volume Runoff (in.)	1.0

Structure Name		WQU-1	WQU-2
Contributing Impervious Area	A (acre)	0.31	0.22
Time of Concentration	Tc (min)	5.0	5.0
Unit Peak Discharge	qu (csm/in)	773	773
Required Water Quality Flow Rate	Q (cfs)	0.38	0.27
Provided Stormceptor Model	STC	450i	450i
Provided Stormceptor Water Quality Flow Rate*	Q (cfs)	0.40	0.40

*Provided water quality flow rates were obtained from the manufacturer's technical literature.

TSS Removal Calculation Worksheet

Location: Deep Sump Catch Basins to WQU 1 to West Infiltration Basin (1P)

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Deep Sump Catch Basins	0.25	1.00	0.25	0.75
Hydrodynamic Separator	0.77	0.75	0.58	0.17
Infiltration Basin	0.80	0.17	0.14	0.03

Total TSS Removal = **97%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: WELLS 2, 3, AND 4 WATER TREATMENT PLANT

Prepared By: Jonathan Hittie, PE

Date: 10/8/2023

*Equals remaining load from previous BMP (E) which enters the BMP

TSS Removal Calculation Worksheet

Location: Deep Sump Catch Basins to WQU 2 to East Infiltration Basin (2P)

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Deep Sump Catch Basins	**0.25**	**1.00**	**0.25**	**0.75**
Hydrodynamic Separator	**0.77**	**0.75**	**0.58**	**0.17**
Infiltration Basin	**0.80**	**0.17**	**0.14**	**0.03**

Total TSS Removal = **97%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **WELLS 2, 3, AND 4 WATER TREATMENT PLANT**

Prepared By: **Jonathan Hittie, PE**

Date: **10/8/2023**

*Equals remaining load from previous BMP (E) which enters the BMP

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

Division of Water Quality
401 East State Street
Post Office Box 029
Trenton, New Jersey 08625-029

BOB MARTIN
Commissioner

September 10, 2010

Scott Perry, CPSWQ
Group Manager
Imbrium Systems
7564 Standish Place, Suite 112
Rockville, MD 20855

Re: On-line Conditional Interim Certification for the Stormceptor STC by Imbrium Systems

Expiration Date: May 15, 2011

Dear Mr. Perry:

This letter is in response to your request for the Stormceptor STC by Imbrium Systems to be used as an on-line device. The Department has reviewed your verification report supplied by NJCAT and has received the required signed statement from the verification entity, manufacturer and testing entity, which listed the protocol requirements and indicated that all of the requirements of the protocol were met or exceeded. Based on a review of the information received the Stormceptor STC by Imbrium Systems can be used as an off-line or on-line device.

Additional information regarding the implementation of the Stormwater Management Rules, N.J.A.C. 7:8, are available at www.njstormwater.org. If you have any questions regarding the above information, please contact Ms. Sandra Blick of my office at (609) 633-7021.

Sincerely,

for B.C.

Barry Chalofsky, P.P., Chief
Bureau of Nonpoint Pollution Control

C: Chron File
Richard Magee, NJCAT
Elizabeth Dragon, BNPC
Marybeth Brenner, NJDEP
Tom Micai, DLUR

Table 5. Mass Balance Results

Operating Rate	Mass In lbs (kg)	Mass Out Lbs (kg)	Mass Balance Performance (%)
25%	6.26 (2.84)	1.59 (0.72)	75%
50%	18.82 (8.54)	4.63 (2.10)	75%
75%	22.36 (10.14)	6.61 (3.00)	70%
100%	24.425 (11.08)	8.95 (4.06)	63%
125%	42.907 (19.46)	11.95 (5.42)	72%

Table 6. NJDEP Weighted Mass Balance Performance

Treatment Operating Rate	NJDEP Weight Factor	Average % Removal: Mass Balance	NJCAT Weighted Avg. Removal:
25%	0.25	75%	18.8%
50%	0.30	75%	22.5%
75%	0.20	70%	14.0%
100%	0.15	63%	9.5%
125%	0.10	72%	7.2%
Total			72%

5.2.3 Field Studies

Based upon the earlier Stormceptor® submittal of field testing, several of the data points were represented of reasonable influent TSS concentration and reasonable flow rates. The Como Park study (Rinker Materials, 2002) met these conditions on two days: August 7, 1998 and August 27, 1998. The influent TSS concentrations were 318 and 196 mg/l, respectively and the peak flow rate was approximately 68% of the operating rate. The TSS removals for these events were 81.4 and 70.4, respectively. The only other relevant data point was collected during the Greenwood Village study (Applied Hydrology Associates, 2003) on August 6, 2002 where influent TSS concentration was 122 mg/l and the peak flow was 23% of the operating rate. This system achieved a 77% TSS removal rate.

These field data generally support the removal efficiency that was measured in the laboratory experiment.

Stormceptor® STC

Stormceptor® is an underground stormwater quality treatment device that is unparalleled in its effectiveness for pollutant capture and retention. With thousands of systems operating worldwide, Stormceptor delivers protection every day in every storm.

With patented technology, optimal treatment occurs by allowing free oil to rise and sediment to settle. The Stormceptor design prohibits scour and release of previously captured pollutants, ensuring superior treatment and protection during even the most extreme storm events.

Stormceptor is very easy to design and provides flexibility under varying site constraints such as tight right-of-ways, zero lot lines and retrofit projects. Design flexibility allows for a cost-effective approach to stormwater treatment. Stormceptor has proven performance backed by the longest record of lab and field verification in the industry.

Tested Performance

- Fine particle capture
- Prevents scour or release
- 95%+ Oil removal

Massachusetts – Water Quality (Q) Flow Rate

Stormceptor STC Model	Inside Diameter (ft)	Typical Depth Below Inlet Pipe Invert [1] (in)	Water Quality Flow Rate Q [2] (cfs)	Peak Conveyance Flow Rate [3] (cfs)	Hydrocarbon Capacity [4] (Gallons)	Maximum Sediment Capacity [4] (ft^3)
STC 450i	4	68	0.40	5.5	86	46
STC 900	6	63	0.89	22	251	89
STC 2400	8	104	1.58	22	840	205
STC 4800	10	140	2.47	22	909	543
STC 7200	12	148	3.56	22	1,059	839
STC 11000	2 x 10	142	4.94	48	2,792	1,086
STC 16000	2 x 12	148	7.12	48	3,055	1,677

[1] Depth Below Pipe Inlet Invert to the Bottom of Base Slab, and Maximum Sediment Capacity can vary to accommodate specific site designs and pollutant loads. Depths can vary to accommodate special designs or site conditions. Contact your local representative for assistance.
[2] Water Quality Flow Rate (Q) is based on 80% annual average TSS removal of the OK110 particle size distribution.
[3] Peak Conveyance Flow Rate is based upon ideal velocity of 3 feet per second and outlet pipe diameters of 18-inch, 36-inch, and 54-inch diameters.
[4] Hydrocarbon & Sediment capacities can be modified to accommodate specific site design requirements, contact your local representative for assistance.

Rinker MATERIALS™
www.rinkerstormceptor.com
Manufacturing Plant: Westfield, MA
Phone: (413) 562-3647

ATTACHMENT H

Operation and Maintenance Plan

MEMORANDUM

Date: October 2023

To Josh Philibert, Conservation Administrator
Town of Sharon Conservation Commission
219 Massagoag Avenue
Sharon, MA 02067

Joseph Garber, Chair
Town of Sharon Zoning Board of Appeals
90 South Main Street
Sharon, MA 02067

From Adam Kran, PE, Senior Project Manager, Environmental Partners

CC Eric Hooper, PE, Superintendent, Department of Public Works, Town of Sharon
Rob Terpstra, Supervisor, Water Division, Town of Sharon
Peter O'Cain, PE, Town Engineer, Town of Sharon
File

Subject **Wells 2, 3, & 4 Water Treatment Plant**
Town of Sharon, Massachusetts
Operation & Maintenance Plan

1. Introduction

This Stormwater Management Operations and Maintenance Plan (O&M Plan) was prepared in accordance with Standard 9 of the Massachusetts Stormwater Management Handbook, the Massachusetts Department of Environmental Protection Stormwater Management Policy, and the Massachusetts Wetlands Protection regulations (310 CMR 10.00). This O&M Plan was prepared for the stormwater management system proposed for the Wells 2, 3, and 4 Water Treatment Plant (WTP) to be located at 15 Tree Lane, Sharon, Massachusetts.

This O&M Plan addresses both construction and post-development stormwater management. The proposed construction period stormwater management system is shown on the Water Treatment

Plant Demolition, Sediment, and Erosion Control Plan. The proposed post-development stormwater management system is also shown on the Water Treatment Plant Grading and Drainage Plan.

This O&M Plan serves to identify the following:

- The Owner of the stormwater management system at the WTP;
- The party responsible for the operation and maintenance of the stormwater management systems;
- The typical/proposed components of both systems;
- The construction details of both systems;
- The routine and non-routine maintenance tasks to be undertaken;
- A schedule for inspection and maintenance of both systems; and
- An inspection and maintenance log template.

2. Ownership and Operation/Maintenance

The WTP and its stormwater management system will be located at 15 Tree Lane, Sharon Massachusetts to the north of the existing Well 4 infrastructure. The proposed WTP is located on an undeveloped and wooded portion of the parcel owned by the Town of Sharon. The existing well and proposed WTP will be operated by the Town of Sharon's Water Division, which is a division of the Town of Sharon Department of Public Works. Therefore, the Town of Sharon is identified as the Owner of the proposed post-development stormwater management system for the WTP.

A General Contractor selected through the public bidding process will be responsible for the operation and maintenance of the construction-period stormwater management system throughout the construction of the new treatment plant. The Town of Sharon Water Division will be charged with the operation and maintenance responsibilities for the proposed post-development stormwater management system.

3. Description of the Proposed Construction Stormwater Management System

The goal of the proposed construction stormwater management system is to prevent off-site (i.e. wetlands) migration of stormwater pollution and/or soil erosion. Generally, the means of accomplishing this goal are achieved through proper planning, soil stabilization, runoff control, and sediment control.

Prior to the start of construction, a system of filter sock and silt fence will be installed between the limits of work and the sensitive resource areas (i.e., bordering vegetated wetlands, and Riverfront Area). During construction, efforts should be made to maximize the preservation of natural vegetation within the limits of work and to minimize the amount of disturbed area. Dust control activities should be implemented to prevent the aerial transport of dust off-site. During clearing, grading, and excavation operations, temporary stormwater runoff diversions should be constructed to divert flow away from sensitive receptors. The stormwater diversions should incorporate sediment traps/barriers and inlet/outlet protection. Stockpiled aggregate materials should be stabilized (poly-sheeting, temporary seeding, etc.) and protected with sediment trap/barriers. The proposed construction period stormwater management system is shown on the Water Treatment Plant Demolition, Sediment, and Erosion Control Plan.

The draft construction Stormwater Pollution Prevention Plan (SWPPP) is provided in the Stormwater Report Attachment K and will be completed with assistance from the selected site contractor prior to construction.

4. Description of the Proposed Post-Development Stormwater Management System

The proposed post-development stormwater management system is comprised of deep sump catch basins, hydrodynamic stormwater separators and stormwater infiltration basins. The proposed post-development Stormwater Management system is shown on the Grading and Drainage Plan.

Deep Sump Catch Basins

Five deep sump catch basins with hoods will be installed to capture, pretreat and convey stormwater runoff from the WTP access road and WTP roof. The catch basins will be located at low points along the access road, at the access road's intersection with Tree Lane, and at the rear of the building along the maintenance walkway.

The catch basin's deep sump captures suspended solids. The hoods preven grease and oil from leaving the catch basins. The drainage network also includes three intermediate drain manholes; stormwater flow will be directed to two hydrodynamic separators.

Hydrodynamic Stormwater Separators

Two hydrodynamic stormwater separators will be installed to provide further treatment of the stormwater runoff. One hydrodynamic separator is located near the access road's intersection with Tree Lane, and the other is located near the parking area.

The hydrodynamic separators will discharge to the infiltration basins via flared end sections.

Stormwater Infiltration Basins

Two stormwater infiltration basins will be constructed to provide infiltration and detention of runoff. The infiltration basins will be located to the east and west of the WTP. The infiltration basins will receive stormwater runoff from the hydrodynamic separators. The infiltration basins are sized to capture and infiltrate the 100-yr storm without overtopping.

5. Maintenance and Inspection Activities

Construction Stormwater Management System

During the course of the construction phase of the project, the Town's General Contractor shall be responsible for the maintenance and inspection of the stormwater management system and erosion and sediment controls.

The Town's General Contractor shall conduct weekly inspections of the stormwater management system and erosion/sediment controls for stability and operation. In addition to the weekly inspections, the General Contractor shall inspect the stormwater system and controls within 24-

hours of any runoff producing precipitation event. Any needed repairs will be made immediately to maintain barriers and controls.

Maintenance will include:

- Annual street sweeping of driveways and parking areas;
- Removing built up sediment at sediment traps and sediment barriers;
- Repairing filter sock that become damaged or displaced;
- Remove built up sediment at truck tracking pads and wheel wash stations;
- Clean or replace gravel/stone when the sediment traps and/or truck pads/washes no longer drain properly;
- Maintain stormwater diversions to control stormwater flow and limit erosion;
- Identify and address locations of stormwater scouring or erosion;
- Practice good site housekeeping (i.e., trash collection, material staging areas, management of aggregate stockpiles);
- All seeded areas will be fertilized and reseeded, as necessary, and mulched according to contract specifications;
- Comply with the conditions of Conservation Commission's Order of Conditions;
- Inspect the site consistent with the requirements of the Construction General Permit and Stormwater Pollution Prevention Plan; and
- Document all inspections and include them with the SWPPP.

Post-Development Stormwater Management System

After receiving a Certificate of Compliance from the Conservation Commission and achieving "Substantial Completion" of construction, the Town will take over all maintenance responsibilities for the post-development stormwater management system.

1. Access roads and parking areas: Sweep annually and on a more frequent basis depending on sanding operations. All resulting sweepings shall be collected and properly disposed of offsite in accordance with MADEP and other applicable requirements.

2. Catch basins, drain manholes, and piping: Inspect four (4) times per year and at the end of foliage and snow-removal seasons. These BMPs shall be cleaned annually twice per year or whenever the depth of deposits is greater than or equal to one half the depth from the bottom of the invert of the lowest pipe in the catch basin or underground system. Accumulated sediment and hydrocarbons present must be removed and properly disposed of offsite in accordance with MADEP and other applicable requirements.

3. Hydrodynamic stormwater separators (Proprietary): Follow manufacturer's recommendations (sample attached).

4. Stormwater Infiltration Basins: Preventative maintenance after every major storm event during the first three (3) months of operation and at least twice per year thereafter. Inspect the basin to ensure proper operation after every major storm event (generally equal or greater to 3.0 inches in 24 hours) for the first three months and monthly thereafter. Mow the basin as needed during the growing season so that grass height is

not less than three (3) inches and does not exceed six (6) inches. Remove brush and woody vegetation annually in the spring or fall; reseed as needed in the spring or fall. The outlet of the basin, if any, shall be inspected for erosion and sedimentation, and rip-rap shall be promptly repaired in the case of erosion. Sediment collecting in the bottom of the basin shall be inspected twice annually, and removal shall commence any time the sediment reaches a depth of six inches anywhere in the basin. Any sediment removed shall be disposed of in accordance with MADEP and other applicable requirements.

6. Maintenance Schedule

Construction Stormwater Management System

During the construction phase, the Town's General Contractor should provide a maintenance and inspection schedule for the stormwater management system for the Town's approval. A typical maintenance and inspection schedule is as follows:

Daily:	Repair stormwater, erosion, and sedimentation controls as necessary;
Weekly:	Inspect stormwater management system for effective and proper operation; repair as necessary;
Run-off Events:	Inspect stormwater management system within 24-hours of event; repair as necessary.

Post-Development Stormwater Management System

Following substantial completion of construction, the Town shall finalize a maintenance and inspection schedule for the stormwater management system and have it on file at the Water Treatment Plant and at the Sharon Water Division office. The proposed maintenance and inspection schedule is as follows:

Daily/Weekly:	Repair stormwater, erosion, and sedimentation controls as necessary; Promote good housekeeping practices in driveways, parking areas, and stormwater management areas;
Monthly:	Inspect stormwater infiltration basins and remove trash;
Quarterly:	Inspect catch basins, drain manholes, piping, and hydrodynamic stormwater separators; Remove sediment twice per year or as needed.
Annual:	Inspect and remove sediment from catch basins, drain manholes, piping, and hydrodynamic stormwater separators; Street sweeping of driveways and parking areas; Remove brush and woody vegetation from infiltration basins and reseed;
As Needed:	Mow the stormwater infiltration basins during the growing season; Replace riprap.

Inspection and maintenance will be performed by Town forces.

7. Maintenance and Inspection Log Form

The following is a typical maintenance and inspection form for the stormwater management system.

Date: ______________________________
Name of Inspector: ______________________________
Organization: ______________________________

Type of Inspection
(Circle One): Daily / Weekly / Monthly / Quarterly / Semi-Annual / Annual

Reason for Inspection
(Circle All that Apply): Routine Maintenance / Routine Inspection / Run-Off Event / Emergency

Stormwater Control:
Condition (Circle One): Excellent / Good / Poor / Not Operational
Notes:
Action Items:

Stormwater Control:
Condition (Circle One): Excellent / Good / Poor / Not Operational
Notes:
Action Items:

Stormwater Control:
Condition (Circle One): Excellent / Good / Poor / Not Operational
Notes:
Action Items:

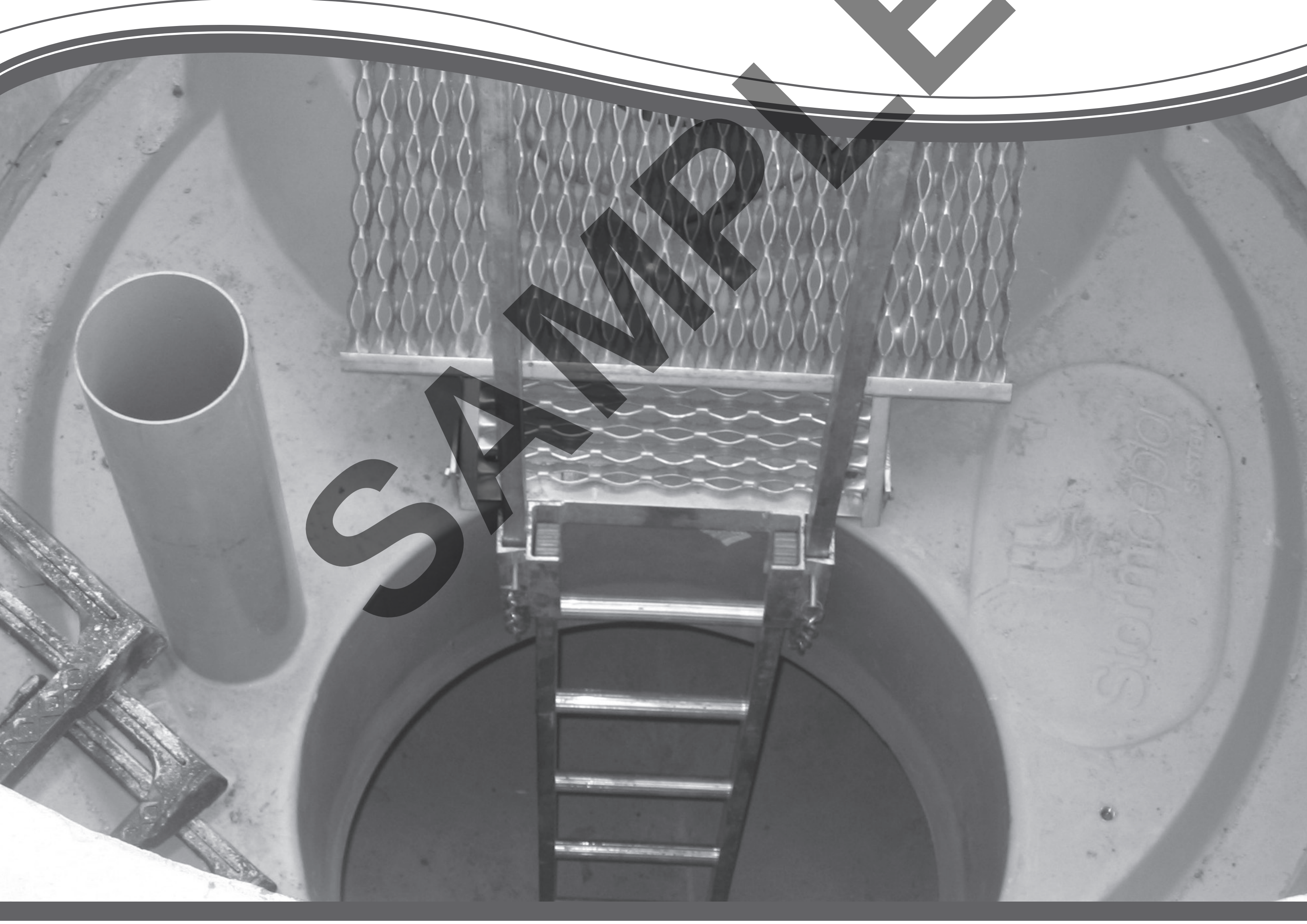
Stormwater Control:
Condition (Circle One): Excellent / Good / Poor / Not Operational
Notes:
Action Items:

Additional Notes:
____
____
____
____
____

Signature:______________________ Date: __________

CONTECH®
ENGINEERED SOLUTIONS

Stormceptor® STC
Operation and Maintenance Guide



Stormceptor® STC

Stormceptor Design Notes

- Only the STC 450i is adaptable to function with a catch basin inlet and/or inline pipes.
- Only the Stormceptor models STC 450i to STC 7200 may accommodate multiple inlet pipes.

Inlet and outlet invert elevation differences are as follows:

Inlet and Outlet Pipe Invert Elevations Differences			
Inlet Pipe Configuration	STC 450i	STC 900 to STC 7200	STC 11000 to STC 16000
Single inlet pipe	3 in. (75 mm)	1 in. (25 mm)	3 in. (75 mm)
Multiple inlet pipes	3 in. (75 mm)	3 in. (75 mm)	Only one inlet pipe.

Maximum inlet and outlet pipe diameters:

Inlet/Outlet Configuration	Inlet Unit STC 450i	In-Line Unit STC 900 to STC 7200	Series* STC 11000 to STC 16000
Straight Through	24 inch (600 mm)	42 inch (1050 mm)	60 inch (1500 mm)
Bend (90 degrees)	18 inch (450 mm)	33 inch (825 mm)	33 inch (825 mm)

- The inlet and in-line Stormceptor units can accommodate turns to a maximum of 90 degrees.
- Minimum distance from top of grade to crown is 2 feet (0.6 m)
- Submerged conditions. A unit is submerged when the standing water elevation at the proposed location of the Stormceptor unit is greater than the outlet invert elevation during zero flow conditions. In these cases, please contact your local Stormceptor representative and provide the following information:
- Top of grade elevation
- Stormceptor inlet and outlet pipe diameters and invert elevations
- Standing water elevation
- Stormceptor head loss, K = 1.3 (for submerged condition, K = 4)

Stormceptor® STC

OPERATION AND MAINTENANCE GUIDE
Table of Content

1. About Stormceptor

The Stormceptor® STC (Standard Treatment Cell) was developed by Imbrium™ Systems to address the growing need to remove and isolate pollution from the storm drain system before it enters the environment. The Stormceptor STC targets hydrocarbons and total suspended solids (TSS) in stormwater runoff. It improves water quality by removing contaminants through the gravitational settling of fine sediments and floatation of hydrocarbons while preventing the re-suspension or scour of previously captured pollutants.

The development of the Stormceptor STC revolutionized stormwater treatment, and created an entirely new category of environmental technology. Protecting thousands of waterways around the world, the Stormceptor System has set the standard for effective stormwater treatment.

1.1. Patent Information

The Stormceptor technology is protected by the following patents:

- Australia Patent No. 693,164 • 693,164 • 707,133 • 729,096 • 779401
- Austrian Patent No. 289647
- Canadian Patent No 2,009,208 •2,137,942 • 2,175,277 • 2,180,305 • 2,180,383 • 2,206,338 • 2,327,768 (Pending)
- China Patent No 1168439
- Denmark DK 711879
- German DE 69534021
- Indonesian Patent No 16688
- Japan Patent No 9-11476 (Pending)
- Korea 10-2000-0026101 (Pending)
- Malaysia Patent No PI9701737 (Pending)
- New Zealand Patent No 314646
- United States Patent No 4,985,148 • 5,498,331 • 5,725,760 • 5,753,115 • 5,849,181 • 6,068,765 • 6,371,690
- Stormceptor OSR Patent Pending • Stormceptor LCS Patent Pending

2. Stormceptor Design Overview

2.1. Design Philosophy

The patented Stormceptor System has been designed to focus on the environmental objective of providing long-term pollution control. The unique and innovative Stormceptor design allows for continuous positive treatment of runoff during all rainfall events, while ensuring that all captured pollutants are retained within the system, even during intense storm events.

An integral part of the Stormceptor design is PCSWMM for Stormceptor - sizing software developed in conjunction with Computational Hydraulics Inc. (CHI) and internationally acclaimed expert, Dr. Bill James. Using local historical rainfall data and continuous simulation modeling, this software allows a Stormceptor unit to be designed for each individual site and the corresponding water quality objectives.

By using PCSWMM for Stormceptor, the Stormceptor System can be designed to remove a wide range of particles (typically from 20 to 2,000 microns), and can also be customized to remove a specific particle size distribution (PSD). The specified PSD should accurately reflect what is in the stormwater runoff to ensure the device is achieving the desired water quality objective. Since stormwater runoff contains small particles (less than 75 microns), it is important to design a treatment system to remove smaller particles in addition to coarse particles.

2.2. Benefits

The Stormceptor System removes free oil and suspended solids from stormwater, preventing spills and non-point source pollution from entering downstream lakes and rivers. The key benefits, capabilities and applications of the Stormceptor System are as follows:

- Provides continuous positive treatment during all rainfall events
- Can be designed to remove over 80% of the annual sediment load
- Removes a wide range of particles
- Can be designed to remove a specific particle size distribution (PSD)
- Captures free oil from stormwater
- Prevents scouring or re-suspension of trapped pollutants
- Pre-treatment to reduce maintenance costs for downstream treatment measures (ponds, swales, detention basins, filters)
- Groundwater recharge protection
- Spills capture and mitigation
- Simple to design and specify
- Designed to your local watershed conditions
- Small footprint to allow for easy retrofit installations
- Easy to maintain (vacuum truck)
- Multiple inlets can connect to a single unit
- Suitable as a bend structure
- Pre-engineered for traffic loading (minimum AASHTO HS-20)
- Minimal elevation drop between inlet and outlet pipes
- Small head loss
- Additional protection provided by an 18" (457 mm) fiberglass skirt below the top of the insert, for the containment of hydrocarbons in the event of a spill.

2.3. Environmental Benefit

Freshwater resources are vital to the health and welfare of their surrounding communities. There is increasing public awareness, government regulations and corporate commitment to reducing the pollution entering our waterways. A major source of this pollution originates from stormwater runoff from urban areas. Rainfall runoff carries oils, sediment and other contaminants from roads and parking lots discharging directly into our streams, lakes and coastal waterways.

The Stormceptor System is designed to isolate contaminants from getting into the natural environment. The Stormceptor technology provides protection for the environment from spills that occur at service stations and vehicle accident sites, while also removing contaminated sediment in runoff that washes from roads and parking lots.

3. Key Operation Features

3.1. Scour Prevention

A key feature of the Stormceptor System is its patented scour prevention technology. This innovation ensures pollutants are captured and retained during all rainfall events, even extreme storms. The Stormceptor System provides continuous positive treatment for all rainfall events, including intense storms. Stormceptor slows incoming runoff, controlling and reducing velocities in the lower chamber to create a non-turbulent environment that promotes free oils and floatable debris to rise and sediment to settle.

The patented scour prevention technology, the fiberglass insert, regulates flows into the lower chamber through a combination of a weir and orifice while diverting high energy flows away through the upper chamber to prevent scouring. Laboratory testing demonstrated no scouring when tested up to 125% of the unit's operating rate, with the unit loaded to 100% sediment capacity (NJDEP, 2005). Second, the depth of the lower chamber ensures the sediment storage zone is adequately separated from the path of flow in the lower chamber to prevent scouring.

3.2. Operational Hydraulic Loading Rate

Designers and regulators need to evaluate the treatment capacity and performance of manufactured stormwater treatment systems. A commonly used parameter is the "operational hydraulic loading rate" which originated as a design methodology for wastewater treatment devices.

Operational hydraulic loading rate may be calculated by dividing the flow rate into a device by its settling area. This represents the critical settling velocity that is the prime determinant to quantify the influent particle size and density captured by the device. PCSWMM for Stormceptor uses a similar parameter that is calculated by dividing the hydraulic detention time in the device by the fall distance of the sediment.

$$v_{SC} = \frac{H}{6_H} = \frac{Q}{A_S}$$

Where:

v_{SC} = critical settling velocity, ft/s (m/s)

H = tank depth, ft (m)

$Ø_H$ = hydraulic detention time, ft/s (m/s)

Q = volumetric flow rate, ft3/s (m3/s)

A_S = surface area, ft^2 (m^2)

(Tchobanoglous, G. and Schroeder, E.D. 1987. Water Quality. Addison Wesley.)

Unlike designing typical wastewater devices, stormwater systems are designed for highly variable flow rates including intense peak flows. PCSWMM for Stormceptor incorporates all of the flows into its calculations, ensuring that the operational hydraulic loading rate is considered not only for one flow rate, but for all flows including extreme events.

3.3. Double Wall Containment

The Stormceptor System was conceived as a pollution identifier to assist with identifying illicit discharges. The fiberglass insert has a continuous skirt that lines the concrete barrel wall for a depth of 18 inches (457 mm) that provides double wall containment for hydrocarbons storage. This protective barrier ensures that toxic floatables do not migrate through the concrete wall into the surrounding soils.

4. Stormceptor Product Line

4.1. Stormceptor Models

A summary of Stormceptor models and capacities are listed in Table 1.

Table 1. Stormceptor Models

Stormceptor Model	Total Storage Volume U.S. Gal (L)	Hydrocarbon Storage Capacity U.S. Gal (L)	Maximum Sediment Capacity ft^3 (L)
STC 450i	470 (1,780)	86 (330)	46 (1,302)
STC 900	952 (3,600)	251 (950)	89 (2,520)
STC 1200	1,234 (4,670)	251 (950)	127 (3,596)
STC 1800	1,833 (6,940)	251 (950)	207 (5,861)
STC 2400	2,462 (9,320)	840 (3,180)	205 (5,805)
STC 3600	3,715 (1,406)	840 (3,180)	373 (10,562)
STC 4800	5,059 (1,950)	909 (3,440)	543 (15,376)
STC 6000	6,136 (23,230)	909 (3,440)	687 (19,453)
STC 7200	7,420 (28,090)	1,059 (4,010)	839 (23,757)
STC 11000	11,194 (42,370)	2,797 (10, 590)	1,086 (30,752)
STC 13000	13,348 (50,530)	2,797 (10, 590)	1,374 (38,907)
STC 16000	15,918 (60,260)	3,055 (11, 560)	1,677 (47,487)

NOTE: Storage volumes may vary slightly from region to region. For detailed information, contact your local Stormceptor representative.

4.2. Inline Stormceptor

The Inline Stormceptor, Figure 1, is the standard design for most stormwater treatment applications. The patented Stormceptor design allows the Inline unit to maintain continuous positive treatment of total suspended solids (TSS) year-round, regardless of flow rate. The Inline Stormceptor is composed of a precast concrete tank with a fiberglass insert situated at the invert of the storm sewer pipe, creating an upper chamber above the insert and a lower chamber below the insert.

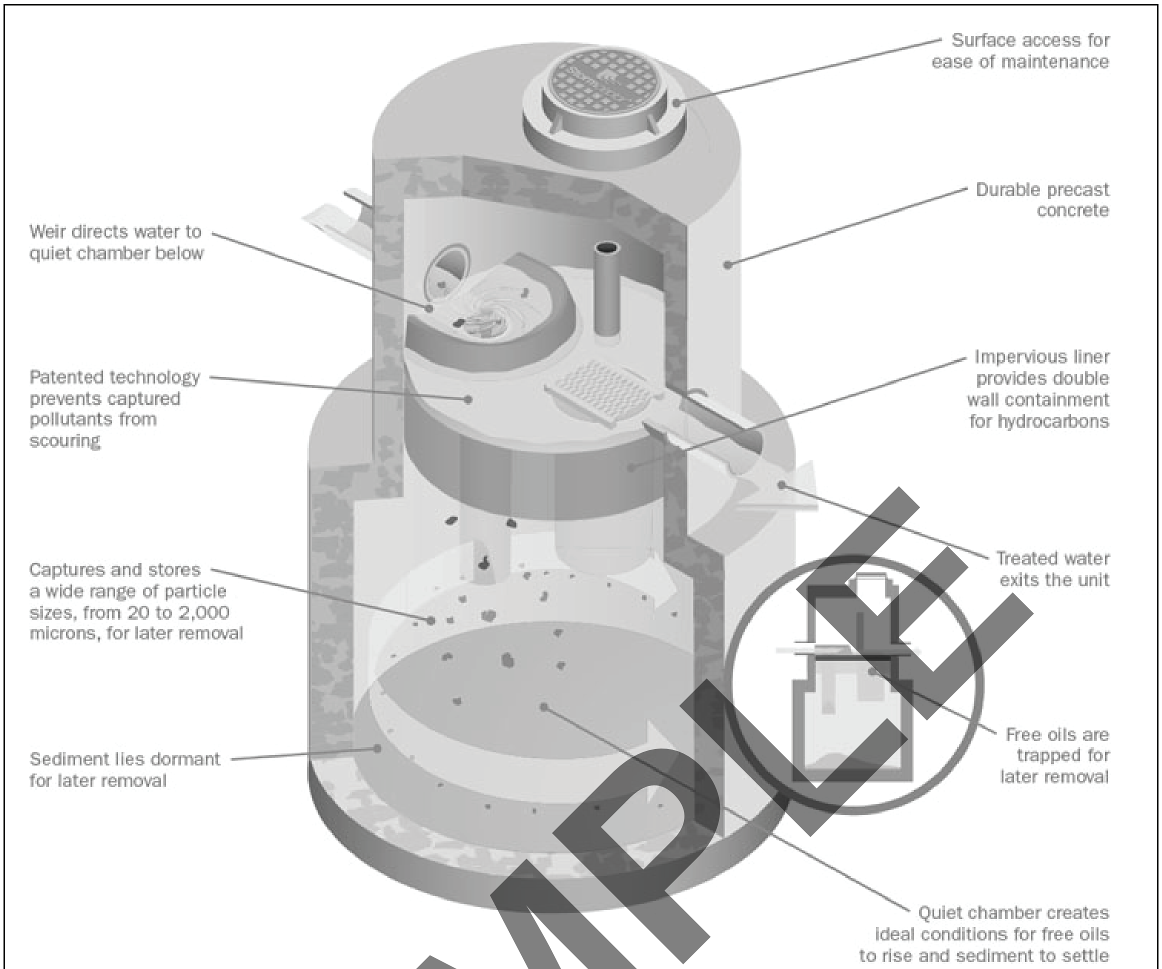


Figure 1. Inline Stormceptor

Operation

As water flows into the Stormceptor unit, it is slowed and directed to the lower chamber by a weir and drop tee. The stormwater enters the lower chamber, a non-turbulent environment, allowing free oils to rise and sediment to settle. The oil is captured underneath the fiberglass insert and shielded from exposure to the concrete walls by a fiberglass skirt. After the pollutants separate, treated water continues up a riser pipe, and exits the lower chamber on the downstream side of the weir before leaving the unit. During high flow events, the Stormceptor System's patented scour prevention technology ensures continuous pollutant removal and prevents re-suspension of previously captured pollutants.

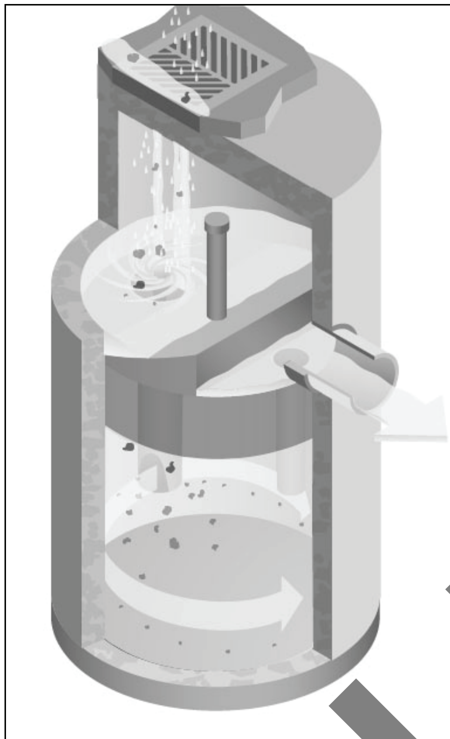


Figure 2. Inlet Stormceptor

4.3. Inlet Stormceptor

The Inlet Stormceptor System, Figure 2, was designed to provide protection for parking lots, loading bays, gas stations and other spill-prone areas. The Inlet Stormceptor is designed to remove sediment from stormwater introduced through a grated inlet, a storm sewer pipe, or both.

The Inlet Stormceptor design operates in the same manner as the Inline unit, providing continuous positive treatment, and ensuring that captured material is not re-suspended.

4.4. Series Stormceptor

Designed to treat larger drainage areas, the Series Stormceptor System, Figure 3, consists of two adjacent Stormceptor models that function in parallel. This design eliminates the need for additional structures and piping to reduce installation costs.

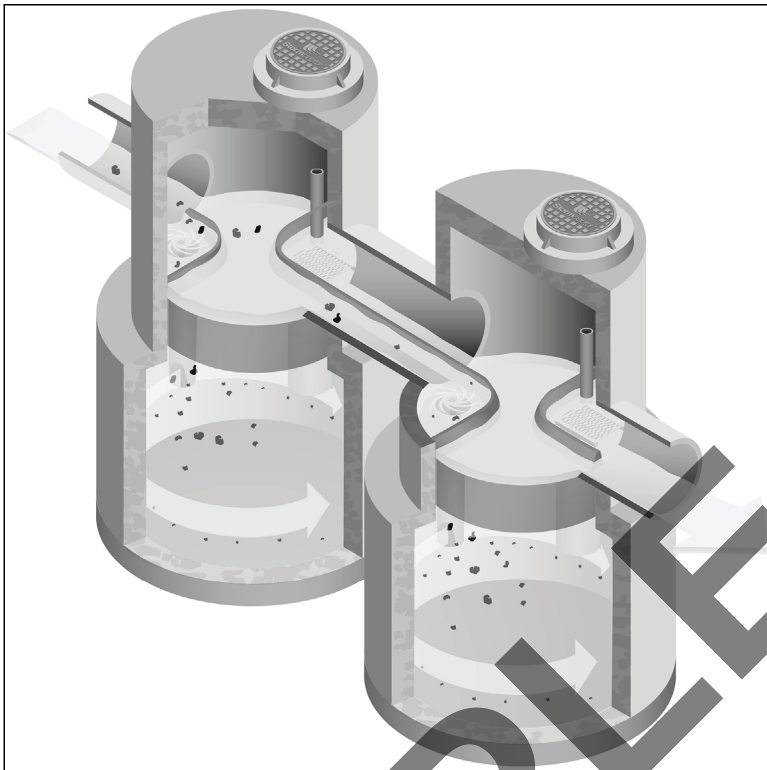


Figure 3. Series System

The Series Stormceptor design operates in the same manner as the Inline unit, providing continuous positive treatment, and ensuring that captured material is not re-suspended.

5. Sizing the Stormceptor System

The Stormceptor System is a versatile product that can be used for many different aspects of water quality improvement. While addressing these needs, there are conditions that the designer needs to be aware of in order to size the Stormceptor model to meet the demands of each individual site in an efficient and cost-effective manner.

PCSWMM for Stormceptor is the support tool used for identifying the appropriate Stormceptor model. In order to size a unit, it is recommended the user follow the seven design steps in the program. The steps are as follows:

STEP 1 – Project Details

The first step prior to sizing the Stormceptor System is to clearly identify the water quality objective for the development. It is recommended that a level of annual sediment (TSS) removal be identified and defined by a particle size distribution.

STEP 2 – Site Details

Identify the site development by the drainage area and the level of imperviousness. It is recommended that imperviousness be calculated based on the actual area of imperviousness based on paved surfaces, sidewalks and rooftops.

STEP 3 – Upstream Attenuation

The Stormceptor System is designed as a water quality device and is sometimes used in conjunction with onsite water quantity control devices such as ponds or underground detention systems. When possible, a greater benefit is typically achieved when installing a Stormceptor unit upstream of a detention facility. By placing the Stormceptor unit upstream of a detention structure, a benefit of less maintenance of the detention facility is realized.

STEP 4 – Particle Size Distribution

It is critical that the PSD be defined as part of the water quality objective. PSD is critical for the design of treatment system for a unit process of gravity settling and governs the size of a treatment system. A range of particle sizes has been provided and it is recommended that clays and silt-sized particles be considered in addition to sand and gravel-sized particles. Options and sample PSDs are provided in PCSWMM for Stormceptor. The default particle size distribution is the Fine Distribution, Table 2, option.

Table 2. Fine Distribution

Particle Size	Distribution	Specific Gravity
20	20%	1.3
60	20%	1.8
150	20%	2.2
400	20%	2.65
2000	20%	2.65

If the objective is the long-term removal of 80% of the total suspended solids on a given site, the PSD should be representative of the expected sediment on the site. For example, a system designed to remove 80% of coarse particles (greater than 75 microns) would provide relatively poor removal efficiency of finer particles that may be naturally prevalent in runoff from the site.

Since the small particle fraction contributes a disproportionately large amount of the total available particle surface area for pollutant adsorption, a system designed primarily for coarse particle capture will compromise water quality objectives.

STEP 5 – Rainfall Records

Local historical rainfall has been acquired from the U.S. National Oceanic and Atmospheric Administration, Environment Canada and regulatory agencies across North America. The rainfall data provided with PCSMM for Stormceptor provides an accurate estimation of small storm hydrology by modeling actual historical storm events including duration, intensities and peaks.

STEP 6 – Summary

At this point, the program may be executed to predict the level of TSS removal from the site. Once the simulation has completed, a table shall be generated identifying the TSS removal of each Stormceptor unit.

STEP 7 – Sizing Summary

Performance estimates of all Stormceptor units for the given site parameters will be displayed in a tabular format. The unit that meets the water quality objective, identified in Step 1, will be highlighted.

5.1. PCSWMM for Stormceptor

The Stormceptor System has been developed in conjunction with PCSWMM for Stormceptor as a technological solution to achieve water quality goals. Together, these two innovations model, simulate, predict and calculate the water quality objectives desired by a design engineer for TSS removal.

PCSWMM for Stormceptor is a proprietary sizing program which uses site specific inputs to a computer model to simulate sediment accumulation, hydrology and long-term total suspended solids removal. The model has been calibrated to field monitoring results from Stormceptor units that have been monitored in North America. The sizing methodology can be described by three processes:

1. Determination of real time hydrology
2. Buildup and wash off of TSS from impervious land areas
3. TSS transport through the Stormceptor (settling and discharge). The use of a calibrated model is the preferred method for sizing stormwater quality structures for the following reasons:
   » The hydrology of the local area is properly and accurately incorporated in the sizing (distribution of flows, flow rate ranges and peaks, back-to-back storms, inter-event times)
   » The distribution of TSS with the hydrology is properly and accurately considered in the sizing
   » Particle size distribution is properly considered in the sizing
   » The sizing can be optimized for TSS removal
   » The cost benefit of alternate TSS removal criteria can be easily assessed
   » The program assesses the performance of all Stormceptor models. Sizing may be selected based on a specific water quality outcome or based on the Maximum Extent Practicable

For more information regarding PCSWMM for Stormceptor, contact your local Stormceptor representative, or visit www.imbriumsystems.com to download a free copy of the program.

5.2. Sediment Loading Characteristics

The way in which sediment is transferred to stormwater can have a considerable effect on which type of system is implemented. On typical impervious surfaces (e.g. parking lots) sediment will build over time and wash off with the next rainfall. When rainfall patterns are examined, a short intense storm will have a higher concentration of sediment than a long slow drizzle. Together with rainfall data representing the site's typical rainfall patterns, sediment loading characteristics play a part in the correct sizing of a stormwater quality device.

Typical Sites

For standard site design of the Stormceptor System, PCSWMM for Stormceptor is utilized to accurately assess the unit's performance. As an integral part of the product's design, the program can be used to meet local requirements for total suspended solid removal. Typical installations of manufactured stormwater treatment devices would occur on areas such as paved parking lots or paved roads. These are considered "stable" surfaces which have non – erodible surfaces.

Unstable Sites

While standard sites consist of stable concrete or asphalt surfaces, sites such as gravel parking lots, or maintenance yards with stockpiles of sediment would be classified as "unstable". These types of sites do not exhibit first flush characteristics, are highly erodible and exhibit atypical sediment loading characteristics and must therefore be sized more carefully. Contact your local Stormceptor representative for assistance in selecting a proper unit sized for such unstable sites.

6. Spill Controls

When considering the removal of total petroleum hydrocarbons (TPH) from a storm sewer system there are two functions of the system: oil removal, and spill capture.

'Oil Removal' describes the capture of the minute volumes of free oil mobilized from impervious surfaces. In this instance relatively low concentrations, volumes and flow rates are considered. While the Stormceptor unit will still provide an appreciable oil removal function during higher flow events and/or with higher TPH concentrations, desired effluent limits may be exceeded under these conditions.

‘Spill Capture’ describes a manner of TPH removal more appropriate to recovery of a relatively high volume of a single phase deleterious liquid that is introduced to the storm sewer system over a relatively short duration. The two design criteria involved when considering this manner of introduction are overall volume and the specific gravity of the material. A standard Stormceptor unit will be able to capture and retain a maximum spill volume and a minimum specific gravity.

For spill characteristics that fall outside these limits, unit modifications are required. Contact your local Stormceptor Representative for more information.

One of the key features of the Stormceptor technology is its ability to capture and retain spills. While the standard Stormceptor System provides excellent protection for spill control, there are additional options to enhance spill protection if desired.

6.1. Oil Level Alarm

The oil level alarm is an electronic monitoring system designed to trigger a visual and audible alarm when a pre-set level of oil is reached within the lower chamber. As a standard, the oil

level alarm is designed to trigger at approximately 85% of the unit’s available depth level for oil capture. The feature acts as a safeguard against spills caused by exceeding the oil storage capacity of the separator and eliminates the need for manual oil level inspection.

The oil level alarm installed on the Stormceptor insert is illustrated in Figure 4.

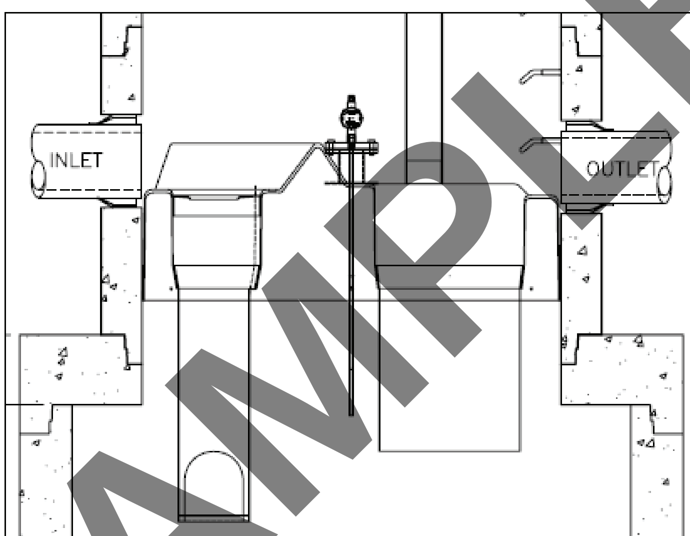


Figure 4. Oil level alarm

6.2. Increased Volume Storage Capacity

The Stormceptor unit may be modified to store a greater spill volume than is typically available. Under such a scenario, instead of installing a larger than required unit, modifications can be made to the recommended Stormceptor model to accommodate larger volumes. Contact your local Stormceptor representative for additional information and assistance for modifications.

7. Stormceptor Options

The Stormceptor System allows flexibility to incorporate to existing and new storm drainage infrastructure. The following section identifies considerations that should be reviewed when installing the system into a drainage network. For conditions that fall outside of the recommendations in this section, please contact your local Stormceptor representative for further guidance.

7.1. Installation Depth Minimum Cover

The minimum distance from the top of grade to the crown of the inlet pipe is 24 inches (600 mm). For situations that have a lower minimum distance, contact your local Stormceptor representative.

7.2. Maximum Inlet and Outlet Pipe Diameters

Maximum inlet and outlet pipe diameters are illustrated in Figure 5. Contact your local Stormceptor representative for larger pipe diameters

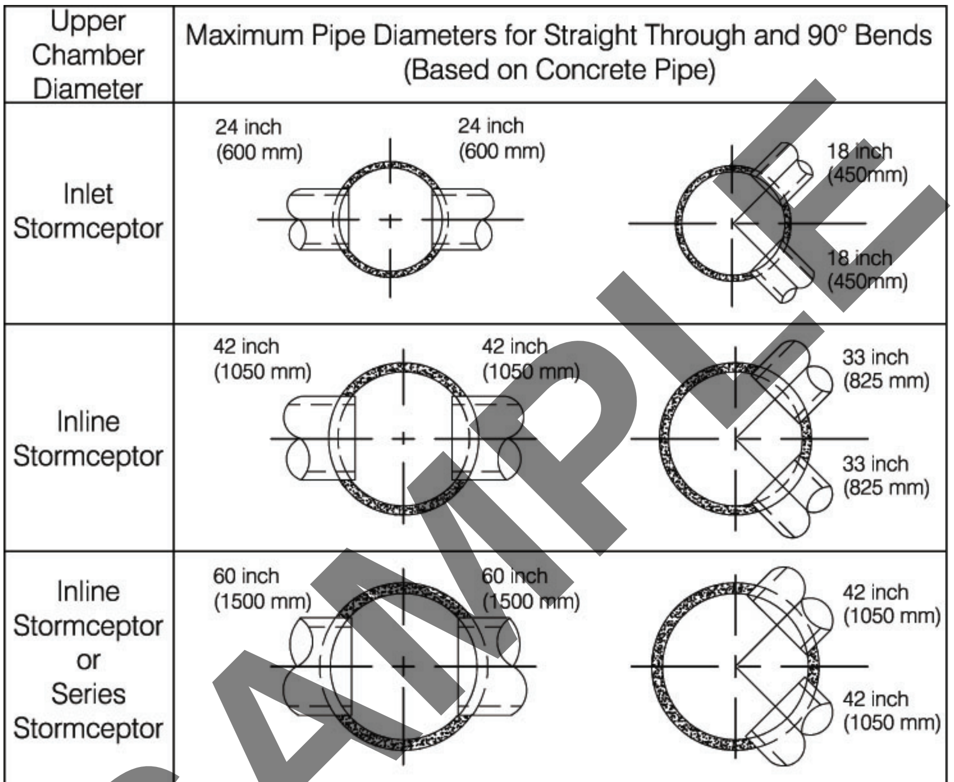


Figure 5. Maximum pipe diameters for straight through and bend applications

*The bend should only be incorporated into the second structure (downstream structure) of the Series Stormceptor System

7.3. Bends

The Stormceptor System can be used to change horizontal alignment in the storm drain network up to a maximum of 90 degrees. Figure 6 illustrates the typical bend situations of the Stormceptor System. Bends should only be applied to the second structure (downstream structure) of the Series Stormceptor System.

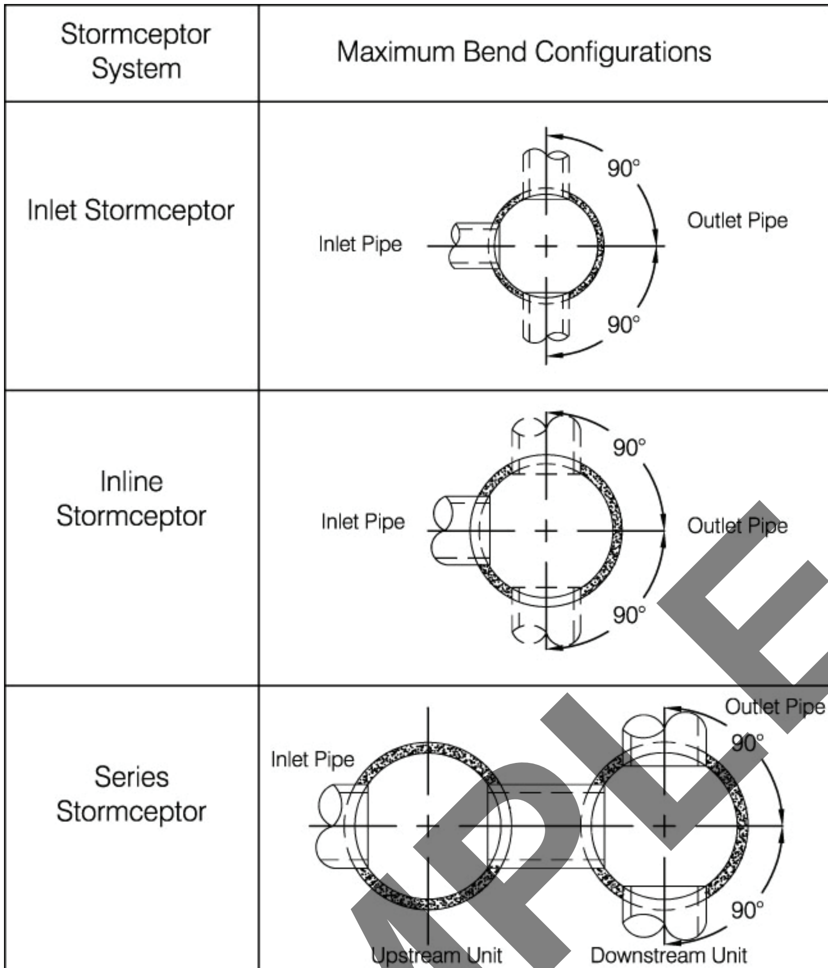


Figure 6. Maximum bend angles

7.4. Multiple Inlet Pipes

The Inlet and Inline Stormceptor System can accommodate two or more inlet pipes. The maximum number of inlet pipes that can be accommodated into a Stormceptor unit is a function of the number, alignment and diameter of the pipes and its effects on the structural integrity of the precast concrete. When multiple inlet pipes are used for new developments, each inlet pipe shall have an invert elevation 3 inches (75 mm) higher than the outlet pipe invert elevation.

7.5. Inlet/Outlet Pipe Invert Elevations

Recommended inlet and outlet pipe invert differences are listed in Table 3.

Table 3. Recommended Drops Between Inlet and Outlet Pipe Inverts

Number of Inlet Pipes	Inlet System	In-Line System	Series System
1	3 inches (75 mm)	1 inch (25 mm)	3 inches (75 mm)
>1	3 inches (75 mm)	3 inches (75 mm)	Not Applicable

7.6. Shallow Stormceptor

In cases where there may be restrictions to the depth of burial of storm sewer systems. In this situation, for selected Stormceptor models, the lower chamber components may be increased in diameter to reduce the overall depth of excavation required.

7.7. Customized Live Load

The Stormceptor system is typically designed for local highway truck loading (AASHTO HS- 20). When the project requires live loads greater than HS-20, the Stormceptor System may be customized structurally for a pre-specified live load. Contact your local Stormceptor representative for customized loading conditions.

7.8. Pre-treatment

The Stormceptor System may be sized to remove sediment and for spills control in conjunction with other stormwater BMPs to meet the water quality objective. For pretreatment applications, the Stormceptor System should be the first unit in a treatment train. The benefits of pre-treatment include the extension of the operational life (extension of maintenance frequency) of large stormwater management facilities, prevention of spills and lower total life- cycle maintenance cost.

7.9. Head loss

The head loss through the Stormceptor System is similar to a 60 degree bend at a manhole. The K value for calculating minor losses is approximately 1.3 (minor loss = k*1.3v2/2g).

However, when a Submerged modification is applied to a Stormceptor unit, the corresponding K value is 4.

7.10. Submerged

The Submerged modification, Figure 7, allows the Stormceptor System to operate in submerged or partially submerged storm sewers. This configuration can be installed on all models of the Stormceptor System by modifying the fiberglass insert. A customized weir height and a secondary drop tee are added.

Submerged instances are defined as standing water in the storm drain system during zero flow conditions. In these instances, the following information is necessary for the proper design and application of submerged modifications:

- Stormceptor top of grade elevation
- Stormceptor outlet pipe invert elevation
- Standing water elevation

Figure 7. Submerged Stormceptor

8. Comparing Technologies

Designers have many choices available to achieve water quality goals in the treatment of stormwater runoff. Since many alternatives are available for use in stormwater quality treatment it is important to consider how to make an appropriate comparison between "approved alternatives". The following is a guide to assist with the accurate comparison of differing technologies and performance claims.

8.1. Particle Size Distribution (PSD)

The most sensitive parameter to the design of a stormwater quality device is the selection of the design particle size. While it is recommended that the actual particle size distribution (PSD) for sites be measured prior to sizing, alternative values for particle size should be selected to represent what is likely to occur naturally on the site. A reasonable estimate of a particle size distribution likely to be found on parking lots or other impervious surfaces should consist of a wide range of particles such as 20 microns to 2,000 microns (Ontario MOE, 1994).

There is no absolute right particle size distribution or specific gravity and the user is cautioned to review the site location, characteristics, material handling practices and regulatory requirements when selecting a particle size distribution. When comparing technologies, designs using different PSDs will result in incomparable TSS removal efficiencies. The PSD of the TSS removed needs to be standard between two products to allow for an accurate comparison.

8.2. Scour Prevention

In order to accurately predict the performance of a manufactured treatment device, there must be confidence that it will perform under all conditions. Since rainfall patterns cannot be predicted, stormwater quality devices placed in storm sewer systems must be able to withstand extreme events, and ensure that all pollutants previously captured are retained in the system.

In order to have confidence in a system's performance under extreme conditions, independent validation of scour prevention is essential when examining different technologies. Lack of independent verification of scour prevention should make a designer wary of accepting any product's performance claims.

8.3. Hydraulics

Full scale laboratory testing has been used to confirm the hydraulics of the Stormceptor System. Results of lab testing have been used to physically design the Stormceptor System and the sewer pipes entering and leaving the unit. Key benefits of Stormceptor are:

- Low head loss (typical k value of 1.3)
- Minimal inlet/outlet invert elevation drop across the structure
- Use as a bend structure
- Accommodates multiple inlets

The adaptability of the treatment device to the storm sewer design infrastructure can affect the overall performance and cost of the site.

8.4. Hydrology

Stormwater quality treatment technologies need to perform under varying climatic conditions. These can vary from long low intensity rainfall to short duration, high intensity storms. Since a treatment device is expected to perform under all these conditions, it makes sense that any system's design should accommodate those conditions as well.

Long-term continuous simulation evaluates the performance of a technology under the varying conditions expected in the climate of the subject site. Single, peak event design does not provide this information and is not equivalent to long-term simulation. Designers should request long-term simulation performance to ensure the technology can meet the long-term water quality objective.

9. Testing

The Stormceptor System has been the most widely monitored stormwater treatment technology in the world. Performance verification and monitoring programs are completed to the strictest standards and integrity. Since its introduction in 1990, numerous independent field tests and studies detailing the effectiveness of the Stormceptor System have been completed.

- Coventry University, UK – 97% removal of oil, 83% removal of sand and 73% removal of peat
- National Water Research Institute, Canada, - scaled testing for the development of the Stormceptor System identifying both TSS removal and scour prevention.
- New Jersey TARP Program – full scale testing of an STC 900 demonstrating 75% TSS removal of particles from 1 to 1000 microns. Scour testing completed demonstrated that the system does not scour. The New Jersey Department of Environmental Protection was followed.
- City of Indianapolis – full scale testing of an STC 900 demonstrating over 80% TSS removal of particles from 50 microns to 300 microns at 130% of the unit's operating rate. Scour testing completed demonstrated that the system does not scour.
- Westwood Massachusetts (1997), demonstrated >80% TSS removal
- Como Park (1997), demonstrated 76% TSS removal
- Ontario MOE SWAMP Program – 57% removal of 1 to 25 micron particles
- Laval Quebec – 50% removal of 1 to 25 micron particles

10. Installation

The installation of the concrete Stormceptor should conform in general to state highway, or local specifications for the installation of manholes. Selected sections of a general specification that are applicable are summarized in the following sections.

10.1. Excavation

Excavation for the installation of the Stormceptor should conform to state highway, or local specifications. Topsoil removed during the excavation for the Stormceptor should be stockpiled in designated areas and should not be mixed with subsoil or other materials.

Topsoil stockpiles and the general site preparation for the installation of the Stormceptor should conform to state highway or local specifications.

The Stormceptor should not be installed on frozen ground. Excavation should extend a minimum of 12 inches (300 mm) from the precast concrete surfaces plus an allowance for shoring and bracing where required. If the bottom of the excavation provides an unsuitable foundation additional excavation may be required.

In areas with a high water table, continuous dewatering may be required to ensure that the excavation is stable and free of water.

10.2. Backfilling

Backfill material should conform to state highway or local specifications. Backfill material should be placed in uniform layers not exceeding 12 inches (300mm) in depth and compacted to state highway or local specifications.

11. Stormceptor Construction Sequence

The concrete Stormceptor is installed in sections in the following sequence:

1. Aggregate base
2. Base slab
3. Lower chamber sections
4. Upper chamber section with fiberglass insert
5. Connect inlet and outlet pipes
6. Assembly of fiberglass insert components (drop tee, riser pipe, oil cleanout port and orifice plate
7. Remainder of upper chamber
8. Frame and access cover

The precast base should be placed level at the specified grade. The entire base should be in contact with the underlying compacted granular material. Subsequent sections, complete with joint seals, should be installed in accordance with the precast concrete manufacturer's recommendations.

Adjustment of the Stormceptor can be performed by lifting the upper sections free of the excavated area, re-leveling the base and re-installing the sections. Damaged sections and gaskets should be repaired or replaced as necessary. Once the Stormceptor has been constructed, any lift holes must be plugged with mortar.

12. Maintenance

12.1. Health and Safety

The Stormceptor System has been designed considering safety first. It is recommended that confined space entry protocols be followed if entry to the unit is required. In addition, the fiberglass insert has the following health and safety features:

- Designed to withstand the weight of personnel
- A safety grate is located over the 24 inch (600 mm) riser pipe opening
- Ladder rungs can be provided for entry into the unit, if required

12.2. Maintenance Procedures

Maintenance of the Stormceptor system is performed using vacuum trucks. No entry into the unit is required for maintenance (in most cases). The vacuum service industry is a well- established sector of the service industry that cleans underground tanks, sewers and catch basins. Costs to clean a Stormceptor will vary based on the size of unit and transportation distances.

The need for maintenance can be determined easily by inspecting the unit from the surface. The depth of oil in the unit can be determined by inserting a dipstick in the oil inspection/cleanout port.

Similarly, the depth of sediment can be measured from the surface without entry into the Stormceptor via a dipstick tube equipped with a ball valve. This tube would be inserted through the riser pipe. Maintenance should be performed once the sediment depth exceeds the guideline values provided in the Table 4.

Table 4. Sediment Depths Indicating Required Servicing*

Particle Size	Specific Gravity
Model	Sediment Depth inches (mm)
450i	8 (200)
900	8 (200)
1200	10 (250)
1800	15 (381)
2400	12 (300)
3600	17 (430)
4800	15 (380)
6000	18 (460)
7200	15 (381)
11000	17 (380)
13000	20 (500)
16000	17 (380)
* based on 15% of the Stormceptor unit’s total storage	

Although annual servicing is recommended, the frequency of maintenance may need to be increased or reduced based on local conditions (i.e. if the unit is filling up with sediment more quickly than projected, maintenance may be required semi-annually; conversely once the site has stabilized maintenance may only be required every two or three years).

Oil is removed through the oil inspection/cleanout port and sediment is removed through the riser pipe. Alternatively oil could be removed from the 24 inches (600 mm) opening if water is removed from the lower chamber to lower the oil level below the drop pipes.

The following procedures should be taken when cleaning out Stormceptor:

1. Check for oil through the oil cleanout port
2. Remove any oil separately using a small portable pump
3. Decant the water from the unit to the sanitary sewer, if permitted by the local regulating authority, or into a separate containment tank
4. Remove the sludge from the bottom of the unit using the vacuum truck
5. Re-fill Stormceptor with water where required by the local jurisdiction

12.3. Submerged Stormceptor

Careful attention should be paid to maintenance of the Submerged Stormceptor System. In cases where the storm drain system is submerged, there is a requirement to plug both the inlet and outlet pipes to economically clean out the unit.

12.4. Hydrocarbon Spills

The Stormceptor is often installed in areas where the potential for spills is great. The Stormceptor System should be cleaned immediately after a spill occurs by a licensed liquid waste hauler.

12.5. Disposal

Requirements for the disposal of material from the Stormceptor System are similar to that of any other stormwater Best Management Practice (BMP) where permitted. Disposal options for the sediment may range from disposal in a sanitary trunk sewer upstream of a sewage treatment plant, to disposal in a sanitary landfill site. Petroleum waste products collected in the Stormceptor (free oil/chemical/fuel spills) should be removed by a licensed waste management company.

12.6. Oil Sheens

With a steady influx of water with high concentrations of oil, a sheen may be noticeable at the Stormceptor outlet. This may occur because a rainbow or sheen can be seen at very small oil concentrations (<10 mg/L). Stormceptor will remove over 98% of all free oil spills from storm sewer systems for dry weather or frequently occurring runoff events.

The appearance of a sheen at the outlet with high influent oil concentrations does not mean the unit is not working to this level of removal. In addition, if the influent oil is emulsified the Stormceptor will not be able to remove it. The Stormceptor is designed for free oil removal and not emulsified conditions.

SUPPORT

Drawings and specifications are available at www.ContechES.com.

Site-specific design support is available from our engineers.

Contech Engineered Solutions LLC provides site solutions for the civil engineering industry. Contech's portfolio includes bridges, drainage, sanitary sewer, stormwater, and earth stabilization products. For information, visit www.ContechES.com or call 800.338.1122

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ATTACHMENT I

Long Term Pollution Prevention Plan

ENVIRONMENTAL PARTNERS
— An Apex Company —

MEMORANDUM

Date: October 2023

To Josh Philibert, Conservation Administrator
Town of Sharon Conservation Commission
219 Massagoag Avenue
Sharon, MA 02067

Joseph Garber, Chair
Town of Sharon Zoning Board of Appeals
90 South Main Street
Sharon, MA 02067

From Adam Kran, PE, Senior Project Manager, Environmental Partners

CC Eric Hooper, PE, Superintendent, Department of Public Works, Town of Sharon
Rob Terpstra, Supervisor, Water Division, Town of Sharon
Peter O'Cain, PE, Town Engineer, Town of Sharon
File

Subject **Wells 2, 3, & 4 Water Treatment Plant**
Town of Sharon, Massachusetts
Long Term Pollution Prevention Plan

Long Term Pollution Prevention Plan

This Long Term Pollution Prevention Plan (LTPPP) was prepared in accordance with Standard 4 of the Massachusetts Stormwater Management Handbook, the Massachusetts Department of Environmental Protection Stormwater Management Policy and the Massachusetts Wetlands Protection regulations (310 CMR 10.00). This LTPPP was prepared to address long term pollution prevention measures at the Wells 2, 3, & 4 Water Treatment Plant to be located on 15 Tree Lane, Sharon, Massachusetts.

Good Housekeeping Practices

All chemicals will be stored inside. All treatment plant operators/employees will be instructed in the importance of not spilling fluids and chemicals onto the ground. All areas in the immediate vicinity of the treatment plant will be kept clean of excess debris.

Storing Materials and Waste Products

All chemicals and treatment process waste will be stored in adequately sized containers within the treatment plant. All treatment waste products will be disposed of in a legal manner at a state licensed recycling center or landfill. General trash generated by treatment plant personnel will be collected in standard trash barrels and disposed of at the public waste facility. The power transformer and generator will be provided with a manufacturer included secondary containment curb for oil containment.

Vehicle Washing

Due to the nature of the site, very few vehicles will be accessing the site on a daily basis. Vehicle washing will not be allowed on the property to limit any potential contamination.

Routine Inspections and Maintenance of Stormwater BMPs

Refer to Stormwater Operation and Maintenance Plan within Attachment H of this Stormwater Report.

Spill Prevention

The following measures will be taken at all loading/ unloading areas:

1. Chemical fill panels located along the exterior of the building shall be maintained. A heavy duty polypropylene chemical spill pillow shall be stored on site for each chemical fill panel.

2. A significant amount of debris can accumulate outside uncovered loading/unloading areas. Sweep these surfaces frequently to remove material that could otherwise be washed off by stormwater. Sweep outside areas that are covered for a period of time by containers, logs, or other material after the areas are cleared.

3. Place drip pans, or other appropriate temporary containment device, at locations where leaks or spills may occur, such as hose connections, hose reels, and filler nozzles. Always use drip pans when making and breaking connections. Check loading and unloading equipment such as valves, pumps, flanges, and connections regularly for leaks and repair as needed.

Pet Waste Management

The proposed gate is designed to limit pedestrian access to the site and surrounding areas, so pet waste is not expected to be a concern.

Proper Management of Deicing Chemicals

Road salt is not typically used in the vicinity of water supplies to minimize the potential for contamination.

Provisions for Prevention of Illicit Discharges

There are no illicit discharges associated with the project.

ATTACHMENT J

Illicit Discharge Statement

ENVIRONMENTAL PARTNERS
— An Apex Company —

October 18, 2023

Josh Philibert, Conservation Administrator
Town of Sharon Conservation Commission
219 Massagoag Avenue
Sharon, MA 02067

Joseph Garber, Chair
Town of Sharon Zoning Board of Appeals
90 South Main Street
Sharon, MA 02067

RE: **Wells 2, 3, & 4 Water Treatment Plant**
Town of Sharon, Massachusetts
Illicit Discharge Statement

Dear Mr. Philibert and Mr. Garber,

Environmental Partners (EP), on behalf of the Town of Sharon Department of Public Works is submitting this Illicit Discharge Compliance Statement for the above referenced project.

This Illicit Discharge Compliance Statement is to verify that to the best of our knowledge, no illicit discharges exist on the site presently, nor will they after the proposed Water Treatment Plant has been completed. The stormwater management system includes catch basins, gravity piping, and stormwater infiltration basins. Stormwater is not directed to the municipal system.

Please refer to the permitting design plans prepared by EP, which includes a Water Treatment Plant Grading and Drainage Plan showing the proposed stormwater management system. The Long Term Pollution Prevention Plan within the Stormwater Report contains measures to prevent illicit discharges.

Sincerely,

Environmental Partners Group, LLC
Adam Kran, PE
Senior Project Manager | Associate
O: 617.657.0273
E: ask@envpartners.com

ATTACHMENT K

Stormwater Pollution Prevention Plan (SWPPP)

DRAFT STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

WELLS 2, 3 AND 4 WATER TREATMENT PLANT

Sharon, Massachusetts
Norfolk County

October 2023

ENVIRONMENTAL PARTNERS
— An Apex Company —

DRAFT

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LIST OF APPENDICES

SECTION 1 CONTACT INFORMATION/RESPONSIBLE PARTIES

Section 1.1 OPERATOR(S)/SUBCONTRACTOR(S)

Names of Operator(s)/Subcontractor(s) to be included when construction contract is awarded.

Operator(s):

Company:					
Name:					
Address:					
City:		State:	MA	Zip Code:	
Telephone:			Email:		

Company:					
Name:					
Address:					
City:		State:	MA	Zip Code:	
Telephone:			Email:		

Subcontractor(s):

Company:					
Name:					
Address:					
City:		State:	MA	Zip Code:	
Telephone:			Email:		

Company:					
Name:					
Address:					
City:		State:	MA	Zip Code:	
Telephone:			Email:		

24-Hour Emergency Contact:

Company:					
Name:					
Address:					
City:		State:	MA	Zip Code:	
Telephone:			Email:		

Section 1.2 STORMWATER TEAM

Stormwater Team to be included when construction contract is awarded.

DRAFT SWPPP Preparer:

Company:	Environmental Partners				
Name:	Adam Kran				
Address:	1900 Crown Colony Dr Unit 402				
City:	Quincy	State:	MA	Zip Code:	02169
Telephone:	617-657-0200		Email:	ask@envpartners.com	

Final SWPPP Preparer:

Company:					
Name:					
Address:					
City:		State:	MA	Zip Code:	
Telephone:			Email:		

Inspection Personnel:

Inspection Personnel to be included when construction contract is awarded.

Company:					
Name:					
Address:					
City:		State:	MA	Zip Code:	
Telephone:			Email:		

Corrective Actions Personnel:

Corrective Actions Personnel shall be the Contractor after the contract is awarded.

Company:					
Name:					
Address:					
City:		State:	MA	Zip Code:	
Telephone:			Email:		

SECTION 2 SITE EVALUATION, ASSESSMENT, AND PLANNING

Section 2.1 PROJECT/SITE INFORMATION

Project Name and Address

Project/Site Name: Wells 2, 3 and 4 Water Treatment Plant

Street/Location: 15 Tree Lane

City: Sharon

State: Massachusetts

ZIP Code: 02067

County or Similar Government Division: Norfolk

Project Latitude/Longitude

Latitude: 42.073635 ° N
(decimal degrees)

Longitude: 71.110492 ° W
(decimal degrees)

Latitude/longitude data source: ☐ Map ☐ GPS ☒ Other (please specify): Google Earth

Horizontal Reference Datum: ☐ NAD 27 ☐ NAD 83 ☒ WGS 84

Additional Site Information

Is your site located on Indian country lands, or on a property of religious or cultural significance to an Indian Tribe? ☐ Yes ☒ No

Section 2.2 DISCHARGE INFORMATION

Does your project/site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)?

☐ Yes ☒ No

Are there any waters of the U.S. within 50 feet of your project's earth disturbances?

☐ Yes ☒ No

Table 1: Discharge Receiving Waters

Point of Discharge ID	Name of receiving water that receives stormwater discharge:	Is the receiving water impaired (on the CWA 303(d) list)?	If yes, list the pollutants that are causing the impairment:	Has a TMDL been completed for this receiving waterbody?	If yes, list TMDL Name and ID:	Pollutant(s) for which there is a TMDL:	Is this receiving water designated as a Tier 2, Tier 2.5, or Tier 3 water?	If yes, specify which Tier (2, 2.5, or 3)?
[001]	Beaver Brook	☐ Yes ☒ No	NA	☐ Yes ☒ No	NA	NA	☐ Yes ☒ No	NA

Section 2.3 NATURE OF CONSTRUCTION ACTIVITIES

General Description of Project

The proposed project includes constructing a new water treatment plant building with associated landscape, access road, parking, utility, and stormwater improvements.

Business days and hours for the project: Monday – Friday

Size of Construction Site

Size of Property	7.6 acres
Total Area Expected to be Disturbed by Construction Activities	1.07 acres
Maximum Area Expected to be Disturbed at Any One Time, Including On-site and Off-site Construction Support Areas	1.07 acres

Type of Construction Site *(check all that apply):*

☐ Single-Family Residential ☐ Multi-Family Residential ☐ Commercial ☐ Industrial

☐ Institutional ☐ Highway or Road ☒ Utility ☐ Other ___________________________

Will you be discharging dewatering water from your site? ☒ Yes ☐ No

If yes, will you be discharging dewatering water from a current or former Federal or State remediation site? ☐ Yes ☒ No

Pollutant-Generating Activities

List and describe all pollutant-generating activities and indicate for each activity the associated pollutants or pollutant constituents that could be discharged in stormwater from your construction site. Take into account where potential spills and leaks could occur that contribute pollutants to stormwater discharges, and any known hazardous or toxic substances, such as PCBs and asbestos, that will be disturbed during construction.

Pollutant generating activities will be consistent with general land development projects. This includes the demolition of an existing buildings on site, disturbance of wooded areas, installation of utilities and stormwater management systems, construction of a 7,500 sf Water Treatment Plant building, construction of new parking areas and site driveways, and general landscaping.

Pollutant-Generating Activity (e.g., paving operations; concrete, paint, and stucco washout and waste disposal; solid waste storage and disposal; and dewatering operations)	**Pollutants or Pollutant Constituents** (e.g., sediment, fertilizers, pesticides, paints, caulks, sealants, fluorescent light ballasts, contaminated substrates, solvents, fuels)
Paving Operations	Fuels, paints

Pollutant-Generating Activity (e.g., paving operations; concrete, paint, and stucco washout and waste disposal; solid waste storage and disposal; and dewatering operations)	**Pollutants or Pollutant Constituents** (e.g., sediment, fertilizers, pesticides, paints, caulks, sealants, fluorescent light ballasts, contaminated substrates, solvents, fuels)
Construction Sediment	Sediment
Construction Debris	Sediment, fuels

Construction Support Activities

Describe any construction support activities for the project (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas):

There will be very limited storage of construction supplies and materials on-site.

Contact Information for Construction Support Activities

Contact information for construction support activities will be identified after project is bid for construction.

Section 2.4 SEQUENCE OF ESTIMATED DATES OF CONSTRUCTION ACTIVITIES

Estimated Schedule

Estimated Start Date of Construction Activities for this Phase	Summer 2024
Estimated End Date of Construction Activities for this Phase	Fall 2026
Estimated Date(s) of Application of Stabilization Measures for Areas of the Site Required to be Stabilized	Summer 2024
Estimated Date(s) when Stormwater Controls will be Removed	Fall 2026

Section 2.5 AUTHORIZED NON-STORMWATER DISCHARGES

List of Authorized Non-Stormwater Discharges Present at the Site

Authorized Non-Stormwater Discharge	Will or May Occur at Your Site?
Discharges from emergency fire-fighting activities	☒ Yes ☐ No
Fire hydrant flushing	☒ Yes ☐ No
Landscape irrigation	☒ Yes ☐ No
Water used to wash vehicles and equipment	☒ Yes ☐ No
Water used to control dust	☒ Yes ☐ No
Potable water including uncontaminated water line flushing	☒ Yes ☐ No
External building washdown (soaps/solvents are not used and external surfaces do not contain hazardous substances)	☐ Yes ☒ No
Pavement wash waters	☒ Yes ☐ No
Uncontaminated air conditioning or compressor condensate	☒ Yes ☐ No
Uncontaminated, non-turbid discharges of ground water or spring water	☒ Yes ☐ No
Foundation or footing drains	☒ Yes ☐ No
Uncontaminated construction dewatering water	☒ Yes ☐ No

Section 2.6 SITE MAPS

Project Design Drawings are included in Appendix A of this report.

SECTION 3 DOCUMENTATION OF COMPLIANCE WITH OTHER FEDERAL REQUIREMENTS

Section 3.1 ENDANGERED SPECIES PROTECTION

This project is eligible for coverage under Criterion C under this permit.

☒ **Criterion C**: Discharges not likely to result in any short- or long-term adverse effects to ESA-listed species and/or designates critical habitats. ESA-listed species and/or designated critical habitat(s) under the jurisdiction of the USFWS and/or NMFS are likely to occur in or near your site's "action area," and you certify to EPA that your site's discharges and discharge-related activities are not likely to result in any short- or long-term adverse effects to ESA-listed threatened or endangered species and/or designated critical habitat. This certification may include consideration of any stormwater controls and/or management practices you will adopt to ensure that your discharges and discharge-related activities are not likely to result in any short- or long-term adverse effects to ESA-listed species and/or designated critical habitat. To certify your eligibility under this criterion, indicate 1) the ESA-listed species and/or designated habitat located in your "action area" using the process outlined in Appendix D of this permit; 2) the distance between the site and the listed species and/or designated critical habitat in the action area (in miles); and 3) a rationale describing specifically how short- or long-term adverse effects to ESA-listed species will be avoided from the discharges and discharge-related activities. (Note: You must include a copy of your site map from your SWPPP showing the upland and in-water extent of your "action area" with your NOI.)

☒ Check to confirm you have provided documentation in your SWPPP as required by CGP Appendix D.

Refer to the US Fish and Wildlife Service report and justification for the Criterion C classification in the attached Appendix K.

Section 3.2 HISTORIC PROPERTY SCREENING PROCESS

Instructions (see CGP Part 1.1.6, 7.2.9.b, Appendix E, and the "Historic Preservation" section of the Appendix H – NOI Form and Instructions):

Follow the screening process in Appendix E of the permit to determine whether your installation of subsurface earth-disturbing stormwater controls will have an effect on historic properties.

- Include documentation supporting your determination of eligibility.
- To contact your applicable State historic preservation office, information is available at *https://ncshpo.org/directory/*
- To contact your applicable Tribal historic preservation office, information is available at *https://grantsdev.cr.nps.gov/THPO_Review/index.cfm*

Appendix E, Step 1

- Do you plan on installing any stormwater controls that require subsurface earth disturbance, including, but not limited to, any of the following stormwater controls at your site? Check all that apply below, and proceed to Appendix E, Step 2.
- ☐ Dike
- ☐ Berm
- ☒ Catch Basin
- ☐ Pond
- ☒ Constructed Site Drainage Feature (e.g., ditch, trench, perimeter drain, swale, etc.)
- ☐ Culvert
- ☐ Channel
- ☒ Other type of ground-disturbing stormwater control: Infiltration Basins, Drain manhole, Proprietary stormwater treatment units

Appendix E, Step 2

- If you answered yes in Step 1, have prior professional cultural resource surveys or other evaluations determined that historic properties do not exist, or have prior disturbances at the site have precluded the existence of historic properties? ☒ YES ☐ NO

  The project has received negative determination from the Massachusetts Historical Commission (MHC) stating that the project is unlikely to affect significant historic or archaeological resources. The notification has been included in the attached Appendix L.

Section 3.3 SAFE DRINKING WATER ACT UNDERGROUND INJECTION CONTROL REQUIREMENTS

Instructions (see CGP Part 7.2.9.c):

- If you will use any of the identified controls in this section, document any contact you have had with the applicable State agency or EPA Regional Office responsible for implementing the requirements for underground injection wells in the Safe Drinking Water Act and EPA's implementing regulations at 40 CFR Parts 144-147.
- For State UIC program contacts, refer to the following EPA website: https://www.epa.gov/uic.

Do you plan to install any of the following controls? Check all that apply below.

☐ Infiltration trenches (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system)

☐ Commercially manufactured pre-cast or pre-built proprietary subsurface detention vaults, chambers, or other devices designed to capture and infiltrate stormwater flow

☐ Drywells, seepage pits, or improved sinkholes (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system)

SECTION 4 EROSION AND SEDIMENT CONTROLS AND DEWATERING PRACTICES

General Instructions (See CGP Parts 2.2 and 7.2.6):

- Describe the erosion and sediment controls that will be implemented at your site to meet the requirements of CGP Part 2.2.
- Describe any applicable stormwater control design specifications (including references to any manufacturer specifications and/or erosion and sediment control manuals/ordinances relied upon).
- Describe any routine stormwater control maintenance specifications.
- Describe the projected schedule for stormwater control installation/implementation.

Erosion and sediment controls that will be implemented at the site include stabilized construction exit, perimeter siltation control with filter sock, additional siltation control with silt fence, loaming and seeding, inlet control placed in catch basins, and the other features as mentioned below. Please refer to the project's Operation and Maintenance manual for maintenance protocols relative to the proprietary stormwater devices on-site.

Section 4.1 NATURAL BUFFERS OR EQUIVALENT SEDIMENT CONTROLS

Buffer Compliance Alternatives

Are there any receiving waters within 50 feet of your project's earth disturbances? ☒ YES ☐ NO

(Note: If no, no further documentation is required for Section 4.1 in the SWPPP Template. Continue to Section 4.2.)

Check the compliance alternative that you have chosen:

☒ No natural buffer exists due to preexisting development disturbances (e.g., structures, impervious surfaces) that occurred prior to the initiation of planning for this project.

Project Design Drawings are included in Appendix A of this report which demonstrates compliance with this alternative.

Section 4.2 PERIMETER CONTROLS

Sediment controls that will be installed downhill of this project site during construction include filter socks and silt fence along with the silt sacks at the catch basins on Tree Lane.

The contractor will install sediment control barriers along the perimeter of the site prior to land disturbance as shown on the Project Design Drawings included in Appendix A. Additional control barriers shall be installed as required to control runoff from the site. If intense rainfall is predicted before all tributary areas are stabilized, erosion control measures will be reinforced for the duration of the storm. All trenches will be backfilled as soon as possible.

Specific Perimeter Controls

Sediment Control Barrier	
Description: Sediment control barriers will be siltation fencing in addition to filter sock	
Installation	Sediment control barriers will be installed prior to the start of land clearing in the locations shown on the Project Drawings. These barriers will remain in place until all tributary surfaces have been fully stabilized. Refer to the Erosion Control Detail Sheet CD-1 in Appendix A for the perimeter controls construction details—sediment control barriers shall be anchored adequately into the ground surface and barriers shall overlap sufficiently (not placed side-by-side) to block passage of sediment.
Maintenance Requirements	• Sediment captured by perimeter controls shall be checked twice each month and after each heavy rain. Silt shall be removed prior to accumulation to one half of the above-ground height of the barrier (minimum of 6 in). • Condition of sediment control device shall be checked twice each month or more frequently as required. Damaged and/or deteriorated items shall be replaced. Sediment control devices shall be maintained in place and in effective condition.

Section 4.3 SEDIMENT TRACK-OUT

Instructions (see CGP Parts 2.2.4 and 7.2.6.b.iii):

– Describe stormwater controls that will be used to minimize sediment track-out.
– Describe location(s) of vehicle exit(s), procedures to remove accumulated sediment off-site (e.g., vehicle tracking), and stabilization practices (e.g., stone pads or wash racks or both) to minimize off-site vehicle tracking of sediment. Also include the design, installation, and maintenance specifications for each control.

The contractor will install, inspect and maintain a stabilized construction exit for the duration of the project to minimize sediment tracking onto impervious surfaces and public ways. Sweeping shall be completed at the end of each working day to minimize sediment track out. The contractor shall inspect the public roadways adjacent to the construction entrance at least twice a day to ensure sediment track out is controlled, and undertake efforts consistent with this SWPPP and local regulations to ensure that any accumulated sediment on public roadways is removed.

Specific Track-Out Controls

Stabilized Construction Exit(s)	
Description: The stabilized construction exit will be constructed of coarse stone aggregate on top of a fabric layer.	
Installation	The construction exit will be installed at the beginning of the project in the location indicated on the Site Plans and will remain in place for the duration of the project.
Maintenance Requirements	• Conditions at the exit from the site shall be inspected, at a minimum of, at the start and finish of each workday. Any sediment tracks or accumulation shall be cleaned by means of sweeping, vacuuming, or brushing/shoveling. Hosing or sweeping of sediment into stormwater conveyance infrastructure not intended for sediment control is prohibited. • Entrance shall be top dressed with new stone as required to maintain effectiveness. Additional locations may also be considered if sediment tracking becomes an issue.
Design Specifications	See Construction Detail CD-1 Plans.

Section 4.4 STOCKPILES OR LAND CLEARING DEBRIS PILES COMPRISED OF SEDIMENT OR SOIL

The contractor shall store materials and equipment off-site and away from the close proximity of the wetland resource areas. Inclusion of any additional perimeter protection shall be considered if need arises for the additional sediment control measures due to stock piles.

Perimeter Protection	
Description: Sediment control barriers will be a filter sock barrier. Control barriers shall be installed at the base of all stockpiles. All stockpiles shall be within the limit of work. In advance of significant rainstorms, considerations for additional protection, including covering the piles, shall be made. Material stockpiles shall be located to minimize potential for runoff impacts, generally away from the surface waters and drainage inlets.	
Installation	Sediment control barriers for stockpiles will be installed once stockpiling of materials begins.
Maintenance Requirements	• Watch for erosion along the pile and regrade/compact to prevent further erosion; cleanup any sediment that travels down the pile. • Any piles that will be unused for 14 or more days will be covered or an appropriate temporary stabilization will be provided. • The contractor is prohibited from hosing down or sweeping soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance, storm drain inlet, or water of the U.S.

Section 4.5 MINIMIZE DUST

The contractor shall take steps to minimize the amount of dust created by construction activities. Dust control should be undertaken on an as-needed basis, especially when unstabilized surfaces are present. The contractor shall expect dust conditions to be worse during summer months or periods of extended dry weather.

Specific Dust Controls

Water Controls	
Description: Contractor shall use on-site water or water trucks to control dust on-site.	
Installation	As necessary.
Maintenance Requirements	N/A

Section 4.6 MINIMIZE STEEP SLOPE DISTURBANCES

The contractor shall minimize the amount of time any disturbed steep slopes are left un-stabilized and should be aware of any weather conditions that may increase the chances of slope wash-out and take necessary precautions to prevent this condition.

Specific Steep Slope Controls

Hydroseed	
Description: Contractor shall hydroseed slopes with general seed mix to stabilize the slopes.	
Installation	Hydroseeding shall be completed within 7 days of final topsoil placement.
Maintenance Requirements	Watch for erosion of soils below and compact and re-hydroseed as needed to continue towards full stabilization and establishment of vegetative materials.

Section 4.7 TOPSOIL

The project includes the conversion of existing wooded areas into impervious area via building construction and construction of asphalt throughout the site. In these areas, the topsoil must be removed to its full depth to allow for the import of the base materials for the finished surfaces. In the areas of proposed infiltrative stormwater features, any topsoil must be removed to a depth sufficient to remove all unsuitable fill material and replaced with appropriate soil media. The intent is to keep as much topsoil on-site; however, it is likely that excess topsoil will be generated and will have to be removed from site. Soils and sediment removed from the site will be legally disposed of to comply with local, state, and federal regulations.

Section 4.8 SOIL COMPACTION

The contractor shall restrict vehicle and equipment use in locations where vegetative stabilization will occur or where infiltration practices will be installed. The contractor shall utilize areas of proposed compacted or impervious surfaces to the greatest extent possible for vehicle or equipment maneuvering. The contractor will manage construction as well as placement of sand below infiltrative stormwater management facilities. The design requires the removal of all fill in the areas of the infiltrative stormwater management facilities and replacement of the fill with sandy material to promote infiltration. The removal of fill and placement of sand in these areas will occur after the building is substantially constructed and heavy machinery is no longer necessary to travel on these areas.

Section 4.9 STORM DRAIN INLETS

Silt sacks shall be installed at all drainage inlets in the general vicinity of the project site.

Specific Storm Drain Inlet Controls

Drain System Protection (Existing and New)	
Description: Silt sacks will be installed at drainage structures and maintained and cleaned until all areas flowing to these structures are adequately stabilized with vegetation and/or final surface treatment.	
Installation	• Inlet protection will be installed prior to the start of construction. These protections will remain in place until all tributary surfaces have been fully stabilized.
Maintenance Requirements	• Sediment within the drain system protection shall be checked twice each month and after each heavy rain. Silt shall be removed if greater than 6 in. deep or is impacting the function of the device. • Clean, or remove and replace, the protection measures as sediment accumulates, the filter becomes clogged, and/or performance is compromised. Where there is evidence of sediment accumulation adjacent to the inlet protection measure, remove the deposited sediment by the end of the same business day in which it is found or by the end of the following business day if removal by the same business day is not feasible.
Design Specifications	See Construction Detail Plans.

Section 4.10 CONSTRUCTED SITE DRAINAGE FEATURE

Specific Site Drainage Controls

Diversion Swales	
Description: The site drainage features to be installed are included in the site plans in Appendix A. These plans outline the various control practices that will be implemented during the construction of the site drainage features to manage erosion and control water velocity.	
Installation	As indicated in the Plans in Appendix A
Maintenance Requirements	Remove sediment accumulated before it reaches one-half of the above ground height of the proposed drainage features.

Section 4.11 SEDIMENT BASINS OR SIMILAR IMPOUNDMENTS

Temporary sediment basins are depressions constructed downslope of construction activity and located such that stormwater runoff from upland areas and any construction diversion swales flow into the basin. After a contractor is selected, the contractor shall be responsible for installing sediment basin(s) to detain the 2-year, 24-hour storm, if needed. The basin(s) shall be kept in effective operating condition and sediment shall be removed when sediment accumulates to one-half of the design capacity of the basin, or sooner.

Section 4.12 CHEMICAL TREATMENT

The use of chemical treatments is not proposed at this time. Should the Operator choose to use polymers, flocculants, or other treatment chemicals at the site, the operator must update the SWPPP to include the following:

- **Soil Types**
  - List all the soil types including soil types expected to be exposed during construction in areas of the project that will drain to chemical treatment systems and those expected to be found in fill material.
- **Treatment Chemicals**
  - List all treatment chemicals that will be used at the site and explain why these chemicals are suited to the soil characteristics.
  - Describe the dosage of all treatment chemicals you will use at the site or the methodology you will use to determine dosage.
  - Provide information from any applicable Safety Data Sheets (SDS).
  - Describe how each of the chemicals will be stored consistent with CGP Part 2.2.13c.
  - Include references to applicable State or local requirements affecting the use of treatment chemicals, and copies of applicable manufacturer's specifications regarding the use of your specific treatment chemicals and/or chemical treatment systems.
- **Special Controls for Cationic Treatment Chemicals** (if applicable)
  - If the applicable EPA Regional Office authorized you to use cationic treatment chemicals, include the official EPA authorization letter or other communication, and identify the specific controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a discharge that does not meet water quality standards.
- **Schematic Drawings of Stormwater Controls/Chemical Treatment Systems**
  - Provide schematic drawings of any chemically-enhanced stormwater controls or chemical treatment systems to be used for application of treatment chemicals.
- **Training**
  - Describe the training that personnel who handle and apply chemicals have received prior to permit coverage, or will receive prior to the use of treatment chemicals.

Section 4.13 DEWATERING PRACTICE

When dewatering is required, the following practices shall be followed:

1. The contractor shall coordinate dewatering with all Local, State, and Federal agencies and obtain all required permits.
2. The contractor shall treat dewatering discharges with controls to minimize discharges of pollutants.
3. The contractor shall not discharge visible floating solids or foam.
4. The contractor shall use an oil-water separator or suitable filtration device (such as a cartridge filter) that is designed to remove oil, grease, or other products if dewatering water is found to contain these materials.
5. To the extent feasible, the contractor shall use vegetated, upland areas of the site to infiltrate dewatering water before discharge. Use of waters of the U.S. as part of the treatment area is prohibited.
6. At all points where dewatering water is discharged, the contractor shall comply with the velocity dissipation requirements of Part 2.2.11 of the CGP.
7. The contractor shall either haul backwash water away for disposal or return it to the beginning of the treatment process.
8. The contractor shall replace and clean the filter media used in dewatering devices when the pressure differential equals or exceeds the manufacturer's specifications.

The project requires the use dewatering bags as shown in the Detail Plans.

Section 4.14 OTHER STORMWATER CONTROLS

Contractor shall update this SWPPP if any additional stormwater control measures have been adapted.

Section 4.15 SITE STABILIZATION

Total Amount of Land Disturbance Occurring at Any One Time

☒ *Five Acres or less*

☐ *More than Five Acres*

Loam and Seed
☒ *Vegetative* ☐ *Non-Vegetative* ☐ *Temporary* ☐ *Permanent*
Description: • Areas of disturbed soils that do not receive a final surface treatment as part of the project will be loamed and seeded. Depending on the final vegetation type (maintained versus naturalized) different seed mixes shall be used accordingly. Initiation of the installation of stabilization measures will begin immediately in any areas of exposed soil where construction activities has permanently ceased or will be temporarily inactive for 14 or more days. Completion of the installation of stabilization measures will be completed as soon as practicable, but not later than seven days after stabilization has been initiated.

Loam and Seed	
Installation	Schedule for seed mix timing is to be determined after the contract project is awarded
Completion	Immediately in any areas of exposed soil where construction activities has permanently ceased or will be temporarily inactive for 14 or more days.
Maintenance Requirements	Irrigate as needed. Care shall be taken by contractor to maintain the loamed and seeded area for the proper growth of vegetation.

SECTION 5 POLLUTION PREVENTION CONTROLS

Section 5.1 POTENTIAL SOURCES OF POLLUTION

Construction Site Pollutants include the following:

Pollutant-Generating Activity	**Pollutants or Pollutant Constituents** (That could be discharged if exposed to stormwater)	**Location on Site** (Or reference SWPPP site map where this is shown)
Clearing/Grubbing/Earthwork	Sediment	Refer to Project Drawings
Paving Operations	Sediment, trash, oils	Refer to Project Drawings
Material Delivery/Storage	Sediment, oils, solids, chemicals	Site Entrance
Solid Waste	Solids	N/A
Spills	Sediment, Nutrients, oils, hazardous chemicals, other chemicals	N/A
Vehicle Storage	Sediment, oils, chemicals	N/A
Landscape Operations	Sediment, nutrients, bacteria	Refer to Project Drawings
Sanitary Facilities	Sediment, nutrients, bacteria	N/A

Section 5.2 SPILL PREVENTION AND RESPONSE

The contractor will train all personnel in the proper handling and cleanup of spilled materials. No spilled hazardous materials or hazardous wastes will be allowed to come in contact with stormwater discharges. If such contact occurs, the stormwater discharge will be contained on-site until appropriate measures in compliance with State and Federal regulations are taken to dispose of such contaminated stormwater. It shall be the responsibility of the job site superintendent to properly train all personnel in spill prevention and cleanup procedures.

All materials with hazardous properties (such as pesticides, petroleum products, fertilizers, detergents, construction chemicals, acids, paints, paint solvents, cleaning solvents, additives for soil stabilization, concrete curing compounds and additives, etc.) will be stored in a secure location, with their lids on, preferably under cover, when not in use.

1. During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater shall not be stored or handled in areas of the site draining to an infiltration area. An 'infiltration area' is any area of the site that by design or as a result of soils, topography and other relevant factors accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other Stormwater Pollution Prevention (SWPPP)

forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purpose of storage and handling of these materials.

2. A spill control and containment kit (containing, for example, absorbent materials, acid neutralizing power, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.) will be provided at the site.

Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be trained regarding these procedures and the location of the information and supplies.

In the event of a spill the following procedures should be followed:

1. All spills will be cleaned up immediately after discovery.
2. The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with the hazardous substances.
3. The project manager and the Engineer of Record will be notified immediately.
4. Spills of toxic or hazardous materials will be reported to the appropriate Federal, State, and/or Local government agency, regardless of the size of the spill.
5. The Sharon Fire Department will be contacted: Call 911 or (781) 784-2121.
6. If the spill exceeds a Reportable Quantity, the SWPPP must be modified within seven (7) calendar days of knowledge of the discharge to provide a description of the release, the circumstances leading to the release, and the date of the release, The plans must identify measures to prevent the recurrence of such release and to respond to such releases.

The job site superintendent will be the spill prevention and response coordinator. He/she will designate the individuals who will receive spill prevention and response training. These individuals will each become responsible for a particular phase of prevention and response. The names of these personnel will be posted on site.

Section 5.3 FUELING AND MAINTENANCE OF EQUIPMENT AND VEHICLES

The Contractor shall minimize fueling and equipment maintenance on site as this is an active drinking water supply property. The Contractor shall take extreme care if fueling and maintenance is performed on site.

Inspect construction vehicles daily and repair any leaks immediately. Dispose of all used oil, antifreeze, solvents, and other automotive-related chemicals according to manufacturer instructions off-site. These wastes require special handling and disposal. Used oil, antifreeze, and some solvents can be recycled at designated facilities, but other chemicals must be disposed of at a hazardous waste disposal site.

Vehicle maintenance operations produce substantial amounts of hazardous and other wastes that require regular disposal. Cleanup spills and dispose of cleanup materials off-site immediately. Inspect equipment and storage containers regularly to identify leaks or signs of deterioration.

Section 5.4 WASHING OF EQUIPMENT AND VEHICLES

Contractor shall minimize washing of equipment and vehicles on site. If the Contractor must, the Contractor shall designate a special paved area for the washing of vehicles and area shall be designated with a sign.

Specific Pollution Prevention Practices

Washing of Equipment / Vehicles	
Description: Contractor shall locate a special paved area for the washing of equipment or vehicles. Area shall have a sign that designates it as a washout area. To direct wash water to treatment facilities, ensure that vehicle washing areas are impervious and are equipped with a berm. Use blowers or vacuums instead of water to remove dry materials from vehicles if possible. Because water alone can remove most dirt adequately, use high-pressure water spray without detergents at vehicle washing areas. If contractor must use detergents, they shall avoid phosphate- or organic-based cleansers to reduce nutrient enrichment and biological oxygen demand in wastewater. Use only biodegradable products that are free of halogenated solvents. Clearly mark all washing areas, and inform workers that all washing must occur in this area. Do not perform other activities, such as vehicle repairs, in the wash area.	
Installation	TBD
Maintenance Requirements	TBD
Design Specifications	N/A

Section 5.5 STORAGE, HANDLING, AND DISPOSAL OF BUILDING PRODUCTS, MATERIALS, AND WASTES

Section 5.5.1 Building Materials and Building Products

The project will result in construction and domestic debris and waste. Contractor shall supply the means to minimize the exposure of construction products, materials, and waste to precipitation and stormwater. The contractor shall provide facilities to properly handle and dispose of waste with considerations for health and safety of the employees.

Specific Pollution Prevention Practices

Storage, Containment, Handling of Materials	
Description: Contractor shall designate a waste collection area on site that does not receive a substantial amount of runoff from upland areas and does not drain directly to a water body. • Ensure that containers have lids so they can be covered before periods of rain, and keep containers in a covered area whenever possible. • Schedule waste collection to prevent the containers from overfilling. • Clean spills immediately. For hazardous materials, follow cleanup instructions on the package. Use an absorbent material such as sawdust or kitty litter to contain the spill. • During the demolition phase of construction, provide extra containers and schedule more frequent pickups. • Collect, remove and dispose of all construction site wastes at authorized disposal areas. • Contact a local environmental agency to identify these disposal sites.	
Installation	TBD
Maintenance Requirements	N/A
Design Specifications	N/A

Section 5.5.2 Pesticides, Herbicides, Insecticides, Fertilizers, and Landscape Materials (CGP 2.3.3.b) General

Fertilizers are not planned to be used on the landscape areas throughout the project site at the time of this SWPPP preparation. If fertilizers are used, the contractor shall follow all regulations that apply to the use, handling, or disposal of pesticides and fertilizers. Contractor shall store fertilizers and pesticides in a dry, covered area and will take precautions to minimize the exposure of these chemicals to precipitation and to stormwater.

Specific Pollution Prevention Practice

Proper Handling and Application of Materials	
Description: • Contractor shall follow all Federal, State, and Local regulations that apply to the use, handling, or disposal of pesticides and fertilizers. • Contractor shall not handle the materials any more than necessary. • Contractor shall store pesticides and fertilizers in a dry, covered area. • Contractor shall construct berms or dikes to contain stored pesticides and fertilizers in case of spillage. • Contractor shall follow the recommended application rates and methods for the products. • Contractor shall have equipment and absorbent materials available in storage and application areas to contain and cleanup any spills that occur.	
Installation	TBD
Maintenance Requirements	N/A
Design Specifications	N/A

Section 5.5.3 Diesel Fuel, Oil, Hydraulic Fluids, Other Petroleum Products, and Other Chemicals (CGP 2.3.3.c)

Any on-site fueling shall be limited to vehicles that are to remain onsite. Other fluids shall not be stored on-site with all maintenance on vehicles being completed at off-site locations. Should storage of materials on site be required, Contractor shall store materials in water-tight containers and provide cover to minimize the exposure of these products to precipitation and stormwater.

Specific Pollution Prevention Practices

<table>
<tr><td colspan="2">Material Handling</td></tr>
<tr><td colspan="2">Description:
Contractor shall store new and used petroleum products for vehicles in covered areas with berms or dikes in place to contain any spills.
Immediately contain and cleanup any spills with absorbent materials.
Have equipment available in fuel storage areas and in vehicles to contain and cleanup any spills that occur.</td></tr>
<tr><td>Installation</td><td>TBD</td></tr>
<tr><td>Maintenance Requirements</td><td>Contractor shall clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly. Contractor is prohibited from hosing down areas to clean surfaces or spills. Contractor shall eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge.</td></tr>
<tr><td>Design Specifications</td><td>N/A</td></tr>
</table>

Section 5.5.4 Hazardous or Toxic Waste (CGP 2.3.3.d)

Should the project result in the generation of toxic or hazardous wastes, the Contractor shall store materials in containers which are constructed to prevent leakage and corrosion.

Specific Pollution Prevention Practices

<table>
<tr><td colspan="2">Material Handling</td></tr>
<tr><td colspan="2">Description:
Contractor shall consult with local waste management authorities about the requirements for disposing of hazardous materials.
To prevent leaks, empty and clean hazardous waste containers before disposing of them.
Never remove the original product label from the container because it contains important safety information. Follow the manufacturer's recommended method of disposal, which should be printed on the label.
Never mix excess products when disposing of them, unless specifically recommended by the manufacturer.
Contractor shall separate hazardous or toxic waste from construction and domestic waste.
Waste shall be stored in sealed containers, which are constructed of suitable materials to prevent leakage and corrosion, and which are labeled in accordance with applicable Resource Conservation and Recovery Act (RCRA) requirements and all other applicable Federal, State, or Local requirements.
All outside containers shall be stored within appropriately-sized secondary containment (spill berms, decks, spill containment pallets) to prevent spills from being discharged.
Contractor shall clean up spills immediately, using dry clean-up methods, and dispose of used materials properly. Contractor is prohibited from hosing the area down to clean surfaces or spills. Contractor shall eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge.
To ensure the proper disposal of any contaminated soils that have been exposed to and still contain hazardous substances, the contractor shall consult with State or Local solid waste regulatory agencies tor private firms. Some landfills might accept contaminated soils, but they require laboratory tests first. Any disposal of contaminated soils shall be coordinated with the Project Engineer and shall conform to all State and Local regulations.</td></tr>
<tr><td>Installation</td><td>TBD</td></tr>
<tr><td>Maintenance Requirements</td><td>Review daily.</td></tr>
<tr><td>Design Specifications</td><td>N/A</td></tr>
</table>

Section 5.5.5 Construction and Domestic Waste (CGP 2.3.3.e)

The project will result in construction and domestic debris and waste. The Contractor shall provide facilities to properly handle and dispose of waste with considerations for health and safety of employees.

Specific Pollution Prevention Practices

Waste Containers	
Description: • Contractor shall designate a waste collection area on site that does not receive a substantial amount of runoff from upland areas and does not drain directly to a water body. • Contractor shall provide waste containers of sufficient size and number to contain construction and domestic wastes. • Contractor shall ensure that containers have lids so they can be covered before periods of rain, and shall keep containers in a covered area whenever possible. • Contractor shall schedule waste collection to prevent the containers from overfilling. • Contractor shall cleanup spills immediately. • Contractor shall collect, remove and dispose of all construction site wastes at authorized disposal areas. Contact a local environmental agency to identify these disposal sites.	
Installation	TBD
Maintenance Requirements	Review daily.
Design Specifications	N/A

Section 5.5.6 Sanitary Waste (CGP 2.3.3.f)

Temporary facilities shall be provided by the contractor for on-site use by employees. This section shall be updated by the contractor once the project is awarded and temporary facilities has been included on-site.

Specific Pollution Prevention Practices

Temporary Facilities	
Description: Temporary facilities shall be provided by the contractor.	
Installation	Temporary facilities will be installed at the beginning of the project. Facilities shall be positioned so that they are secure and will not be tipped or knocked over. Temporary facilities shall be located away from the waters of the U.S. and stormwater inlets and conveyances.
Maintenance Requirements	Temporary facilities shall have routine inspections and shall be scheduled for waste collection as needed.
Design Specifications	N/A

Section 5.6 WASHING OF APPLICATORS AND CONTAINERS USED FOR STUCCO, PAINT, CONCRETE, FORM RELEASE OILS, CUTTING COMPOUNDS, OR OTHER MATERIALS

Should washout of paint of other materials be required, Contractor shall direct wash water into leak-proof containers or lined pit designed so that no overflows can occur due to inadequate sizing or precipitation.

Specific Pollution Prevention Practices

<table>
<tr><th colspan="2">Washout Container</th></tr>
<tr><td colspan="2">Description: Contractor shall direct wash water into a leak-proof container or leak-proof and lined pit designed so that no overflows can occur due to inadequate sizing or precipitation. If the washout of paint or other materials are required, Contractor shall handle washout or cleanout wastes as follows:
Contractor shall not dump liquid wastes in storm sewers or waters of the U.S.
Contractor shall dispose of liquid wastes in accordance with applicable requirements in Part 2.3.3 of the 2017 CGP.
Contractor shall remove and dispose of hardened concrete waste consistent with the handling of other construction wastes.</td></tr>
<tr><td>Installation</td><td>Washout container will be installed as required for the project. Any washout or cleanout activities will be located as far away as possible from the waters of the U.S. and stormwater inlets or conveyances, and, to the extent feasible, the contractor shall designated the washout areas to be used for washout or cleanout only.</td></tr>
<tr><td>Maintenance Requirements</td><td>Maintenance of the washout is to include removal of hardened concrete. The facility shall have sufficient volume to contain all the concrete waste resulting from washout and a minimum freeboard of 1 foot. Facility shall not be filled beyond 95% capacity and shall be cleaned out once 75% full unless a new facility is constructed.</td></tr>
<tr><td>Design Specifications</td><td>N/A</td></tr>
</table>

Section 5.7 APPLICATION OF FERTILIZERS

At the time of the preparation of this SWPPP, fertilizers are not planned to be used on the landscape areas throughout the project site. If the contractor deems fertilizers necessary, and approved by the Engineer and Owner, the Contractor shall follow all regulations that apply to the use, handling, or disposal of fertilizers. Contractor shall store fertilizers in a dry, covered area and will take precautions to minimize the exposure of these chemicals to precipitation and to stormwater.

Specific Pollution Prevention Practices

<table>
<tr><th>Appropriate Use</th></tr>
<tr><td>Description: Type and amount of fertilizer is to be determined by the final plantings determined for the site.</td></tr>
</table>

Appropriate Use	
Installation	Fertilizer shall be applied at the appropriate time of year to coincide as closely as possible to the period of maximum vegetation uptake and growth. Contractor shall apply fertilizer at a rate in amounts consistent with manufacturer's specifications. Contractor shall avoid applying fertilizers before heavy rains that could cause excess nutrients to be discharged. Contractor shall never apply fertilizers to frozen ground. Contractor shall never apply fertilizers to stormwater conveyance channels. Contractor shall follow all Federal, State, and Local requirements regarding fertilizer application.
Maintenance Requirements	N/A
Design Specifications	N/A

Section 5.8 OTHER POLLUTION PREVENTION PRACTICES

Contractor shall provide information below about any other pollution prevention practices that are implemented during construction that are not described above.

SECTION 6 INSPECTION, MAINTENANCE, AND CORRECTIVE ACTION

Section 6.1 INSPECTION PERSONNEL AND PROCEDURES

Instructions (see CGP Parts 4, 5, and 7.2.7):

Describe the procedures you will follow for maintaining your stormwater controls, conducting inspections, and, where necessary, taking corrective actions in accordance with CGP Parts 4, 5, and 7.2.7.

Inspection Personnel shall be designated by the Contractor after the construction contract is awarded.

Site Inspection Schedule

Standard Frequency:
☐ Every 7 calendar days ☒ Every 14 calendar days and within 24 hours of either: ▪ A storm event that produces 0.25 inches or more of rain within a 24-hour period (including when there are multiple, smaller storms that alone produce less than 0.25 inches but together produce 0.25 inches or more in 24 hours), or ▪ A storm event that produces 0.25 inches or more of rain within a 24-hour period on the first day of a storm and continues to produce 0.25 inches or more of rain on subsequent days (you conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the last day of the storm that produces 0.25 inches or more of rain (i.e., only two inspections would be required for such a storm event)), or ▪ A discharge caused by snowmelt from a storm event that produces 3.25 inches or more of snow within a 24-hour period.
Reduced Frequency (if applicable)
For stabilized areas ☐ Twice during first month, no more than 14 calendar days apart; then once per month after first month until permit coverage is terminated consistent with Part 9 in any area of your site where the stabilization steps in 2.2.14.a have been completed. ▪ Specify locations where stabilization steps have been completed ▪ Insert date that they were completed (Note: It is likely that you will not be able to include this in your initial SWPPP. If you qualify for this reduction (see CGP Part 4.4.1), you will need to modify your SWPPP to include this information. If construction activity resumes in this portion of the site at a later date, the inspection frequency immediately increases to that required in Parts 4.2 and 4.3, as applicable.)

For stabilized areas on "linear construction sites" (as defined in Appendix A) ☐ Twice during first month, no more than 14 calendar days apart; then once more within 24 hours of a storm event that produces 0.25 inches or more of rain within a 24-hour period, or within 24 hours of a snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period ▪ Specify locations where stabilization steps have been completed ▪ Insert date that they were completed (Note: It is likely that you will not be able to include this in your initial SWPPP. If you qualify for this reduction (see CGP Part 4.4.1), you will need to modify your SWPPP to include this information.)
For arid, semi-arid, or drought-stricken areas during seasonally dry periods or during drought ☐ Once per month and within 24 hours of either: ▪ A storm event that produces 0.25 inches or more of rain within a 24-hour period, or ▪ A snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period. Insert beginning and ending month identified as the seasonally dry period for your area or the valid period of drought: ▪ Beginning month of the seasonally dry period: Insert approximate date ▪ Ending month of the seasonally dry period: Insert approximate date
For frozen conditions where construction activities are being conducted ☐ Once per month Insert beginning and ending dates of frozen conditions on your site: ▪ Beginning date of frozen conditions: Insert approximate date ▪ Ending date of frozen conditions: Insert approximate date
For frozen conditions where construction activities are suspended ☐ Inspections are temporarily suspended Insert beginning and ending dates of frozen conditions on your site: ▪ Beginning date of frozen conditions: Insert approximate date ▪ Ending date of frozen conditions: Insert approximate date

Dewatering Inspection Schedule

Select the inspection frequency that applies based on CGP Part 4.3.2

Dewatering Inspection
☒ Once per day on which the discharge of dewatering water occurs.

Site Inspection Report Forms

See Appendix D for inspection report form.

Section 6.2 CORRECTIVE ACTION

Instructions (CGP Parts 5 and 7.2.7):

- Describe the procedures for taking corrective action in compliance with CGP Part 5.

Personnel Responsible for Corrective Actions
The Contractor shall be responsible for corrective actions. The Contractor will be selected following public bidding.

Corrective Action Forms

See Appendix E for Corrective Action Form.

Section 6.3 DELEGATION OF AUTHORITY

Instructions:

- Identify the individual(s) or positions within the company who have been delegated authority to sign inspection reports.
- Attach a copy of the signed delegation of authority (see example in Appendix J of this SWPPP Template.)
- For more on this topic, see Appendix G, Subsection 11 of EPA's CGP.

Duly Authorized Representative(s) or Position(s):

This section of the SWPPP will be updated after the project contract is awarded.

See Appendix J for Delegation of Authority documentation.

SECTION 7 CERTIFICATION AND NOTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: ______________________________ Title: ______________________________

Signature: ______________________________ Date: ______________

APPENDIX A

Site Plans

(Provided under separate cover)

APPENDIX B

2022 CGP

(Provided under separate cover)

APPENDIX C
NOI and EPA Authorization Email

This appendix will be updated after the NOI has been submitted by the Contractor.

APPENDIX D
Site Inspection Form and Dewatering Inspection Form

Section A – General Information (If necessary, complete additional inspection reports for each separate inspection location.)	
Inspector Information	
Inspector Name:	**Title:**
Company Name:	**Email:**
Address:	**Phone Number:**
Inspection Details	
Inspection Date:	**Inspection Location:**
Inspection Start Time:	**Inspection End Time:**
Current Phase of Construction:	**Weather Conditions During Inspection:**
Did you determine that any portion of your site was unsafe for inspection per CGP Part 4.5? ☐ Yes ☐ No **If "Yes," provide the following information:** Location of unsafe conditions: The conditions that prevented you inspecting this location:	
Indicate the required inspection frequency: (Check all that apply. You may be subject to different inspection frequencies in different areas of the site.)	
Standard Frequency (CGP Part 4.2): ☐ At least once every 7 calendar days; **OR** ☐ Once every 14 calendar days *and* within 24 hours of the occurrence of either: • A storm event that produces 0.25 inches or more of rain within a 24-hour period, or • A snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period	
Increased Frequency (CGP Part 4.3.1) (If site discharges to sediment or nutrient-impaired waters or to waters designated as Tier 2, Tier 2.5, or Tier 3): ☐ Once every 7 calendar days *and* within 24 hours of the occurrence of either: • A storm event that produces 0.25 inches or more of rain within a 24-hour period, or • A snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period	

Reduced Frequency (CGP Part 4.4):

- ☐ For stabilized areas: Twice during first month, no more than 14 calendar days apart; then once per month after first month until permit coverage is terminated
- ☐ For stabilized areas on "linear construction sites": Twice during first month, no more than 14 calendar days apart; then once more within 24 hours of the occurrence of either:
  - A storm event that produces 0.25 inches or more of rain within a 24-hour period, or
  - A snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period
- ☐ For arid, semi-arid, or drought-stricken areas during seasonally dry periods or during drought: Once per month and within 24 hours of the occurrence of either:
  - A storm event that produces 0.25 inches or more of rain within a 24-hour period, or
  - A snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period
- ☐ For frozen conditions where construction activities are being conducted: Once per month

Was this inspection triggered by a storm event producing 0.25 inches or more of rain within a 24-hour period? ☐ Yes ☐ No

If "Yes," how did you determine whether the storm produced 0.25 inches or more of rain?

- ☐ On-site rain gauge
- ☐ Weather station representative of site.
  Weather station location:

Total rainfall amount that triggered the inspection (inches):

Was this inspection triggered by a snowmelt discharge from a storm event producing 3.25 inches or more of snow within a 24-hour period? ☐ Yes ☐ No

If "Yes," how did you determine whether the storm produced 3.25 inches or more of snow?

- ☐ On-site rain gauge
- ☐ Weather station representative of site.
  Weather station location:

Total snowfall amount that triggered the inspection (inches):

Section B – Condition and Effectiveness of Erosion and Sediment (E&S) Controls (CGP Part 2.2) (Insert additional rows if needed)					
Type and Location of E&S Control	**Conditions Requiring Routine Maintenance?[1]**	**If "Yes," How Many Times (Including This Occurrence) Has This Condition Been Identified?**	**Conditions Requiring Corrective Action?[2, 3]**	**Date on Which Condition First Observed (If Applicable)?**	**Description of Conditions Observed**
1.	☐ Yes ☐ No		☐ Yes ☐ No		
2.	☐ Yes ☐ No		☐ Yes ☐ No		
3.	☐ Yes ☐ No		☐ Yes ☐ No		
4.	☐ Yes ☐ No		☐ Yes ☐ No		
5.	☐ Yes ☐ No		☐ Yes ☐ No		
If the same routine maintenance was found to be necessary three or more times for the same control at the same location (including this occurrence), follow the corrective action requirements and record the required information in your corrective action log, or describe here why you believe the specific condition should still be addressed as routine maintenance:					

[1] Routine maintenance includes minor repairs or other upkeep performed to ensure that the site's stormwater controls remain in effective operating condition, not including significant repairs or the need to install a new or replacement control. Routine maintenance is also required for specific conditions: (1) for perimeter controls, whenever sediment has accumulated to half or more the above-ground height of the control (CGP Part 2.2.3.c.i); (2) where sediment has been tracked-out from the site onto paved roads, sidewalks, or other paved areas (CGP Part 2.2.4.d); (3) for inlet protection measures, when sediment accumulates, the filter becomes clogged, and/or performance is compromised (CGP Part 2.2.10.b); and (4) for sediment basins, as necessary to maintain at least half of the design capacity of the basin (CGP Part 2.2.12.f)

[2] Corrective actions are triggered only for specific conditions (CGP Part 5.1):

1. A stormwater control needs a significant repair or a new or replacement control is needed, or, in accordance with Part 2.1.4.c, you find it necessary to repeatedly (i.e., three (3) or more times) conduct the same routine maintenance fix to the same control at the same location (unless you document in your inspection report under Part 4.7.1.c that the specific reoccurrence of this same problem should still be addressed as a routine maintenance fix under 2.1.4); or
2. A stormwater control necessary to comply with the requirements of this permit was never installed, or was installed incorrectly; or
3. Your discharges are not meeting applicable water quality standards; or
4. A prohibited discharge has occurred (see CGP Part 1.3); or
5. During the discharge from site dewatering activities:
   a. The weekly average of your turbidity monitoring results exceeds the 50 NTU benchmark (or alternate benchmark if approved by EPA pursuant to Part 3.3.2.b); or
   b. You observe or you are informed by EPA, State, or local authorities of the presence of the conditions specified in Part 4.6.3.e.

[3] If a condition on your site requires a corrective action, you must also fill out a corrective action log found at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates. See CGP Part 5.4 for more information.

Section C – Condition and Effectiveness of Pollution Prevention (P2) Practices and Controls (CGP Part 2.3) (Insert additional rows if needed)					
Type and Location of P2 Practices and Controls	**Conditions Requiring Routine Maintenance?[1]**	**If "Yes," How Many Times (Including This Occurrence) Has This Condition Been Identified?**	**Conditions Requiring Corrective Action?[2, 3]**	**Date on Which Condition First Observed (If Applicable)?**	**Description of Conditions Observed**
1.	☐ Yes ☐ No		☐ Yes ☐ No		
2.	☐ Yes ☐ No		☐ Yes ☐ No		
3.	☐ Yes ☐ No		☐ Yes ☐ No		
4.	☐ Yes ☐ No		☐ Yes ☐ No		
5.	☐ Yes ☐ No		☐ Yes ☐ No		
If the same routine maintenance was found to be necessary three or more times for the same control at the same location (including this occurrence), follow the corrective action requirements and record the required information in your corrective action log, or describe here why you believe the specific condition should still be addressed as routine maintenance:					

Section D – Stabilization of Exposed Soil (CGP Part 2.2.14) (Insert additional rows if needed)					
Specific Location That Has Been or Will Be Stabilized	**Stabilization Method and Applicable Deadline**	**Stabilization Initiated?**	**Final Stabilization Criteria Met?**	**Final Stabilization Photos Taken?**	**Notes**
1.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	
2.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	
3.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	
4.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	
5.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	

Section E – Description of Discharges (CGP Part 4.6.2) (Insert additional rows if needed)	
Was a discharge (not including dewatering) occurring from any part of your site at the time of the inspection?[4] ☐ Yes ☐ No **If "Yes," for each point of discharge, document the following:** • The visual quality of the discharge. • The characteristics of the discharge, including color; odor; floating, settled, or suspended solids; foam; oil sheen; and other indicators of stormwater pollutants. • Signs of the above pollutant characteristics that are visible from your site and attributable to your discharge in receiving waters or in other constructed or natural site drainage features.	
Discharge Location	**Observations**
1.	
2.	
3.	
4.	
5.	

[4] If a dewatering discharge was occurring, you must conduct a dewatering inspection pursuant to CGP Part 4.3.2 and complete a separate dewatering inspection report.

Section F – Signature and Certification (CGP Part 4.7.2)	
"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."	
MANDATORY: Signature of Operator or "Duly Authorized Representative:"	
Signature:	**Date:**
Printed Name:	**Affiliation:**
OPTIONAL: Signature of Contractor or Subcontractor	
Signature:	**Date:**
Printed Name:	**Affiliation:**

General Tips for Using This Template

This Site Inspection Report Template is provided to assist you in preparing site inspection reports for EPA's 2022 Construction General Permit (CGP). If you are covered under the 2022 CGP, you can use this template to create a site inspection report form that is customized to the specific circumstances of your site and that complies with the minimum reporting requirements of Part 4.7 of the permit. Note that the use of this form is optional; you may use your own site inspection report form provided it includes the minimum information required in Part 4.7 of the CGP.

This template does not address the CGP's inspection reporting requirements related to dewatering activities. A separate inspection template has been developed specifically for dewatering activities and is available at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates.

Keep in mind that this document is a template and not an "off-the-shelf" inspection report that is ready to use without some modification. You must first customize this form to include the specifics of your project in order for it to be useable for your inspection reports. Once you have entered all of your site-specific information into the blank fields, you may use this form to complete inspection reports.

The following tips for using this template will help you ensure that the minimum permit requirements are met:

- **Review the inspection requirements.** Before you start developing your inspection report form, read the CGP's Part 4 inspection requirements. This will ensure that you have a working understanding of the permit's underlying inspection requirements.
- **Complete all required blank fields.** Fill out all blank fields. Only by filling out all fields will the template be compliant with the requirements of the permit. (Note: Where you do not need the number of rows provided in the template form for your inspection, you may delete these or cross them off as you see fit. Or, if you need more space to document your findings, you may insert additional rows in the electronic version of this form or use the bottom of the page in the field version of this form.)
- **Use your site map to document inspection findings.** In several places in the template, you are directed to specify the location of certain features of your site, including where stormwater controls are installed and where you will be stabilizing exposed soil. You are also asked to fill in location information for unsafe conditions and the locations of any discharges occurring during your inspections. Where you are asked for location information, EPA encourages you to reference the point on your SWPPP site map that corresponds to the requested location on the inspection form. Using the site map as a tool in this way will help you conduct efficient inspections, will assist you in evaluating problems found, and will ensure proper documentation.
- **Complete the inspection report within 24 hours of completing a site inspection.** You must complete an inspection report in accordance with Part 4.7.1 of the CGP.
- **Include the inspection form with your SWPPP.** Once your form is complete, make sure to include a copy of the inspection form in your SWPPP in accordance with Part 7.2.7.e of the CGP.
- **Retain copies of all inspection reports with your records.** You must also retain in your records copies of all inspection reports in accordance with the requirements in Part 4.7.3 of the CGP. These reports must be retained for at least 3 years from the date your permit coverage expires or is terminated in accordance with the requirements in Part 4.7.4 of the CGP.

Instructions for Section A

Inspector Name

Enter the name of the person that conducted the inspection. Include the person's contact information (title, affiliated company name, address, email, and phone number).

Inspection Date and Time

Enter the date you performed the inspection and the time you started and ended the inspection.

Weather Conditions During Inspection

Enter the weather conditions occurring during the inspection, e.g., sunny, overcast, light rain, heavy rain, snowing, icy, windy.

Current Phase of Construction
If this project is being completed in more than one phase, indicate which phase it is currently in.

Inspection Location
If your project has multiple locations where you conduct separate inspections, specify the location where this inspection is being conducted. If only one inspection is conducted for your entire project, enter "Entire Site." If necessary, complete additional inspection report forms for each separate inspection location.

Unsafe Conditions for Inspection (CGP Part 4.5.7)
Inspections are not required where a portion of the site or the entire site is subject to unsafe conditions. These conditions should not regularly occur and should not be consistently present on a site. Generally, unsafe conditions are those that render the site (or a portion of it) inaccessible or that would pose a significant probability of injury to applicable personnel. Examples could include severe storm or flood conditions, high winds, and downed electrical wires.

If your site, or a portion of it, is affected by unsafe conditions during the time of your inspection, provide a description of the conditions that prevented you from conducting the inspection and what parts of the site were affected. If the entire site was considered unsafe, specify the location as "Entire Site."

Inspection Frequency
Check all the inspection frequencies that apply to your project. Note that you may be subject to different inspection frequencies in different areas of your site.

Inspection Triggered by a Storm Event
If you were required to conduct this inspection because of a storm event that produced 0.25 inches or more of rain within a 24-hour period, indicate whether you relied on an on-site rain gauge or a nearby weather station (and where the weather station is located). Also, specify the total amount of rainfall for this specific storm event.

If you were required to conduct this inspection because of a snowmelt discharge from a storm event that produced 3.25 inches or more of snow within a 24-hour period, then indicate whether you relied on an on-site measurement or a nearby weather station (and where the weather station is located). Also, specify the total amount of snowfall for this specific storm event.

Instructions for Section B

Type and Location of Erosion and Sediment (E&S) Controls
Provide a list of all erosion and sediment (E&S) controls that your SWPPP indicates will be installed and implemented at your site. This list must include at a minimum all E&S controls required by CGP Part 2.2. Include also any natural buffers established under CGP Part 2.2.1. Buffer requirements apply if your project's earth-disturbing activities will occur within 50 feet of a discharge to receiving water. You may group your E&S controls on your form if you have several of the same type of controls (e.g., you may group "Inlet Protection Measures," "Perimeter Controls," and "Stockpile Controls" together on one line), but if there are any problems with a specific control, you must separately identify the location of the control, whether routine maintenance or corrective action is necessary, and in the notes section you must describe the specifics about the problem you observed.

Conditions Requiring Routine Maintenance?
Answer "Yes" if the E&S control requires routine maintenance as defined in footnote 1 of this template. Note that in many cases, "Yes" answers are expected and indicate a project with an active operation and maintenance program. You should also answer "Yes" if work to fix the problem is still ongoing from the previous inspection, though necessary work must be initiated immediately and completed by the end of the next business day or within seven calendar days if documented in accordance with CGP Part 2.1.4.b.

If "Yes," How Many Times (Including this Occurrence) Has this Condition Been Identified?
Indicate how many times the routine maintenance has been required for the same control at the same location.

Conditions Requiring Corrective Action?
Answer "Yes" if you found any of the conditions listed in footnote 2 in this template to be present during your inspection (CGP Part 5.1). If you answer "Yes," you must take corrective action and complete a corrective action log, found at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates. You should also answer "Yes" if work to fix the problem from a previous inspection is still ongoing, though the operator must comply with the corrective action deadlines in CGP Part 5.2.

Date on Which Condition First Observed (If Applicable)?
Provide the date on which the condition that triggered the need for routine maintenance or corrective action was first identified. If the condition was just discovered during this inspection, enter the inspection date. If the condition is a carryover from a previous inspection, enter the original date of the condition's discovery.

Description of Conditions Observed
For each E&S control and the area immediately surrounding it, describe whether the control is properly installed and whether it appears to be working to minimize sediment discharge. Indicate also whether a new or modified control is necessary to comply with the permit. Describe any problem condition(s) you observed such as the following:

1. Failure to install or to properly install a required E&S control
2. Damage or destruction to an E&S control caused by vehicles, equipment, or personnel, a storm event, or other event
3. Mud or sediment deposits found downslope from E&S controls, including in receiving waters, or on nearby streets, curbs, or open conveyance channels
4. Sediment tracked out onto paved areas by vehicles leaving construction site
5. Noticeable erosion or sedimentation at discharge outlets or at adjacent streambanks or channels
6. Erosion of the site's sloped areas (e.g., formation of rills or gullies)
7. E&S control is no longer working due to lack of maintenance
8. Other incidents of noncompliance

Describe also why you think the problem condition(s) occurred as well as actions (e.g., routine maintenance or corrective action) you will take or have taken to fix the problem.

For buffer areas, make note of whether they are marked off as required, whether there are signs of construction disturbance within the buffer, which is prohibited under the CGP, and whether there are visible signs of erosion resulting from discharges through the area.

If routine maintenance or corrective action is required, briefly note the reason. If routine maintenance or corrective action has been completed, make a note of the date it was completed and what was done. *If corrective action is required, note that you will need to complete a separate corrective action log describing the condition and your work to fix the problem*.

Routine Maintenance Need Has Been Found to be Necessary Three (3) or More Times for the Same Control at the Same Location (Including this Occurrence)
If routine maintenance has been required three (3) or more times for the same control at the same location, the permit requires (CGP Part 2.1.4.c) you to fix the problem using the corrective action procedures in CGP Part 5 or to document why you believe the reoccurring problem can be addressed as a routine maintenance fix. If you believe the problem can continue to be fixed as routine maintenance, describe why you believe the specific condition should still be addressed as routine maintenance.

Instructions for Section C

Type and Location of Pollution Prevention (P2) Practices and Controls
Provide a list of all pollution prevention (P2) practices and controls that are implemented at your site. This list must include all P2 practices and controls required by CGP Part 2.3 and those that are described in your SWPPP.

Conditions Requiring Routine Maintenance?
Answer "Yes" if the P2 practice or control requires routine maintenance as defined in footnote 1of this template. Note that in many cases, "Yes" answers are expected and indicate a project with an active operation and maintenance program. You should also answer "Yes" if work to fix the problem is still ongoing

from the previous inspection, though necessary work must be initiated immediately and completed by the end of the next business day or within seven calendar days if documented in accordance with CGP Part 2.1.4.b.

If "Yes," How Many Times (Including this Occurrence) Has this Condition Been Identified?
Indicate how many times the routine maintenance has been required for the same practice or control at the same location.

Conditions Requiring Corrective Action?
Answer "Yes" if you found any of the conditions listed in footnote 2 in this template to be present during your inspection (CGP Part 5.1). If you answer "Yes," you must take corrective action and complete a corrective action log, found at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates. You should also answer "Yes" if work to fix the problem from a previous inspection is still ongoing, though the operator must comply with the corrective action deadlines in CGP Part 5.2.

Date on Which Condition First Observed (If Applicable)?
Provide the date on which the condition that triggered the need for maintenance or corrective action was first identified. If the condition was just discovered during this inspection, enter the inspection date. If the condition is a carryover from a previous inspection, enter the original date of the condition's discovery.

Description of Conditions Observed
For each P2 control and the area immediately surrounding it, describe whether the control is properly installed, and whether it appears to be working to minimize or eliminate pollutant discharges. Indicate also whether a new or modified control is necessary to comply with the permit. Describe any problem condition(s) you observed such as the following:

1. Failure to install or to properly install a required P2 control
2. Damage or destruction to a P2 control caused by vehicles, equipment, or personnel, or a storm event
3. Evidence of a spill, leak, or other type of pollutant discharge, or failure to have properly cleaned up a previous spill, leak, or other type of pollutant discharge
4. Spill response supplies are absent, insufficient, or not where they are supposed to be located
5. Improper storage, handling, or disposal of chemicals, building materials or products, fuels, or wastes
6. P2 control is no longer working due to lack of maintenance
7. Other incidents of noncompliance

Describe also why you think the problem condition(s) occurred as well as actions (e.g., routine maintenance or corrective action) you will take or have taken to fix the problem.

If routine maintenance or corrective action is required, briefly note the reason. If routine maintenance or corrective action has been completed, make a note of the date it was completed and what was done. *If corrective action is required, note that you will need to complete a separate corrective action log describing the condition and your work to fix the problem*.

Routine Maintenance Need Was Found to be Necessary Three (3) or More Times for the Same Control at the Same Location (Including this Occurrence)
If routine maintenance has been required three (3) or more times for the same control at the same location, the permit requires (CGP Part 2.1.4.c) you to fix the problem using the corrective action procedures in CGP Part 5 or to document why you believe the reoccurring problem can be addressed as a routine maintenance fix. If you believe the problem can continue to be fixed as routine maintenance, describe why you believe the specific condition should still be addressed as routine maintenance.

Instructions for Section D

Specific Location That Has Been or Will Be Stabilized
List all areas where soil stabilization is required to begin because construction work in that area has permanently stopped or temporarily stopped (i.e., work will stop for 14 or more days), and all areas where stabilization has been implemented (CGP Part 2.2.14).

Stabilization Method and Applicable Deadline
For each area, specify the method of stabilization (e.g., hydroseed, sod, planted vegetation, erosion control blanket, mulch, rock).

Specify also which of the following stabilization deadlines apply to this location:

1. 5 acres or less of land disturbance occurring at any one time at site: Complete no later than 14 calendar days after stabilization initiated.
2. More than 5 acres of land disturbance occurring at any one time at site: Complete no later than 7 calendar days after stabilization initiated.
3. Arid, semi-arid, and drought-stricken areas: See CGP Part 2.2.14.b.i.
4. Unforeseen circumstances: See CGP Part 2.2.14.b.ii.
5. Discharges to a sediment- or nutrient-impaired water or to a water identified as Tier 2, 2.5, or 3 for antidegradation purposes: Complete no later than 7 days after stabilization initiated.

Stabilization Initiated?
For each area, indicate whether stabilization has been initiated. If "Yes," then enter the date stabilization was initiated.

Final Stabilization Criteria Met?
For each area, indicate whether the final stabilization criteria in CGP Part 2.2.14.c have been met. If "Yes," then enter the date final stabilization criteria were met.

Final Stabilization Photos Taken?
Answer "Yes" if you have taken photos before and after meeting the stabilization criteria as required in CGP Part 8.2.1.a.

Notes
For each area where stabilization has been initiated, describe the progress that has been made and what additional actions are necessary to complete stabilization. Note the effectiveness of stabilization in preventing erosion. If stabilization has been initiated but not completed, make a note of the date it is to be completed. If stabilization has been completed, make a note of the date it was completed. If stabilization has not yet been initiated, make a note of the date it is to be initiated and the date it is to be completed.

Instructions for Section E
You are only required to complete this section if a discharge is occurring at the time of the inspection (CGP Part 4.6.2).

Was a discharge (not including dewatering) occurring from any part of your site at the time of the inspection?
During your inspection, examine all points of discharge from your site, and determine whether a discharge is occurring. If a dewatering discharge was occurring, you must conduct a dewatering inspection pursuant to CGP Part 4.3.2. If there is a discharge, answer "Yes" and complete the questions below regarding the specific discharge. If there is not a discharge, answer "No" and skip to the next page.

Discharge Location (Repeat as necessary if there are multiple points of discharge.)
Specify the location on your site where the discharge is occurring. The location may be an outlet from a stormwater control or constructed stormwater channel, a discharge into a storm sewer inlet, or a specific point on the site. Be as specific as possible; it is recommended that you refer to a precise point on your site map.

Observations
Document the visual quality of the discharge and take note of the characteristics of the stormwater discharge, including color; odor; floating, settled, or suspended solids; foam; oily sheen; and other indicators of stormwater pollutants. Also, document signs of these same pollutant characteristics that are visible from your site and attributable to your discharge in receiving waters or in other constructed or natural site drainage features.

Instructions for Section F

Each inspection report must be signed and certified to be considered complete (CGP Part 4.7.2).

Operator or "Duly Authorized Representative" – MANDATORY (CGP Appendix G Part G.11.2 and CGP Appendix H Section X)

At a minimum, the site inspection report must be signed by either (1) the person who signed the NOI, or (2) a duly authorized representative of that person. The following requirements apply:

If the signatory will be the person who signed the NOI for permit coverage, as a reminder, that person must be one of the following types of individuals:

- *For a corporation*: By a responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
- *For a partnership or sole proprietorship*: By a general partner or the proprietor, respectively.
- *For a municipality, State, Federal, or other public agency*: By either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive officer of a Federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

If the signatory will be a duly authorized representative, the following requirements must be met:

- The authorization is made in writing by the person who signed the NOI (see above);
- The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
- The signed and dated written authorization is included in the SWPPP. A copy must be submitted to EPA, if requested.

Sign, date and print your name and affiliation.

Contractor or Subcontractor - OPTIONAL

Where you rely on a contractor or subcontractor to complete the site inspection report, you should consider requiring the individual(s) to sign and certify each report. Note that this does not relieve you, the permitted operator, of the requirement to sign and certify the site inspection report as well. If applicable, sign, date, and print your name and affiliation.

Note

While EPA has made every effort to ensure the accuracy of all instructions contained in this template, it is the permit, not this template, that determines the actual obligations of regulated construction stormwater discharges. In the event of a conflict between this template and any corresponding provision of the CGP, you must abide by the requirements in the permit. EPA welcomes comments on this Site Inspection Report Template at any time and will consider those comments in any future revision. You may contact EPA for CGP-related inquiries at cgp@epa.gov

Section A – Dewatering Discharges (CGP Part 4.6.3) Complete this section within 24 hours of completing the inspection. (If necessary, complete additional inspection reports for each separate inspection location.)	
Inspector Information	
Inspector Name:	**Title:**
Company Name:	**Email:**
Address:	**Phone Number:**
Inspection Details	
Inspection Date:	**Inspection Location:**
Discharge Start Time:	**Discharge End Time:**
Rate of Discharge (gallons per day):	**Corrective Action Required?**[1] ☐ Yes ☐ No
Describe Indicators of Pollutant Discharge at Point of Dewatering Discharge:[1]	
Attach Photographs of: 1. Dewatering water prior to treatment by a dewatering control(s) and the final discharge after treatment; and 2. Dewatering control(s); and 3. Point of discharge to any receiving waters flowing through or immediately adjacent to the site and/or to constructed or natural site drainage features, storm drain inlets, and other conveyances to receiving waters.	

[1] If you observe any of the following indicators of pollutant discharge, you are required to take corrective action under Part 5.1.5.b:

- a sediment plume, suspended solids, unusual color, presence of odor, decreased clarity, or presence of foam; or
- a visible sheen on the water surface or visible oily deposits on the bottom or shoreline of the receiving water.

Section B – Signature and Certification (CGP Part 4.7.2)	
"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."	
MANDATORY: Signature of Operator or "Duly Authorized Representative:"	
Signature:	**Date:**
Printed Name:	**Affiliation:**
OPTIONAL: Signature of Contractor or Subcontractor	
Signature:	**Date:**
Printed Name:	**Affiliation:**

General Tips for Using This Template

This Dewatering Inspection Report Template is provided to assist you in preparing dewatering inspection reports for EPA's 2022 Construction General Permit (CGP). If you are covered under the 2022 CGP, you can use this template to create a dewatering inspection report form that complies with the minimum reporting requirements of Part 4.6.3 of the permit. Note that the use of this form is optional; you may use your own inspection report form provided it includes the minimum information required in Part 4.6.3 of the CGP.

This template is for dewatering inspections only. A separate site inspection report template that does not include dewatering inspections and complies with the minimum reporting requirements of Part 4.7 of the permit is available at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates.

If you are covered under a State CGP, this template may be helpful in developing a report that can be used for that permit; however, it will need to be modified to meet the specific requirements of that permit. If your permitting authority requires you to use a specific inspection report form, you should not use this form.

The following tips for using this template will help you ensure that the minimum permit requirements are met:

- **Review the inspection requirements.** Before you start developing your inspection report form, read the CGP's Part 4 inspection requirements. This will ensure that you have a working understanding of the permit's underlying inspection requirements.
- **Complete all required blank fields.** Fill out all blank fields. Only by filling out all fields will the template be compliant with the requirements of the permit. (Note: Where you do not need the number of rows provided in the template form for your inspection, you may delete these as you see fit. Or, if you need more space to document your findings, you may insert additional rows in the electronic version of this form or use the bottom of the page in the field version of this form.)
- **Use your site map to document inspection findings.** In several places in the template, you are directed to specify the location of certain features of your site, including where stormwater controls are installed and where you will be stabilizing exposed soil. You are also asked to fill in location information for unsafe conditions and the locations of any discharges occurring during your inspections. Where you are asked for location information, EPA encourages you to reference the point on your SWPPP site map that corresponds to the requested location on the inspection form. Using the site map as a tool in this way will help you conduct efficient inspections, will assist you in evaluating problems found, and will ensure proper documentation.
- **Include the inspection form with your SWPPP.** Once your form is complete, make sure to include a copy of the inspection form in your SWPPP in accordance with Part 7.2.7.e of the CGP.
- **Retain copies of all inspection reports with your records.** You must also retain copies of all inspection reports in your records in accordance with the requirements in Part 4.7.3 of the CGP. These reports must be retained for at least 3 years from the date your permit coverage expires or is terminated in accordance with the requirements in Part 4.7.4 of the CGP.

Instructions for Section A

Inspector Name

Enter the name of the person that conducted the inspection. Include the person's contact information (title, affiliated company name, address, email, and phone number).

Inspection Date

Enter the date you performed the inspection.

Inspection Location

If your project has multiple locations where you conduct separate dewatering inspections, specify the location where this inspection is being conducted. Otherwise, you can enter "dewatering operation."

Discharge Start and End Times

Enter the approximate time the dewatering discharge started and ended on the day of the inspection.

Rate of Discharge
Enter the rate of discharge in gallons per day on the day of inspection.

To estimate the approximate discharge rate on the day of dewatering inspection, one approach is to use the manufacturer's design pump rating for the pump model in use. For example, a pump rated at 164 gpm (gallons per minute) by the manufacturer can be assumed to be discharging at 164 gpm in most cases. To convert to gallons per day, multiply the rate in gpm by the ratio of minutes in one-day (1,440 minutes per day), resulting in a discharge rate of 236,160 gallons per day.

In cases where the dewatering discharge is being pumped over long distances or a substantial distance uphill, which will result in a reduced pump rate relative to manufacturer's specification, the operator may improve the accuracy of the estimate by estimating the time required to fill a container of a known volume. For example, if it takes 60 seconds to fill an empty 55-gallon barrel, the estimated discharge rate is 55 gpm, or 79,200 gallons per day.

Indicators of Pollutant Discharge
For the point of discharge, describe any observed sediment plume, suspended solids, unusual color, presence of odor, decreased clarity, or presence of foam; and/or a visible sheen on the water surface or visible oily deposits on the bottom or shoreline of the receiving water.

Corrective Action Required?
Answer "Yes" if during your inspection you found any of the conditions listed above in the instructions for the Indicators of Pollutant Discharge section. If you answer "Yes," you must take corrective action and complete a corrective action log, found at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates. Answer "No" if you did not observe any of the listed pollutant indicators.

Photographs
As required in CGP Part 8.2.1.a, attach photos of: (1) dewatering water prior to treatment by a dewatering control(s) and the final discharge after treatment; (2) the dewatering control(s); and (3) the point of discharge to any receiving waters flowing through or immediately adjacent to the site and/or to constructed or natural site drainage features, storm drain inlets, and other conveyances to receiving waters.

Instructions for Section B

Each inspection report must be signed and certified to be considered complete (CGP Part 4.7.2).

Operator or "Duly Authorized Representative" – MANDATORY (CGP Appendix G Part G.11.2 and CGP Appendix H Section X)
At a minimum, the dewatering inspection report must be signed by either (1) the person who signed the NOI, or (2) a duly authorized representative of that person. The following requirements apply:

If the signatory will be the person who signed the NOI for permit coverage, as a reminder, that person must be one of the following types of individuals:

- *For a corporation*: By a responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
- *For a partnership or sole proprietorship*: By a general partner or the proprietor, respectively.

- *For a municipality, State, Federal, or other public agency*: By either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive officer of a Federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

If the signatory will be a duly authorized representative, the following requirements must be met:

- The authorization is made in writing by the person who signed the NOI (see above);
- The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
- The signed and dated written authorization is included in the SWPPP. A copy must be submitted to EPA, if requested.

Sign, date and print your name and affiliation.

Contractor or Subcontractor - OPTIONAL

Where you rely on a contractor or subcontractor to complete the dewatering inspection report, you should consider requiring the individual(s) to sign and certify each report. Note that this does not relieve you, the permitted operator, of the requirement to sign and certify the dewatering inspection report as well. If applicable, sign, date, and print your name and affiliation.

Note

While EPA has made every effort to ensure the accuracy of all instructions contained in this template, it is the permit, not this template, that determines the actual obligations of regulated construction stormwater discharges. In the event of a conflict between this template and any corresponding provision of the CGP, you must abide by the requirements in the permit. EPA welcomes comments on this Dewatering Inspection Report Template at any time and will consider those comments in any future revision. You may contact EPA for CGP-related inquiries at cgp@epa.gov

APPENDIX E
Corrective Action Log

2022 CGP Corrective Action Log
Project Name: ____
NPDES ID Number: ____

Section A – Individual Completing this Log	
Name:	**Title:**
Company Name:	**Email:**
Address:	**Phone Number:**

Section B – Details of the Problem (CGP Part 5.4.1.a) Complete this section within 24 hours of discovering the condition that triggered corrective action.	
Date problem was first identified:	**Time problem was first identified**:
What site conditions triggered this corrective action? *(Check the box that applies. See instructions for a description of each triggering condition (1 thru 6).)* ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5a ☐ 5b ☐ 6	
Specific location where problem identified:	
Provide a description of the specific condition that triggered the need for corrective action and the cause (if identifiable):	

Section C – Corrective Action Completion (CGP Part 5.4.1.b) Complete this section within 24 hours after completing the corrective action.
For site condition # 1, 2, 3, 4, or 6 (those not related to a dewatering discharge) confirm that you met the following deadlines (CGP Part 5.2.1):
☐ Immediately took all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events. **AND**
☐ Completed corrective action by the close of the next business day, unless a new or replacement control, or significant repair, was required. **OR**
☐ Completed corrective action within seven (7) calendar days from the time of discovery because a new or replacement control, or significant repair, was necessary to complete the installation of the new or modified control or complete the repair. **OR**
☐ It was infeasible to complete the installation or repair within 7 calendar days from the time of discovery. Provide the following additional information: Explain why 7 calendar days was infeasible to complete the installation or repair:

Provide your schedule for installing the stormwater control and making it operational as soon as feasible after the 7 calendar days:
For site condition # 5a, 5b, or 6 (those related to a dewatering discharge), confirm that you met the following deadlines: ☐ Immediately took all reasonable steps to minimize or prevent the discharge of pollutants until a solution could be implemented, including shutting off the dewatering discharge as soon as possible depending on the severity of the condition taking safety considerations into account. ☐ Determined whether the dewatering controls were operating effectively and whether they were causing the conditions. ☐ Made any necessary adjustments, repairs, or replacements to the dewatering controls to lower the turbidity levels below the benchmark or remove the visible plume or sheen.

Describe any modification(s) made as part of corrective action: (Insert additional rows below if applicable)	**Date of completion:**	**SWPPP update necessary?**	**If yes, date SWPPP was updated:**
1.		☐ Yes ☐ No	
2.		☐ Yes ☐ No	

Section D - Signature and Certification (CGP Part 5.4.2)

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

MANDATORY: Signature of Operator or "Duly Authorized Representative:"	
Signature:	**Date:**
Printed Name:	**Affiliation:**
OPTIONAL: Signature of Contractor or Subcontractor	
Signature:	**Date:**
Printed Name:	**Affiliation:**

General Instructions

This Corrective Action Log Template is provided to assist you creating a corrective action log that complies with the minimum reporting requirements of Part 5.4 of the EPA's Construction General Permit (CGP). For each triggering condition on your site, you will need to fill out a separate corrective action log.

The entire form must be completed to be compliant with the requirements of the permit. (Note: In Section C, if you do not need the number of rows provided in the corrective action log, you may delete these or cross them off. Alternatively, if you need more space to describe any modifications, you may insert additional rows in the electronic version of this form or use the bottom of the page in the field version of this form.)

If you are covered under a State CGP, this template may be helpful in developing a log that can be used for that permit; however, you will likely need to modify this form to meet the specific requirements of any State-issued permit. If your permitting authority requires you to use a specific corrective action log, you should not use this template.

Instructions for Section A

Individual completing this form Enter the name of the person completing this log. Include the person's contact information (title, affiliated company name, address, email, and phone number).

Instructions for Section B

You must complete Section B within 24 hours of discovering the condition that triggered corrective action. (CGP Part 5.4)

When was the problem first discovered?
Specify the date and time when the triggering condition was first discovered.

What site conditions triggered this corrective action? (CGP Parts 5.1 and 5.3)
Check the box corresponding to the numbered triggering condition below that applies to your site.

1. A stormwater control needs a significant repair or a new or replacement control is needed, or, in accordance with Part **Error! Reference source not found.**, you find it necessary to repeatedly (i.e., 3 or more times) conduct the same routine maintenance fix to the same control at the same location (unless you document in your inspection report under Part **Error! Reference source not found.** that the specific reoccurrence of this same problem should still be addressed as a routine maintenance fix under Part **Error! Reference source not found.**);
2. A stormwater control necessary to comply with the requirements of this permit was never installed, or was installed incorrectly;
3. Your discharges are not meeting applicable water quality standards;
4. A prohibited discharge has occurred (see Part 1.3);
5. During discharge from site dewatering activities:
   a. The weekly average of your turbidity monitoring results exceeds the 50 NTU benchmark (or alternate benchmark if approved by EPA pursuant to Part **Error! Reference source not found.**); or
   b. You observe or you are informed by EPA, State, or local authorities of the presence of any of the following at the point of discharge to a receiving water flowing through or immediately adjacent to your site and/or to constructed or natural site drainage features or storm drain inlets:
      - sediment plume
      - suspended solids
      - unusual color
      - presence of odor
      - decreased clarity
      - presence of foam
      - visible sheen on the water surface or visible oily deposits on the bottom or shoreline of the receiving water
6. EPA requires corrective action as a result of permit violations found during an inspection carried out under Part 4.8.

Provide a description of the problem (CGP Part 5.4.1.a)
Provide a summary description of the condition you found that triggered corrective action, the cause of the problem (if identifiable), and the specific location where it was found. Be as specific as possible about the location; it is recommended that you refer to a precise point on your site map.

Instructions for Section C

You must complete Section C within 24 hours after completing the correction action. (CGP Part 5.4)

Deadlines for completing corrective action for condition # 1, 2, 3, 4, or 6 (if not relating to a dewatering discharge) (CGP Part 5.2.1)
Check the box to confirm that you met the deadlines that apply to each triggering condition. You are always required to check the first box (i.e., Immediately took all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events.). Only one of the next three boxes should be checked depending on the situation that applies to this corrective action.

Check the second box if the corrective action for this particular triggering condition does not require a new or replacement control, or a significant repair. These actions must be completed by the close of the next business day from the time of discovery of the condition.

Check the third box if the corrective action for this particular triggering condition requires a new or replacement control, or a significant repair. These actions must be completed by no later than seven calendar days from the time of discover of the condition.

Check the fourth box if the corrective action for this particular triggering condition requires a new or replacement control, or a significant repair, and if it is infeasible to complete the work within seven calendar days. Additionally, you will need to fill out the table below the checkbox that requires:

1. An explanation as to why it was infeasible to complete the installation or repair within seven calendar days of discovering the condition.
2. Provide the schedule you will adhere to for installing the stormwater control and making it operational as soon as feasible after the seventh day following discovery.

Note: Per Part 5.2.1.c, where these actions result in changes to any of the stormwater controls or procedures documented in your SWPPP, you must modify your SWPPP accordingly within seven calendar days of completing this work.

Deadlines for completing corrective action for condition # 5a, 5b, or 6 related to a dewatering discharge (CGP Part 5.2.2)
These deadlines apply to conditions relating to construction dewatering activities. Check the box to confirm that you met the deadlines that apply to each triggering condition. You are required to check all of the boxes in this section to indicate your compliance with the corrective action deadlines.

List of modification(s) to correct problem
Provide a list of modifications you completed to correct the problem.

Date of completion
Enter the date you completed the modification. The work must be completed by the deadline you indicated above.

SWPPP update necessary?
Check "Yes" or "No" to indicate if a SWPPP update is necessary consistent with Part 7.4.1.a in order to reflect changes implemented at your site. If "Yes," then enter the date you updated your SWPPP. The SWPPP updates must be made within seven calendar days of completing a corrective action. (CGP Part 5.2.1.c)

Instructions for Section D

Each corrective action log entry must be signed and certified following completion of Section D to be considered complete. (CGP Part 5.4.2)

Operator or "Duly Authorized Representative" – MANDATORY (CGP Appendix G Part G.11.2 and CGP Appendix H Section X)

At a minimum, the corrective action log must be signed by either (1) the person who signed the NOI, or (2) a duly authorized representative of that person. The following requirements apply:

If the signatory will be the person who signed the NOI for permit coverage, as a reminder, that person must be one of the following types of individuals:

- *For a corporation*: By a responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
- *For a partnership or sole proprietorship*: By a general partner or the proprietor, respectively.
- *For a municipality, State, Federal, or other public agency*: By either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive officer of a Federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

If the signatory will be a duly authorized representative, the following requirements must be met:

- The authorization is made in writing by the person who signed the NOI (see above);
- The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
- The signed and dated written authorization is included in the SWPPP. A copy must be submitted to EPA, if requested.

Sign, date and print your name and affiliation.

Contractor or Subcontractor - OPTIONAL
Where you rely on a contractor or subcontractor to complete this log and the associated corrective action, you should consider requiring the individual(s) to sign and certify each log entry. Note that this does not relieve you, the permitted operator, of the requirement to sign and certify the log as well. If applicable, sign, date, and print your name and affiliation.

Recordkeeping
Logs must be retained for at least 3 years from the date your permit coverage expires or is terminated. (CGP Part 5.4.4)

Keep copies of your signed corrective action log entries at the site or at an easily accessible location so that it can be made immediately available at the time of an on-site inspection or upon request by EPA. (CGP Part 5.4.3) Include a copy of the corrective action log in your SWPPP. (CGP Part 7.2.7.e)

Note
While EPA has made every effort to ensure the accuracy of all instructions contained in this template, it is the permit, not this template, that determines the actual obligations of regulated construction stormwater discharges. In the event of a conflict between this template and any corresponding provision of the CGP, you must abide by the requirements in the permit. EPA welcomes comments on this Corrective Action Log Template at any time and will consider those comments in any future revision. You may contact EPA for CGP-related inquiries at cgp@epa.gov

APPENDIX F
SWPPP Amendment Log

Appendix F –SWPPP Amendment Log

Instructions (see CGP Part 7.4):

- Create a log here of changes and updates to the SWPPP. You may use the table below to track these modifications.
- SWPPP modifications are required pursuant to CGP Part 7.4.1 in the following circumstances:
  - ✓ Whenever new operators become active in construction activities on your site, or you make changes to your construction plans, stormwater controls, or other activities at your site that are no longer accurately reflected in your SWPPP (this includes changes made in response to corrective actions triggered under CGP Part 5);
  - ✓ To reflect areas on your site map where operational control has been transferred (and the date of transfer) since initiating permit coverage;
  - ✓ If inspections or investigations determine that SWPPP modifications are necessary for compliance with this permit;
  - ✓ *Where EPA determines it is necessary to install and/or implement additional controls at your site in order to meet requirements of the permit;*
  - ✓ To reflect any revisions to applicable Federal, State, Tribal, or local requirements that affect the stormwater control measures implemented at the site; and
  - ✓ If applicable, if a change in chemical treatment systems or chemically-enhanced stormwater control is made, including use of a different treatment chemical, different dosage rate, or different area of application.

No.	Description of the Amendment	Date of Amendment	Amendment Prepared by [Name(s) and Title]
		INSERT DATE	
		INSERT DATE	
		INSERT DATE	
		INSERT DATE	
		INSERT DATE	
		INSERT DATE	
		INSERT DATE	
		INSERT DATE	

APPENDIX G

Subcontractor Certifications/Agreements

Appendix G – Subcontractor Certifications/Agreements

SUBCONTRACTOR CERTIFICATION
STORMWATER POLLUTION PREVENTION PLAN

Project Number: ____________________

Project Title: Wells 2, 3 And 4 Water Treatment Plant

Operator(s): ____________________

As a subcontractor, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the office trailer.

Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the practices described in the SWPPP.

This certification is hereby signed in reference to the above named project:

Company: ____________________

Address: ____________________

Telephone Number: ____________________

Type of construction service to be provided: ____________________

____

____

Signature: ____________________

Title: ____________________

Date:

APPENDIX H
Grading and Stabilization Activities Log

Appendix H – Grading and Stabilization Activities Log

Date Grading Activity Initiated	**Description of Grading Activity**	**Description of Stabilization Measure and Location**	**Date Grading Activity Ceased** (Indicate Temporary or Permanent)	**Date When Stabilization Measures Initiated**
INSERT DATE			INSERT DATE ☐ Temporary ☐ Permanent	INSERT DATE
INSERT DATE			INSERT DATE ☐ Temporary ☐ Permanent	INSERT DATE
INSERT DATE			INSERT DATE ☐ Temporary ☐ Permanent	INSERT DATE
INSERT DATE			INSERT DATE ☐ Temporary ☐ Permanent	INSERT DATE
INSERT DATE			INSERT DATE ☐ Temporary ☐ Permanent	INSERT DATE
INSERT DATE			INSERT DATE ☐ Temporary ☐ Permanent	INSERT DATE
INSERT DATE			INSERT DATE ☐ Temporary ☐ Permanent	INSERT DATE
INSERT DATE			INSERT DATE ☐ Temporary ☐ Permanent	INSERT DATE

APPENDIX I

Training Documentation

(Include documentation showing completion of trainings in accordance with Section 1.2 of the SWPPP and section 7.2.2 of the CGP)

APPENDIX J
Delegation of Authority

Appendix J –Delegation of Authority Form

Delegation of Authority

I, ______________________ (name), hereby designate the person or specifically described position below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the EPA's Construction General Permit (CGP), at the ___________________________________ construction site. The designee is authorized to sign any reports, stormwater pollution prevention plans and all other documents required by the permit.

_______________________________________ (name of person or position)
_______________________________________ (company)
_______________________________________ (address)
_______________________________________ (city, State, zip)
_______________________________________ (phone)

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in Appendix G of EPA's CGP, and that the designee above meets the definition of a "duly authorized representative" as set forth in Appendix G.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: ____

Company: ____

Title: ____

Signature: ____

Date: ____

APPENDIX K

Endangered Species Documentation

Note to reviewer: Please refer to the end of this Appendix for documentation supporting the Criterion C eligibility of this project per Section 3.1 of the SWPPP narrative.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104

In Reply Refer To:
Project Code: 2023-0044951
Project Name: Sharon Well 4 Treatment System

February 13, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Updated 12/27/2022 - Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

About Official Species Lists

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Federal and non-Federal project proponents have responsibilities under the Act to consider effects on listed species.

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested by returning to an existing project's page in IPaC.

Endangered Species Act Project Review

Please visit the "**New England Field Office Endangered Species Project Review and Consultation**" website for step-by-step instructions on how to consider effects on listed species and prepare and submit a project review package if necessary:

https://www.fws.gov/office/new-england-ecological-services/endangered-species-project-review

NOTE Please do not use the **Consultation Package Builder** tool in IPaC except in specific situations following coordination with our office. Please follow the project review guidance on our website instead and reference your **Project Code** in all correspondence.

Northern Long-eared Bat - (Updated 12/27/2022) Please visit our New England Field Office Project Review webpage at the link above for updated northern long-eared bat consultation guidance. The Service published a final rule to reclassify the northern long-eared bat (NLEB) as endangered on November 30, 2022. The final rule will go into effect on **January 30, 2023**. After that date, the current 4(d) rule for NLEB will no longer be in effect, and the 4(d) determination key will no longer be available. New compliance tools will be available by mid- to late-January, and information will be posted on our New England Field Office Project Review webpage in January, so please check this site often for updates.
Depending on the type of effects a project has on NLEB, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective. If your project may result in incidental take of NLEB after the new listing goes into effect, this will need to be addressed in an updated consultation that includes an Incidental Take Statement. Many of these situations will be addressed through the new compliance tools. If your project may require re-initiation of consultation, please wait for information on the new tools to appear on our website or contact our office at **newengland@fws.gov** for additional guidance.

Additional Info About Section 7 of the Act
Under section 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether projects may affect threatened and endangered species and/or designated critical habitat. If a Federal agency, or its non-Federal representative, determines that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Federal agency also may need to consider proposed species and proposed critical habitat in the consultation. 50 CFR 402.14(c)(1) specifies the information required for consultation under the Act regardless of the format of the evaluation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/service/section-7-consultations

In addition to consultation requirements under Section 7(a)(2) of the ESA, please note that under sections 7(a)(1) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Please contact NEFO if you would like more information.

Candidate species that appear on the enclosed species list have no current protections under the

ESA. The species' occurrence on an official species list does not convey a requirement to consider impacts to this species as you would a proposed, threatened, or endangered species. The ESA does not provide for interagency consultations on candidate species under section 7, however, the Service recommends that all project proponents incorporate measures into projects to benefit candidate species and their habitats wherever possible.

Migratory Birds

In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see:

https://www.fws.gov/program/migratory-bird-permit

https://www.fws.gov/library/collections/bald-and-golden-eagle-management

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

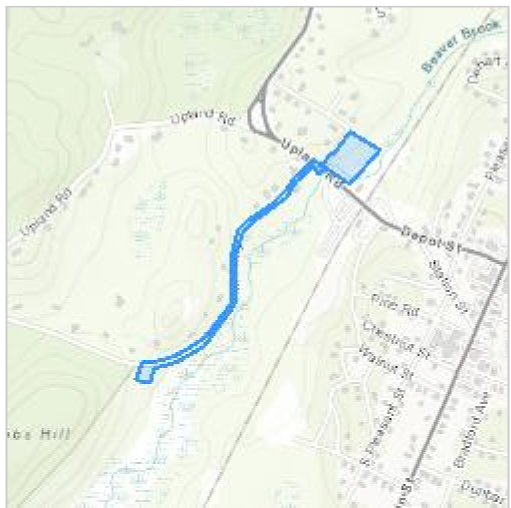
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Project Code:	2023-0044951
Project Name:	Sharon Well 4 Treatment System
Project Type:	Water Supply Facility - New Constr
Project Description:	The project includes the construction of a new water treatment facility for PFAS removal at an existing municipal well site in Sharon, MA. The project also includes a water main extension approximately 1-mile in length from a nearby well-site to the proposed treatment facility.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@42.1238397,-71.18842996193376,14z



Counties: Norfolk County, Massachusetts

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

IPaC User Contact Information

Agency:	Environmental Partners
Name:	Mollie Scott
Address:	1900 Crown Colony Drive
Address Line 2:	Unit 402
City:	Quincy
State:	MA
Zip:	02169
Email	mms@envpartners.com
Phone:	6176570950

Lead Agency Contact Information

Lead Agency: Environmental Protection Agency

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104

In Reply Refer To: October 04, 2023
Project Code: 2024-0001575
Project Name: Wells 2, 3 and 4 Water Treatment Plant

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Updated 4/12/2023 - Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

About Official Species Lists

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Federal and non-Federal project proponents have responsibilities under the Act to consider effects on listed species.

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested by returning to an existing project's page in IPaC.

Endangered Species Act Project Review

Please visit the "**New England Field Office Endangered Species Project Review and Consultation**" website for step-by-step instructions on how to consider effects on listed species and prepare and submit a project review package if necessary:

https://www.fws.gov/office/new-england-ecological-services/endangered-species-project-review

NOTE Please do not use the **Consultation Package Builder** tool in IPaC except in specific situations following coordination with our office. Please follow the project review guidance on our website instead and reference your **Project Code** in all correspondence.

Northern Long-eared Bat - (**Updated 4/12/2023**) The Service published a final rule to reclassify the northern long-eared bat (NLEB) as endangered on November 30, 2022. The final rule went into effect on March 31, 2023. You may utilize the **Northern Long-eared Bat Rangewide Determination Key** available in IPaC. More information about this Determination Key and the Interim Consultation Framework are available on the northern long-eared bat species page:

https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis

For projects that previously utilized the 4(d) Determination Key, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective. If your project was not completed by March 31, 2023, and may result in incidental take of NLEB, please reach out to our office at newengland@fws.gov to see if reinitiation is necessary.

Additional Info About Section 7 of the Act
Under section 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether projects may affect threatened and endangered species and/or designated critical habitat. If a Federal agency, or its non-Federal representative, determines that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Federal agency also may need to consider proposed species and proposed critical habitat in the consultation. 50 CFR 402.14(c)(1) specifies the information required for consultation under the Act regardless of the format of the evaluation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/service/section-7-consultations

In addition to consultation requirements under Section 7(a)(2) of the ESA, please note that under sections 7(a)(1) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Please contact NEFO if you would like more information.

Candidate species that appear on the enclosed species list have no current protections under the ESA. The species' occurrence on an official species list does not convey a requirement to consider impacts to this species as you would a proposed, threatened, or endangered species. The ESA does not provide for interagency consultations on candidate species under section 7, however, the Service recommends that all project proponents incorporate measures into projects to benefit candidate species and their habitats wherever possible.

Migratory Birds

In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see:

https://www.fws.gov/program/migratory-bird-permit

https://www.fws.gov/library/collections/bald-and-golden-eagle-management

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

PROJECT SUMMARY

Project Code: 2024-0001575
Project Name: Wells 2, 3 and 4 Water Treatment Plant
Project Type: Water Supply Facility - New Constr
Project Description: The project includes the construction of a new water treatment facility for PFAS removal at an existing municipal well site in Sharon, MA. The project also includes a water main extension approximately 1-mile in length from a nearby well-site to the proposed treatment facility.
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@42.116660800000005,-71.19350374999999,14z

Counties: Norfolk County, Massachusetts

ENDANGERED SPECIES ACT SPECIES

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Environmental Partners Group, LLC
Name: Srushti Shah
Address: 1900 Crown Colony Drive, Suite 402
City: Quincy
State: MA
Zip: 02169
Email sbs@envpartners.com
Phone: 8577535140

Criterion C Eligibility Requirements

■ **C** **Discharges not likely to result in any short- or long-term adverse effects to ESA-listed species and/or designated critical habitat.** ESA-listed species and/or designated critical habitat(s) under the jurisdiction of the USFWS and/or NMFS are likely to occur in or near your site's "action area," and you certify to EPA that your site's discharges and discharge-related activities are not likely to result in any short- or long-term adverse effects to ESA-listed threatened or endangered species and/or designated critical habitat. This certification may include consideration of any stormwater controls and/or management practices you will adopt to ensure that your discharges and discharge-related activities are not likely to result in any short- or long-term adverse effects to ESA-listed species and/or designated critical habitat. To certify your eligibility under this criterion, you must indicate below1) the ESA-listed species and/or designated habitat located in your "action area" using the process outlined in this Appendix; 2) the distance between the site and the listed species and/or designated critical habitat in the action area (in miles); and 3) a rationale describing specifically how short- or long-term adverse effects to ESA-listed species will be avoided from the discharges and discharge-related activities. You must also include a copy of your site map from your SWPPP showing the upland and in-water extent of your "action area" with your NOI.

C1. I confirm that both ESA-listed species and designated critical habitat under the jurisdiction of the USFWS and/or NMFS were considered in my evaluation. Yes ■

C2. Provide the USFWS information resources and expertise used to arrive at this criterion selection:

The above report provided by the USFWS confirms the Northern Long-eared Bat and the Monarch Butterfly as threatened species within the listed project area.

C3. Provide the NMFS information resources and expertise used to arrive at this criterion selection:

N/A

C4. What ESA-listed species and/or designated critical habitat are located in your "action area?" (or attach a printout of the species' list(s))

Northern Long-eared Bat (Threatened)
Monarch Butterfly (Candidate)

No critical habitats were found in the project's "action area."

C5. What is the distance between your site and the ESA-listed species and/or designated critical habitat within the action area (in miles, state "on site" if the ESA-listed species and/or designated critical habitat is within the area to be disturbed)? ______________________________

C6. Provide the rationale describing specifically how any short- or long-term adverse effects to ESA-listed species will be avoided from the discharge and discharge-related activities.

The listed species are not land-based species; as such, the at-grade discharge related activities from the proposed development is not expected to directly affect the species in an adverse manner. The proposed project area is a relatively small area, primarily contained to an existing roadway to which no long term surface level alterations are proposed. This suggests the discharge activities will not cause any significant change from existing conditions and will not cause significant disruption to these species.

C7. I confirm that a site map from my SWPPP showing the upland and in-water extent of my "action area" is attached. Yes ■

C8. Check to confirm you have provided documentation in your SWPPP supporting your eligibility under Criterion C. Yes ■

Instructions

- **If you selected Criterion C above and answered questions C1-C8, you are done with this worksheet. If you are not filing electronically, you must submit this worksheet with your NOI.** STOP
- If not, please proceed to step 4.

APPENDIX L
Historic Preservation Documentation

RECEIVED

MAR 31 2023

MASS. HIST. COMM

RC.73030

APPENDIX A

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD
BOSTON, MASS. 02125
617-727-8470, FAX: 617-727-5128

PROJECT NOTIFICATION FORM

After review of MHC files and the materials you submitted, it has been determined that this project is unlikely to affect significant historic or archaeological resources.

MHC# RC.73030

Edward L. Bell — Date
Deputy State Historic Preservation Officer
Massachusetts Historical Commission

xc: Maria Pinaud, DEP SRF Program
Sarah Price, Environmental Partners

Project Name: Wells 2, 3, and 4 Water Treatment Plant

Location / Address: 15 Tree Lane

City / Town: Town of Sharon, Massachusetts

Project Proponent

Name: Eric Hooper, Department of Public Works Superintendent

Address: 217R South Main Street, BOX 517

City/Town/Zip/Telephone: Town of Sharon, Massachusetts 02067 (781) 784-1525 ext. 2311

Agency license or funding for the project (list all licenses, permits, approvals, grants or other entitlements being sought from state and federal agencies).

Agency Name	Type of License or funding (specify)
Refer to the Attached License/Funding List	

Project Description (narrative):

The project consists of the construction of a water treatment plant at the 15 Tree Lane site, the existing site of Well 4. Site improvements include the construction of an access road, a building (7,500 square feet), infiltration basins to attenuate stormwater, and new water main piping to connect the well sites to the new treatment facility.

Does the project include demolition? If so, specify nature of demolition and describe the building(s) which are proposed for demolition.

This project includes the possible demolition of the existing chemical building located south of the proposed WTP, as the building will no longer be needed following construction of the proposed facility.

Does the project include rehabilitation of any existing buildings? If so, specify nature of rehabilitation and describe the building(s) which are proposed for rehabilitation.

Yes, the project includes rehabilitation of existing water treatment equipment and support systems. The existing chemical equipment will be removed at all well sites. Hazardous material assessments will also be conducted to determine whether additional rehabilitation is needed.

Does the project include new construction? If so, describe (attach plans and elevations if necessary).

Yes, the project includes the construction of a new water treatment plant. Refer to Figure 3 for a preliminary design plan.

APPENDIX A (continued)

To the best of your knowledge, are any historic or archaeological properties known to exist within the project's area of potential impact? If so, specify.

No.

What is the total acreage of the project area?

Woodland	±3.1	acres	Productive Resources:		
Wetland	±0.9	acres	Agriculture		acres
Floodplain	±1.6	acres	Forestry		acres
Open space	0	acres	Mining/Extraction		acres
Developed	±0.7	acres	Total Project Acreage	6.3	acres

What is the acreage of the proposed new construction? 0.17 acres (building only)

What is the present land use of the project area?

The project area is adjacent to an existing paved right-of-way and is currently undeveloped (wooded).

Please attach a copy of the section of the USGS quadrangle map which clearly marks the project location.

Please refer to the attached Figure 1 and Figure 2.

This Project Notification Form has been submitted to the MHC in compliance with 950 CMR 71.00.

Signature of Person submitting this form: Date: 3/29/2023

Name: Sarah Price, P.E.

Address: Environmental Partners
1900 Crown Colony Drive, Suite 402

City/Town/Zip: Quincy, MA

Telephone: (617) 657-0287

REGULATORY AUTHORITY

950 CMR 71.00: M.G.L. c. 9, §§ 26-27C as amended by St. 1988, c. 254.

Federal and State License and Funding List
Wells 2, 3, and 4 Water Treatment Plant – Well 3 Site
Sharon, Massachusetts

Agency Name	Type of License of Funding
DWSRF	Grant/loan funding
ARPA	Funding
MassDEP Drinking Water	Approval
MEPA	Approval
Conservation Commission	Approval
Zoning Board	Approval

APPENDIX M
Rainfall Gauge Recording

Appendix M – Rainfall Gauge Recording

Use the table below to record the rainfall gauge readings at the beginning and end of each work day. An example table follows.

Month/Year			Month/Year			Month/Year		
Day	Start time	End time	Day	Start time	End time	Day	Start time	End time
1			1			1		
2			2			2		
3			3			3		
4			4			4		
5			5			5		
6			6			6		
7			7			7		
8			8			8		
9			9			9		
10			10			10		
11			11			11		
12			12			12		
13			13			13		
14			14			14		
15			15			15		
16			16			16		
17			17			17		
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19			19			19		
20			20			20		
21			21			21		
22			22			22		
23			23			23		
24			24			24		
25			25			25		
26			26			26		
27			27			27		
28			28			28		
29			29			29		
30			30			30		
31			31			31		

APPENDIX N

Turbidity Meter Manual and Manufacturer’s Instructions

This SWPPP does not list the Beaver Brook as “sensitive waters” (which are (1) receiving waters listed as impaired for sediment or a sediment-related parameter per Appendix A of the CGP and (2) receiving waters designated as a Tier 2, 2.5, or 3).

The EPA’s Stormwater Discharge Mapping Tools found at https://www.epa.gov/npdes/epas-stormwater-discharge-mapping-tools have been used to confirm the point of discharge and designation of the sediment receiving water.

ATTACHMENT L

NRCS Soil Report

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Norfolk and Suffolk Counties, Massachusetts

November 22, 2022

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map

Map Scale: 1:2,690 if printed on A landscape (11" x 8.5") sheet.

Meters: 0, 35, 70, 140, 210

Feet: 0, 100, 200, 400, 600

N

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 Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 18, Sep 9, 2022

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

Date(s) aerial images were photographed: May 22, 2022—Jun 5, 2022

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
51	Swansea muck, 0 to 1 percent slopes	3.7	30.1%
253D	Hinckley loamy sand, 15 to 35 percent slopes	5.3	42.7%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	0.2	1.7%
254C	Merrimac fine sandy loam, 8 to 15 percent slopes	0.3	2.6%
260B	Sudbury fine sandy loam, 2 to 8 percent slopes	0.4	3.1%
602	Urban land, 0 to 15 percent slopes	0.9	7.4%
653	Udorthents, sandy	1.5	12.5%
Totals for Area of Interest		**12.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Norfolk and Suffolk Counties, Massachusetts

51—Swansea muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2trl2
Elevation: 0 to 1,140 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Swansea and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Swansea

Setting

Landform: Bogs, swamps
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Highly decomposed organic material over loose sandy and gravelly glaciofluvial deposits

Typical profile

Oa1 - 0 to 24 inches: muck
Oa2 - 24 to 34 inches: muck
Cg - 34 to 79 inches: coarse sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Rare
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 16.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: B/D
Ecological site: F144AY043MA - Acidic Organic Wetlands
Hydric soil rating: Yes

Minor Components

Freetown

Percent of map unit: 10 percent
Landform: Bogs, swamps

Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Whitman

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scarboro

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

253D—Hinckley loamy sand, 15 to 35 percent slopes

Map Unit Setting

National map unit symbol: 2svmd
Elevation: 0 to 860 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Hinckley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Outwash deltas, outwash terraces, moraines, eskers, kames, outwash plains, kame terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 10 percent
Landform: Moraines, eskers, kames, outwash deltas, outwash terraces, outwash plains, kame terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Merrimac

Percent of map unit: 3 percent
Landform: Kame terraces, outwash plains, outwash terraces, moraines, eskers, kames
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Sudbury

Percent of map unit: 2 percent
Landform: Outwash deltas, outwash plains, kame terraces, outwash terraces, moraines

Landform position (two-dimensional): Backslope, footslope, toeslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: No

254B—Merrimac fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tyqs
Elevation: 0 to 1,290 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Merrimac and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Outwash plains, outwash terraces, moraines, eskers, kames
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent

Maximum salinity: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Sudbury

Percent of map unit: 5 percent
Landform: Deltas, terraces, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Hinckley

Percent of map unit: 5 percent
Landform: Deltas, kames, eskers, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Windsor

Percent of map unit: 3 percent
Landform: Outwash plains, outwash terraces, dunes, deltas
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Agawam

Percent of map unit: 2 percent
Landform: Outwash plains, outwash terraces, moraines, stream terraces, eskers, kames
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

254C—Merrimac fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2tyqt
Elevation: 0 to 1,030 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Merrimac and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Eskers, outwash plains, moraines, kames, outwash terraces
Landform position (two-dimensional): Backslope, footslope, summit, shoulder
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Hinckley

Percent of map unit: 5 percent
Landform: Deltas, kames, eskers, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Sudbury

Percent of map unit: 5 percent
Landform: Deltas, terraces, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Windsor

Percent of map unit: 5 percent
Landform: Outwash plains, dunes, deltas, outwash terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

260B—Sudbury fine sandy loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: vky4
Elevation: 0 to 2,100 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Sudbury and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sudbury

Setting

Landform: Outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over loose sandy glaciofluvial deposits

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 22 inches: sandy loam
H3 - 22 to 60 inches: gravelly coarse sand

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: 18 to 36 inches to strongly contrasting textural stratification
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F144AY027MA - Moist Sandy Outwash
Hydric soil rating: No

Minor Components

Walpole

Percent of map unit: 5 percent
Landform: Terraces
Hydric soil rating: Yes

Merrimac

Percent of map unit: 5 percent
Hydric soil rating: No

Deerfield

Percent of map unit: 5 percent
Landform: Outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

602—Urban land, 0 to 15 percent slopes

Map Unit Setting

National map unit symbol: vkyj
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 120 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 99 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Parent material: Excavated and filled land

Minor Components

Rock outcrops

Percent of map unit: 1 percent
Hydric soil rating: Unranked

653—Udorthents, sandy

Map Unit Setting

National map unit symbol: vky8
Elevation: 0 to 3,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Landform position (two-dimensional): Shoulder, summit

Landform position (three-dimensional): Riser, tread
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Excavated and filled sandy glaciofluvial deposits

Typical profile

H1 - 0 to 6 inches: variable
H2 - 6 to 60 inches: variable

Properties and qualities

Slope: 0 to 25 percent
Depth to restrictive feature: More than 80 inches
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.06 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Hydric soil rating: Unranked

Minor Components

Udorthents

Percent of map unit: 8 percent
Hydric soil rating: Unranked

Urban land

Percent of map unit: 5 percent
Hydric soil rating: Unranked

Swansea

Percent of map unit: 2 percent
Landform: Bogs
Hydric soil rating: Yes

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ATTACHMENT M

Pipe Sizing Calculations

WELLS 2, 3, AND 4 WATER TREATMENT PLANT
15 TREE LANE
SHARON, MA 02067
October 2023

Rational Pipe Sizing Calculations

Design Period Storm:		**25**	**Year**	**Design Period Intensity***			**6.3**	**in/hr**									
LOCATION		IMPERVIOUS			OTHER			SUM CA	Tc (min)	I (in/hr)	Q (cfs)	D (in)	S (ft/ft)	Material	n	Q Full (cfs)	V Full (fps)
FROM	TO	A (ac)	C	CA	A (ac)	C	CA										
CB-3	DMH-2	0.22	0.95	0.21	0.00	0.30	0.00	0.21	6	6.3	1.33	12	0.020	HDPE	0.012	5.47	6.96
CB-2	DMH-2	0.07	0.95	0.06	0.07	0.30	0.02	0.08	6	6.3	0.53	12	0.041	HDPE	0.012	7.82	9.96
DMH-2	DMH-1	0.29	0.95	0.27	0.07	0.30	0.02	0.29	6	6.3	1.86	12	0.022	HDPE	0.012	5.73	7.29
CB-1	DMH-1	0.02	0.95	0.02	0.00	0.30	0.00	0.02	6	6.3	0.14	12	0.011	HDPE	0.012	4.10	5.22
DMH-1	WQU-1	0.31	0.95	0.30	0.07	0.30	0.02	0.32	6	6.3	2.00	12	0.025	HDPE	0.012	6.14	7.82
WQU-1	FES- 1	0.31	0.95	0.30	0.07	0.30	0.02	0.32	6	6.3	2.00	12	0.025	HDPE	0.012	6.15	7.83
CB-5	DMH-3	0.11	0.95	0.11	0.00	0.30	0.00	0.11	6	6.3	0.66	12	0.010	HDPE	0.012	3.89	4.95
CB-4	DMH-3	0.11	0.95	0.10	0.00	0.30	0.00	0.10	6	6.3	0.65	12	0.010	HDPE	0.012	3.90	4.97
DMH-3	WQU-2	0.22	0.95	0.21	0.00	0.30	0.00	0.21	6	6.3	1.31	12	0.016	HDPE	0.012	4.85	6.18
WQU-2	FES-2	0.22	0.95	0.21	0.00	0.30	0.00	0.21	6	6.3	1.31	12	0.015	HDPE	0.012	4.73	6.02

*Rainfall intensity provided by NRCC and NRCS
* Contributing areas measured in CAD

ATTACHMENT N

Design Drawings

(Provided under separate cover)

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