Preliminary Stormwater Pollution Prevention Plan

Issued for SEQRA DEIS Review

Cricket Valley Energy

Town of Dover
Dutchess County, New York

July 16, 2010

THE Chazen COMPANIES®

Engineers / Surveyors
Planners
Environmental Scientists
Landscape Architects

Prepared for:
Cricket Valley Energy Center, LLC
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Boston, Massachusetts

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1.0 INTRODUCTION

This Preliminary Stormwater Pollution Prevention Plan (SWPPP) has been prepared for major activities associated with construction of Cricket Valley Energy (CVE), located in the Town of Dover, Dutchess County, NY. This Preliminary SWPPP includes the elements necessary to comply with the national baseline general permit for construction activities enacted by the U.S. Environmental Protection Agency (EPA) under the National Pollutant Discharge Elimination System (NPDES) program and all local governing agency requirements.

The preliminary analysis and design completed and documented in this report is intended to support the State Environmental Quality Review (SEQR) of the application made for a power plant project completed on behalf of the Cricket Valley Energy Center, LLC. It has been developed in accordance with the "New York State Department of Environmental Conservation (NYSDEC) State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity" General Permit Number GP-0-10-001, effective January 29, 2010 through January 28, 2015," included in Appendix A. Preliminary hydrologic analysis for pre-development and post-development conditions was performed using computer modeling. As such, design concepts are provided for water quality, runoff reduction volume, and quantity control facilities, and sediment control facilities. Although preliminary sizing has been provided for the stormwater management and sediment control facilities, this report is not an engineering design report to accompany design of facilities.

The intent of this Preliminary SWPPP is to provide sufficient documentation for an overall SEQR determination, and to serve as a baseline for the Final SWPPP to follow during the site plan review, approval and permitting processes. The methodology used to develop this Preliminary SWPPP shall be adhered to for the preparation the subsequent Final SWPPP. Stormwater quality, runoff reduction volume, and quantity controls recommended for this SWPPP are preliminary in nature and are intended to demonstrate their location, approximate size, and design concept. Detailed analysis and design of these practices will be advanced after SEQR is completed.

1.1 Project Description

Cricket Valley Energy Center, LLC is proposing to construct a natural gas-fired, combined-cycle electric generating facility in the Town of Dover, New York (the Project). This Project is not located within a regulated, traditional land use control Municipal Separate Stormwater Sewer System (MS4).

The proposed Project would occupy approximately 30 acres (the Site) of a combined 131-acre property (the Property) which consists of four industrially zoned parcels off NY Route 22. The proposed Site has an address of 2241 NY Route 22, Dover, New York. A location map of the site has been provided in Appendix B, as Figure 1.

The Property is located within the Town of Dover's Industrial/Manufacturing District (M), which permits industrial and related uses, and is currently occupied by a collection of vacant, dilapidated, industrial buildings. This existing industrial site sits in relative isolation, with vegetation and topography providing a natural buffer for visual and aesthetic impacts.

The Property (and in particular the Project Development Area) has a long history of industrial use. It was used as a magnesium production facility during World War II and the Korean conflict (1941-1953). Subsequent to that service, a Formica production facility operated at the site. During the early 1990's until the January 1, 1996 fire, the site was operated by the Poly Tech Recycling Corporation as part of its tire recycling operation. There is still debris evidence on the site of its varied history.

The proposed development footprint is located entirely to the east of this railroad line. No work is proposed on the property between the railroad and the river (approximately 70 acres).

The Project would generate a nominal 1,000 megawatts (MW) of electricity for the local/regional electric transmission grid through an interconnection with the ConEd 345-kilovolt (kV) transmission lines, which abut the north property line of the Property. Natural gas would be supplied as the sole fuel to the facility via a short lateral pipeline (less than 500ft) from the Iroquois Gas Transmission Company (IGT) interstate pipeline, which also passes just north of the Property.

The facility would comprise three separate combined-cycle units. Each unit would be a 1x1x1 configuration consisting of one combustion turbine generator (CTG), one Heat Recovery Steam Generator (HRSG) with supplemental duct firing, and one steam turbine generator (STG). Associated Air Cooled Condensers (ACCs) and additional Balance of Plant (BOP) equipment and systems would also be used to support operation.

The Project plans incorporate technologies to minimize water use to the greatest extent possible, including advanced dry cooling ACCs, which utilize air instead of water for cooling, and a Water Treatment facility with a Zero Liquid Discharge (ZLD) system to recycle process water. These advanced technologies reduce water use by approximately 99 percent when compared to an equivalent water-cooled facility.

The Project proposes to use on-site, bedrock water wells (approximately 600-800 feet in depth) to meet water needs and CVE will conduct long-term pump tests to ensure that neither neighboring wells nor the Swamp River are adversely affected.

Only small quantities of fuel and lubricating oil will be stored and used on-site, since the project's combustion turbines and majority of other ancillary equipment will consume only natural gas. Permanent diesel fuel storage on-site will be limited to: the fire pump's integrated 650-gallon diesel fuel tank and the three emergency black-start generators with integrated 1,000-gallon diesel fuel storage containers. Other lubricating and cooling oils will be associated with the CTG and STG equipment lubricating system and the transformers. All tanks, equipment, and vessels containing fuel (diesel) and lubricating oils will be inside an environmental concrete containment, sump or curb dike area as required for spill control and management.

Construction of the facility would require approximately 30-36 months. CVE proposes to limit construction to an approximately 30-acre footprint located within the 131-acre Property. The Project would utilize the existing footprint established by the previous users of the Property, which currently includes several unusable, vacant and partially collapsed industrial buildings in varying stages of disrepair. Building demolition, clearing, and grading would occur during the

early-stages of project construction. The proposed commercial operation date for the facility is late of 2014 with construction proposed to start in late 2011.

1.2 Relevant Standards and Guidelines

The recommended stormwater measures outlined herein have been designed to provide both quality and quantity controls by treating and detaining runoff prior to its discharge off site. Pre- and post-development surface runoff rates have been evaluated for the 1-, 10-, and 100-year 24-hour storm events. The design intent is to attenuate runoff generated during the 1-,10-year, and 100-year 24 hour rainfall events such that the peak rates realized at the designated design points will not exceed the rates that existed prior to development of the project.

These measures have been designed and evaluated in accordance with the following standards and guidelines:

- New York State Stormwater Management Design Manual (April 2008)
- Draft New York State Stormwater Management Design Manual (November 2009).

Erosion control measures, designed to minimize soil loss, and sediment control measures, intended to retain eroded soil and prevent it from reaching water bodies or adjoining properties, have been recommended in accordance with the following documents:

- NYSDEC SPDES General Permit for Stormwater Discharges From Construction Activity, Permit No. GP-0-010-001 (effective January 29, 2010 through January 28, 2015)
- New York State Standards and Specifications for Erosion and Sediment Control, NYSDEC (August 2005)
- Town of Dover Erosion and Sediment Control Ordinance

1.3 Stormwater Discharges Associated With Industrial Activity

At a meeting on February 3, 2010, the New York State Department of Environmental Conservation (NYSDEC) determined that the proposed electric power generating facility will not be subject to an Individual SPDES Permit or SPDES Multi-Sector General Permit since the project will not discharge stormwater to the waters of the United States from a point source that conducts industrial activities identified within 49 CFR Part 122.26(b)(14)(i) through (ix) and (x).

On-site runoff directed toward the recommended storm water management practices will consist of roof, access drive, and parking lot runoff.

Cricket Valley Energy will implement measures to prevent contamination of surface runoff from the following industrial activities listed below through containment and reuse or sheltering practices:

- Three black start diesel electrical generators will have integral fuel tanks with steel bases located within a building. A concrete containment curb will be placed around the outer foundation of the generator and fuel tank to hold the maximum amount of fuel and any oil/contaminant leaks.

- The diesel fire pump engine and associated fuel tank will be located within a building. A concrete containment curb will be placed around the outer foundation of the fire pump and fuel tank to hold the maximum amount of fuel and any oil/contaminant leaks.

- Natural gas will be filtered prior to being directed to combined turbine generators, duct burners, and auxiliary burners. Filtered hydrocarbons will be directed to a sump tank that will be enclosed by a concrete containment curb. The tank will be emptied into a mobile tanker monthly or annually (depending on the interstate pipeline quality) and hauled to a suitable disposal facility.

- The air cooled condensers will be a sealed/closed loop steam and water system and no exterior chemicals will be used during operations. The exterior radiator fins will be cleaned once a year with raw well water to remove dust collected from the air movement.

- The switchyard consists of a gravel surface, but the equipment will be located within a building placed in the center of the gravel area. The building will be equipped with floor drain that will be piped to an oil/water separator. The oil/water separator will be housed and curbed. The process water from the separator will be recycled to the plants raw water system and will not be sent to the stormwater system. Captured oil from the separator will be removed from the site and hauled to a suitable disposal facility.

- The step-up transformers, located within the power blocks, will be contained in concrete curbs to hold the maximum volume of oil leak and rainfall. Collected liquid will be piped to an oil/water separator. The oil/water separator will be housed and curbed. The process water from the separator will be recycled to the plants raw water system and will not be sent to the stormwater system. Captured oil from the separator will be removed from the site and hauled to a suitable disposal facility.

- Aqueous ammonia storage tanks, forwarding pumps, and associated loading area will be contained in concrete curbs. Collected liquid from the loading area will be piped to the oil water separator. The process water will be recycled to the plants raw water system and will not be sent to the stormwater system. If an ammonia leak occurs, this liquid would be pumped to a specialized environmental tanker for off-site remediation and disposal.

- Temporary covers and containment will be placed during the use of the lay down areas. Temporary covers consisting of plywood or tarps will cover the lay down areas prior to placement of non-oily equipment/parts or parts that do not have liquid associated in its process. Equipment/parts that have oil or liquid associated with its process will be placed within temporary spill containment berms or environmental sorbent material pads. The lay down areas are used for temporary storage of new or old equipment or parts removed or replaced from the turbine buildings as part of the general maintenance program. It is anticipated that the lay down areas will be in use four weeks over the course of each year,

Non-stormwater discharge will consist of fire hydrant flushing, discharge from fire fighting activities, and potable water source.

1.4 Stormwater Management Concept Summary

The primary goals of this preliminary SWPPP are to analyze the peak rate of runoff under pre- and post-development conditions, to maintain the pre-development rate of runoff in order to minimize impacts to adjacent or downstream properties, apply runoff reduction methods, and to minimize the impact to the quality of runoff exiting the site. The preliminary SWPPP and accompanying plans identify and detail stormwater management (SWM), pollution prevention, and erosion and sediment control measures necessary during and following completion of construction.

This report considers the impacts associated with the intended development with the purpose of:

1. Maintaining existing drainage patterns as much as possible while continuing the conveyance of upland watershed runoff;

2. Controlling increases in the rate of stormwater runoff resulting from the proposed development so as not to adversely alter downstream conditions; and

3. Implementing volume reduction techniques to manage, reduce, and treat storm water and maintain and restore natural hydrology by infiltration, evapo-transpiration, and capture and reuse of stormwater.

4. Mitigating potential stormwater quality impacts and preventing soil erosion and sedimentation resulting from stormwater runoff generated both during and after construction.

2.0 SITE CHARACTERISTICS

2.1 Existing Land Use and Topography

The Project Development Area is located near the bottom of a western facing slope, along a small north-south trending ridge that separates the Swamp River and the Ten Mile River. Although the Project Development Area is relatively flat, there is a westerly trending slope toward the active commuter rail line and the Swamp River. Several wetland areas are located outside of the developed portions of the Project Development Area. The eastern side of the Project Development Area rises steeply (~30-40 feet) to the elevation of New York State Route 22, and consists of rock outcropping, vegetation, and sparsely to thickly populated trees. Site elevations range from approximately 418 feet above mean sea level (MSL) to 490 feet MSL. The vegetation and trees provide a natural buffer, and currently limit views of existing on-site structures.

2.2 Soils and Groundwater

The United States Department of Agriculture (USDA) Soil Conservation Service (SCS) Soil Survey for Dutchess County was reviewed and provided surficial soil conditions for the study area. The SCS identified the presence of CuA, FcB, FcC, FcD, GfB, SmB, Su, Ud, and Wy series soil types. Soil data as provided by the SCS is presented in Table 1.

Table 1: USDA Soil Data

Map Symbol & Description	Hydrologic Soil Group	Permeability (inches/hour)	Erosion Factor K	Depth to Water Table (feet)	Depth to Bedrock (inches)
CuA - Copake gravely silt loam, nearly level, 0 to 2 percent slopes	B	0.6 – 6.0	0.24	> 6.0	> 60
FcB - Farmington-Galway complex, undulating, very rocky, 1 to 6 percent slopes	C	0.6 – 2.0	0.32	> 6.0	10 - 20
FcC - Farmington-Galway complex, rolling, very rocky, 5 to 16 percent slopes	C	0.6 – 2.0	0.32	> 6.0	10 - 20
FcD – Farmington-Galway complex, hilly, very rocky, 15 to 30 percent slopes	C	0.6 – 2.0	0.32	> 6.0	10 - 20
GfB - Galway-Farmington-Urban land complex, undulating, rocky, 1 to 6 percent slopes	B	0.6 – 2.0	0.24	1.5 – 3.0	20 - 40
SmB – Stockbridge-Farmington complex, undulating, rocky, 1 to 6 percent slopes	C	0.6 – 2.0	0.28	> 6.0	> 60

Map Symbol & Description	Hydrologic Soil Group	Permeability (inches/hour)	Erosion Factor K	Depth to Water Table (feet)	Depth to Bedrock (inches)
Su - Sun silt loam, 0 to 3 percent slopes	D	0.6 – 2.0	0.28	+1 – 0.5	> 60
Ud - Udorthents, smoothed, predominantly 0 to 8 percent slopes	A/D	0.06 – 20	0.37	> 3.0	> 60
Wy - Wayland silt loam, 0 to 3 percent slopes	C/D	0.2 – 2.0	0.43	+0.5 – 1.0	> 60

Upon review of the soil data presented in Table 1, the project site does not contain soils with a soil slope phase of E or F.

The Soil Conservation Service defines the hydrologic soil groups as follows:

- Type A Soils: Soils having a high infiltration rate and low runoff potential when thoroughly wet. These soils consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a moderate rate of water transmission.

- Type B Soils: Soils having a moderate infiltration rate when thoroughly wet and consisting mainly of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately course textures. These soils have a moderate rate of water transmission.

- Type C Soils: Soils having a low infiltration rate when thoroughly wet and consisting chiefly of soils with a layer that impedes downward movement of water and soils with moderately fine-to-fine texture. These soils have a low rate of water transmission.

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

A soils map for the study area and the watershed area is presented in Appendix B, as Figure 2A and Figure 2B, respectively.

2.3 Watershed Designation

Because the project site is not located in a restricted watershed identified in Appendix C of GP-0-10-001, enhanced phosphorous removal standards not are required.

Because this type of project is included in Table 2 of Appendix B of GP-0-10-001; and not located within an enhanced phosphorous removal watershed, this SWPPP includes only post-construction stormwater management practices as well as erosion and sediment controls.

2.4 Receiving Water Bodies

Runoff from the project site will be discharged to Wetland 2 and Intermittent Stream, described in Section 2.6, and eventually conveyed to the Swamp River.

The Swamp River is classified by NYSDEC as a Class C (T) water course, and is not included in the Section 303(d) list of impaired waters found in Appendix E of GP-0-10-001. Impaired waters are identified as by the NYSDEC as waters that do not support appropriate uses and require the development of a Total Maximum Daily Load (TMDL) or other strategy to reduce the input of the specific pollutant(s) that restrict water uses; in order to restore and protect such uses.

2.5 Aquifer Designation

The project site is located over the Carbonate Rock aquifer, which is not listed as a sole source aquifer. Thus, additional separation requirements to groundwater are not required for proposed stormwater measures. This aquifer is identified as a principle aquifer in the Global Information Systems (GIS) data set obtained from the U.S. Geological Survey, entitled "Principal Aquifers of New York State States, Polygon (Shapefile: 1998).

2.6 Wetlands

Wetlands depicted on the accompanying plan set were delineated by ARCADIS on April 22-24, 2009. The wetland identification and boundary delineations were performed in accordance with the Routine Determination Method presented in the 1987 United States Army Corps of Engineers (USACE) *Wetlands Delineation Manual* (the Manual) (Environmental Laboratory 1987) and the draft regional supplement to the Manual (USACE 2008). Five areas were identified as wetlands and one area was identified as an intermittent stream.

- Wetland 1 consists of 1.73 acres and is neither USACE nor NYSDEC jurisdictional.
- Wetland 2 consists of 8.69 acres and is both USACE and NYSDEC jurisdictional.
- Wetland 3 consists of 3A (0.13 acres) and 3B (0.41 acres). Neither is NYSDEC jurisdictional, but 3A is USACE jurisdictional.
- Wetland 4 consists of 15.11 acres and is NYSDEC jurisdictional. It is located on the property, but outside of the Project Development Area. However, the 100-foot Adjacent Area extends into the Project Development Area.
- Wetland 5 consists of 30.05 acres and is NYSDEC jurisdictional. It is located on the property, but outside of the Project Development Area. However, the 100-foot Adjacent Area extends into the Project Development Area
- Intermittent stream located on southwest corner of the project site determined to be under ACOE jurisdictional determination.

2.7 Flood Plains

According to the National Flood Insurance Program Flood Insurance Rate Map (FIRM), Town of Dover, New York, Community Panel Numbers 361335 0020 A and 0025 A, this lies outside of

the 100-year flood zone. A printout of the flood plain map is presented in Appendix B, as Figure 6.

2.8 Listed, Endangered, or Threatened Species

According to a July 20, 2009 letter from the United States Department of Interior Fish and Wildlife Service, the following threatened, or endangered species, or critical habitats, are known to exist within the limits and/or around the vicinity of the project site:

1) Federally listed threatened and State listed endangered bog turtle.

2) Federally and State listed endangered Indiana bat. Two males were captured approximately 2 miles from the project area and there is the potential for a maternity colony approximately 5 miles from the site.

3) New England cottontail is known to occur within 4 miles of the project site. The New England cotton tail is a candidate species which is being considered by the Service for addition to the Federal List of Endangered and Threatened Wildlife and Plants.

An ecological assessment report dated August 17, 2009 by ARCADIS, indicates that the suitable bog turtle habitat does not exist on the project site; concludes mist netting survey for Indiana bats is not warranted due to specific location of the project and existing buildings; and the selection of a previously developed industrial property and selection of technologies that minimize footprint limit potential concerns about encroachment on New England cottontail habitat.

A September 21, 2009 letter from the United States Department of Interior Fish and Wildlife Service acknowledged the following:

1) Although Bog turtle habitat was not found on-site, there have been occurrences off-site within NYSDEC Wetland DP-22 (part of which is located on-site). Further assessment of potential indirect effects to wetland DP-22 should be determined.

2) Mist netting is not warranted. However, tree removal should occur between October 1 and March 31; bright orange construction fencing/flagging should clearly demarcate trees to be protected; limiting the amount of lights, including motion sensors or timers, directing the lights toward the ground and buildings, and in/around the detention basin; and a recommendation for placement of a conservation easement on the property west of the railroad tracks.

3) No further comments on New England cottontail.

The stormwater that discharges from the project site will not adversely impact listed, endangered or threatened species listed herein so long as the stormwater management practices have been constructed in accordance with this SWPPP.

Copies of correspondence between ARCADIS and United States Department of Interior Fish and Wildlife Service have been placed within Appendix F.

2.9 Historic Places

A State Preservation Historical Information Network Exchange search on the New York State Historic Preservation Office website, performed on January 14, 2010, revealed that the property is located within an archeologically sensitive area. A printout of the historic places screening map is presented in Appendix B, as Figure 3.

An information request was submitted to the State Historic Preservation Office (SHPO) on September 15, 2009 by Arcadis. Based upon review of the project in accordance with Section 106 of the National Historic Preservation Act of 1966, SHPO concluded in a letter dated September 25, 2009, that the "project will have No Effect upon cultural resources in or eligible for inclusion in the National Registers of Historic Places. Copies of this letter has been included within Appendix G.

2.10 Rainfall Data

Rainfall data utilized in the modeling and analysis were interpolated from maps presented in Chapter 4 of the NYSDEC Stormwater Management Design Manual, and in the National Weather Service (NWS) Technical Paper 40 (TP-40), *Rainfall Frequency Atlas of the United States for Durations from 30 minutes to 24 Hours and Return Periods from 1 to 100 Years* (1961). Rainfall data specific to the portion of Dutchess County under consideration, for various 24-hour storm events, is presented in Table 2:

Table 2: Rainfall Data

Storm Event Return Period	24-Hour Rainfall (inches)
1-year	2.8
10-year	5.0
100-year	8.0

These values were used to evaluate the pre- and post-development stormwater runoff characteristics.

3.0 CONSTRUCTION SEQUENCE

Project construction activities will consist primarily of site grading, paving, and the installation of storm drainage, water supply and sewage collection infrastructure to support the power plant facilities. Construction phase pollutant sources anticipated at the site are disturbed (exposed) soil, vehicle fuels and lubricants, chemicals associated with building construction, and building materials. Without adequate control there is the potential for each type of pollutant to be transported by stormwater.

The Project's construction will be approximately 36 months in duration. The construction phases will include overlapping activities for initial site clearing/preparation, major foundations, steel and building erections, equipment delivery and sitting, piping and electrical installation, and commissioning and startup. The following is a high level sequence of these activities:

- Installation of construction stormwater and erosion control measures, demolition, clearing, potential minimal blasting, and rough grading, and construction office trailers, utilities, and parking.

- Installation of major foundations and underground utilities (including yard piping and electrical duct banks)

- Erection of structural steel and buildings and the delivery and setting major equipment

- Installation of interconnection piping and wiring, balance of plant equipment, controls and instrumentation, and final grading.

- Testing, commissioning, and startup of the systems, final road tops, landscaping, and complete facility.

In order for construction to progress in a practical and efficient manner, soil disturbance in excess of five acres at any given time will be required. The General Permit allows for soil disturbance of greater than five acres upon written authorization from the NYSDEC. Site construction will need to proceed with greater than 5-acres of soil disturbed at a given time. As the development plan is refined during the site plan review and permitting process, a waiver to disturb greater than 5-acres of soil will be requested from the NYSDEC. The waiver request will include a phasing plan that defines the maximum disturbed area per phase and shows the required cuts and fills. When received, a copy of the approval will be included in the Site Log Book. This approval will be subject to the limitations outlined in the approval letter and documented within the construction sequencing plans included with the waiver request.

Should the waiver request be denied by NYSDEC, the Contractor, as described in Section 6.0, will have to develop a plan for limiting the area of disturbance to less than five acres of disturbance at any given time. The Contractor shall prepare and submit to the Operator's Engineer, as described in Section 6.0, a sequencing plan that identifies the progression of construction through the site. This sequencing plan must be retained as part of the Site Log Book.

The "Pre-Construction Erosion & Sediment Control Plan" (Sheet SP1) and "Preliminary Construction Phasing Plan" (Sheet SP3) in the accompanying drawings identifies the major construction activities that are the subject of this preliminary SWPPP. The order (or sequence) in which the major activities are expected to begin is presented on the accompanying drawings, though each activity will not necessarily be completed before the next begins. In addition, these activities could occur in a different order if necessary to maintain adequate erosion and sediment control. If this is the case, the Contractor shall notify the Operator's Engineer overseeing the implementation of the SWPPP.

The Contractor will be responsible for implementing the erosion and sediment control measures identified on the Final SWPPP.

4.0 CONSTRUCTION-PHASE POLLUTION CONTROL

The preliminary SWPPP and accompanying plans identify the temporary and permanent erosion and sediment control measures that will be incorporated into the final design of this project. These measures will be implemented during construction, to minimize soil erosion and control sediment transport off-site, and after construction, to control the quality and quantity of stormwater runoff from the developed site.

The preliminary SWPPP and accompanying plans identify and detail the temporary and permanent erosion and sediment control structures that will be installed prior to construction. The Final SWPPP will outline the construction scheduling for implementing the erosion and sediment control measures; and will include limitations on the duration of soil exposure, criteria and specifications for placement and installation of the erosion and sediment control measures, a maintenance schedule, and specifications for the implementation of erosion and sediment control practices and procedures.

Temporary and permanent erosion and sediment control measures that shall be applied during construction generally include:

1. Minimizing soil erosion and sedimentation by stabilization of disturbed areas and by removing sediment from construction-site discharges.

2. Following the completion of construction activities in any portion of the site permanent vegetation shall be established on all exposed soils.

3. Site preparation activities shall be planned to minimize the area and duration of soil disruption.

4. Permanent traffic corridors shall be established and “routes of convenience” shall be avoided.

4.1 Temporary Erosion and Sediment Control Measures

The temporary erosion and sediment control measures recommended and described in the following sections are to be installed and/or implemented prior to the initiation of construction and during construction.

4.1.1 Stabilized Construction Entrance

Prior to construction, stabilized construction entrances will be installed at points of entry and egress from the site to reduce the tracking of sediment onto public roadways.

Construction traffic must enter and exit the site at the stabilized construction entrance. The intent is to trap dust and mud that would otherwise be carried off-site by construction traffic.

The entrance shall be maintained in a condition, which will control tracking of sediment onto public rights-of-way or streets. When necessary, the placement of additional aggregate atop the filter fabric will be done to assure the minimum thickness is maintained. All sediments and soils

spilled, dropped, or washed onto the public rights-of-way must be removed immediately. Periodic inspection and needed maintenance shall be provided after each substantial rainfall event.

4.1.2 Dust Control

Water trucks will be used as needed during construction to reduce dust generated on the site. Dust control must be provided by the general Contractor to a degree that is acceptable to the Owner, and in compliance with the applicable local and state dust control requirements.

4.1.3 Temporary Soil Stockpile

Materials, such as topsoil, will be temporarily stockpiled (if necessary) on the site during the construction process. Stockpiles will be located in an area away from storm drainage, water bodies and/or courses, and will be properly protected from erosion by a surrounding silt fence barrier.

4.1.4 Silt Fencing

Prior to the initiation of and during construction activities, a geotextile filter fabric (or silt fence) will be established along the down slope perimeter of areas to be disturbed as a result of the construction which lie up gradient of watercourses or adjacent properties. These barriers may extend into non-impact areas to provide adequate protection of adjacent lands.

Clearing and grubbing will be performed only as necessary for the installation of the sediment control barrier. To facilitate effectiveness of the silt fencing, daily inspections and inspections immediately after significant storm events will be performed by site personnel. Maintenance of the fence will be performed as needed.

4.1.5 Temporary Seeding

Areas undergoing clearing or grading and any areas disturbed by construction activities where work has temporarily or permanently ceased will be stabilized with temporary vegetative cover within seven days from the date the soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the New York State Standards and Specifications For Erosion and Sediment Control.

4.1.6 Stone Inlet Protection Barrier

Concrete blocks surrounded by wire mesh and crushed stone will be placed around both existing catch basins, and proposed catch basins within areas of pavement once they have been installed, to keep sediment from entering the catch basins and storm sewer system. During construction, crushed stone shall be replaced as necessary to ensure proper function of the structure.

4.1.7 Erosion Control Blanket

Erosion control blankets (jute mesh) shall be installed on top of topsoil and seed within slopes between 15% and 30% slopes to provide temporary erosion protection while the vegetation is establishing on the adjacent slopes. Erosion control blankets provide temporary erosion

protection, rapid vegetative establishment, and long-term erosion resistance to shear stresses associated with high runoff flow velocities associated with steep slopes. The blankets shall then be unrolled to maintain direct contact with the soil and anchored to the slope in accordance with the manufacturer's instructions.

4.1.8 Stone Check Dams

Stone check dams will be installed within temporary diversion swales to reduce the velocity of stormwater runoff, to promote settling of sediment, and to reduce sediment transport offsite.

Sediment accumulated behind the stone check dam will be removed as needed to allow the channel to drain through the stone check dam and prevent large flows from carrying sediment over or around the dam. Stones will be replaced as needed to maintain the design cross section of the structures.

4.1.9 Temporary Sediment Trap

Rip-rap outlet traps have been proposed at part of the conceptual erosion and sediment control plan to intercept sediment-laden runoff and allow it to settle out of the surface runoff prior to being discharged from the site. Temporary sediment traps shall be constructed to intercept sediment-laden runoff and reduce the amount of sediment leaving the disturbed areas and to protect drainage ways, properties, and rights-of-way.

Accumulated sediment shall be removed from the trap when it reaches 50 percent of the design capacity and shall not exceed 50 percent. Sediment shall not be placed downstream from the embankment, adjacent to a stream, or floodplain.

Temporary sediment traps have been designed to provide 3,600 cf. of storage per acre of tributary watershed. Calculations have been indentified on the project plans and provided in Appendix E. The following table has been provided summarizing the sediment traps proposed for this project:

Table 5: Summary of Sediment Trap Sizing

Sediment Trap	Type of Facility	Watershed Area (ac)	Volume Required (cf)	Volume Provided (cf)
1	Rip-Rap Outlet Trap	14.65	52,740	63,915
2	Rip-Rap Outlet Trap	2.82	10,152	15,665
3	Rip-Rap Outlet Trap	4.8	17,280	18,037
4	Rip-Rap Outlet Trap	1.01	3,636	4,228
5	Rip-Rap Outlet Trap	0.95	3,420	3,696

Note:
1. Storage is measured to one foot below overflow weir elevation.

4.1.10 Temporary Diversion Swales

Temporary diversion swales will be used to divert off-site runoff around the construction site, divert runoff from stabilized areas around disturbed areas, and direct runoff from disturbed areas into sediment traps.

4.1.11 Dewatering Operations

Dewatering will be used to intercept sediment-laden stormwater or pumped groundwater and allow it to settle out of the pumped discharge prior to being discharged from the site. Water from dewatering operations shall be treated to eliminate the discharge of sediment and other pollutants. Water resulting from dewatering operations shall be directed to the temporary sediment traps, or dewatering devices, such as the Dandy Dewatering Bag, manufactured by Mirafic Geosynthetics. Temporary sediment traps and dewatering bags will be provided, installed and maintained at down-gradient locations to control sediment deposits to the wetlands.

4.2 Permanent Erosion and Sediment Control Measures

The permanent erosion and sediment control measures described in the following sections are included as part of the construction documents.

4.2.1 Establishment of Permanent Vegetation

Disturbed areas that will be vegetated must be seeded in accordance with the contract documents. The type of seed, mulch, and maintenance measures as described in the contract documents shall also be followed.

All areas at final grade must be seeded and mulched within 14 days after completion of the major construction activity. All seeded areas should be protected with mulch.

Final site stabilization is achieved when all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of 80 percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

4.2.2 Rock Outlet Protection

Rock outlet protection shall be installed at the locations as indicated and detailed on the accompanying plans. The installation of rock outlet protection will reduce the depth, velocity, and energy of water, such that the flow will not erode the receiving watercourse or water body.

4.2.3 Permanent Turf Reinforcement

Permanent turf reinforcement mats (TRMs) provide long-term erosion protection and vegetation establishment assistance while permanently reinforcing vegetation. TRMs shall be installed on all slopes exceeding 30%. TRM's provide two key advantages. First, their unique fiber shape and 3-D pattern create a thick matrix of voids that trap seed, soil and water in place for quicker, thicker vegetation growth. Secondly, they provide additional reinforcement that doubles your

vegetation's natural erosion protection abilities by remaining a permanent part of the application, anchoring mature plants to the soil for superior, long-term erosion resistance.

4.3 Other Pollutant Controls

Control of sediments has been described previously. Other aspects of this SWPPP are listed below:

4.3.1 Solid and Liquid Waste Disposal

No solid or liquid waste materials, including building materials, shall be discharged from the site with stormwater. All solid waste, including disposable materials incidental to any construction activities, must be collected and placed in containers. The containers shall be emptied periodically by a licensed trash disposal service and hauled away from the site.

Substances that have the potential for polluting surface and/or groundwater must be controlled by whatever means necessary in order to ensure that they do not discharge from the site. As an example, special care must be exercised during equipment fueling and servicing operations. If a spill occurs, it must be contained and disposed of so that it will not flow from the site or enter groundwater, even if this requires removal, treatment, and disposal of soil. In this regard, potentially polluting substances should be handled in a manner consistent with the impact they represent.

4.3.2 Sanitary Facilities

Temporary sanitary facilities will be provided by the Contractor throughout the construction phase. They must be utilized by all construction personnel and will be serviced by a licensed commercial Contractor. These facilities must comply with state and local sanitary or septic system regulations.

4.3.3 Water Source

Non-stormwater components of site discharge must be clean water. Water used for construction, which discharges from the site, must originate from a public water supply or private well approved by the Health Department. Water used for construction that does not originate from an approved public supply must not discharge from the site; such water can be retained in the ponds until it infiltrates and/or evaporates.

4.4 Construction Housekeeping Practices

During the construction phase, the general Contractor will implement the following measures:

4.4.1 Material Stockpiles

Material resulting from the clearing and grubbing operation will be stockpiled up slope from adequate sedimentation controls.

4.4.2 Equipment Cleaning and Maintenance

The general Contractor will designate areas for equipment cleaning, maintenance, and repair. The general Contractor and subcontractors will utilize those areas. The areas will be protected by a temporary perimeter berm.

4.4.3 Detergents

The use of detergents for large-scale washing is prohibited (i.e., vehicles, buildings, pavement surfaces, etc.)

4.4.4 Spill Prevention and Response

A Spill Prevention and Response Plan shall be developed for the site by the Contractor. The plan shall detail the steps needed to be followed in the event of an accidental spill and shall identify contact names and phone numbers of people and agencies that must be notified.

The plan shall include Material Safety Data Sheets (MSDS) for all materials to be stored on-site. All workers on-site will be required to be trained on safe handling and spill prevention procedures for all materials used during construction. Regular tailgate safety meetings shall be held and all workers that are expected on the site during the week shall be required to attend.

4.4.5 Concrete Wash Areas

Concrete trucks will be allowed to wash out or discharge surplus concrete or drum wash water on the site, but only in specifically designated diked and impervious washout areas which have been prepared to prevent contact between the concrete wash and storm water. Waste generated from concrete wash water shall not be allowed to flow into drainage ways, inlets, receiving waters or highway right of ways, or any location other than the designated Concrete Wash Areas. Proper signage designating the “Concrete Wash Areas” shall be placed near the facility. Concrete Wash Areas shall be located at minimum 100 linear feet from drainage ways, inlets and surface waters.

The hardened residue from the Concrete Wash Areas shall be disposed of in the same manner as other non-hazardous construction waste materials. Maintenance of the wash area is to include removal of hardened concrete. Facility shall have sufficient volume to contain all the concrete waste resulting from washout and a minimum freeboard of 12 inches. Facility shall not be filled beyond 95% capacity and shall be cleaned out once 75% full unless a new facility is constructed. The Contractor will be responsible for seeing that these procedures are followed.

Saw-cut Portland Cement Concrete (PCC) slurry shall not be allowed to enter storm drains or watercourses. Saw-cut residue should not be left on the surface of pavement or be allowed to flow over and off pavement.

The Project may require the use of multiple concrete wash areas. All concrete wash areas shall be located in an area where the likelihood of the area contributing to storm water discharges is negligible. If required, additional BMPs must be implemented to prevent concrete wastes from contributing to stormwater discharges.

4.4.6 Material Storage

Construction materials shall be stored in a dedicated staging area. The staging area shall be located in an area that minimizes the impacts of the construction materials effecting stormwater quality.

Chemicals, paints, solvents, fertilizers, and other toxic material must be stored in waterproof containers. Except during application, the contents must be kept in trucks or within storage facilities. Runoff containing such material must be collected, removed from the site, treated, and disposed of at an approved solid waste or chemical disposal facility.

5.0 POST-CONSTRUCTION STORMWATER CONTROL

The goals of this Preliminary SWPPP are to analyze the peak rate of runoff under pre- and post-development conditions, to maintain the pre-development rate of runoff in order to minimize impacts to adjacent or downstream properties, apply runoff reduction methods, and to minimize the impact to the quality of runoff exiting the site.

As discussed in this SWPPP, the April 2008 NYS Stormwater Management Design Manual describes provisions for both water quality, and quantity methods. However, in November 2009, the NYS issued a draft addendum to the subject Stormwater Design Manual which describes methods to reduce the total water quality volume to the maximum extent practicable through the incorporation of green infrastructure techniques thereby reducing overall site runoff volume. These objectives will be met by applying stormwater control practices which will limit peak runoff rates and improve the quality of runoff leaving the developed site as described below.

5.1 Stormwater Control Practices

Stormwater quality treatment and quantity rate controls recommended to attain the goals of this SWPPP in the subsequent sections are preliminary in nature and subject to change. They are intended to demonstrate their preliminary location and design concept. A detailed analysis of these practices must be performed, and the design of each practice must be refined as part of the final SWPPP preparation to occur during the site plan review, approval and permitting processes.

Preliminary design calculations for each measure have been included in Appendix E.

The layout of the recommended practices has been depicted on Sheet SP2 titled “Conceptual Subsurface Sewage Disposal System and Stormwater Management Plan.”

Based upon a review of the NYS Division of Water Regulations Part 673.4, none of the stormwater management facilities to be constructed as part of this project require a dam permit for construction, reconstruction, repair, breach, or removal.

Chapter 6 of the NYS Stormwater Management Design Manual defines all acceptable stormwater management practices (SMP) for stormwater quantity and quality control. The Design manual then assigns a variant for each general method. These variants include ponds which use the variant “P”, filters “F”, open channel systems “O”, infiltration “I”, and stormwater wetlands “W”. In order to reference the manual and a particular type of practice, a number was assigned to each type of practice.

5.1.1 Wet Extended Detention Pond (Design Variant P-3)

Wet extended detention ponds are very similar to wet ponds with the exception that their design is more focused on attenuating peak runoff flows. As a result, more storage volume is committed to managing peak flows as opposed to maximizing the wet pool depth. The configuration of the outfall structure may also differ from typical wet pond designs to provide additional storage volume above the level of the permanent pool.

Wet extended detention ponds can be used to attenuate the peak flow and provide quality treatment by sedimentation, chemical flocculation, and biological removal. Wet extended detention ponds are designed for a contributing drainage area of 25 acres or more. Sediment forebays will capture sediment and floatable trash/debris prior to entering the pond. The pond is landscaped with a variety of plantings including emergents and woody shrubs, with each type of planting corresponding to the water depth. An extended aquatic bench will maximize the biological uptake of pollutants.

The Wet Extended Detention Pond (P-3) was designed according to the criteria set forth in Section 6.1 "Stormwater Ponds" of the draft NYS Stormwater Management Design Manual.

5.1.2 Bioretention Areas (Design Variant F-5)

Bioretention systems are shallow landscaped depressions adapted to treat stormwater runoff on the developed site. These depressions are design to incorporate many of the pollutant removal mechanisms that operate in forested ecosystems. Stormwater flows into the bioretention area, ponds above the mulch and soil, and gradually infiltrated into the soil bed. Pollutants are removed by a number of processes, such as adsorption, filtration, volatilization, ion exchange, and decomposition. Filtered runoff will infiltrate into the surrounding soil, functioning as an infiltration basin or rainwater garden.

The Bioretention Areas (F-5) were preliminary designed according to the criteria set forth in Section 6.4 "Stormwater Filtering Systems" of the November 2009 draft NYS Stormwater Management Design Manual.

5.1.3 Pre-treatment Areas

The NYS Design Manual requires that stormwater enter a pre-treatment device/area to provide filtering/sedimentation of coarse materials before entering a SMP.

Plunge pools have been provided to assist in the trapping of incoming sediment and taking up of nutrients prior to reaching the Bioretention Areas. They have been preliminary sized to capture 40% of the water quality volume. Each plunge pool will consist of a separate cell of a minimum of four feet in depth, formed by an earth barrier and will be equipped with a trapezoidal weir to convey storm water to the treatment practice. The trapezoidal weirs will be stabilized with rip rap to prevent erosion to the earthern berm.

Similarly to the plunge pool, forebays are provided at inlets of stormwater ponds to pre-treat stormwater. Forebays are hydraulically connected to stormwater basins within the permanent pool elevation but utilize earthen berms to trap sediment to facilitate maintenance/cleaning activities. Forebays have been preliminary sized to capture 10% of the water quality volume, and also may used for quantity calculations.

5.1.4 Soil Restoration

The structure of healthy soil is permeable, with spaces between solid particles where water, air, and soil organisms can move. Soil compaction occurs when weight on the soil surface collapses these spaces, creating a hard solid mass. Water, air, and roots may be completely unable to

penetrate compacted soil, reducing or destroying its capacity to sustain life. Soil restoration promotes greater stormwater infiltration in areas with pervious cover, and therefore helps to reduce runoff volume.

Soil restoration is achieved by aeration through mechanical loosening, and addition of organic matter and soil amendments. In areas where soil disturbance has occurred outside of buildings and pavement areas, the disturbed sub-soils shall be returned to rough grade and the following soils restoration steps applied:

1) Apply three inches of compost over soil. Compost shall be aged, from plant derived materials, free of viable weed seeds, have no visible free water or dust produced when handling, pass through a half inch screen and have a pH suitable to grow desired plants.

2) Till compost into the subsoil to a depth of at least 12-inches using a cat-mounted ripper, tractor mounted disc, or tiller, mixing and circulating air and compost into sub-soils.

3) Rock-pick until uplifted stone/rock materials of four inches and larger size are cleaned off the site.

4) Apply topsoil to a depth of six inches.

5.2 Stormwater Quality Analysis

Stormwater runoff from impervious surfaces is recognized as a significant contributor of pollution that can adversely affect the quality of receiving water bodies. Therefore, treatment of stormwater runoff is important since most runoff related water quality contaminants are transported from land, particularly the impervious surfaces, during the initial stages of storm events.

5.2.1 NYSDEC Requirements

The draft NYS Stormwater Management Design Manual requires that water quality treatment be provided for the initial flush of runoff from every storm. The NYSDEC refers to the amount of runoff to be treated as the "Water Quality Volume" (WQv). Section 4.2 of the November 2009 Draft Manual defines the Water Quality Volume as follows:

$$WQv = \frac{[(P)(R_V)(A)]}{12}$$

Where: P = 90% Rainfall Event Number
Rv = 0.05 + 0.009 (I), minimum Rv = 0.2
I = Impervious Cover (Percent)
A = Contributing Area in Acres

This definition ensures that, all other things being equal, the Water Quality Volume will increase along with the impervious cover percentage.

5.2.2 Methodology

The Water Quality Volume equation has been applied to the drainage area tributary to each of the stormwater quality practices proposed for this project, as shown on Figure 5B in Appendix B. The practices have been sized to accommodate the Water Quality Volume, as per the performance criteria presented in Chapter 6 of the draft NYS Stormwater Management Design Manual.

Design computations for the proposed stormwater quality practices are presented in Appendix E.

5.2.3 Performance Summary

For the proposed stormwater quality practices, Table 3 summarizes both the Water Quality Volume requirements and the treatment volumes provided.

Table 3: Summary of Pond WQ Practices

SWM Practice ID	NYSDEC Design Variant	Tributary Drainage Area (acres)	Calculated WQv Required (cubic feet)	Required WQv Distribution		Provided WQv Distribution			
				Permanent Pool	Extended Detention	Permanent Pool		Extended Detention	
				(min %)	(max %)	cubic feet	%	cubic feet	%
P-1	P-3	15.01	52,662	50	50	48,229	91.6	4,433	8.4

Table 4: Summary of Filtration WQ Practices

SWM Practice ID	NYSDEC Design Variant	Tributary Drainage Area (acres)	WQv Required (cubic feet)	Pretreatment Volume Required (% of WQv)	WQv Provided (cubic feet)	Pretreatment Volume Provided (cubic feet)
F-1	F-5	0.71	1,989	40	3,341	904
F-2	F-5	2.11	7,609	40	11,067	3,229
F-3	F-5	5.86	4,155	40	5,770	1,720

Table 5: Summary of Stormwater Reuse Practices

Reuse Area	Tributary Drainage Area (square feet)	Calculated WQv (cubic feet)
Site Buildings	136,448	11,848
Site Containment Areas	12,064	871

For the proposed water quality control practices, the above tables indicate that the NYS water quality requirements have been met. Therefore, the project should not have a significant adverse impact on the quality of the receiving waters.

5.3 Runoff Reduction Volume

Land use change and development in the watershed increases the volume of runoff. Reductions in the amount of runoff from new development accomplished through the implementation of a storm water management plan for the site will play an important role in the success or failure of the watershed wide stormwater management plan. Runoff reduction techniques such as: preservation of natural resources; reduction of impervious cover; conservation; and incorporation of green infrastructure such as bioretention, trees, green roofs, planters, porous pavers, cisterns, etc can be a valuable part of any stormwater management plan. Volume reduction techniques manage, reduce, and treat stormwater and maintain and restore natural hydrology by infiltration, evapo-transpiration, and capture and reuse of stormwater. Volume reduction techniques by themselves typically are not sufficient to provide adequate attenuation of stormwater runoff, but they do decrease the size of the peak runoff rate reduction facilities.

5.3.1 NYSDEC Requirements

The draft NYS Stormwater Management Design Manual states that runoff reduction shall be achieved by infiltration, groundwater recharge, reuse, recycle, evaporation/evapo-transpiration of 100-percent of the post-development water quality volumes to the maximum extent practical. If the runoff reduction volume (RRv) is greater than the WQv, then the designer has already met the requirement for WQv by applying runoff reduction techniques. Projects that cannot meet 100-percent of the runoff reduction requirement due to physical or hydraulic conditions of the site, must provide a justification that evaluates each of the green infrastructure planning and reduction techniques, presented in Chapter 5 of the Draft Manual, and identify the limitations of the site according to which application of the criterion is not feasible. Projects that do not achieve runoff reduction requirements must, at a minimum, reduce a percentage of the runoff from impervious areas to be constructed on the site. The percent reduction is based upon the Hydrologic Soil Group (HSG) of the site and is defined as Specific Reduction Factor (S). Section 4.3 of the Draft Manual defines the Runoff Reduction Volume as:

$$RRv = \frac{[(P)(Rv^*)(Ai)]}{12}$$

Where:
- RRv = Runoff Reduction Volume (in acre-feet)
- P = 90% Rainfall Event Number
- Ai = Measured impervious cover targeted for infiltration. Ai = (S)(A)
- Rv^* = 0.05+0.009(I)
- I = Impervious Cover (Percent) = 100%
- S = Hydrologic Soil Group (HSG) Specific Reduction Factor where:

HSG A = 0.55	HSG C = 0.30
HSG B = 0.40	HSG D = 0.20

Those projects not meeting 100-percent runoff reduction and are subject to the minimum RRV, and must incorporate stormwater management practices to address water quality treatment. This

project, however, has been designed such that at least 100-percent of the runoff reduction has been met for all areas of future impervious surface. Given that this site is classified as a redevelopment site, runoff reduction of the WQv coming from all future impervious areas must be realized. This has been accomplished, at this site, through the use of three bioretention facilities as well as by employing stormwater reuse techniques, where roof areas and "containment" areas will be built such that the runoff in those areas will be captured and used in plant operations. All building roof areas, as well as containment areas are identified on the "Conceptual Subsurface Sewage Disposal System and Stormwater Management Plan" which has been included in the accompanying drawings. The total areas and associated WQv of each area is depicted on the "Runoff Reduction Volume" worksheet presented in Appendix E.

5.4 Stormwater Quantity Analysis

This report presents the pre-development and post-development features and conditions associated with the rate of surface water runoff within the study area. For both cases, the drainage patterns, drainage structures, soil types, and ground cover types are considered in this study.

5.4.1 NYSDEC Requirements

The draft NYS Stormwater Management Design Manual requires that projects meet three separate stormwater quantity criteria:

1. The Channel Protection (CPv) requirement is designed to protect stream channels from erosion. This is accomplished by providing 24 hours of extended detention for the 1-year, 24-hour storm event. The Design Manual defines the CPv detention time as the center of mass detention time through each stormwater management practice. For trout streams, the extended detention requirement is relaxed to 12 hours. Although runoff from the site is eventually conveyed to the Swamp River, classified by NYSDEC as a Class C(T) water course, the NYSDEC has informed the Applicant during a meeting on February 3, 2010 that they are not subjected to 12-hours of extended detention since the project discharges to a vast wetland prior to eventually being conveyed to the Swamp River.

2. The Overbank Flood Control (Qp) requirement is designed to prevent an increase in the frequency and magnitude of flow events that exceed the bank-full capacity of a channel, and therefore must spill over into the floodplain. This is accomplished by providing detention storage to ensure that, at each design point, the post-development 10-year 24-hour peak discharge rate does not exceed the corresponding pre-development rate.

3. The Extreme Flood Control (Qf) requirement is designed to prevent the increased risk of flood damage from large storm events, to maintain the boundaries of the pre-development 100-year floodplain, and to protect the physical integrity of stormwater management practices. This is accomplished by providing detention storage to ensure that, at each design point, the post-development 100-year 24-hour peak discharge rate does not exceed the corresponding pre-development rate.

5.4.2 Methodology

In order to demonstrate that detention storage requirements are being met, the draft NYS Stormwater Management Design Manual requires that a hydrologic and hydraulic analysis of the pre- and post-development conditions be performed using the Natural Resources Conservation Service Technical Release 20 (TR-20) and Technical Release 55 (TR-55) methodologies. HydroCAD, developed by HydroCAD Software Solutions LLC of Tamworth, New Hampshire, is a Computer-Aided-Design (CAD) program for analyzing the hydrologic and hydraulic characteristics of a given watershed and associated stormwater management facilities. HydroCAD uses the TR-20 algorithms and TR-55 methods to create and route runoff hydrographs.

HydroCAD has the capability of computing hydrographs (which represent discharge rates characteristic of specified watershed conditions, precipitation, and geologic factors) combining hydrographs and routing flows though pipes, streams and ponds. HydroCAD can also calculate the center of mass detention time for various hydraulic features. Documentation for HydroCAD can be found on their website: http://www.hydrocad.net/.

For this analysis, the watershed and drainage system was broken down into a network consisting of three types of components as described below:

1. Subcatchment: A relatively homogeneous area of land, which produces a volume and rate of runoff unique to that area.

2. Reach: Uniform streams, channels, or pipes that convey stormwater from one point to another.

3. Pond: Natural or man-made impoundment, which temporarily stores stormwater runoff and empties in a manner determined by its geometry and the hydraulic structure located at its outlets.

Subcatchments, reaches, and ponds are represented by hexagons, squares, and triangles, respectively, on the watershed routing diagrams provided with the computations included in Appendix C and Appendix D.

The analysis of hydrologic and hydraulic conditions and proposed stormwater management facilities, servicing the study area, was performed by dividing the tributary watershed into relatively homogeneous subcatchments. The separation of the watershed into subcatchments was dictated by watershed conditions, methods of collection, conveyance, and points of discharge. Watershed characteristics for each subcatchment were then assessed from United States Geological Service (USGS) 7.5-minute topographic maps, aerial photographs, a topographical survey, soil surveys, site investigations, and land use maps.

Preliminary stormwater management facilities, with the exception of the storm sewer system, were designed and evaluated in accordance with the draft NYS Stormwater Management Design Manual and local regulatory requirements. The detailed design of the storm sewer system will be presented during the site plan review, approval and permitting processes. The hydrologic and hydraulic analysis considered the SCS, Type III 24-hour storm events identified in Table 6.

Table 6: Design Events

Facility	24-hour Storm Event
Storm Sewer	25-year (During Site Plan Approval Phase)
Detention Basin	1-year
	10-year
	100-year
Flood Conditions	100-year

5.4.3 Description of Design Points

The study area consists of an overall watershed that encompasses approximately 130.2 acres and contains the 30 acre project site. The overall watershed was broken down into smaller watersheds, or subcatchments, to allow for analysis of runoff conditions at several locations throughout the study area. Each of these locations was defined as a Design Point (DP) in order to compare the effects resulting from stormwater management facilities proposed as part of the project. Descriptions of each of the selected design points are provided below.

- Design Point 1: Low point in Existing NYSDEC wetland 2.
- Design Point 2: Entrance point to an existing 36” RCP culvert, located to the southwest corner of the project site. The culvert flows from east to west under the railroad tracks.

5.4.4 Pre-development Watershed Conditions

A site visit was conducted by Chazen personnel on January 15, 2010, to verify predevelopment watershed conditions at and around the project site. As part of the site visit, the predevelopment watershed boundaries were identified, as were ground cover conditions, and design points. Overall, it was found that the contributing pre-development watershed area was comprised of two large subcatchments, labeled in the Pre-Development Stormwater Modeling Calculations as ES1 and ES2.

Subcatchment ES1 is largely comprised of wooded areas with scattered brush areas in its north, east and western sections. Also found in the north and west sections of the Subcatchment are NYS Route 22 and supporting secondary roads as well as a few residential homes. The west side of the subcatchment is bordered by a rail road. The south section of ES1 contains approximately half of the existing site, which consists of several large older manufacturing/industrial buildings, as well as associated roadways which have been overgrown with scattered vegetation. A NYSDEC Jurisdictional wetland is found at the lowest end of ES1. This wetland serves as the design point (Design Point #1) for this subcatchment as all areas within the Subcatchment drain to this wetland.

ES2 is also largely comprised of wooded areas in its east, south and western sections, with the central portion of the site containing a gravel pit. The north end of ES2 contains half of the existing site, with all areas draining to Design Point #2, a 36” RCP culvert located in the western edge of the Subcatchment, under the rail road.

A Pre-Development Watershed Delineation Map has been provided in Appendix B as Figure 4. The analysis of pre-development conditions considered existing drainage patterns, soil types, ground cover, and topography.

The results of the computer modeling used to analyze the overall watershed under pre-development conditions are presented in Appendix C. A summary of the pre-development watershed runoff rates at each Design Point is presented in Table 7.

5.4.5 Post-development Watershed Conditions

The post-development project site is covered predominantly by pavement, gravel, buildings, woods, and wetlands. The analysis of post-development conditions considered existing drainage patterns, soil types, ground cover to remain, planned site development, site grading and, stormwater management facilities proposed as part of site improvements.

The contributing post-development watershed areas were divided into 8 subcatchments, labeled PS-1.1 through PS2.4. The following subcatchments are tributary to these stormwater management devices:

- Bioretention area F-1: PS-1.3
- Bioretention area F-2: PS-1.4
- Bioretention area F-3: PS-2.3
- Stormwater Management Pond P-1: PS-2.2 and PS-2.4

It should be noted that not all areas in subcatchments PS1.4 and PS2.2 are tributary to a proposed stormwater management facility or design point. This is because runoff produced on the roofs and other containment areas found in these subcatchments is proposed to be captured, stored and ultimately utilized as process water in the electric power generation operation of the plant. This "reuse" of stormwater is a benefit to the watershed, because it both decreases the peak rate of runoff as well as the total volume of runoff discharging from the site. Additionally, the reuse of this stormwater runoff will also reduce the amount of makeup water the plant would otherwise withdraw from the proposed wells on site. The roof and containment areas that are proposed to capture stormwater runoff are identified on the "Conceptual Subsurface Sewage Disposal System and Stormwater Management Plan" Sheet SP2, as provided in the accompanying drawings. The Overall Post-Development Watershed Delineation Map which depicts the subcatchments, has been provided in Appendix B as Figure 5A.

The results of the computer modeling used to analyze the overall watershed under post-development conditions are presented in Appendix D. A summary of the post-development watershed runoff rates at each design point is presented in Table 7.

Stormwater discharge from the project site is controlled by three bioretention facilities and one stormwater management basin. They have been designed to provide the above quantity controls by attenuating stormwater runoff and releasing runoff to off-site locations at a rate equal to or

less than that which existed prior to development of the site. The design is detailed on the accompanying plans.

5.4.6 Performance Summary

A comparison of the pre- and post-development watershed conditions was performed for all design points and storm events evaluated herein. For all design points and design storms, this comparison demonstrates that the peak rate of runoff will not be increased. Therefore, the project will not have a significant adverse impact on the adjacent or downstream properties or receiving water courses.

The results of the computer modeling used to analyze the pre- and post-development watersheds are presented in Appendix C and Appendix D, respectively. Table 7 summarizes the results of this analysis.

Table 7: Summary of Pre- and Post-Development Peak Discharge Rates

Pre- vs. Post-Development Discharge Rate (cfs)				
Design Point (DP)	**10-year 24-hour storm event**		**100-year 24-hour storm event**	
	Pre	**Post**	**Pre**	**Post**
1	38.81	26.64	195.42	159.10
2	67.13	51.88	136.44	111.11

For each of the stormwater management facilities that provide detention, Table 8 presents the center of mass detention time for the 1-year 24-hour storm event.

Table 8: Center of Mass Detention Time for the 1-year, 24-hour Storm

SWM Practice ID	**NYSDEC Design Variant**	**Center of Mass Detention Time for the 1-year Storm (hours)**		**Diameter of the Extended Detention Orifice (inches)**	
		Required	**Provided**	**Required to achieve the required center of mass detention time**	**Provided**
P-1	P-3	24	24.5	4.4	4.4

6.0 SWPPP IMPLEMENTATION RESPONSIBILITIES

A summary of the responsibilities and obligations of all parties involved with compliance with the NYSDEC SPDES General Permit GP-0-10-001 conditions is outlined in the subsequent sections. For a complete listing of the definitions, responsibilities, and obligations, refer to the SPDES General Permit GP-0-10-001 presented in Appendix A.

6.1 Definitions

1. "General SPDES Permit" means a SPDES permit issued pursuant to 6 NYCRR Part 750-1.21 authorizing a category of discharges.

2. "Owner" or "Operator" means the person, persons, or legal entity which owns or leases the property on which the construction activity is occurring; and/or an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications. There may be occasions during the course of a project in which there are multiple Operators, all of which will need to file and maintain the appropriate SWPPP documents and plans, including without limitation, the Notice of Intent (NOI) and Notice of Termination (NOT).

3. "Operator's Engineer" shall be that person or entity retained by an Operator to design and oversee the implementation of the SWPPP.

4. "Contractor" shall be that person or entity identified as such in the construction contract with the Operator. The term "Contractor" shall also include the Contractor's authorized representative, as well as any and all subcontractors retained by the Contractor.

5. "Qualified Inspector" means a person that is knowledgeable in the principles and practices of erosion and sediment control, such as licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), licensed Landscape Architect, or other Department endorsed individual(s). It also means someone working under the direct supervision of the licensed Professional Engineer or licensed Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control (herein referred to as "Trained Inspector.") Training in the principles and practices of erosion and sediment control means that an individual performing a site inspection has received four (4) hours of training, endorsed by the Department, from a Soil and Water Conservation District, or other Department endorsed entity in proper erosion and sediment control principles. After receiving the initial training, an individual working under the direct supervision of the licensed Professional Engineer or licensed Landscape Architect shall receive four (4) hours of training every three (3) years. Note: Inspections of any post-construction stormwater management practices that include structural components, such as a dam for an impoundment, shall be performed by a licensed Professional Engineer.

6. "Qualified Professional" means a person that is knowledgeable in the principles and practices of stormwater management and treatment, such as a licensed Professional Engineer, licensed Landscape Architect, or other Department endorsed individual(s).

Individuals preparing SWPPPs that require the post-construction stormwater management practice component must have an understanding of the principles of hydrology, water quality management practice design, water quantity control design, and, in many cases, the principles of hydraulics in order to prepare a SWPPP that conforms to the Department's technical standards. All components of the SWPPP that involve the practice of engineering, as defined by the NYS Education Law (see Article 145), shall be prepared by, or under the direct supervision of, a professional engineer licensed to practice in the State of New York.

7. "Trained Contractor" means an employee from a contracting (construction) firm that has received four (4) hours of training, which has been endorsed by the Department, from a Soil and Water Conservation District, or other Department endorsed entity, in proper erosion and sediment control principles. After receiving the initial training, the Trained Contractor shall receive four (4) hours of training every three (3) years. The Trained Contractor will be responsible for the day to day implementation of the SWPPP.

6.2 Operator's Responsibilities

1. Retain the services of a "Qualified Professional", as defined under Section 6.1, to provide the services outlined in Section 6.3 "Operator's Engineer's Responsibilities".

2. Have an authorized corporate officer sign the completed NOI. A copy of the completed NOI is included in Appendix H.

3. Submit the signed NOI to the following:

   NOTICE OF INTENT
   NYS DEC, Bureau of Water Permits
   625 Broadway, 4th Floor
   Albany, New York 12233-3505

   Town of Dover
   126 East Duncan Hill Road
   Dover Plains, NY 12522

4. Pay the required initial and annual fees upon receipt of invoices from NYSDEC. These invoices are generally issued in the fall of each year. The initial fee is calculated as $100.00 per acre disturbed plus $600.00 per acre of net increase in impervious cover, and the annual fee is $100.00.

5. Retain the services of an independent certified materials testing and inspection firm operating under the direction of a licensed Professional Engineer to perform regular tests, inspections, and certifications of the construction materials used in the construction of all post-construction stormwater management practices.

6. Retain the services of a NYS licensed land surveyor to perform an as-built topographic survey of the completed post-construction stormwater management facilities.

7. Prior to the commencement of construction activity, identify the contractor(s) and subcontractor(s) that will be responsible for implementing the erosion and sediment control measures and stormwater management practices described in this SWPPP. Have each of these contractors and subcontractors identify at least one "Trained Contractor", as defined under Section 2.1, that will be responsible for the implementation of the SWPPP. Ensure that the Contractor has at least one "Trained Contractor" on site on a daily basis when soil disturbance activities are being performed.

8. Schedule a pre-construction meeting which shall include the Town of Dover representative, Operator's Engineer, Contractor, and their sub-contractors to discuss responsibilities as they relate to the implementation of this SWPPP.

9. Require the Contractor to fully implement the SWPPP prepared for the site by the Operator's Engineer to ensure that the provisions of the SWPPP are implemented from the commencement of construction activity until all areas of disturbance have achieved final stabilization and the Notice of Termination (NOT) has been submitted.

10. Forward a copy of the NOI Acknowledgement Letter received from the regulatory agency to the Operator's Engineer for project records, and to the Contractor for display at the job site.

11. Maintain a copy of the General Permit (GP-0-10-001), NOI, NOI Acknowledgement Letter, SWPPP, inspection reports, Spill Prevention, Countermeasures, and Cleanup ("SPCC") Plan, inspection records, and other required records on the job site so that they may be made available to the regulatory agencies.

12. Post at the site, in a publicly accessible location, a copy of the General Permit (GP-0-10-001), a signed copy of the NOI, the NOI Acknowledgement Letter, and on a monthly basis a summary of the site inspection activities.

13. Prepare a written summary of projects status with respect to compliance with the general permit at a minimum frequency of every three months during which coverage under the permit exists. The summary should address the status of achieving the overall goal of the SWPPP. The summary shall be maintained at the site in a publicly accessible location.

14. Prior to submitting a Notice of Termination, ensure that a deed restriction is in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

15. Submit a Notice of Termination (NOT) form (see Appendix H) within 48 hours of receipt of the Operator's Engineer's certification of final site stabilization to the following:

    NOTICE OF TERMINATION
    NYS DEC, Bureau of Water Permits
    625 Broadway, 4th Floor
    Albany, New York 12233-3505

    Town of Dover

126 East Duncan Hill Road
Dover Plains, NY 12522

16. Request and receive all SWPPP records from the Operator's Engineer and archive those records for a minimum of five years after the NOT is filed.

17. Require the implementation of the Post-Construction Inspections and Maintenance procedures outlined in Appendix I.

6.3 Operator's Engineer's Responsibilities

1. Prepare the SWPPP using good engineering practices, best management practices, and in compliance with all federal, state, and local regulatory requirements.

2. Prepare the Notice of Intent (NOI) form (see Appendix H), sign the "SWPPP Preparer Certification" section of the NOI, and forward to Operator for signature.

3. Provide copies of the SWPPP to the Town of Dover once all signatures and attachments are complete.

4. Prepare a construction Site Log Book to be used in maintaining a record of all inspection reports generated throughout the duration of construction.

5. Participate in a pre-construction meeting with the Town of Dover representative, Operator, Contractor, and their sub-contractors to discuss responsibilities as they relate to the implementation of this SWPPP.

6. Enter Contractor's information in Section 6.5 "SWPPP Participants" once a Contractor is selected by the Operator.

7. Conduct an initial assessment of the site prior to the commencement of construction and certify in an inspection report that the appropriate erosion and sediment control measures described within this SWPPP have been adequately installed and implemented to ensure overall preparedness of the site.

8. Provide on-site inspections to determine compliance with the SWPPP. Because this project involves the disturbance of greater than five acres of soil at any one time, site inspections shall occur at an interval of at least twice every seven calendar days, with the inspections separated by a minimum of at least two full calendar days. A written inspection report shall be provided to the Operator and general contractor within one business day of the completion of the inspection, with any deficiencies identified. Include color photographs, with date stamp, taken with a digital camera that clearly shows the condition of all practices that have been identified as needing corrective actions. Paper copies of photographs shall be attached to the inspection report within seven calendar days of inspection. Color photographs, with date stamp, must also be taken with a digital camera that clearly shows the condition of practice(s) after the corrective action has been completed. Paper copies of the digital photographs, that document completion of the corrective action work within 7 calendar days of inspection,

shall be attached to inspection report. A sample inspection form is provided in Appendix J.

9. Review the Contractor's SWPPP records on a periodic basis to ensure compliance with the requirements for daily reports and inspections and maintenance logs.

10. Maintain the construction Site Log Book throughout the duration of construction.

11. Update the SWPPP each time there is a significant modification to the pollution prevention measures or a change of the principal Contractor working on the project who may disturb site soil.

12. Based on the as-built survey and material testing certifications performed by others, perform evaluations of the completed stormwater management facilities to determine whether they were constructed in accordance with this SWPPP.

13. Conduct a final site assessment and prepare a certification letter to the Operator indicating that, upon review of the material testing and inspection reports prepared by the firm retained by the Operator, review of the completed topographic survey, and evaluation of the completed stormwater management facilities, the stormwater management facilities have been constructed substantially in accordance with the contract documents and should function as designed.

14. Prepare the Notice of Termination (NOT). Sign the NOT Certifications VI (Final Stabilization) and VII (Post-construction Stormwater Management Practices), and forward the NOT to the Owner/Operator for his signature on Certification VIII (Owner or Operator Certification).

15. Transfer the SWPPP documents, along with all NOI's, permit certificates, NOT's, construction Site Log Book, and written records required by the General Permit to the Operator for archiving.

6.4 Contractor's Responsibilities

1. Sign the SWPPP Contractor's Certification Form contained within Appendix K and forward to the Operator's Engineer for inclusion in the Site Log Book.

2. Identify at least one Trained Contractor that will be responsible for implementation of the SWPPP. Ensure that at least one Trained Contractor is on site on a daily basis when soil disturbance activities are being performed.

3. Provide the names and addresses of all subcontractors working on the project site. Require all subcontractors who will be involved with construction activities that will result in soil disturbance to identify at least one Trained Contractor that will be on site on a daily basis when soil disturbance activities are being performed; and to sign a copy of the Contractor's Certification Form and forward to the Operator's Engineer for inclusion into the Site Log Book. This information must be retained as part of the Site Log Book.

4. Maintain a Spill Prevention and Response Plan in accordance with requirements outlined in Section 4.4 of this Preliminary SWPPP. This plan shall be provided to the Operator's Engineer for inclusion in the Site Log Book.

5. Participate in a pre-construction meeting which shall include the Town of Dover representative, Operator, Operator's Engineer, and all sub-contractors to discuss responsibilities as they relate to the implementation of this Preliminary SWPPP.

6. If Contractor plans on utilizing adjacent properties for material, waste, borrow, or equipment storage areas, or if Contractor plans to engage in industrial activity other than construction (such as operating asphalt and/or concrete plants) at the site, Contractor shall submit appropriate documentation to the Operator's Engineer so that the SWPPP can be modified accordingly.

7. Implement site stabilization, erosion and sediment control measures, and other requirements of the SWPPP.

8. In accordance with the requirements in the most current version of the NYS Standards and Specifications for Erosion and Sediment Control, conduct inspections of erosion and sediment control measures installed at the site to ensure that they remain in effective operating condition at all times. Prepare and retain written documentation of inspections as well as of all repairs/maintenance activities performed. This information must be retained as part of the Site Log Book.

9. Maintain a record of the dates when major grading activities occur, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures are initiated, until such time as the NOT is filed. A log for keeping such records is provided in Appendix L.

10. Begin implementing corrective actions within one day of receipt of notification by the Qualified Inspector that deficiencies exist with the erosion and sedimentation control measures employed at the site. Corrective actions shall be completed within a reasonable time frame.

6.5 SWPPP Participants

1. Operator's Engineer: The Chazen Companies
   21 Fox Street
   Poughkeepsie, New York
   Phone: (845) 454-3980
   Fax: (845) 454-4026
   Attention: Christopher Lapine, P.E.

2. Operator: Cricket Valley Energy Center, LLC
   31 Milk Street
   Suite 1001
   Boston, MA 02109
   Phone: (617) 456-2200
   Fax: (617) 456-2201
   Attention: Jeff Ahrens

3. Contractor[1]: Name and Title: _____

   Company Name: _____

   Mailing Address: _____

   _____

   Phone: _____

   Fax: _____

[1] Contractor's information to be entered once the Contractor has been selected.

7.0 INSPECTIONS, MAINTENANCE, AND REPORTING

7.1 Inspection and Maintenance Requirements

7.1.1 Pre-Construction Inspection and Certification

Prior to the commencement of construction, the Operator's Engineer shall conduct an assessment of the site and certify that the appropriate erosion and sediment control measures have been adequately installed and implemented. The Contractor shall contact the Operator's Engineer once the erosion and sediment control measures have been installed.

7.1.2 Construction Phase Inspections and Maintenance

A Qualified Inspector, as defined in Appendix A of the General Permit GP-0-010-001, shall conduct regular site inspections between the time the Final SWPPP is implemented and final site stabilization. Because this project involves the disturbance of greater than five acres of soil at any one time, site inspections shall occur at an interval of at least twice every seven calendar days, with the inspections separated by a minimum of at least two full calendar days.

The purpose of site inspections is to assess performance of pollutant controls. Based on these inspections, the Qualified Inspector will decide whether it is necessary to modify this SWPPP, add or relocate sediment barriers, or whatever else may be needed in order to prevent pollutants from leaving the site via stormwater runoff. The general contractor has the duty to cause pollutant control measures to be repaired, modified, maintained, supplemented, or whatever else is necessary in order to achieve effective pollutant control.

Examples of particular items to evaluate during site inspections are listed below. This list is not intended to be comprehensive. During each inspection the inspector must evaluate overall pollutant control system performance as well as particular details of individual system components. Additional factors should be considered as appropriate to the circumstances.

1. Locations where vehicles enter and exit the site must be inspected for evidence of off-site sediment tracking. A stabilized construction entrance will be constructed where vehicles enter and exit. This entrance will be maintained or supplemented as necessary to prevent sediment from leaving the site on vehicles.
2. Sediment barriers must be inspected and, if necessary, they must be enlarged or cleaned in order to provide additional capacity. All material from behind sediment barriers will be stockpiled on the up slope side. Additional sediment barriers must be constructed as needed.
3. Inspections will evaluate disturbed areas and areas used for storing materials that are exposed to rainfall for evidence of, or the potential for, pollutants entering the drainage system. If necessary, the materials must be covered or original covers must be repaired or supplemented. Also, protective berms must be constructed, if needed, in order to contain runoff from material storage areas.
4. Grassed areas will be inspected to confirm that a healthy stand of grass is maintained. The site has achieved final stabilization once all areas are covered with building

foundation or pavement, or have a stand of grass with at least 80 percent density. The density of 80 percent or greater must be maintained to be considered as stabilized. Areas must be watered, fertilized, and reseeded as needed to achieve this goal.

5. All discharge points must be inspected to determine whether erosion control measures are effective in preventing significant impacts to receiving waters.

The inspection reports must be completed entirely and additional remarks should be included if needed to fully describe a situation. An important aspect of the inspection report is the description of additional measures that need to be taken to enhance plan effectiveness. The inspection report must identify whether the site was in compliance with the Final SWPPP at the time of inspection and specifically identify all incidents of non-compliance.

Within one business day of the completion of an inspection, the Qualified Inspector shall notify the Owner or Operator and appropriate contractor (or subcontractor) of any corrective actions that need to be taken. The Contractor (or subcontractor) shall begin implementing corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

In addition to the inspections performed by the Operator's Engineer, the Contractor shall perform routine inspections that include a visual check of all erosion and sediment control measures. All inspections and maintenance shall be performed in accordance with the inspection and maintenance schedule provided on the accompanying plans. Sediment removed from erosion and sediment control measures will be exported from the site, stockpiled for later use, or used immediately for general non-structural fill.

It is the responsibility of the general contractor to assure the adequacy of site pollutant discharge controls. Actual physical site conditions or contractor practices could make it necessary to install more structural controls than what will be shown on the Final Site Plans. (For example, localized concentrations of runoff could make it necessary to install additional sediment barriers.) Assessing the need for additional controls and implementing them or adjusting existing controls will be a continuing aspect of the Final SWPPP until the site achieves final stabilization.

7.1.3 Temporary Suspension of Construction Activities

For constructions sites where soil disturbance activities have been temporarily suspended (e.g. Winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the frequency of Qualified Inspector inspections can be reduced to once every 30 calendar days. Prior to reducing the frequency of inspections, the Owner/Operator shall notify the NYSDEC Region 3 stormwater contact person in writing.

7.1.4 Partial Project Completion

For constructions sites where soil disturbance activities have been shut down with partial project completion, all areas disturbed as of the project shutdown date have achieved final stabilization, and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational, the

Qualified Inspector inspections can stop. Prior to the shutdown, the Owner/Operator shall notify the NYSDEC Region 3 stormwater contact person in writing.

If soil disturbance activities have not resumed within two years from the date of shutdown, a Notice of Termination (NOT) shall be properly completed and submitted to the NYSDEC.

7.1.5 Post-Construction Inspections and Maintenance

Inspections and maintenance of post-construction stormwater management practices shall be performed in accordance with Appendix I, when all disturbed areas are stabilized and all stormwater management systems are in place and operable.

7.2 Reporting Requirements

7.2.1 Inspection and Maintenance Reports

Inspection/maintenance reports shall be prepared prior to and during construction in accordance with the schedule outlined herein and in the SPDES General Permit GP-0-010-001 Part IV.C.2. The reports shall be prepared to identify and document the maintenance of the erosion and sediment control measures. A sample inspection form is provided in Appendix J.

Specifically, each inspection shall record the following information:

1. Date and time of inspection.

2. Name and title of person(s) performing inspection.

3. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection.

4. A description of the condition of the runoff at all points of discharge (including conveyance systems and overland flow) from the construction site. This shall include identification of any discharges of sediment from the construction site.

5. Identification of all erosion and sediment control practices that need repair or maintenance.

6. Identification of all erosion and sediment control practices that were not installed properly or are not functioning as designed and need to be reinstalled or repaired.

7. Description and sketch of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection.

8. Current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards.

9. Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s).

10. Include color photographs with date stamp, taken with a digital camera that clearly shows the condition of all practices that have been identified as needing corrective actions. Color copies of photographs shall be attached to the inspection report within 7 calendar days of inspection. Color photographs with date stamp, taken with a digital camera must clearly show the condition of practice(s) after the corrective action has been completed. Color copies of the photographs, that document completion of the corrective action work within 7 calendar days of inspection, shall be attached to inspection report.

7.2.2 Site Log Book

The Operator shall retain a copy of the Final SWPPP required by NYSDEC SPDES General Permit GP-0-10-001 at the construction-site from the date of initiation of construction activities to the date of final stabilization.

During construction, the Operator's Engineer shall maintain a record of all SWPPP inspection reports at the site in the Site Log Book. The Site Log Book shall be maintained on-site and made available to the permitting authority.

7.2.3 Post Construction Records and Archiving

Following construction, the Operator shall retain copies of the Final SWPPP, the complete construction Site Log Book, and records of all data used to complete the NOI to be covered by this permit, for a period of at least five years from the date that the site is finally stabilized. This period may be extended by the NYSDEC, at its sole discretion, at any time upon written notification.

Records shall be maintained of all post construction inspections and maintenance work performed in accordance with the requirements outlined in Appendix I.

8.0 CONCLUSION

8.1 Conclusion

This project is not subject to the requirements of a regulated MS4, and this preliminary SWPPP has been prepared in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control and draft NYS Stormwater Management Design Manual. As such, it is anticipated that GP-0-10-001 coverage will be effective five (5) business days from the date the NYSDEC receives the complete NOI, unless notified otherwise by the NYSDEC.

The proposed stormwater collection system consisting of pipes, open drainage ways and on-site stormwater management facilities will adequately collect, treat, and convey the stormwater. A wet extended detention basin and bio-retention areas will be used to treat the water quality volume produced from the proposed development. Runoff from containment areas; and from the roofs of the administrative/control room building, maintenance shop/warehouse building, Gas Insulated Substation(GIS) switchyard building, water treatment building, and Units 1-3 (i.e. step up transformer) for all storms will be captured, routed to the on-site storage tank via a pump, for reuse within the plant. These areas have been identified on Sheet SP2 "Conceptual Subsurface Sewage Disposal System and Stormwater Management Plan."

The post-construction stormwater management practice(s) will be owned by Cricket Valley Energy Center, LLC. Policy and procedures will be put in place, which ensure operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

It is our opinion that the proposed development will not adversely impact adjacent or downstream properties if the stormwater management facilities are properly constructed and maintained in accordance with the requirements outlined herein.

Appendix A:
NYSDEC SPDES General Permit GP-0-10-001

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SPDES GENERAL PERMIT
FOR STORMWATER DISCHARGES

from

CONSTRUCTION ACTIVITY

Permit No. GP-0-10-001

Issued Pursuant to Article 17, Titles 7, 8 and Article 70
of the Environmental Conservation Law

Effective Date: January 29, 2010 Expiration Date: January 28, 2015

William R. Adriance
Chief Permit Administrator

William R. Adriance January 28, 2010
Authorized Signature Date

Address: NYS DEC
Div. Environmental Permits
625 Broadway, 4th Floor
Albany, N.Y. 12233-1750

PREFACE

Pursuant to Section 402 of the Clean Water Act ("CWA"), stormwater *discharges* from certain *construction activities* are unlawful unless they are authorized by a *National Pollutant Discharge Elimination System ("NPDES")* permit or by a state permit program. New York's *State Pollutant Discharge Elimination System ("SPDES")* is a NPDES-approved program with permits issued in accordance with the *Environmental Conservation Law ("ECL").*

This general permit ("permit") is issued pursuant to Article 17, Titles 7, 8 and Article 70 of the ECL. An *owner or operator* may obtain coverage under this permit by submitting a Notice of Intent ("NOI") to the Department. Copies of this permit and the NOI for New York are available by calling (518) 402-8109 or at any New York State Department of Environmental Conservation ("the Department") regional office (see Appendix G).They are also available on the Department's website at:

http://www.dec.ny.gov/

An *owner or operator* of a *construction activity* that is eligible for coverage under this permit must obtain coverage prior to the *commencement of construction activity*. Activities that fit the definition of "*construction activity*", as defined under 40 CFR 122.26(b)(14)(x), (15)(i), and (15)(ii), constitute construction of a point source and therefore, pursuant to Article 17-0505 of the ECL, the *owner or operator* must have coverage under a SPDES permit prior to *commencing construction activity*. They cannot wait until there is an actual *discharge* from the construction site to obtain permit coverage.

***Note: The italicized words/phrases within this permit are defined in Appendix A.**

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SPDES GENERAL PERMIT FOR STORMWATER DISCHARGES

FROM CONSTRUCTION ACTIVITIES

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Part I. PERMIT COVERAGE AND LIMITATIONS

A. Permit Application - This permit authorizes stormwater *discharges* to *surface waters of the State* from the following *construction activities* identified within 40 CFR Parts 122.26(b)(14)(x), 122.26(b)(15)(i) and 122.26(b)(15)(ii), provided all of the eligibility provisions of this permit are met:

1. *Construction activities* involving soil disturbances of one (1) or more acres; including disturbances of less than one acre that are part of a *larger common plan of development or sale* that will ultimately disturb one or more acres of land; excluding *routine maintenance activity* that is performed to maintain the original line and grade, hydraulic capacity or original purpose of a facility;

2. *Construction activities* involving soil disturbances of less than one (1) acre where the Department has determined that a *SPDES* permit is required for stormwater *discharges* based on the potential for contribution to a violation of a *water quality standard* or for significant contribution of *pollutants* to *surface waters of the State.*

3. *Construction activities* located in the watershed(s) identified in Appendix D that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land.

B. Maintaining Water Quality - It shall be a violation of this permit and the *ECL* for any *discharge* to either cause or contribute to a violation of *water quality standards* as contained in Parts 700 through 705 of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York, such as:

1. There shall be no increase in turbidity that will cause a substantial visible contrast to natural conditions;

2. There shall be no increase in suspended, colloidal or settleable solids that will cause deposition or impair the waters for their best usages; and

3. There shall be no residue from oil and floating substances, nor visible oil film, nor globules of grease.

C. Eligibility Under This General Permit

1. This permit may authorize all *discharges* of stormwater from *construction activity* to *surface waters of the State* and *groundwaters* except for ineligible *discharges* identified under subparagraph D. of this Part.

2. Except for non-stormwater *discharges* explicitly listed in the next paragraph, this permit only authorizes stormwater discharges from *construction activities*.

(Part I. C)

3. Notwithstanding paragraphs C.1 and C.2 above, the following non-stormwater *discharges* may be authorized by this permit: discharges from fire fighting activities; fire hydrant flushings; waters to which cleansers or other components have not been added that are used to wash vehicles or control dust in accordance with the SWPPP, routine external building washdown which does not use detergents; pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; uncontaminated groundwater or spring water; uncontaminated discharges from construction site de-watering operations; and foundation or footing drains where flows are not contaminated with process materials such as solvents. For those entities required to obtain coverage under this permit, and who discharge as noted in this paragraph, and with the exception of flows from fire fighting activities, these discharges must be identified in the SWPPP. Under all circumstances, the *owner or operator* must still comply with water quality standards in Part I.B.

D. <u>Activities Which Are Ineligible for Coverage Under This General Permit</u> - All of the following are **<u>not</u>** authorized by this permit:

1. *Discharges* after *construction activities* have been completed and the site has undergone *final stabilization*;

2. *Discharges* that are mixed with sources of non-stormwater other than those expressly authorized under subsection C.3. of this Part and identified in the SWPPP required by this permit;

3. *Discharges* that are required to obtain an individual SPDES permit or another SPDES general permit pursuant to Part VII, subparagraph K of this permit;

4. *Discharges* from *construction activities* that adversely affect a listed, or proposed to be listed, endangered or threatened species, or its critical habitat;

5. *Discharges* which either cause or contribute to a violation of *water quality standards* adopted pursuant to the *ECL* and its accompanying regulations;

6. *Construction activities* for residential, commercial and institutional projects that:

    a. are tributary to waters of the state classified as AA or AA-s; and

(Part I. D. 6)

b. disturb one or more acres of land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey for the County in which the disturbance will occur.

7. *Construction activities* for linear transportation projects and linear utility projects that:
   a. are tributary to waters of the state classified as AA or AA-s; and

   b. disturb two or more acres of land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey for the County in which the disturbance will occur.

8. *Construction activities* that adversely affect a property that is listed or is eligible for listing on the State or National Register of Historic Places (Note: includes Archeological sites), unless there are written agreements in place with the NYS Office of Parks, Recreation and Historic Preservation (OPRHP) or other governmental agencies to mitigate the effects, or there are local land use approvals evidencing the same.

Part II. <u>OBTAINING PERMIT COVERAGE</u>

A. <u>Notice of Intent (NOI) Submittal</u>

1. An *owner or operator* of a *construction activity* that is <u>not</u> subject to the requirements of a *regulated, traditional land use control MS4* must first develop a SWPPP in accordance with all applicable requirements of this permit and then submit a completed NOI form to the address below in order to be authorized to *discharge* under this permit. The NOI form shall be one which is associated with this permit, signed in accordance with Part VII.H. of this permit.

   NOTICE OF INTENT
   NYS DEC, Bureau of Water Permits
   625 Broadway, 4th Floor
   Albany, New York 12233-3505

2. An *owner or operator* of a *construction activity* that is subject to the requirements of a *regulated, traditional land use control MS4* must first develop a SWPPP in accordance with all applicable requirements of this permit and then have its SWPPP reviewed and accepted by the *MS4* prior to submitting the NOI to the Department. The *owner or operator* shall have the "MS4 SWPPP Acceptance" form signed by the principal executive officer or ranking elected official from the *regulated, traditional land use control MS4*, or by a duly authorized representative of that person, and then submit that form along with the NOI to the address referenced under "Notice of Intent (NOI) Submittal".

(Part II. A)

3. This requirement does not apply to an *owner or operator* that is obtaining permit coverage in accordance with the requirements in Part II.E. (Change of Owner or Operator).

4. The *owner or operator* shall have the SWPPP preparer sign the "SWPPP Preparer Certification" statement on the NOI prior to submitting the form to the Department.

5. As of the date the NOI is submitted to the Department, the *owner or operator* shall make the NOI and SWPPP available for review and copying in accordance with the requirements in Part VII.F. of this permit.

B. <u>Permit Authorization</u>

1. An *owner or operator* shall not *commence construction activity* until their authorization to *discharge* under this permit goes into effect.

2. Authorization to *discharge* under this permit will be effective when the *owner or operator* has satisfied <u>all</u> of the following criteria:

    a. project review pursuant to the State Environmental Quality Review Act (SEQRA) have been satisfied, when SEQRA is applicable,

    b. where required, all necessary Department permits subject to the *Uniform Procedures Act (UPA)* (see 6 NYCRR Part 621) have been obtained, unless otherwise notified by the Department pursuant to 6 NYCRR 621.3(a)(4). *Owners or operators* of *construction activities* that are required to obtain *UPA* permits must submit a preliminary SWPPP to the appropriate DEC Regional Office in Appendix F at the time all other necessary *UPA* permit applications are submitted. The preliminary SWPPP must include sufficient information to demonstrate that the *construction activity* qualifies for authorization under this permit,

    c. the final SWPPP has been prepared, and

    d. an NOI has been submitted to the Department in accordance with the requirements of this permit.

3. An *owner or operator* that has satisfied the requirements of Part II.B.2 above will be authorized to *discharge* stormwater from their *construction activity* in accordance with the following schedule:

(Part II. B. 3)

a. For *construction activities* that are not subject to the requirements of a *regulated, traditional land use control MS4*:

i. Five (5) business days from the date the Department receives a complete NOI for *construction activities* with a SWPPP that has been prepared in conformance with the technical standards referenced in Parts III.B.1, 2 and/or 3, or

ii. Sixty (60) business days from the date the Department receives a complete NOI for *construction activities* with a SWPPP that has not been prepared in conformance with the technical standards referenced in Parts III.B.1, 2 or 3.

b. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*:

i. Five (5) business days from the date the Department receives a complete NOI and signed "MS4 SWPPP Acceptance" form,

4. The Department may suspend or deny an *owner's or operator's* coverage under this permit if the Department determines that the SWPPP does not meet the permit requirements.

5. Coverage under this permit authorizes stormwater *discharges* from only those areas of disturbance that are identified in the NOI. If an *owner or operator* wishes to have stormwater *discharges* from future or additional areas of disturbance authorized, they must submit a new NOI that addresses that phase of the development, unless otherwise notified by the Department.

C. General Requirements For Owners or Operators With Permit Coverage

1. The *owner or operator* shall ensure that the provisions of the SWPPP are implemented from the *commencement of construction activity* until all areas of disturbance have achieved *final stabilization* and the Notice of Termination (NOT) has been submitted to the Department in accordance with Part V. of this permit. This includes any changes made to the SWPPP pursuant to Part III.A.4.

2. The *owner or operator* shall maintain a copy of the General Permit (GP-0-10-001), NOI, *NOI Acknowledgment Letter*, SWPPP, MS4 SWPPP Acceptance form and inspection reports at the construction site until all disturbed areas have achieved *final stabilization* and the NOT has been submitted to the Department.

(Part II. C. 2)

The documents must be maintained in a secure location, such as a job trailer, on-site construction office, or mailbox with lock. The secure location must be accessible during normal business hours to an individual performing a compliance inspection.

3. The *owner or operator* of a *construction activity* shall not disturb greater than five (5) acres of soil at any one time without prior written authorization from the Department or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the MS4 (provided the MS4 is not the *owner or operator* of the construction activity). At a minimum, the *owner or operator* must comply with the following requirements in order to be authorized to disturb greater than five (5) acres of soil at any one time:

    a. The *owner or operator* shall have a *qualified inspector* conduct **at least** two (2) site inspections in accordance with Part IV.C. every seven (7) calendar days, for as long as greater than five (5) acres of soil remain disturbed. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

    b. In areas where soil disturbance activity has been temporarily or permanently ceased, temporary and/or permanent soil stabilization measures shall be installed and/or implemented within seven (7) days from the date the soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control.

    c. The *owner or operator* shall prepare a phasing plan that defines maximum disturbed area per phase and shows required cuts and fills.

    d. The *owner or operator* shall install any additional site specific practices needed to protect water quality.

    e. The *owner or operator* shall include the requirements above in their SWPPP.

4. The Department may suspend or revoke an *owner's or operator's* coverage under this permit at any time if the Department determines that the SWPPP does not meet the permit requirements.

(Part II. C)

5. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4,* the *owner or operator* shall notify the *MS4* in writing of any planned amendments or modifications to the post-construction stormwater management practice component of the SWPPP required by Part III.A. 4. and 5. of this permit. Unless otherwise notified by the *MS4*, the *owner or operator* shall have the SWPPP amendments or modifications reviewed and accepted by the *MS4* prior to commencing construction of the post-construction stormwater management practice.

D. <u>Permit Coverage for Discharges Authorized Under GP-0-08-001</u>

1. Upon renewal of SPDES General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-08-001), a*n owner or operator* of *construction activity* with coverage under GP-0-08-001, as of the effective date of GP-0-10-001, shall be authorized to *discharge* in accordance with GP-0-10-001 unless otherwise notified by the Department.

E. <u>Change of Owner or Operator</u>

1. When property ownership changes or when there is a change in operational control over the construction plans and specifications, the original *owner or operator* must notify the new *owner or operator*, <u>in writing,</u> of the requirement to obtain permit coverage by submitting a NOI with the Department. Once the new *owner or operator* obtains permit coverage, the original *owner or operator* shall then submit a completed NOT with the name and permit identification number of the new *owner or operator* to the Department at the address in Part II.A.1.. If the original *owner or operator* maintains ownership of a portion of the *construction activity* and will disturb soil, they must maintain their coverage under the permit.

   Permit coverage for the new *owner or operator* will be effective as of the date the Department receives a complete NOI, provided the original *owner or operator* was not subject to a sixty (60) business day authorization period that has not expired as of the date the Department receives the NOI from the new *owner or operator*.

Part III. <u>STORMWATER POLLUTION PREVENTION PLAN (SWPPP</u>)

A. <u>General SWPPP Requirements</u>

1. The SWPPP shall be prepared prior to the submittal of the NOI. The NOI shall be submitted to the Department prior to the *commencement of construction activity*.

(Part III. A)

2. The SWPPP shall describe the erosion and sediment control practices and where required, post-construction stormwater management practices that will be used and/or constructed to reduce the pollutants in stormwater discharges and to assure compliance with the terms and conditions of this permit. In addition, the SWPPP shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater *discharges*.

3. All SWPPPs that require the post-construction stormwater management practice component shall be prepared by a *qualified professional* that is knowledgeable in the principles and practices of stormwater management and treatment.

4. The *owner or operator* must keep the SWPPP current so that it at all times accurately documents the erosion and sediment controls practices that are being used or will be used during construction, and all post-construction stormwater management practices that will be constructed on the site. At a minimum, the *owner or operator* shall amend the SWPPP:

    a. whenever the current provisions prove to be ineffective in minimizing pollutants in stormwater *discharges* from the site;

    b. whenever there is a change in design, construction, or operation at the construction site that has or could have an effect on the discharge of pollutants; and

    c. to address issues or deficiencies identified during an inspection by the *qualified inspector*, the Department or other regulatory authority.

5. The Department may notify the *owner or operator* at any time that the SWPPP does not meet one or more of the minimum requirements of this permit. The notification shall be in writing and identify the provisions of the SWPPP that require modification. Within fourteen (14) calendar days of such notification, or as otherwise indicated by the Department, the *owner or operator* shall make the required changes to the SWPPP and submit written notification to the Department that the changes have been made. If the *owner or operator* does not respond to the Department's comments in the specified time frame, the Department may suspend the *owner's or operator's* coverage under this permit.

6. Prior to the *commencement of construction activity*, the *owner or operator* must identify the contractor(s) and subcontractor(s) that will be responsible for installing, constructing, repairing, replacing, inspecting and maintaining the erosion and sediment control practices included in the SWPPP; and the contractor(s) and subcontractor(s) that will be responsible for constructing the post-construction stormwater management practices included in the SWPPP.

(Part III. A. 6)

The *owner or operator* shall have each of the contractors and subcontractors identify at least one person from their company that will be responsible for implementation of the SWPPP. This person shall be known as the *trained contractor*. The *owner or operator* shall ensure that at least one *trained contractor* is on site on a daily basis when soil disturbance activities are being performed.

The *owner or operator* shall have each of the contractors and subcontractors identified above sign a copy of the following certification statement below before they commence any *construction activity*:

> "I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the *qualified inspector* during a site inspection. I also understand that the *owner or operator* must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings. "

In addition to providing the certification statement above, the certification page must also identify the specific elements of the SWPPP that each contractor and subcontractor will be responsible for and include the name and title of the person providing the signature; the name and title of the *trained contractor* responsible for SWPPP implementation; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification statement is signed. The *owner or operator* shall attach the certification statement(s) to the copy of the SWPPP that is maintained at the construction site. If new or additional contractors are hired to implement measures identified in the SWPPP after construction has commenced, they must also sign the certification statement and provide the information listed above.

7. For projects where the Department requests a copy of the SWPPP or inspection reports, the *owner or operator* shall submit the documents in both electronic (PDF only) and paper format within five (5) business days, unless otherwise notified by the Department.

8. The SWPPP must include documentation supporting the determination of permit eligibility with regard to Part I.D.8. (Historic Places or Archeological Resource). At a minimum, the supporting documentation shall include the following:

(Part III. A. 8)

a. Information on whether the stormwater discharge or *construction activities* would have an effect on a property (historic or archeological resource) that is listed or eligible for listing on the State or National Register of Historic Places;

b. Results of historic resources screening determinations conducted. Information regarding the location of historic places listed, or eligible for listing, on the State or National Registers of Historic Places and areas of archeological sensitivity that may indicate the need for a survey can be obtained online by viewing the New York State Office of Parks, Recreation and Historic Places (OPRHP) online resources located on their web site at: http://nysparks.state.ny.us/shpo/online-tools/ (using The Geographic Information System for Archeology and National Register). OPRHP can also be contacted at: NYS OPRHP, State Historic Preservation Office, Peebles Island Resources Center, P.O. Box 189, Waterford, NY 12188-0189, phone: 518-237-8643;

c. A description of measures necessary to avoid or minimize adverse impacts on places listed, or eligible for listing, on the State or National Register of Historic Places. If the *owner or operator* fails to describe and implement such measures, the stormwater *discharge* is ineligible for coverage under this permit; and

d. Where adverse effects may occur, any written agreements in place with OPRHP or other governmental agency to mitigate those effects, or local land use approvals evidencing the same.

B. Required SWPPP Contents

1. Erosion and sediment control component - All SWPPPs prepared pursuant to this permit shall include erosion and sediment control practices designed in conformance with the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control. Where erosion and sediment control practices are not designed in conformance with this technical standard, the *owner or operator* must demonstrate equivalence to the technical standard. At a minimum, the erosion and sediment control component of the SWPPP shall include the following:

    a. Background information about the scope of the project, including the location, type and size of project;

(Part III. B. 1)

b. A site map/construction drawing(s) for the project, including a general location map. At a minimum, the site map shall show the total site area; all improvements; areas of disturbance; areas that will not be disturbed; existing vegetation; on-site and adjacent off-site surface water(s), wetlands and drainage patterns that could be affected by the construction activity; existing and final slopes; locations of different soil types with boundaries; material, waste, borrow or equipment storage areas located on adjacent properties; and location(s) of the stormwater discharge(s);

c. A description of the soil(s) present at the site, including an identification of the Hydrologic Soil Group (HSG);

d. A construction phasing plan and sequence of operations describing the intended order of construction activities, including clearing and grubbing, excavation and grading, utility and infrastructure installation and any other activity at the site that results in soil disturbance;

e. A description of the minimum erosion and sediment control practices to be installed or implemented for each construction activity that will result in soil disturbance. Include a schedule that identifies the timing of initial placement or implementation of each erosion and sediment control practice and the minimum time frames that each practice should remain in place or be implemented;

f. A temporary and permanent soil stabilization plan that meets the requirements of the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, for each stage of the project, including initial land clearing and grubbing to project completion and achievement of final stabilization;

g. A site map/construction drawing(s) showing the specific location(s), size(s), and length(s) of each erosion and sediment control practice;

h. The dimensions, material specifications, installation details, and operation and maintenance requirements for all erosion and sediment control practices. Include the location and sizing of any temporary sediment basins and structural practices that will be used to divert flows from exposed soils;

(Part III. B. 1)

i. A maintenance inspection schedule for the contractor(s) identified in Part III.A.6., to ensure continuous and effective operation of the erosion and sediment control practices. The maintenance inspection schedule shall be in accordance with the requirements in the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control;

j. A description of the pollution prevention measures that will be used to control litter, construction chemicals and construction debris from becoming a pollutant source in the stormwater *discharges*;

k. A description and location of any stormwater *discharges* associated with industrial activity other than construction at the site, including, but not limited to, stormwater *discharges* from asphalt plants and concrete plants located on the construction site; and

l. Identification of any elements of the design that are not in conformance with the requirements in the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control. Include the reason for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is equivalent to the technical standards.

2. Post-construction stormwater management practice component - All construction projects identified in Table 2 of Appendix B as needing post-construction stormwater management practices shall prepare a SWPPP that includes practices designed in conformance with the most current version of the technical standard, New York State Stormwater Management Design Manual ("Design Manual"). If the Design Manual is revised during the term of this permit, an *owner or operator* must begin using the revised version of the Design Manual to prepare their SWPPP six (6) months from the final revision date of the Design Manual.

   Where post-construction stormwater management practices are not designed in conformance with this technical standard, the *owner or operator* must demonstrate equivalence to the technical standard.

   At a minimum, the post-construction stormwater management practice component of the SWPPP shall include the following:

   a. Identification of all post-construction stormwater management practices to be constructed as part of the project;

(Part III. B. 2)

b. A site map/construction drawing(s) showing the specific location and size of each post-construction stormwater management practice;

c. The dimensions, material specifications and installation details for each post-construction stormwater management practice;

d. Identification of any elements of the design that are not in conformance with the Design Manual. Include the reason for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is equivalent to the technical standards;

e. A hydrologic and hydraulic analysis for all structural components of the stormwater management control system;

f. A detailed summary (including calculations) of the sizing criteria that was used to design all post-construction stormwater management practices. At a minimum, the summary shall address the required design criteria from the applicable chapter of the Design Manual; including the identification of and justification for any deviations from the Design Manual, and identification of any design criteria that are not required based on the design criteria or waiver criteria included in the Design Manual; and

g. An operations and maintenance plan that includes inspection and maintenance schedules and actions to ensure continuous and effective operation of each post-construction stormwater management practice. The plan shall identify the entity that will be responsible for the long term operation and maintenance of each practice.

3. Enhanced Phosphorus Removal Standards - All construction projects identified in Table 2 of Appendix B that are located in the watersheds identified in Appendix C shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the Enhanced Phosphorus Removal Standards included in the Design Manual. At a minimum, the post-construction stormwater management practice component of the SWPPP shall include items 2.a - 2.g. above.

(Part III. C)

C. <u>Required SWPPP Components by Project Type</u> - Unless otherwise notified by the Department, *owners or operators* of *construction activities* identified in Table 1 of Appendix B are required to prepare a SWPPP that only includes erosion and sediment control practices designed in conformance with Part III.B.1. *Owners or operators* of the *construction activities* identified in Table 2 of Appendix B shall prepare a SWPPP that also includes post-construction stormwater management practices designed in conformance with Part III.B.2 or 3.

Part IV. <u>INSPECTION AND MAINTENANCE REQUIREMENTS</u>

A. <u>General Construction Site Inspection and Maintenance Requirements</u>

1. The *owner or operator* must ensure that all erosion and sediment control practices and all post-construction stormwater management practices identified in the SWPPP are maintained in effective operating condition at all times.

2. The terms of this permit shall not be construed to prohibit the State of New York from exercising any authority pursuant to the ECL, common law or federal law, or prohibit New York State from taking any measures, whether civil or criminal, to prevent violations of the laws of the State of New York, or protect the public health and safety and/or the environment.

B. <u>Owner or Operator Maintenance Inspection Requirements</u>

1. The *owner or operator* shall inspect, in accordance with the requirements in the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, the erosion and sediment controls identified in the SWPPP to ensure that they are being maintained in effective operating condition at all times.

2. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the *owner or operator* can stop conducting the maintenance inspections. The *owner or operator* shall begin conducting the maintenance inspections in accordance with Part IV.B.1. as soon as soil disturbance activities resume.

3. For construction sites where soil disturbance activities have been shut down with partial project completion, the *owner or operator* can stop conducting the maintenance inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* <u>and</u> all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational.

(Part IV. C)

C. <u>Qualified Inspector Inspection Requirements</u> - The *owner or operator* shall have a *qualified inspector* conduct site inspections in conformance with the following requirements:

[Note: The *trained contractor* identified in Part III.A.6. **cannot** conduct the *qualified inspector* site inspections unless they meet the *qualified inspector* qualifications included in Appendix A. In order to perform these inspections, the *trained contractor* would have to be a:

- Licensed Professional Engineer,
- Certified Professional in Erosion and Sediment Control (CPESC),
- Registered Landscape Architect, or
- Someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity].

1. A *qualified inspector* shall conduct site inspections for all *construction activities* identified in Tables 1 and 2 of Appendix B, <u>with the exception of</u>:

    a. the construction of a single family residential subdivision with 25% or less impervious cover at total site build-out that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is <u>not</u> located in one of the watersheds listed in Appendix C and <u>not</u> directly discharging to one of the 303(d) segments listed in Appendix E;

    b. the construction of a single family home that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is <u>not</u> located in one of the watersheds listed in Appendix C and <u>not</u> directly discharging to one of the 303(d) segments listed in Appendix E;

    c. construction on agricultural property that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres; and

    d. construction activities located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land.

2. Unless otherwise notified by the Department, the *qualified inspector* shall conduct site inspections in accordance with the following timetable:

    a. For construction sites where soil disturbance activities are on-going, the *qualified inspector* shall conduct a site inspection at least once every seven (7) calendar days.

(Part IV. C. 2)

b. For construction sites where soil disturbance activities are on-going and the *owner or operator* has received authorization in accordance with Part II.C.3 to disturb greater than five (5) acres of soil at any one time, the *qualified inspector* shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

c. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the *qualified inspector* shall conduct a site inspection at least once every thirty (30) calendar days. The *owner or operator* shall notify the Regional Office stormwater contact person (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the MS4 (provided the MS4 is not the *owner or operator* of the construction activity) in writing prior to reducing the frequency of inspections.

d. For construction sites where soil disturbance activities have been shut down with partial project completion, the *qualified inspector* can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* <u>and</u> all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational. The *owner or operator* shall notify the Regional Office stormwater contact person (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the MS4 (provided the MS4 is not the *owner or operator* of the construction activity). in writing prior to the shutdown. If soil disturbance activities are not resumed within 2 years from the date of shutdown, the *owner or operator* shall have the *qualified inspector* perform a final inspection and certify that all disturbed areas have achieved *final stabilization*, <u>and</u> all temporary, structural erosion and sediment control measures have been removed*;* and that all post-construction stormwater management practices have been constructed in conformance with the SWPPP by signing the "Final Stabilization" and "Post-Construction Stormwater Management Practice" certification statements on the NOT. The *owner or operator* shall then submit the completed NOT form to the address in Part II.A.1..

(Part IV. C. 3)

3. At a minimum, the *qualified inspector* shall inspect all erosion and sediment control practices to ensure integrity and effectiveness, all post-construction stormwater management practices under construction to ensure that they are constructed in conformance with the SWPPP, all areas of disturbance that have not achieved *final stabilization*, all points of discharge to natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the construction site, and all points of discharge from the construction site.

4. The *qualified inspector* shall prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report shall include and/or address the following:

    a. Date and time of inspection;

    b. Name and title of person(s) performing inspection;

    c. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection;

    d. A description of the condition of the runoff at all points of discharge from the construction site. This shall include identification of any *discharges* of sediment from the construction site. Include *discharges* from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow;

    e. A description of the condition of all natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the construction site which receive runoff from disturbed areas. This shall include identification of any *discharges* of sediment to the surface waterbody;

    f. Identification of all erosion and sediment control practices that need repair or maintenance;

    g. Identification of all erosion and sediment control practices that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;

    h. Description and sketch of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection;

(Part IV. C 4)

i. Current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards;

j. Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s); and

k. Digital photographs, with date stamp, that clearly show the condition of all practices that have been identified as needing corrective actions. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report being maintained onsite within seven (7) calendar days of the date of the inspection. The *qualified inspector* shall also take digital photographs, with date stamp, that clearly show the condition of the practice(s) after the corrective action has been completed. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report that documents the completion of the corrective action work within seven (7) calendar days of that inspection.

5. Within one business day of the completion of an inspection, the *qualified inspector* shall notify the *owner or operator* and appropriate contractor or subcontractor identified in Part III.A.6. of any corrective actions that need to be taken. The contractor or subcontractor shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

6. All inspection reports shall be signed by the *qualified inspector*. Pursuant to Part II.C.2., the inspection reports shall be maintained on site with the SWPPP.

Part V. <u>TERMINATION OF PERMIT COVERAGE</u>

A. <u>Termination of Permit Coverage</u>

1. An *owner or operator* that is eligible to terminate coverage under this permit must submit a completed NOT form to the address in Part II.A.1. The NOT form shall be one which is associated with this general permit, signed in accordance with Part VII.H.

2. An *owner or operator* may terminate coverage when one or more the following conditions have been met:

(Part V. A. 2)

a. Total project completion - All construction activity identified in the SWPPP has been completed; and all areas of disturbance have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices have been constructed in conformance with the SWPPP and are operational;

b. Planned shutdown with partial project completion - All soil disturbance activities have ceased; and all areas disturbed as of the project shutdown date have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational;

c. A new *owner or operator* has obtained coverage under this permit in accordance with Part II.E.

3. For *construction activities* meeting subdivision 2a. or 2b. of this Part, the *owner or operator* shall have the *qualified inspector* perform a final site inspection prior to submitting the NOT. The *qualified inspector* shall, by signing the "Final Stabilization" and "Post-Construction Stormwater Management Practice" certification statements on the NOT, certify that all disturbed areas have achieved *final stabilization;* and all temporary, structural erosion and sediment control measures have been removed; and that all post-construction stormwater management practices have been constructed in conformance with the SWPPP.

4. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4* and meet subdivision 2a. or 2b. of this Part, the *owner or operator* shall also have the MS4 sign the "MS4 Acceptance" statement on the NOT. The *owner or operator* shall have the principal executive officer, ranking elected official, or duly authorized representative from the *regulated, traditional land use control MS4*, sign the "MS4 Acceptance" statement. The MS4 official, by signing this statement, has determined that it is acceptable for the *owner or operator* to submit the NOT in accordance with the requirements of this Part. The MS4 can make this determination by performing a final site inspection themselves or by accepting the *qualified inspector's* final site inspection certification(s) required in Part V.3.

5. For *construction activities* that require post-construction stormwater management practices and meet subdivision 2a. of this Part, the *owner or operator* must, prior to submitting the NOT, ensure one of the following:

(Part V. A. 5)

a. the post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain such practice(s) have been deeded to the municipality in which the practice(s) is located,

b. an executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s),

c. for post-construction stormwater management practices that are privately owned, the *owner or operator* has modified their deed of record to include a deed covenant that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan,

d. for post-construction stormwater management practices that are owned by a public or private institution (e.g. school, college, university), or government agency or authority, the *owner or operator* has policy and procedures in place that ensures operation and maintenance of the practices in accordance with the operation and maintenance plan.

Part VI. REPORTING AND RETENTION OF RECORDS

A. Record Retention - The *owner or operator* shall retain a copy of the NOI, NOI Acknowledgment Letter, SWPPP, MS4 SWPPP Acceptance form and any inspection reports that were prepared in conjunction with this permit for a period of at least five (5) years from the date that the site achieves *final stabilization*. This period may be extended by the Department, in its sole discretion, at any time upon written notification.

B. Addresses - With the exception of the NOI, NOT, and MS4 SWPPP Acceptance form (which must be submitted to the address referenced in Part II.A.1), all written correspondence requested by the Department, including individual permit applications, shall be sent to the address of the appropriate Department Regional Office listed in Appendix F.

Part VII. STANDARD PERMIT CONDITIONS

A. Duty to Comply - The *owner or operator* must comply with all conditions of this permit. All contractors and subcontractors associated with the project must comply with the terms of the SWPPP. Any non-compliance with this permit constitutes a violation of the Clean Water Act (CWA) and the ECL and is grounds for an enforcement action against the *owner or operator* and/or the contractor/subcontractor; permit revocation, suspension or modification; or denial of a permit renewal application. Upon a finding of significant non-compliance with this permit or the applicable SWPPP, the Department may order an immediate stop to all *construction activity* at the site until the non-compliance is remedied.

(Part VII. A)

The stop work order shall be in writing, shall describe the non-compliance in detail, and shall be sent to the *owner or operator*.

B. <u>Continuation of the Expired General Permit</u> - This permit expires five (5) years from the effective date. However, coverage may be obtained under the expired general permit, which will continue in force and effect, until a new general permit is issued. Unless otherwise notified by the Department in writing, an *owner or operator* seeking authorization under the new general permit must submit a new NOI in accordance with the terms of such new general permit.

C. <u>Enforcement</u> - Failure of the *owner or operator*, its contractors, subcontractors, agents and/or assigns to strictly adhere to any of the permit requirements contained herein shall constitute a violation of this permit. There are substantial criminal, civil, and administrative penalties associated with violating the provisions of this permit. Fines of up to $37,500 per day for each violation and imprisonment for up to fifteen (15) years may be assessed depending upon the nature and degree of the offense.

D. <u>Need to Halt or Reduce Activity Not a Defense</u> - It shall not be a defense for an *owner or operator* in an enforcement action that it would have been necessary to halt or reduce the *construction activity* in order to maintain compliance with the conditions of this permit.

E. <u>Duty to Mitigate</u> - The *owner or operator* and its contractors and subcontractors shall take all reasonable steps to minimize or prevent any *discharge* in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

F. <u>Duty to Provide Information</u> - The *owner or operator* shall make available to the Department for review and copying or furnish to the Department within five (5) business days of receipt of a Department request for such information, any information requested for the purpose of determining compliance with this permit. This can include, but is not limited to, the NOI, NOI Acknowledgment Letter, SWPPP, MS4 SWPPP Acceptance form, executed maintenance agreement, and inspection reports. Failure to provide information requested by the Department within the request timeframe shall be a violation of this permit.

The NOI, SWPPP and inspection reports required by this permit are public documents that the *owner or operator* must make available for review and copying by any person within five (5) business days of the *owner or operator* receiving a written request by any such person to review the NOI, SWPPP or inspection reports. Copying of documents will be done at the requester's expense.

G. <u>Other Information</u> - When the *owner or operator* becomes aware that they failed to submit any relevant facts, or submitted incorrect information in the NOI or in any other report, or have made substantive revisions to the SWPPP (e.g. the scope of the project changes significantly, the type of post-construction stormwater management practice(s)

changes, there is a reduction in the sizing of the post-construction stormwater management practice, or there is an increase in the disturbance area or impervious area), which were not reflected in the original NOI submitted to the Department, they shall promptly submit such facts or information to the Department. Failure of the *owner or operator* to correct or supplement any relevant facts within five (5) business days of becoming aware of the deficiency shall constitute a violation of this permit.

H. <u>Signatory Requirements</u>

1. All NOIs and NOTs shall be signed as follows:

    a. For a corporation these forms shall be signed by a responsible corporate officer. For the purpose of this section, 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;

    b. For a partnership or sole proprietorship these forms shall be signed by a general partner or the proprietor, respectively; or

    c. For a municipality, State, Federal, or other public agency these forms shall be signed by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

        i. the chief executive officer of the agency, or

(Part VII. H. 1. c)

ii. a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

2. The SWPPP and other information requested by the Department shall be signed by a person described in Part VII.H.1. or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a. The authorization is made in writing by a person described in Part VII.H.1.;

   b. 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,

   c. The written authorization shall include the name, title and signature of the authorized representative and be attached to the SWPPP.

3. All inspection reports shall be signed by the *qualified inspector* that performs the inspection.

4. The MS4 SWPPP Acceptance form shall be signed by the principal executive officer or ranking elected official from the *regulated, traditional land use control MS4,* or by a duly authorized representative of that person.

   It shall constitute a permit violation if an incorrect and/or improper signatory authorizes any required forms, SWPPP and/or inspection reports.

I. <u>Property Rights</u> - The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations. *Owners or operators* must obtain any applicable conveyances, easements, licenses and/or access to real property prior to *commencing construction activity*.

J. <u>Severability</u> - The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

(Part VII. K)
K. <u>Denial of Coverage Under This Permit</u>

1. At its sole discretion, the Department may require any *owner or operator* authorized by this permit to apply for and/or obtain either an individual SPDES permit or another SPDES general permit. When the Department requires any discharger authorized by a general permit to apply for an individual SPDES permit, it shall notify the discharger in writing that a permit application is required. This notice shall include a brief statement of the reasons for this decision, an application form, a statement setting a time frame for the *owner or operator* to file the application for an individual SPDES permit, and a deadline, not sooner than 180 days from *owner or operator* receipt of the notification letter, whereby the authorization to discharge under this general permit shall be terminated. Applications must be submitted to the appropriate Regional Office. The Department may grant additional time upon demonstration, to the satisfaction of the Regional Water Engineer, that additional time to apply for an alternative authorization is necessary or where the Department has not provided a permit determination in accordance with Part 621 of this Title.

2. Any *owner or operator* authorized by this permit may request to be excluded from the coverage under this permit by applying for an individual permit or another general permit. In such cases, the *owner or operator* shall submit an individual application or an alternative general permit application in accordance with the requirements of this general permit, 40 CFR 122.26(c)(1)(ii) and 6 NYCRR Part 621, with reasons supporting the request, to the Department at the address for the appropriate Department Office (see addresses in Appendix F).The request may be granted by issuance of an individual permit or another general permit at the discretion of the Department.

3. When an individual SPDES permit is issued to a discharger authorized to discharge under a general SPDES permit for the same discharge(s), the general permit authorization for outfalls authorized under the individual SPDES permit is automatically terminated on the effective date of the individual permit unless termination is earlier in accordance with 6 NYCRR Part 750.

L. <u>Proper Operation and Maintenance</u> - The *owner or operator* shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the *owner or operator* to achieve compliance with the conditions of this permit and with the requirements of the SWPPP.

M. <u>Inspection and Entry</u> - The *owner or operator* shall allow the Department or an authorized representative of EPA, the State, or, in the case of a construction site which discharges through an *MS4*, an authorized representative of the *MS4* receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

(Part VII. M)

1. Enter upon the *owner's or operator's* premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;

2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and

3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment).

N. <u>Permit Actions</u> - At the Department's sole discretion, this permit may, at any time, be modified, suspended, revoked, or renewed. The filing of a request by the *owner or operator* for a permit modification, revocation and reissuance, termination, a notification of planned changes or anticipated noncompliance does not limit, diminish and/or stay compliance with any terms of this permit.

O. <u>Definitions</u> - Definitions of key terms are included in Appendix A of this permit.

P. <u>Re-Opener Clause</u>

1. If there is evidence indicating potential or realized impacts on water quality due to any stormwater discharge associated with *construction activity* covered by this permit, the *owner or operator* of such discharge may be required to obtain an individual permit or alternative general permit in accordance with Part VII.K. of this permit or the permit may be modified to include different limitations and/or requirements.

2. Permit modification, suspension or revocation will be conducted in accordance with 6 NYCRR Part 621, 6 NYCRR 750-1.18, and 6 NYCRR 750-1.20.

Q. <u>Penalties for Falsification of Forms and Reports</u> – Article 17 of the ECL provides for a civil penalty of $37,500 per day per violation of this permit. Articles 175 and 210 of the New York State Penal Law provide for a criminal penalty of a fine and/or imprisonment for falsifying forms and reports required by this permit.

R. <u>Other Permits</u> – Nothing in this permit relieves the *owner or operator* from a requirement to obtain any other permits required by law.

APPENDIX A

Definitions

Alter Hydrology from Pre to Post-Development Conditions - means the post-development peak flow rate(s) has increased by more than 5% of the pre-developed condition for the design storm of interest (e.g. 10 yr and 100 yr).

Combined Sewer - means a sewer that is designed to collect and convey both "sewage" and "stormwater".

Commence (Commencement of) Construction Activities - means the initial disturbance of soils associated with clearing, grading or excavation activities; or other construction related activities that disturb or expose soils such as demolition, stockpiling of fill material, and the initial installation of erosion and sediment control practices required in the SWPPP. See definition for "Construction Activity(ies)" also.

Construction Activity(ies) - means any clearing, grading, excavation, filling, demolition or stockpiling activities that result in soil disturbance. Clearing activities can include, but are not limited to, logging equipment operation, the cutting and skidding of trees, stump removal and/or brush root removal. Construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

Direct Discharge (to a specific surface waterbody) - means that runoff flows from a construction site by overland flow and the first point of discharge is the specific surface waterbody, or runoff flows from a construction site to a separate storm sewer system and the first point of discharge from the separate storm sewer system is the specific surface waterbody.

Discharge(s) - means any addition of any pollutant to waters of the State through an outlet or point source.

Environmental Conservation Law (ECL) - means chapter 43-B of the Consolidated Laws of the State of New York, entitled the Environmental Conservation Law.

Final Stabilization - means that all soil disturbance activities have ceased and a uniform, perennial vegetative cover with a density of eighty (80) percent over the entire pervious surface has been established; or other equivalent stabilization measures, such as permanent landscape mulches, rock rip-rap or washed/crushed stone have been applied on all disturbed areas that are not covered by permanent structures, concrete or pavement.

General SPDES permit - means a SPDES permit issued pursuant to 6 NYCRR Part 750-1.21 authorizing a category of discharges.

Groundwater - means waters in the saturated zone. The saturated zone is a subsurface zone in

which all the interstices are filled with water under pressure greater than that of the atmosphere. Although the zone may contain gas-filled interstices or interstices filled with fluids other than water, it is still considered saturated.

Impervious Area (Cover) - means all impermeable surfaces that cannot effectively infiltrate rainfall. This includes paved, concrete and gravel surfaces (i.e. parking lots, driveways, roads, runways and sidewalks); building rooftops and miscellaneous impermeable structures such as patios, pools, and sheds.

Larger Common Plan of Development or Sale - means a contiguous area where multiple separate and distinct construction activities are occurring, or will occur, under one plan. The term "plan" in "larger common plan of development or sale" is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, marketing plan, advertisement, drawing, permit application, State Environmental Quality Review Act (SEQRA) application, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating that construction activities may occur on a specific plot.

For discrete construction projects that are located within a larger common plan of development or sale that are at least 1/4 mile apart, each project can be treated as a separate plan of development or sale provided any interconnecting road, pipeline or utility project that is part of the same "common plan" is not concurrently being disturbed.

Municipal Separate Storm Sewer (MS4) - a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

i. Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to surface waters of the State*;*
ii. Designed or used for collecting or conveying stormwater;
iii. Which is not a *combined sewer*; and
iv. Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

National Pollutant Discharge Elimination System (NPDES) - means the national system for the issuance of wastewater and stormwater permits under the Federal Water Pollution Control Act (Clean Water Act).

NOI Acknowledgment Letter - means the letter that the Department sends to an owner or operator to acknowledge the Department's receipt and acceptance of a complete Notice of Intent. This letter documents the owner's or operator's authorization to discharge in accordance with the general permit for stormwater discharges from construction activity.

Owner or Operator - means the person, persons or legal entity which owns or leases the property on which the construction activity is occurring; and/or an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications.

Pollutant - means dredged spoil, filter backwash, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand and industrial, municipal, agricultural waste and ballast discharged into water; which may cause or might reasonably be expected to cause pollution of the waters of the state in contravention of the standards or guidance values adopted as provided in Parts 700 et seq of this Title.

Qualified Inspector - means a person that is knowledgeable in the principles and practices of erosion and sediment control, such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or other Department endorsed individual(s).

It can also mean someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means that the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect shall receive four (4) hours of training every three (3) years.

It can also mean a person that meets the *Qualified Professional* qualifications in addition to the *Qualified Inspector* qualifications.

Note: Inspections of any post-construction stormwater management practices that include structural components, such as a dam for an impoundment, shall be performed by a licensed Professional Engineer.

Qualified Professional - means a person that is knowledgeable in the principles and practices of stormwater management and treatment, such as a licensed Professional Engineer, Registered Landscape Architect or other Department endorsed individual(s). Individuals preparing SWPPPs that require the post-construction stormwater management practice component must have an understanding of the principles of hydrology, water quality management practice design, water quantity control design, and, in many cases, the principles of hydraulics in order to prepare a SWPPP that conforms to the Department's technical standard. All components of the SWPPP that involve the practice of engineering, as defined by the NYS Education Law (see Article 145), shall be prepared by, or under the direct supervision of, a professional engineer licensed to practice in the State of New York.

Regulated, Traditional Land Use Control MS4 - means a city, town or village with land use control authority that is required to gain coverage under New York State DEC's SPDES General Permit For Stormwater Discharges from Municipal Separate Stormwater Sewer Systems (MS4s).

Routine Maintenance Activity - means construction activity that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility, including, but not limited to:

- Re-grading of gravel roads or parking lots,
- Stream bank restoration projects (does not include the placement of spoil material),
- Cleaning and shaping of existing roadside ditches and culverts that maintains the approximate original line and grade, and hydraulic capacity of the ditch,
- Cleaning and shaping of existing roadside ditches that does not maintain the approximate original grade, hydraulic capacity and purpose of the ditch if the changes to the line and grade, hydraulic capacity or purpose of the ditch are installed to improve water quality and quantity controls (e.g. installing grass lined ditch),
- Placement of aggregate shoulder backing that makes the transition between the road shoulder and the ditch or embankment,
- Full depth milling and filling of existing asphalt pavements, replacement of concrete pavement slabs, and similar work that does not expose soil or disturb the bottom six (6) inches of subbase material,
- Long-term use of equipment storage areas at or near highway maintenance facilities,
- Removal of sediment from the edge of the highway to restore a previously existing sheet-flow drainage connection from the highway surface to the highway ditch or embankment,
- Existing use of Canal Corp owned upland disposal sites for the canal, and
- Replacement of curbs, gutters, sidewalks and guide rail posts.

State Pollutant Discharge Elimination System (SPDES) - means the system established pursuant to Article 17 of the ECL and 6 NYCRR Part 750 for issuance of permits authorizing discharges to the waters of the state.

Surface Waters of the State - shall be construed to include lakes, bays, sounds, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic ocean within the territorial seas of the state of New York and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters that do not combine or effect a junction with natural surface or underground waters), which are wholly or partially within or bordering the state or within its jurisdiction. Waters of the state are further defined in 6 NYCRR Parts 800 to 941.

Temporary Stabilization - means that exposed soil has been covered with material(s) as set forth in the technical standard, New York Standards and Specifications for Erosion and Sediment Control, to prevent the exposed soil from eroding. The materials can include, but are not limited to, mulch, seed and mulch, and erosion control mats (e.g. jute twisted yarn, excelsior wood fiber mats).

Total Maximum Daily Loads (TMDLs) - A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. It is a calculation of the maximum amount of a pollutant that a waterbody can receive on a daily basis and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL stipulates wasteload allocations (WLAs) for point source discharges, load allocations (LAs) for nonpoint sources, and a margin of safety (MOS).

Trained Contractor - means an employee from the contracting (construction) company, identified in Part III.A.6., that has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the *trained contractor* shall receive four (4) hours of training every three (3) years.

It can also mean an employee from the contracting (construction) company, identified in Part III.A.6., that meets the *qualified inspector* qualifications (e.g. licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity).

The *trained contractor* will be responsible for the day to day implementation of the SWPPP.

Uniform Procedures Act (UPA) Permit - means a permit required under 6 NYCRR Part 621 of the Environmental Conservation Law (ECL), Article 70.

Water Quality Standard - means such measures of purity or quality for any waters in relation to their reasonable and necessary use as promulgated in 6 NYCRR Part 700 et seq.

APPENDIX B

Required SWPPP Components by Project Type

Table 1
CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT ONLY INCLUDES EROSION AND SEDIMENT CONTROLS

The following construction activities that involve soil disturbances of one (1) or more acres of land, but less than five (5) acres: • Single family home not located in one of the watersheds listed in Appendix C and not *directly discharging* to one of the 303(d) segments listed in Appendix E • Single family residential subdivisions with 25% or less impervious cover at total site build-out and not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E • Construction of a barn or other agricultural building, silo, stock yard or pen.
The following construction activities that involve soil disturbances of one (1) or more acres of land: • Installation of underground, linear utilities; such as gas lines, fiber-optic cable, cable TV, electric, telephone, sewer mains, and water mains • Environmental enhancement projects, such as wetland mitigation projects, stormwater retrofits and stream restoration projects • Bike paths and trails • Sidewalk construction projects that are not part of a road/ highway construction or reconstruction project • Slope stabilization projects • Slope flattening that changes the grade of the site, but does not significantly change the runoff characteristics • Spoil areas that will be covered with vegetation • Land clearing and grading for the purposes of creating vegetated open space (i.e. recreational parks, lawns, meadows, fields), excluding projects that *alter hydrology from pre to post development* conditions • Athletic fields (natural grass) that do not include the construction or reconstruction of *impervious area* and do not *alter hydrology from pre to post development* conditions • Demolition project where vegetation will be established and no redevelopment is planned • Overhead electric transmission line project that does not include the construction of permanent access roads or parking areas surfaced with *impervious cover* • Structural practices as identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State", excluding projects that involve soil disturbances of less than five acres and construction activities that include the construction or reconstruction of impervious area
The following construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land: • All construction activities located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land.

Table 2
CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Single family home located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions that involve soil disturbances of between one (1) and five (5) acres of land with greater than 25% impervious cover at total site build-out
- Single family residential subdivisions that involve soil disturbances of five (5) or more acres of land, and single family residential subdivisions that involve soil disturbances of less than five (5) acres that are part of a larger common plan of development or sale that will ultimately disturb five or more acres of land
- Multi-family residential developments; includes townhomes, condominiums, senior housing complexes, apartment complexes, and mobile home parks
- Airports
- Amusement parks
- Campgrounds
- Cemeteries that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Commercial developments
- Churches and other places of worship
- Construction of a barn or other agricultural building(e.g. silo) and structural practices as identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State" that include the construction or reconstruction of *impervious area*, excluding projects that involve soil disturbances of less than five acres.
- Golf courses
- Institutional, includes hospitals, prisons, schools and colleges
- Industrial facilities, includes industrial parks
- Landfills
- Municipal facilities; includes highway garages, transfer stations, office buildings, POTW's and water treatment plants
- Office complexes
- Sports complexes
- Racetracks, includes racetracks with earthen (dirt) surface
- Road construction or reconstruction
- Parking lot construction or reconstruction
- Athletic fields (natural grass) that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Athletic fields with artificial turf
- Permanent access roads, parking areas, substations, compressor stations and well drilling pads, surfaced with *impervious cover*, and constructed as part of an over-head electric transmission line project , wind-power project, cell tower project, oil or gas well drilling project or other linear utility project
- All other construction activities that include the construction or reconstruction of *impervious area* <u>and</u> *alter the hydrology from pre to post development* conditions, <u>and</u> are not listed in Table 1

APPENDIX C

Watersheds Where Enhanced Phosphorus Removal Standards Are Required

Watersheds where *owners or operators* of construction activities identified in Table 2 of Appendix B must prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the Enhanced Phosphorus Removal Standards included in the technical standard, New York State Stormwater Management Design Manual ("Design Manual").

- Entire New York City Watershed located east of the Hudson River - Figure 1
- Onondaga Lake Watershed - Figure 2
- Greenwood Lake Watershed -Figure 3
- Oscawana Lake Watershed – Figure 4

Figure 1 - New York City Watershed East of the Hudson

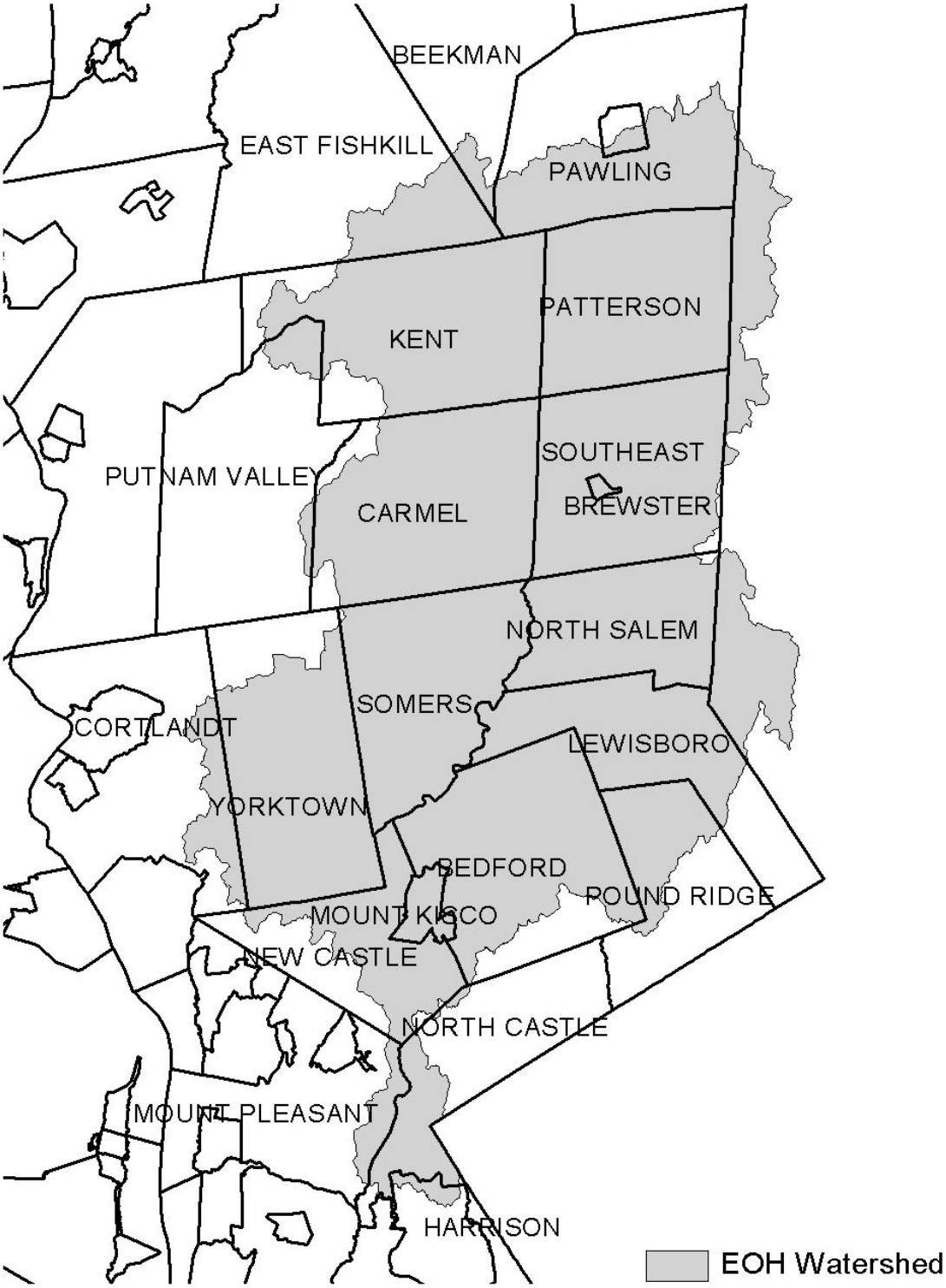
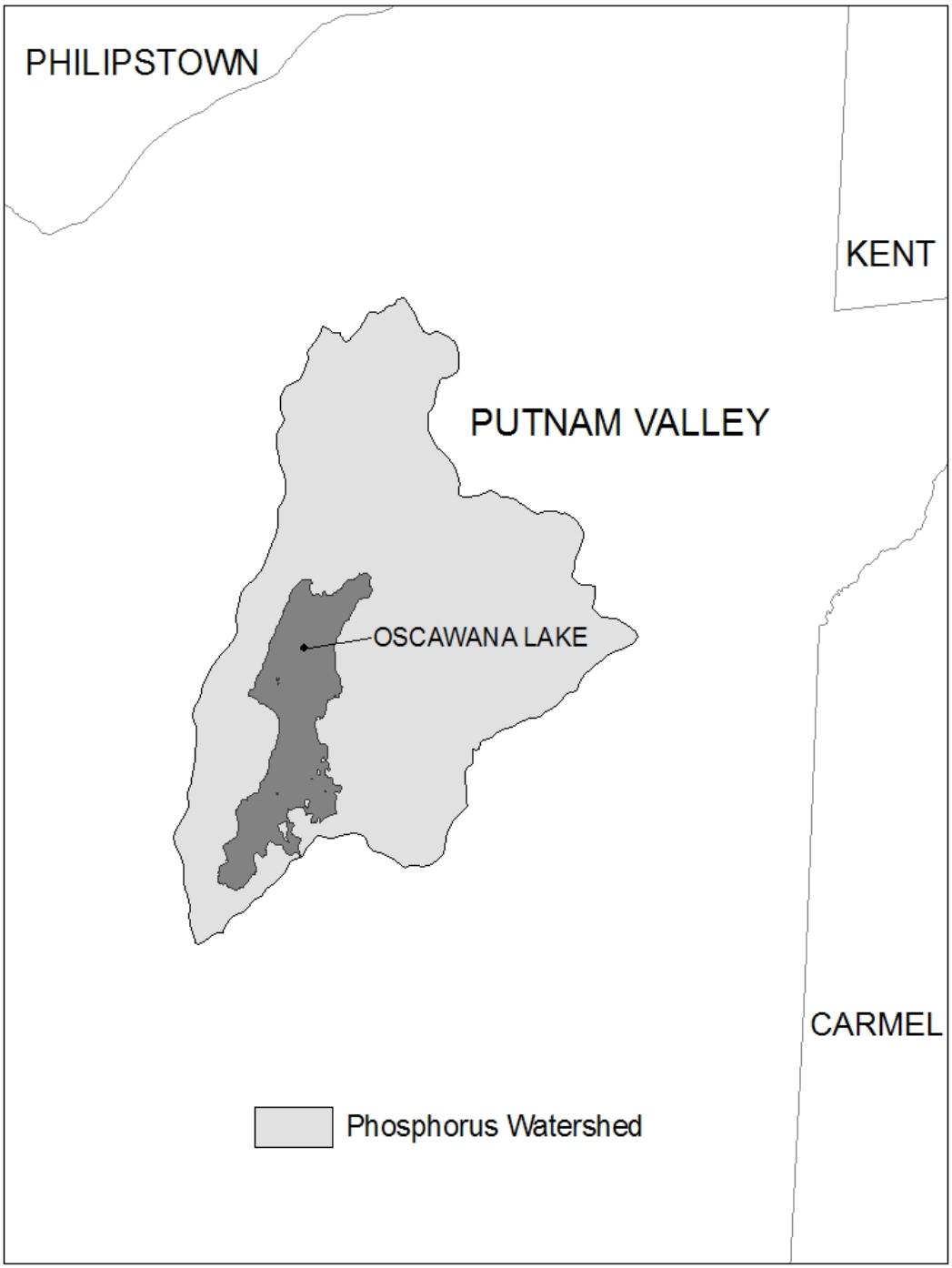


Figure 2 - Onondaga Lake Watershed

Figure 3 - Greenwood Lake Watershed

Figure 4 - Oscawana Lake Watershed



APPENDIX D

Watersheds where *owners or operators* of construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land must obtain coverage under this permit.

Entire New York City Watershed that is located east of the Hudson River - See Figure 1 in Appendix C

APPENDIX E

List of 303(d) segments impaired by pollutants related to construction activity (e.g. silt, sediment or nutrients). *Owners or operators* of single family home and single family residential subdivision construction activities that involve soil disturbances of one or more acres of land, but less than 5 acres, and *directly discharge* to one of the listed segments below shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the most current version of the technical standard, New York State Stormwater Management Design Manual ("Design Manual").

COUNTY	WATERBODY
Albany	Ann Lee (Shakers) Pond, Stump Pond
Albany	Basic Creek Reservoir
Bronx	Van Cortlandt Lake
Broome	Whitney Point Lake/Reservoir
Broome	Beaver Lake
Broome	White Birch Lake
Chautauqua	Chautauqua Lake, North
Chautauqua	Chautauqua Lake, South
Chautauqua	Bear Lake
Chautauqua	Chadakoin River and tribs
Chautauqua	Lower Cassadaga Lake
Chautauqua	Middle Cassadaga Lake
Chautauqua	Findley Lake
Clinton	Great Chazy River, Lower, Main Stem
Columbia	Kinderhook Lake
Columbia	Robinson Pond
Dutchess	Hillside Lake
Dutchess	Wappinger Lakes
Dutchess	Fall Kill and tribs
Dutchess	Rudd Pond
Erie	Rush Creek and tribs
Erie	Ellicott Creek, Lower, and tribs
Erie	Beeman Creek and tribs
Erie	Murder Creek, Lower, and tribs
Erie	South Branch Smoke Cr, Lower, and tribs
Erie	Little Sister Creek, Lower, and tribs
Essex	Lake George (primary county listed as Warren)
Genesee	Black Creek, Upper, and minor tribs
Genesee	Tonawanda Creek, Middle, Main Stem
Genesee	Tonawanda Creek, Upper, and minor tribs
Genesee	Little Tonawanda Creek, Lower, and tribs
Genesee	Oak Orchard Creek, Upper, and tribs
Genesee	Bowen Brook and tribs
Genesee	Bigelow Creek and tribs
Greene	Schoharie Reservoir
Greene	Sleepy Hollow Lake
Herkimer	Steele Creek tribs
Kings	Hendrix Creek
Lewis	Mill Creek/South Branch and tribs
Livingston	Conesus Lake
Livingston	Jaycox Creek and tribs
Livingston	Mill Creek and minor tribs
Monroe	Genesee River, Lower, Main Stem
Monroe	Genesee River, Middle, Main Stem
Monroe	Black Creek, Lower, and minor tribs
Monroe	Buck Pond
Monroe	Long Pond
Monroe	Cranberry Pond
Monroe	Mill Creek and tribs
Monroe	Shipbuilders Creek and tribs
Monroe	Minor tribs to Irondequoit Bay
Monroe	Thomas Creek/White Brook and tribs
Nassau	Glen Cove Creek, Lower, and tribs
Nassau	LI Tribs (fresh) to East Bay
Nassau	East Meadow Brook, Upper, and tribs
Nassau	Hempstead Bay
Nassau	Hempstead Lake
Nassau	Grant Park Pond
Niagara	Bergholtz Creek and tribs
Oneida	Ballou, Nail Creeks
Onondaga	Ley Creek and tribs
Onondaga	Onondaga Creek, Lower and tribs
Onondaga	Onondaga creek, Middle and tribs
Onondaga	Onondaga Creek, Upper, and minor tribs
Onondaga	Harbor Brook, Lower, and tribs
Onondaga	Ninemile Creek, Lower, and tribs
Onondaga	Minor tribs to Onondaga Lake
Ontario	Honeoye Lake
Ontario	Hemlock Lake Outlet and minor tribs
Ontario	Great Brook and minor tribs
Oswego	Lake Neatahwanta
Putnam	Oscawana Lake
Putnam	Lake Carmel
Queens	Jamaica Bay, Eastern, and tribs (Queens)
Queens	Bergen Basin
Queens	Shellbank Basin
Rensselaer	Snyders Lake
Richmond	Grasmere, Arbutus and Wolfes Lakes
Saratoga	Dwaas Kill and tribs
Saratoga	Tribs to Lake Lonely
Saratoga	Lake Lonely
Saratoga	Schuyler Creek and tribs
Schenectady	Collins Lake

APPENDIX E

List of 303(d) segments impaired by pollutants related to construction activity, cont'd.

COUNTY	WATERBODY	COUNTY	WATERBODY
Schoharie	Engleville Pond		
Schoharie	Summit Lake		
St. Lawrence	Black Lake Outlet/Black Lake		
Steuben	Lake Salubria		
Steuben	Smith Pond		
Suffolk	Millers Pond		
Suffolk	Mattituck (Marratooka) Pond		
Suffolk	Tidal tribs to West Moriches Bay		
Suffolk	Canaan Lake		
Suffolk	Lake Ronkonkoma		
Tompkins	Cayuga Lake, Southern End		
Tompkins	Owasco Inlet, Upper, and tribs		
Ulster	Ashokan Reservoir		
Ulster	Esopus Creek, Upper, and minor tribs		
Warren	Lake George		
Warren	Tribs to L.George, Village of L George		
Warren	Huddle/Finkle Brooks and tribs		
Warren	Indian Brook and tribs		
Warren	Hague Brook and tribs		
Washington	Tribs to L.George, East Shore of Lake George		
Washington	Cossayuna Lake		
Wayne	Port Bay		
Wayne	Marbletown Creek and tribs		
Westchester	Peach Lake		
Westchester	Mamaroneck River, Lower		
Westchester	Mamaroneck River, Upper, and minor tribs		
Westchester	Sheldrake River and tribs		
Westchester	Blind Brook, Lower		
Westchester	Blind Brook, Upper, and tribs		
Westchester	Lake Lincolndale		
Westchester	Lake Meahaugh		
Wyoming	Java Lake		
Wyoming	Silver Lake		

Note: The list above identifies those waters from the final New York State "2008 Section 303(d) List of Impaired Waters Requiring a TMDL/Other Strategy", dated May 26, 2008, that are impaired by silt, sediment or nutrients.

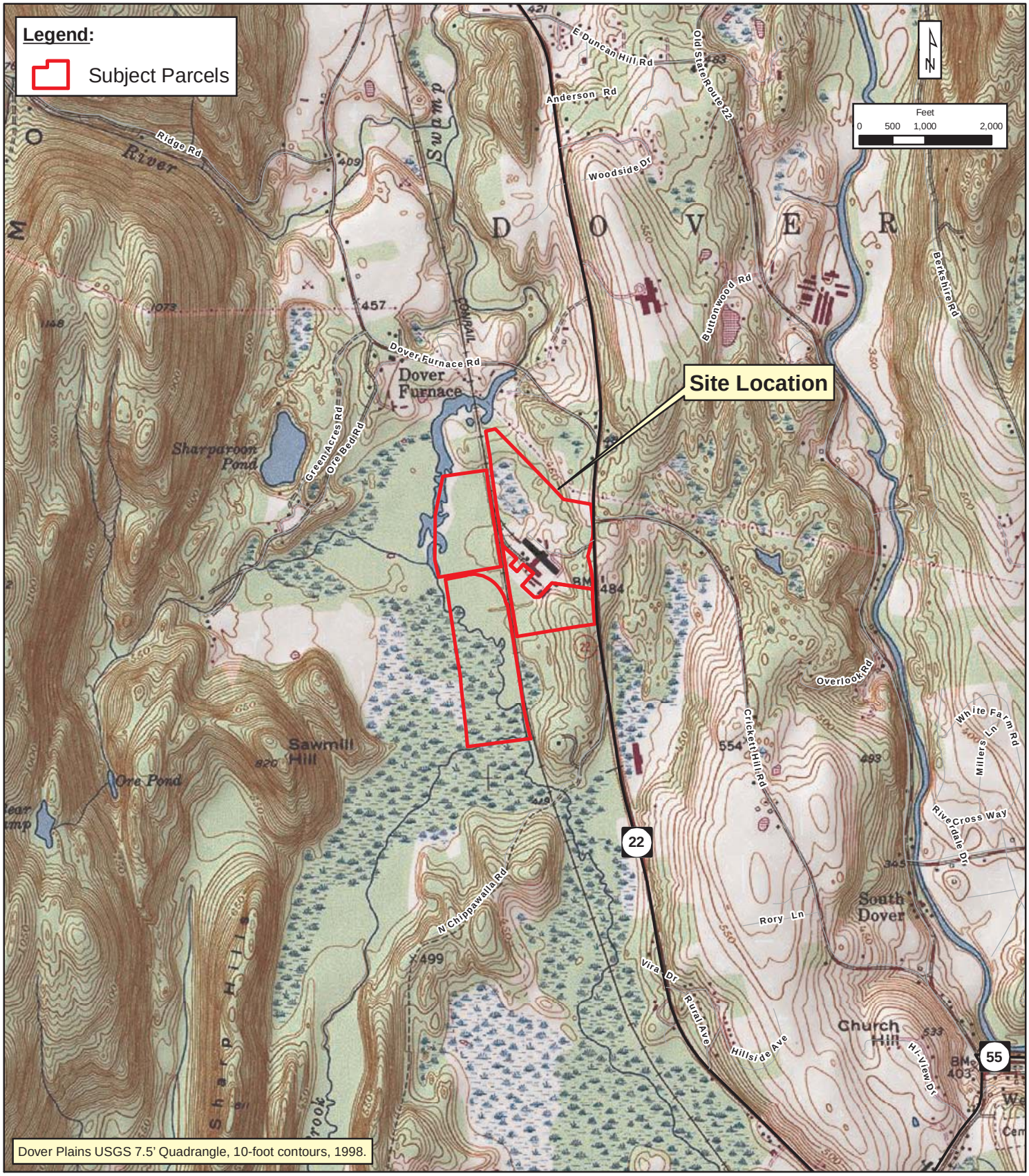
APPENDIX F

LIST OF NYS DEC REGIONAL OFFICES

Region	COVERING THE FOLLOWING COUNTIES:	DIVISION OF ENVIRONMENTAL PERMITS (DEP) PERMIT ADMINISTRATORS	DIVISION OF WATER (DOW) WATER (SPDES) PROGRAM
1	NASSAU AND SUFFOLK	50 CIRCLE ROAD STONY BROOK, NY 11790 TEL. (631) 444-0365	50 CIRCLE ROAD STONY BROOK, NY 11790-3409 TEL. (631) 444-0405
2	BRONX, KINGS, NEW YORK, QUEENS AND RICHMOND	1 HUNTERS POINT PLAZA, 47-40 21ST ST. LONG ISLAND CITY, NY 11101-5407 TEL. (718) 482-4997	1 HUNTERS POINT PLAZA, 47-40 21ST ST. LONG ISLAND CITY, NY 11101-5407 TEL. (718) 482-4933
3	DUTCHESS, ORANGE, PUTNAM, ROCKLAND, SULLIVAN, ULSTER AND WESTCHESTER	21 SOUTH PUTT CORNERS ROAD NEW PALTZ, NY 12561-1696 TEL. (845) 256-3059	100 HILLSIDE AVENUE, SUITE 1W WHITE PLAINS, NY 10603 TEL. (914) 428 - 2505
4	ALBANY, COLUMBIA, DELAWARE, GREENE, MONTGOMERY, OTSEGO, RENSSELAER, SCHENECTADY AND SCHOHARIE	1150 NORTH WESTCOTT ROAD SCHENECTADY, NY 12306-2014 TEL. (518) 357-2069	1130 NORTH WESTCOTT ROAD SCHENECTADY, NY 12306-2014 TEL. (518) 357-2045
5	CLINTON, ESSEX, FRANKLIN, FULTON, HAMILTON, SARATOGA, WARREN AND WASHINGTON	1115 STATE ROUTE 86, PO BOX 296 RAY BROOK, NY 12977-0296 TEL. (518) 897-1234	232 GOLF COURSE ROAD, PO BOX 220 WARRENSBURG, NY 12885-0220 TEL. (518) 623-1200
6	HERKIMER, JEFFERSON, LEWIS, ONEIDA AND ST. LAWRENCE	STATE OFFICE BUILDING 317 WASHINGTON STREET WATERTOWN, NY 13601-3787 TEL. (315) 785-2245	STATE OFFICE BUILDING 207 GENESEE STREET UTICA, NY 13501-2885 TEL. (315) 793-2554
7	BROOME, CAYUGA, CHENANGO, CORTLAND, MADISON, ONONDAGA, OSWEGO, TIOGA AND TOMPKINS	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7438	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7500
8	CHEMUNG, GENESEE, LIVINGSTON, MONROE, ONTARIO, ORLEANS, SCHUYLER, SENECA, STEUBEN, WAYNE AND YATES	6274 EAST AVON-LIMA ROAD AVON, NY 14414-9519 TEL. (585) 226-2466	6274 EAST AVON-LIMA RD. AVON, NY 14414-9519 TEL. (585) 226-2466
9	ALLEGANY, CATTARAUGUS, CHAUTAUQUA, ERIE, NIAGARA AND WYOMING	270 MICHIGAN AVENUE BUFFALO, NY 14203-2999 TEL. (716) 851-7165	270 MICHIGAN AVE. BUFFALO, NY 14203-2999 TEL. (716) 851-7070

Appendix B: Figures

Figure 1:
Site Location Map



Dover Plains USGS 7.5' Quadrangle, 10-foot contours, 1998.

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Phone: (518) 273-0055

Glens Falls Office:
100 Glen Street, Glens Falls, NY 12801
Phone: (518) 812-0513

New London Office:
914 Hartford Turnpike Waterford, CT. 06385
Phone: (860) 440-2690

Cricket Valley Energy

Site Location

State Route 22
Town of Dover
Dutchess County, New York

Drawn:	CLC
Date:	01/12/2010
Scale:	1:24,000
Project:	81001.00
Figure:	1

Map Document: (R:\8\81000-81999\81001_00\GIS\maps\81001_00_SiteLocation_8x11.mxd)
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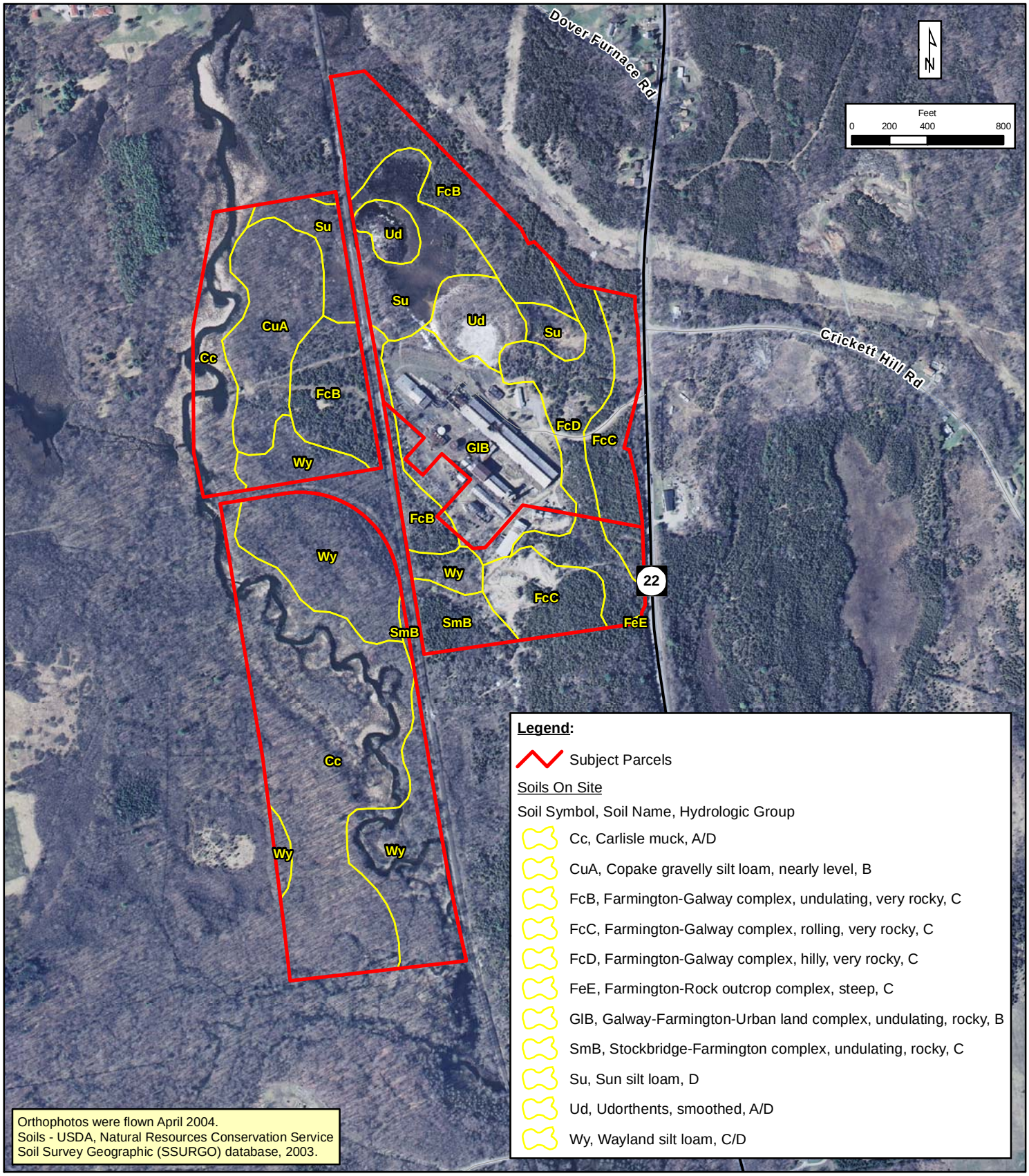
Figure 2A:
Site Soils Map



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Cricket Valley Energy

Site Soils Map

State Route 22
Town of Dover
Dutchess County, New York

Drawn:	CLC
Date:	06/22/2010
Scale:	1:8,400
Project:	81001.00
Figure:	2A

Map Document: (R:\8\81000-81999\81001_00\GIS\maps\81001_00_SiteSoilsMap_8x11.mxd)
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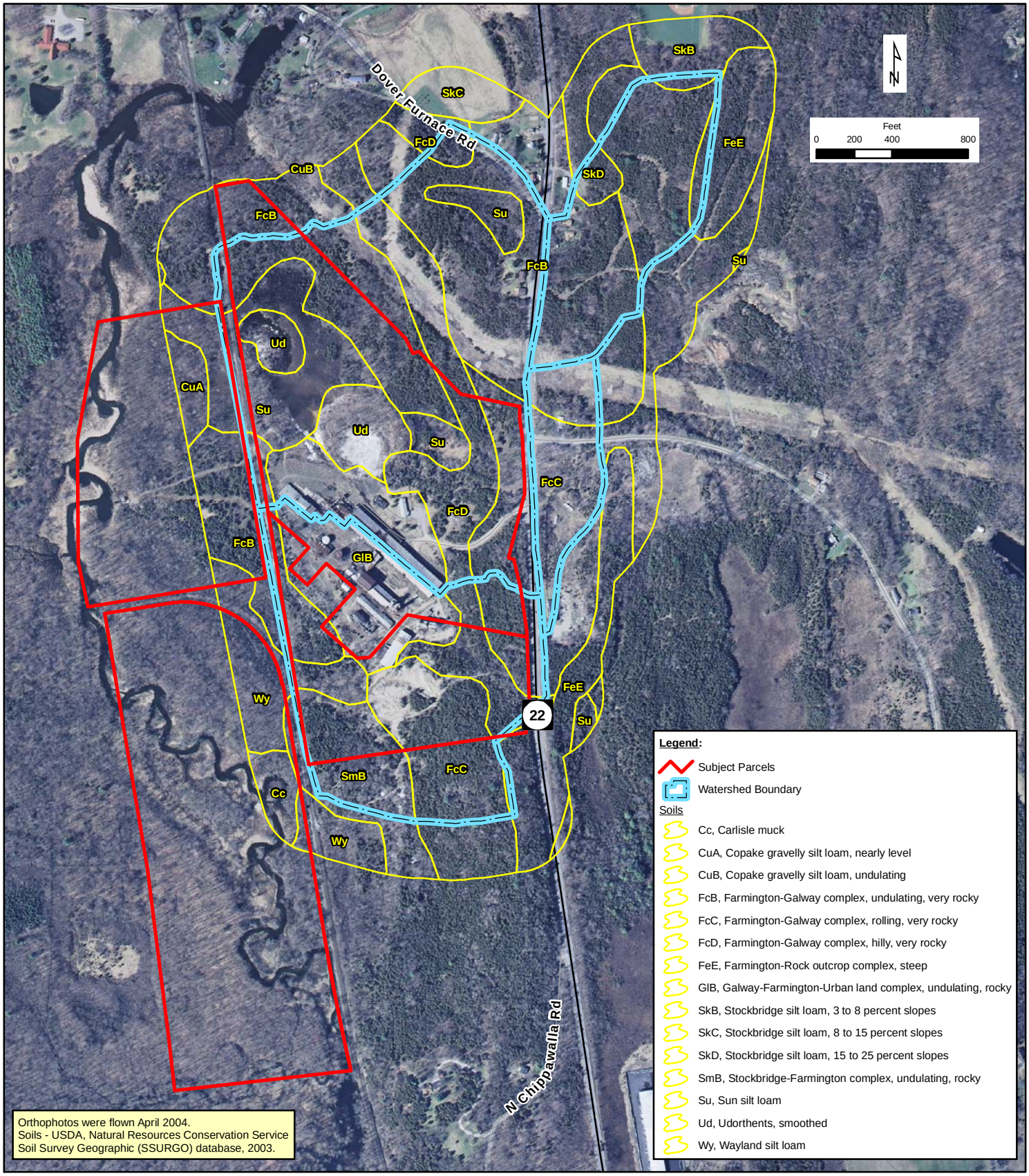
Figure 2B:
Watershed Soils Map



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Cricket Valley Energy

Soils in Watershed

State Route 22
Town of Dover
Dutchess County, New York

Drawn:	CLC
Date:	06/22/2010
Scale:	1:8,400
Project:	81001.00
Figure:	2B

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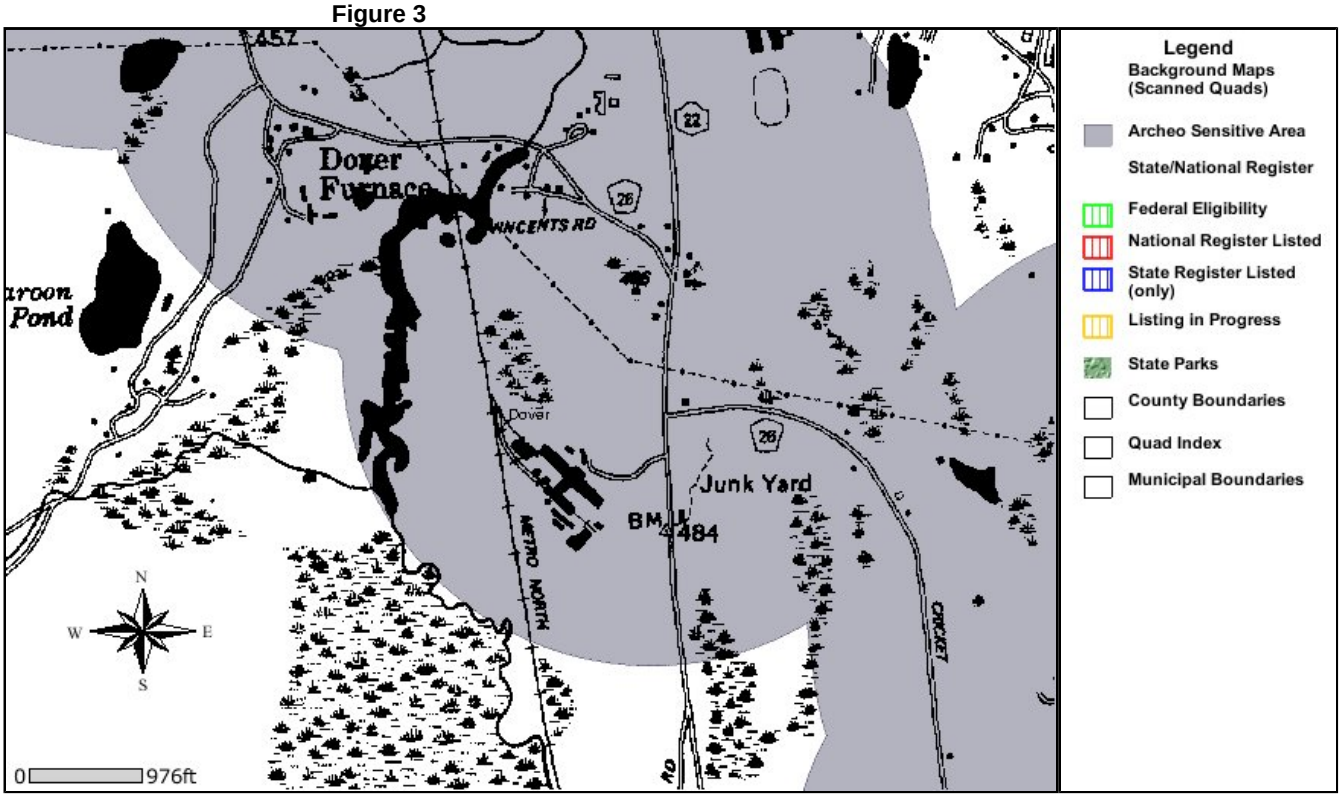
Figure 3:
Historic Places Screening Map

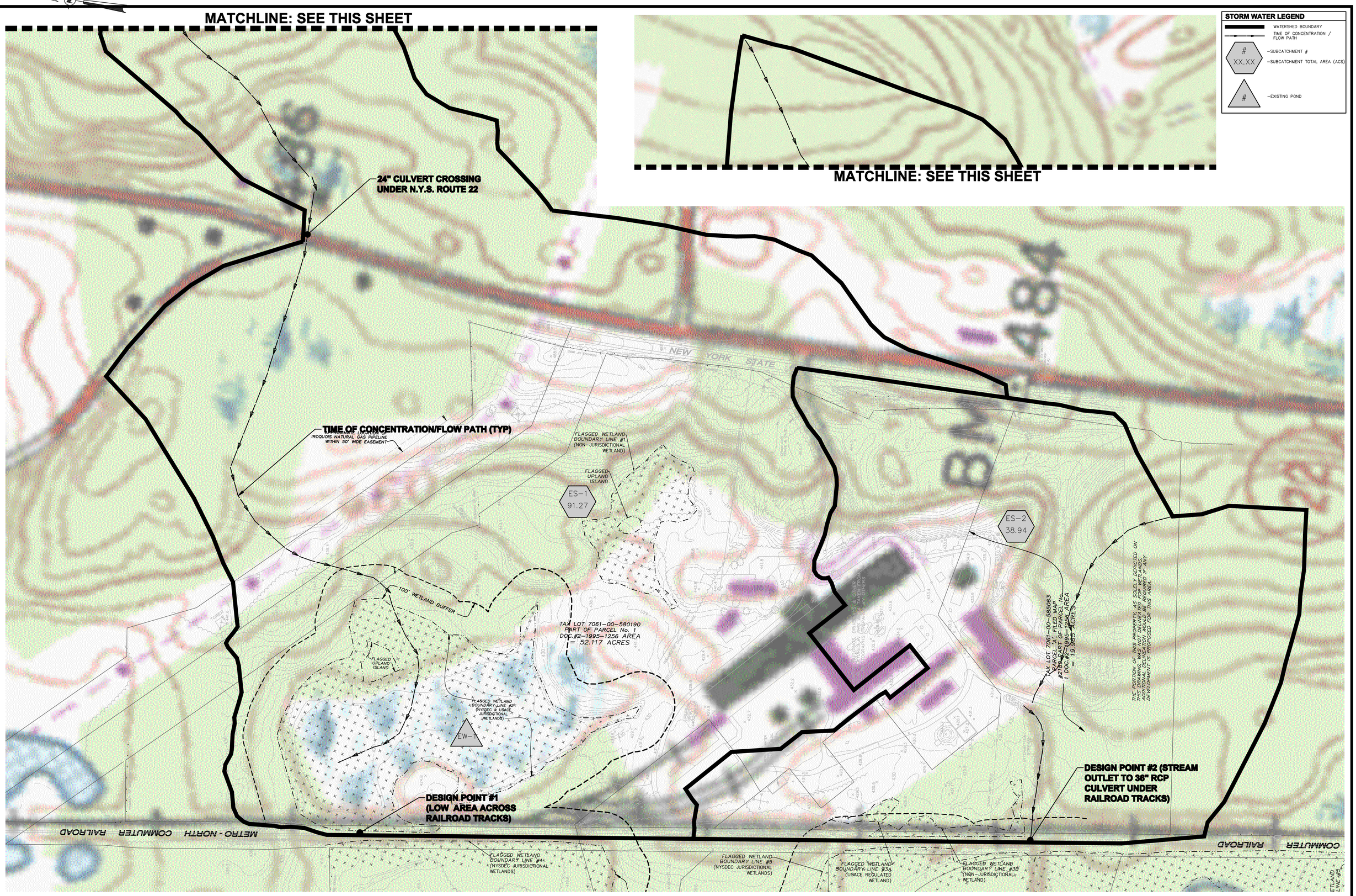
Historic Screenings Map - Figure 3



January 14, 2010

Disclaimer: This map was prepared by the New York State Parks, Recreation and Historic Preservation National Register Listing Internet Application. The information was compiled using the most current data available. It is deemed accurate, but is not guaranteed.

Figure 4:
Pre-Development Watershed Delineation Map



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rev.	date	description

CRICKET VALLEY ENERGY

PRE-DEVELOPMENT WATERSHED DELINEATION MAP

TOWN OF DOVER, DUTCHESS COUNTY, NEW YORK

drawn	checked
SBR	CL
date 7/16/10	scale 1" = 100'
project no. 81001.00	
sheet no. FIG. 4	

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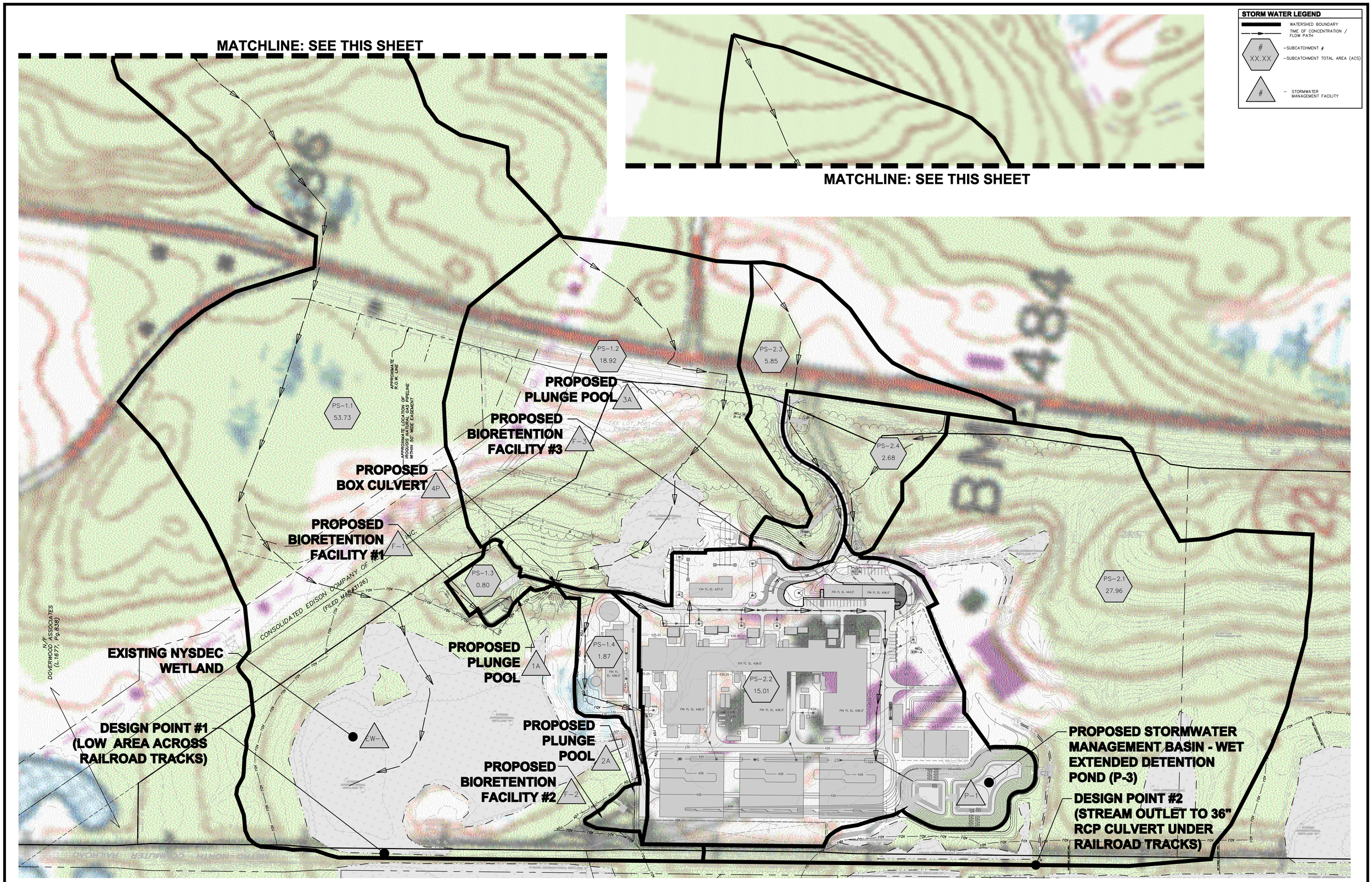
Date Printed: Jul 16, 2010, 12:32pm

Figure 5A:
Overall Post-Development
Watershed Delineation Map



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OWNER OF RECORD
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0 100' 200' 300'
SCALE: 1"=100'

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Phone: (518) 812-0513

rev.	date	description
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CRICKET VALLEY ENERGY

OVERALL POST-DEVELOPMENT WATERSHED DELINEATION MAP

TOWN OF DOVER, DUTCHESS COUNTY, NEW YORK

drawn MMF	checked CL
date 7/16/10	scale 1"=100'
project no. 81001.00	
sheet no. FIG. 5A	

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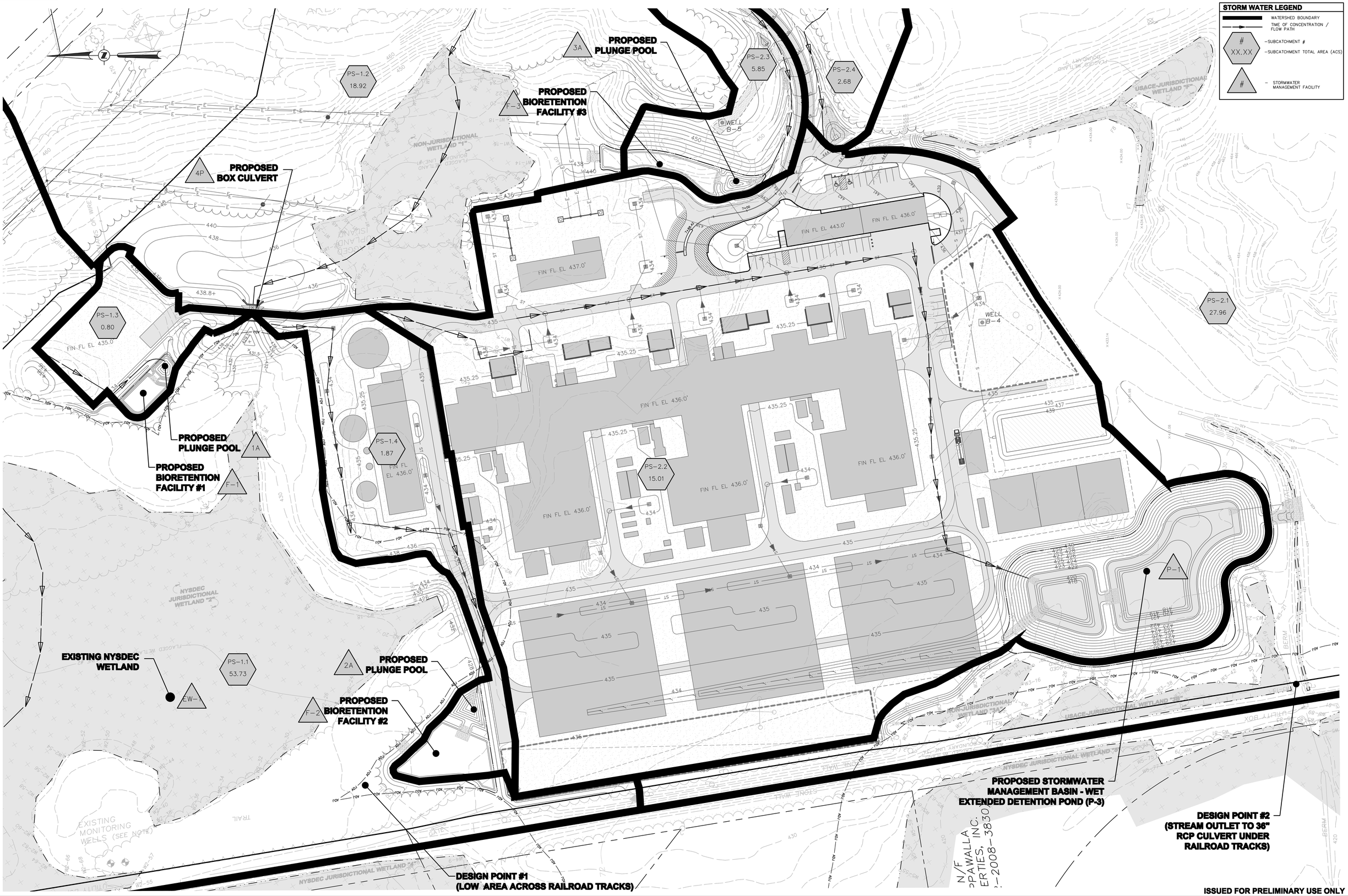
Date Printed: Jun 04, 2012, 4:51pm

Figure 5B:
Enlarged Post-Development
Watershed Delineation Map



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0 0.5" 1" 2" 3"
0 25' 50' 100' 150'
SCALE: 1" = 50'

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rev.	date	description

CRICKET VALLEY ENERGY

ENLARGED POST-DEVELOPMENT WATERSHED DELINEATION MAP

TOWN OF DOVER, DUTCHESS COUNTY, NEW YORK

drawn MMF	checked CL
date 7/16/10	scale 1" = 50'
project no. 81001.00	
sheet no. FIG. 5B	

Drawing Name: S:\81\81000-81099\81001.00\ENG\DWG\05-FIG-5_Postdevelopment Watershed Map.dwg
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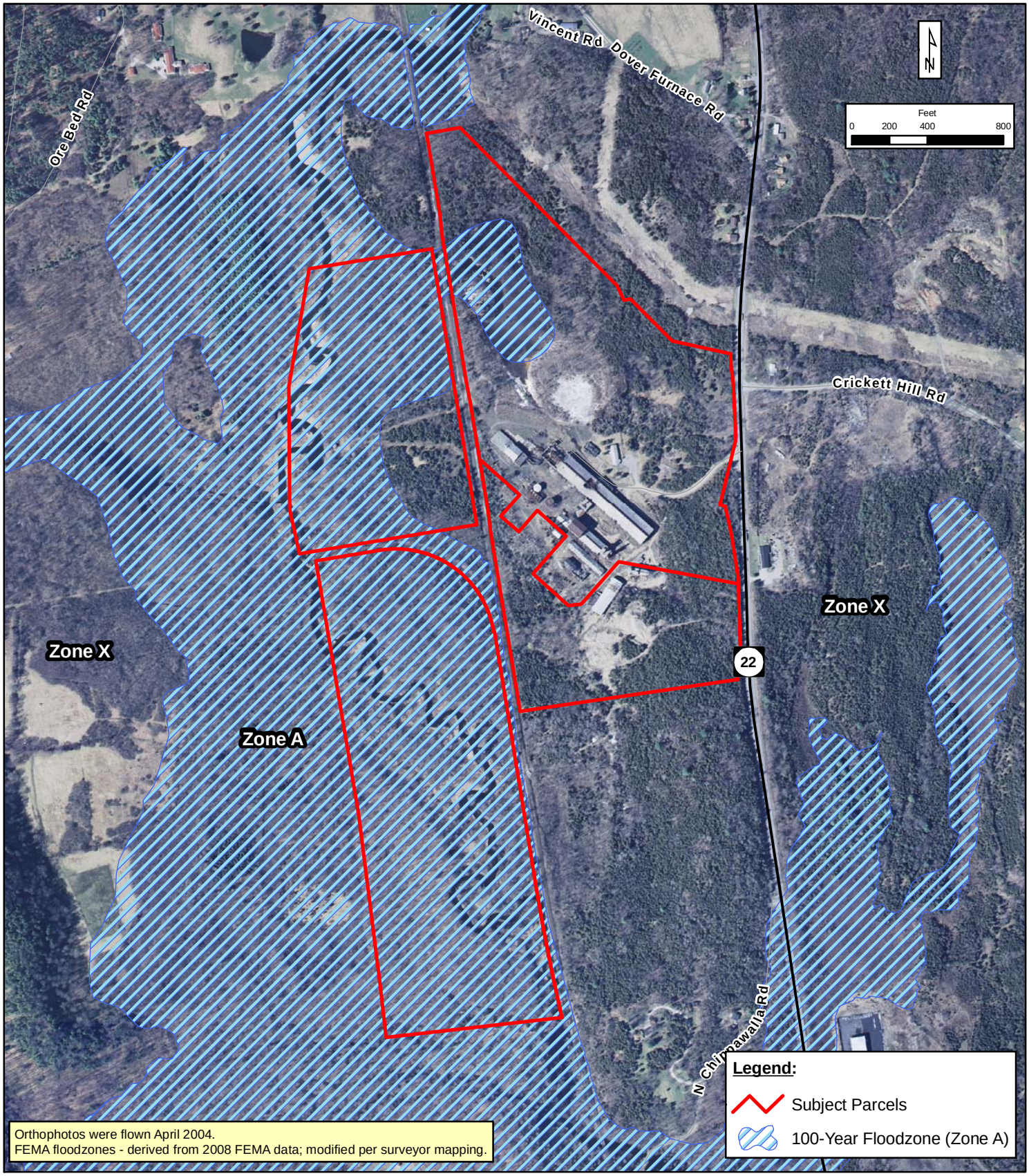
Figure 6:
FEMA Floodzone Map



Orthophotos were flown April 2004.
FEMA floodzones - derived from 2008 FEMA data; modified per surveyor mapping.

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Cricket Valley Energy

FEMA Floodzone

State Route 22
Town of Dover
Dutchess County, New York

Drawn:	CLC
Date:	06/22/2010
Scale:	1:8,400
Project:	81001.00
Figure:	6

Map Document: (R:\8\81000-81999\81001_00\GIS\maps\81001_00_FEMAfloodzones_8x11.mxd)
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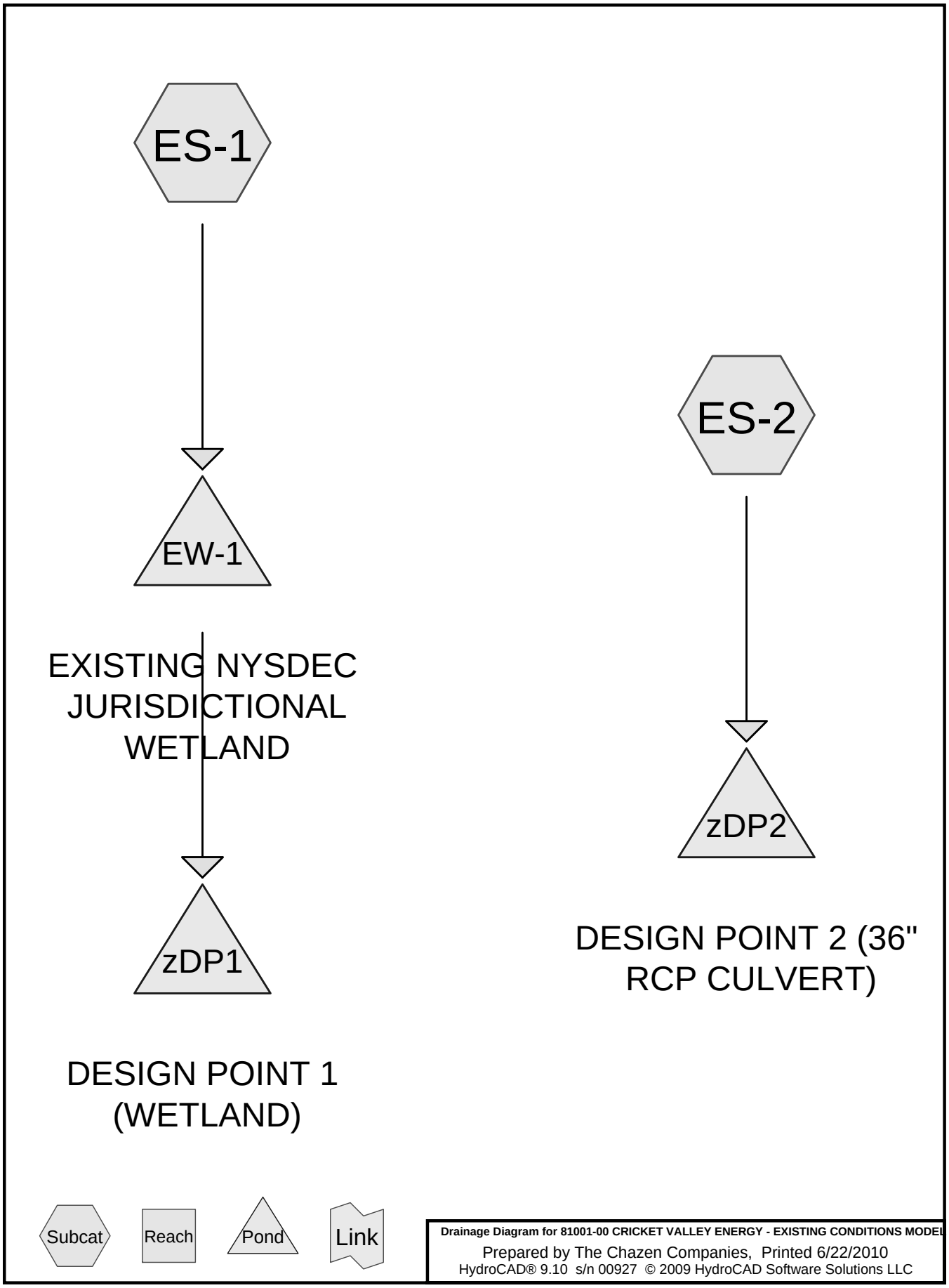
Appendix C:
Pre-Development Stormwater Modeling



Drainage Diagram for 81001-00 CRICKET VALLEY ENERGY - EXISTING CONDITIONS MODEL

Prepared by The Chazen Companies, Printed 6/22/2010

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.120	55	Woods, Good, HSG B (ES-2)
3.442	56	Brush, Fair, HSG B (ES-1, ES-2)
9.805	70	Brush, Fair, HSG C (ES-1, ES-2)
74.464	73	Woods, Fair, HSG C (ES-1, ES-2)
2.002	74	>75% Grass cover, Good, HSG C (ES-1)
4.698	76	Gravel/Brush Mix, HSG B (ES-2)
3.455	76	gravel brush mix (ES-1)
10.097	77	Brush, Fair, HSG D (ES-1)
1.471	77	Woods, Good, HSG D (ES-2)
6.175	79	Woods, Fair, HSG D (ES-1)
4.947	89	Gravel roads, HSG C (ES-1, ES-2)
1.337	91	Gravel roads, HSG D (ES-1, ES-2)
2.481	98	Paved parking and buildings HSG C (ES-2)
4.711	98	Paved parking, HSG C (ES-1)
130.206		**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
9.260	HSG B	ES-1, ES-2
98.410	HSG C	ES-1, ES-2
19.080	HSG D	ES-1, ES-2
3.455	Other	ES-1
130.206		**TOTAL AREA**

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment ES-1: Runoff Area=3,975,624 sf 5.16% Impervious Runoff Depth=0.83"
Flow Length=3,203' Tc=57.8 min CN=75 Runoff=32.98 cfs 6.332 af

Subcatchment ES-2: Runoff Area=1,696,141 sf 6.37% Impervious Runoff Depth=0.88"
Flow Length=1,190' Tc=28.1 min CN=76 Runoff=22.00 cfs 2.865 af

Pond EW-1: EXISTING NYSDEC Peak Elev=421.66' Storage=275,804 cf Inflow=32.98 cfs 6.332 af
Outflow=0.00 cfs 0.000 af

Pond zDP1: DESIGN POINT 1 (WETLAND) Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Pond zDP2: DESIGN POINT 2 (36" RCP CULVERT) Inflow=22.00 cfs 2.865 af
Primary=22.00 cfs 2.865 af

Total Runoff Area = 130.206 ac Runoff Volume = 9.196 af Average Runoff Depth = 0.85"
94.48% Pervious = 123.014 ac 5.52% Impervious = 7.192 ac

Summary for Subcatchment ES-1:

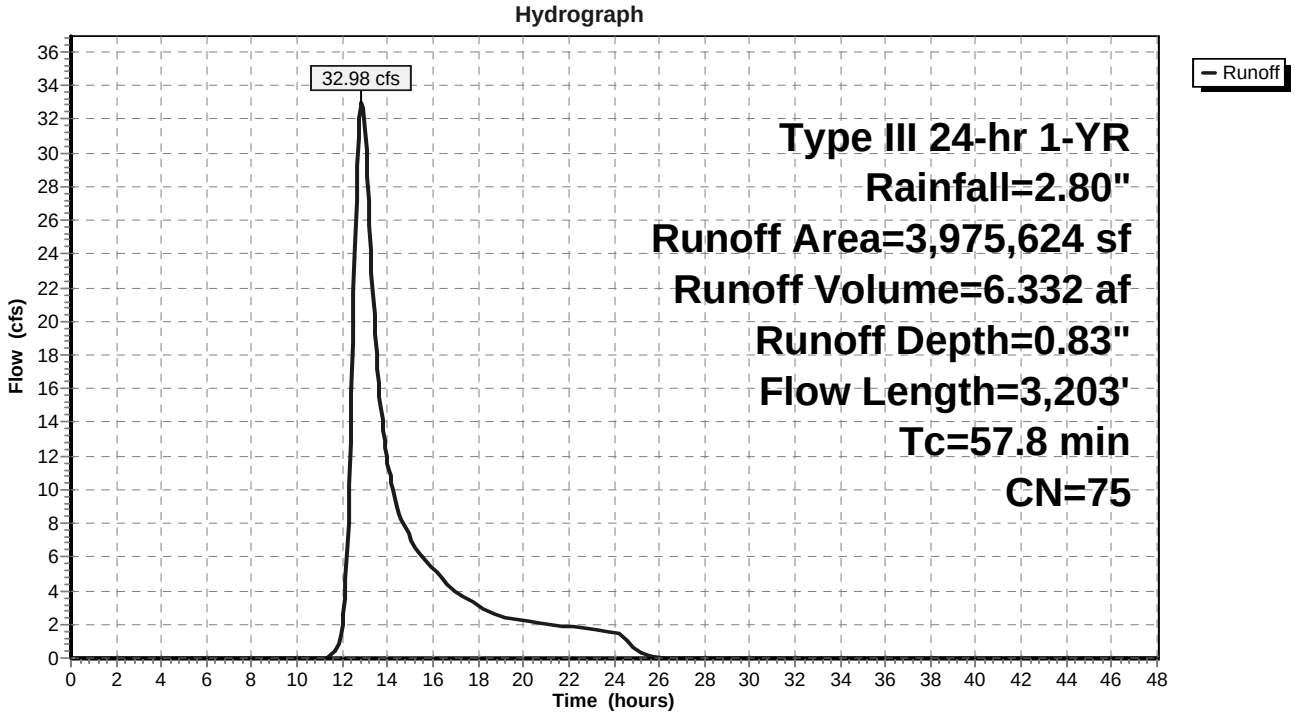
Runoff = 32.98 cfs @ 12.85 hrs, Volume= 6.332 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YR Rainfall=2.80"

	Area (sf)	CN	Description
	119,851	56	Brush, Fair, HSG B
	413,826	70	Brush, Fair, HSG C
	2,207,540	73	Woods, Fair, HSG C
	87,189	74	>75% Grass cover, Good, HSG C
	30,621	89	Gravel roads, HSG C
	439,846	77	Brush, Fair, HSG D
	52,095	91	Gravel roads, HSG D
	268,973	79	Woods, Fair, HSG D
	205,191	98	Paved parking, HSG C
*	150,492	76	gravel brush mix
	3,975,624	75	Weighted Average
	3,770,433		94.84% Pervious Area
	205,191		5.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.7	100	0.0785	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.50"
13.2	1,144	0.0839	1.45		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	60	0.0167	6.05	19.00	**Pipe Channel, PIPE CULVERT ON Rt. 22** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.020 Corrugated PE, corrugated interior
13.0	753	0.0372	0.96		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.5	256	0.0586	1.69		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.1	434	0.0415	1.02		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	456		6.95		**Lake or Reservoir,** Mean Depth= 1.50'
57.8	3,203	Total			

Subcatchment ES-1:



Summary for Subcatchment ES-2:

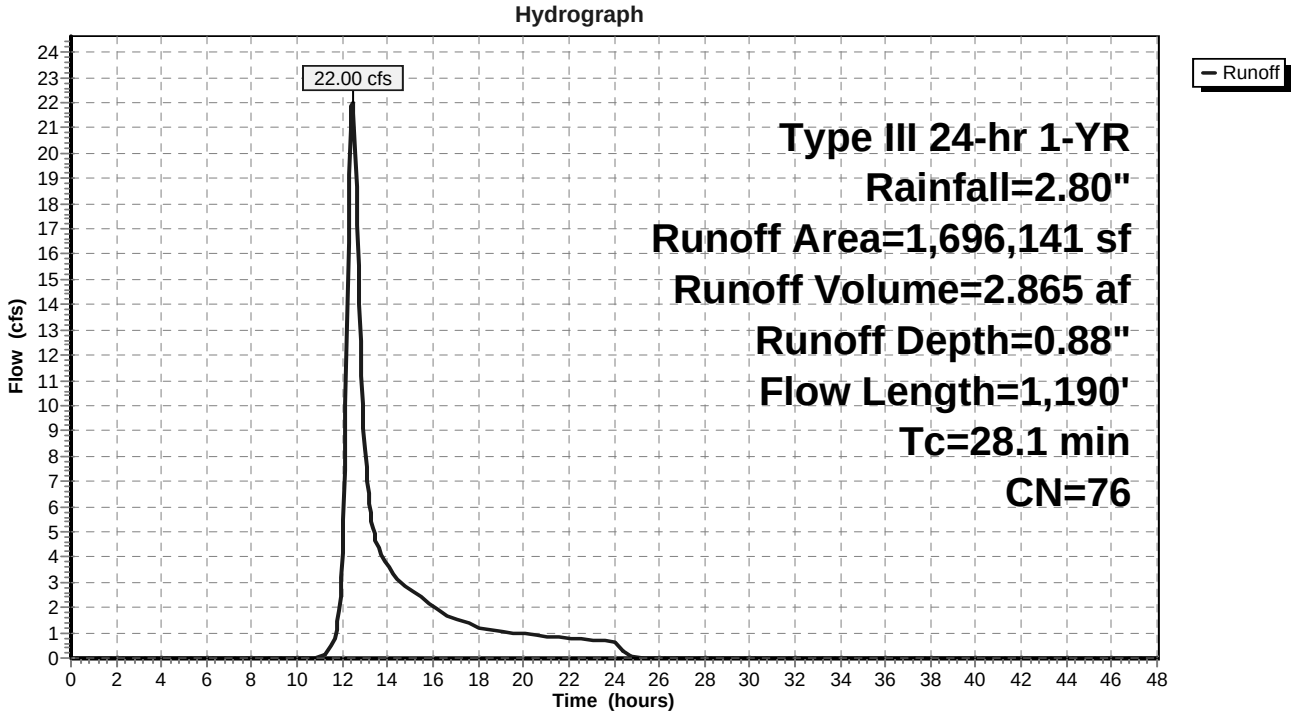
Runoff = 22.00 cfs @ 12.43 hrs, Volume= 2.865 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YR Rainfall=2.80"

	Area (sf)	CN	Description
	30,081	56	Brush, Fair, HSG B
	48,799	55	Woods, Good, HSG B
	184,886	89	Gravel roads, HSG C
	13,281	70	Brush, Fair, HSG C
	1,036,127	73	Woods, Fair, HSG C
*	108,088	98	Paved parking and buildings HSG C
	64,079	77	Woods, Good, HSG D
*	204,649	76	Gravel/Brush Mix, HSG B
	6,151	91	Gravel roads, HSG D
	1,696,141	76	Weighted Average
	1,588,053		93.63% Pervious Area
	108,088		6.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.1200	0.10		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.50"
2.4	250	0.1200	1.73		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.6	430	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.6	410	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
28.1	1,190	Total			

Subcatchment ES-2:



Summary for Pond EW-1: EXISTING NYSDEC JURISDICTIONAL WETLAND

Inflow Area = 91.268 ac, 5.16% Impervious, Inflow Depth = 0.83" for 1-YR event
Inflow = 32.98 cfs @ 12.85 hrs, Volume= 6.332 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 421.66' @ 27.30 hrs Surf.Area= 266,379 sf Storage= 275,804 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

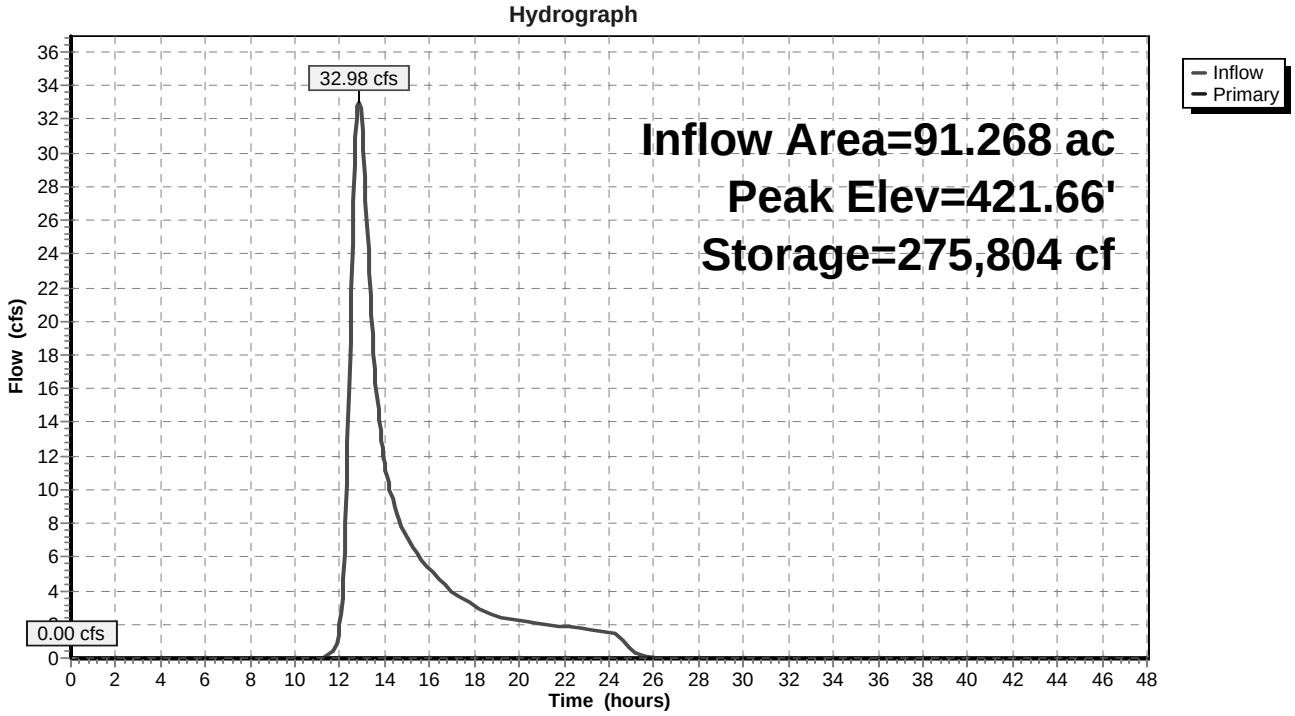
Volume	Invert	Avail.Storage	Storage Description
#1	419.80'	688,314 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
419.80	0	0	0
420.00	64,917	6,492	6,492
421.00	178,530	121,724	128,215
422.00	310,941	244,736	372,951
423.00	319,785	315,363	688,314

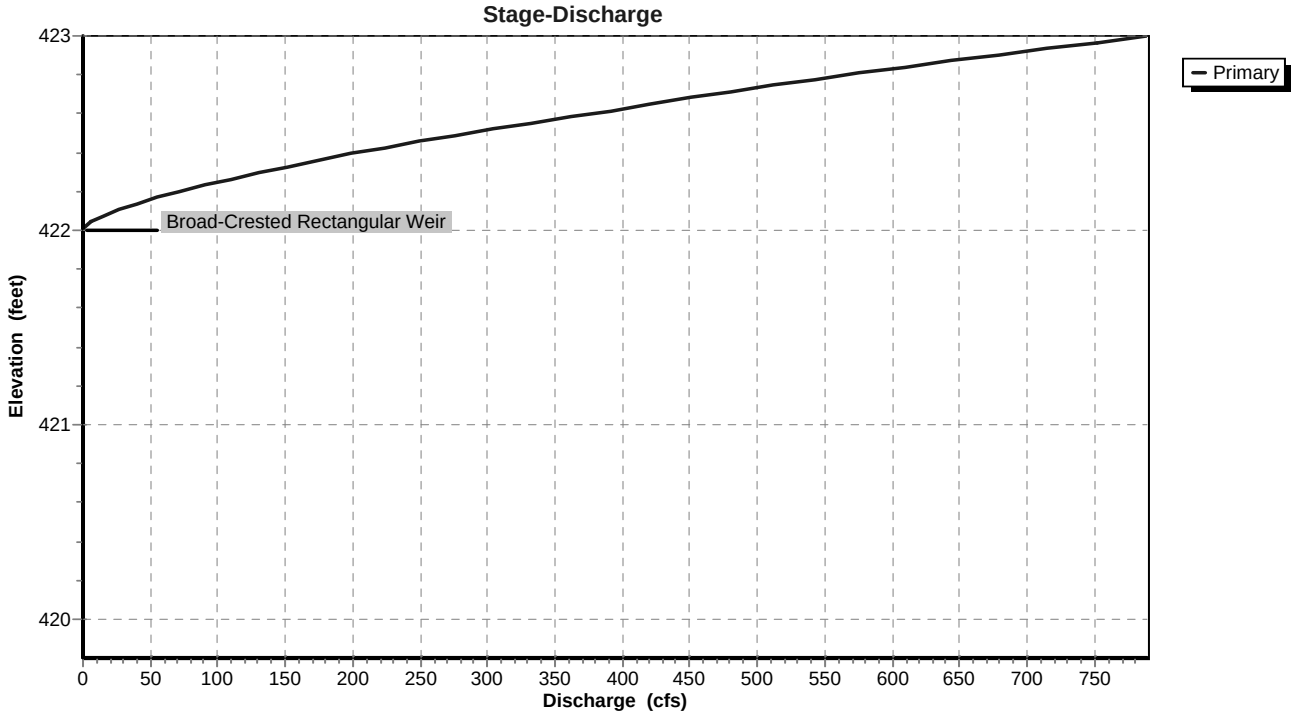
Device	Routing	Invert	Outlet Devices
#1	Primary	422.00'	**300.0' long x 20.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=419.80' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond EW-1: EXISTING NYSDEC JURISDICTIONAL WETLAND



Pond EW-1: EXISTING NYSDEC JURISDICTIONAL WETLAND

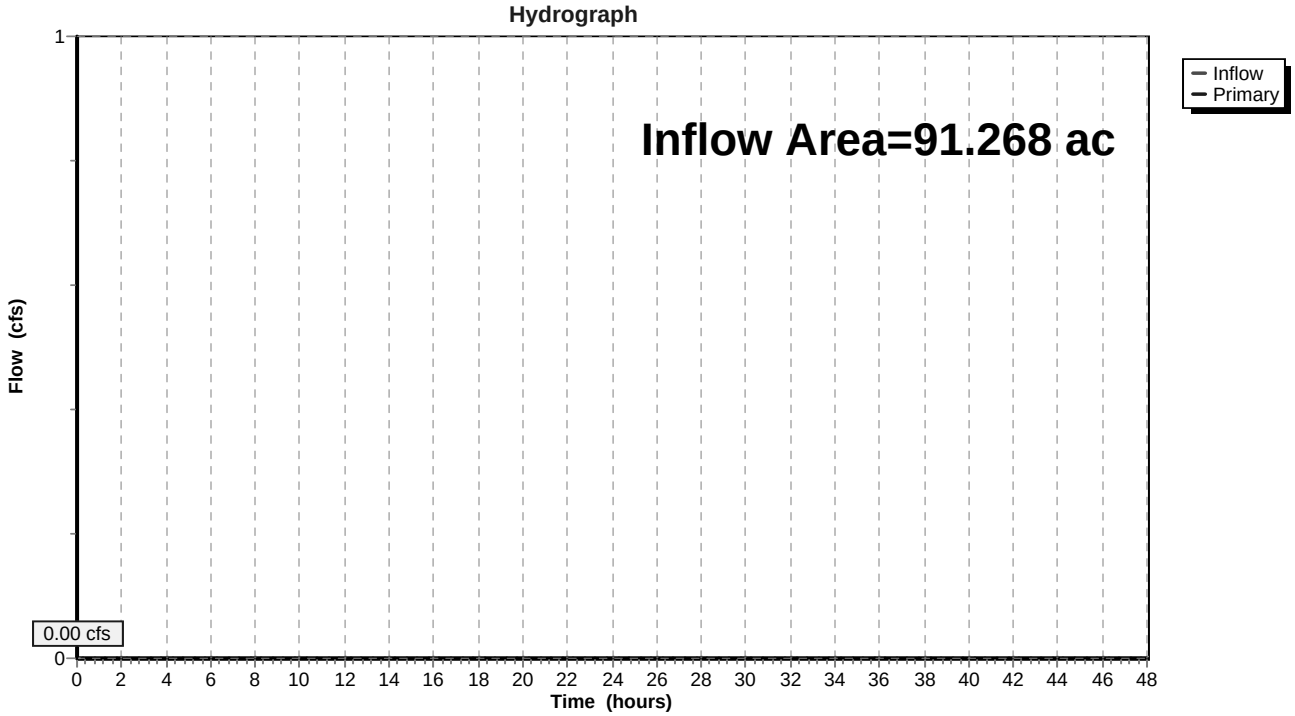


Summary for Pond zDP1: DESIGN POINT 1 (WETLAND)

Inflow Area = 91.268 ac, 5.16% Impervious, Inflow Depth = 0.00" for 1-YR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Pond zDP1: DESIGN POINT 1 (WETLAND)

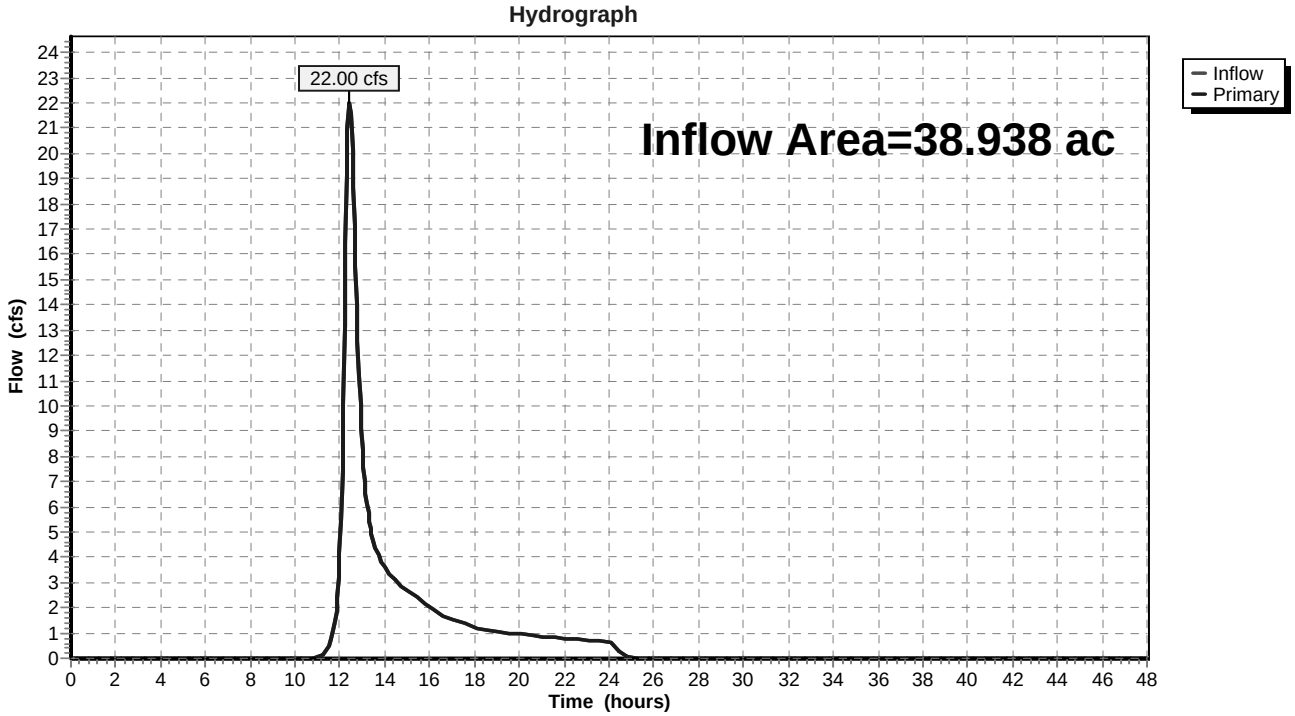


Summary for Pond zDP2: DESIGN POINT 2 (36" RCP CULVERT)

Inflow Area = 38.938 ac, 6.37% Impervious, Inflow Depth = 0.88" for 1-YR event
Inflow = 22.00 cfs @ 12.43 hrs, Volume= 2.865 af
Primary = 22.00 cfs @ 12.43 hrs, Volume= 2.865 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Pond zDP2: DESIGN POINT 2 (36" RCP CULVERT)



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment ES-1: Runoff Area=3,975,624 sf 5.16% Impervious Runoff Depth=2.45"
Flow Length=3,203' Tc=57.8 min CN=75 Runoff=104.88 cfs 18.628 af

Subcatchment ES-2: Runoff Area=1,696,141 sf 6.37% Impervious Runoff Depth=2.54"
Flow Length=1,190' Tc=28.1 min CN=76 Runoff=67.13 cfs 8.227 af

Pond EW-1: EXISTING NYSDEC Peak Elev=422.13' Storage=414,188 cf Inflow=104.88 cfs 18.628 af
Outflow=38.81 cfs 10.067 af

Pond zDP1: DESIGN POINT 1 (WETLAND) Inflow=38.81 cfs 10.067 af
Primary=38.81 cfs 10.067 af

Pond zDP2: DESIGN POINT 2 (36" RCP CULVERT) Inflow=67.13 cfs 8.227 af
Primary=67.13 cfs 8.227 af

Total Runoff Area = 130.206 ac Runoff Volume = 26.856 af Average Runoff Depth = 2.48"
94.48% Pervious = 123.014 ac 5.52% Impervious = 7.192 ac

Summary for Subcatchment ES-1:

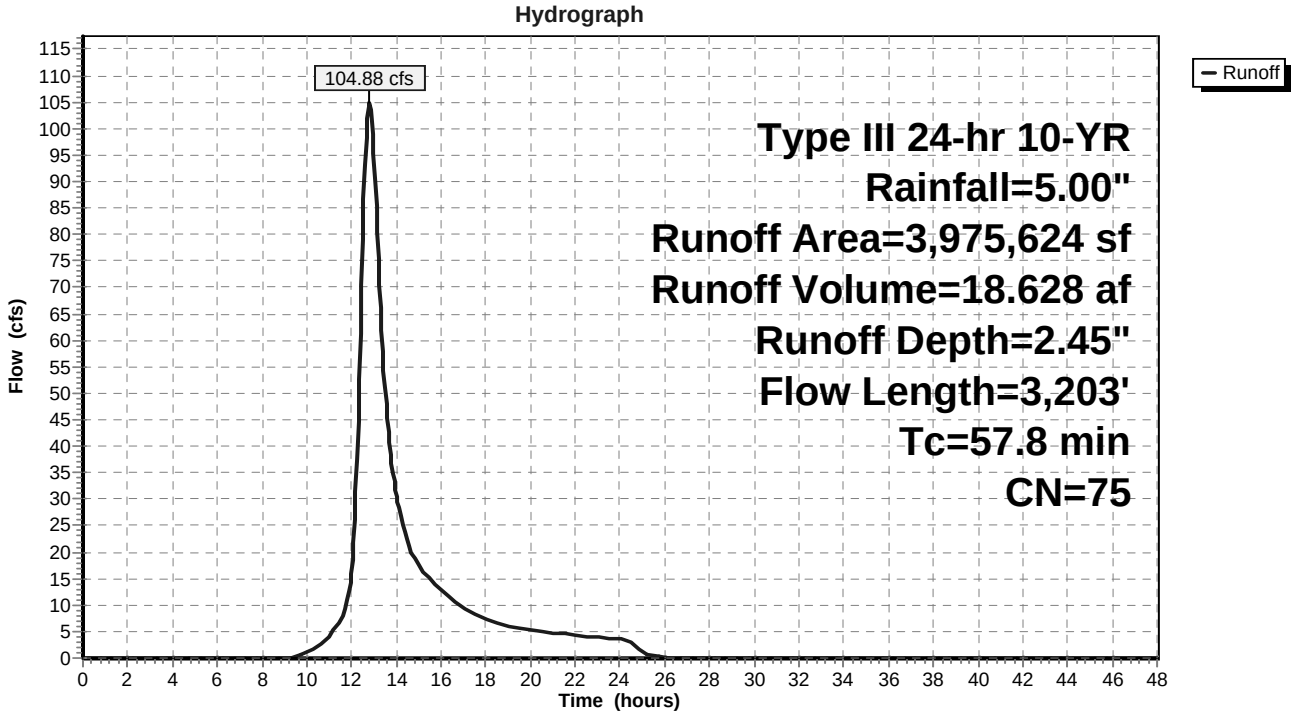
Runoff = 104.88 cfs @ 12.80 hrs, Volume= 18.628 af, Depth= 2.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=5.00"

	Area (sf)	CN	Description
	119,851	56	Brush, Fair, HSG B
	413,826	70	Brush, Fair, HSG C
	2,207,540	73	Woods, Fair, HSG C
	87,189	74	>75% Grass cover, Good, HSG C
	30,621	89	Gravel roads, HSG C
	439,846	77	Brush, Fair, HSG D
	52,095	91	Gravel roads, HSG D
	268,973	79	Woods, Fair, HSG D
	205,191	98	Paved parking, HSG C
*	150,492	76	gravel brush mix
	3,975,624	75	Weighted Average
	3,770,433		94.84% Pervious Area
	205,191		5.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.7	100	0.0785	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.50"
13.2	1,144	0.0839	1.45		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	60	0.0167	6.05	19.00	**Pipe Channel, PIPE CULVERT ON Rt. 22** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.020 Corrugated PE, corrugated interior
13.0	753	0.0372	0.96		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.5	256	0.0586	1.69		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.1	434	0.0415	1.02		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	456		6.95		**Lake or Reservoir,** Mean Depth= 1.50'
57.8	3,203	Total			

Subcatchment ES-1:



Summary for Subcatchment ES-2:

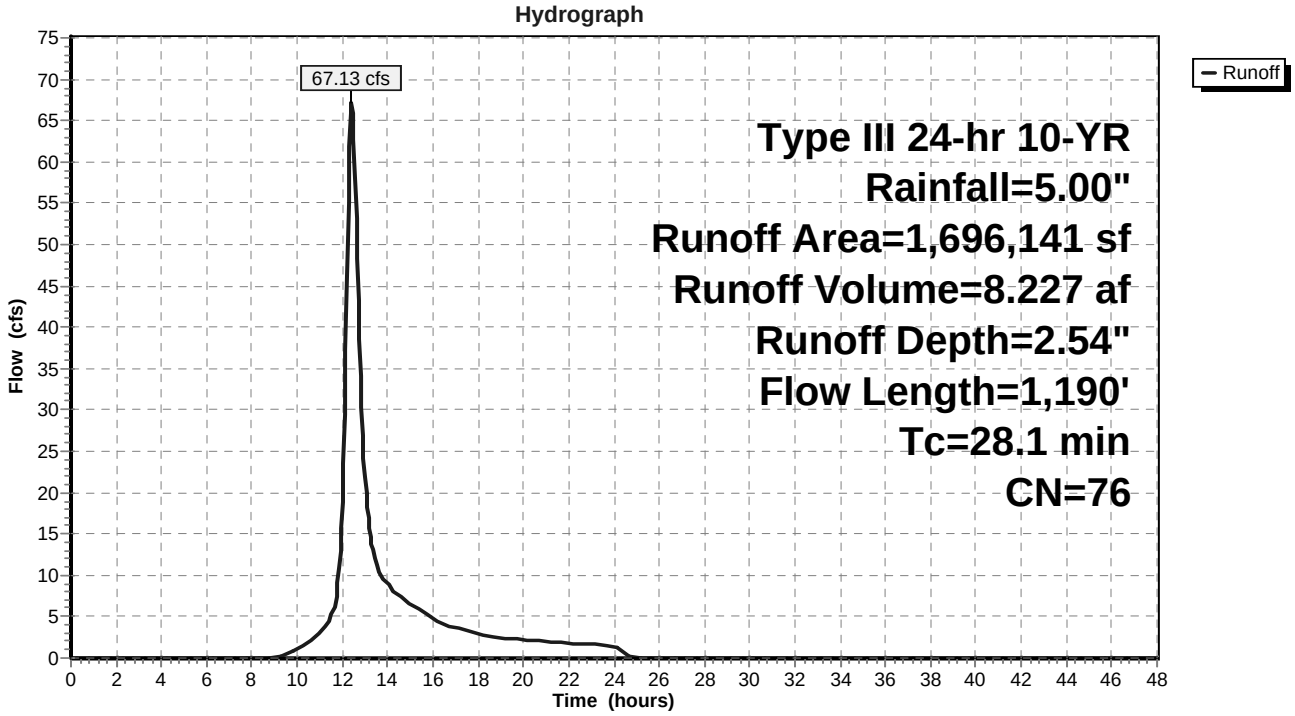
Runoff = 67.13 cfs @ 12.40 hrs, Volume= 8.227 af, Depth= 2.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=5.00"

	Area (sf)	CN	Description
	30,081	56	Brush, Fair, HSG B
	48,799	55	Woods, Good, HSG B
	184,886	89	Gravel roads, HSG C
	13,281	70	Brush, Fair, HSG C
	1,036,127	73	Woods, Fair, HSG C
*	108,088	98	Paved parking and buildings HSG C
	64,079	77	Woods, Good, HSG D
*	204,649	76	Gravel/Brush Mix, HSG B
	6,151	91	Gravel roads, HSG D
	1,696,141	76	Weighted Average
	1,588,053		93.63% Pervious Area
	108,088		6.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.1200	0.10		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.50"
2.4	250	0.1200	1.73		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.6	430	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.6	410	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
28.1	1,190	Total			

Subcatchment ES-2:



Summary for Pond EW-1: EXISTING NYSDEC JURISDICTIONAL WETLAND

Inflow Area = 91.268 ac, 5.16% Impervious, Inflow Depth = 2.45" for 10-YR event
Inflow = 104.88 cfs @ 12.80 hrs, Volume= 18.628 af
Outflow = 38.81 cfs @ 13.75 hrs, Volume= 10.067 af, Atten= 63%, Lag= 56.8 min
Primary = 38.81 cfs @ 13.75 hrs, Volume= 10.067 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 422.13' @ 13.75 hrs Surf.Area= 312,112 sf Storage= 414,188 cf

Plug-Flow detention time= 252.6 min calculated for 10.067 af (54% of inflow)
Center-of-Mass det. time= 133.3 min (1,016.2 - 882.9)

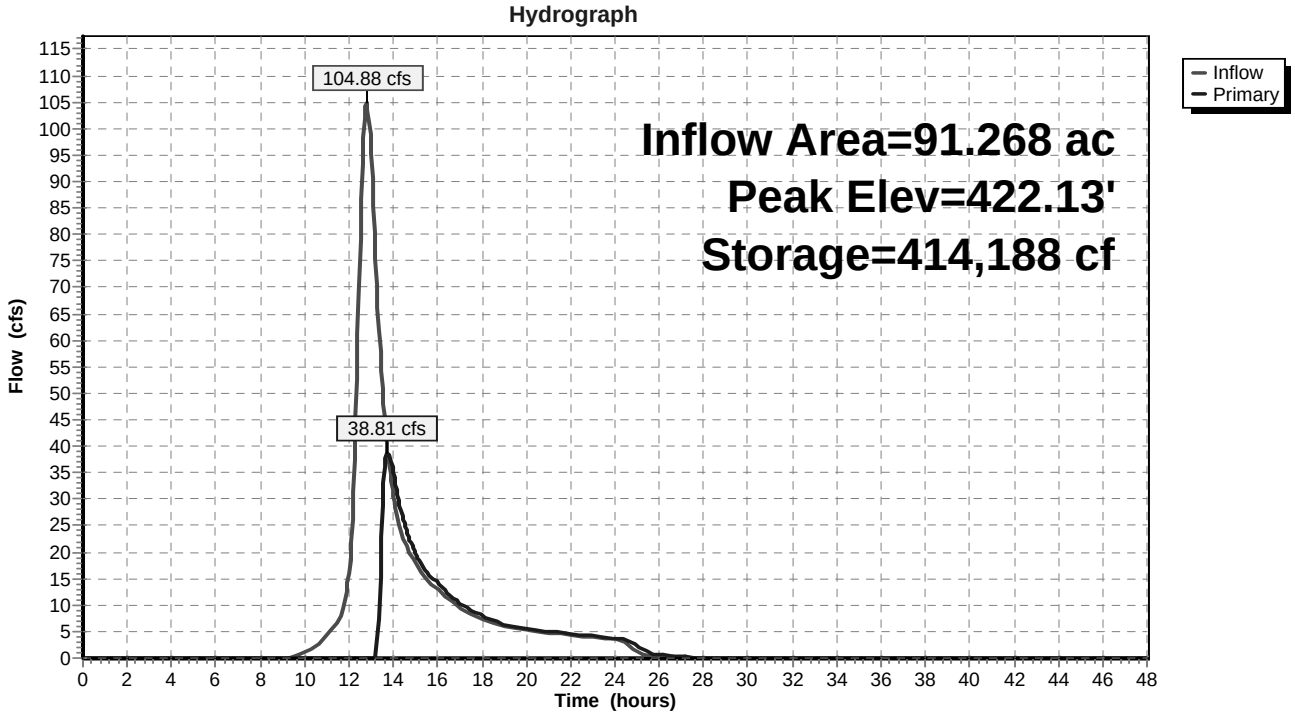
Volume	Invert	Avail.Storage	Storage Description
#1	419.80'	688,314 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
419.80	0	0	0
420.00	64,917	6,492	6,492
421.00	178,530	121,724	128,215
422.00	310,941	244,736	372,951
423.00	319,785	315,363	688,314

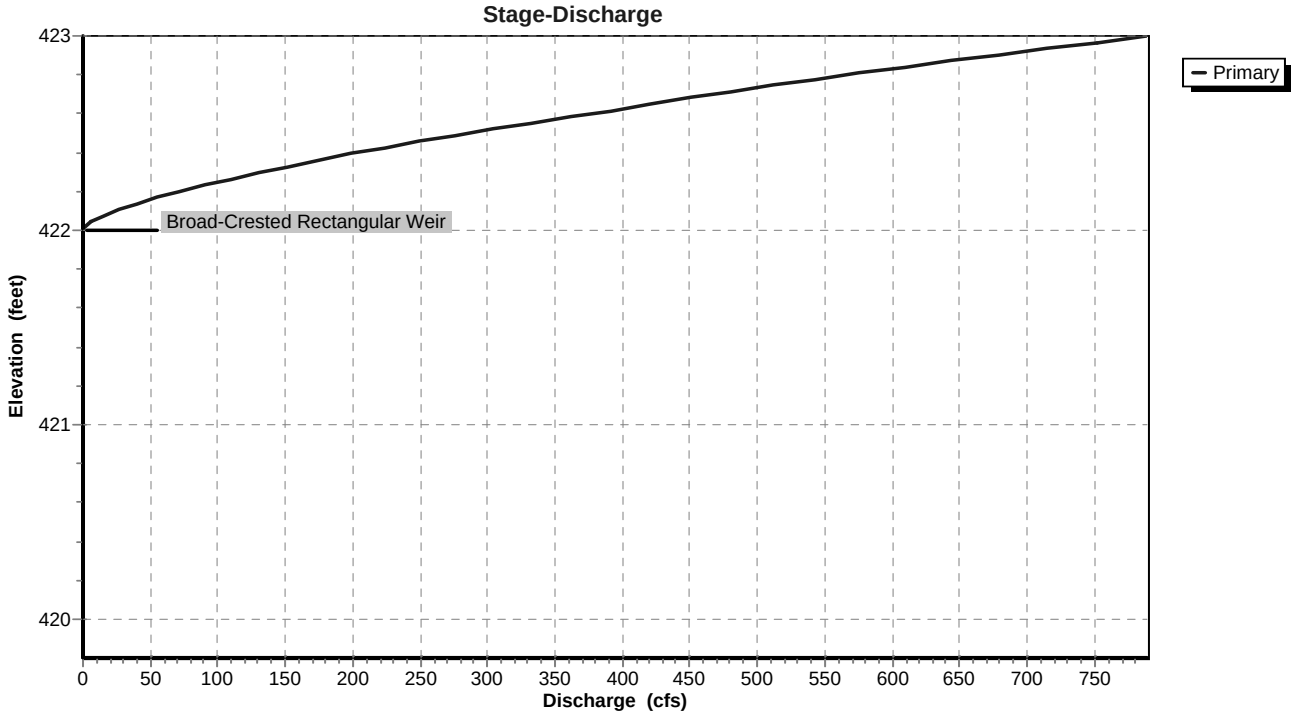
Device	Routing	Invert	Outlet Devices
#1	Primary	422.00'	**300.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=38.70 cfs @ 13.75 hrs HW=422.13' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 38.70 cfs @ 0.97 fps)

Pond EW-1: EXISTING NYSDEC JURISDICTIONAL WETLAND



Pond EW-1: EXISTING NYSDEC JURISDICTIONAL WETLAND

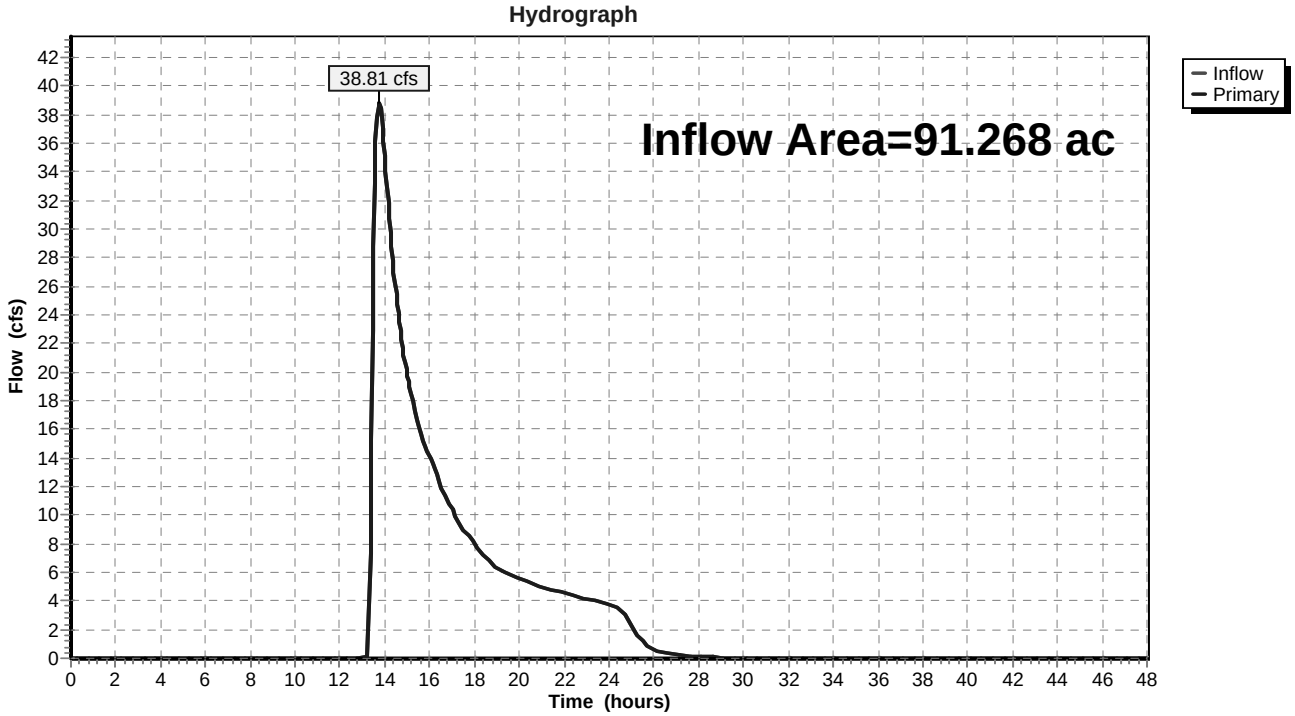


Summary for Pond zDP1: DESIGN POINT 1 (WETLAND)

Inflow Area = 91.268 ac, 5.16% Impervious, Inflow Depth = 1.32" for 10-YR event
Inflow = 38.81 cfs @ 13.75 hrs, Volume= 10.067 af
Primary = 38.81 cfs @ 13.75 hrs, Volume= 10.067 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Pond zDP1: DESIGN POINT 1 (WETLAND)

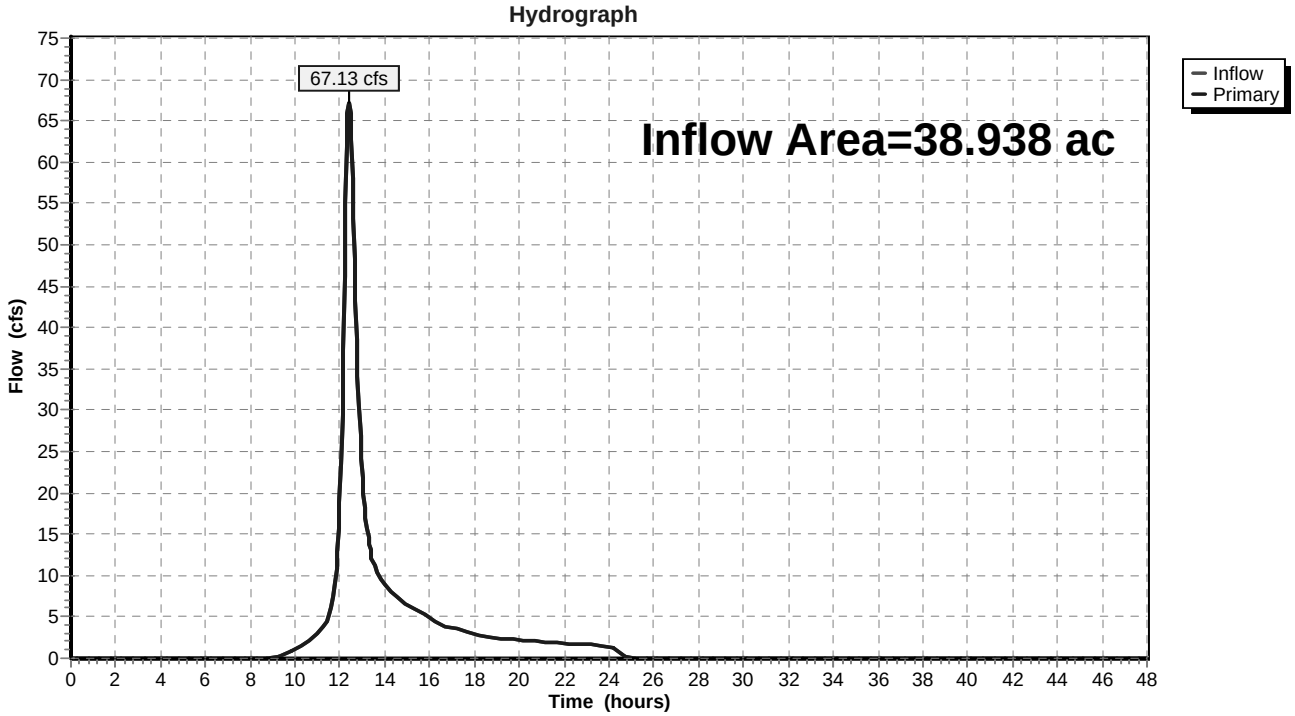


Summary for Pond zDP2: DESIGN POINT 2 (36" RCP CULVERT)

Inflow Area = 38.938 ac, 6.37% Impervious, Inflow Depth = 2.54" for 10-YR event
Inflow = 67.13 cfs @ 12.40 hrs, Volume= 8.227 af
Primary = 67.13 cfs @ 12.40 hrs, Volume= 8.227 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Pond zDP2: DESIGN POINT 2 (36" RCP CULVERT)



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment ES-1: Runoff Area=3,975,624 sf 5.16% Impervious Runoff Depth=5.04"
Flow Length=3,203' Tc=57.8 min CN=75 Runoff=217.02 cfs 38.345 af

Subcatchment ES-2: Runoff Area=1,696,141 sf 6.37% Impervious Runoff Depth=5.16"
Flow Length=1,190' Tc=28.1 min CN=76 Runoff=136.44 cfs 16.737 af

Pond EW-1: EXISTING NYSDEC Peak Elev=422.39' Storage=494,131 cf Inflow=217.02 cfs 38.345 af
Outflow=195.42 cfs 29.783 af

Pond zDP1: DESIGN POINT 1 (WETLAND) Inflow=195.42 cfs 29.783 af
Primary=195.42 cfs 29.783 af

Pond zDP2: DESIGN POINT 2 (36" RCP CULVERT) Inflow=136.44 cfs 16.737 af
Primary=136.44 cfs 16.737 af

Total Runoff Area = 130.206 ac Runoff Volume = 55.082 af Average Runoff Depth = 5.08"
94.48% Pervious = 123.014 ac 5.52% Impervious = 7.192 ac

Summary for Subcatchment ES-1:

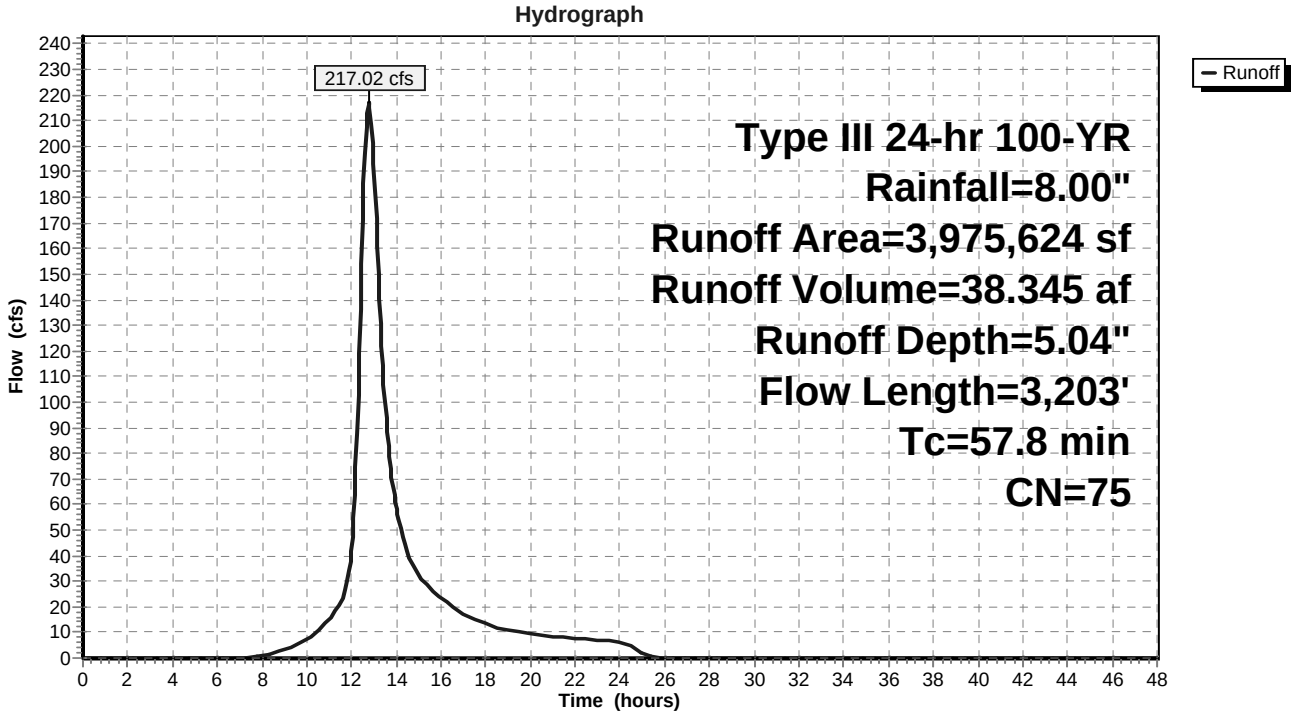
Runoff = 217.02 cfs @ 12.78 hrs, Volume= 38.345 af, Depth= 5.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=8.00"

	Area (sf)	CN	Description
	119,851	56	Brush, Fair, HSG B
	413,826	70	Brush, Fair, HSG C
	2,207,540	73	Woods, Fair, HSG C
	87,189	74	>75% Grass cover, Good, HSG C
	30,621	89	Gravel roads, HSG C
	439,846	77	Brush, Fair, HSG D
	52,095	91	Gravel roads, HSG D
	268,973	79	Woods, Fair, HSG D
	205,191	98	Paved parking, HSG C
*	150,492	76	gravel brush mix
	3,975,624	75	Weighted Average
	3,770,433		94.84% Pervious Area
	205,191		5.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.7	100	0.0785	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.50"
13.2	1,144	0.0839	1.45		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	60	0.0167	6.05	19.00	**Pipe Channel, PIPE CULVERT ON Rt. 22** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.020 Corrugated PE, corrugated interior
13.0	753	0.0372	0.96		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.5	256	0.0586	1.69		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.1	434	0.0415	1.02		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	456		6.95		**Lake or Reservoir,** Mean Depth= 1.50'
57.8	3,203	Total			

Subcatchment ES-1:



Summary for Subcatchment ES-2:

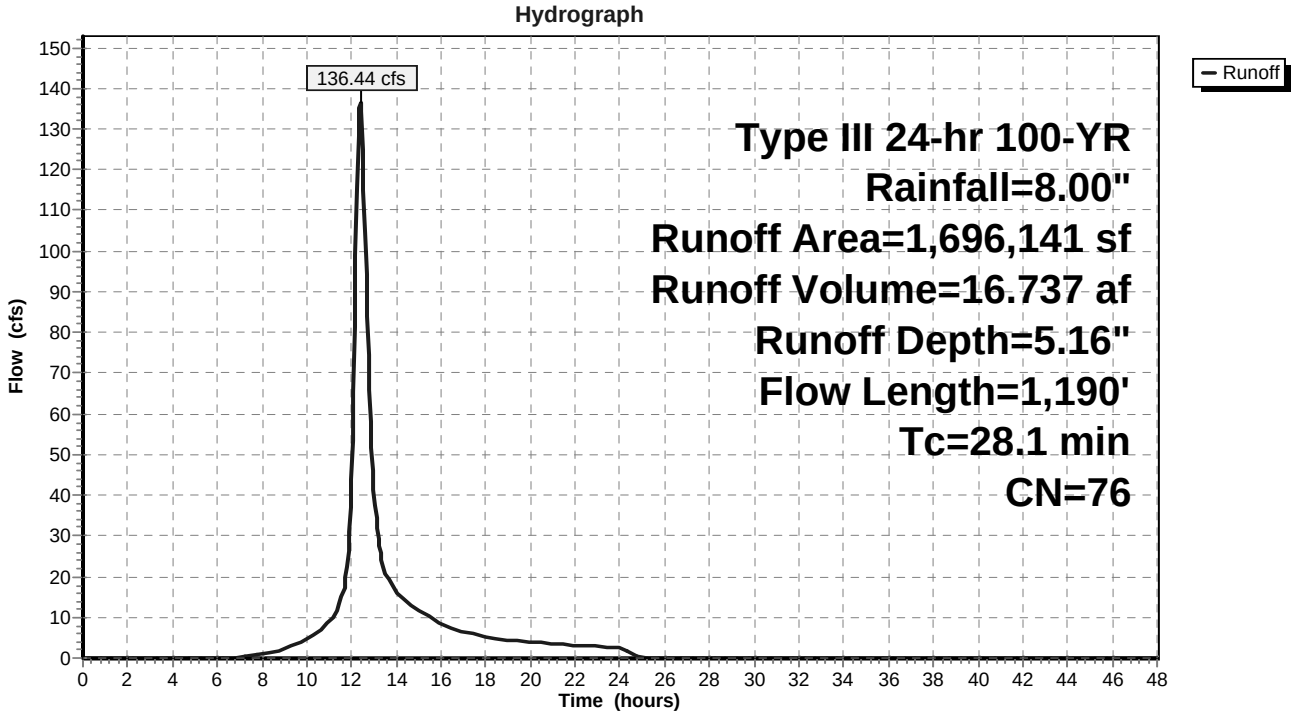
Runoff = 136.44 cfs @ 12.39 hrs, Volume= 16.737 af, Depth= 5.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=8.00"

	Area (sf)	CN	Description
	30,081	56	Brush, Fair, HSG B
	48,799	55	Woods, Good, HSG B
	184,886	89	Gravel roads, HSG C
	13,281	70	Brush, Fair, HSG C
	1,036,127	73	Woods, Fair, HSG C
*	108,088	98	Paved parking and buildings HSG C
	64,079	77	Woods, Good, HSG D
*	204,649	76	Gravel/Brush Mix, HSG B
	6,151	91	Gravel roads, HSG D
	1,696,141	76	Weighted Average
	1,588,053		93.63% Pervious Area
	108,088		6.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.1200	0.10		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.50"
2.4	250	0.1200	1.73		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.6	430	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.6	410	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
28.1	1,190	Total			

Subcatchment ES-2:



Summary for Pond EW-1: EXISTING NYSDEC JURISDICTIONAL WETLAND

Inflow Area = 91.268 ac, 5.16% Impervious, Inflow Depth = 5.04" for 100-YR event
Inflow = 217.02 cfs @ 12.78 hrs, Volume= 38.345 af
Outflow = 195.42 cfs @ 12.99 hrs, Volume= 29.783 af, Atten= 10%, Lag= 12.6 min
Primary = 195.42 cfs @ 12.99 hrs, Volume= 29.783 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 422.39' @ 12.99 hrs Surf.Area= 314,369 sf Storage= 494,131 cf

Plug-Flow detention time= 143.1 min calculated for 29.752 af (78% of inflow)
Center-of-Mass det. time= 61.9 min (924.0 - 862.2)

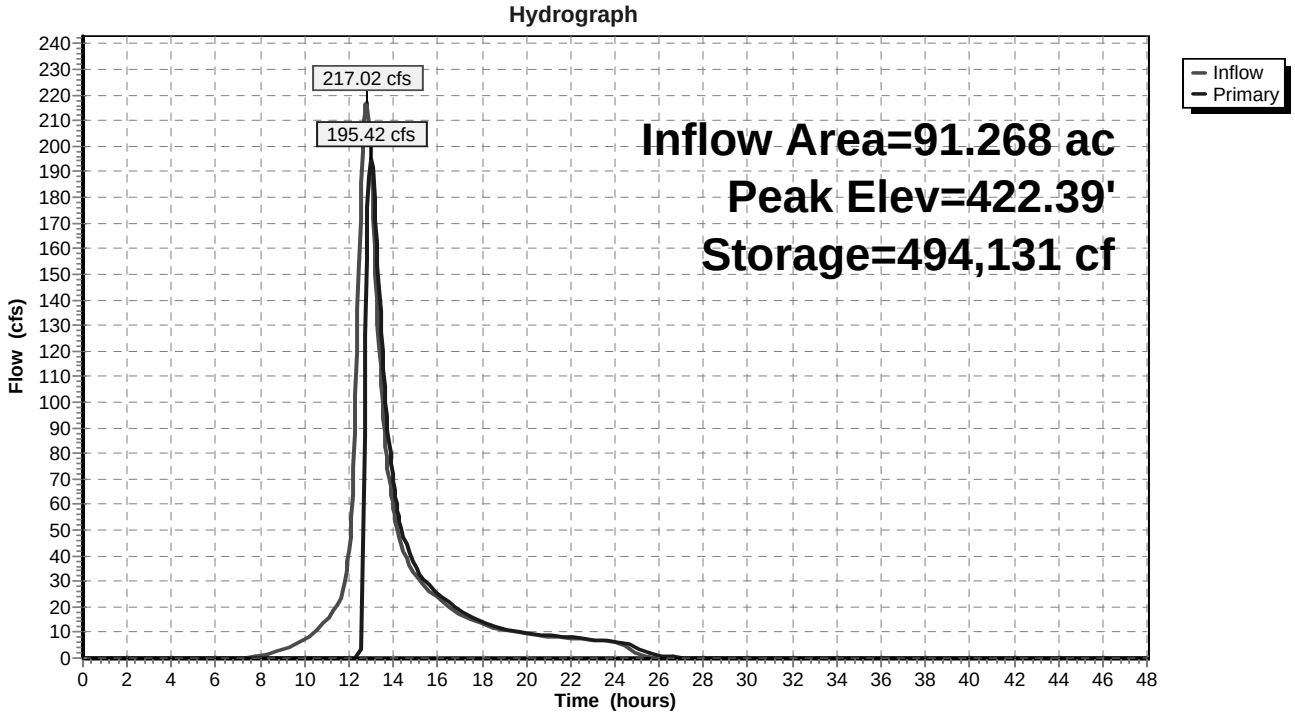
Volume	Invert	Avail.Storage	Storage Description
#1	419.80'	688,314 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
419.80	0	0	0
420.00	64,917	6,492	6,492
421.00	178,530	121,724	128,215
422.00	310,941	244,736	372,951
423.00	319,785	315,363	688,314

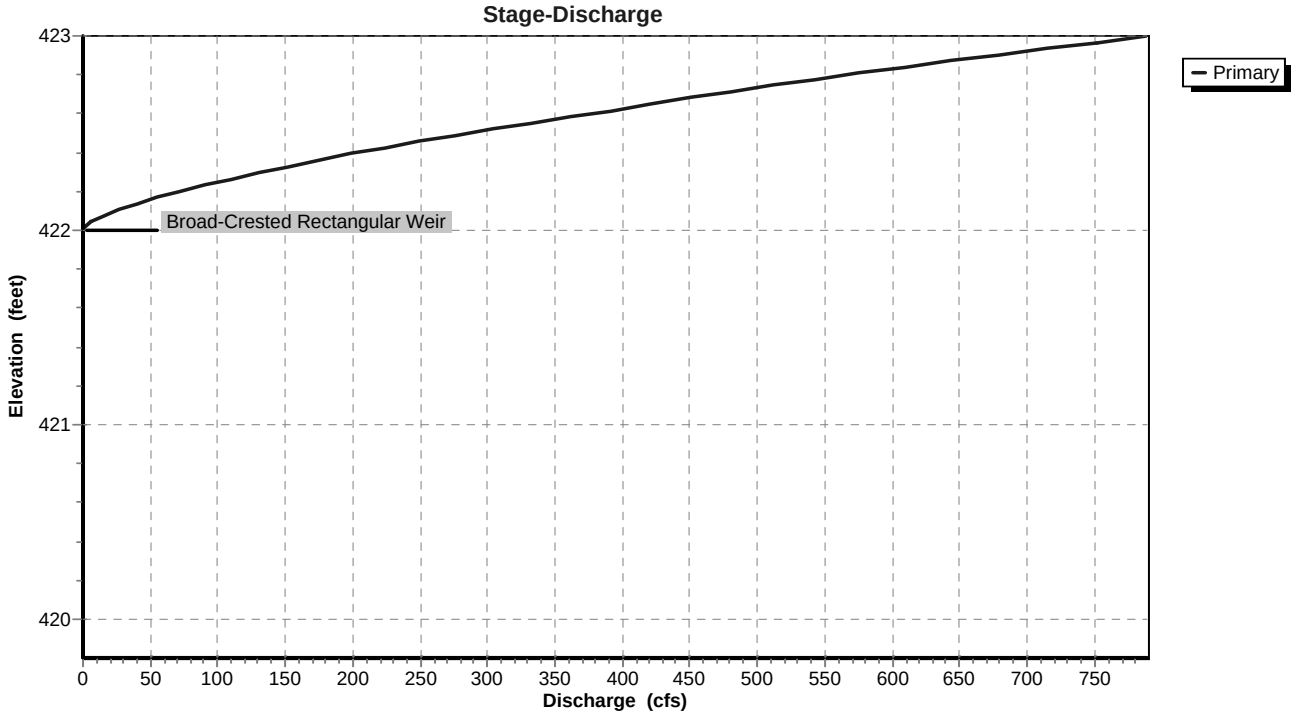
Device	Routing	Invert	Outlet Devices
#1	Primary	422.00'	**300.0' long x 20.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=195.04 cfs @ 12.99 hrs HW=422.39' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 195.04 cfs @ 1.68 fps)

Pond EW-1: EXISTING NYSDEC JURISDICTIONAL WETLAND



Pond EW-1: EXISTING NYSDEC JURISDICTIONAL WETLAND

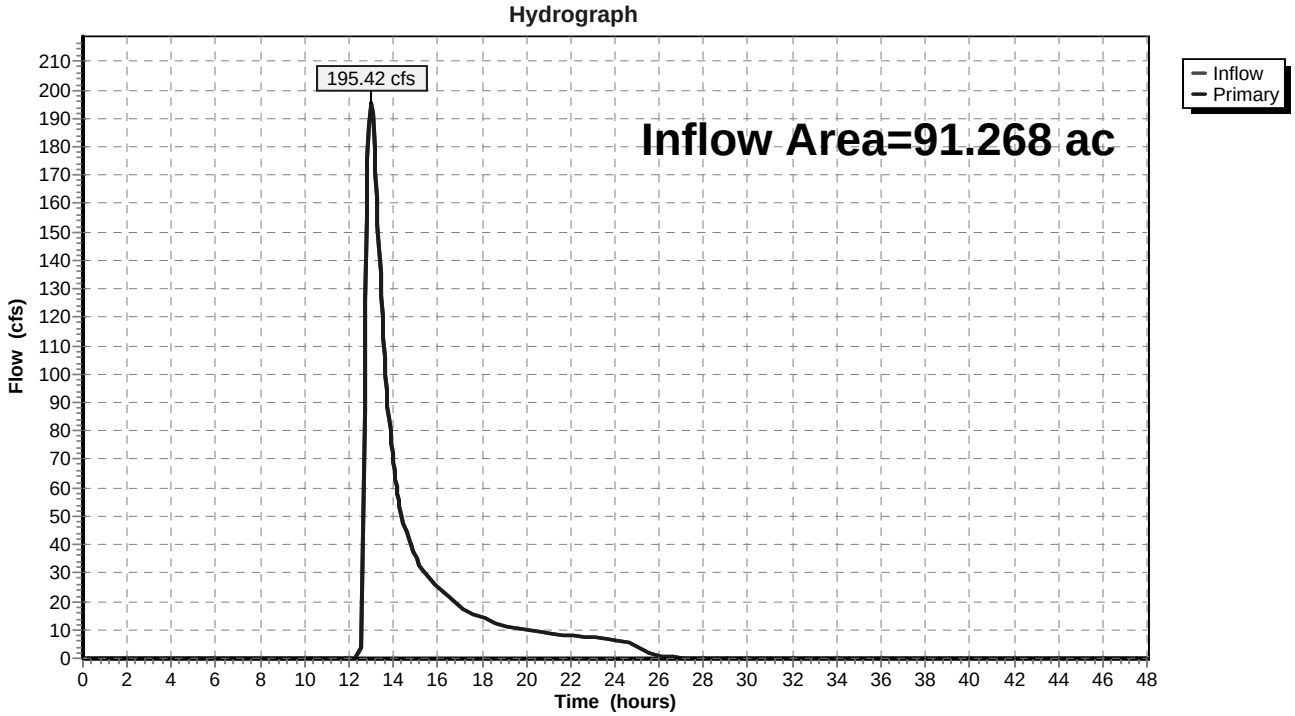


Summary for Pond zDP1: DESIGN POINT 1 (WETLAND)

Inflow Area = 91.268 ac, 5.16% Impervious, Inflow Depth = 3.92" for 100-YR event
Inflow = 195.42 cfs @ 12.99 hrs, Volume= 29.783 af
Primary = 195.42 cfs @ 12.99 hrs, Volume= 29.783 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Pond zDP1: DESIGN POINT 1 (WETLAND)

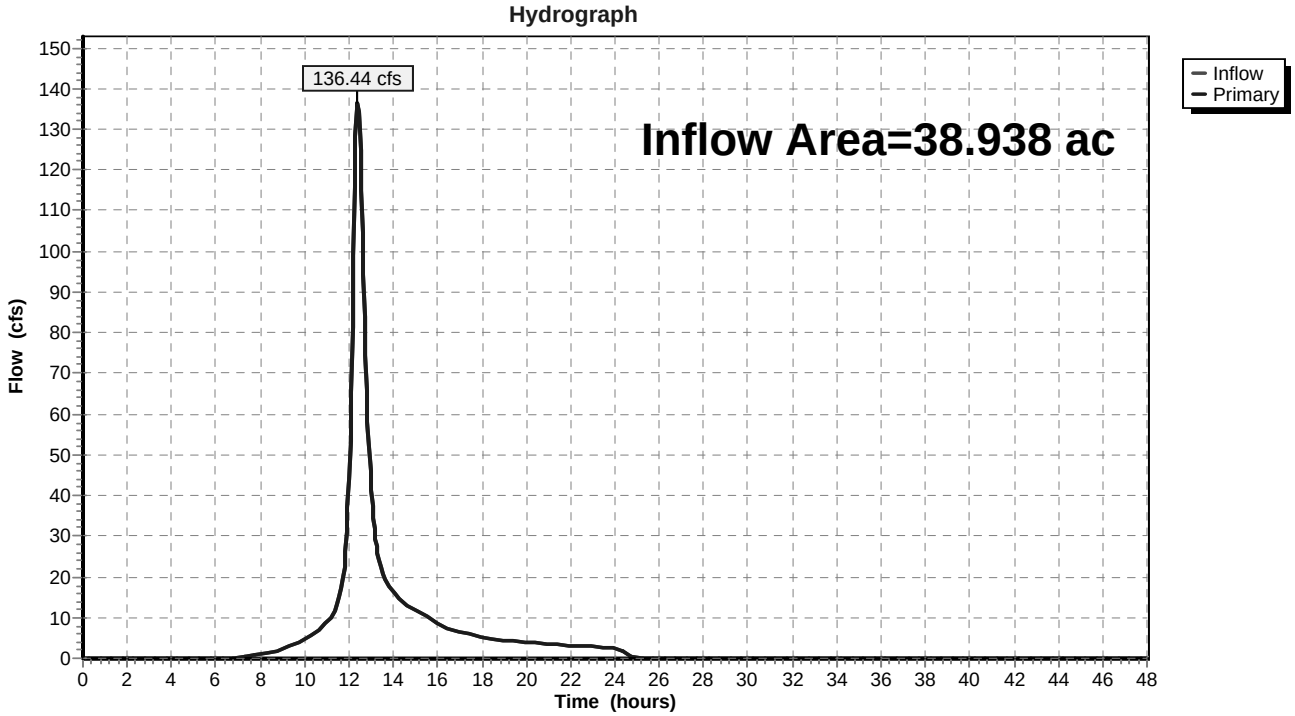


Summary for Pond zDP2: DESIGN POINT 2 (36" RCP CULVERT)

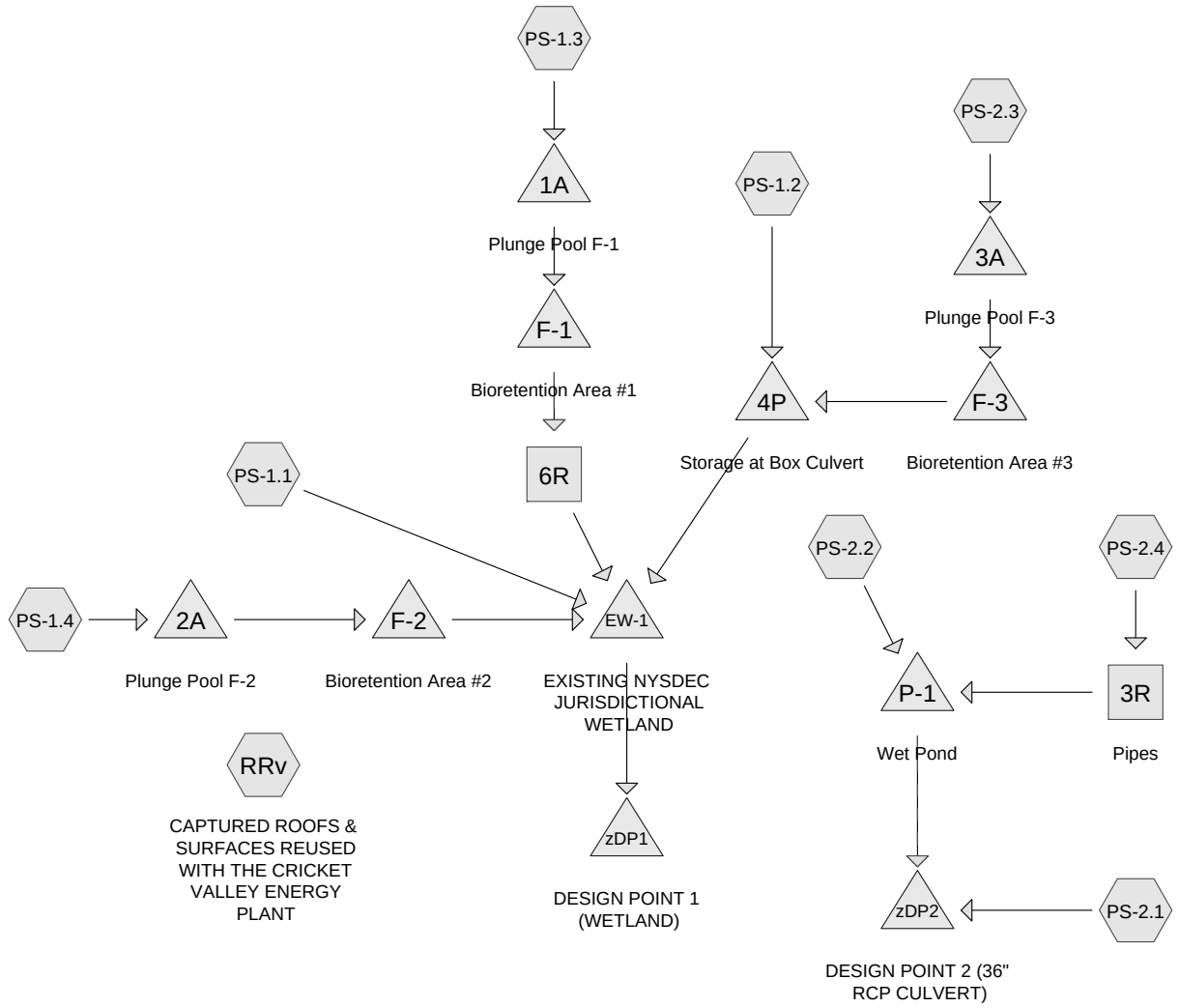
Inflow Area = 38.938 ac, 6.37% Impervious, Inflow Depth = 5.16" for 100-YR event
Inflow = 136.44 cfs @ 12.39 hrs, Volume= 16.737 af
Primary = 136.44 cfs @ 12.39 hrs, Volume= 16.737 af, Atten= 0%, Lag= 0.0 min

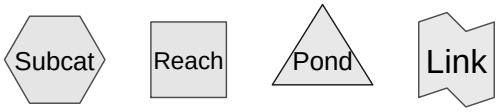
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Pond zDP2: DESIGN POINT 2 (36" RCP CULVERT)



Appendix D:
Post-Development Stormwater Modeling





Drainage Diagram for 81001-00 CRICKET VALLEY ENERGY - PROPOSED CONDITIONS MODEL

Prepared by The Chazen Companies, Printed 7/16/2010

HydroCAD® 9.10 s/n 00927 © 2009 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.070	55	Woods, Good, HSG B (PS-2.1)
0.215	56	Brush, Fair, HSG B (PS-1.1, PS-2.1)
0.744	61	>75% Grass cover, Good, HSG B (PS-1.4, PS-2.1, PS-2.2)
9.449	70	Brush, Fair, HSG C (PS-1.1, PS-1.2, PS-2.1, PS-2.3)
67.052	73	Woods, Fair, HSG C (PS-1.1, PS-1.2, PS-2.1, PS-2.3, PS-2.4)
6.740	74	>75% Grass cover, Good, HSG C (PS-1.1, PS-1.2, PS-1.3, PS-1.4, PS-2.1, PS-2.2, PS-2.3, PS-2.4)
1.217	76	Gravel/Brush Mix, HSG B (PS-2.1)
8.337	77	Brush, Fair, HSG D (PS-1.1, PS-1.2)
0.712	77	Woods, Good, HSG D (PS-2.1)
5.820	79	Woods, Fair, HSG D (PS-1.1, PS-1.2)
0.971	80	>75% Grass cover, Good, HSG D (PS-1.1, PS-1.2, PS-1.4, PS-2.2)
5.933	85	Gravel roads, HSG B (PS-1.4, PS-2.1, PS-2.2)
6.886	89	Gravel roads, HSG C (PS-1.1, PS-1.3, PS-1.4, PS-2.1, PS-2.2, PS-2.3)
1.967	91	Gravel roads, HSG D (PS-1.1, PS-1.4, PS-2.1, PS-2.2)
1.107	98	Paved parking & roofs (PS-1.2)
6.113	98	Paved parking, HSG A (PS-2.2, PS-2.3, RRv)
2.862	98	Paved parking, HSG C (PS-1.1, PS-1.3, PS-1.4, PS-2.1, PS-2.4)
3.293	98	Roofs, HSG A (PS-2.2)
0.704	98	Water Surface, HSG B (PS-2.2)
130.192		**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
9.407	HSG A	PS-2.2, PS-2.3, RRv
8.883	HSG B	PS-1.1, PS-1.4, PS-2.1, PS-2.2
92.988	HSG C	PS-1.1, PS-1.2, PS-1.3, PS-1.4, PS-2.1, PS-2.2, PS-2.3, PS-2.4
17.808	HSG D	PS-1.1, PS-1.2, PS-1.4, PS-2.1, PS-2.2
1.107	Other	PS-1.2
130.192		**TOTAL AREA**

Time span=0.00-500.00 hrs, dt=0.01 hrs, 50001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PS-1.1: Runoff Area=2,349,900 sf 2.26% Impervious Runoff Depth=0.83"
Flow Length=3,203' Tc=57.8 min CN=75 Runoff=19.51 cfs 3.743 af

Subcatchment PS-1.2: Runoff Area=824,088 sf 5.85% Impervious Runoff Depth=0.78"
Flow Length=1,595' Tc=23.1 min CN=74 Runoff=10.05 cfs 1.236 af

Subcatchment PS-1.3: Runoff Area=35,738 sf 8.88% Impervious Runoff Depth=1.35"
Tc=6.0 min CN=84 Runoff=1.30 cfs 0.093 af

Subcatchment PS-1.4: Runoff Area=81,628 sf 27.04% Impervious Runoff Depth=1.64"
Tc=6.0 min CN=88 Runoff=3.61 cfs 0.256 af

Subcatchment PS-2.1: Runoff Area=1,218,013 sf 2.44% Impervious Runoff Depth=0.93"
Flow Length=1,190' Tc=28.1 min CN=77 Runoff=16.94 cfs 2.178 af

Subcatchment PS-2.2: Runoff Area=653,875 sf 42.26% Impervious Runoff Depth=1.80"
Tc=6.0 min CN=90 Runoff=31.53 cfs 2.253 af

Subcatchment PS-2.3: Runoff Area=254,905 sf 10.88% Impervious Runoff Depth=0.88"
Flow Length=951' Tc=20.3 min CN=76 Runoff=3.80 cfs 0.430 af

Subcatchment PS-2.4: Runoff Area=116,690 sf 14.20% Impervious Runoff Depth=0.93"
Flow Length=575' Tc=15.1 min CN=77 Runoff=2.10 cfs 0.209 af

Subcatchment RRv: CAPTURED ROOFS & Runoff Area=3.130 ac 100.00% Impervious Runoff Depth=2.57"
Tc=0.0 min CN=98 Runoff=10.34 cfs 0.670 af

Reach 3R: Pipes Inflow=2.10 cfs 0.209 af
Outflow=2.10 cfs 0.209 af

Reach 6R: Inflow=0.99 cfs 0.073 af
Outflow=0.99 cfs 0.073 af

Pond 1A: Plunge Pool F-1 Peak Elev=430.64' Storage=997 cf Inflow=1.30 cfs 0.093 af
Outflow=1.28 cfs 0.093 af

Pond 2A: Plunge Pool F-2 Peak Elev=429.02' Storage=3,687 cf Inflow=3.61 cfs 0.256 af
Outflow=3.46 cfs 0.256 af

Pond 3A: Plunge Pool F-3 Peak Elev=439.29' Storage=2,066 cf Inflow=3.80 cfs 0.430 af
Outflow=3.78 cfs 0.391 af

Pond 4P: Storage at Box Culvert Peak Elev=433.60' Storage=680 cf Inflow=11.70 cfs 1.582 af
105.0" x 30.0" Box Culvert x 0.84 n=0.022 L=25.0' S=0.0200 '/' Outflow=11.64 cfs 1.582 af

Pond EW-1: EXISTING NYSDEC Peak Elev=421.55' Storage=246,272 cf Inflow=28.01 cfs 5.654 af
Outflow=0.00 cfs 0.000 af

Pond F-1: Bioretention Area #1 Peak Elev=430.62' Storage=1,083 cf Inflow=1.28 cfs 0.093 af
Outflow=0.99 cfs 0.073 af

Pond F-2: Bioretention Area #2 Peak Elev=428.95' Storage=3,156 cf Inflow=3.46 cfs 0.256 af
Outflow=2.59 cfs 0.256 af

Pond F-3: Bioretention Area #3 Peak Elev=439.24' Storage=2,978 cf Inflow=3.78 cfs 0.391 af
Outflow=2.82 cfs 0.346 af

Pond P-1: Wet Pond Peak Elev=424.25' Storage=155,117 cf Inflow=32.79 cfs 2.462 af
Primary=0.73 cfs 2.462 af Secondary=0.00 cfs 0.000 af Outflow=0.73 cfs 2.462 af

Pond zDP1: DESIGN POINT 1 (WETLAND) Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Pond zDP2: DESIGN POINT 2 (36" RCP CULVERT) Inflow=17.55 cfs 4.640 af
Primary=17.55 cfs 4.640 af

Total Runoff Area = 130.192 ac Runoff Volume = 11.068 af Average Runoff Depth = 1.02"
89.19% Pervious = 116.113 ac 10.81% Impervious = 14.079 ac

Summary for Subcatchment PS-1.1:

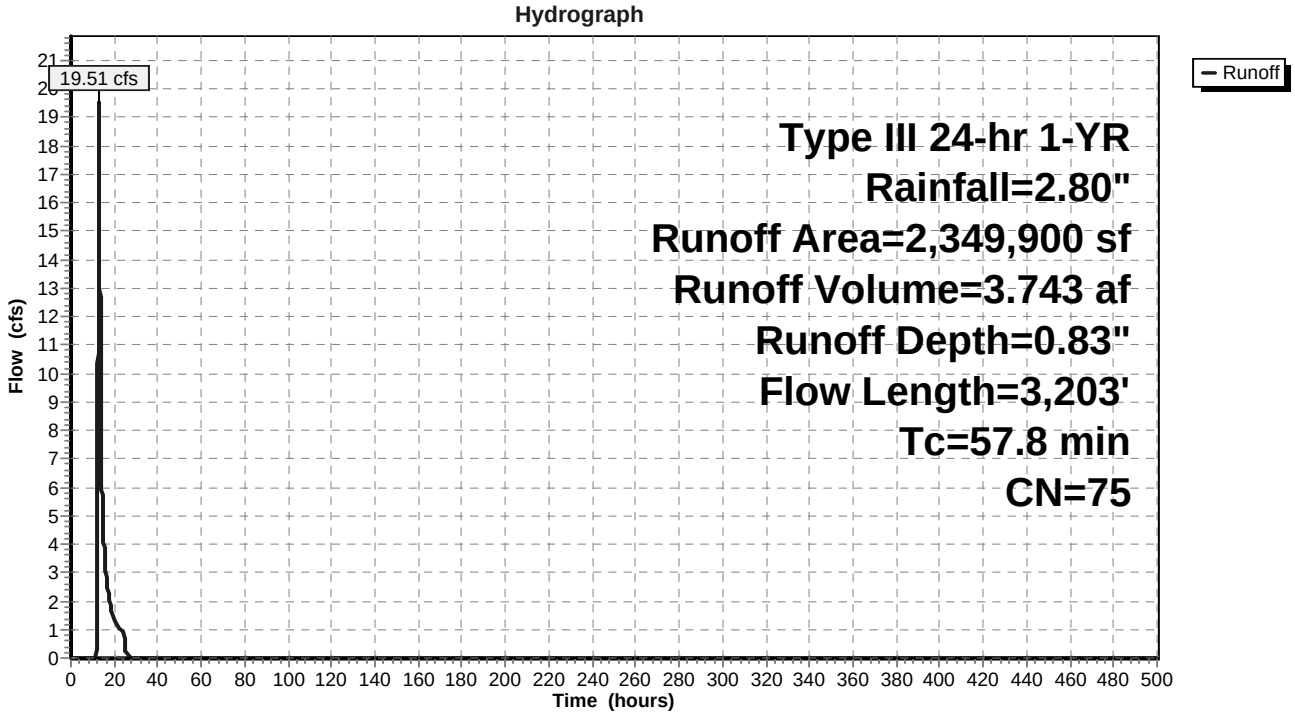
Runoff = 19.51 cfs @ 12.85 hrs, Volume= 3.743 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR Rainfall=2.80"

Area (sf)	CN	Description
5,609	56	Brush, Fair, HSG B
219,739	70	Brush, Fair, HSG C
1,378,531	73	Woods, Fair, HSG C
99,805	74	>75% Grass cover, Good, HSG C
14,337	80	>75% Grass cover, Good, HSG D
14,067	89	Gravel roads, HSG C
304,723	77	Brush, Fair, HSG D
16,528	91	Gravel roads, HSG D
243,474	79	Woods, Fair, HSG D
53,087	98	Paved parking, HSG C
2,349,900	75	Weighted Average
2,296,813		97.74% Pervious Area
53,087		2.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.7	100	0.0785	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.50"
13.2	1,144	0.0839	1.45		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	60	0.0167	6.05	19.00	**Pipe Channel, PIPE CULVERT ON Rt. 22** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.020 Corrugated PE, corrugated interior
13.0	753	0.0372	0.96		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.5	256	0.0586	1.69		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.1	434	0.0415	1.02		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	456		6.95		**Lake or Reservoir,** Mean Depth= 1.50'
57.8	3,203	Total			

Subcatchment PS-1.1:



Summary for Subcatchment PS-1.2:

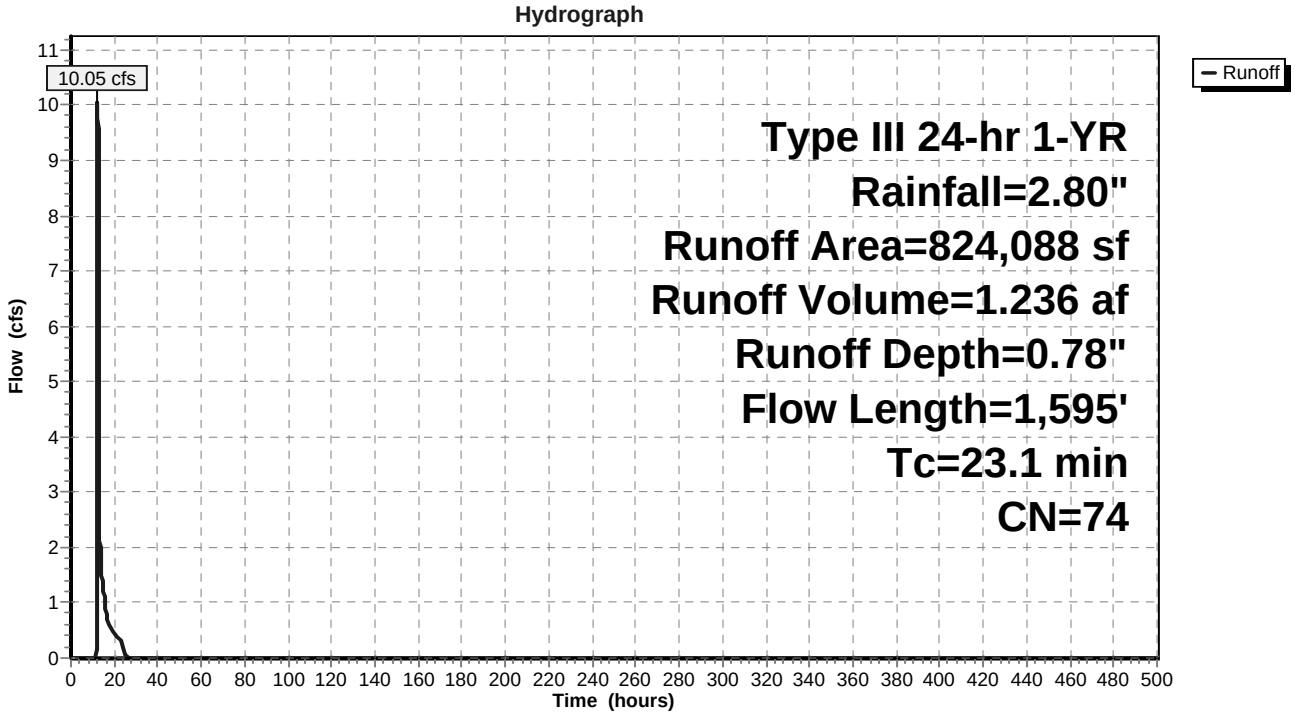
Runoff = 10.05 cfs @ 12.35 hrs, Volume= 1.236 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR Rainfall=2.80"

Area (sf)	CN	Description
476,732	73	Woods, Fair, HSG C
167,171	70	Brush, Fair, HSG C
58,454	77	Brush, Fair, HSG D
10,064	79	Woods, Fair, HSG D
57,883	74	>75% Grass cover, Good, HSG C
5,552	80	>75% Grass cover, Good, HSG D
48,232	98	Paved parking & roofs
824,088	74	Weighted Average
775,856		94.15% Pervious Area
48,232		5.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	100	0.0560	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.50"
0.7	65	0.0560	1.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.7	355	0.0626	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	75	0.0050	4.03	4.95	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	115	0.0260	7.79	103.88	**Parabolic Channel,** W=10.00' D=2.00' Area=13.3 sf Perim=11.0' n= 0.035 Earth, dense weeds
0.1	85	0.0820	10.72	33.69	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
0.3	310	0.0967	15.03	200.34	**Parabolic Channel,** W=10.00' D=2.00' Area=13.3 sf Perim=11.0' n= 0.035 Earth, dense weeds
5.7	325	0.0184	0.95		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.1	165	0.0030	1.30	15.21	**Parabolic Channel,** W=35.00' D=0.50' Area=11.7 sf Perim=35.0' n= 0.030 Earth, grassed & winding
23.1	1,595	Total			

Subcatchment PS-1.2:



Summary for Subcatchment PS-1.3:

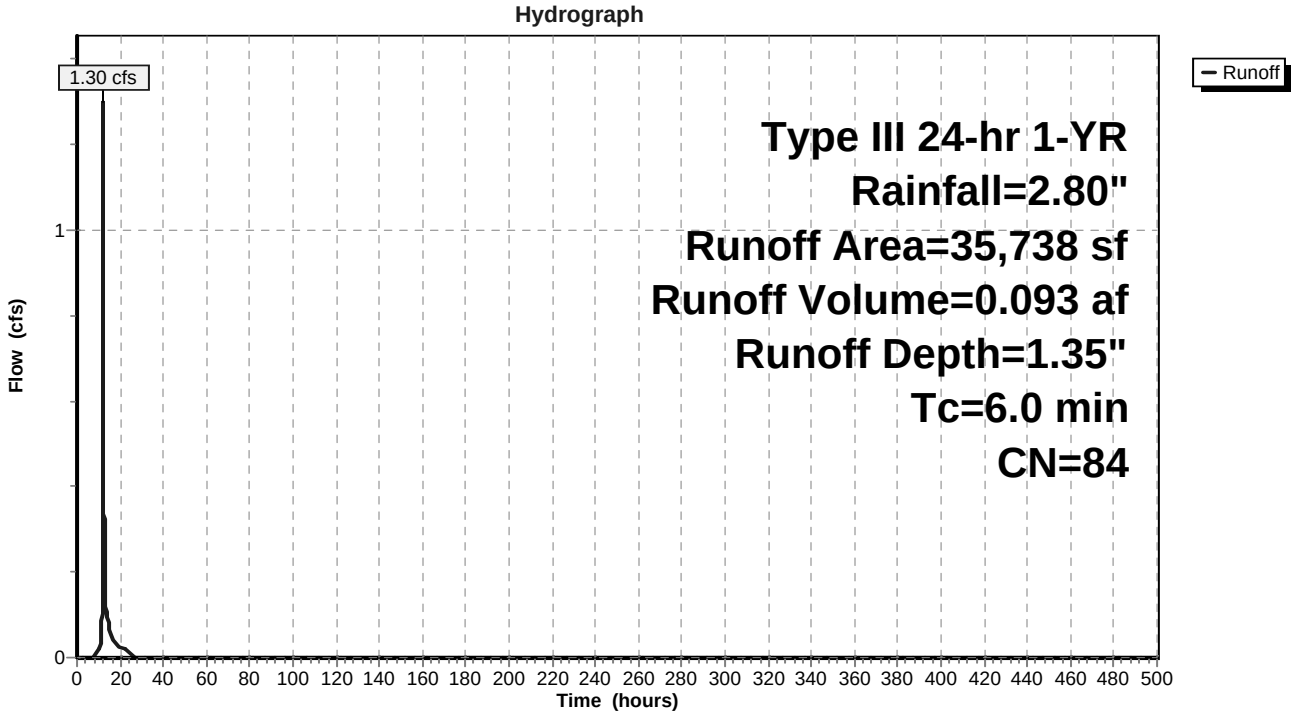
Runoff = 1.30 cfs @ 12.09 hrs, Volume= 0.093 af, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR Rainfall=2.80"

Area (sf)	CN	Description
3,172	98	Paved parking, HSG C
13,366	74	>75% Grass cover, Good, HSG C
19,200	89	Gravel roads, HSG C
35,738	84	Weighted Average
32,566		91.12% Pervious Area
3,172		8.88% Impervious Area

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

Subcatchment PS-1.3:



Summary for Subcatchment PS-1.4:

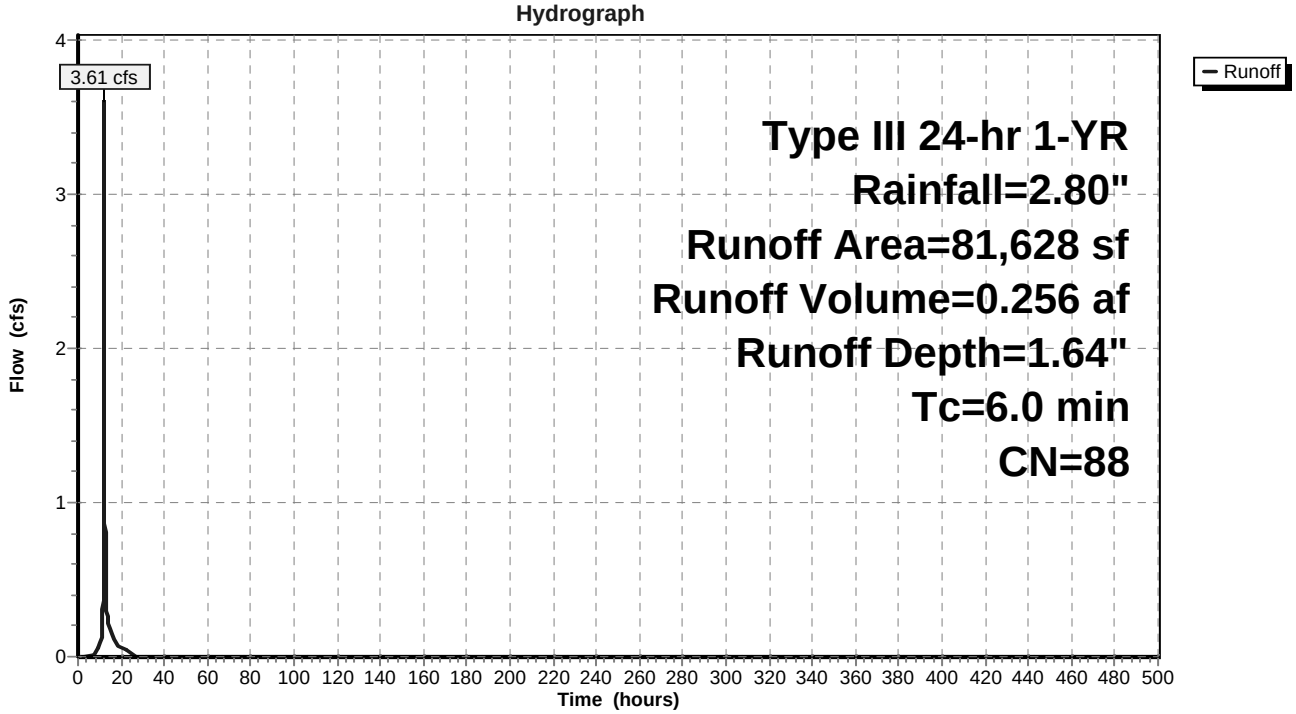
Runoff = 3.61 cfs @ 12.09 hrs, Volume= 0.256 af, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR Rainfall=2.80"

Area (sf)	CN	Description
22,070	98	Paved parking, HSG C
36,079	91	Gravel roads, HSG D
9,940	80	>75% Grass cover, Good, HSG D
2,243	85	Gravel roads, HSG B
8,845	61	>75% Grass cover, Good, HSG B
2,224	74	>75% Grass cover, Good, HSG C
227	89	Gravel roads, HSG C
81,628	88	Weighted Average
59,558		72.96% Pervious Area
22,070		27.04% Impervious Area

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

Subcatchment PS-1.4:



Summary for Subcatchment PS-2.1:

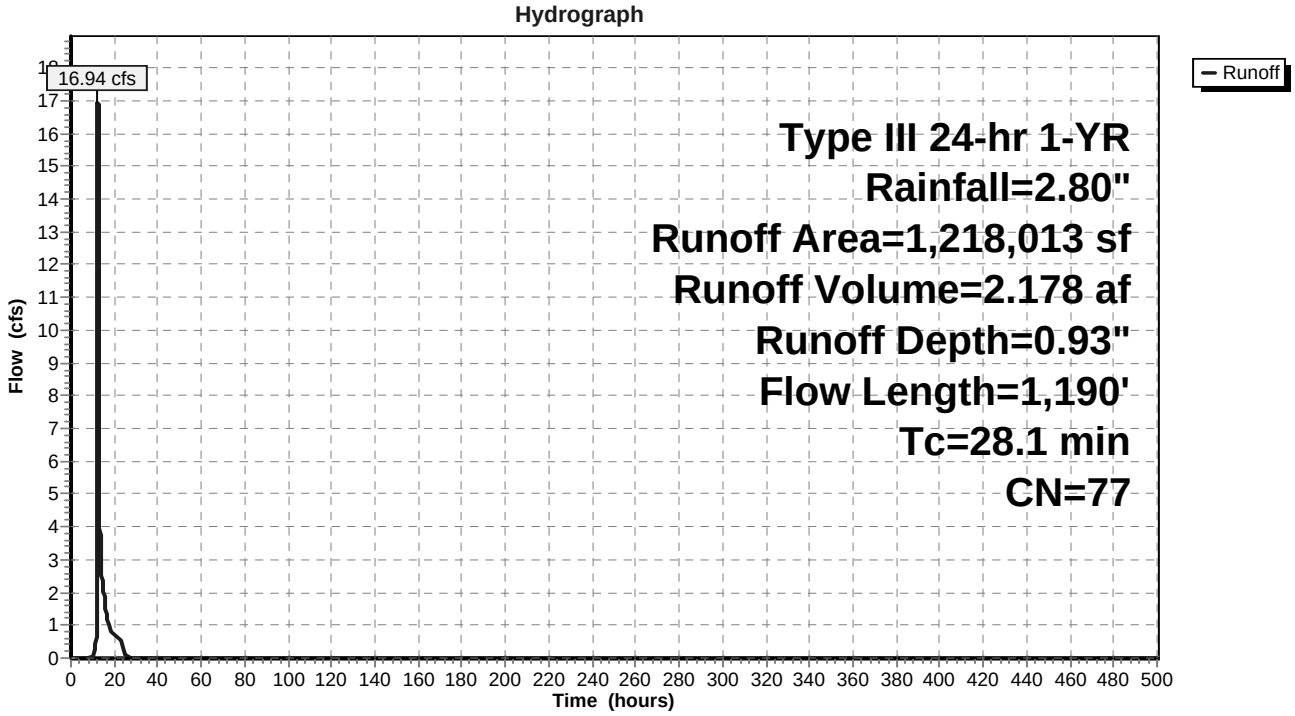
Runoff = 16.94 cfs @ 12.42 hrs, Volume= 2.178 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR Rainfall=2.80"

	Area (sf)	CN	Description
	3,751	56	Brush, Fair, HSG B
	3,034	55	Woods, Good, HSG B
	192,194	89	Gravel roads, HSG C
	7,372	70	Brush, Fair, HSG C
	858,494	73	Woods, Fair, HSG C
	29,750	98	Paved parking, HSG C
	31,009	77	Woods, Good, HSG D
*	53,016	76	Gravel/Brush Mix, HSG B
	15,977	85	Gravel roads, HSG B
	14,855	91	Gravel roads, HSG D
	3,028	61	>75% Grass cover, Good, HSG B
	5,533	74	>75% Grass cover, Good, HSG C
	1,218,013	77	Weighted Average
	1,188,263		97.56% Pervious Area
	29,750		2.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.1200	0.10		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.50"
2.4	250	0.1200	1.73		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.6	430	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.6	410	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
28.1	1,190	Total			

Subcatchment PS-2.1:



Summary for Subcatchment PS-2.2:

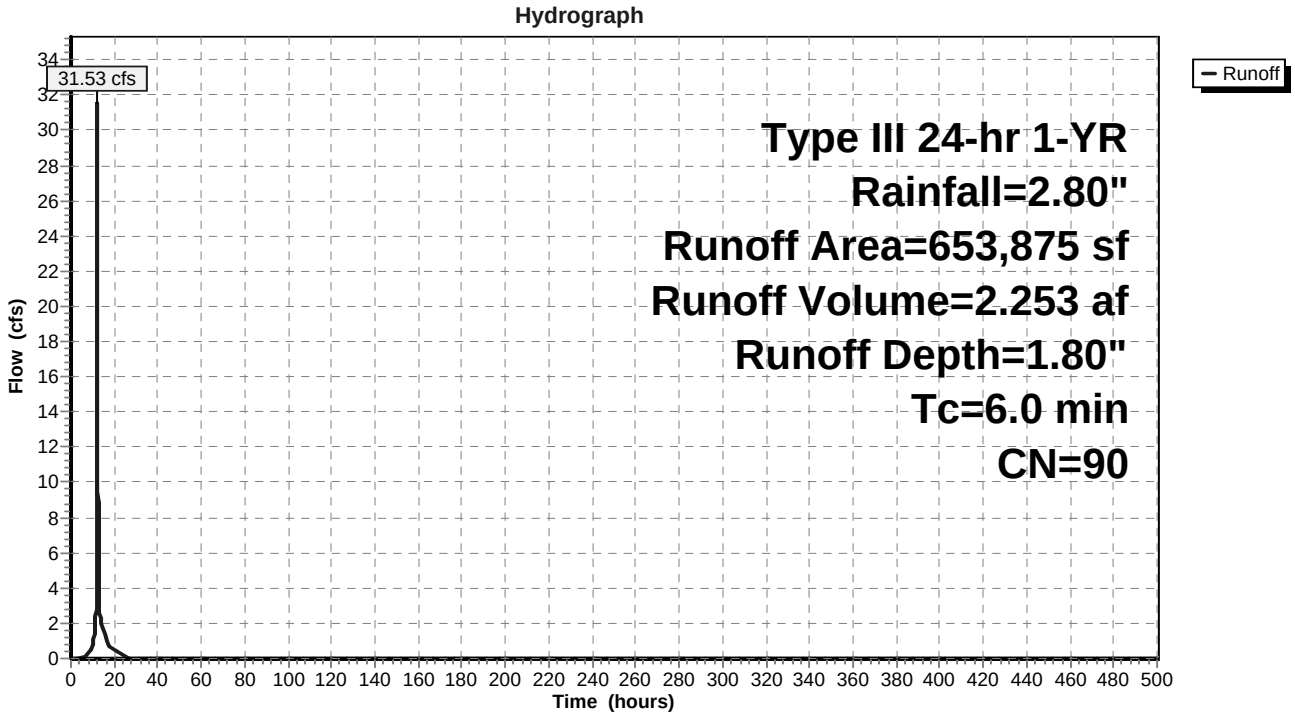
Runoff = 31.53 cfs @ 12.09 hrs, Volume= 2.253 af, Depth= 1.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR Rainfall=2.80"

Area (sf)	CN	Description
65,818	89	Gravel roads, HSG C
18,237	91	Gravel roads, HSG D
20,546	61	>75% Grass cover, Good, HSG B
240,237	85	Gravel roads, HSG B
20,235	74	>75% Grass cover, Good, HSG C
30,655	98	Water Surface, HSG B
143,453	98	Roofs, HSG A
102,225	98	Paved parking, HSG A
12,469	80	>75% Grass cover, Good, HSG D
653,875	90	Weighted Average
377,542		57.74% Pervious Area
276,333		42.26% Impervious Area

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

Subcatchment PS-2.2:



Summary for Subcatchment PS-2.3:

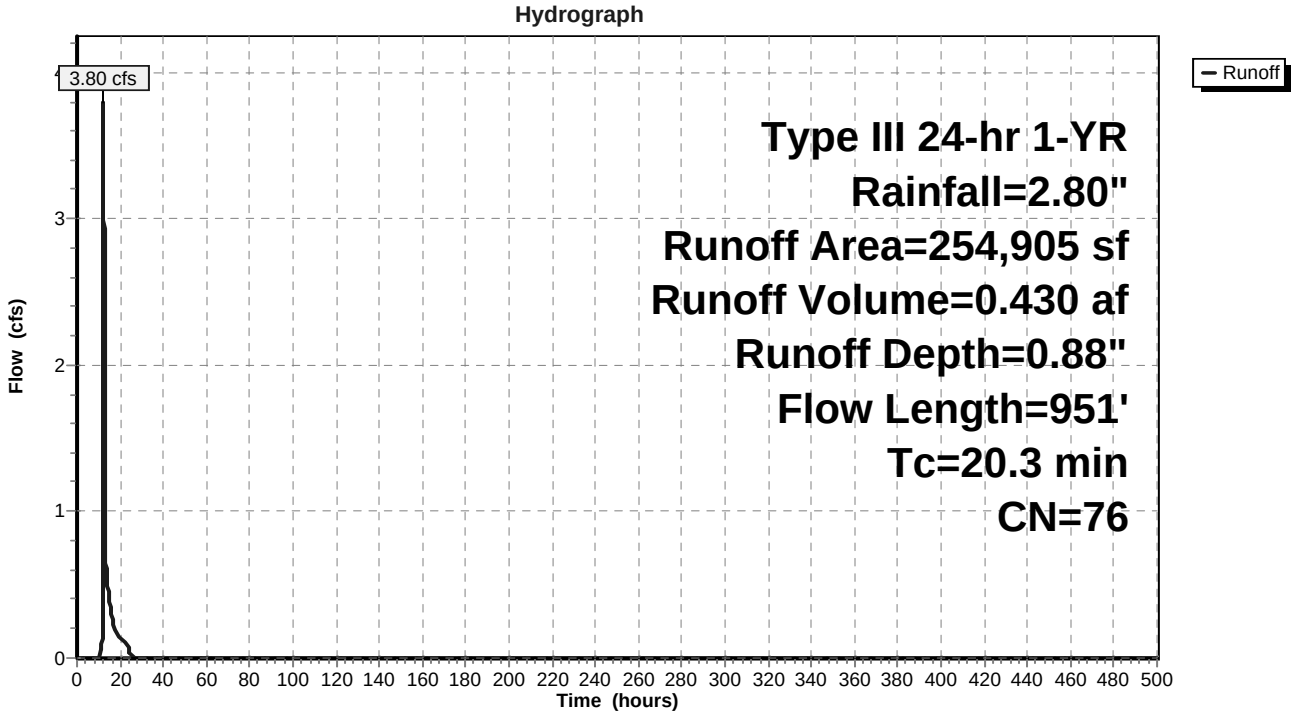
Runoff = 3.80 cfs @ 12.30 hrs, Volume= 0.430 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR Rainfall=2.80"

Area (sf)	CN	Description
81,119	74	>75% Grass cover, Good, HSG C
27,727	98	Paved parking, HSG A
120,312	73	Woods, Fair, HSG C
17,305	70	Brush, Fair, HSG C
8,442	89	Gravel roads, HSG C
254,905	76	Weighted Average
227,178		89.12% Pervious Area
27,727		10.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0500	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
1.2	135	0.1480	1.92		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.0	168	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	95	0.0320	3.63		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	453	0.0730	15.23	203.08	**Parabolic Channel,** W=10.00' D=2.00' Area=13.3 sf Perim=11.0' n= 0.030 Earth, grassed & winding
20.3	951	Total			

Subcatchment PS-2.3:



Summary for Subcatchment PS-2.4:

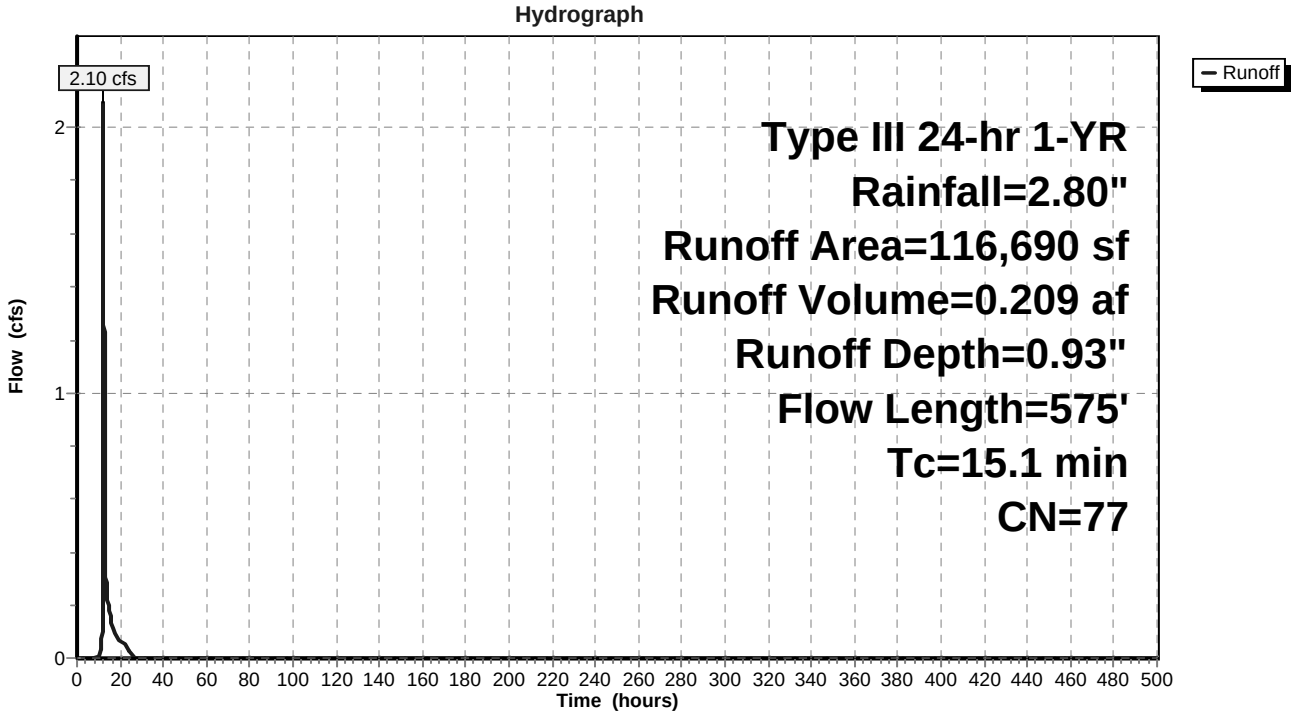
Runoff = 2.10 cfs @ 12.23 hrs, Volume= 0.209 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR Rainfall=2.80"

Area (sf)	CN	Description
86,696	73	Woods, Fair, HSG C
13,423	74	>75% Grass cover, Good, HSG C
16,571	98	Paved parking, HSG C
116,690	77	Weighted Average
100,119		85.80% Pervious Area
16,571		14.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	20	0.0200	1.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.50"
10.9	80	0.0625	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
3.8	295	0.0661	1.29		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	180	0.0722	21.12	563.30	**Parabolic Channel,** W=10.00' D=4.00' Area=26.7 sf Perim=13.3' n= 0.030 Earth, grassed & winding
15.1	575	Total			

Subcatchment PS-2.4:



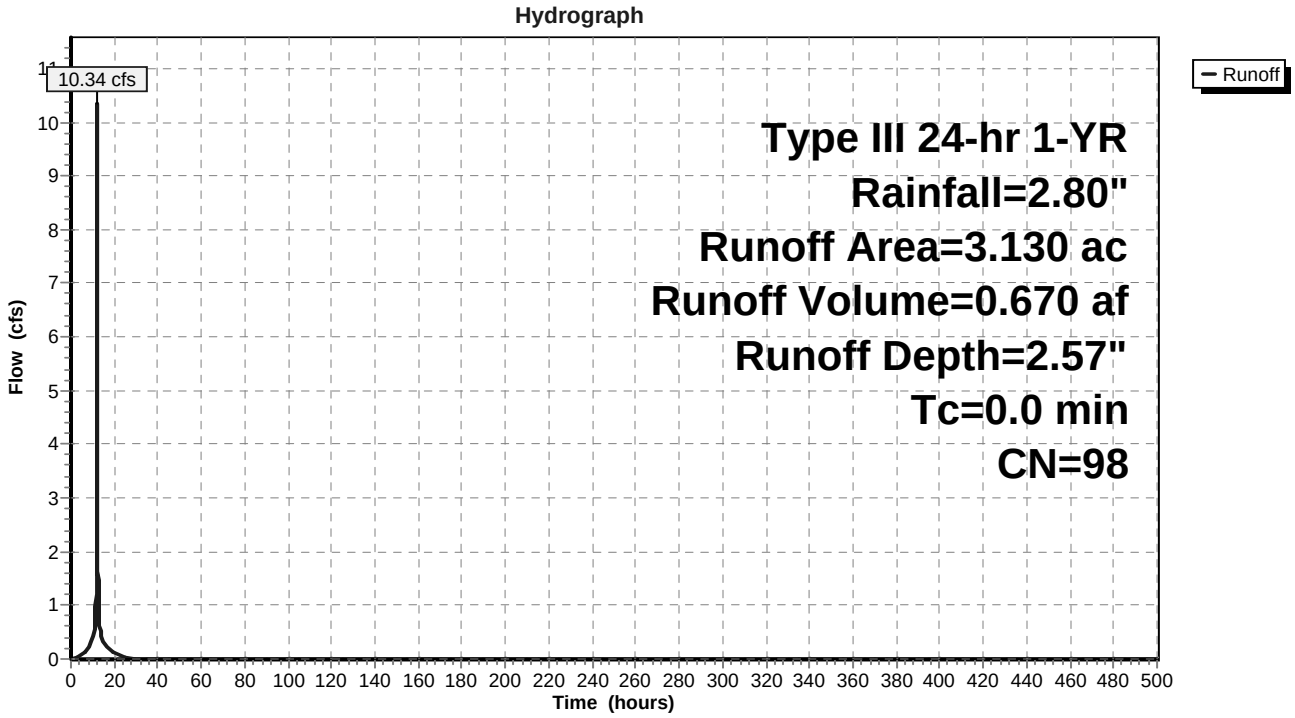
y for Subcatchment RRv: CAPTURED ROOFS & SURFACES REUSED WITH THE CRICKET VALLEY ENE

Runoff = 10.34 cfs @ 12.00 hrs, Volume= 0.670 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR Rainfall=2.80"

Area (ac)	CN	Description
3.130	98	Paved parking, HSG A
3.130		100.00% Impervious Area

ubcatchment RRv: CAPTURED ROOFS & SURFACES REUSED WITH THE CRICKET VALLEY ENERGY PI

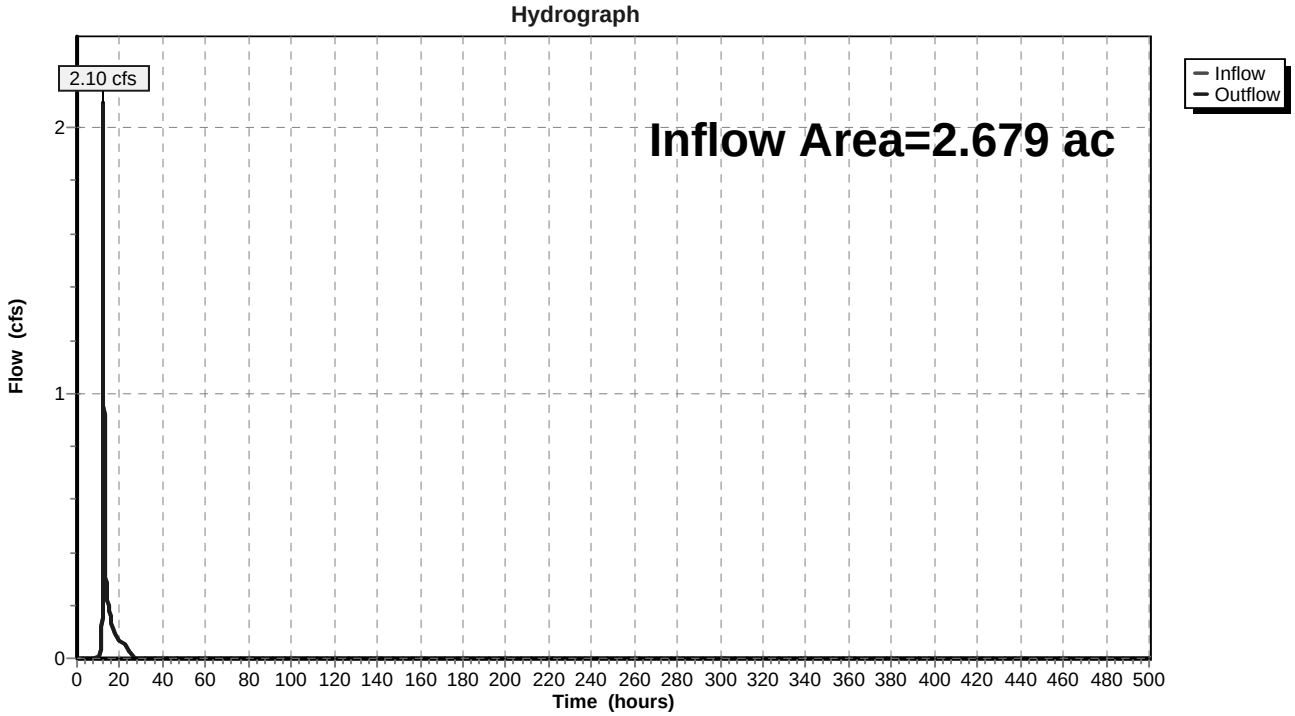


Summary for Reach 3R: Pipes

Inflow Area = 2.679 ac, 14.20% Impervious, Inflow Depth = 0.93" for 1-YR event
Inflow = 2.10 cfs @ 12.23 hrs, Volume= 0.209 af
Outflow = 2.10 cfs @ 12.23 hrs, Volume= 0.209 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs

Reach 3R: Pipes

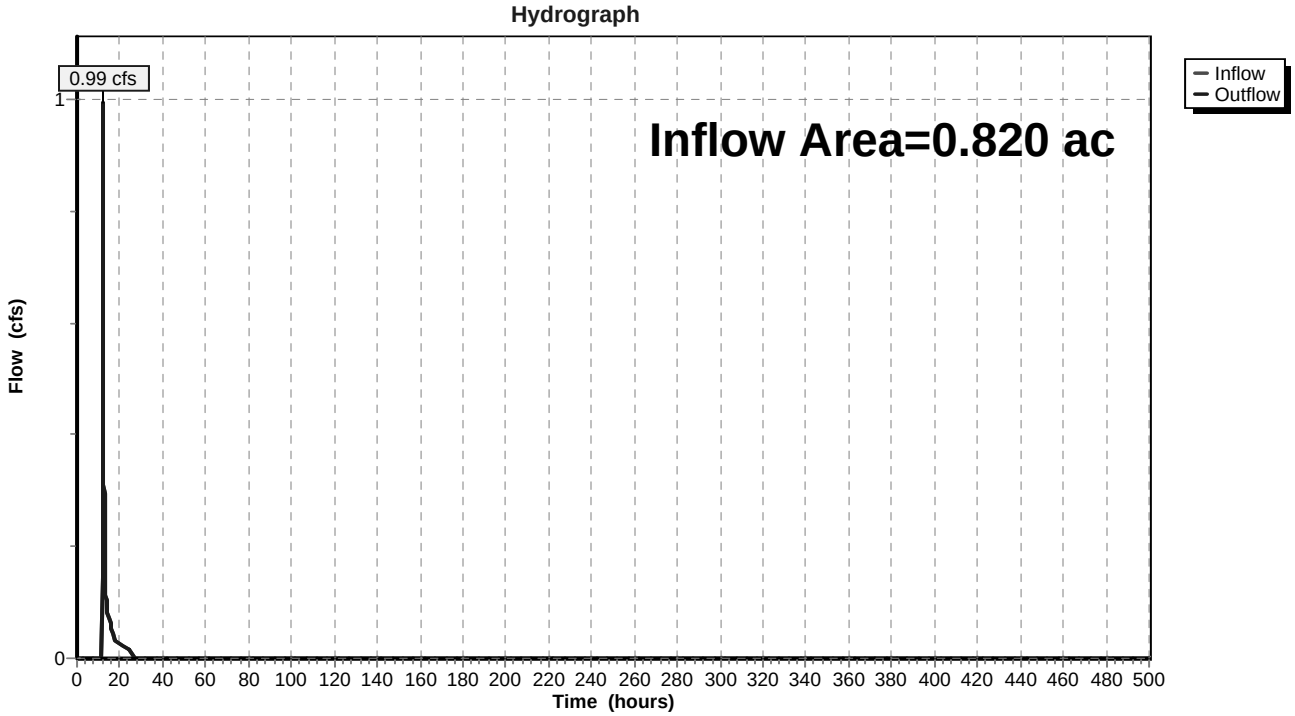


Summary for Reach 6R:

Inflow Area = 0.820 ac, 8.88% Impervious, Inflow Depth = 1.06" for 1-YR event
Inflow = 0.99 cfs @ 12.17 hrs, Volume= 0.073 af
Outflow = 0.99 cfs @ 12.17 hrs, Volume= 0.073 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs

Reach 6R:



Summary for Pond 1A: Plunge Pool F-1

Inflow Area = 0.820 ac, 8.88% Impervious, Inflow Depth = 1.35" for 1-YR event
Inflow = 1.30 cfs @ 12.09 hrs, Volume= 0.093 af
Outflow = 1.28 cfs @ 12.11 hrs, Volume= 0.093 af, Atten= 2%, Lag= 0.9 min
Primary = 1.28 cfs @ 12.11 hrs, Volume= 0.093 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Starting Elev= 430.50' Surf.Area= 631 sf Storage= 904 cf
Peak Elev= 430.64' @ 12.11 hrs Surf.Area= 674 sf Storage= 997 cf (94 cf above start)
Flood Elev= 431.50' Surf.Area= 952 sf Storage= 1,690 cf (786 cf above start)

Plug-Flow detention time= 127.0 min calculated for 0.072 af (78% of inflow)
Center-of-Mass det. time= 2.4 min (838.2 - 835.9)

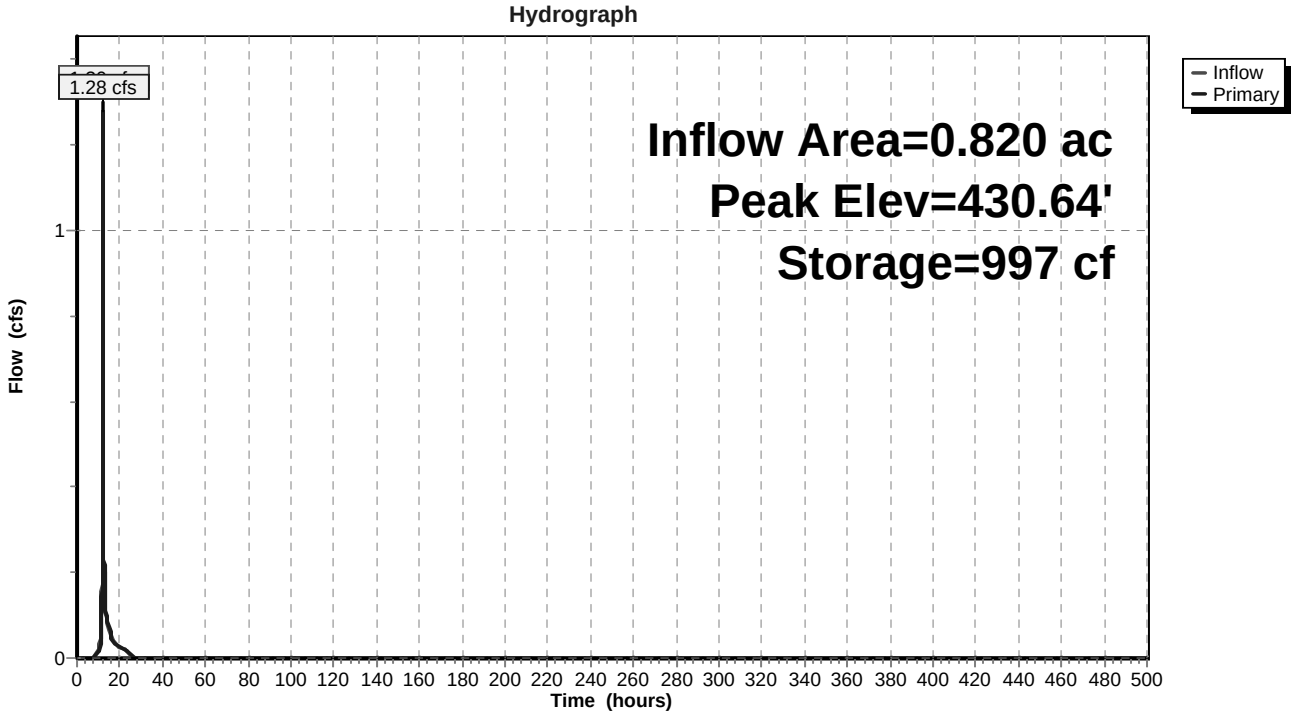
Volume	Invert	Avail.Storage	Storage Description
#1	427.00'	1,690 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
427.00	18	0	0
428.00	106	62	62
429.00	264	185	247
430.00	489	377	624
430.50	631	280	904
431.00	781	353	1,257
431.50	952	433	1,690

Device	Routing	Invert	Outlet Devices
#1	Primary	430.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.27 cfs @ 12.11 hrs HW=430.64' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 1.27 cfs @ 0.89 fps)

Pond 1A: Plunge Pool F-1



Summary for Pond 2A: Plunge Pool F-2

Inflow Area = 1.874 ac, 27.04% Impervious, Inflow Depth = 1.64" for 1-YR event
Inflow = 3.61 cfs @ 12.09 hrs, Volume= 0.256 af
Outflow = 3.46 cfs @ 12.11 hrs, Volume= 0.256 af, Atten= 4%, Lag= 1.4 min
Primary = 3.46 cfs @ 12.11 hrs, Volume= 0.256 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Starting Elev= 428.75' Surf.Area= 1,593 sf Storage= 3,229 cf
Peak Elev= 429.02' @ 12.11 hrs Surf.Area= 1,741 sf Storage= 3,687 cf (457 cf above start)
Flood Elev= 430.00' Surf.Area= 2,316 sf Storage= 5,666 cf (2,437 cf above start)

Plug-Flow detention time= 152.2 min calculated for 0.182 af (71% of inflow)
Center-of-Mass det. time= 4.0 min (824.6 - 820.7)

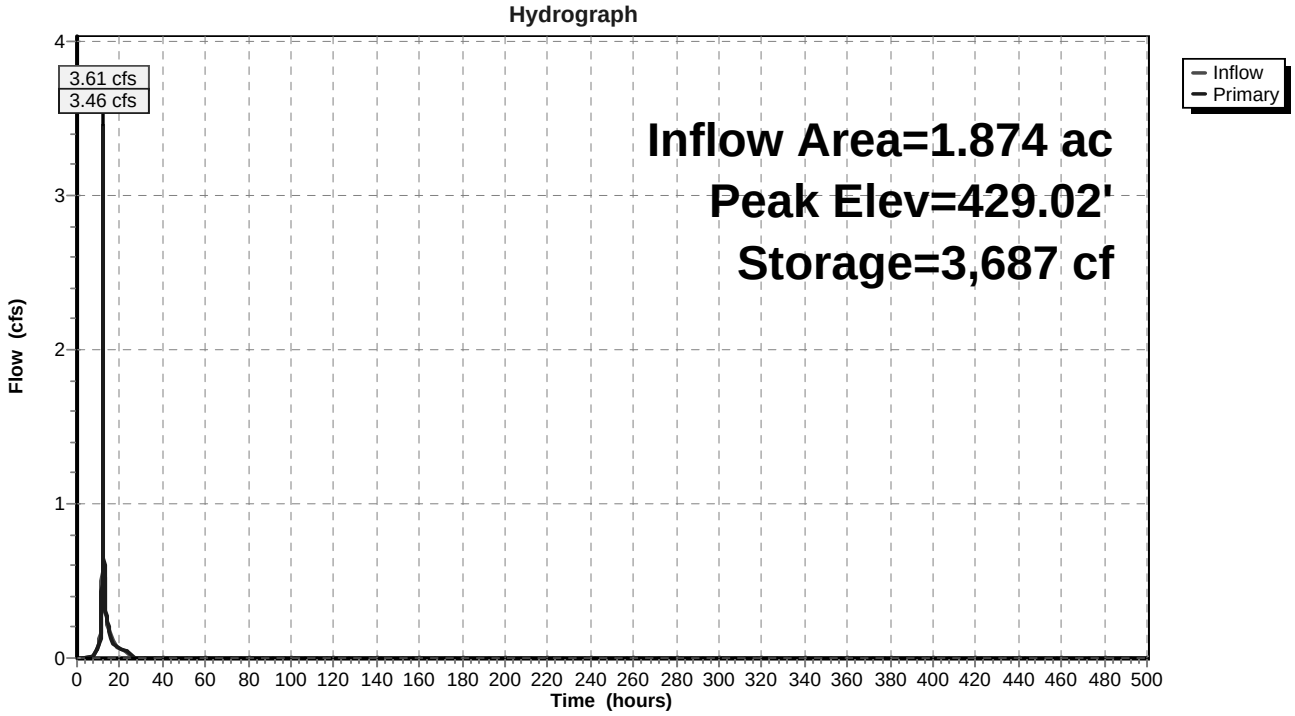
Volume	Invert	Avail.Storage	Storage Description
#1	424.00'	5,666 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
424.00	76	0	0
425.00	234	155	155
426.00	479	357	512
427.00	809	644	1,156
428.00	1,225	1,017	2,173
428.75	1,593	1,057	3,229
429.00	1,727	415	3,644
430.00	2,316	2,022	5,666

Device	Routing	Invert	Outlet Devices
#1	Primary	428.75'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.45 cfs @ 12.11 hrs HW=429.02' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 3.45 cfs @ 1.26 fps)

Pond 2A: Plunge Pool F-2



Summary for Pond 3A: Plunge Pool F-3

Inflow Area = 5.852 ac, 10.88% Impervious, Inflow Depth = 0.88" for 1-YR event
Inflow = 3.80 cfs @ 12.30 hrs, Volume= 0.430 af
Outflow = 3.78 cfs @ 12.32 hrs, Volume= 0.391 af, Atten= 0%, Lag= 1.3 min
Primary = 3.78 cfs @ 12.32 hrs, Volume= 0.391 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Peak Elev= 439.29' @ 12.32 hrs Surf.Area= 1,268 sf Storage= 2,066 cf
Flood Elev= 440.00' Surf.Area= 1,631 sf Storage= 3,095 cf

Plug-Flow detention time= 64.0 min calculated for 0.391 af (91% of inflow)
Center-of-Mass det. time= 18.7 min (895.7 - 877.0)

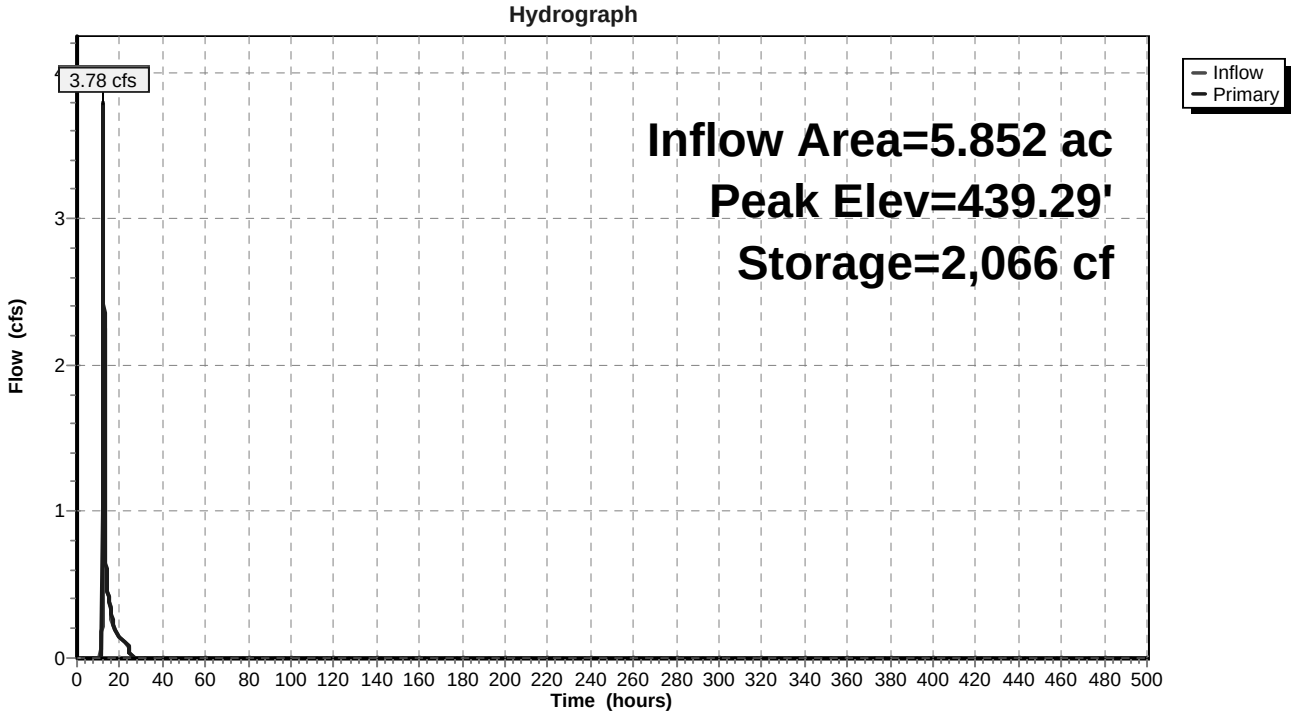
Volume	Invert	Avail.Storage	Storage Description
#1	435.00'	3,095 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
435.00	13	0	0
436.00	115	64	64
437.00	347	231	295
438.00	691	519	814
439.00	1,120	906	1,720
440.00	1,631	1,376	3,095

Device	Routing	Invert	Outlet Devices
#1	Primary	439.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.77 cfs @ 12.32 hrs HW=439.29' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 3.77 cfs @ 1.30 fps)

Pond 3A: Plunge Pool F-3



Summary for Pond 4P: Storage at Box Culvert

Inflow Area = 24.770 ac, 7.04% Impervious, Inflow Depth = 0.77" for 1-YR event
Inflow = 11.70 cfs @ 12.46 hrs, Volume= 1.582 af
Outflow = 11.64 cfs @ 12.48 hrs, Volume= 1.582 af, Atten= 1%, Lag= 1.5 min
Primary = 11.64 cfs @ 12.48 hrs, Volume= 1.582 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Peak Elev= 433.60' @ 12.48 hrs Surf.Area= 2,280 sf Storage= 680 cf

Plug-Flow detention time= 0.6 min calculated for 1.582 af (100% of inflow)
Center-of-Mass det. time= 0.6 min (896.3 - 895.7)

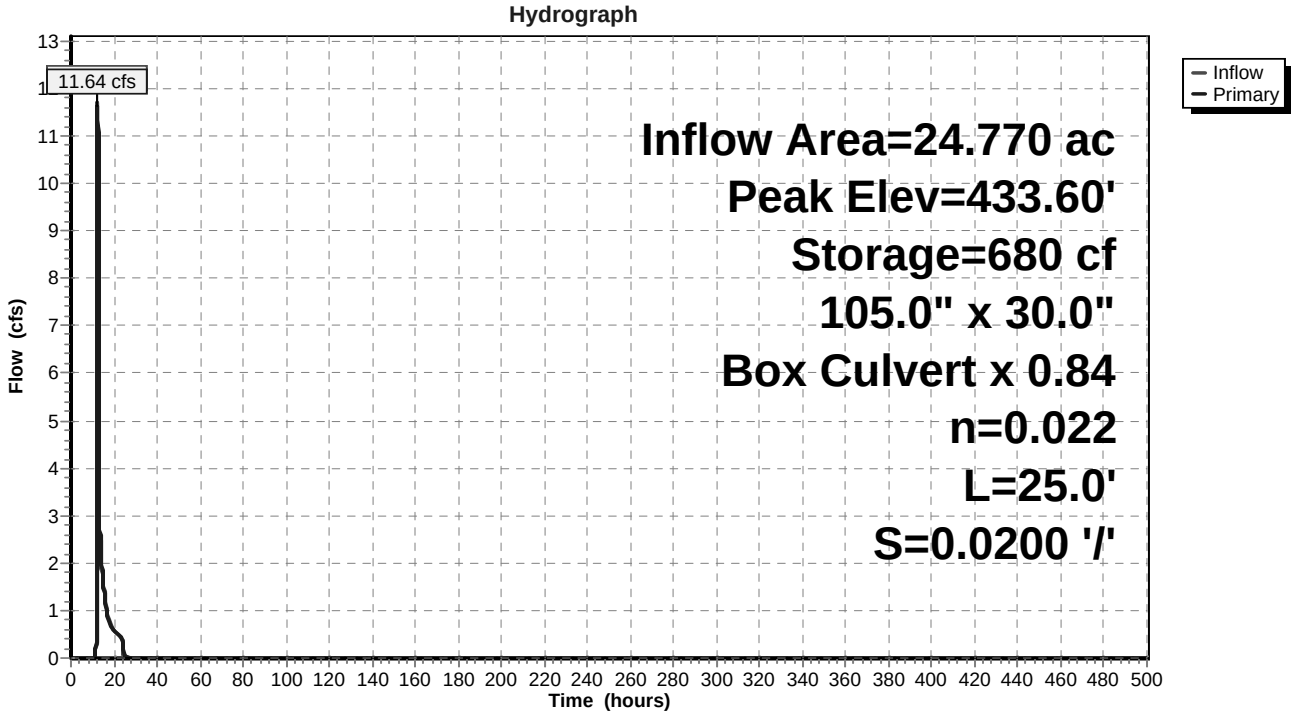
Volume	Invert	Avail.Storage	Storage Description
#1	433.00'	27,483 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
433.00	0	0	0
434.00	3,825	1,913	1,913
435.00	4,835	4,330	6,243
435.50	5,362	2,549	8,792
436.00	69,402	18,691	27,483

Device	Routing	Invert	Outlet Devices
#1	Primary	433.00'	**105.0" W x 30.0" H Box Culvert X 0.84** L= 25.0' Box, 30-75° wingwalls, square crown, Ke= 0.400 Inlet / Outlet Invert= 433.00' / 432.50' S= 0.0200 '/' Cc= 0.900 n= 0.022 Earth, clean & straight

Primary OutFlow Max=11.63 cfs @ 12.48 hrs HW=433.60' (Free Discharge)
└**1=Culvert** (Inlet Controls 11.63 cfs @ 2.23 fps)

Pond 4P: Storage at Box Culvert



Summary for Pond EW-1: EXISTING NYSDEC JURISDICTIONAL WETLAND

Inflow Area = 81.411 ac, 4.35% Impervious, Inflow Depth = 0.83" for 1-YR event
Inflow = 28.01 cfs @ 12.65 hrs, Volume= 5.654 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Peak Elev= 421.55' @ 46.03 hrs Surf.Area= 251,271 sf Storage= 246,272 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

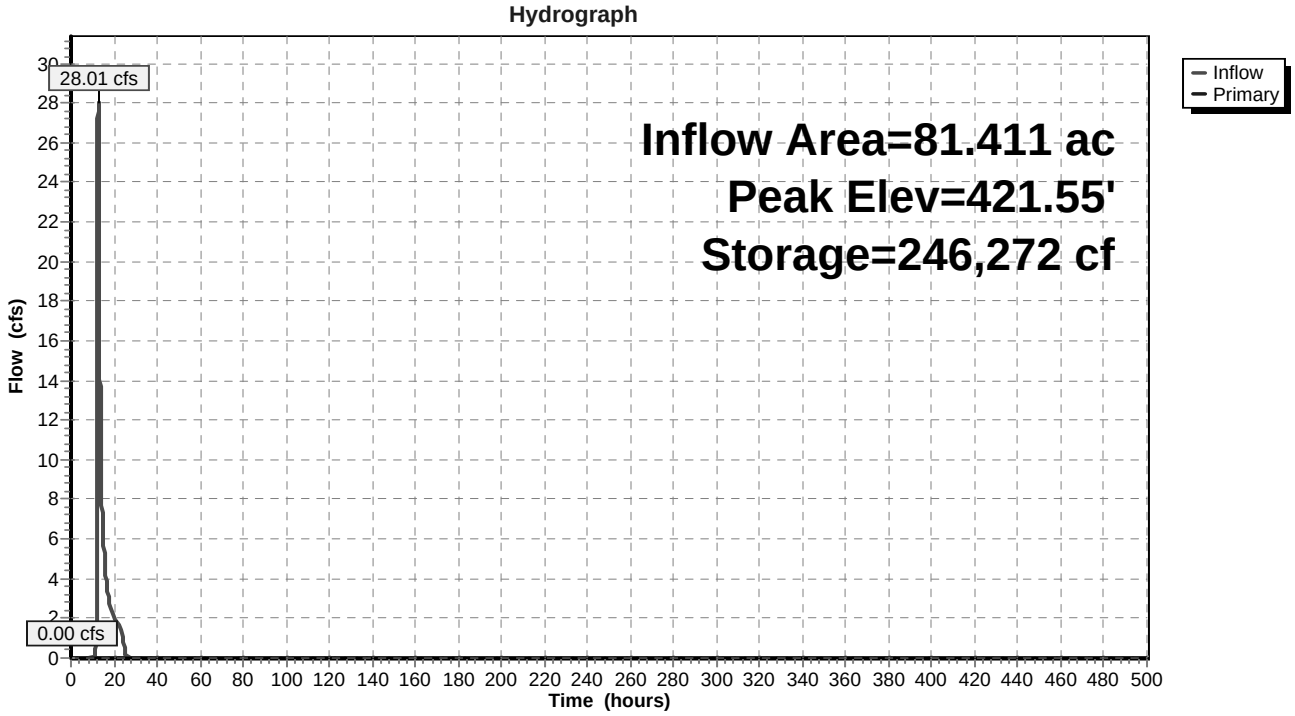
Volume	Invert	Avail.Storage	Storage Description
#1	419.80'	688,314 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
419.80	0	0	0
420.00	64,917	6,492	6,492
421.00	178,530	121,724	128,215
422.00	310,941	244,736	372,951
423.00	319,785	315,363	688,314

Device	Routing	Invert	Outlet Devices
#1	Primary	422.00'	**300.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=419.80' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond EW-1: EXISTING NYSDEC JURISDICTIONAL WETLAND



Summary for Pond F-1: Bioretention Area #1

Inflow Area = 0.820 ac, 8.88% Impervious, Inflow Depth = 1.35" for 1-YR event
Inflow = 1.28 cfs @ 12.11 hrs, Volume= 0.093 af
Outflow = 0.99 cfs @ 12.17 hrs, Volume= 0.073 af, Atten= 22%, Lag= 4.1 min
Secondary = 0.99 cfs @ 12.17 hrs, Volume= 0.073 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Peak Elev= 430.62' @ 12.17 hrs Surf.Area= 1,914 sf Storage= 1,083 cf
Flood Elev= 431.50' Surf.Area= 2,412 sf Storage= 2,987 cf

Plug-Flow detention time= 128.0 min calculated for 0.073 af (79% of inflow)
Center-of-Mass det. time= 45.6 min (883.9 - 838.2)

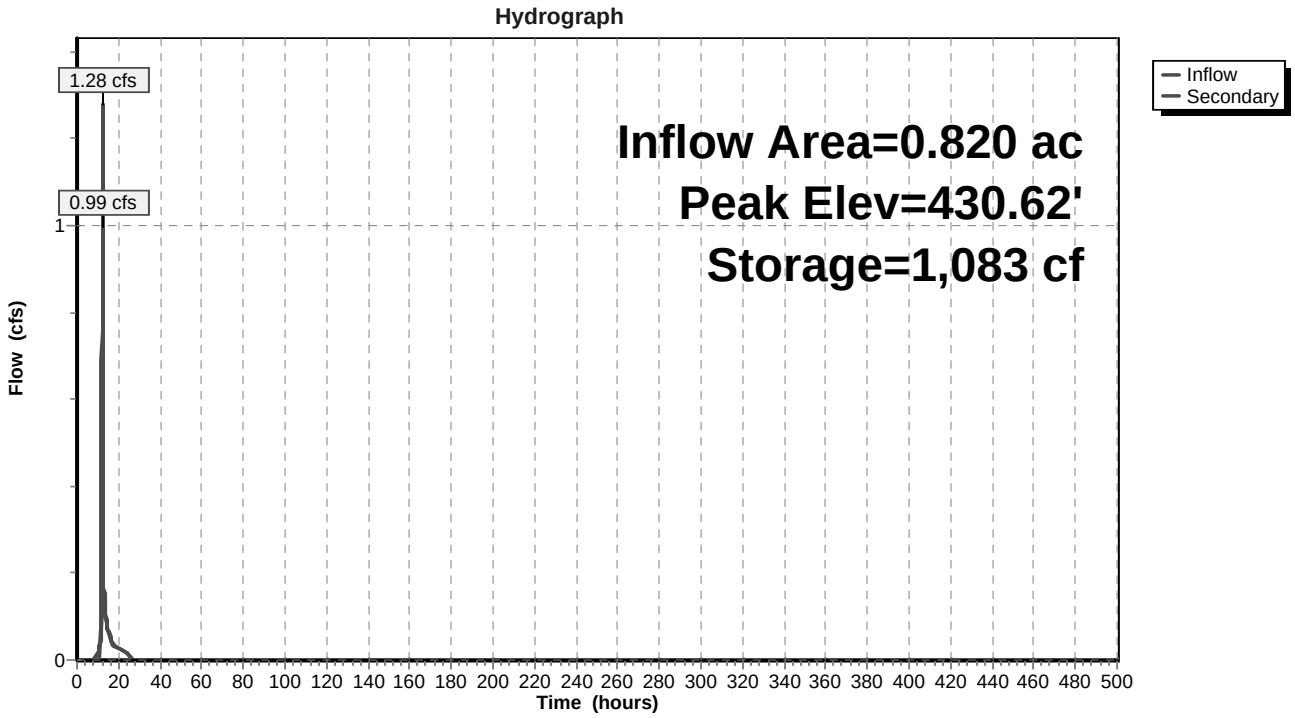
Volume	Invert	Avail.Storage	Storage Description
#1	430.00'	2,987 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
430.00	1,589	0	0
430.50	1,849	860	860
431.00	2,124	993	1,853
431.50	2,412	1,134	2,987

Device	Routing	Invert	Outlet Devices
#1	Secondary	430.50'	**10.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Secondary OutFlow Max=0.99 cfs @ 12.17 hrs HW=430.62' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 0.99 cfs @ 0.84 fps)

Pond F-1: Bioretention Area #1



Summary for Pond F-2: Bioretention Area #2

Inflow Area = 1.874 ac, 27.04% Impervious, Inflow Depth = 1.64" for 1-YR event
Inflow = 3.46 cfs @ 12.11 hrs, Volume= 0.256 af
Outflow = 2.59 cfs @ 12.19 hrs, Volume= 0.256 af, Atten= 25%, Lag= 4.8 min
Primary = 2.59 cfs @ 12.19 hrs, Volume= 0.256 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Starting Elev= 428.75' Surf.Area= 6,983 sf Storage= 1,706 cf
Peak Elev= 428.95' @ 12.19 hrs Surf.Area= 7,245 sf Storage= 3,156 cf (1,450 cf above start)
Flood Elev= 430.00' Surf.Area= 8,314 sf Storage= 11,301 cf (9,595 cf above start)

Plug-Flow detention time= 113.0 min calculated for 0.217 af (85% of inflow)
Center-of-Mass det. time= 18.2 min (842.8 - 824.6)

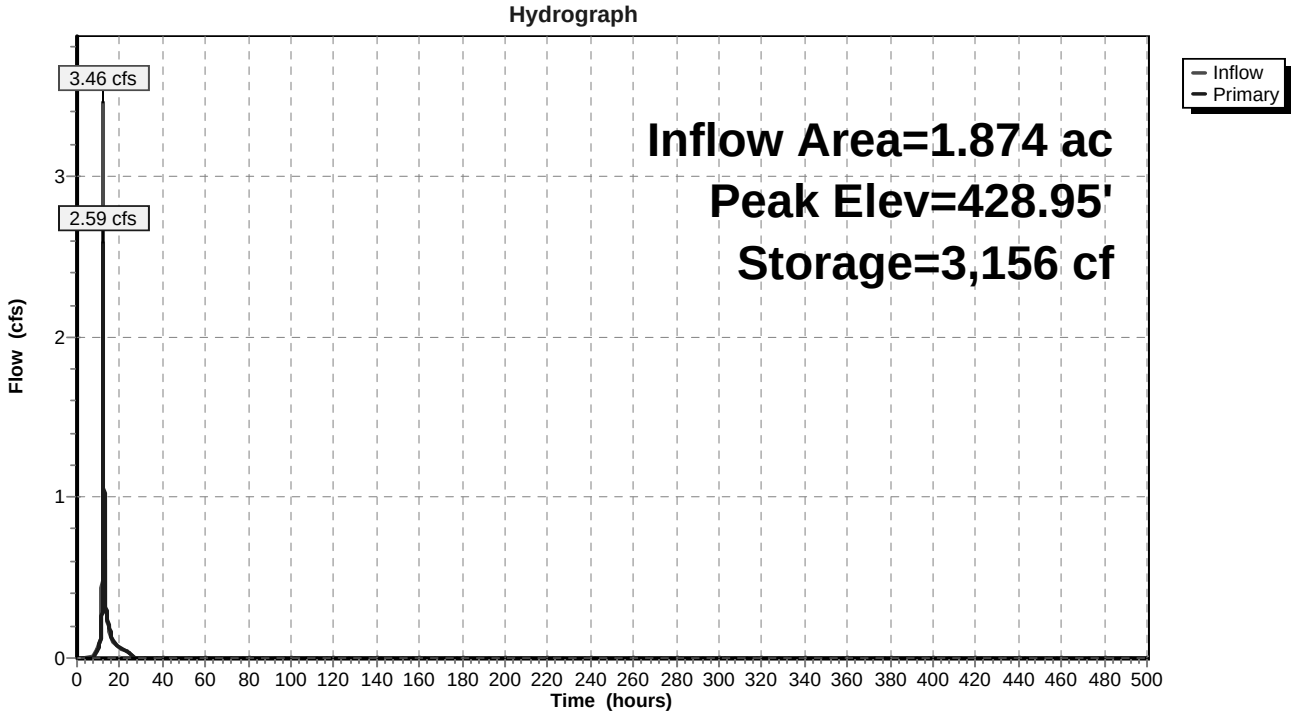
Volume	Invert	Avail.Storage	Storage Description
#1	428.50'	11,301 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
428.50	6,662	0	0
429.00	7,304	3,492	3,492
430.00	8,314	7,809	11,301

Device	Routing	Invert	Outlet Devices
#1	Primary	428.75'	**12.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=2.59 cfs @ 12.19 hrs HW=428.95' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 2.59 cfs @ 1.06 fps)

Pond F-2: Bioretention Area #2



Summary for Pond F-3: Bioretention Area #3

Inflow Area = 5.852 ac, 10.88% Impervious, Inflow Depth = 0.80" for 1-YR event
Inflow = 3.78 cfs @ 12.32 hrs, Volume= 0.391 af
Outflow = 2.82 cfs @ 12.54 hrs, Volume= 0.346 af, Atten= 25%, Lag= 13.1 min
Primary = 2.82 cfs @ 12.54 hrs, Volume= 0.346 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Peak Elev= 439.24' @ 12.54 hrs Surf.Area= 4,498 sf Storage= 2,978 cf
Flood Elev= 440.00' Surf.Area= 5,442 sf Storage= 6,774 cf

Plug-Flow detention time= 85.6 min calculated for 0.346 af (89% of inflow)
Center-of-Mass det. time= 31.5 min (927.3 - 895.7)

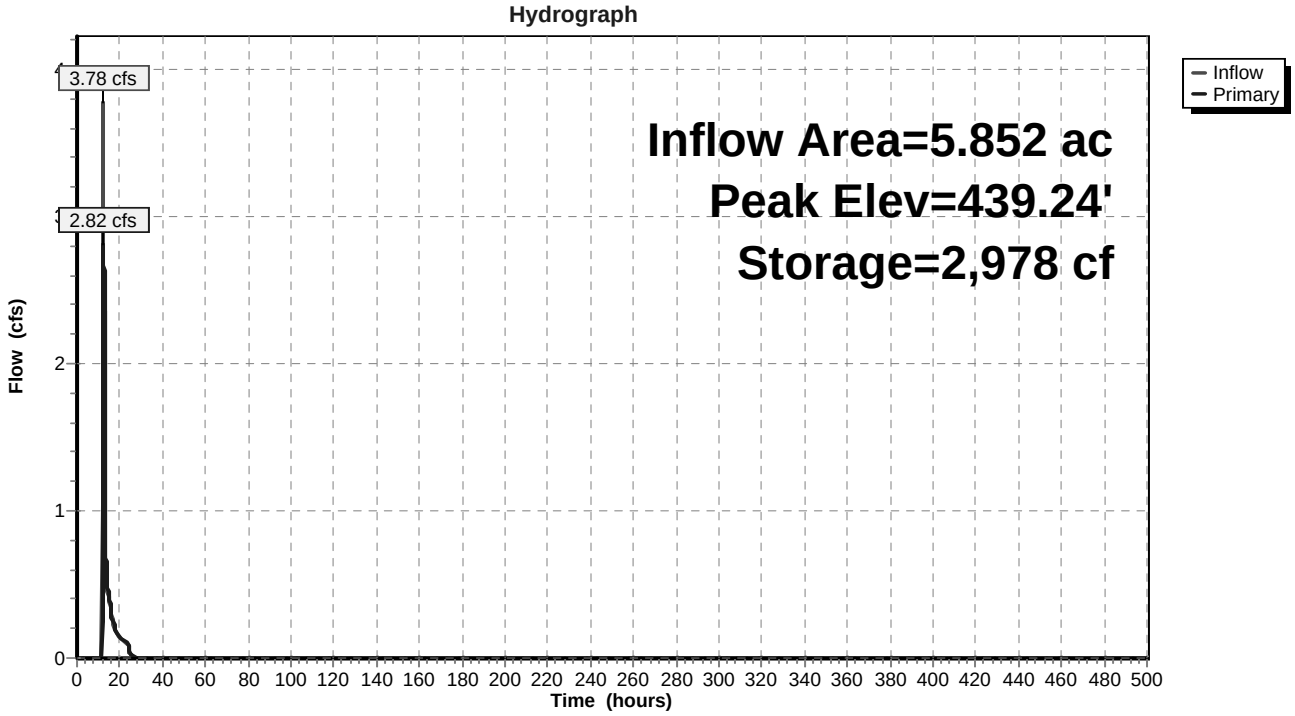
Volume	Invert	Avail.Storage	Storage Description
#1	438.50'	6,774 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
438.50	3,592	0	0
439.00	4,206	1,950	1,950
440.00	5,442	4,824	6,774

Device	Routing	Invert	Outlet Devices
#1	Primary	439.00'	**10.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=2.81 cfs @ 12.54 hrs HW=439.24' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 2.81 cfs @ 1.19 fps)

Pond F-3: Bioretention Area #3



Summary for Pond P-1: Wet Pond

Inflow Area = 17.690 ac, 38.01% Impervious, Inflow Depth = 1.67" for 1-YR event
Inflow = 32.79 cfs @ 12.09 hrs, Volume= 2.462 af
Outflow = 0.73 cfs @ 17.90 hrs, Volume= 2.462 af, Atten= 98%, Lag= 348.4 min
Primary = 0.73 cfs @ 17.90 hrs, Volume= 2.462 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Starting Elev= 422.00' Surf.Area= 30,655 sf Storage= 75,367 cf
Peak Elev= 424.25' @ 17.90 hrs Surf.Area= 40,496 sf Storage= 155,117 cf (79,750 cf above start)
Flood Elev= 429.00' Surf.Area= 59,091 sf Storage= 390,986 cf (315,619 cf above start)

Plug-Flow detention time= 3,181.8 min calculated for 0.732 af (30% of inflow)
Center-of-Mass det. time= 1,470.5 min (2,287.5 - 817.0)

Volume	Invert	Avail.Storage	Storage Description
#1	418.00'	452,178 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

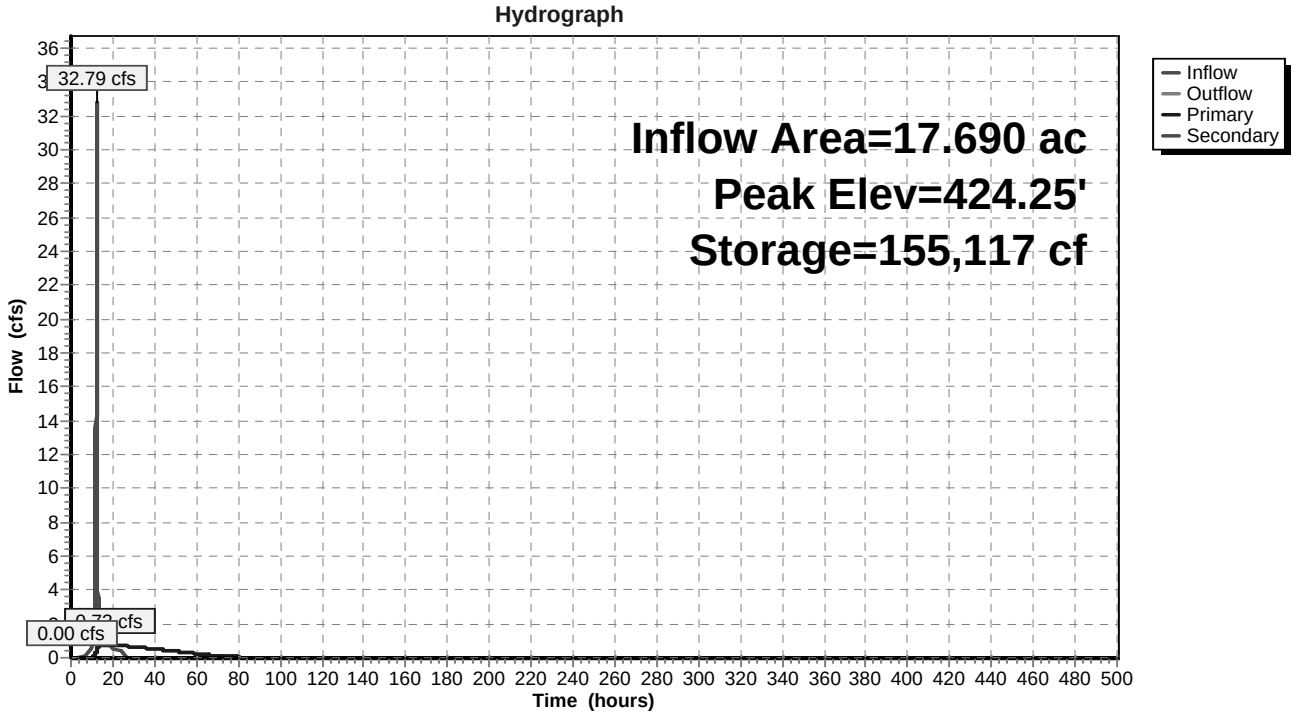
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
418.00	14,212	0	0
420.00	16,608	30,820	30,820
421.00	19,142	17,875	48,695
421.50	28,445	11,897	60,592
422.00	30,655	14,775	75,367
423.00	34,805	32,730	108,097
424.00	39,588	37,197	145,293
425.00	43,288	41,438	186,731
426.00	47,088	45,188	231,919
427.00	50,988	49,038	280,957
428.00	54,989	52,989	333,946
429.00	59,091	57,040	390,986
430.00	63,293	61,192	452,178

Device	Routing	Invert	Outlet Devices
#1	Primary	421.85'	**30.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 421.85' / 421.50' S= 0.0140 '/' Cc= 0.900 n= 0.013
#2	Device 1	422.00'	**4.4" Vert. Orifice/Grate** C= 0.600
#3	Device 1	424.24'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	426.50'	**2.5' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#5	Secondary	429.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir X 0.00** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.73 cfs @ 17.90 hrs HW=424.25' (Free Discharge)
└─**1=Culvert** (Passes 0.73 cfs of 20.13 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.73 cfs @ 6.91 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 0.00 cfs @ 0.25 fps)
  └─**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=422.00' (Free Discharge)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-1: Wet Pond

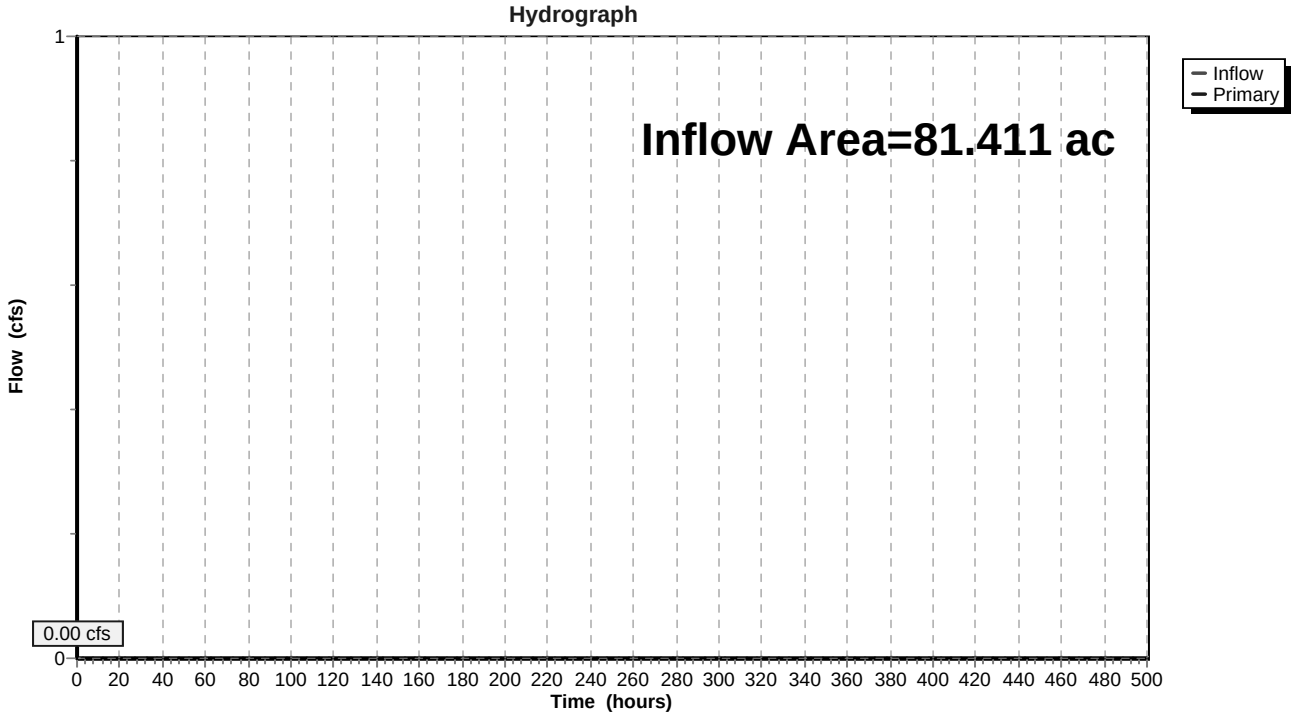


Summary for Pond zDP1: DESIGN POINT 1 (WETLAND)

Inflow Area = 81.411 ac, 4.35% Impervious, Inflow Depth = 0.00" for 1-YR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs

Pond zDP1: DESIGN POINT 1 (WETLAND)

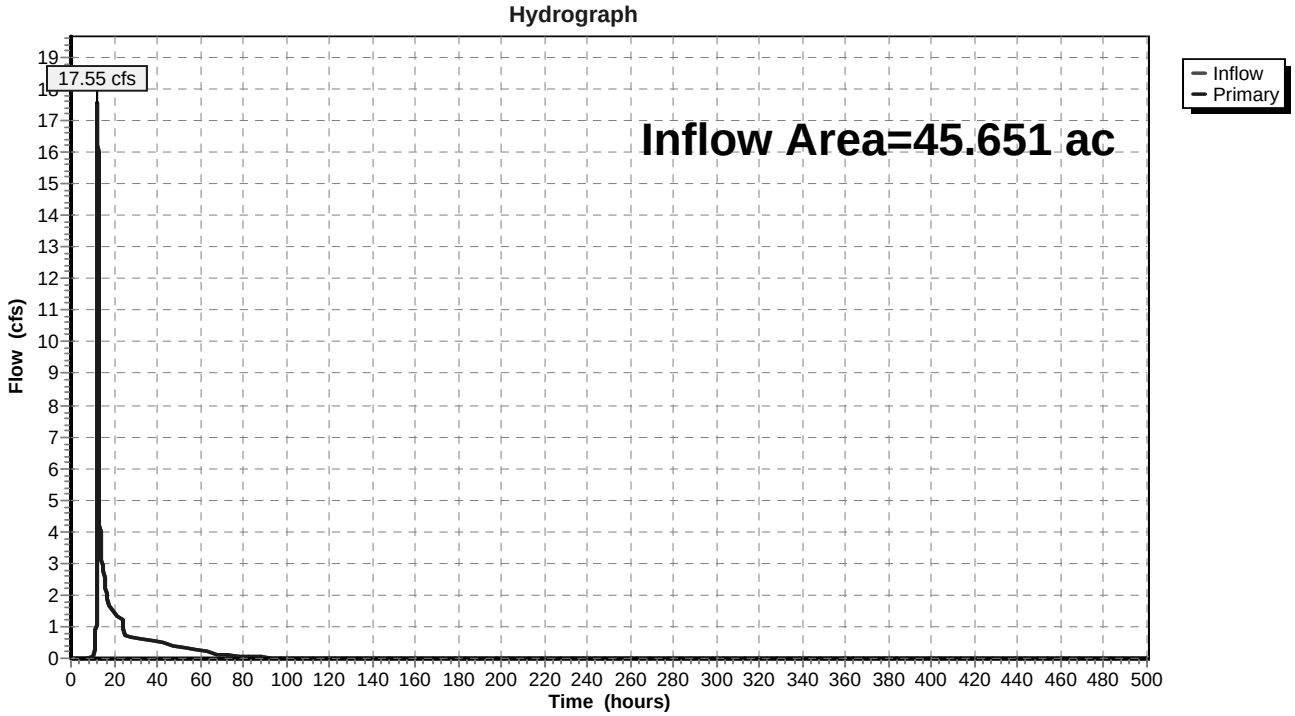


Summary for Pond zDP2: DESIGN POINT 2 (36" RCP CULVERT)

Inflow Area = 45.651 ac, 16.23% Impervious, Inflow Depth = 1.22" for 1-YR event
Inflow = 17.55 cfs @ 12.43 hrs, Volume= 4.640 af
Primary = 17.55 cfs @ 12.43 hrs, Volume= 4.640 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs

Pond zDP2: DESIGN POINT 2 (36" RCP CULVERT)



Time span=0.00-500.00 hrs, dt=0.01 hrs, 50001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PS-1.1: Runoff Area=2,349,900 sf 2.26% Impervious Runoff Depth=2.45"
Flow Length=3,203' Tc=57.8 min CN=75 Runoff=62.14 cfs 11.011 af

Subcatchment PS-1.2: Runoff Area=824,088 sf 5.85% Impervious Runoff Depth=2.36"
Flow Length=1,595' Tc=23.1 min CN=74 Runoff=32.99 cfs 3.727 af

Subcatchment PS-1.3: Runoff Area=35,738 sf 8.88% Impervious Runoff Depth=3.27"
Tc=6.0 min CN=84 Runoff=3.12 cfs 0.224 af

Subcatchment PS-1.4: Runoff Area=81,628 sf 27.04% Impervious Runoff Depth=3.67"
Tc=6.0 min CN=88 Runoff=7.87 cfs 0.573 af

Subcatchment PS-2.1: Runoff Area=1,218,013 sf 2.44% Impervious Runoff Depth=2.62"
Flow Length=1,190' Tc=28.1 min CN=77 Runoff=50.08 cfs 6.112 af

Subcatchment PS-2.2: Runoff Area=653,875 sf 42.26% Impervious Runoff Depth=3.88"
Tc=6.0 min CN=90 Runoff=65.81 cfs 4.849 af

Subcatchment PS-2.3: Runoff Area=254,905 sf 10.88% Impervious Runoff Depth=2.54"
Flow Length=951' Tc=20.3 min CN=76 Runoff=11.63 cfs 1.236 af

Subcatchment PS-2.4: Runoff Area=116,690 sf 14.20% Impervious Runoff Depth=2.62"
Flow Length=575' Tc=15.1 min CN=77 Runoff=6.21 cfs 0.586 af

Subcatchment RRv: CAPTURED ROOFS & Runoff Area=3.130 ac 100.00% Impervious Runoff Depth=4.76"
Tc=0.0 min CN=98 Runoff=18.68 cfs 1.242 af

Reach 3R: Pipes Inflow=6.21 cfs 0.586 af
Outflow=6.21 cfs 0.586 af

Reach 6R: Inflow=2.93 cfs 0.204 af
Outflow=2.93 cfs 0.204 af

Pond 1A: Plunge Pool F-1 Peak Elev=430.76' Storage=1,075 cf Inflow=3.12 cfs 0.224 af
Outflow=3.10 cfs 0.224 af

Pond 2A: Plunge Pool F-2 Peak Elev=429.20' Storage=4,000 cf Inflow=7.87 cfs 0.573 af
Outflow=7.69 cfs 0.573 af

Pond 3A: Plunge Pool F-3 Peak Elev=439.57' Storage=2,445 cf Inflow=11.63 cfs 1.236 af
Outflow=11.61 cfs 1.197 af

Pond 4P: Storage at Box Culvert Peak Elev=434.45' Storage=3,722 cf Inflow=44.31 cfs 4.880 af
105.0" x 30.0" Box Culvert x 0.84 n=0.022 L=25.0' S=0.0200 '/' Outflow=43.96 cfs 4.880 af

Pond EW-1: EXISTING NYSDEC Peak Elev=422.10' Storage=405,117 cf Inflow=88.73 cfs 16.667 af
Outflow=26.71 cfs 8.105 af

Pond F-1: Bioretention Area #1 Peak Elev=430.74' Storage=1,324 cf Inflow=3.10 cfs 0.224 af
Outflow=2.93 cfs 0.204 af

Pond F-2: Bioretention Area #2 Peak Elev=429.11' Storage=4,284 cf Inflow=7.69 cfs 0.573 af
Outflow=6.33 cfs 0.573 af

Pond F-3: Bioretention Area #3 Peak Elev=439.56' Storage=4,519 cf Inflow=11.61 cfs 1.197 af
Outflow=11.32 cfs 1.152 af

Pond P-1: Wet Pond Peak Elev=426.23' Storage=242,770 cf Inflow=69.93 cfs 5.434 af
Primary=2.27 cfs 5.434 af Secondary=0.00 cfs 0.000 af Outflow=2.27 cfs 5.434 af

Pond zDP1: DESIGN POINT 1 (WETLAND) Inflow=26.71 cfs 8.105 af
Primary=26.71 cfs 8.105 af

Pond zDP2: DESIGN POINT 2 (36" RCP CULVERT) Inflow=51.88 cfs 11.546 af
Primary=51.88 cfs 11.546 af

Total Runoff Area = 130.192 ac Runoff Volume = 29.560 af Average Runoff Depth = 2.72"
89.19% Pervious = 116.113 ac 10.81% Impervious = 14.079 ac

Summary for Subcatchment PS-1.1:

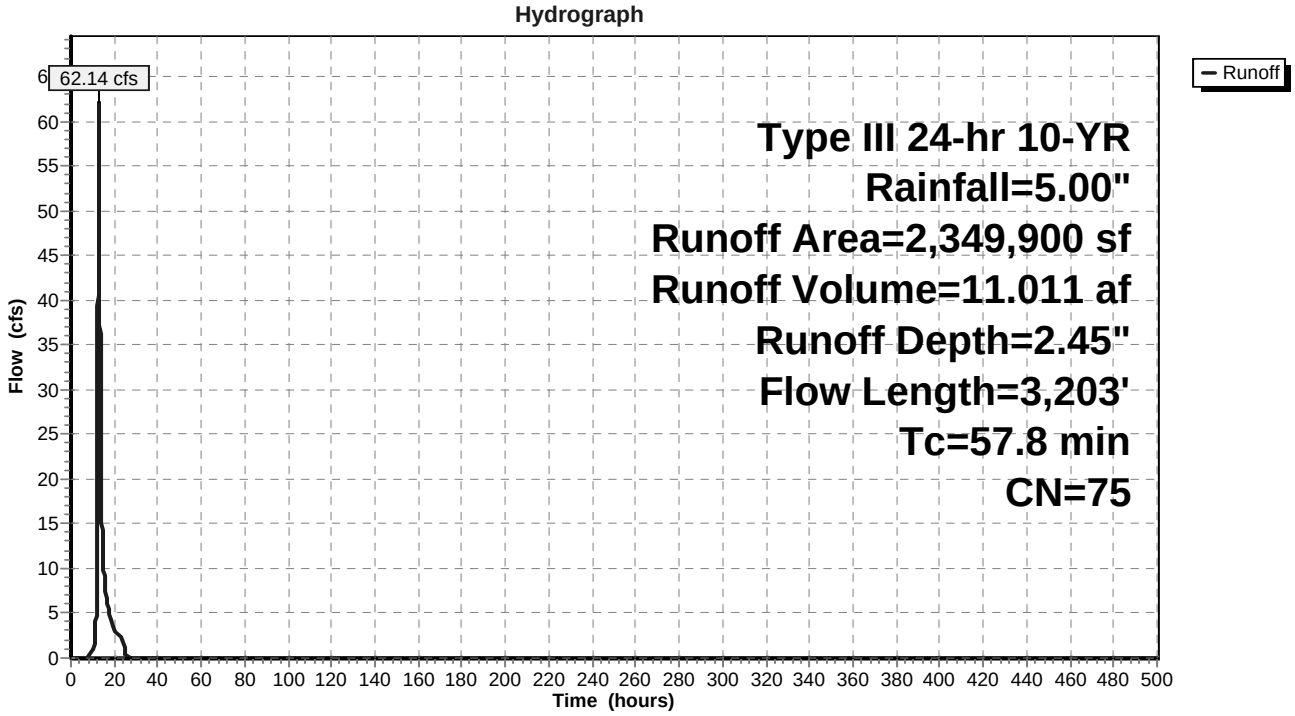
Runoff = 62.14 cfs @ 12.78 hrs, Volume= 11.011 af, Depth= 2.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.00"

Area (sf)	CN	Description
5,609	56	Brush, Fair, HSG B
219,739	70	Brush, Fair, HSG C
1,378,531	73	Woods, Fair, HSG C
99,805	74	>75% Grass cover, Good, HSG C
14,337	80	>75% Grass cover, Good, HSG D
14,067	89	Gravel roads, HSG C
304,723	77	Brush, Fair, HSG D
16,528	91	Gravel roads, HSG D
243,474	79	Woods, Fair, HSG D
53,087	98	Paved parking, HSG C
2,349,900	75	Weighted Average
2,296,813		97.74% Pervious Area
53,087		2.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.7	100	0.0785	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.50"
13.2	1,144	0.0839	1.45		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	60	0.0167	6.05	19.00	**Pipe Channel, PIPE CULVERT ON Rt. 22** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.020 Corrugated PE, corrugated interior
13.0	753	0.0372	0.96		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.5	256	0.0586	1.69		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.1	434	0.0415	1.02		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	456		6.95		**Lake or Reservoir,** Mean Depth= 1.50'
57.8	3,203	Total			

Subcatchment PS-1.1:



Summary for Subcatchment PS-1.2:

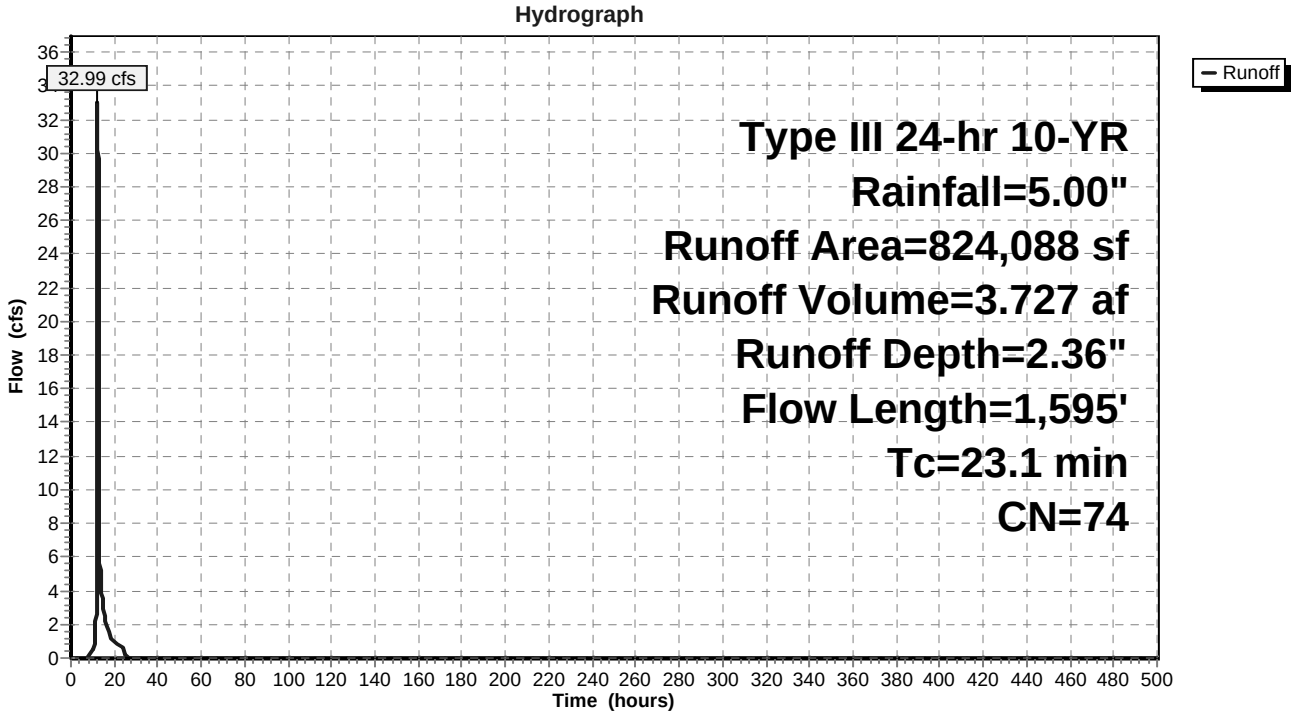
Runoff = 32.99 cfs @ 12.33 hrs, Volume= 3.727 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.00"

Area (sf)	CN	Description
476,732	73	Woods, Fair, HSG C
167,171	70	Brush, Fair, HSG C
58,454	77	Brush, Fair, HSG D
10,064	79	Woods, Fair, HSG D
57,883	74	>75% Grass cover, Good, HSG C
5,552	80	>75% Grass cover, Good, HSG D
48,232	98	Paved parking & roofs
824,088	74	Weighted Average
775,856		94.15% Pervious Area
48,232		5.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	100	0.0560	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.50"
0.7	65	0.0560	1.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.7	355	0.0626	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	75	0.0050	4.03	4.95	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	115	0.0260	7.79	103.88	**Parabolic Channel,** W=10.00' D=2.00' Area=13.3 sf Perim=11.0' n= 0.035 Earth, dense weeds
0.1	85	0.0820	10.72	33.69	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
0.3	310	0.0967	15.03	200.34	**Parabolic Channel,** W=10.00' D=2.00' Area=13.3 sf Perim=11.0' n= 0.035 Earth, dense weeds
5.7	325	0.0184	0.95		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.1	165	0.0030	1.30	15.21	**Parabolic Channel,** W=35.00' D=0.50' Area=11.7 sf Perim=35.0' n= 0.030 Earth, grassed & winding
23.1	1,595	Total			

Subcatchment PS-1.2:



Summary for Subcatchment PS-1.3:

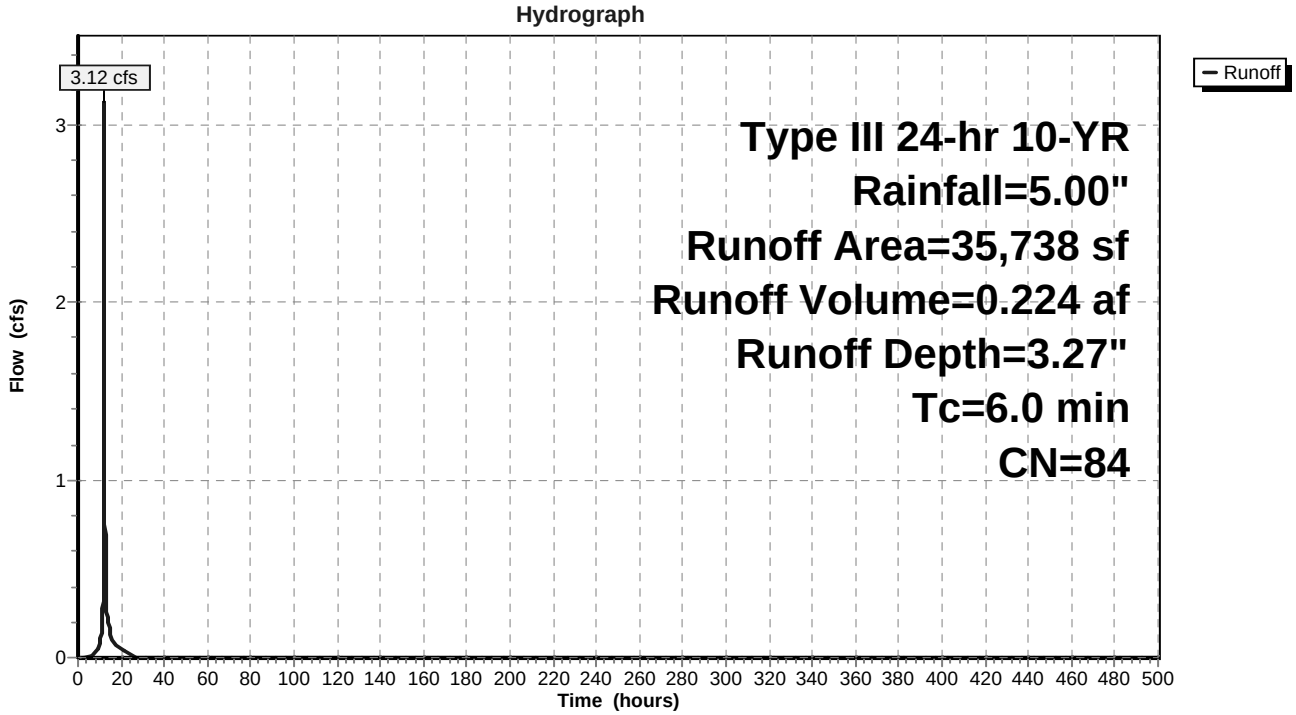
Runoff = 3.12 cfs @ 12.09 hrs, Volume= 0.224 af, Depth= 3.27"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.00"

Area (sf)	CN	Description
3,172	98	Paved parking, HSG C
13,366	74	>75% Grass cover, Good, HSG C
19,200	89	Gravel roads, HSG C
35,738	84	Weighted Average
32,566		91.12% Pervious Area
3,172		8.88% Impervious Area

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

Subcatchment PS-1.3:



Summary for Subcatchment PS-1.4:

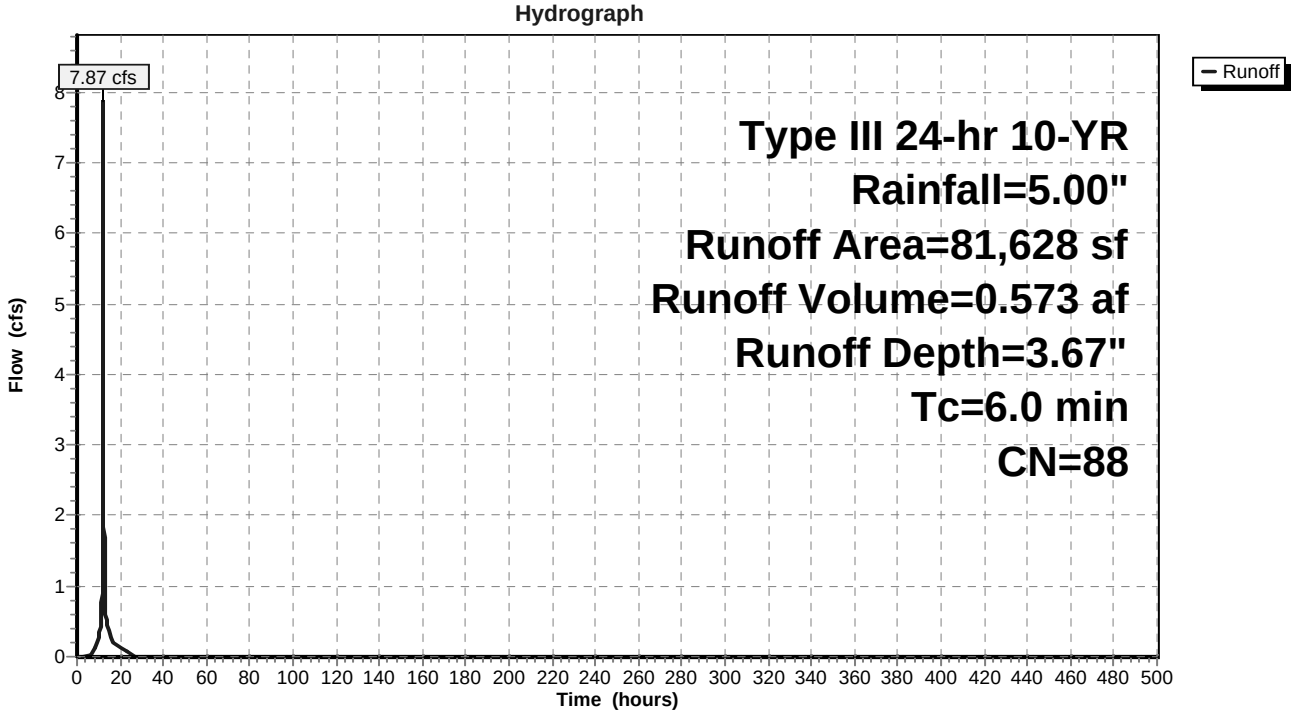
Runoff = 7.87 cfs @ 12.09 hrs, Volume= 0.573 af, Depth= 3.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.00"

Area (sf)	CN	Description
22,070	98	Paved parking, HSG C
36,079	91	Gravel roads, HSG D
9,940	80	>75% Grass cover, Good, HSG D
2,243	85	Gravel roads, HSG B
8,845	61	>75% Grass cover, Good, HSG B
2,224	74	>75% Grass cover, Good, HSG C
227	89	Gravel roads, HSG C
81,628	88	Weighted Average
59,558		72.96% Pervious Area
22,070		27.04% Impervious Area

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

Subcatchment PS-1.4:



Summary for Subcatchment PS-2.1:

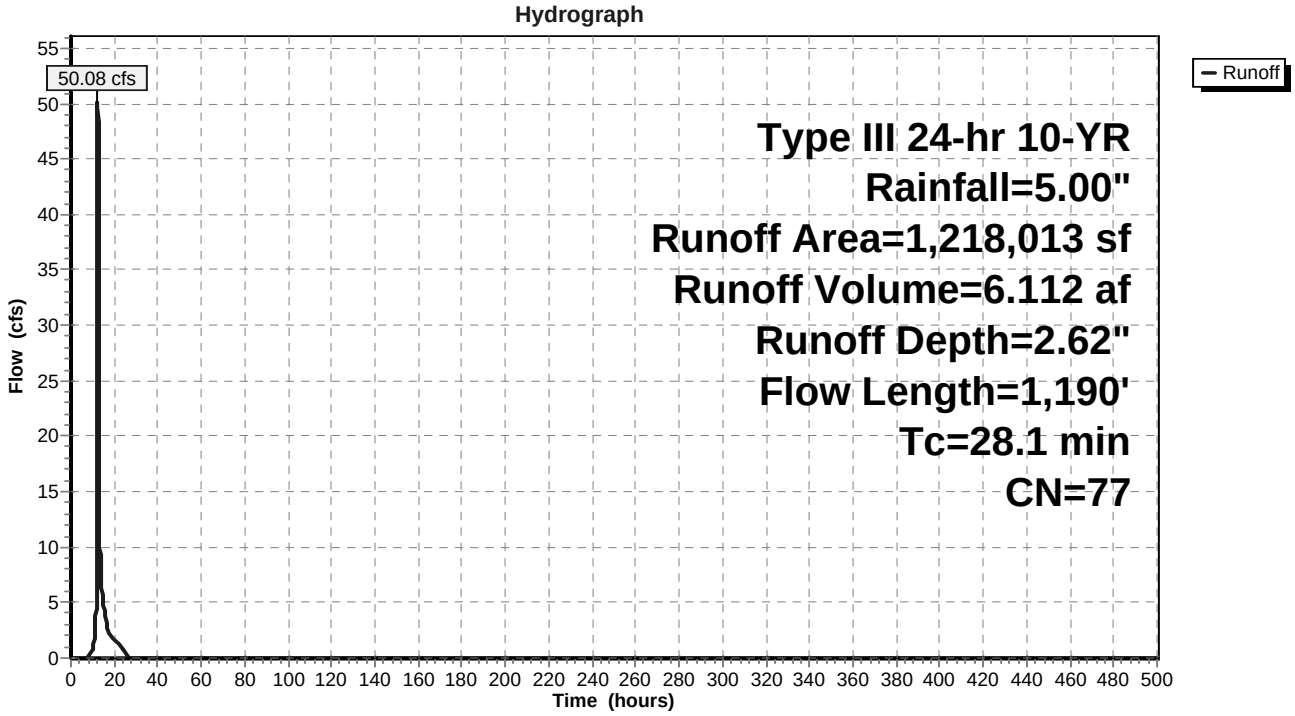
Runoff = 50.08 cfs @ 12.40 hrs, Volume= 6.112 af, Depth= 2.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.00"

	Area (sf)	CN	Description
	3,751	56	Brush, Fair, HSG B
	3,034	55	Woods, Good, HSG B
	192,194	89	Gravel roads, HSG C
	7,372	70	Brush, Fair, HSG C
	858,494	73	Woods, Fair, HSG C
	29,750	98	Paved parking, HSG C
	31,009	77	Woods, Good, HSG D
*	53,016	76	Gravel/Brush Mix, HSG B
	15,977	85	Gravel roads, HSG B
	14,855	91	Gravel roads, HSG D
	3,028	61	>75% Grass cover, Good, HSG B
	5,533	74	>75% Grass cover, Good, HSG C
	1,218,013	77	Weighted Average
	1,188,263		97.56% Pervious Area
	29,750		2.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.1200	0.10		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.50"
2.4	250	0.1200	1.73		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.6	430	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.6	410	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
28.1	1,190	Total			

Subcatchment PS-2.1:



Summary for Subcatchment PS-2.2:

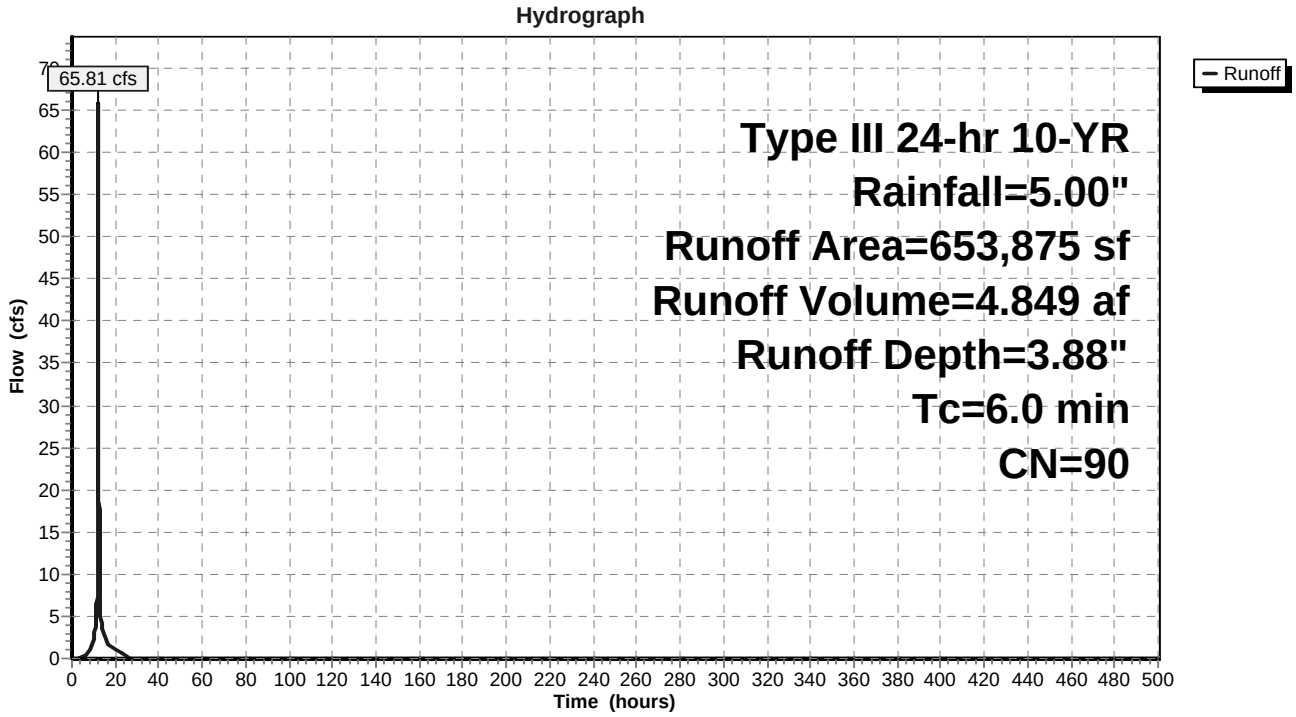
Runoff = 65.81 cfs @ 12.09 hrs, Volume= 4.849 af, Depth= 3.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.00"

Area (sf)	CN	Description
65,818	89	Gravel roads, HSG C
18,237	91	Gravel roads, HSG D
20,546	61	>75% Grass cover, Good, HSG B
240,237	85	Gravel roads, HSG B
20,235	74	>75% Grass cover, Good, HSG C
30,655	98	Water Surface, HSG B
143,453	98	Roofs, HSG A
102,225	98	Paved parking, HSG A
12,469	80	>75% Grass cover, Good, HSG D
653,875	90	Weighted Average
377,542		57.74% Pervious Area
276,333		42.26% Impervious Area

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

Subcatchment PS-2.2:



Summary for Subcatchment PS-2.3:

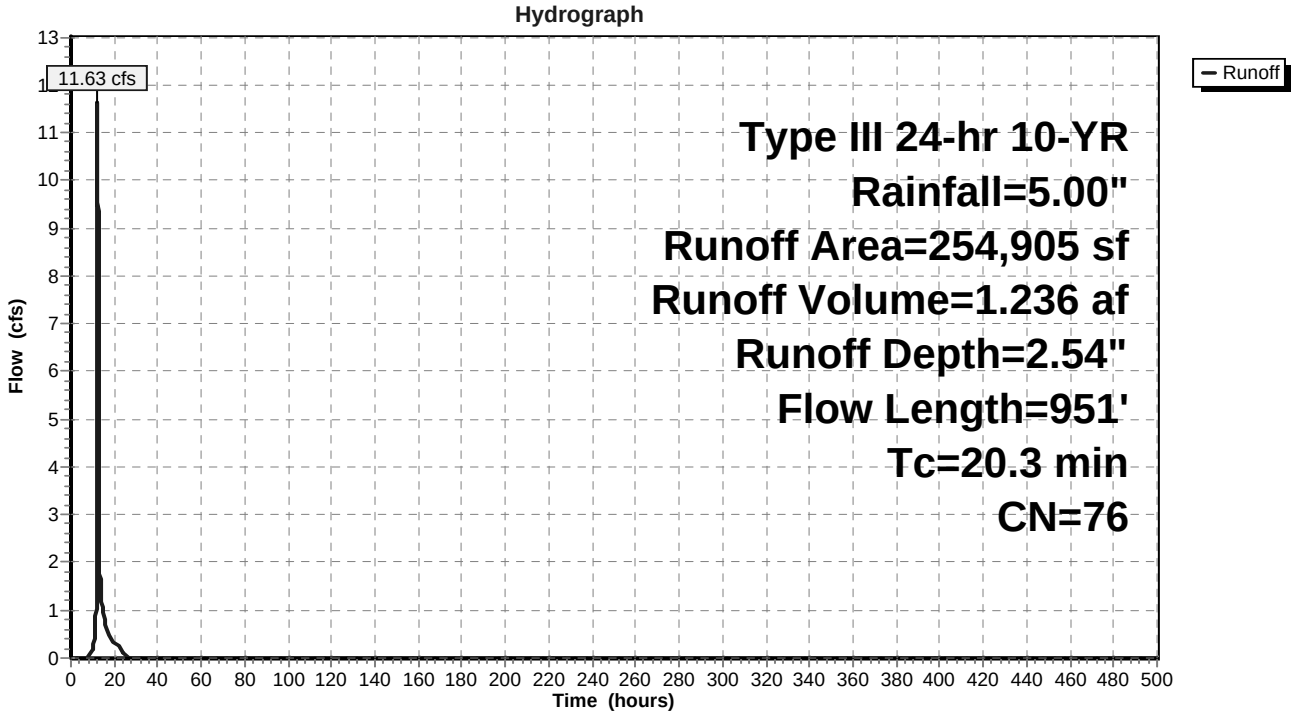
Runoff = 11.63 cfs @ 12.29 hrs, Volume= 1.236 af, Depth= 2.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.00"

Area (sf)	CN	Description
81,119	74	>75% Grass cover, Good, HSG C
27,727	98	Paved parking, HSG A
120,312	73	Woods, Fair, HSG C
17,305	70	Brush, Fair, HSG C
8,442	89	Gravel roads, HSG C
254,905	76	Weighted Average
227,178		89.12% Pervious Area
27,727		10.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0500	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
1.2	135	0.1480	1.92		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.0	168	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	95	0.0320	3.63		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	453	0.0730	15.23	203.08	**Parabolic Channel,** W=10.00' D=2.00' Area=13.3 sf Perim=11.0' n= 0.030 Earth, grassed & winding
20.3	951	Total			

Subcatchment PS-2.3:



Summary for Subcatchment PS-2.4:

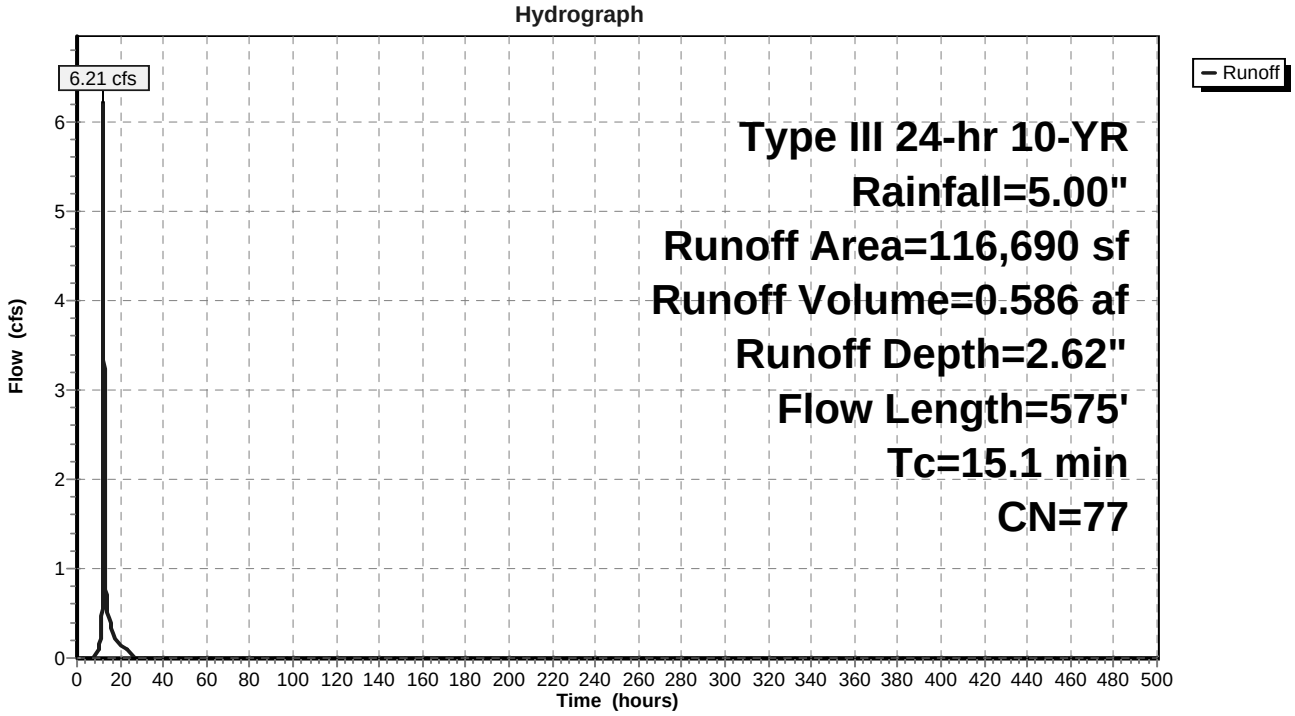
Runoff = 6.21 cfs @ 12.21 hrs, Volume= 0.586 af, Depth= 2.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.00"

Area (sf)	CN	Description
86,696	73	Woods, Fair, HSG C
13,423	74	>75% Grass cover, Good, HSG C
16,571	98	Paved parking, HSG C
116,690	77	Weighted Average
100,119		85.80% Pervious Area
16,571		14.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	20	0.0200	1.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.50"
10.9	80	0.0625	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
3.8	295	0.0661	1.29		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	180	0.0722	21.12	563.30	**Parabolic Channel,** W=10.00' D=4.00' Area=26.7 sf Perim=13.3' n= 0.030 Earth, grassed & winding
15.1	575	Total			

Subcatchment PS-2.4:



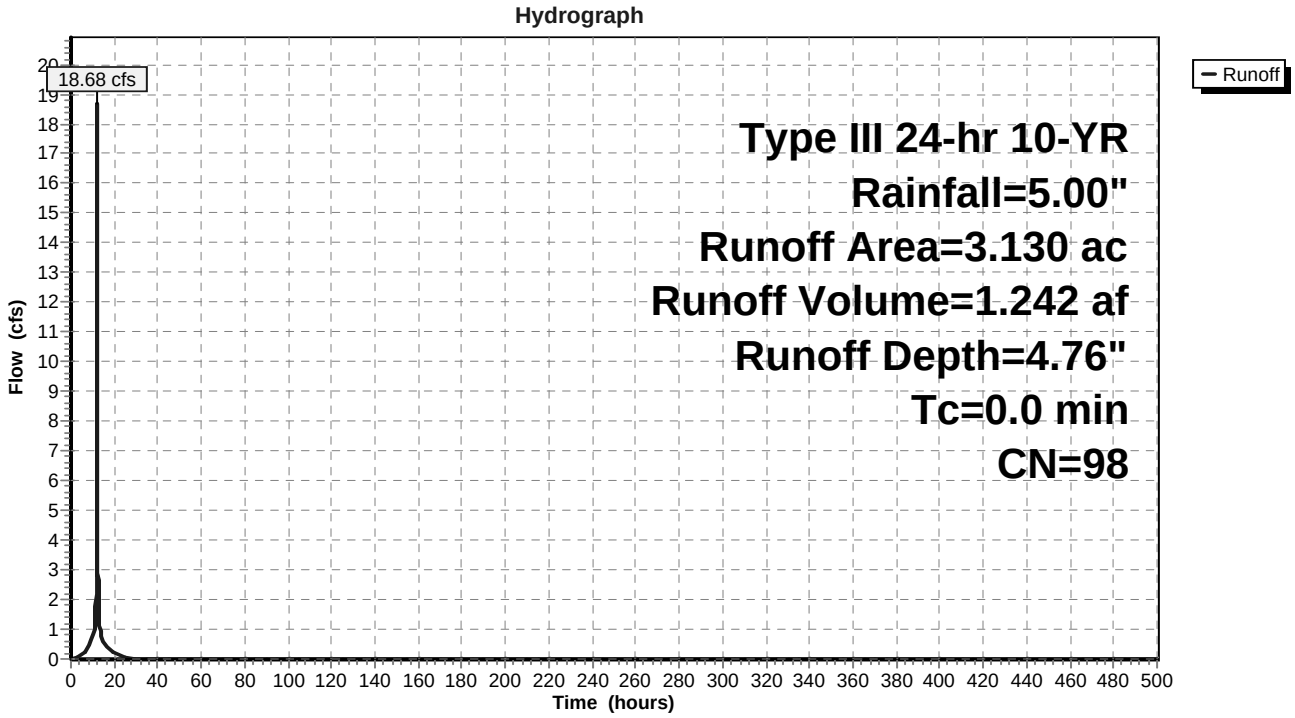
y for Subcatchment RRv: CAPTURED ROOFS & SURFACES REUSED WITH THE CRICKET VALLEY ENE

Runoff = 18.68 cfs @ 12.00 hrs, Volume= 1.242 af, Depth= 4.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.00"

Area (ac)	CN	Description
3.130	98	Paved parking, HSG A
3.130		100.00% Impervious Area

ubcatchment RRv: CAPTURED ROOFS & SURFACES REUSED WITH THE CRICKET VALLEY ENERGY PI

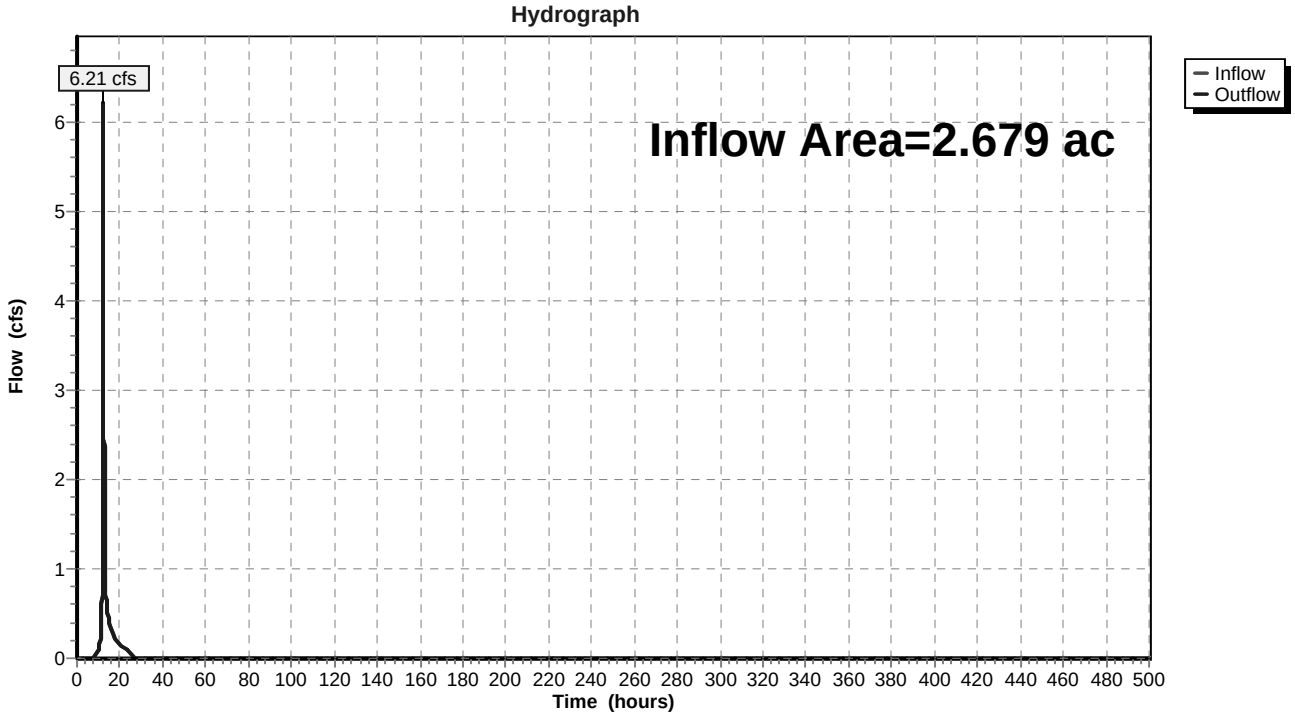


Summary for Reach 3R: Pipes

Inflow Area = 2.679 ac, 14.20% Impervious, Inflow Depth = 2.62" for 10-YR event
Inflow = 6.21 cfs @ 12.21 hrs, Volume= 0.586 af
Outflow = 6.21 cfs @ 12.21 hrs, Volume= 0.586 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs

Reach 3R: Pipes

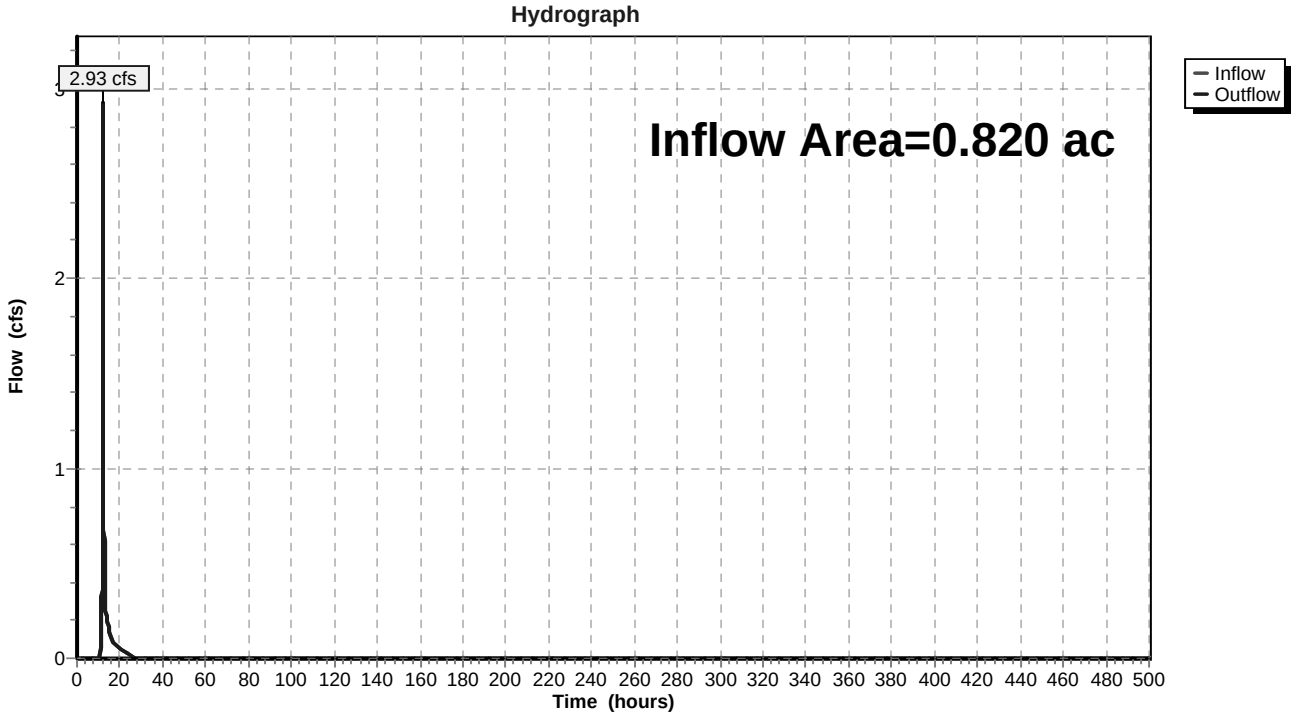


Summary for Reach 6R:

Inflow Area = 0.820 ac, 8.88% Impervious, Inflow Depth = 2.98" for 10-YR event
Inflow = 2.93 cfs @ 12.13 hrs, Volume= 0.204 af
Outflow = 2.93 cfs @ 12.13 hrs, Volume= 0.204 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs

Reach 6R:



Summary for Pond 1A: Plunge Pool F-1

Inflow Area = 0.820 ac, 8.88% Impervious, Inflow Depth = 3.27" for 10-YR event
Inflow = 3.12 cfs @ 12.09 hrs, Volume= 0.224 af
Outflow = 3.10 cfs @ 12.10 hrs, Volume= 0.224 af, Atten= 1%, Lag= 0.6 min
Primary = 3.10 cfs @ 12.10 hrs, Volume= 0.224 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Starting Elev= 430.50' Surf.Area= 631 sf Storage= 904 cf
Peak Elev= 430.76' @ 12.10 hrs Surf.Area= 708 sf Storage= 1,075 cf (171 cf above start)
Flood Elev= 431.50' Surf.Area= 952 sf Storage= 1,690 cf (786 cf above start)

Plug-Flow detention time= 69.0 min calculated for 0.203 af (91% of inflow)
Center-of-Mass det. time= 1.8 min (812.4 - 810.5)

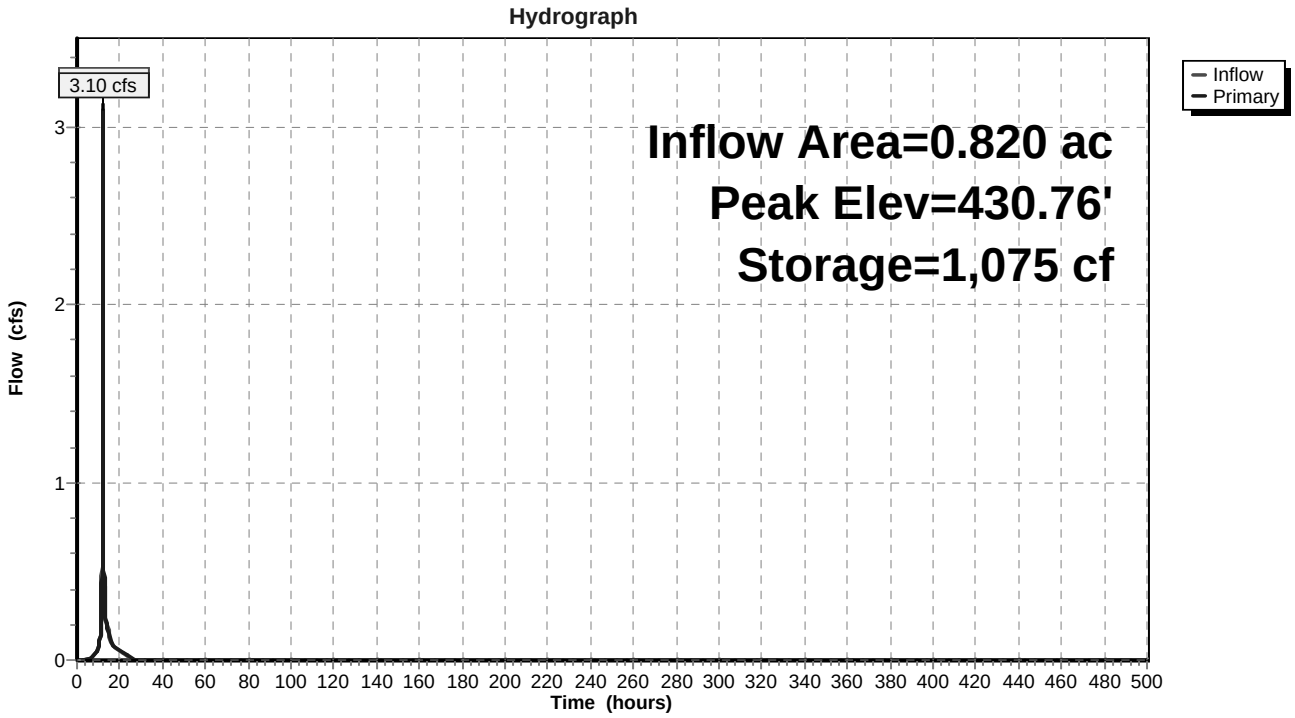
Volume	Invert	Avail.Storage	Storage Description
#1	427.00'	1,690 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
427.00	18	0	0
428.00	106	62	62
429.00	264	185	247
430.00	489	377	624
430.50	631	280	904
431.00	781	353	1,257
431.50	952	433	1,690

Device	Routing	Invert	Outlet Devices
#1	Primary	430.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.08 cfs @ 12.10 hrs HW=430.76' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 3.08 cfs @ 1.21 fps)

Pond 1A: Plunge Pool F-1



Summary for Pond 2A: Plunge Pool F-2

Inflow Area = 1.874 ac, 27.04% Impervious, Inflow Depth = 3.67" for 10-YR event
Inflow = 7.87 cfs @ 12.09 hrs, Volume= 0.573 af
Outflow = 7.69 cfs @ 12.10 hrs, Volume= 0.573 af, Atten= 2%, Lag= 1.1 min
Primary = 7.69 cfs @ 12.10 hrs, Volume= 0.573 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Starting Elev= 428.75' Surf.Area= 1,593 sf Storage= 3,229 cf
Peak Elev= 429.20' @ 12.10 hrs Surf.Area= 1,844 sf Storage= 4,000 cf (770 cf above start)
Flood Elev= 430.00' Surf.Area= 2,316 sf Storage= 5,666 cf (2,437 cf above start)

Plug-Flow detention time= 92.1 min calculated for 0.499 af (87% of inflow)
Center-of-Mass det. time= 3.4 min (801.3 - 797.9)

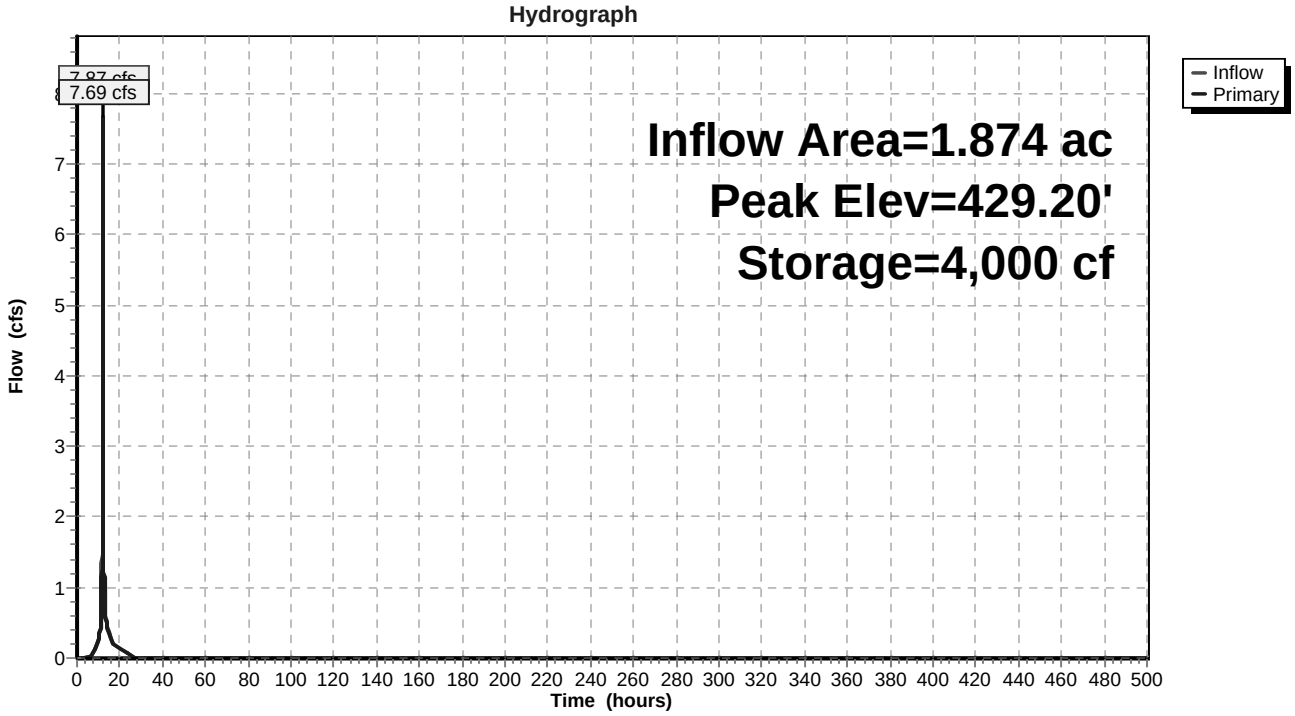
Volume	Invert	Avail.Storage	Storage Description
#1	424.00'	5,666 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
424.00	76	0	0
425.00	234	155	155
426.00	479	357	512
427.00	809	644	1,156
428.00	1,225	1,017	2,173
428.75	1,593	1,057	3,229
429.00	1,727	415	3,644
430.00	2,316	2,022	5,666

Device	Routing	Invert	Outlet Devices
#1	Primary	428.75'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=7.65 cfs @ 12.10 hrs HW=429.20' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 7.65 cfs @ 1.71 fps)

Pond 2A: Plunge Pool F-2



Summary for Pond 3A: Plunge Pool F-3

Inflow Area = 5.852 ac, 10.88% Impervious, Inflow Depth = 2.54" for 10-YR event
Inflow = 11.63 cfs @ 12.29 hrs, Volume= 1.236 af
Outflow = 11.61 cfs @ 12.30 hrs, Volume= 1.197 af, Atten= 0%, Lag= 0.5 min
Primary = 11.61 cfs @ 12.30 hrs, Volume= 1.197 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Peak Elev= 439.57' @ 12.30 hrs Surf.Area= 1,413 sf Storage= 2,445 cf
Flood Elev= 440.00' Surf.Area= 1,631 sf Storage= 3,095 cf

Plug-Flow detention time= 27.3 min calculated for 1.197 af (97% of inflow)
Center-of-Mass det. time= 9.2 min (854.7 - 845.6)

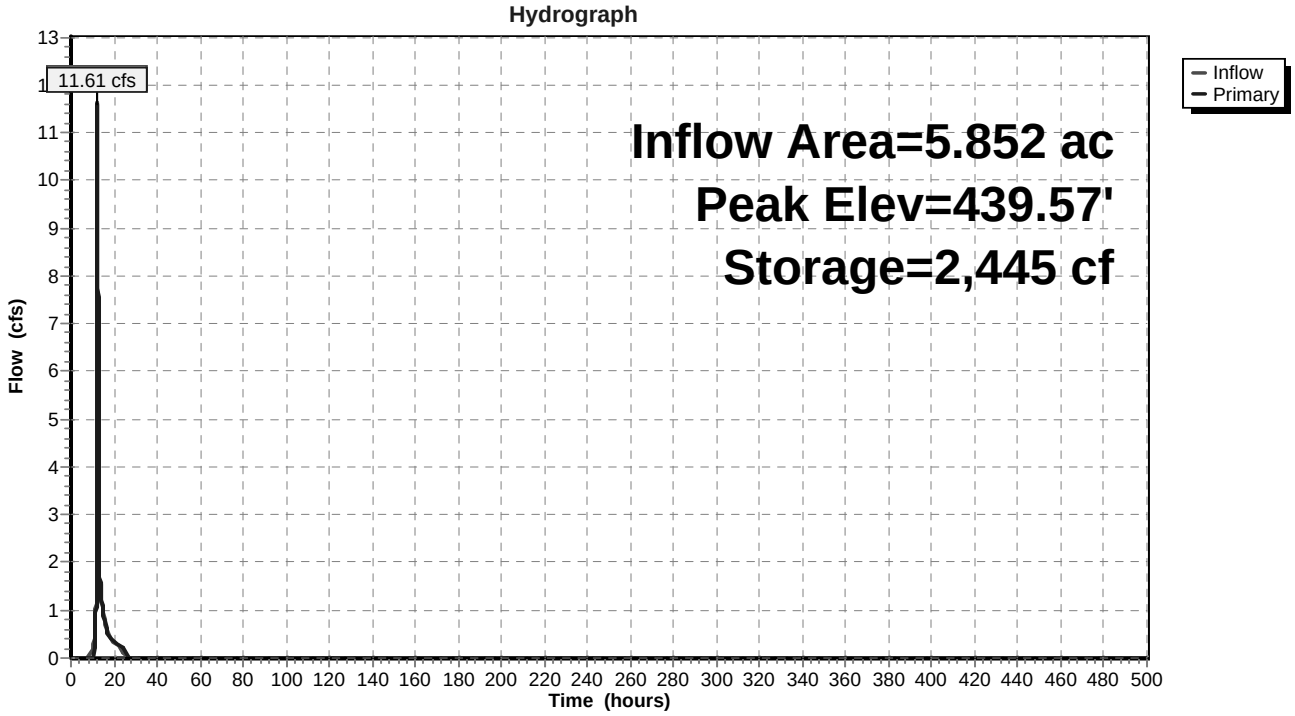
Volume	Invert	Avail.Storage	Storage Description
#1	435.00'	3,095 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
435.00	13	0	0
436.00	115	64	64
437.00	347	231	295
438.00	691	519	814
439.00	1,120	906	1,720
440.00	1,631	1,376	3,095

Device	Routing	Invert	Outlet Devices
#1	Primary	439.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=11.59 cfs @ 12.30 hrs HW=439.57' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 11.59 cfs @ 2.02 fps)

Pond 3A: Plunge Pool F-3



Summary for Pond 4P: Storage at Box Culvert

Inflow Area = 24.770 ac, 7.04% Impervious, Inflow Depth = 2.36" for 10-YR event
Inflow = 44.31 cfs @ 12.34 hrs, Volume= 4.880 af
Outflow = 43.96 cfs @ 12.36 hrs, Volume= 4.880 af, Atten= 1%, Lag= 1.4 min
Primary = 43.96 cfs @ 12.36 hrs, Volume= 4.880 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Peak Elev= 434.45' @ 12.36 hrs Surf.Area= 4,276 sf Storage= 3,722 cf

Plug-Flow detention time= 0.9 min calculated for 4.879 af (100% of inflow)
Center-of-Mass det. time= 0.9 min (857.7 - 856.8)

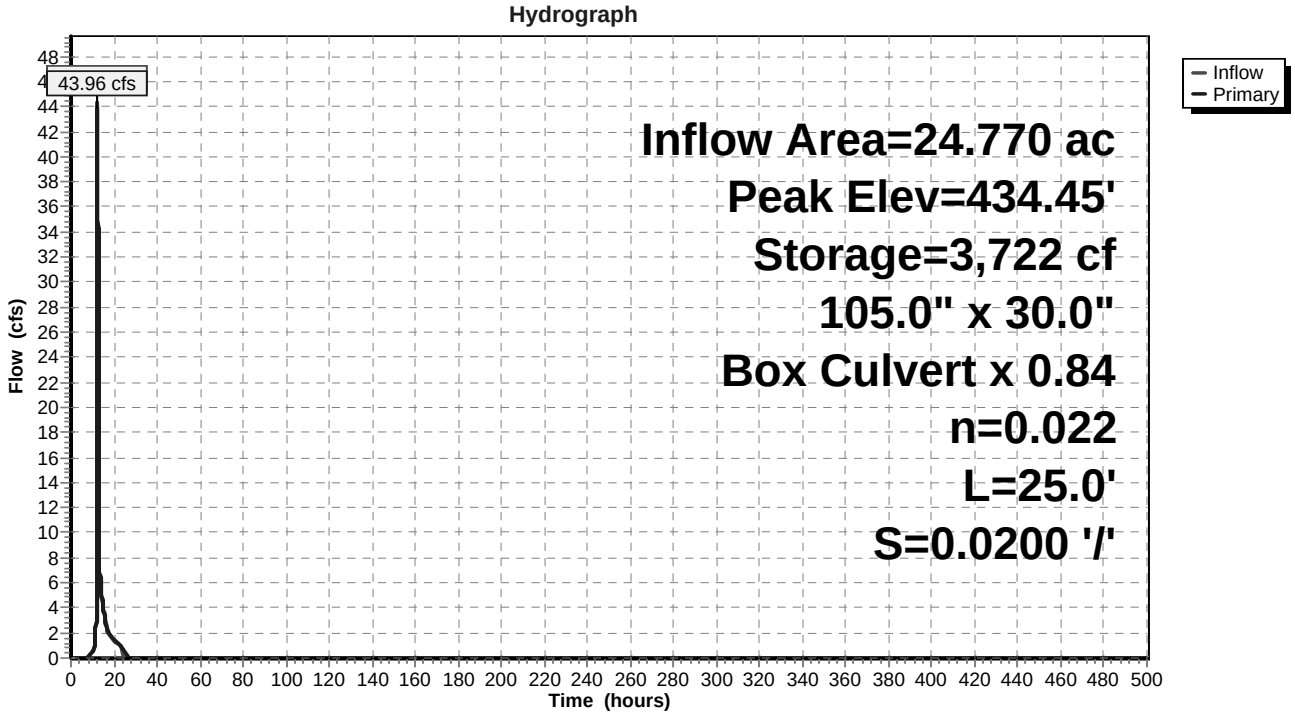
Volume	Invert	Avail.Storage	Storage Description
#1	433.00'	27,483 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
433.00	0	0	0
434.00	3,825	1,913	1,913
435.00	4,835	4,330	6,243
435.50	5,362	2,549	8,792
436.00	69,402	18,691	27,483

Device	Routing	Invert	Outlet Devices
#1	Primary	433.00'	**105.0" W x 30.0" H Box Culvert X 0.84** L= 25.0' Box, 30-75° wingwalls, square crown, Ke= 0.400 Inlet / Outlet Invert= 433.00' / 432.50' S= 0.0200 '/' Cc= 0.900 n= 0.022 Earth, clean & straight

Primary OutFlow Max=43.95 cfs @ 12.36 hrs HW=434.45' (Free Discharge)
└─**1=Culvert** (Barrel Controls 43.95 cfs @ 4.63 fps)

Pond 4P: Storage at Box Culvert



Summary for Pond EW-1: EXISTING NYSDEC JURISDICTIONAL WETLAND

Inflow Area = 81.411 ac, 4.35% Impervious, Inflow Depth = 2.46" for 10-YR event
Inflow = 88.73 cfs @ 12.59 hrs, Volume= 16.667 af
Outflow = 26.71 cfs @ 13.86 hrs, Volume= 8.105 af, Atten= 70%, Lag= 76.7 min
Primary = 26.71 cfs @ 13.86 hrs, Volume= 8.105 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Peak Elev= 422.10' @ 13.86 hrs Surf.Area= 311,855 sf Storage= 405,117 cf

Plug-Flow detention time= 280.9 min calculated for 8.105 af (49% of inflow)
Center-of-Mass det. time= 156.5 min (1,029.2 - 872.7)

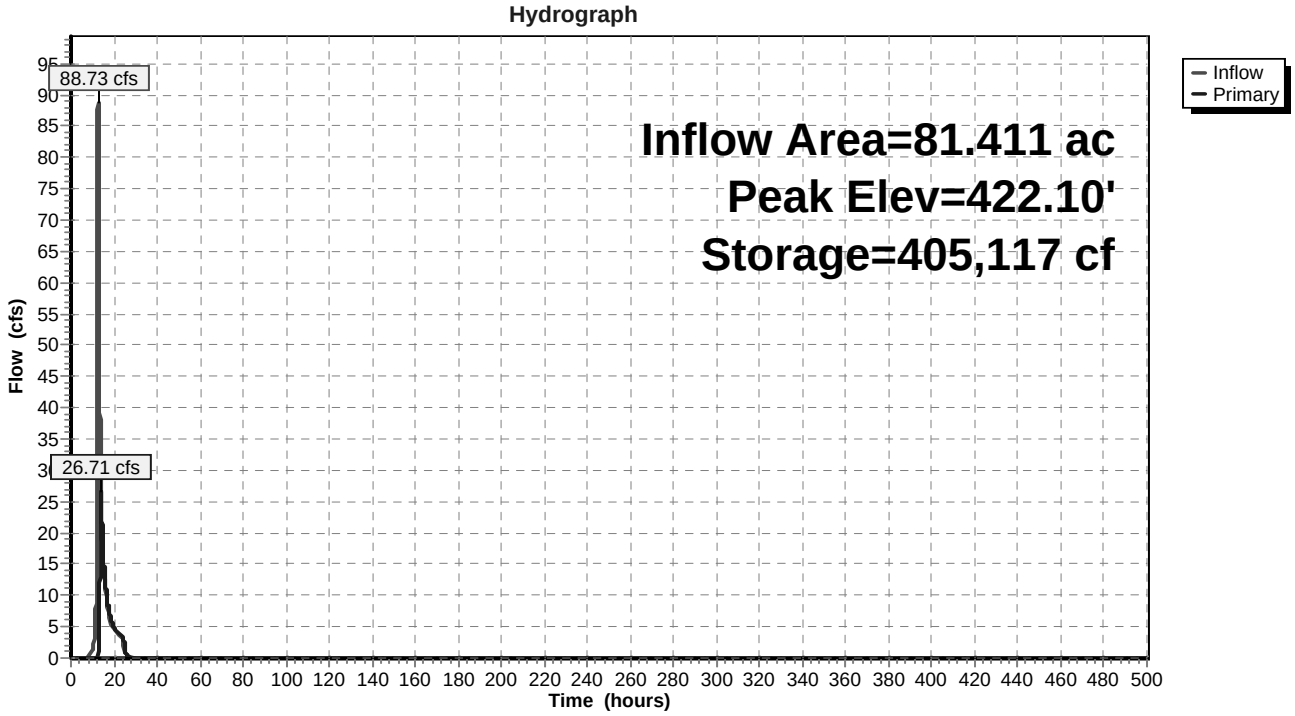
Volume	Invert	Avail.Storage	Storage Description
#1	419.80'	688,314 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
419.80	0	0	0
420.00	64,917	6,492	6,492
421.00	178,530	121,724	128,215
422.00	310,941	244,736	372,951
423.00	319,785	315,363	688,314

Device	Routing	Invert	Outlet Devices
#1	Primary	422.00'	**300.0' long x 20.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=26.69 cfs @ 13.86 hrs HW=422.10' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 26.69 cfs @ 0.86 fps)

Pond EW-1: EXISTING NYSDEC JURISDICTIONAL WETLAND



Summary for Pond F-1: Bioretention Area #1

Inflow Area = 0.820 ac, 8.88% Impervious, Inflow Depth = 3.27" for 10-YR event
Inflow = 3.10 cfs @ 12.10 hrs, Volume= 0.224 af
Outflow = 2.93 cfs @ 12.13 hrs, Volume= 0.204 af, Atten= 6%, Lag= 1.7 min
Secondary = 2.93 cfs @ 12.13 hrs, Volume= 0.204 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Peak Elev= 430.74' @ 12.13 hrs Surf.Area= 1,982 sf Storage= 1,324 cf
Flood Elev= 431.50' Surf.Area= 2,412 sf Storage= 2,987 cf

Plug-Flow detention time= 70.1 min calculated for 0.204 af (91% of inflow)
Center-of-Mass det. time= 25.7 min (838.1 - 812.4)

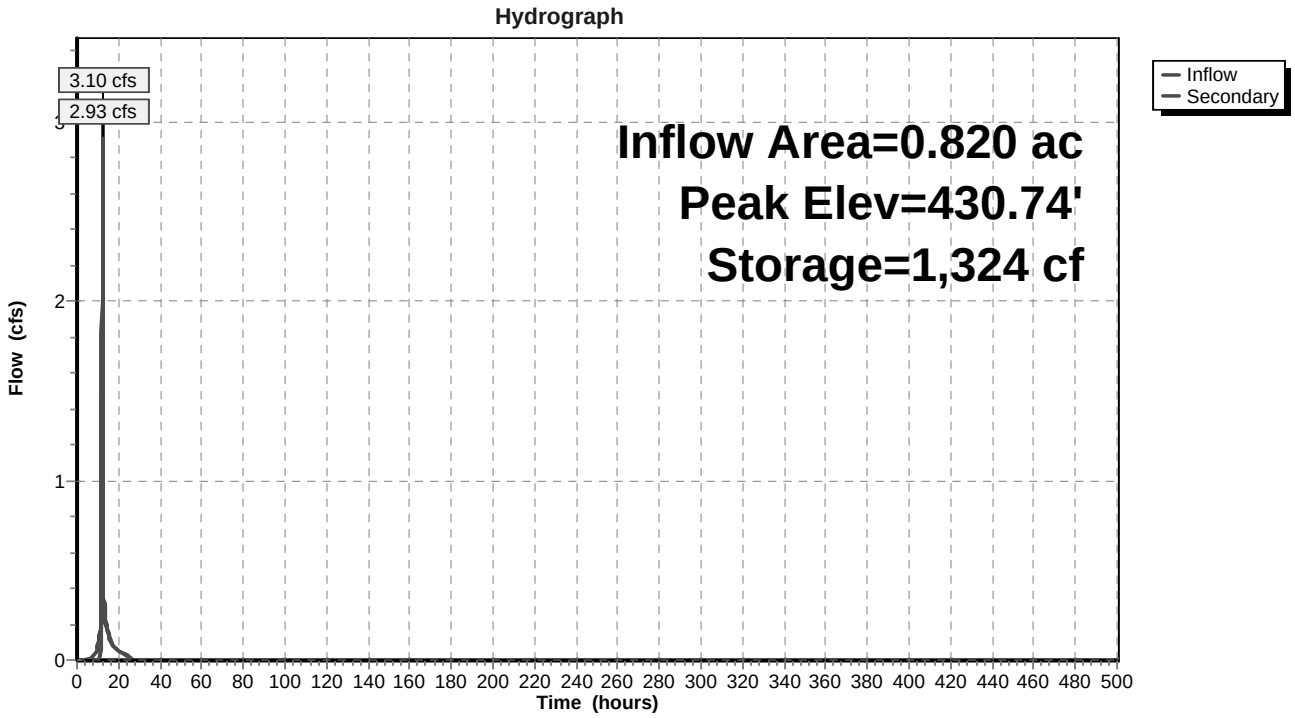
Volume	Invert	Avail.Storage	Storage Description
#1	430.00'	2,987 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
430.00	1,589	0	0
430.50	1,849	860	860
431.00	2,124	993	1,853
431.50	2,412	1,134	2,987

Device	Routing	Invert	Outlet Devices
#1	Secondary	430.50'	**10.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Secondary OutFlow Max=2.92 cfs @ 12.13 hrs HW=430.74' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 2.92 cfs @ 1.21 fps)

Pond F-1: Bioretention Area #1



Summary for Pond F-2: Bioretention Area #2

Inflow Area = 1.874 ac, 27.04% Impervious, Inflow Depth = 3.67" for 10-YR event
Inflow = 7.69 cfs @ 12.10 hrs, Volume= 0.573 af
Outflow = 6.33 cfs @ 12.16 hrs, Volume= 0.573 af, Atten= 18%, Lag= 3.5 min
Primary = 6.33 cfs @ 12.16 hrs, Volume= 0.573 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Starting Elev= 428.75' Surf.Area= 6,983 sf Storage= 1,706 cf
Peak Elev= 429.11' @ 12.16 hrs Surf.Area= 7,413 sf Storage= 4,284 cf (2,579 cf above start)
Flood Elev= 430.00' Surf.Area= 8,314 sf Storage= 11,301 cf (9,595 cf above start)

Plug-Flow detention time= 69.4 min calculated for 0.534 af (93% of inflow)
Center-of-Mass det. time= 14.5 min (815.8 - 801.3)

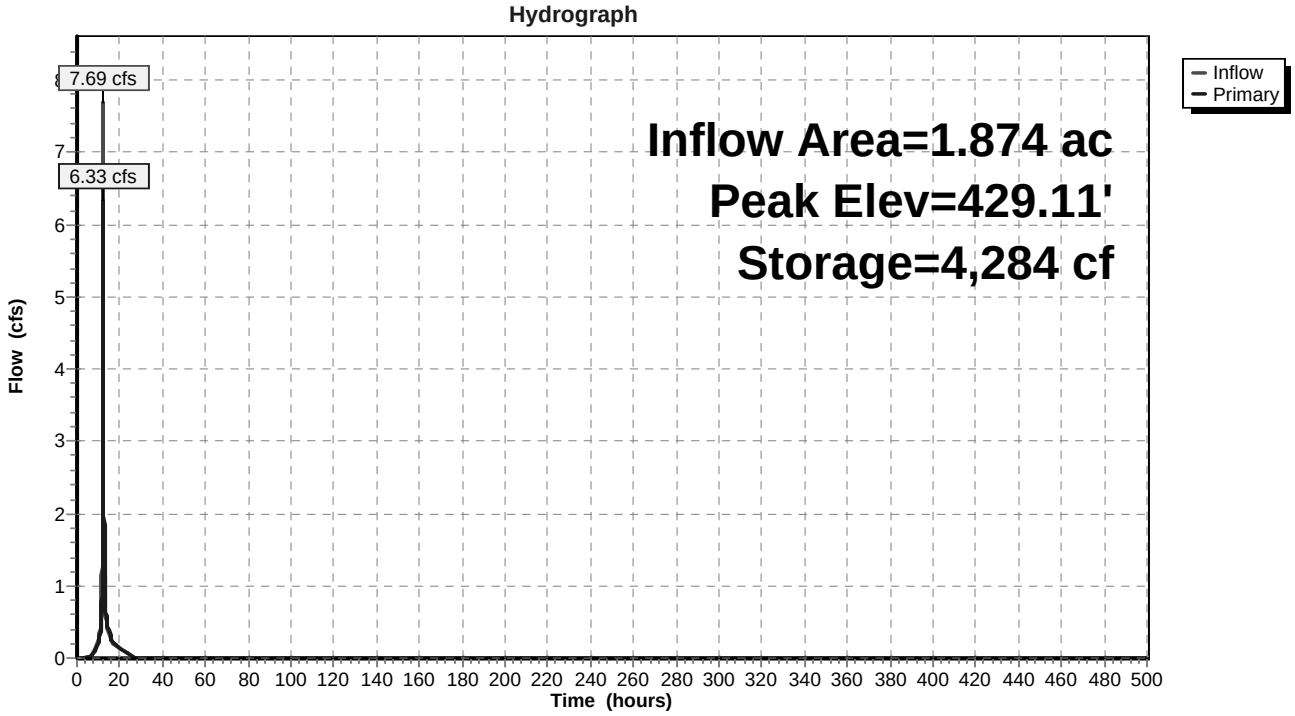
Volume	Invert	Avail.Storage	Storage Description
#1	428.50'	11,301 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
428.50	6,662	0	0
429.00	7,304	3,492	3,492
430.00	8,314	7,809	11,301

Device	Routing	Invert	Outlet Devices
#1	Primary	428.75'	**12.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=6.33 cfs @ 12.16 hrs HW=429.11' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 6.33 cfs @ 1.47 fps)

Pond F-2: Bioretention Area #2



Summary for Pond F-3: Bioretention Area #3

Inflow Area = 5.852 ac, 10.88% Impervious, Inflow Depth = 2.45" for 10-YR event
Inflow = 11.61 cfs @ 12.30 hrs, Volume= 1.197 af
Outflow = 11.32 cfs @ 12.34 hrs, Volume= 1.152 af, Atten= 2%, Lag= 2.6 min
Primary = 11.32 cfs @ 12.34 hrs, Volume= 1.152 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Peak Elev= 439.56' @ 12.34 hrs Surf.Area= 4,903 sf Storage= 4,519 cf
Flood Elev= 440.00' Surf.Area= 5,442 sf Storage= 6,774 cf

Plug-Flow detention time= 34.2 min calculated for 1.152 af (96% of inflow)
Center-of-Mass det. time= 13.4 min (868.1 - 854.7)

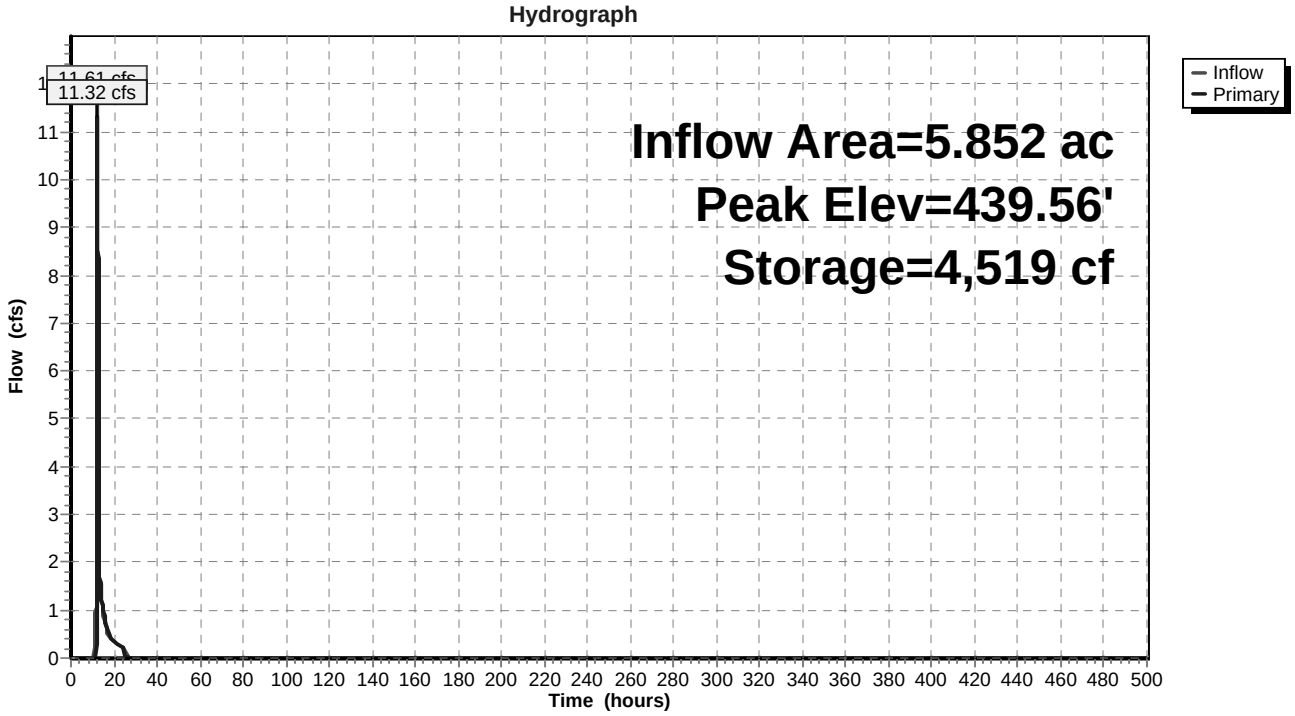
Volume	Invert	Avail.Storage	Storage Description
#1	438.50'	6,774 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
438.50	3,592	0	0
439.00	4,206	1,950	1,950
440.00	5,442	4,824	6,774

Device	Routing	Invert	Outlet Devices
#1	Primary	439.00'	**10.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=11.32 cfs @ 12.34 hrs HW=439.56' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 11.32 cfs @ 2.01 fps)

Pond F-3: Bioretention Area #3



Summary for Pond P-1: Wet Pond

Inflow Area = 17.690 ac, 38.01% Impervious, Inflow Depth = 3.69" for 10-YR event
Inflow = 69.93 cfs @ 12.09 hrs, Volume= 5.434 af
Outflow = 2.27 cfs @ 16.00 hrs, Volume= 5.434 af, Atten= 97%, Lag= 234.9 min
Primary = 2.27 cfs @ 16.00 hrs, Volume= 5.434 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Starting Elev= 422.00' Surf.Area= 30,655 sf Storage= 75,367 cf
Peak Elev= 426.23' @ 16.00 hrs Surf.Area= 47,978 sf Storage= 242,770 cf (167,403 cf above start)
Flood Elev= 429.00' Surf.Area= 59,091 sf Storage= 390,986 cf (315,619 cf above start)

Plug-Flow detention time= 1,913.1 min calculated for 3.704 af (68% of inflow)
Center-of-Mass det. time= 1,298.6 min (2,094.5 - 795.8)

Volume	Invert	Avail.Storage	Storage Description
#1	418.00'	452,178 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

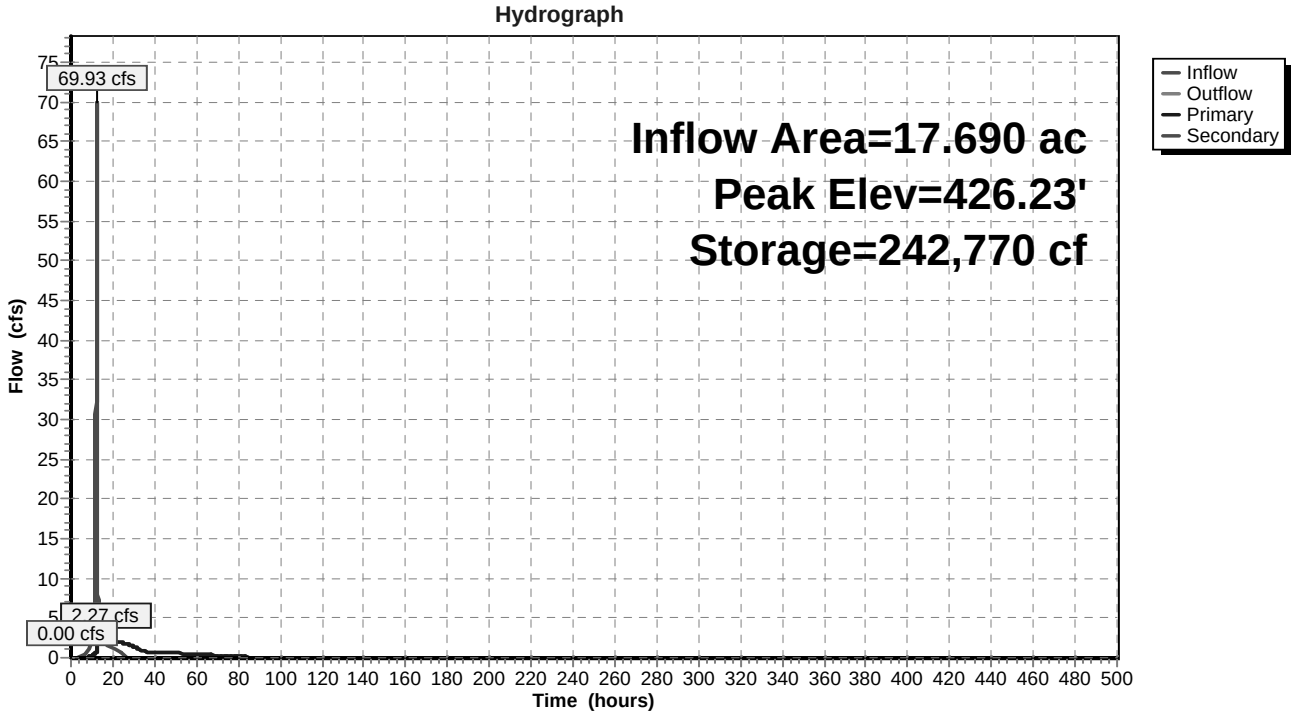
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
418.00	14,212	0	0
420.00	16,608	30,820	30,820
421.00	19,142	17,875	48,695
421.50	28,445	11,897	60,592
422.00	30,655	14,775	75,367
423.00	34,805	32,730	108,097
424.00	39,588	37,197	145,293
425.00	43,288	41,438	186,731
426.00	47,088	45,188	231,919
427.00	50,988	49,038	280,957
428.00	54,989	52,989	333,946
429.00	59,091	57,040	390,986
430.00	63,293	61,192	452,178

Device	Routing	Invert	Outlet Devices
#1	Primary	421.85'	**30.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 421.85' / 421.50' S= 0.0140 '/' Cc= 0.900 n= 0.013
#2	Device 1	422.00'	**4.4" Vert. Orifice/Grate** C= 0.600
#3	Device 1	424.24'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	426.50'	**2.5' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#5	Secondary	429.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir X 0.00** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.27 cfs @ 16.00 hrs HW=426.23' (Free Discharge)
└─**1=Culvert** (Passes 2.27 cfs of 33.00 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 1.02 cfs @ 9.68 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 1.25 cfs @ 6.35 fps)
  └─**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=422.00' (Free Discharge)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-1: Wet Pond

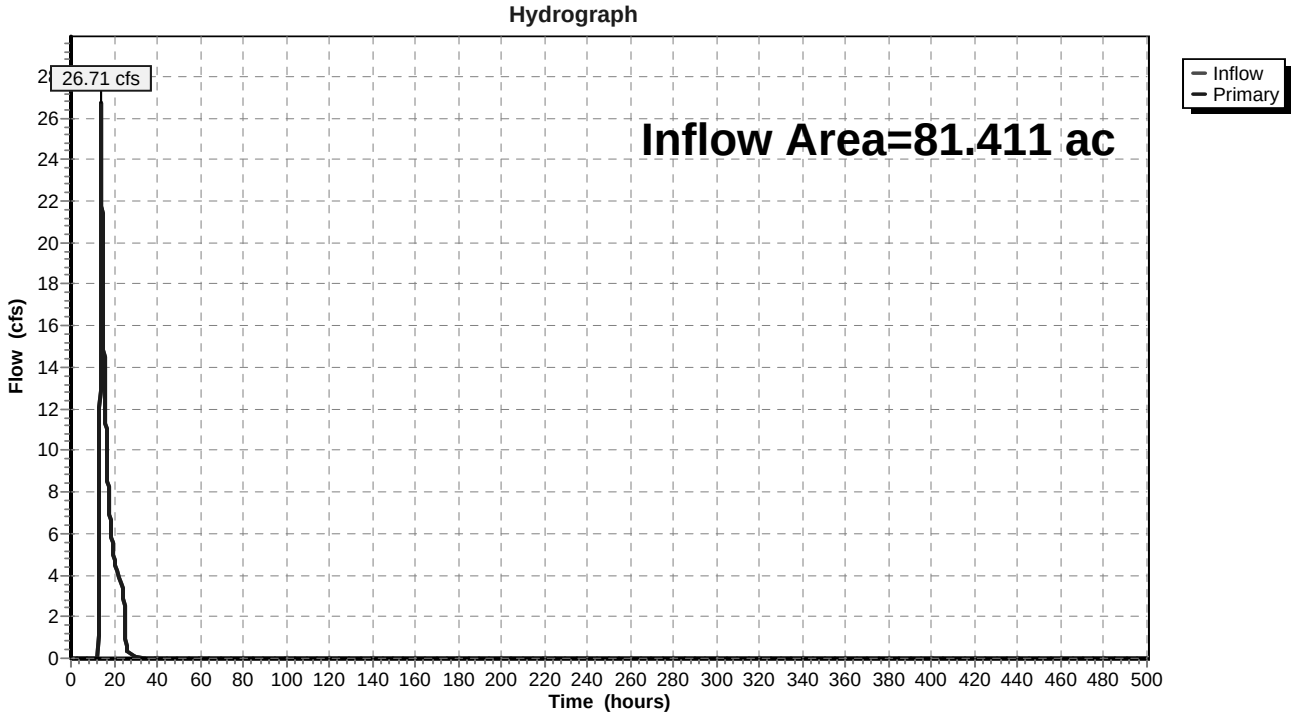


Summary for Pond zDP1: DESIGN POINT 1 (WETLAND)

Inflow Area = 81.411 ac, 4.35% Impervious, Inflow Depth = 1.19" for 10-YR event
Inflow = 26.71 cfs @ 13.86 hrs, Volume= 8.105 af
Primary = 26.71 cfs @ 13.86 hrs, Volume= 8.105 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs

Pond zDP1: DESIGN POINT 1 (WETLAND)

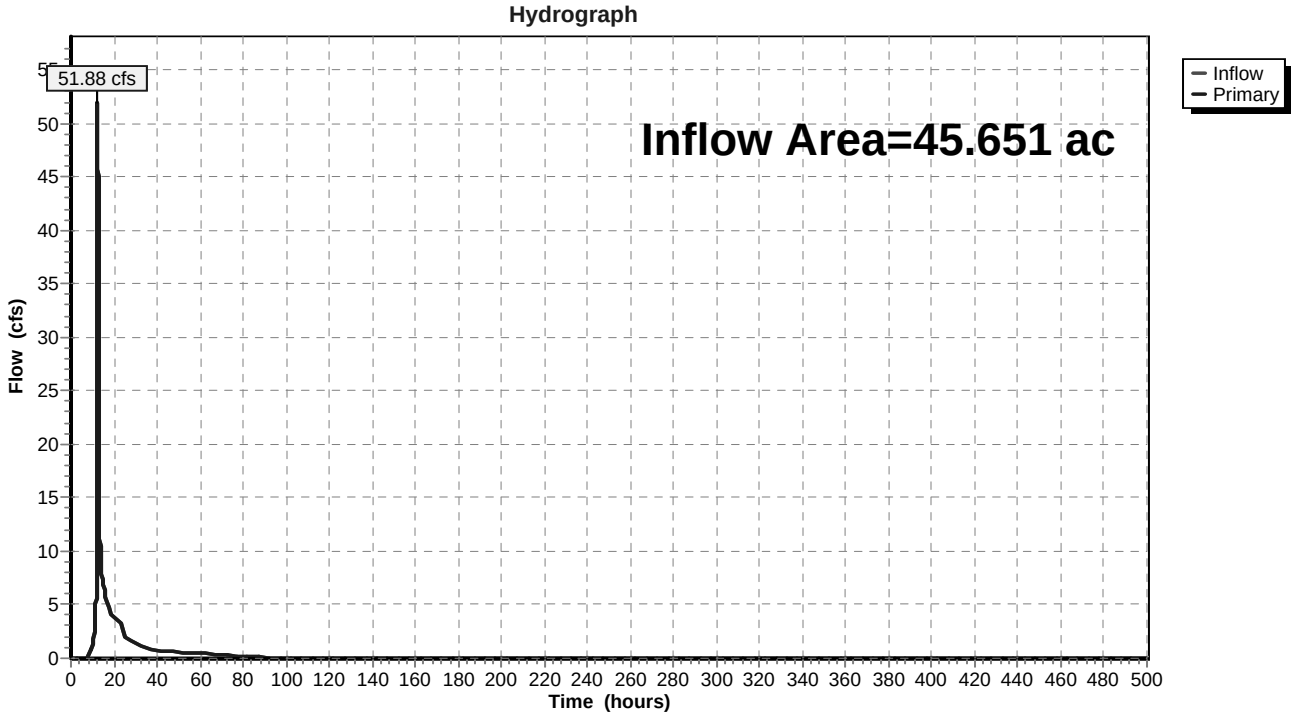


Summary for Pond zDP2: DESIGN POINT 2 (36" RCP CULVERT)

Inflow Area = 45.651 ac, 16.23% Impervious, Inflow Depth = 3.04" for 10-YR event
Inflow = 51.88 cfs @ 12.40 hrs, Volume= 11.546 af
Primary = 51.88 cfs @ 12.40 hrs, Volume= 11.546 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs

Pond zDP2: DESIGN POINT 2 (36" RCP CULVERT)



Time span=0.00-500.00 hrs, dt=0.01 hrs, 50001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PS-1.1: Runoff Area=2,349,900 sf 2.26% Impervious Runoff Depth=5.04"
Flow Length=3,203' Tc=57.8 min CN=75 Runoff=128.68 cfs 22.665 af

Subcatchment PS-1.2: Runoff Area=824,088 sf 5.85% Impervious Runoff Depth=4.93"
Flow Length=1,595' Tc=23.1 min CN=74 Runoff=69.19 cfs 7.766 af

Subcatchment PS-1.3: Runoff Area=35,738 sf 8.88% Impervious Runoff Depth=6.10"
Tc=6.0 min CN=84 Runoff=5.68 cfs 0.417 af

Subcatchment PS-1.4: Runoff Area=81,628 sf 27.04% Impervious Runoff Depth=6.57"
Tc=6.0 min CN=88 Runoff=13.68 cfs 1.026 af

Subcatchment PS-2.1: Runoff Area=1,218,013 sf 2.44% Impervious Runoff Depth=5.27"
Flow Length=1,190' Tc=28.1 min CN=77 Runoff=100.27 cfs 12.290 af

Subcatchment PS-2.2: Runoff Area=653,875 sf 42.26% Impervious Runoff Depth=6.81"
Tc=6.0 min CN=90 Runoff=111.97 cfs 8.513 af

Subcatchment PS-2.3: Runoff Area=254,905 sf 10.88% Impervious Runoff Depth=5.16"
Flow Length=951' Tc=20.3 min CN=76 Runoff=23.63 cfs 2.515 af

Subcatchment PS-2.4: Runoff Area=116,690 sf 14.20% Impervious Runoff Depth=5.27"
Flow Length=575' Tc=15.1 min CN=77 Runoff=12.45 cfs 1.177 af

Subcatchment RRv: CAPTURED ROOFS & Runoff Area=3.130 ac 100.00% Impervious Runoff Depth=7.76"
Tc=0.0 min CN=98 Runoff=29.99 cfs 2.024 af

Reach 3R: Pipes Inflow=12.45 cfs 1.177 af
Outflow=12.45 cfs 1.177 af

Reach 6R: Inflow=5.43 cfs 0.397 af
Outflow=5.43 cfs 0.397 af

Pond 1A: Plunge Pool F-1 Peak Elev=430.87' Storage=1,160 cf Inflow=5.68 cfs 0.417 af
Outflow=5.65 cfs 0.417 af

Pond 2A: Plunge Pool F-2 Peak Elev=429.38' Storage=4,339 cf Inflow=13.68 cfs 1.026 af
Outflow=13.42 cfs 1.026 af

Pond 3A: Plunge Pool F-3 Peak Elev=439.92' Storage=2,964 cf Inflow=23.63 cfs 2.515 af
Outflow=23.59 cfs 2.476 af

Pond 4P: Storage at Box Culvert Peak Elev=435.50' Storage=8,782 cf Inflow=92.25 cfs 10.197 af
105.0" x 30.0" Box Culvert x 0.84 n=0.022 L=25.0' S=0.0200 '/' Outflow=91.33 cfs 10.197 af

Pond EW-1: EXISTING NYSDEC Peak Elev=422.34' Storage=478,632 cf Inflow=183.79 cfs 34.284 af
Outflow=159.10 cfs 25.722 af

Pond F-1: Bioretention Area #1 Peak Elev=430.86' Storage=1,560 cf Inflow=5.65 cfs 0.417 af
Outflow=5.43 cfs 0.397 af

Pond F-2: Bioretention Area #2 Peak Elev=429.27' Storage=5,485 cf Inflow=13.42 cfs 1.026 af
Outflow=11.71 cfs 1.026 af

Pond F-3: Bioretention Area #3 Peak Elev=439.90' Storage=6,258 cf Inflow=23.59 cfs 2.476 af
Outflow=23.09 cfs 2.431 af

Pond P-1: Wet Pond Peak Elev=427.82' Storage=324,228 cf Inflow=120.54 cfs 9.691 af
Primary=14.05 cfs 9.691 af Secondary=0.00 cfs 0.000 af Outflow=14.05 cfs 9.691 af

Pond zDP1: DESIGN POINT 1 (WETLAND) Inflow=159.10 cfs 25.722 af
Primary=159.10 cfs 25.722 af

Pond zDP2: DESIGN POINT 2 (36" RCP CULVERT) Inflow=111.11 cfs 21.981 af
Primary=111.11 cfs 21.981 af

Total Runoff Area = 130.192 ac Runoff Volume = 58.393 af Average Runoff Depth = 5.38"
89.19% Pervious = 116.113 ac 10.81% Impervious = 14.079 ac

Summary for Subcatchment PS-1.1:

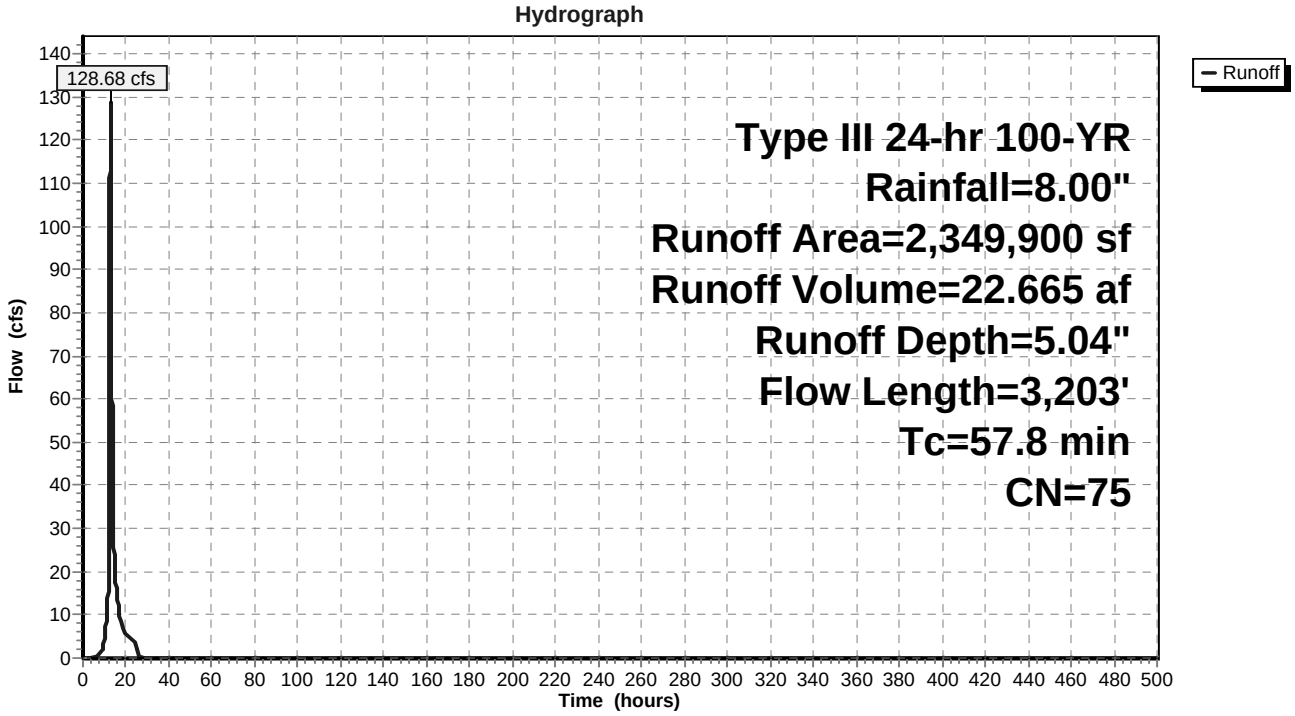
Runoff = 128.68 cfs @ 12.78 hrs, Volume= 22.665 af, Depth= 5.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.00"

Area (sf)	CN	Description
5,609	56	Brush, Fair, HSG B
219,739	70	Brush, Fair, HSG C
1,378,531	73	Woods, Fair, HSG C
99,805	74	>75% Grass cover, Good, HSG C
14,337	80	>75% Grass cover, Good, HSG D
14,067	89	Gravel roads, HSG C
304,723	77	Brush, Fair, HSG D
16,528	91	Gravel roads, HSG D
243,474	79	Woods, Fair, HSG D
53,087	98	Paved parking, HSG C
2,349,900	75	Weighted Average
2,296,813		97.74% Pervious Area
53,087		2.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.7	100	0.0785	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.50"
13.2	1,144	0.0839	1.45		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	60	0.0167	6.05	19.00	**Pipe Channel, PIPE CULVERT ON Rt. 22** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.020 Corrugated PE, corrugated interior
13.0	753	0.0372	0.96		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.5	256	0.0586	1.69		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.1	434	0.0415	1.02		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	456		6.95		**Lake or Reservoir,** Mean Depth= 1.50'
57.8	3,203	Total			

Subcatchment PS-1.1:



Summary for Subcatchment PS-1.2:

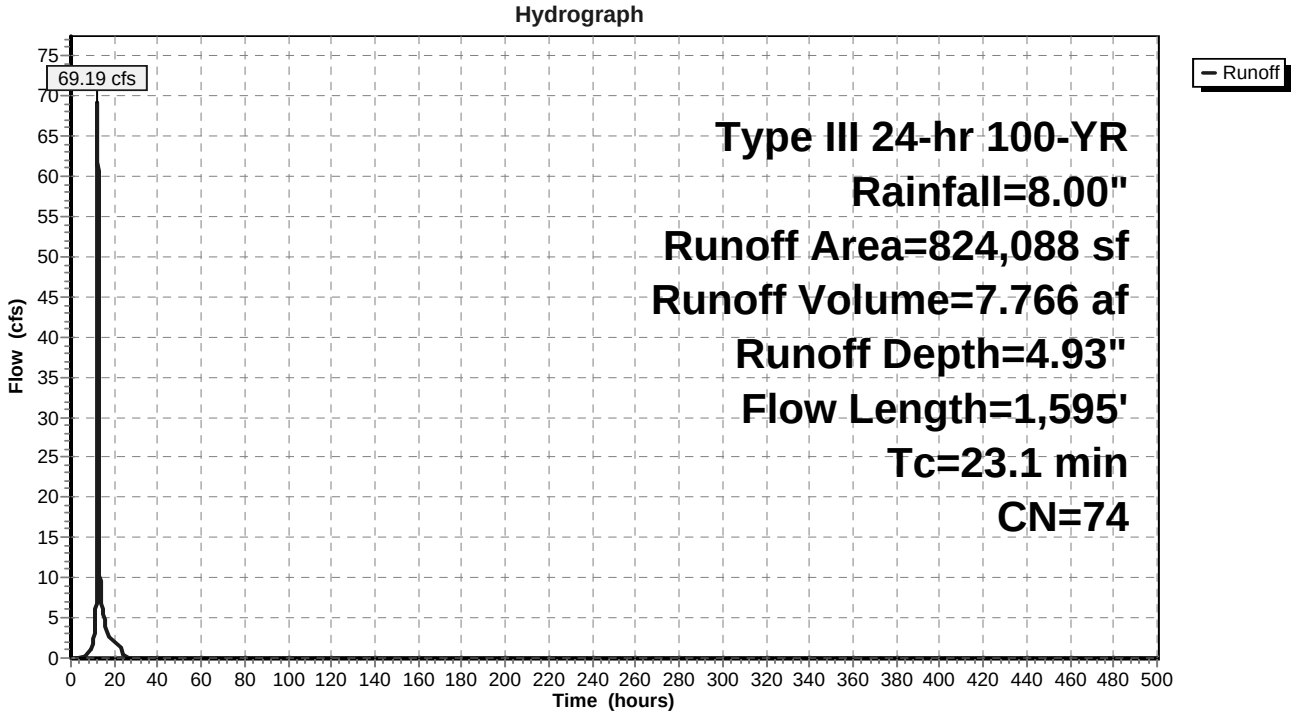
Runoff = 69.19 cfs @ 12.32 hrs, Volume= 7.766 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.00"

Area (sf)	CN	Description
476,732	73	Woods, Fair, HSG C
167,171	70	Brush, Fair, HSG C
58,454	77	Brush, Fair, HSG D
10,064	79	Woods, Fair, HSG D
57,883	74	>75% Grass cover, Good, HSG C
5,552	80	>75% Grass cover, Good, HSG D
48,232	98	Paved parking & roofs
824,088	74	Weighted Average
775,856		94.15% Pervious Area
48,232		5.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	100	0.0560	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.50"
0.7	65	0.0560	1.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.7	355	0.0626	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	75	0.0050	4.03	4.95	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	115	0.0260	7.79	103.88	**Parabolic Channel,** W=10.00' D=2.00' Area=13.3 sf Perim=11.0' n= 0.035 Earth, dense weeds
0.1	85	0.0820	10.72	33.69	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
0.3	310	0.0967	15.03	200.34	**Parabolic Channel,** W=10.00' D=2.00' Area=13.3 sf Perim=11.0' n= 0.035 Earth, dense weeds
5.7	325	0.0184	0.95		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.1	165	0.0030	1.30	15.21	**Parabolic Channel,** W=35.00' D=0.50' Area=11.7 sf Perim=35.0' n= 0.030 Earth, grassed & winding
23.1	1,595	Total			

Subcatchment PS-1.2:



Summary for Subcatchment PS-1.3:

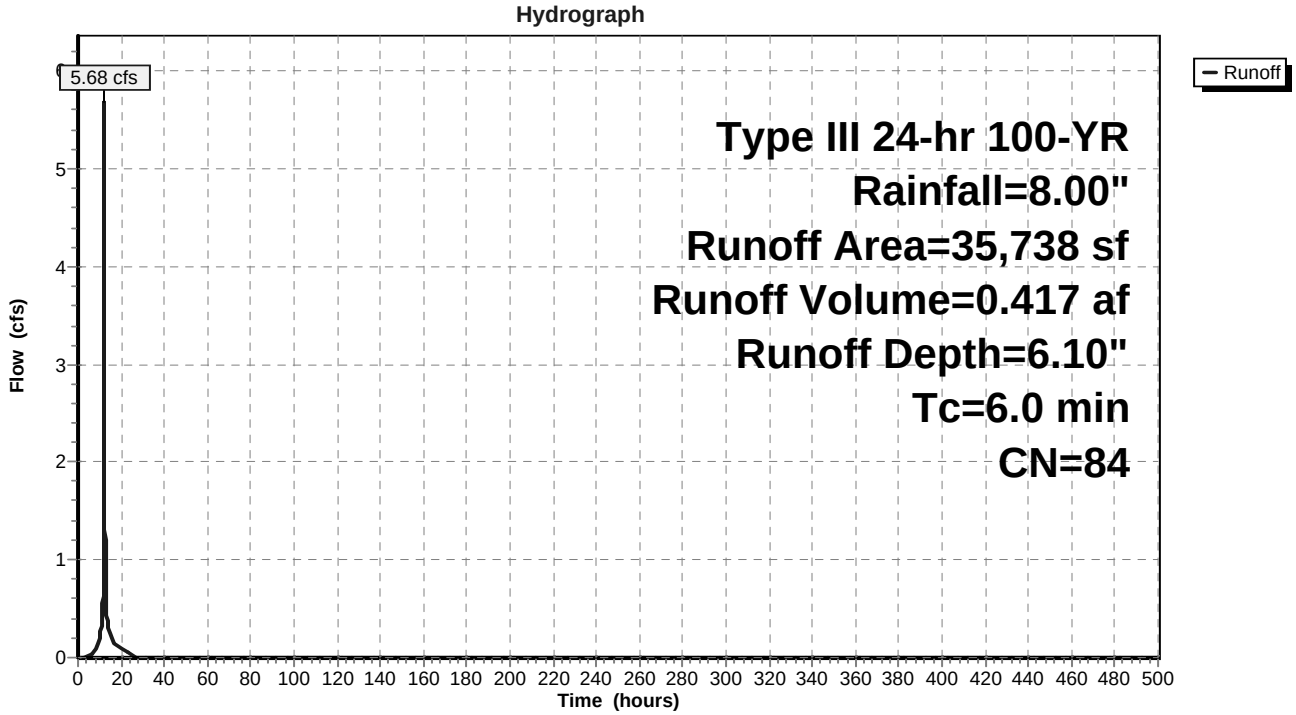
Runoff = 5.68 cfs @ 12.09 hrs, Volume= 0.417 af, Depth= 6.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.00"

Area (sf)	CN	Description
3,172	98	Paved parking, HSG C
13,366	74	>75% Grass cover, Good, HSG C
19,200	89	Gravel roads, HSG C
35,738	84	Weighted Average
32,566		91.12% Pervious Area
3,172		8.88% Impervious Area

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

Subcatchment PS-1.3:



Summary for Subcatchment PS-1.4:

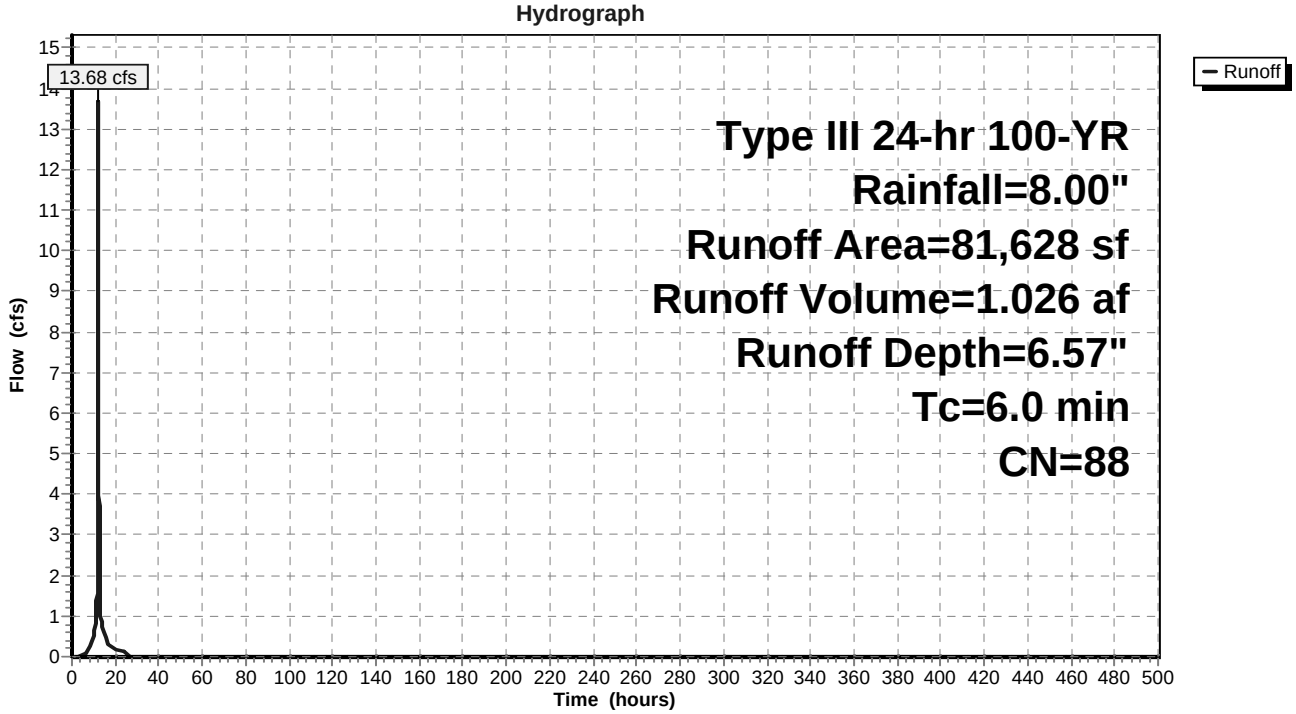
Runoff = 13.68 cfs @ 12.08 hrs, Volume= 1.026 af, Depth= 6.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.00"

Area (sf)	CN	Description
22,070	98	Paved parking, HSG C
36,079	91	Gravel roads, HSG D
9,940	80	>75% Grass cover, Good, HSG D
2,243	85	Gravel roads, HSG B
8,845	61	>75% Grass cover, Good, HSG B
2,224	74	>75% Grass cover, Good, HSG C
227	89	Gravel roads, HSG C
81,628	88	Weighted Average
59,558		72.96% Pervious Area
22,070		27.04% Impervious Area

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

Subcatchment PS-1.4:



Summary for Subcatchment PS-2.1:

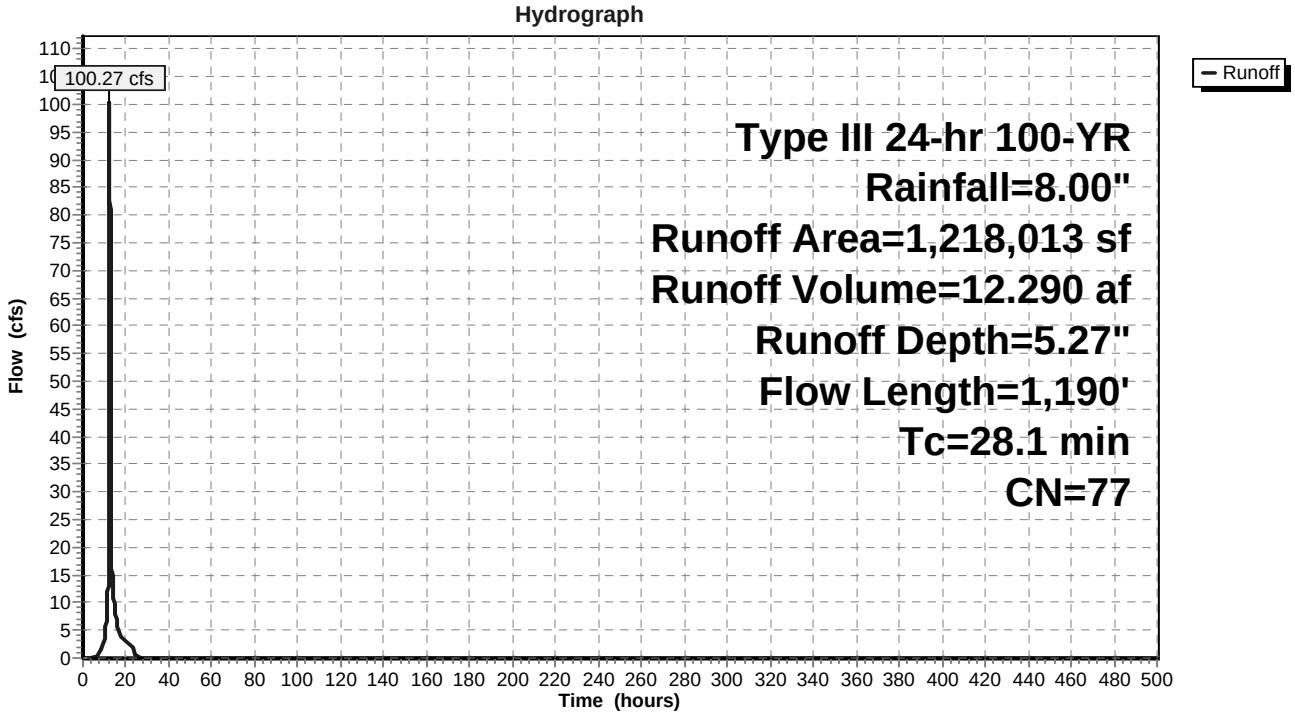
Runoff = 100.27 cfs @ 12.39 hrs, Volume= 12.290 af, Depth= 5.27"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.00"

	Area (sf)	CN	Description
	3,751	56	Brush, Fair, HSG B
	3,034	55	Woods, Good, HSG B
	192,194	89	Gravel roads, HSG C
	7,372	70	Brush, Fair, HSG C
	858,494	73	Woods, Fair, HSG C
	29,750	98	Paved parking, HSG C
	31,009	77	Woods, Good, HSG D
*	53,016	76	Gravel/Brush Mix, HSG B
	15,977	85	Gravel roads, HSG B
	14,855	91	Gravel roads, HSG D
	3,028	61	>75% Grass cover, Good, HSG B
	5,533	74	>75% Grass cover, Good, HSG C
	1,218,013	77	Weighted Average
	1,188,263		97.56% Pervious Area
	29,750		2.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.1200	0.10		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.50"
2.4	250	0.1200	1.73		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.6	430	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.6	410	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
28.1	1,190	Total			

Subcatchment PS-2.1:



Summary for Subcatchment PS-2.2:

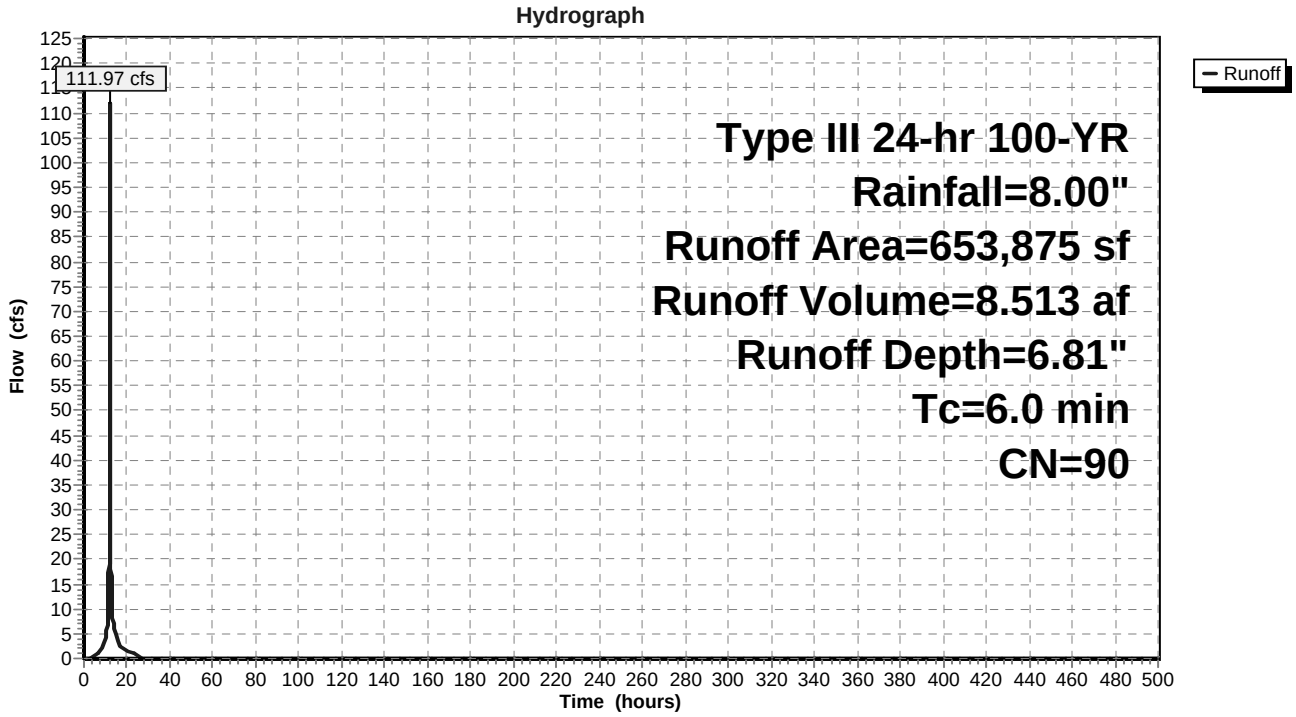
Runoff = 111.97 cfs @ 12.08 hrs, Volume= 8.513 af, Depth= 6.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.00"

Area (sf)	CN	Description
65,818	89	Gravel roads, HSG C
18,237	91	Gravel roads, HSG D
20,546	61	>75% Grass cover, Good, HSG B
240,237	85	Gravel roads, HSG B
20,235	74	>75% Grass cover, Good, HSG C
30,655	98	Water Surface, HSG B
143,453	98	Roofs, HSG A
102,225	98	Paved parking, HSG A
12,469	80	>75% Grass cover, Good, HSG D
653,875	90	Weighted Average
377,542		57.74% Pervious Area
276,333		42.26% Impervious Area

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

Subcatchment PS-2.2:



Summary for Subcatchment PS-2.3:

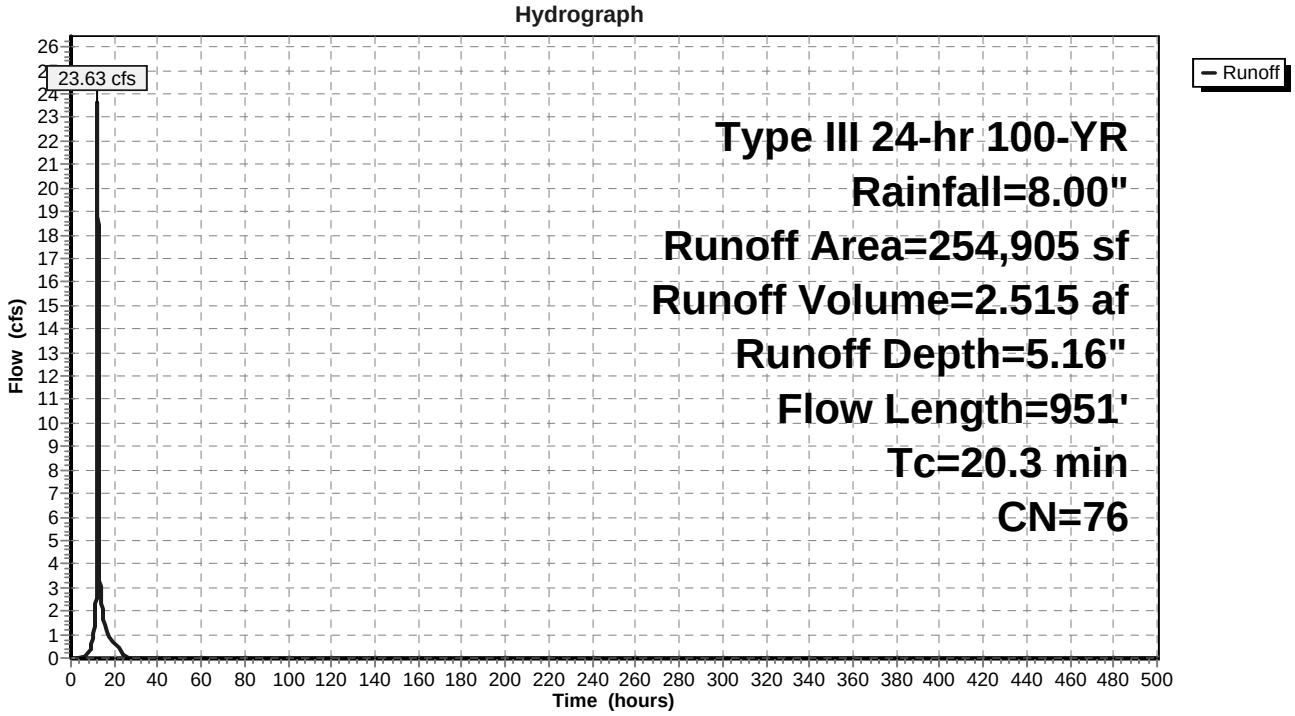
Runoff = 23.63 cfs @ 12.27 hrs, Volume= 2.515 af, Depth= 5.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.00"

Area (sf)	CN	Description
81,119	74	>75% Grass cover, Good, HSG C
27,727	98	Paved parking, HSG A
120,312	73	Woods, Fair, HSG C
17,305	70	Brush, Fair, HSG C
8,442	89	Gravel roads, HSG C
254,905	76	Weighted Average
227,178		89.12% Pervious Area
27,727		10.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0500	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
1.2	135	0.1480	1.92		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.0	168	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	95	0.0320	3.63		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	453	0.0730	15.23	203.08	**Parabolic Channel,** W=10.00' D=2.00' Area=13.3 sf Perim=11.0' n= 0.030 Earth, grassed & winding
20.3	951	Total			

Subcatchment PS-2.3:



Summary for Subcatchment PS-2.4:

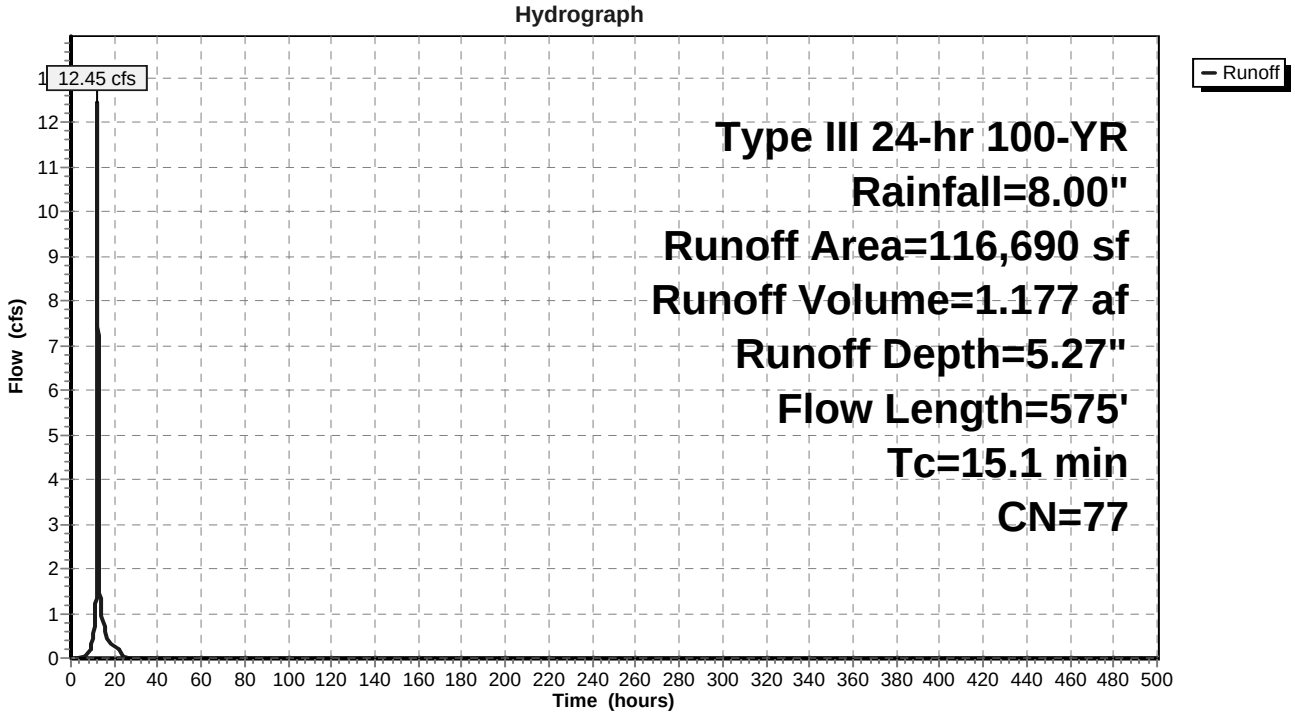
Runoff = 12.45 cfs @ 12.20 hrs, Volume= 1.177 af, Depth= 5.27"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.00"

Area (sf)	CN	Description
86,696	73	Woods, Fair, HSG C
13,423	74	>75% Grass cover, Good, HSG C
16,571	98	Paved parking, HSG C
116,690	77	Weighted Average
100,119		85.80% Pervious Area
16,571		14.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	20	0.0200	1.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.50"
10.9	80	0.0625	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
3.8	295	0.0661	1.29		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	180	0.0722	21.12	563.30	**Parabolic Channel,** W=10.00' D=4.00' Area=26.7 sf Perim=13.3' n= 0.030 Earth, grassed & winding
15.1	575	Total			

Subcatchment PS-2.4:



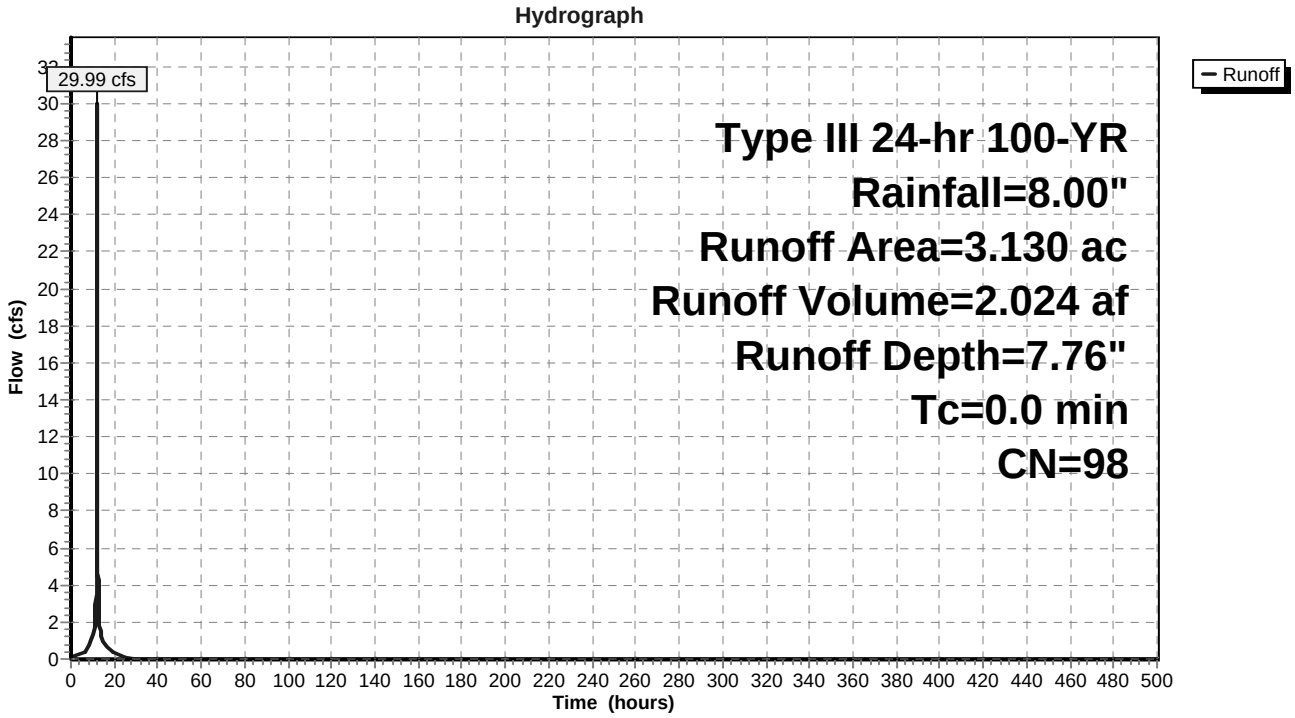
y for Subcatchment RRv: CAPTURED ROOFS & SURFACES REUSED WITH THE CRICKET VALLEY ENE

Runoff = 29.99 cfs @ 12.00 hrs, Volume= 2.024 af, Depth= 7.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.00"

Area (ac)	CN	Description
3.130	98	Paved parking, HSG A
3.130		100.00% Impervious Area

ubcatchment RRv: CAPTURED ROOFS & SURFACES REUSED WITH THE CRICKET VALLEY ENERGY PI

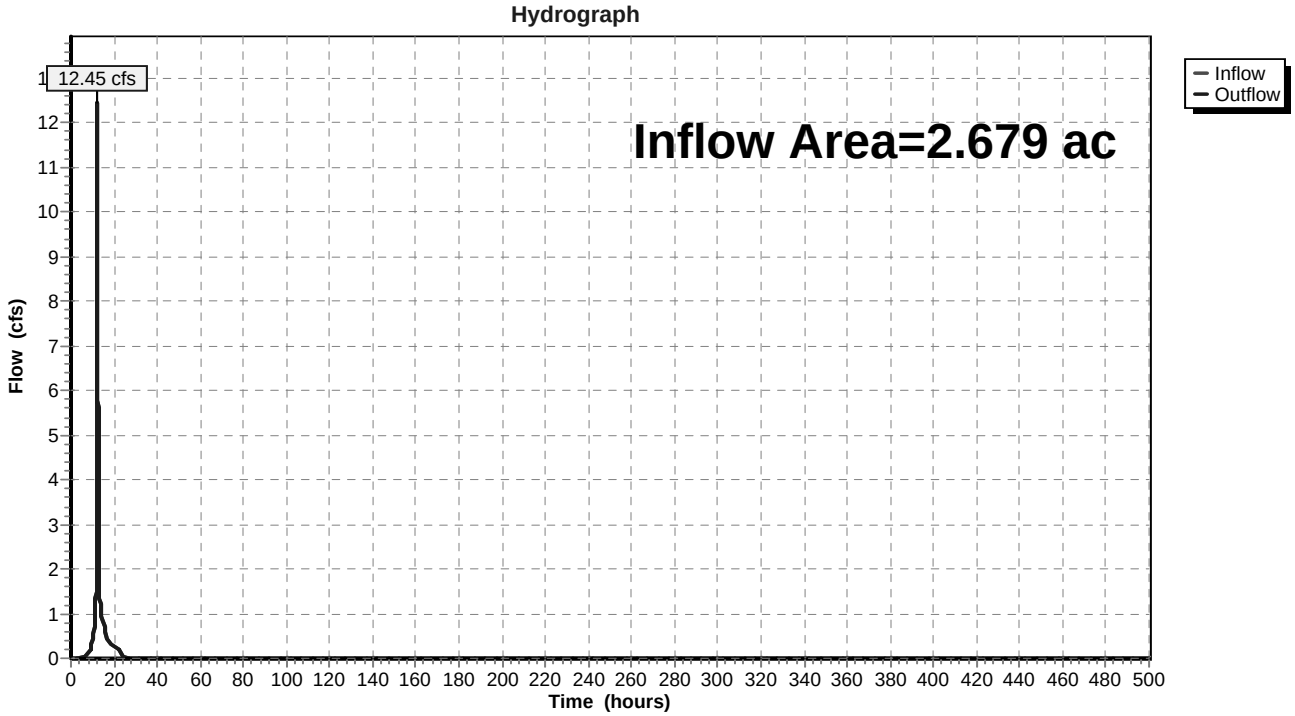


Summary for Reach 3R: Pipes

Inflow Area = 2.679 ac, 14.20% Impervious, Inflow Depth = 5.27" for 100-YR event
Inflow = 12.45 cfs @ 12.20 hrs, Volume= 1.177 af
Outflow = 12.45 cfs @ 12.20 hrs, Volume= 1.177 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs

Reach 3R: Pipes

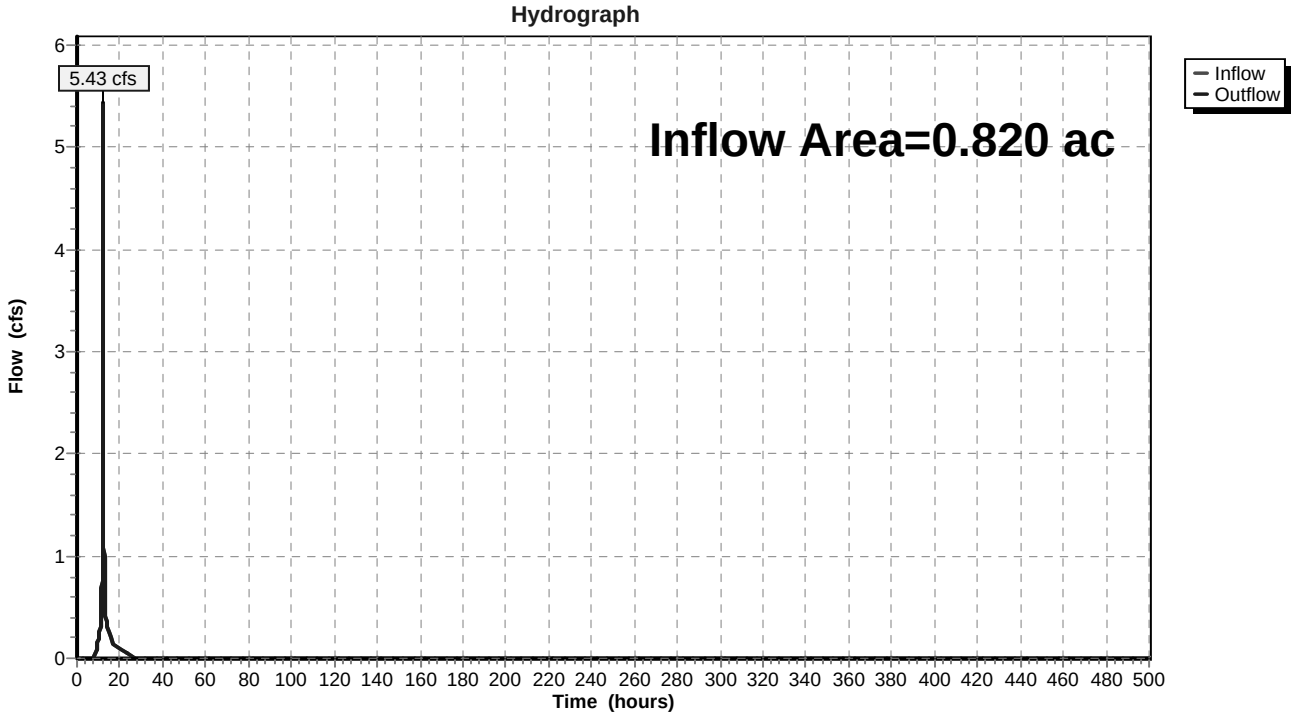


Summary for Reach 6R:

Inflow Area = 0.820 ac, 8.88% Impervious, Inflow Depth = 5.81" for 100-YR event
Inflow = 5.43 cfs @ 12.12 hrs, Volume= 0.397 af
Outflow = 5.43 cfs @ 12.12 hrs, Volume= 0.397 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs

Reach 6R:



Summary for Pond 1A: Plunge Pool F-1

Inflow Area = 0.820 ac, 8.88% Impervious, Inflow Depth = 6.10" for 100-YR event
Inflow = 5.68 cfs @ 12.09 hrs, Volume= 0.417 af
Outflow = 5.65 cfs @ 12.09 hrs, Volume= 0.417 af, Atten= 1%, Lag= 0.5 min
Primary = 5.65 cfs @ 12.09 hrs, Volume= 0.417 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Starting Elev= 430.50' Surf.Area= 631 sf Storage= 904 cf
Peak Elev= 430.87' @ 12.09 hrs Surf.Area= 743 sf Storage= 1,160 cf (256 cf above start)
Flood Elev= 431.50' Surf.Area= 952 sf Storage= 1,690 cf (786 cf above start)

Plug-Flow detention time= 45.2 min calculated for 0.396 af (95% of inflow)
Center-of-Mass det. time= 1.6 min (794.7 - 793.1)

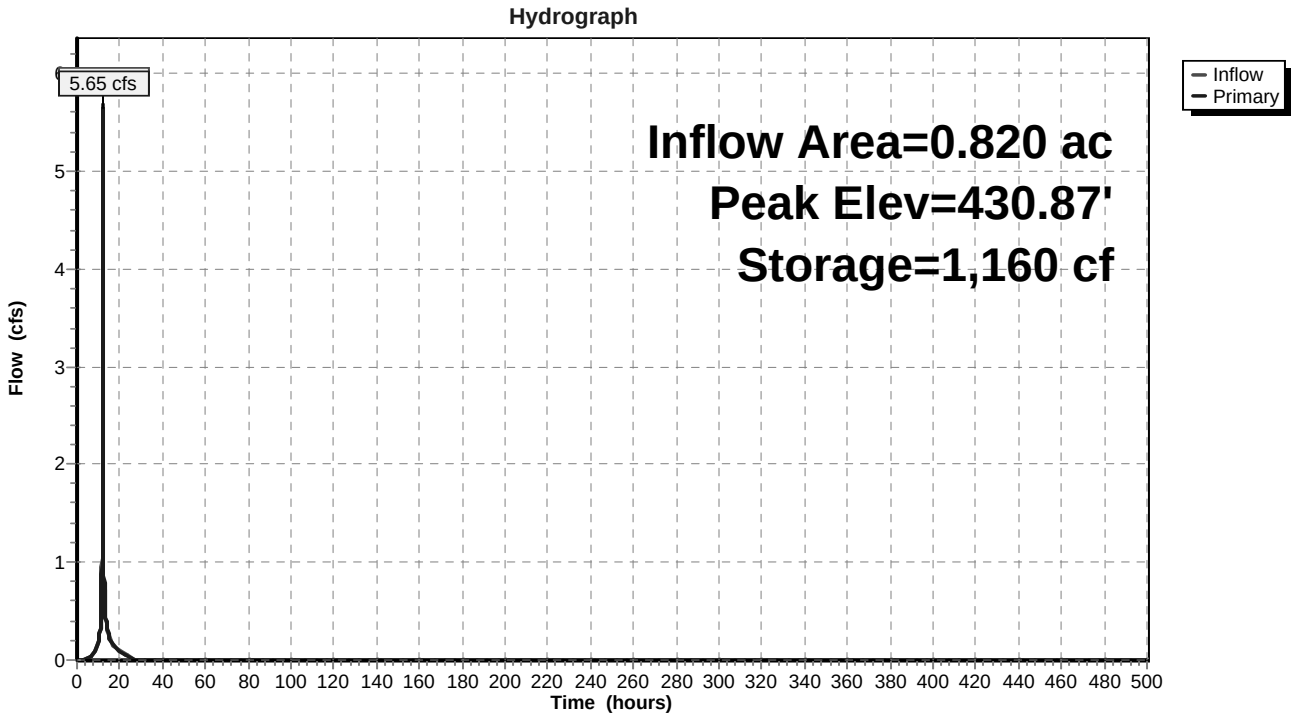
Volume	Invert	Avail.Storage	Storage Description
#1	427.00'	1,690 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
427.00	18	0	0
428.00	106	62	62
429.00	264	185	247
430.00	489	377	624
430.50	631	280	904
431.00	781	353	1,257
431.50	952	433	1,690

Device	Routing	Invert	Outlet Devices
#1	Primary	430.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=5.64 cfs @ 12.09 hrs HW=430.87' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 5.64 cfs @ 1.51 fps)

Pond 1A: Plunge Pool F-1



Summary for Pond 2A: Plunge Pool F-2

Inflow Area = 1.874 ac, 27.04% Impervious, Inflow Depth = 6.57" for 100-YR event
Inflow = 13.68 cfs @ 12.08 hrs, Volume= 1.026 af
Outflow = 13.42 cfs @ 12.10 hrs, Volume= 1.026 af, Atten= 2%, Lag= 1.0 min
Primary = 13.42 cfs @ 12.10 hrs, Volume= 1.026 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Starting Elev= 428.75' Surf.Area= 1,593 sf Storage= 3,229 cf
Peak Elev= 429.38' @ 12.10 hrs Surf.Area= 1,950 sf Storage= 4,339 cf (1,110 cf above start)
Flood Elev= 430.00' Surf.Area= 2,316 sf Storage= 5,666 cf (2,437 cf above start)

Plug-Flow detention time= 64.7 min calculated for 0.952 af (93% of inflow)
Center-of-Mass det. time= 3.0 min (785.1 - 782.1)

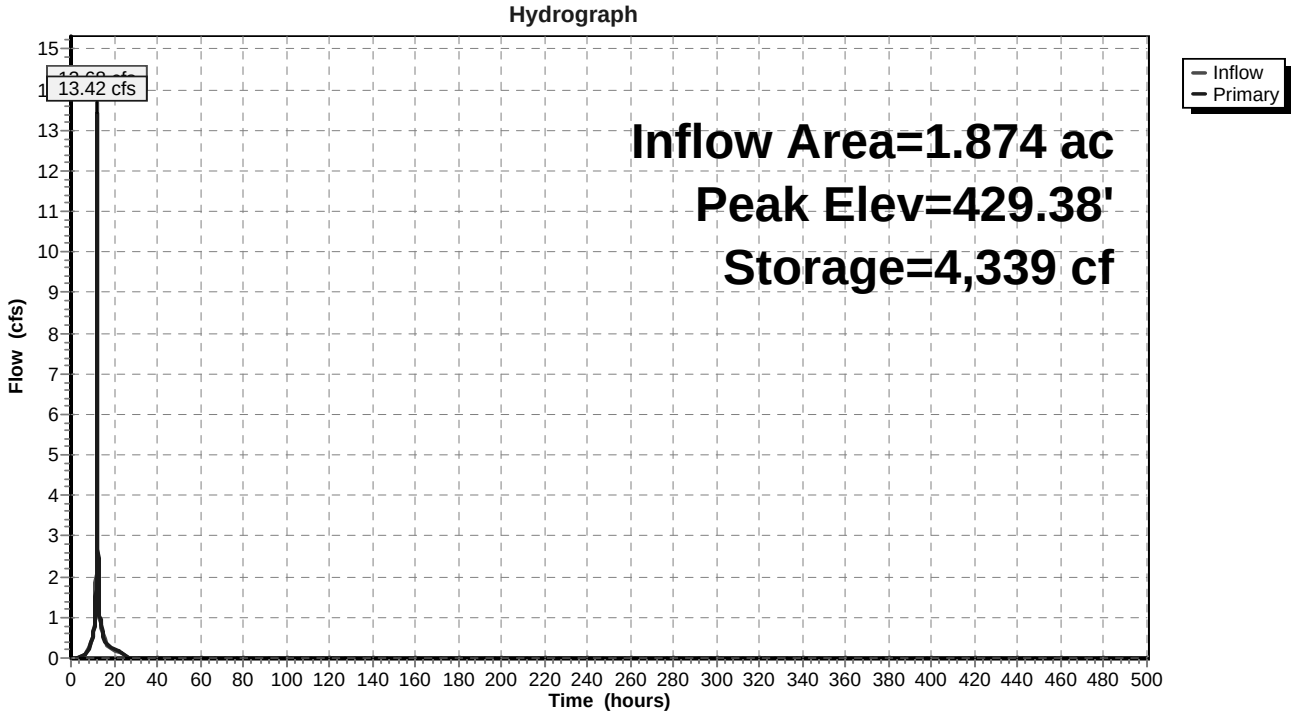
Volume	Invert	Avail.Storage	Storage Description
#1	424.00'	5,666 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
424.00	76	0	0
425.00	234	155	155
426.00	479	357	512
427.00	809	644	1,156
428.00	1,225	1,017	2,173
428.75	1,593	1,057	3,229
429.00	1,727	415	3,644
430.00	2,316	2,022	5,666

Device	Routing	Invert	Outlet Devices
#1	Primary	428.75'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=13.42 cfs @ 12.10 hrs HW=429.38' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 13.42 cfs @ 2.14 fps)

Pond 2A: Plunge Pool F-2



Summary for Pond 3A: Plunge Pool F-3

Inflow Area = 5.852 ac, 10.88% Impervious, Inflow Depth = 5.16" for 100-YR event
Inflow = 23.63 cfs @ 12.27 hrs, Volume= 2.515 af
Outflow = 23.59 cfs @ 12.29 hrs, Volume= 2.476 af, Atten= 0%, Lag= 0.8 min
Primary = 23.59 cfs @ 12.29 hrs, Volume= 2.476 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Peak Elev= 439.92' @ 12.29 hrs Surf.Area= 1,589 sf Storage= 2,964 cf
Flood Elev= 440.00' Surf.Area= 1,631 sf Storage= 3,095 cf

Plug-Flow detention time= 16.0 min calculated for 2.476 af (98% of inflow)
Center-of-Mass det. time= 6.5 min (831.7 - 825.2)

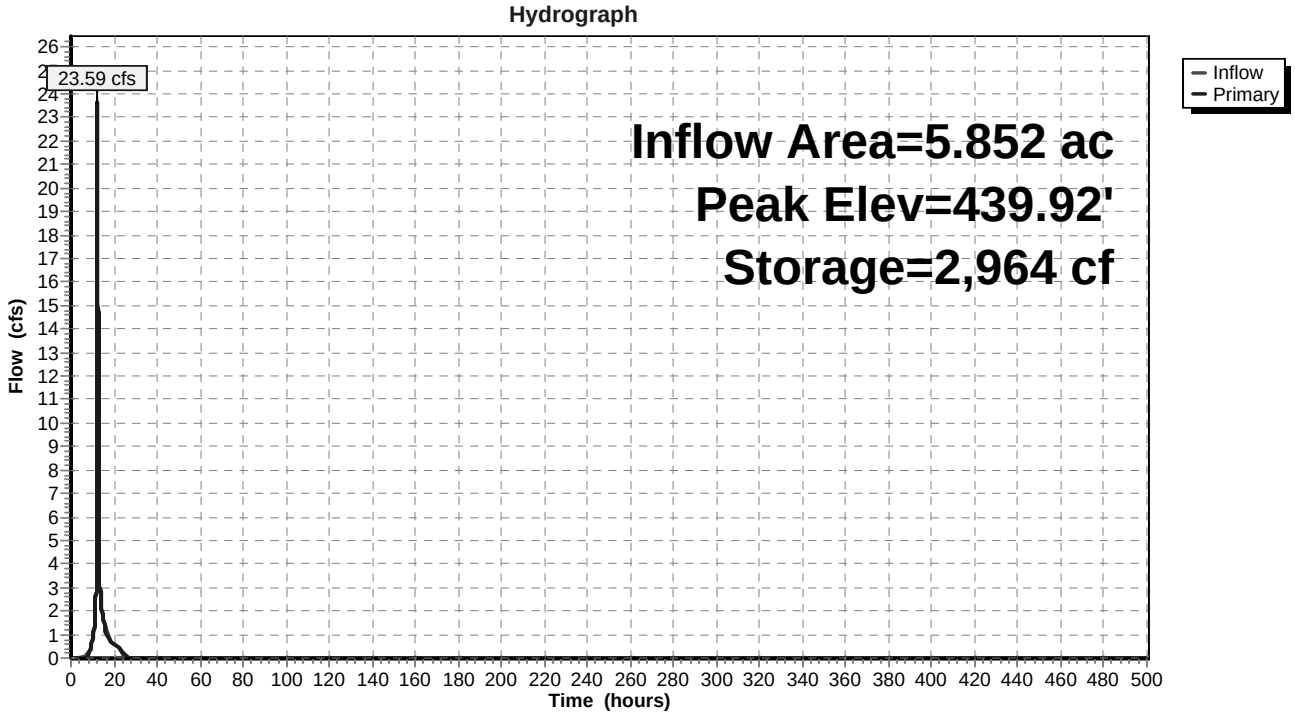
Volume	Invert	Avail.Storage	Storage Description
#1	435.00'	3,095 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
435.00	13	0	0
436.00	115	64	64
437.00	347	231	295
438.00	691	519	814
439.00	1,120	906	1,720
440.00	1,631	1,376	3,095

Device	Routing	Invert	Outlet Devices
#1	Primary	439.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=23.58 cfs @ 12.29 hrs HW=439.92' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 23.58 cfs @ 2.57 fps)

Pond 3A: Plunge Pool F-3



Summary for Pond 4P: Storage at Box Culvert

Inflow Area = 24.770 ac, 7.04% Impervious, Inflow Depth = 4.94" for 100-YR event
Inflow = 92.25 cfs @ 12.32 hrs, Volume= 10.197 af
Outflow = 91.33 cfs @ 12.35 hrs, Volume= 10.197 af, Atten= 1%, Lag= 1.9 min
Primary = 91.33 cfs @ 12.35 hrs, Volume= 10.197 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Peak Elev= 435.50' @ 12.35 hrs Surf.Area= 5,360 sf Storage= 8,782 cf

Plug-Flow detention time= 1.1 min calculated for 10.196 af (100% of inflow)
Center-of-Mass det. time= 1.1 min (835.6 - 834.5)

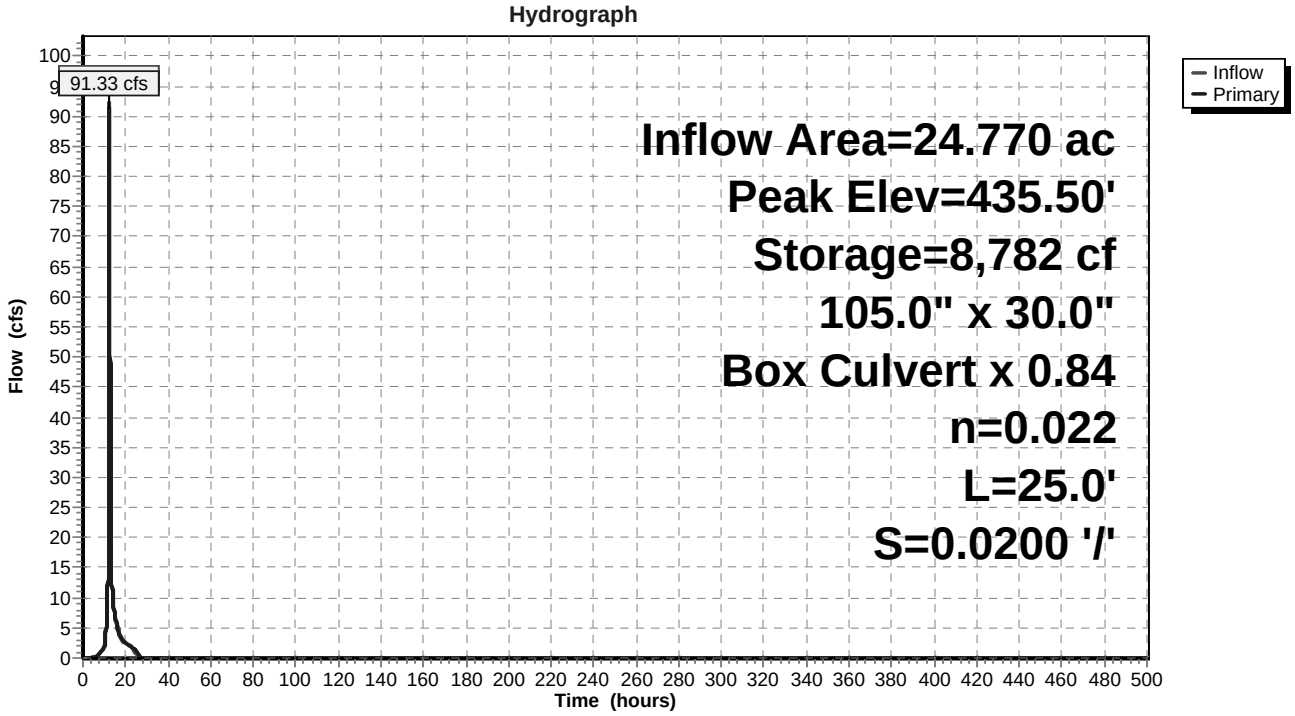
Volume	Invert	Avail.Storage	Storage Description
#1	433.00'	27,483 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
433.00	0	0	0
434.00	3,825	1,913	1,913
435.00	4,835	4,330	6,243
435.50	5,362	2,549	8,792
436.00	69,402	18,691	27,483

Device	Routing	Invert	Outlet Devices
#1	Primary	433.00'	**105.0" W x 30.0" H Box Culvert X 0.84** L= 25.0' Box, 30-75° wingwalls, square crown, Ke= 0.400 Inlet / Outlet Invert= 433.00' / 432.50' S= 0.0200 '/' Cc= 0.900 n= 0.022 Earth, clean & straight

Primary OutFlow Max=91.32 cfs @ 12.35 hrs HW=435.50' (Free Discharge)
└─**1=Culvert** (Barrel Controls 91.32 cfs @ 5.57 fps)

Pond 4P: Storage at Box Culvert



Summary for Pond EW-1: EXISTING NYSDEC JURISDICTIONAL WETLAND

Inflow Area = 81.411 ac, 4.35% Impervious, Inflow Depth = 5.05" for 100-YR event
Inflow = 183.79 cfs @ 12.53 hrs, Volume= 34.284 af
Outflow = 159.10 cfs @ 12.86 hrs, Volume= 25.722 af, Atten= 13%, Lag= 19.7 min
Primary = 159.10 cfs @ 12.86 hrs, Volume= 25.722 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Peak Elev= 422.34' @ 12.86 hrs Surf.Area= 313,932 sf Storage= 478,632 cf

Plug-Flow detention time= 155.3 min calculated for 25.722 af (75% of inflow)
Center-of-Mass det. time= 68.2 min (919.9 - 851.8)

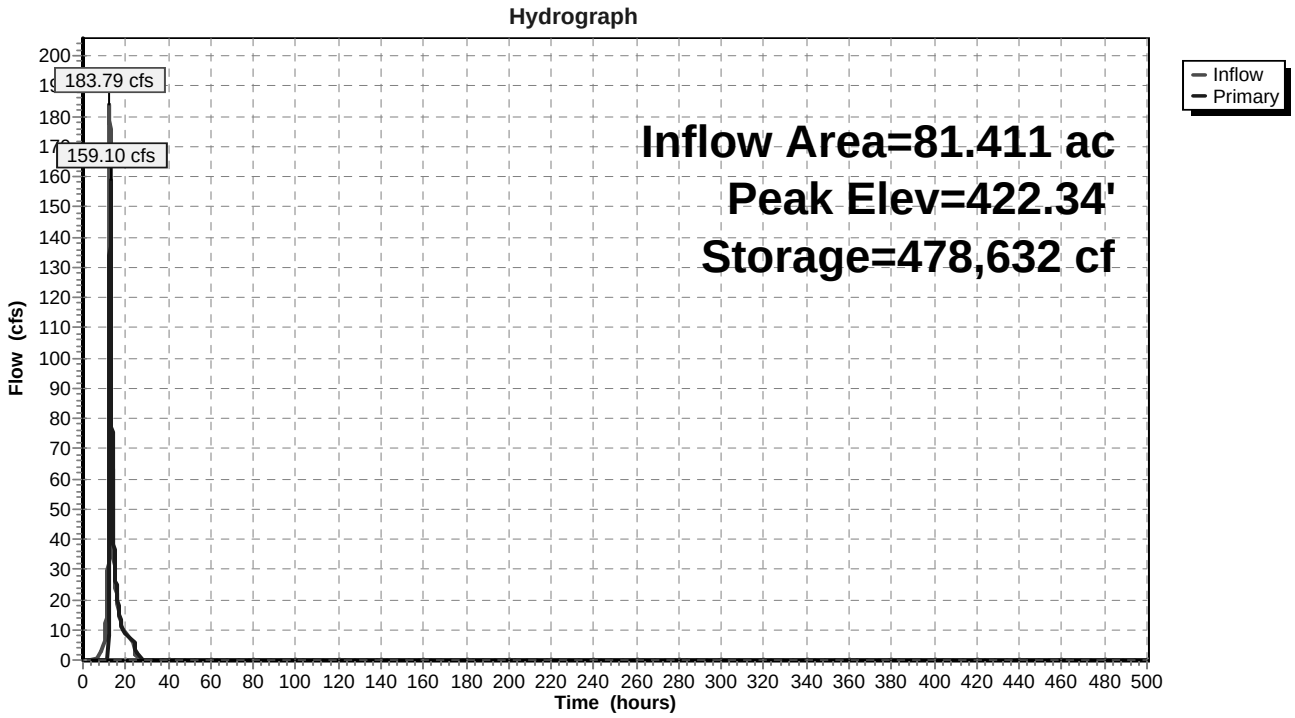
Volume	Invert	Avail.Storage	Storage Description
#1	419.80'	688,314 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
419.80	0	0	0
420.00	64,917	6,492	6,492
421.00	178,530	121,724	128,215
422.00	310,941	244,736	372,951
423.00	319,785	315,363	688,314

Device	Routing	Invert	Outlet Devices
#1	Primary	422.00'	**300.0' long x 20.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=158.97 cfs @ 12.86 hrs HW=422.34' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 158.97 cfs @ 1.57 fps)

Pond EW-1: EXISTING NYSDEC JURISDICTIONAL WETLAND



Summary for Pond F-1: Bioretention Area #1

Inflow Area = 0.820 ac, 8.88% Impervious, Inflow Depth = 6.10" for 100-YR event
Inflow = 5.65 cfs @ 12.09 hrs, Volume= 0.417 af
Outflow = 5.43 cfs @ 12.12 hrs, Volume= 0.397 af, Atten= 4%, Lag= 1.4 min
Secondary = 5.43 cfs @ 12.12 hrs, Volume= 0.397 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Peak Elev= 430.86' @ 12.12 hrs Surf.Area= 2,047 sf Storage= 1,560 cf
Flood Elev= 431.50' Surf.Area= 2,412 sf Storage= 2,987 cf

Plug-Flow detention time= 46.5 min calculated for 0.397 af (95% of inflow)
Center-of-Mass det. time= 19.6 min (814.3 - 794.7)

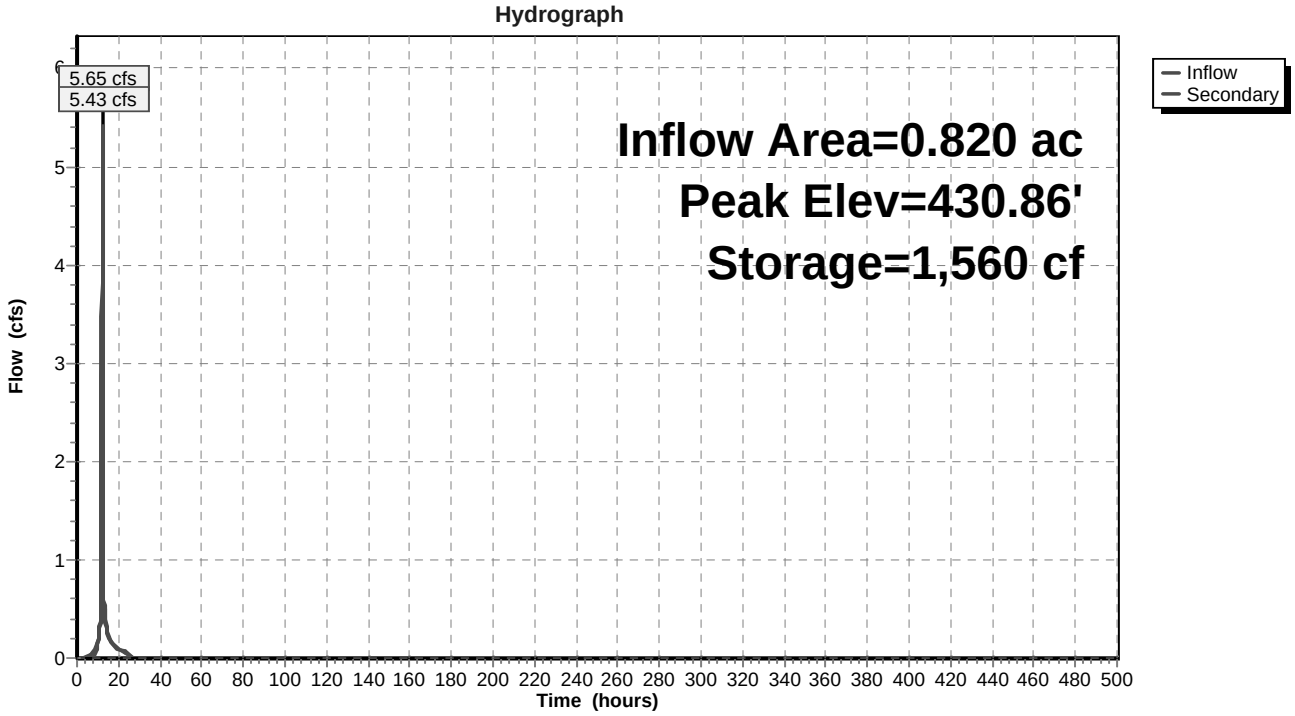
Volume	Invert	Avail.Storage	Storage Description
#1	430.00'	2,987 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
430.00	1,589	0	0
430.50	1,849	860	860
431.00	2,124	993	1,853
431.50	2,412	1,134	2,987

Device	Routing	Invert	Outlet Devices
#1	Secondary	430.50'	**10.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Secondary OutFlow Max=5.42 cfs @ 12.12 hrs HW=430.86' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 5.42 cfs @ 1.51 fps)

Pond F-1: Bioretention Area #1



Summary for Pond F-2: Bioretention Area #2

Inflow Area = 1.874 ac, 27.04% Impervious, Inflow Depth = 6.57" for 100-YR event
Inflow = 13.42 cfs @ 12.10 hrs, Volume= 1.026 af
Outflow = 11.71 cfs @ 12.15 hrs, Volume= 1.026 af, Atten= 13%, Lag= 2.8 min
Primary = 11.71 cfs @ 12.15 hrs, Volume= 1.026 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Starting Elev= 428.75' Surf.Area= 6,983 sf Storage= 1,706 cf
Peak Elev= 429.27' @ 12.15 hrs Surf.Area= 7,575 sf Storage= 5,485 cf (3,779 cf above start)
Flood Elev= 430.00' Surf.Area= 8,314 sf Storage= 11,301 cf (9,595 cf above start)

Plug-Flow detention time= 48.6 min calculated for 0.987 af (96% of inflow)
Center-of-Mass det. time= 12.2 min (797.3 - 785.1)

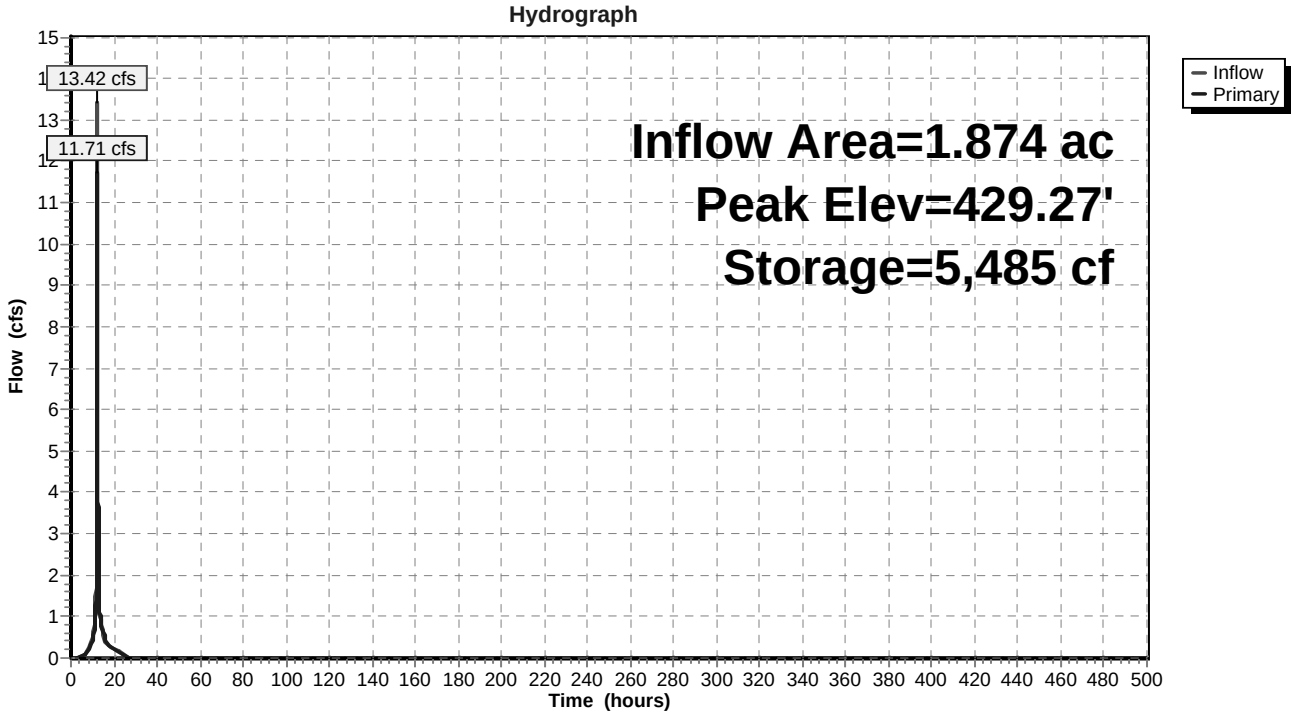
Volume	Invert	Avail.Storage	Storage Description
#1	428.50'	11,301 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
428.50	6,662	0	0
429.00	7,304	3,492	3,492
430.00	8,314	7,809	11,301

Device	Routing	Invert	Outlet Devices
#1	Primary	428.75'	**12.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=11.70 cfs @ 12.15 hrs HW=429.27' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 11.70 cfs @ 1.88 fps)

Pond F-2: Bioretention Area #2



Summary for Pond F-3: Bioretention Area #3

Inflow Area = 5.852 ac, 10.88% Impervious, Inflow Depth = 5.08" for 100-YR event
Inflow = 23.59 cfs @ 12.29 hrs, Volume= 2.476 af
Outflow = 23.09 cfs @ 12.33 hrs, Volume= 2.431 af, Atten= 2%, Lag= 2.4 min
Primary = 23.09 cfs @ 12.33 hrs, Volume= 2.431 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Peak Elev= 439.90' @ 12.33 hrs Surf.Area= 5,324 sf Storage= 6,258 cf
Flood Elev= 440.00' Surf.Area= 5,442 sf Storage= 6,774 cf

Plug-Flow detention time= 21.0 min calculated for 2.431 af (98% of inflow)
Center-of-Mass det. time= 10.2 min (841.9 - 831.7)

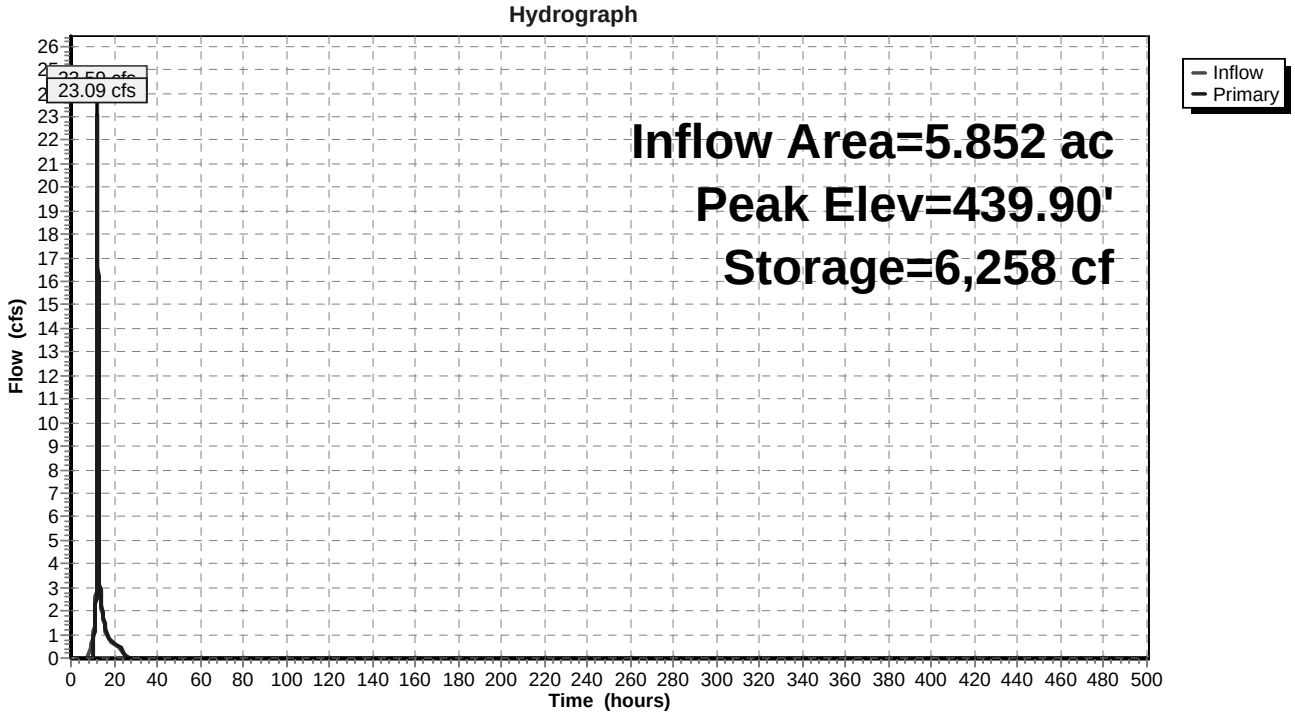
Volume	Invert	Avail.Storage	Storage Description
#1	438.50'	6,774 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
438.50	3,592	0	0
439.00	4,206	1,950	1,950
440.00	5,442	4,824	6,774

Device	Routing	Invert	Outlet Devices
#1	Primary	439.00'	**10.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=23.08 cfs @ 12.33 hrs HW=439.90' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 23.08 cfs @ 2.55 fps)

Pond F-3: Bioretention Area #3



Summary for Pond P-1: Wet Pond

Inflow Area = 17.690 ac, 38.01% Impervious, Inflow Depth = 6.57" for 100-YR event
Inflow = 120.54 cfs @ 12.09 hrs, Volume= 9.691 af
Outflow = 14.05 cfs @ 12.81 hrs, Volume= 9.691 af, Atten= 88%, Lag= 43.4 min
Primary = 14.05 cfs @ 12.81 hrs, Volume= 9.691 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs
Starting Elev= 422.00' Surf.Area= 30,655 sf Storage= 75,367 cf
Peak Elev= 427.82' @ 12.81 hrs Surf.Area= 54,277 sf Storage= 324,228 cf (248,861 cf above start)
Flood Elev= 429.00' Surf.Area= 59,091 sf Storage= 390,986 cf (315,619 cf above start)

Plug-Flow detention time= 1,193.9 min calculated for 7.960 af (82% of inflow)
Center-of-Mass det. time= 918.3 min (1,699.3 - 781.0)

Volume	Invert	Avail.Storage	Storage Description
#1	418.00'	452,178 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

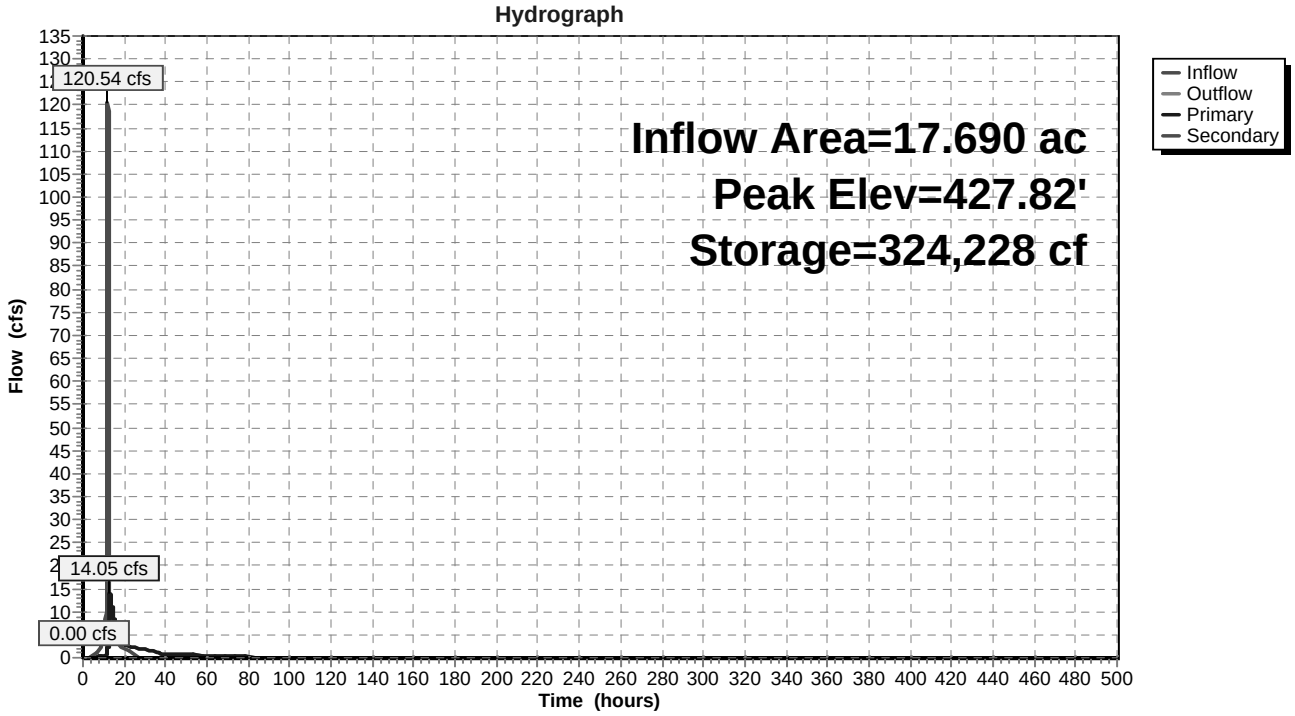
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
418.00	14,212	0	0
420.00	16,608	30,820	30,820
421.00	19,142	17,875	48,695
421.50	28,445	11,897	60,592
422.00	30,655	14,775	75,367
423.00	34,805	32,730	108,097
424.00	39,588	37,197	145,293
425.00	43,288	41,438	186,731
426.00	47,088	45,188	231,919
427.00	50,988	49,038	280,957
428.00	54,989	52,989	333,946
429.00	59,091	57,040	390,986
430.00	63,293	61,192	452,178

Device	Routing	Invert	Outlet Devices
#1	Primary	421.85'	**30.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 421.85' / 421.50' S= 0.0140 '/' Cc= 0.900 n= 0.013
#2	Device 1	422.00'	**4.4" Vert. Orifice/Grate** C= 0.600
#3	Device 1	424.24'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	426.50'	**2.5' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#5	Secondary	429.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir X 0.00** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=14.05 cfs @ 12.81 hrs HW=427.82' (Free Discharge)
└─**1=Culvert** (Passes 14.05 cfs of 40.55 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 1.21 cfs @ 11.43 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 1.73 cfs @ 8.79 fps)
  └─**4=Sharp-Crested Rectangular Weir** (Weir Controls 11.11 cfs @ 3.76 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=422.00' (Free Discharge)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-1: Wet Pond

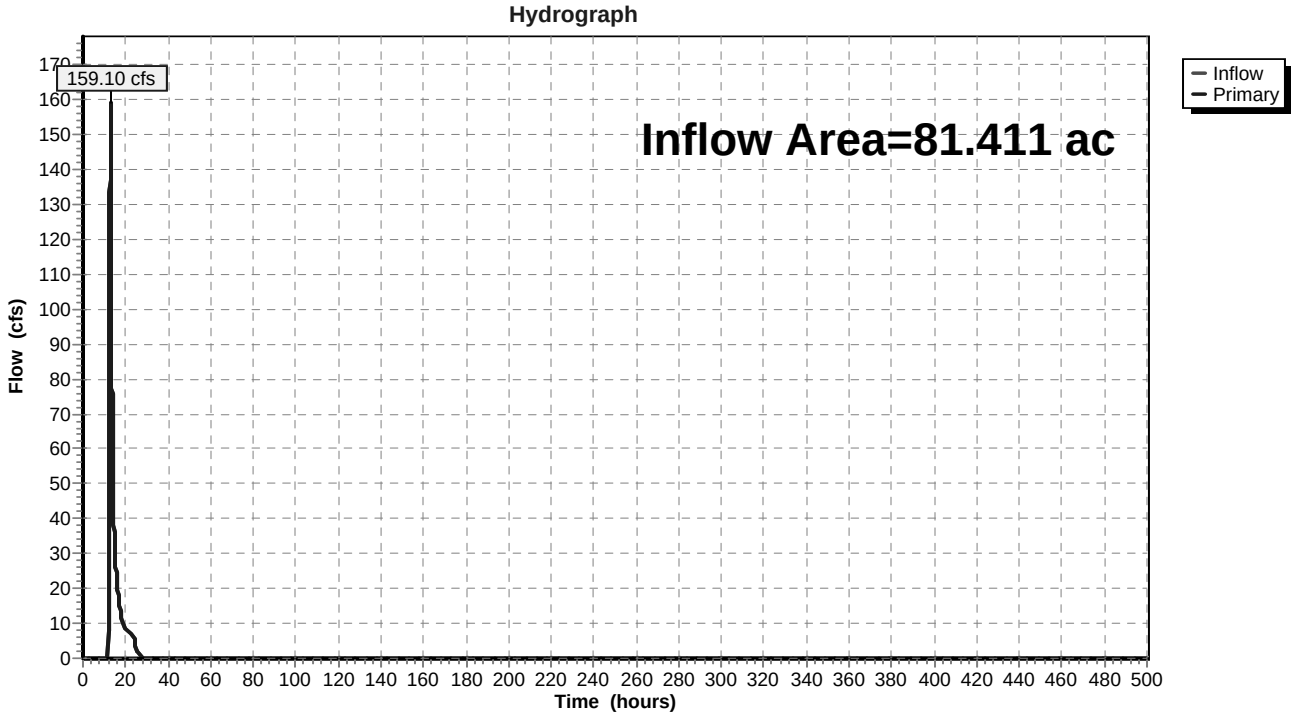


Summary for Pond zDP1: DESIGN POINT 1 (WETLAND)

Inflow Area = 81.411 ac, 4.35% Impervious, Inflow Depth = 3.79" for 100-YR event
Inflow = 159.10 cfs @ 12.86 hrs, Volume= 25.722 af
Primary = 159.10 cfs @ 12.86 hrs, Volume= 25.722 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs

Pond zDP1: DESIGN POINT 1 (WETLAND)

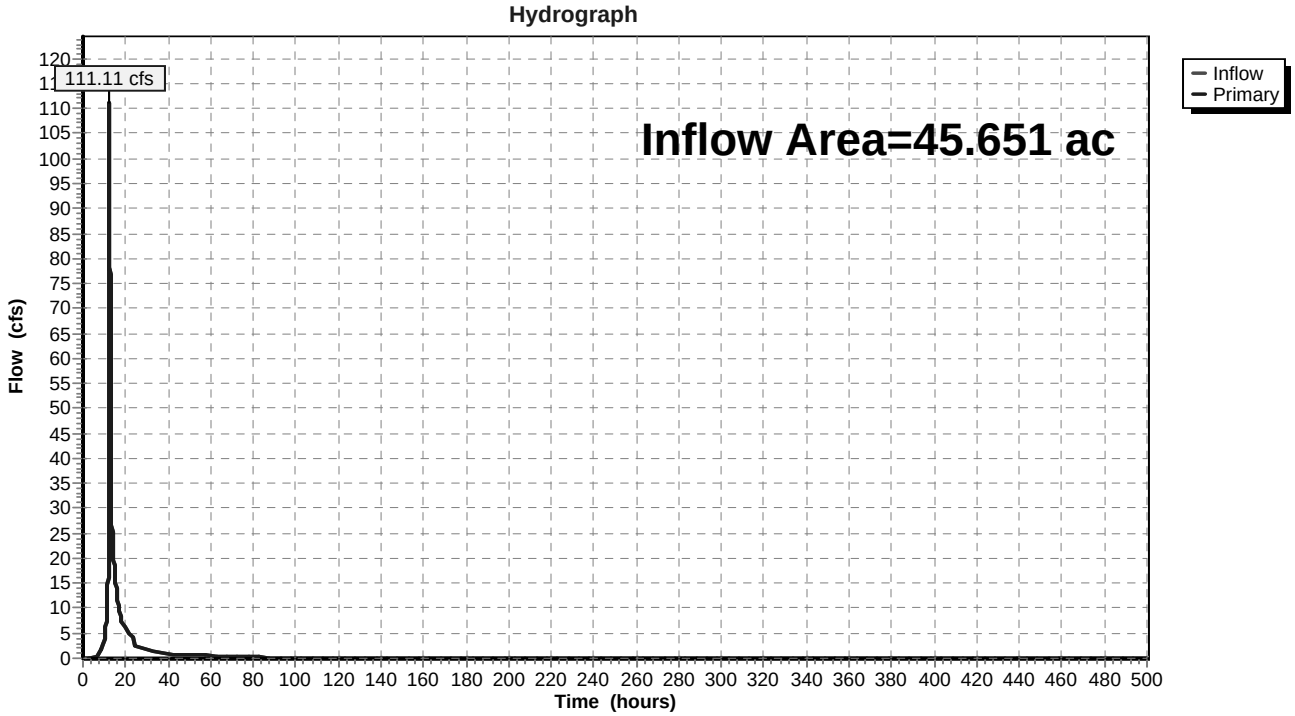


Summary for Pond zDP2: DESIGN POINT 2 (36" RCP CULVERT)

Inflow Area = 45.651 ac, 16.23% Impervious, Inflow Depth = 5.78" for 100-YR event
Inflow = 111.11 cfs @ 12.40 hrs, Volume= 21.981 af
Primary = 111.11 cfs @ 12.40 hrs, Volume= 21.981 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.01 hrs

Pond zDP2: DESIGN POINT 2 (36" RCP CULVERT)



Appendix E:
Preliminary Design Calculations

Water Quality Volume

Job:	Cricket Vallet Energy		
Job No.:	81001.00		
Description:	Preliminary Stormwater Quality Volumes		
Prep. By:	MF	Date:	7/16/2010
Check By:	SD	Date:	7/16/2010

Preliminary Stormwater Quality Design:
Stormwater Quality will be accomplished by treating the runoff volume generated by the 90% rainfall of the average annual stormwater runoff volume (August 2003 NYS Stormwater Design Manual).

Volume Generated By 90 % Rule (Using methodology of August 2003 NYS Stormwater Design Manual):

WQv = [P x Rv x A] / 12
WQv = Water quality volume (in acre-feet)
Rv = 0.05+0.009(I) = Minimum Rv = 0.2
I = Impervious Cover (Percentage)
P = 90 % Rainfall Event Number (see F4.1)
A = Site area in acres

Preliminary Water Quality Volume For The Development Conveyed to Treatment Practice

Practice	Total Area (Ac)	Impervious Area (Ac)	Impervious Cover (%)	Rv	P (in)	WQv (ac-ft)	WQv (cf)	Pre-Treatment Required. (%)	Pre-Treatment Required (cf)	Pre-Treatment Provided (cf)
Northeastern Portion of Site - Bioretention #1	0.710	0.514	72	0.70	1.1	0.05	1,989	40	796	904
Northwestern Portion of Site - Bioretention #2	2.110	2.000	95	0.90	1.1	0.17	7,609	40	3,043	3,229
Entrance Road - Bioretention #3	5.855	0.831	14	0.18	1.1	0.10	4,155	40	1,662	1,720
Stormwater Management Basin Wet extended Detention Pond (Type P-3)	15.010	13.820	92	0.88	1.1	1.21	52,662	10	5,266	26,794

Water Quality Distribution For Wet Pond					
Practice	WQv (cf)	Permanent Pool (50% min.)	Permanent Pool (WQv Provided)	Extended Detention (50% WQv max.)	Extended Detention (WQv Provided)
Wet Pond (Type P-3)	52,662	26,331	48,229	26,331	4,433

Water Quality Practice Design

Job:	Cricket Vallet Energy		
Job No.:	81001.00		
Description:	Preliminary Sizing For Recommended Stormwater Quality Practice		
Prep. By:	MMF	Date:	2/19/2010
Check By:	SD	Date:	2/19/2010

Northeastern Portion of Site - Bioretention Area #1

Step 1 - Determine minimum volume of treatment chamber (inlcuding pre-treatment)

Water quality volume = 1,989 cf

As per Section 6.4.4 of NYS Stormwater Management Design Manual, the entire treatment chamber (inlcuding pre-treatment) shall be designed to temporarily hold at least 75 % of the water quality volume.

75 % WQV = 1,492 cf (min)

Pretreatment shall be provided prior to the filer media to at least 40 % of WQv (where sanded)
40 % WQV = 796 cf (min)

Step 2 - Approximate Filter Bed Area

Af = (WQv) (df) / [((k) (hf + df) (tf)]

Af = Surface area of filter bed (sf)
WQv = Water quality volume (cf)
df = Filter bed depth (ft) - minimum of 30"
k = coefficient of permeability of filter media (ft/day) - 0.5 ft/day for bioretention as per Section 6.4.4 of NYS Stormwater Design Manual
hf = Average height of water above filter bed
tf = Design filter bed drain time (days) - 2 days or 48 hours for bioretention as per Section 6.4.4 of NYS Stormwater Design Manual

df =	2.5
k =	0.5
hf =	0.5
tf =	2

Min. Af = 1,657 sf
Provided Area = 1,850 sf

Step 3 - Confirm practice capable holding 75 % WQv

The entire treatment system (including pre-treatment) shall be sized to temporarily hold at least 75 % of the WQv prior to filtration.

Volume within filter bed: Vf = Af (df) (n); n =0.25 for bioretention soils
Vf = 1,156 cf.

Storage above filter bed (6" Ponding layer): Vpond= (hf)(Af)
Vpond = 925 cf.

- Pre-treatment Storage: Vs

$Vs_{(req.)}$ = 796 cf
$Vs_{(prov.)}$ = 1,260 cf

Total Storage = 3,341 cf. > 1,989 cf.

Northwestern Portion of Site - Bio-Retention Area #2

Step 1 - Determine minimum volume of treatment chamber (inlcuding pre-treatment)

Water quality volume = 7,609 cf

As per Section 6.4.4 of NYS Stormwater Management Design Manual, the entire treatment chamber (inlcuding pre-treatment) shall be designed to temporarily hold at least 75 % of the water quality volume.

75 % WQV = 5,706 cf (min)

Pretreatment shall be provided prior to the filer media to at least 40 % of WQv (where sanded)
40 % WQV = 3,043 cf (min)

Step 2 - Approximate Filter Bed Area

Af = (WQv) (df) / [((k) (hf + df) (tf)]

Af = Surface area of filter bed (sf)
WQv = Water quality volume (cf)
df = Filter bed depth (ft) - minimum of 30"
k = coefficient of permeability of filter media (ft/day) - 0.5 ft/day for bioretention as per Section 6.4.4 of NYS Stormwater Design Manual
hf = Average height of water above filter bed
tf = Design filter bed drain time (days) - 2 days or 48 hours for bioretention as per Section 6.4.4 of NYS Stormwater Design Manual

df =	2.5
k =	0.5
hf =	0.5
tf =	2

Min. Af = 6,341 sf
Provided Af = 6,662 sf

Step 3 - Confirm practice capable holding 75 % WQv

The entire treatment system (including pre-treatment) shall be sized to temporarily hold at least 75 % of the WQv prior to filtration.

Volume within filter bed: Vf = Af (df) (n); n =0.25 for bioretention soils
Vf = 4,164 cf.

Storage above filter bed (6" Ponding layer): Vpond= (hf)(Af)
Vpond = 3,331 cf.

- Pre-treatment Storage: Vs

$V_{s\,(req.)}$ = 3,043 cf
$V_{s\,(prov.)}$ = 3,572 cf

Total Storage = 11,067 cf. > 5,706 cf.

Entrance Road - Bio-Retention Area #3

Step 1 - Determine minimum volume of treatment chamber (inlcuding pre-treatment)

Water quality volume = 4,155 cf

As per Section 6.4.4 of NYS Stormwater Management Design Manual, the entire treatment chamber (inlcuding pre-treatment) shall be designed to temporarily hold at least 75 % of the water quality volume.

75 % WQV = 3,116 cf (min)

Pretreatment shall be provided prior to the filer media to at least 40 % of WQv (where sanded)
40 % WQV = 1,662 cf (min)

Step 2 - Approximate Filter Bed Area

Af = (WQv) (df) / [((k) (hf + df) (tf)]

Af = Surface area of filter bed (sf)
WQv = Water quality volume (cf)
df = Filter bed depth (ft) - minimum of 30"
k = coefficient of permeability of filter media (ft/day) - 0.5 ft/day for bioretention as per Section 6.4.4 of NYS Stormwater Design Manual
hf = Average height of water above filter bed
tf = Design filter bed drain time (days) - 2 days or 48 hours for bioretention as per Section 6.4.4 of NYS Stormwater Design Manual

df =	2.5
k =	0.5
hf =	0.5
tf =	2

Min. Af = 3,463 sf
Provided Af = 3,600 sf

Step 3 - Confirm practice capable holding 75 % WQv

The entire treatment system (including pre-treatment) shall be sized to temporarily hold at least 75 % of the WQv prior to filtration.

Volume within filter bed: Vf = Af (df) (n); n =0.25 for bioretention soils
Vf = 2,250 cf.

Storage above filter bed (6" Ponding layer): Vpond= (hf)(Af)
Vpond = 1,800 cf.

- Pre-treatment Storage: Vs

$V_{s\ (req.)}$ = 1,662 cf
$V_{s\ (prov.)}$ = 1,720 cf

Total Storage = 5,770 cf. > 3,116 cf.

Runoff Reduction Volume Analysis

Job:	Cricket Vallet Energy		
Job No.:	81001.00		
Description:	Preliminary Sizing For Required Runoff Reduction Volume		
Prep. By:	SD	Date:	6/21/2010
Check By:	CPL	Date:	6/21/2010

Site Statistics		
	Total Area (acres)	Impervious Area (acres)
Pre-Development	130.21	12.7
Post Development	130.21	18.83
Area for Required Runoff Reduction Volume (RRv)=		6.13

Section 4.2 of the NYSDEC Stormwater Management Design Manual (SWMDM) describes the Water Quality Volume equation as:

WQv = (P/12) * Rv * A

where: WQv = Water Quality Volume (acre-feet)

P = 90% Rainfall Event Number (inches) (interpolated from SWMDM Figure 4.1)

Rv = 0.05 + 0.009 (I); min Rv = 0.2

I = Impervious Cover (%) within the drainage area contributing to the SWM practice

A = Drainage area (acres) contributing to the SWM practice

P (inches)	Total Area (acres)	Impervious Cover (acres)	I (%)	Rv	Required RRv (acre-feet)
1.10	6.130	6.130	100	0.95	0.534
				RRv (cf)=	23,261.0

Runoff Reduction Computations						
Building #/Area	Building/Area Name	Area Captured (sf)	Percent Impervious	Associated WQv (ac-ft)	Required RRv=Wqv (cu-feet)	Provided RRv (cf)
Containment Areas - Capture and Reuse Stormwater						
1	Steam Turbine Generator / Step Up Transformer	1,072	100	0.002	87.12	87.1
2	Steam Turbine Generator / Step Up Transformer	1,072	100	0.002	87.12	87.1
3	Steam Turbine Generator / Step Up Transformer	1,072	100	0.002	87.12	87.1
4	Gas Turbine Step Up Transformer	1,562	100	0.003	130.68	130.7
5	Gas Turbine Step Up Transformer	1,562	100	0.003	130.68	130.7
6	Gas Turbine Step Up Transformer	1,335	100	0.003	130.68	130.7
7	Closed Cooling Water Pumps	444	100	0.001	43.56	43.6
8	Aqueous Ammonia Storage Area w/Truck Parking Area	1,921	100	0.004	174.24	174.2
9	Blackstart Generator Area	441	100	0.001	43.56	43.6
10	Auxiliary Boiler Area	1,583	100	0.003	130.68	130.7
Total		12,064		0.02	871.2	871.2
Roof Areas - Capture and Reuse Stormwater						
1	GIS Switchyard Bldg	7,199	100	0.014	609.84	609.8
2	Administration Control Room/Maintenance Shop/Warehouse Building	8,465	100	0.017	740.52	740.5
3	Water Treatment Building	10,665	100	0.021	914.76	914.8
4	Turbine Generator Building/Heat Recovery Steam Generator	110,119	100	0.22	9583.2	9,583.2
Total		136,448		0.272	11848.32	11,848.3
Green Infrastrucutre Practices						
1	Bioretention Facility #1	30,928	72.39	0.046	1,989	3,341
2	Bioretention Facility #2	91,912	94.79	0.175	7,609	10,538
3	Bioretention Facility #3	255,043	14.19	0.095	3,403	4,978
Total		377,882		0.316	13,001	18,857
	Total Area (Square Feet)	526,394	WQv (ac-ft)	0.608	RRV Provided	31,577
	Total Area (Acres)	12.08	WQv (cf)	25,721		
	Percentage of RRv Provided=		135.75%			

Post-Development Swale Design

Job:	Cricket Valley Energy		
Job No.:	81001.00		
Description:	Grass Lined Channel Design		
Prep. By:	CPL	Date:	2/16/2010
Check By:		Date:	

- Vegeated channels having turf reinforcement matting, the permissble velocity shall not exceed 8 ft/sec.
- Under Appendix L of NYS Storm Water Management Design Manual, maximum permissible velocities within vegetated channels shall not exceed values shown in Table L.1 "Permissible Velocites for Channels Lined with Vegetation"
- See attached calculations for determining flowrates.

Manning's Flow Calculator For Trapezoidal Channels

$$Q = (1.49 / n) * A * R^{2/3} * S^{1/2}$$

- Q = Flow Rate (cfs)
- n = Manning's Coefficient
- A = Cross - Sectional Flow Area (ft^2)
- R = Hydraulic Radius (Cross - Sectional Flow Area / Wetted Perimeter)
- S = Slope

$$F = V / ((D_h * g)^{1/2})$$ **(For Non-Rectangular Channels)**

- F = Froude Number
- V = Velocity (ft/s)
- D_h = Hydraulic Depth (ft) = Cross - Sectional Area / Width of Flow at Water Surface
- g = Gravitational Constant = 32.2 ft/s

Channel	Mannings n	Side Slope	Side Slope	Bottom Width (ft)	Depth (ft)	Slope (ft / ft)	Area (ft^2)	Wetted Perimeter (ft)	Hydraulic Radius	Actual Flow Rate (cfs)	Calculated Flow Rate (cfs)	Velocity (ft / s)	Velocity * Hydraulic Radius	Froude Number	Allowable Velocity (fps) For Slope (3)	Acceptable Velocity	Vegetative Lining	Erosion Control Matting
PS-2.4	0.078	3	3	3	0.750	0.070	3.938	7.743	0.508	12.00	12.68	3.220	1.637	0.783	4	Yes	(1/3) Reed Canary, (1/3) Tall Fescue, (1/3) Kentuck Bluegrass	NA
PS-2.3	0.056	3	3	4	0.880	0.070	5.843	9.566	0.611	27.00	29.61	5.068	3.096	1.126	5	Yes	(1/3) Reed Canary, (1/3) Tall Fescue, (1/3) Kentuck Bluegrass	Yes

Notes:

1. Mannings Values obtained from Figure L.1 "Manning's Value With Varying Flow Depth" of August 2003 New York State Storm Water Management Design Manual.
2. Flow's based upon 100-year storm.
3. Allowable velocities for vegetated slopes per Table L.1 "Permissible Velocities for Channels Lined with Vegeation" from August 2003 New York State Storm Water Management Design Manual.

Sediment Trap Design

Job:	Advanced Power-Cricket Valley Energy		
Job No.:	81001.01		
Description:	Erosion Control - Sediment Basin/Trap Calculations		
Prep. By:	MMF	Date:	7/16/2010
Check By:	CPL	Date:	7/16/2010

• As per the New York Standards and Specifications For Erosion and Sediment Control, August 2005, the volume of a volume of a sediment trap/basin shall be at least 3,600 cubic feet per acre of drainage area.
• Sediment shall be removed and the trap restored to the original dimensions when the sediment has accumulated to 1/2 of the design depth of the sediment trap/basin.
• All embankments for sediment basins shall not exceed 5 feet in height as measured at the low point of the original ground along the centerline of the embankment. Embankments shall have a minimum 4 foot wide top and side slopes of 2:1 or flatter.

Rip-Rap Outlet Sediment Traps
• Maximum drainage area for rip-rap outlet sediment basin is 15 acres.
• Storage volume available for a rip-rap outlet sediment trap is the volume available behind the outlet structure up to an elevation of 1 foot below the level of the weir crest.

Weir Dimensions - Per Page 5A.37 of NY Guidelines		
Contributing Drainage Area (ac)	**Depth of Channel (ft)**	**Length of Weir (ft)**
0	1.5	4
1	1.5	4
2	1.5	5
3	1.5	6
4	1.5	10
5	1.5	12
6	1.5	14
7	1.5	16
8	2	10
9	2	10
10	2	12
11	2	14
12	2	14
13	2	16
14	2	16
15	2	18
15.99		

SEDIMENT TRAPS					
RIP RAP OUTLET SEDIMENT TRAP	**TYPE OF FACILITY**	**AREA (sf)**	**AREA (AC)**	**VOLUME REQUIRED (cf)**	**CLEANOUT VOLUME (cf)**
1	Rip-Rap	638,154	14.65	52,740	26,370
2	Rip-Rap	122,839	2.82	10,152	5,076
3	Rip-Rap	209,302	4.80	17,280	8,640
4	Rip-Rap	43,996	1.01	3,636	1,818
5	Rip-Rap	41,382	0.95	3,420	1,710

Proposed Rip-Rap Outlet Sediment Trap # 1

- As per the table on page 5A.35 of the New York Guidelines for Urban Erosion and Sediment Control, a contributing drainage area of 14.65 acres requires the following:

- Length of Weir (ft) = 18
- Depth of Channel (ft) = 2
- Weir Crest Elev. = 423
- Top of Channel Elevation = Weir Crest Elevation + Depth of Channel = 425
- Freeboard (ft) = 0.5 x Depth of Channel = 1
- Top of Berm (ft) = Freeboard + Top of Channel Elevation = 426

Areas

Contour	Area (sf)	Cumulative Volume (cf)
420	28,674	0
421	31,932	30,303
422	35,291	63,915

Elevation at Storage Limit (one foot below weir elevation) = 422
Storage Limit (cf) = 63,915 > 52,740
Cleanout Volume (cf) = 26,370
Cleanout Elevation = 420.84

Proposed Rip-Rap Outlet Sediment Trap # 2

- As per the table on page 5A.35 of the New York Guidelines for Urban Erosion and Sediment Control, a contributing drainage area of 2.82 acres requires the following:

- Length of Weir (ft) = 6
- Depth of Channel (ft) = 1.5
- Weir Crest Elev. = 427.75
- Top of Channel Elevation = Weir Crest Elevation + Depth of Channel = 429.25
- Freeboard (ft) = 0.5 x Depth of Channel = 0.75
- Top of Berm (ft) = Freeboard + Top of Channel Elevation = 430

Areas

Contour	Area (sf)	Cumulative Volume (cf)
424	4,203	0
425	5,234	4,719
426	6,387	10,529
426.75	7,309	15,665

Elevation at Storage Limit (one foot below weir elevation) = 426.75
Storage Limit (cf) = 15,665 > 10,152
Cleanout Volume (cf) = 5,076
Cleanout Elevation = 425.08

Proposed Rip-Rap Outlet Sediment Trap # 3

- As per the table on page 5A.35 of the New York Guidelines for Urban Erosion and Sediment Control, a contributing drainage area of 4.80 acres requires the following:

- Length of Weir (ft) = 12
- Depth of Channel (ft) = 1.5
- Weir Crest Elev. = 434.5
- Top of Channel Elevation = Weir Crest Elevation + Depth of Channel = 436
- Freeboard (ft) = 0.5 x Depth of Channel = 0.75
- Top of Berm (ft) = Freeboard + Top of Channel Elevation = 436.75

Areas

Contour	Area (sf)	Cumulative Volume (cf)
429.5	2,187	0
430	3,041	1,307
431	3,978	4,817
432	4,996	9,304
433	6,091	14,847
433.5	6,668	18,037

Elevation at Storage Limit (one foot below weir elevation) = 433.5
Storage Limit (cf) = 18,037 > 17,280
Cleanout Volume (cf) = 8,640
Cleanout Elevation = 431.90

Proposed Rip-Rap Outlet Sediment Trap # 4

- As per the table on page 5A.35 of the New York Guidelines for Urban Erosion and Sediment Control, a contributing drainage area of 1.01 acres requires the following:

- Length of Weir (ft) = 5
- Depth of Channel (ft) = 1.5
- Weir Crest Elev. = 434.5
- Top of Channel Elevation = Weir Crest Elevation + Depth of Channel = 436
- Freeboard (ft) = 0.5 x Depth of Channel = 0.75
- Top of Berm (ft) = Freeboard + Top of Channel Elevation = 436.75

Areas

Contour	Area (sf)	Cumulative Volume (cf)
431	525	0
432	1,197	861
433	2,459	2,689
433.5	3,698	4,228

Elevation at Storage Limit (one foot below weir elevation) = 433.5
Storage Limit (cf) = 4,228 > 3,636
Cleanout Volume (cf) = 1,818
Cleanout Elevation = 432.49

Proposed Rip-Rap Outlet Sediment Trap # 5

- As per the table on page 5A.35 of the New York Guidelines for Urban Erosion and Sediment Control, a contributing drainage area of 0.95 acres requires the following:

- Length of Weir (ft) = 4
- Depth of Channel (ft) = 1.5
- Weir Crest Elev. = 429.75
- Top of Channel Elevation = Weir Crest Elevation + Depth of Channel = 431.25
- Freeboard (ft) = 0.5 x Depth of Channel = 0.75
- Top of Berm (ft) = Freeboard + Top of Channel Elevation = 432

Areas

Contour	Area (sf)	Cumulative Volume (cf)
427	1,590	0
428	2,175	1,883
428.75	2,662	3,696

Elevation at Storage Limit (one foot below weir elevation) = 428.75
Storage Limit (cf) = 3,696 > 3,420
Cleanout Volume (cf) = 1,710
Cleanout Elevation = 427.85

Appendix F:
Threatened and Endangered Species Correspondence

Faxed 09/21/2009

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, NY 13045

September 21, 2009

Ms. Lynn Gresock
Environmental Consultant
ARCADIS
Two Executive Drive, Suite 303
Chelmsford, MA 01824

Dear Ms. Gresock:

This is in response to your August 17, 2009, letter regarding the proposed 131.6-acre Cricket Valley Site in the Town of Dover, Dutchess County, New York. The following comments are provided pursuant to the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*). This response does not preclude additional U.S. Fish and Wildlife Service (Service) comments under other legislation.

The Service previously provided initial comments on the potential for listed species to occur at the project area in our July 20, 2009, letter to you. As you are aware, we stated that the Federally-listed threatened and State-listed endangered bog turtle (*Glypemys [=Clemmys] muhlenbergii*) is known to occur within and around the vicinity of the project area. In addition, we noted the potential for the Federally- and State-listed endangered Indiana bat (*Myotis sodalis*) to occur within the proposed project area.

We have reviewed the additional information provided in your August 17, 2009, letter and the above statements continue to represent our general findings of known/potential presence. We offer specific comments and recommendations by species below.

Bog turtle

We understand that Phase 1 bog turtle surveys were conducted in June 2009. While no suitable habitat was found within the property limits, New York State Department of Environmental Conservation (NYSDEC) wetland DP-22 (part of which occurs within the property) contains known occurrences of bog turtles off-site. Therefore, the next step is to determine the potential for impacts to this species. We previously provided you with a list (although not exhaustive) of potential impacts to bog turtles to consider. Given the negative results of the Phase 1 surveys within the project limits, it appears that the focus of the assessment should address potential indirect effects to wetland DP-22.

Indiana bat

We have reviewed the additional details (size of the patches [2.24-4.24 acres], overall acreage of tree removal [9.22 acres], separation of patches, tree description, current developed nature of the portion of the parcel proposed for development, and remaining forested acreage) provided on proposed tree-clearing activities for the project and agree with your conclusion that mist-netting is not warranted to assist with an analysis of impacts to the Indiana bat. Without any additional site-specific bat studies, it is reasonable to assume that Indiana bats are using the project area given its location and natural features of the site. Therefore, similar to the bog turtle, the next step is to determine the potential impacts to this species.

The Service considers the potential for direct and indirect effects to Indiana bats. For example, indirect effects may result from the loss and/or fragmentation of roosting or foraging habitat. In addition, lighting may deter Indiana bats from using areas (Sparks et al. 2005). It appears that tree removal associated with the project is unlikely to result in indirect effects to Indiana bats. However, additional information is necessary to evaluate the potential for other impacts. We offer the following recommended conservation measures for the proposed project and look forward to discussing these with you further. Tree removal should occur between October 1 and March 31 to avoid direct effects to Indiana bats associated with tree clearing. Bright orange fencing/flagging should clearly demarcate trees to be protected compared with those to be cut prior to the initiation of any construction activities at the site. This will help ensure that contractors do not accidently remove more trees than anticipated. To minimize potential impacts to Indiana bats from increased lighting in the area, we recommend limiting the number of lights, including motion sensors or timers, directing the lights towards the ground and buildings, and including shields to direct the light downward. We discourage the use of lighting and chemicals in/around storage detention basins. Finally, we recommend placing a conservation easement on the property west of the railroad tracks. As we continue to further understand the proposed project, we may have additional recommendations for you.

We have no further comments on the New England cottontail (*Sylvilagus transitionalis*) at this time.

As a reminder, the most recent compilation of Federally-listed and proposed endangered and threatened species in New York* is available for your information. Until the proposed project is complete, we recommend that you check our website* every 90 days from the date of this letter, to ensure that the listed species presence/absence information for the proposed project is current. Any additional information regarding the project and its potential to impact listed species should be coordinated with both this office and with the New York State Department of Environmental Conservation (NYSDEC). The NYSDEC contact for the Endangered Species Program is Mr. Peter Nye, Endangered Species Unit, 625 Broadway, Albany, NY 12233 (telephone: [518] 402-8859).

Thank you for your time. If you require additional information please contact Robyn Niver at (607) 753-9334. Future correspondence with us on this project should reference project file 90453.

Sincerely,

David A. Stilwell
Field Supervisor

*Additional information referred to above may be found on our website at: http://www.fws.gov/northeast/nyfo/es/section7.htm

References:

Sparks, D.W., C. M Ritzi, J. E. Duchamp, and J. O. Whitaker, Jr. 2005. Foraging habitat of the Indiana bat (*Myotis sodalis*) at an urban-rural interface. Journal of Mammalogy 86:713-718.

cc: NYSDEC, New Paltz, NY (Attn: L. Masi/A. Ciesluk)
NYSDEC, Albany, NY (Endangered Species; Attn: P. Nye)
COE, New York, NY (Attn: B. Orzel)

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U.S. Fish and Wildlife Service
3817 Luker Road
Cortland, NY 13045-9349
Attn: Robyn Niver

Subject:
Advanced Power NA – Cricket Valley Site – Project File Number 90453

Date:
August 17, 2009

Contact:
Lynn Gresock

Phone:
978.937.9999, ext. 320

Email:
lynn.gresock@
arcadis-us.com

Our ref:
CO001447

Dear Ms. Niver:

This letter is to provide follow-up information regarding the correspondence received from David Stilwell of your office dated July 20, 2009. We appreciate that the information you provided was based on site location only, and that no details of the project had been provided. Since that time, additional efforts on the project have occurred that better characterize the site and project details. We would appreciate your review of the information in this letter, and your response with regard to the conclusions we have reached for each issue. Below, please find additional information with regard to the Federal-listed threatened and State-listed endangered bog turtle (*Glypemys [=Clemmys] muhlenbergii*); the Federal- and State-listed endangered Indiana bat (Myotis sodais); and the candidate species New England cottontail (*Sylvilagus transitionalis*).

Bog Turtle

As recommended by New York State Department of Environmental Conservation (NYSDEC) and using an expert from the list provided by the United States Fish and Wildlife Services (USFWS), a Phase I Bog Turtle Survey has been completed for the project site. The report, included with this letter, concludes that suitable bog turtle habitat is not located at the site. We look forward to review of the report by your office and NYSDEC to confirm whether any further actions are recommended in this regard. Note that the report also includes a habitat assessment for timber rattlesnake (*Crotalus horridus*), which was also recommended by NYSDEC; that assessment concluded that this site does not have suitable den habitat and that abundant and more suitable habitat for this species exists more proximate to documented regional den sites.

Indiana Bat

Your correspondence notes the potential for Indiana bat to occur in the project area, with reference to two males captured within 2 miles from the project area and the likelihood of a maternity colony approximately 5 miles away. A mist netting survey was suggested, consistent with USFWS guidelines, which would require completion of the survey between May 15 and August 15. Due to the specific location of the

proposed project and existing buildings, we do not believe a mist netting survey is warranted for the project in order to provide adequate protection for the avoidance and minimization of adverse effects to Indiana bats. Information about the existing condition and location of the proposed project, a general description of project activities, and the area and characteristics for anticipated tree encroachment are provided below to provide additional context for this issue.

Site Location and Condition

As previously provided, the site is located in Dover, Dutchess County (Figure 1). As shown on Figure 1, the site is bounded on the east by Route 22, and the Swamp River flows through the site's westernmost extent. An active railroad line also extends through the site in a north-south direction. The area east of the railroad tracks includes many dilapidated structures that would be removed as part of project development at this previously developed industrial site. The proposed development area will focus on the portion of the site east of the railroad tracks; no work is proposed west of the railroad. The entire parcel optioned by Cricket Valley Energy is 131.6 acres. The proposed development parcel, however, is considerably smaller at approximately 56 acres (the portion of the site east of the railroad tracks on Figure 1).

Figure 2 provides representative photographs showing some of the industrial buildings currently located on the site. The extent of the development area currently disturbed can also be seen on the aerial photograph in Figure 3.

Project Activities and Characteristics

The proposed Cricket Valley Energy project is a 1,000 megawatt natural gas-fired combined-cycle electric generating facility. Figure 4 provides a preliminary site plan for the facility. As shown in that figure, natural gas (the project's sole fuel) and electrical interconnections will be made with existing infrastructure adjacent to the site. The project will utilize air cooling and a zero liquid discharge system in order to minimize water demand and eliminate the need for wastewater discharge (with the exception of septic and stormwater flows).

Project Location and Tree Encroachment

The project's preliminary layout can be overlain onto the aerial photograph to illustrate the degree to which the proposed facility would utilize previously disturbed and developed industrial area. Three separate areas around the perimeters of the

existing developed land are anticipated to require clearing, as shown in Figure 3. A significant priority in the layout of the project has been maintaining trees throughout the site for their benefits that include visual buffer. No work is proposed west of the railroad tracks, where much of the on-site forested habitat and the Swamp River are located.

Area 1, the gas insulated switchgear (GIS) switchyard area, is partially wooded with eastern red cedar, sycamore, black cherry, red maple and cottonwood of diameters ranging from 1 inch to 10 inches. The use of a GIS switchyard has been selected at significant cost to the project in order to greatly minimize the potential for wetland encroachment and tree clearing. It is estimated that approximately 2.24 acres of clearing would occur in this area.

Area 2 includes elements associated with the project that are related to the natural gas and electrical interconnections. Again, a GIS substation has been selected to substantially minimize the footprint. Access and piping estimates have been conservatively located for the assessment of potential impact. The vegetated portions of this area contain relatively small white ash, eastern red cedar, black walnut and black cherry trees. It is estimated that approximately 4.24 acres of clearing would occur in this area.

Area 3 is the detention pond and a portion of one air-cooled condenser. This area supports small (< 6" diameter) cottonwood, aspen, and eastern red cedar trees that recently colonized a formerly open area of the site. Layout elements have avoided wetland impact in this area, and will be further optimized as design work continues for the project. As currently shown, approximately 2.74 acres of clearing would occur in this area.

Summary

Although clearing will occur at the site, relatively small areas of clearing in disparate locations around the perimeter of previously developed area are proposed. Significant forested area will remain, more proximate to the Swamp River and more contiguous forest. The project itself is unlikely to pose a risk to Indiana bat individuals with the potential to utilize the area. We do not believe that additional surveys, such as mist netting, would conclusively determine the use of the area, nor would provide for additional species protection. We look forward to your comments and will be pleased to work with USFWS to address any remaining concerns.

New England Cottontail

Although the New England cottontail is not yet a listed species, we appreciate the information regarding its current proposed status. We understand that the New England cottontail prefers early successional forests, often called thickets, with thick and tangled vegetation. A dense shrub layer allows them to forage more safely from predators. As is the case for the Indiana bat, we believe the selection of a site that utilizes previously developed industrial property and selection of technologies that minimize the footprint limit potential concerns about encroachment on habitat.

We look forward to your additional guidance with regard to species issues at this site. If you have any questions or require additional information, please do not hesitate to contact me. Thank you in advance for your assistance.

Sincerely,

ARCADIS

Lynn Gresock

Lynn Gresock
Environmental Consultant

Copies: C. Hogan, NYSDEC; J.Ahrens, Advanced Power

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, NY 13045

July 20, 2009

Mr. Lynn Gresock
Associate Vice President
ARCADIS
Two Executive Drive, Suite 303
Chelmsford, MA 01824

Dear Mr. Gresock:

This is in response to your June 2, 2009, letter regarding the proposed 131.6-acre Cricket Valley Site in the Town of Dover, Dutchess County, New York. The following comments are provided pursuant to the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*). This response does not preclude additional U.S. Fish and Wildlife Service (Service) comments under other legislation.

Given our understanding of the project site, it appears that the Federally-listed threatened and State-listed endangered bog turtle (*Glypemys [=Clemmys] muhlenbergii*) occurs within and around the vicinity of the project area. Therefore, efforts must be made to avoid direct and indirect effects to the wetlands within and offsite of the proposed project area.

At this time, the Service has no information regarding the plans for the site. However, adverse impacts associated with residential and commercial development could include, but are not limited to, fragmentation of habitat and alterations to bog turtle dispersal routes; introduction of contaminated surface water runoff into the wetland from pesticides, herbicides, fertilizers, road deicers, etc.; alteration of wetland hydrology; introduction of nutrients from septic systems; introduction of yard and other waste materials into wetlands; introduction of people, pets, and recreational vehicles into wetlands; and death/injury of bog turtles that wander onto lawns and roads. Generally, the larger the upland buffer, the lower the risk of many of these potential adverse affects. However, some of the effects may not be adequately addressed by buffers. The Bog Turtle (*Clemmys muhlenbergii*) Northern Population Recovery Plan (U.S. Fish and Wildlife Service 2001) (Appendix A - Bog Turtle Conservation Zones) includes recommendations for minimum buffers for various activities. You can find this document at http://nyfo.fws.gov/es/btconszone.pdf. Please note that the Service generally recommends a minimum of a 300-foot buffer around wetlands with known or likely bog turtle populations. The Recovery Plan recommends avoiding many activities within this area including development, delineation of lot lines, herbicide application, and pesticide or fertilizer application.

In addition to the bog turtle, there is potential for the Federally- and State-listed endangered Indiana bat (*Myotis sodalis*) to occur within the proposed project area. Two males were captured approximately 2 miles from the project area and there is likely a maternity colony approximately

5 miles from the site. The Service recommends that the applicant conduct mist netting between May 15 and August 15. The Service's current mist-netting guidelines are available on our website.* Should any Indiana bats be captured during mist-netting activities, a radio-transmitter should be attached to the bat and the bat should be tracked to determine whether there is roosting, foraging, and/or maternity habitat present within the proposed project area. We encourage the applicant to coordinate with the Service to develop the proposed survey and tracking scope of work. This type of information can greatly assist the Service and any involved Federal agencies with a full analysis of the effects of the proposed activity. We recommend that the applicant provide the requested information to the Service to determine whether additional conservation measures may be needed to avoid or minimize adverse effects to Indiana bats.

In addition, the New England cottontail (*Sylvilagus transitionalis*) is known to occur within 4 miles of the proposed project. The New England cottontail is a candidate species which is being considered by the Service for addition to the Federal List of Endangered and Threatened Wildlife and Plants. Candidate species are species for which the Service has on file sufficient information on the biological vulnerability and threat(s) to support issuance of a proposal to list, but issuance of a proposed rule is currently precluded by higher priority listing actions. Candidate species do not receive substantive or procedural protection under the ESA; however, the Service does encourage Federal agencies and other appropriate parties to consider these species in the project planning process.

Should the New England cottontail be proposed for listing as endangered or threatened prior to completion of this project, conference procedures pursuant to Section 7(a)(4) of the ESA may be necessary if your project involves Federal authorizations. Should this species be listed prior to completion of the project, further coordination or consultation pursuant to the ESA will be required to evaluate potential adverse effects of project implementation on the New England cottontail or its habitat, and to determine if formal consultation is necessary. Please visit our website for more information on New England cottontail.

The most recent compilation of Federally-listed and proposed endangered and threatened species in New York is available for your information. Until the proposed project is complete, we recommend that you check our website every 90 days from the date of this letter to ensure that listed species presence/absence information for the proposed project is current.

As stated above, the Indiana bat and bog turtle are listed as endangered by the State of New York. The New England cottontail is a New York State Species of Special Concern. Any additional information regarding the project and its potential to impact listed species should be coordinated with both this office and with the New York State Department of Environmental Conservation (NYSDEC). The NYSDEC contact for the Endangered Species Program is Mr. Peter Nye, Endangered Species Unit, 625 Broadway, Albany, NY 12233 (telephone: [518] 402-8859).

In summary, we have concerns about potential impacts to Federally-listed species from the proposed project. We recommend additional coordination among the appropriate consulting firms, the NYSDEC, any involved Federal agencies, the applicant, and the Service regarding these potential impacts.

Thank you for your time. If you require additional information please contact Robyn Niver at (607) 753-9334. Future correspondence with us on this project should reference project file 90453.

Sincerely,

David A. Stilwell
Field Supervisor

*Additional information referred to above may be found on our website at: http://www.fws.gov/northeast/nyfo/es/section7.htm

References:

U.S. Fish and Wildlife Service. 2001. Bog Turtle (*Clemmys muhlenbergii*), Northern Population, Recovery Plan. Hadley, Massachusetts. 103 pp.

cc: NYSDEC, New Paltz, NY (Attn: L. Masi/A. Ciesluk)
NYSDEC, Albany, NY (Endangered Species; Attn: P. Nye)
COE, New York, NY (Attn: B. Orzel)

Appendix G:
State Historic Preservation Office (SHPO) Letter

EXHIBIT – 21.0

Cultural Resource Survey/Letters (Historical & Archaeological)

OFFICE OF PARKS · RECREATION · HISTORIC PRESERVATION
NEW YORK STATE

New York State Office of Parks, Recreation and Historic Preservation

Historic Preservation Field Services Bureau • Peebles Island, PO Box 189, Waterford, New York 12188-0189
518-237-8643
www.nysparks.com

David A. Paterson
Governor

Carol Ash
Commissioner

September 25, 2009

Lynn Gresock
Arcadis
Two Executive Drive
Suite 303
Chelmsford, Massachusetts 01824

Re: EPA,CORPS PERMITS,DEC,PSC,SEQRA
Advanced Power NA; Cricket Valley Site
West of NY 22, Dover Furnace
vicinity/DOVER, Dutchess County
09PR04340

Dear Ms. Gresock:

Thank you for requesting the comments of the State Historic Preservation Office (SHPO). We have reviewed the project in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include potential environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8).

Based upon this review, it is the SHPO's opinion that your project will have No Effect upon cultural resources in or eligible for inclusion in the National Registers of Historic Places.

If further correspondence is required regarding this project, please be sure to refer to the OPRHP Project Review (PR) number noted above.

Sincerely,

Ruth L. Pierpont

Ruth L. Pierpont
Director

ARCADIS
Infrastructure, environment, buildings

ARCADIS
Two Executive Drive
Suite 303
Chelmsford
Massachusetts 01824
Tel 978.937.9999
Fax 978.937.7555
www.arcadis-us.com

Mr. Kenneth Markunas
New York State Historic Preservation Office
Peebles Island Resource Center
P.O. Box 189
Waterford, NY 12188-0189

Subject:
OPRHP Project Review Number: 09PR04340
Historic and Archaeological Resource Review
Advanced Power NA - Cricket Valley Site

Date:
September 15, 2009

Contact:
Lynn Gresock

Phone:
978.937.9999, ext. 320

Email:
lynn.gresock@
arcadis-us.com

Our ref:
CO001447

Dear Mr. Markunas:

As you know, ARCADIS is requesting information from the Office of Parks, Recreation and Historic Preservation (OPRHP) regarding the presence of archaeological or cultural resources or listings in the National Register of Historic Places associated with the proposed Cricket Valley Energy project located in the Town of Dover, Dutchess County. Mapping has been provided to indicate the location of the site, and the portion of the site that will comprise the development parcel. In response to your request for a site plan showing existing and proposed conditions, this letter provides a preliminary version of the proposed project's grading plan, focused on the approximately 60-acre footprint where development is proposed within the approximately 130-acre site. Because no activities are proposed west of the railroad tracks, details regarding site characteristics have not been provided for that portion of the site.

The preliminary grading plan provided has been highlighted to show in green the extent of the development parcel on this portion of the site. The yellow highlighting at the base of the drawing (to the west) is the location of the existing, active rail line. No project development is proposed west of this feature. Boundaries of wetlands and the preliminary footprint of the project area shown in the black lines on the drawing; the blue lines illustrate existing site contours. As noted in our prior correspondence on August 13, 2009, the site has been in industrial use since 1932, and a significant portion of the proposed project will be located where existing buildings are currently located. The existing structures and roadways on the site have also been highlighted in yellow for ease of comparison with the overall development area and the preliminary footprint. Note that the roughly circular area between the two wetlands located in the northerly portion of the site represents a

slag pile (largely limestone) that is a remnant from the former industrial uses at the site. The development parcel, therefore, consists almost entirely of previously developed industrial area, wetlands, and the easterly steep slopes extending down from Route 22.

We would greatly appreciate it if you could review your files and provide any available information regarding known resources in the area, and let us know whether additional studies are recommended for either historic structures or potential archaeological sensitivity. If you have any questions or require additional information, please do not hesitate to contact me. Thank you in advance for your assistance.

Sincerely,

ARCADIS

Lynn Gresock

Lynn Gresock
Environmental Consultant

Copies: C. Hogan, NYSDEC; J.Ahrens, Advanced Power

Appendix H:
NYSDEC Forms

Notice of Intent
(Sample Form)

NOTICE OF INTENT

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

NYR ☐☐☐☐☐☐
(for DEC use only)

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-10-001

All sections must be completed unless otherwise noted. Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this General Permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan prior to submitting this NOI. Applicants are responsible for identifying and obtaining other DEC permits that may be required.

-IMPORTANT-
RETURN THIS FORM TO THE ADDRESS ABOVE
OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

Owner/Operator (Company Name/Private Owner Name/Municipality Name)

Owner/Operator Contact Person Last Name (NOT CONSULTANT)

Owner/Operator Contact Person First Name

Owner/Operator Mailing Address

City

State

Zip -

Phone (Owner/Operator) - -

Fax (Owner/Operator) - -

Email (Owner/Operator)

FED TAX ID - (not required for individuals)

Project Site Information

Project/Site Name

Street Address (NOT P.O. BOX)

Side of Street

○ **North** ○ **South** ○ **East** ○ **West**

City/Town/Village (THAT ISSUES BUILDING PERMIT)

State N Y

Zip -

County

DEC Region

Name of Nearest Cross Street

Distance to Nearest Cross Street (Feet)

Project In Relation to Cross Street

○ **North** ○ **South** ○ **East** ○ **West**

Tax Map Numbers
Section-Block-Parcel

Tax Map Numbers

1. Provide the Geographic Coordinates for the project site in NYTM Units. To do this you **must** go to the NYSDEC Stormwater Interactive Map on the DEC website at:

www.dec.ny.gov/imsmaps/stormwater/viewer.htm

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located your project site, go to the tool boxes on the top and choose "i"(identify). Then click on the center of your site and a new window containing the X, Y coordinates in UTM will pop up. Transcribe these coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting)

Y Coordinates (Northing)

4

2. What is the nature of this construction project?

○ **New Construction**

○ **Redevelopment with increase in imperviousness**

○ **Redevelopment with no increase in imperviousness**

3. Select the predominant land use for both pre and post development conditions.
SELECT ONLY ONE CHOICE FOR EACH

Pre-Development Existing Land Use

- ○ FOREST
- ○ PASTURE/OPEN LAND
- ○ CULTIVATED LAND
- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY
- ○ PARKING LOT
- ○ OTHER

Post-Development Future Land Use

- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION — Number of Lots
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ MUNICIPAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY (water, sewer, gas, etc.)
- ○ PARKING LOT
- ○ CLEARING/GRADING ONLY
- ○ DEMOLITION, NO REDEVELOPMENT
- ○ OTHER

4. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law ? ○ **Yes** ○ **No**

5. Is this a project which does not require coverage under the General Permit (e.g. Project done under an Individual SPDES Permit, or department approved remediation)? ○ **Yes** ○ **No**

6. Is this property owned by a state authority, state agency or local government? ○ **Yes** ○ **No**

7. In accordance with the larger common plan of development or sale, enter the total project site acreage, the acreage to be disturbed and the future impervious area (acreage)within the disturbed area. Round to the nearest tenth of an acre.

Total Site Acreage	**Acreage To Be Disturbed**	**Existing Impervious Area Within Disturbed**	**Future Impervious Area Within Disturbed**
.	.	.	.

8. Do you plan to disturb more than 5 acres of soil at any one time? ○ **Yes** ○ **No**

9. Indicate the percentage of each Hydrologic Soil Group(HSG) at the site.

A	**B**	**C**	**D**
%	%	%	%

10. Is this a phased project? ○ **Yes** ○ **No**

11. Enter the planned start and end dates of the disturbance activities.

Start Date __ / __ / ____ - **End Date** __ / __ / ____

12. Identify the nearest, natural, surface waterbody(ies) to which construction site runoff will discharge.

Name

12a. Type of waterbody identified in Question 12?

- ○ Wetland / State Jurisdiction On Site (Answer 12b)
- ○ Wetland / State Jurisdiction Off Site
- ○ Wetland / Federal Jurisdiction On Site (Answer 12b)
- ○ Wetland / Federal Jurisdiction Off Site
- ○ Stream / Creek On Site
- ○ Stream / Creek Off Site
- ○ River On Site
- ○ River Off Site
- ○ Lake On Site
- ○ Lake Off Site
- ○ Other Type On Site
- ○ Other Type Off Site

12b. How was the wetland identified?

- ○ Regulatory Map
- ○ Delineated by Consultant
- ○ Delineated by Army Corps of Engineers
- ○ Other (identify)

13. Has the surface waterbody(ies) in question 12 been identified as a 303(d) segment in Appendix E of GP-0-10-001? ○ **Yes** ○ **No**

14. Is this project located in one of the Watersheds identified in Appendix C of GP-0-10-001? ○ **Yes** ○ **No**

15. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? **If no, skip question 16.** ○ **Yes** ○ **No**

16. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey? ○ **Yes** ○ **No**
If Yes, what is the acreage to be disturbed?
____ . __

17. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area? ○ **Yes** ○ **No**

18. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)? ○ **Yes** ○ **No** ○ **Unknown**
(If No, skip question 19)

19. What is the name of the municipality/entity that owns the separate storm sewer system?

20. Does any runoff from the site enter a sewer classified as a Combined Sewer? ○ **Yes** ○ **No** ○ **Unknown**

21. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book) ? ○ **Yes** ○ **No**

22. Does this construction activity require the development of a SWPPP that includes Water Quality and Quantity Control components (Post-Construction Stormwater Management Practices) ○ **Yes** ○ **No**
(If No, skip questions 23 and 27-35)

23. Have the Water Quality and Quantity Control components of the SWPPP been developed in comformance with the current NYS Stormwater Management Design Manual ? ○ **Yes** ○ **No**

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:

- ○ **Professional Engineer (P.E.)**
- ○ **Soil and Water Conservation District (SWCD)**
- ○ **Registered Landscape Architect (R.L.A)**
- ○ **Certified Professional in Erosion and Sediment Control (CPESC)**
- ○ **Owner/Operator**
- ○ **Other**

SWPPP Preparer

Contact Name (Last, Space, First)

Mailing Address

City

State

Zip -

Phone - -

Fax - -

Email

SWPPP Preparer Certification

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-10-001. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

First Name

MI

Last Name

Signature

Date / /

25. Has a construction sequence schedule for the planned management practices been prepared? ○ Yes ○ No

26. Select **all** of the erosion and sediment control practices that will be employed on the project site:

Temporary Structural

- ○ Check Dams
- ○ Construction Road Stabilization
- ○ Dust Control
- ○ Earth Dike
- ○ Level Spreader
- ○ Perimeter Dike/Swale
- ○ Pipe Slope Drain
- ○ Portable Sediment Tank
- ○ Rock Dam
- ○ Sediment Basin
- ○ Sediment Traps
- ○ Silt Fence
- ○ Stabilized Construction Entrance
- ○ Storm Drain Inlet Protection
- ○ Straw/Hay Bale Dike
- ○ Temporary Access Waterway Crossing
- ○ Temporary Stormdrain Diversion
- ○ Temporary Swale
- ○ Turbidity Curtain
- ○ Water bars

Biotechnical

- ○ Brush Matting
- ○ Wattling

Vegetative Measures

- ○ Brush Matting
- ○ Dune Stabilization
- ○ Grassed Waterway
- ○ Mulching
- ○ Protecting Vegetation
- ○ Recreation Area Improvement
- ○ Seeding
- ○ Sodding
- ○ Straw/Hay Bale Dike
- ○ Streambank Protection
- ○ Temporary Swale
- ○ Topsoiling
- ○ Vegetating Waterways

Permanent Structural

- ○ Debris Basin
- ○ Diversion
- ○ Grade Stabilization Structure
- ○ Land Grading
- ○ Lined Waterway (Rock)
- ○ Paved Channel (Concrete)
- ○ Paved Flume
- ○ Retaining Wall
- ○ Riprap Slope Protection
- ○ Rock Outlet Protection
- ○ Streambank Protection

Other

Water Quality and Quantity Control

Important: **Completion of Questions 27-35 is not required if response to Question 22 is No.**

Post-Construction Stormwater Management Practices

27. Indicate **all** Stormwater Management Practice(s) that will be installed/constructed on this site:

Ponds

- ○ **Micropool Extended Detention (P-1)**
- ○ **Wet Pond (P-2)**
- ○ **Wet Extended Detention (P-3)**
- ○ **Multiple Pond System (P-4)**
- ○ **Pocket Pond (P-5)**

Filtering

- ○ **Surface Sand Filter (F-1)**
- ○ **Underground Sand Filter (F-2)**
- ○ **Perimeter Sand Filter (F-3)**
- ○ **Organic Filter (F-4)**
- ○ **Bioretention (F-5)**
- ○ **Other** _____

Alternative Practice

- ○ **Rain Garden**
- ○ **Cistern**
- ○ **Green Roof**
- ○ **Stormwater Planters**
- ○ **Permeable Paving (Modular Block)**

Wetlands

- ○ **Shallow Wetland (W-1)**
- ○ **Extended Detention Wetland (W-2)**
- ○ **Pond/Wetland System (W-3)**
- ○ **Pocket Wetland (W-4)**

Infiltration

- ○ **Infiltration Trench (I-1)**
- ○ **Infiltration Basin (I-2)**
- ○ **Dry Well (I-3)**
- ○ **Underground Infiltration System**

Open Channels

- ○ **Dry Swale (O-1)**
- ○ **Wet Swale (O-2)**

Verified Proprietary Practice

- ○ **Hydrodynamic**
- ○ **Wet Vault**
- ○ **Media Filter**

28. Describe other stormwater management practices not listed above or explain any deviations from the technical standards.

29. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed? ○ **Yes** ○ **No**

If Yes, Identify the entity responsible for the long term Operation and Maintenance

30. Provide the total water quality volume required and the total provided for the site.

WQv Required ___.___ **acre-feet**

WQv Provided ___.___ **acre-feet**

31. Provide the following Unified Stormwater Sizing Criteria for the site.

Total Channel Protection Storage Volume (CPv) - Extended detention of post-developed 1 year, 24 hour storm event

CPv Required ___.___ **acre-feet**

CPv Provided ___.___ **acre-feet**

31a. The need to provide for channel protection has been waived because:

○ **Site discharges directly to fourth order stream or larger**

Total Overbank Flood Control Criteria (Qp) - Peak discharge rate for the 10 year storm

Pre-Development ___.___ **CFS**

Post-development ___.___ **CFS**

Total Extreme Flood Control Criteria (Qf) - Peak discharge rate for the 100 year storm

Pre-Development ___.___ **CFS**

Post-development ___.___ **CFS**

31b. The need to provide for flood control has been waived because:

○ **Site discharges directly to fourth order stream or larger**

○ **Downstream analysis reveals that flood control is not required**

IMPORTANT: For questions 31 and 32, impervious area should be calculated considering the project site and all offsite areas that drain to the post-construction stormwater management practice(s). (Total Drainage Area = Project Site + Offsite areas)

32. Pre-Construction Impervious Area - As a percent of the Total Drainage Area enter the percentage of the existing impervious areas before construction begins. ___ %

33. Post-Construction Impervious Area - As a percent of the Total Drainage Area, enter the percentage of the future impervious areas that will be created/remain on the site after completion of construction. ___ %

34. Indicate the total number of post-construction stormwater management practices to be installed/constructed. ___

35. Provide the total number of stormwater discharge points from the site. (include discharges to either surface waters or to separate storm sewer systems) ___

36. Identify other DEC permits that are required for this project.

DEC Permits

- ○ Air Pollution Control
- ○ Coastal Erosion
- ○ Hazardous Waste
- ○ Long Island Wells
- ○ Mined Land Reclamation
- ○ Other SPDES
- ○ Solid Waste
- ○ None
- ○ Navigable Waters Protection / Article 15
- ○ Water Quality Certificate
- ○ Dam Safety
- ○ Water Supply
- ○ Freshwater Wetlands/Article 24
- ○ Tidal Wetlands
- ○ Wild, Scenic and Recreational Rivers
- ○ Stream Bed or Bank Protection / Article 15
- ○ Other

37. Does this project require a US Army Corps of Engineers Wetland Permit? ○ **Yes** ○ **No**
If Yes, Indicate Size of Impact. ____.__

38. Is this project subject to the requirements of a regulated, traditional land use control MS4? ○ **Yes** ○ **No**
(If No, skip question 39)

39. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI? ○ **Yes** ○ **No**

40. If this NOI is being submitted for the purpose of continuing coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned. N Y R

Owner/Operator Certification

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Print First Name **MI**

Print Last Name

Owner/Operator Signature

Date __ / __ / ____

Notice of Termination
(Sample Form)

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505
(NOTE: Submit completed form to address above)

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity

Please indicate your permit identification number: NYR ___ ___ ___ ___ ___ ___

I. Owner or Operator Information

1. Owner/Operator Name:

2. Street Address:

3. City/State/Zip:

4. Contact Person: | 4a.Telephone:

5. Contact Person E-Mail:

II. Project Site Information

5. Project/Site Name:

6. Street Address:

7. City/Zip:

8. County:

III. Reason for Termination

9a. ☐ All disturbed areas have achieved final stabilization in accordance with the general permit and SWPPP.
***Date final stabilization completed** (month/year): _____

9b. ☐ Permit coverage has been transferred to new owner/operator. Indicate new owner/operator's permit identification number: NYR ___ ___ ___ ___ ___ ___
(Note: Permit coverage can not be terminated by owner identified in I.1. above until new owner/operator obtains coverage under the general permit)

9c. ☐ Other (Explain on Page 2)

IV. Final Site Information:

10a. Did this construction activity require the development of a SWPPP that includes post-construction stormwater management practices? ☐ yes ☐ no (If no, go to question 10f.)

10b. Have all post-construction stormwater management practices included in the final SWPPP been constructed? ☐ yes ☐ no (If no, explain on Page 2)

10c. Identify the entity responsible for long-term operation and maintenance of practice(s)?

_____

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

10d. Has the entity responsible for long-term operation and maintenance been given a copy of the operation and maintenance plan required by the general permit? ☐ yes ☐ no

10e. Indicate the method used to ensure long-term operation and maintenance of the post-construction stormwater management practice(s):

☐ Post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain practice(s) have been deeded to the municipality.

☐ Executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s).

☐ For post-construction stormwater management practices that are privately owned, the deed of record has been modified to include a deed covenant that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

☐ For post-construction stormwater management practices that are owned by a public or private institution (e.g. school, college, university), or government agency or authority, policy and procedures are in place that ensures operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

10f. Provide the total area of impervious surface (i.e. roof, pavement, concrete, gravel, etc.) constructed within the disturbance area? _____ (acres)

11. Is this project subject to the requirements of a regulated, traditional land use control MS4? ☐ yes ☐ no
(If Yes, complete section VI - "MS4 Acceptance" statement

V. Additional Information/Explanation:
(Use this section to answer questions 9c. and 10b., if applicable)

VI. MS4 Acceptance - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative (Note: Not required when 9b. is checked -transfer of coverage)

I have determined that it is acceptable for the owner or operator of the construction project identified in question 5 to submit the Notice of Termination at this time.

Printed Name:

Title/Position:

Signature:	Date:

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued	
VII. Qualified Inspector Certification - Final Stabilization:	
I hereby certify that all disturbed areas have achieved final stabilization as defined in the current version of the general permit, and that all temporary, structural erosion and sediment control measures have been removed. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.	
Printed Name:	
Title/Position:	
Signature:	Date:
VIII. Qualified Inspector Certification - Post-construction Stormwater Management Practice(s):	
I hereby certify that all post-construction stormwater management practices have been constructed in conformance with the SWPPP. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.	
Printed Name:	
Title/Position:	
Signature:	Date:
IX. Owner or Operator Certification	
I hereby certify that this document was prepared by me or under my direction or supervision. My determination, based upon my inquiry of the person(s) who managed the construction activity, or those persons directly responsible for gathering the information, is that the information provided in this document is true, accurate and complete. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.	
Printed Name:	
Title/Position:	
Signature:	Date:

(NYS DEC Notice of Termination - January 2010)

Appendix I:
Post-Construction Inspections and Maintenance

POST CONSTRUCTION INSPECTIONS AND MAINTENANCE

1. SITE COVER

a. Inspections

Site cover and associated structures and embankments should be inspected periodically for the first few months following construction and then on a biannual basis. Site inspections should also be performed following all major (i.e., intense storms, thunder storms, cloud burst, etc.) storm events. Items to check for include (but are not limited to):

i. Differential settlement of embankments, cracking or erosion.

ii. Lack of vigor and density of grass turf.

iii. Accumulation of sediments or litter on lawn areas, paved areas, or within catch basin sumps.

iv. Accumulation of pollutants, including oils or grease, in catch basin sumps.

v. Damage or fatigue of storm sewer structures or associated components.

b. Mowing and Sweeping

Vegetated areas and landscaping should be maintained to promote vigorous and dense growth. Lawn areas should be mowed at least three times a year (more frequent mowing may be desired for aesthetic reasons). Resultant yard waste shall be collected and disposed of off-site.

Paved areas should be swept at least twice a year. Additional sweeping may be appropriate in the early spring for removal of deicing materials

c. Debris and Litter Removal

Accumulation of litter and debris should be removed during each mowing or sweep operation.

d. Structural Repair or Replacement

Components of the system which require repair or replacement should be addressed immediately following identification.

e. Catch Basins

The frequency for cleanout of catch basin sumps will depend on the efficiency of mowing, sweeping, and debris and litter removal. Sumps should be cleaned when accumulation of sediments are within six inches of the catch basin outlet pipe.

Disposal of material from catch basins sumps, drainage manholes, and trench drains shall be in accordance with local, state, and federal guidelines.

f. Grassed Swales

Swale maintenance will include periodic mowing, occasional spot reseeding and weed control to keep grass cover dense and vigorous. Resultant yard waste shall be collected and disposed of off-site. Application of fertilizers and pesticides should be restricted or limited.

g. Rip-rap Dissipation structures

Rip-rap used to dissipate energy from pipe outfalls shall be cleaned or replaced when it becomes overburdened with silt or sediment.

h. Winter Maintenance

To prevent impacts to storm water management facilities, the following winter maintenance limitations, restrictions, or requirements are recommended:

i. Remove snow and ice from inlet structures, basin inlet and outlet structures and away from culvert end sections.

ii. Snow removed from paved areas should not be piled at inlets/outlets of the storm water management basin.

iii. Use of deicing materials should be limited to sand and "environmentally friendly" chemical products. Use of salt mixtures should be kept to a minimum.

iv. Sand used for deicing should be clean, course material free of fines, silt, and clay.

v. Materials used for deicing should be removed during the early spring by sweeping and/ or vacuuming.

2. SURFACE DETENTION BASIN

a. Inspections

Detention Basin should be inspected periodically for the first few months after construction and then on an annual basis. Detention Basin should be inspected after major storm events to ensure inlets and outlets remain clear. Items to check for include (but are not limited to):

i. Differential settlement of embankments.

ii. Cracking, erosion, or seepage through embankments.

iii. Evidence of clogging at inlets or outlets.

iv. Erosion of the flow path through the detention basin.

v. Brush, shrub, or tree growth on embankments.

vi. Condition of the overflow spillway.

vii. Lack of vigor and density of grass turf on the basin embankments.

b. Mowing

The side slopes, embankments, inlets, and overflow spillways of the detention basin should be mowed at least three times a year and resultant yard wastes collected and disposed of off-site.

c. Debris and Litter Control

Removal of debris and litter should be accomplished during mowing operations. Inlet and outlet structures should be cleared of all debris and litter.

d. Structural repairs and Replacement

Components of the detention basin, which require repair or replacement, should be addressed immediately following identification.

e. Erosion Control

Sources of sedimentation, specifically eroded areas in upland drainage areas, should be stabilized immediately upon identification. Stabilization should be with vegetative practices or other erosion control practices when vegetative measures do not prove effective.

Soil slumpage, erosion of the basin embankment or around inlets/outlets, and cracking should be stabilized and repaired immediately upon identification. Repair, replacement, or addition of rip-rap aprons, channels or embankments should be pursued as required.

f. Sediment removal

Sediments, which accumulate in the detention basin, should be removed periodically to prevent clogging of inlet or outlet structures. A typical clean-out cycle should be between 5 to 10 years with more frequent cleanings near inlet and outlet structures.

3. FOREBAYS AND WET POOL

a. Inspections

Forebays and Wet Pool should be inspected periodically for the first few months after construction and then on an annual basis. Forebays and Wet Pool should be inspected following all major storm events. Items to check for include (but are not limited to):

i. Differential settlement of embankments.

ii. Cracking, erosion, or seepage through embankments.

iii. Erosion of the flow path through the facility.

iv. Brush, shrub, or tree growth on embankments.

v. Condition of the overflow spillway.

vi. Accumulation of sediment.

b. Mowing

Tree and brush growth must be prevented on basin embankments, side slopes, bottoms, and around inlets and the overflow spillway(s). Mowing of the embankments shall be at least three times a year unless more frequent mowing is required to control vegetative growth. Resultant yard waste shall be collected and disposed of off-site.

c. Debris and Litter Removal

Removal of debris and litter shall be accomplished during mowing operations. Inlet structures should be cleared of all debris and litter.

d. Structural Repairs and Replacement

Components of the forebay or wet pool, which require repair or replacement, should be addressed immediately following identification.

e. Erosion Control

Sources of sedimentation, specifically eroded areas in upland drainage areas, should be stabilized immediately upon identification. Stabilization should be with vegetative practices or other erosion control practices when vegetative measures do not prove effective.

Soil slumpage, erosion of the basin embankment or around inlets or overflow outlets, and cracking should be stabilized and repaired immediately upon identification. Repair, replacement or addition of rip-rap aprons, channels or embankments should be pursued as required.

f. Sediment Removal

Cleanout frequency of Forebays and Wet Pool is dependent upon bottom cover, storage capacity, volume of inflow, and sediment load.

Sediment shall be removed from the Forebays and Wet Pool every 5 to 6 years or when accumulations reach 12 inches in depth. Monitoring the depth of sediments can be measured by installing permanent markers in the newly constructed facilities with a mark 12 inches above the permanent water surface. Markers should not be spaced more than 50 feet apart along the flow path through the facility. A log should be kept indicating the date that the facility was inspected and the distance to the bottom.

When sediment removal is required, the original grades depicted on the project drawings should be reestablished by a qualified contractor. If any of the impermeable material used in the construction of the basin bottom is removed it must be replaced with clean material consistent with the original material specifications.

4. AQUATIC BENCHES

a. Inspection

Aquatic Benches should be inspected periodically for the first few months after construction and then on an annual basis. Aquatic Bench should be inspected after all major storm events. Items to check for include (but are not limited to):

i. Checking basin embankments for subsidence, erosion, cracking, tree growth, and the presence of burrowing animals.

ii. Health and vigor of wetland vegetation.

iii. Accumulation of sediment.

b. Mowing

Mowing is not desirable nor allowed in the Aquatic Bench. Trees and shrubs should be removed from around inlet and outlet structures. Removal should be biannual.

c. Debris, Trash and Litter Control

Debris, trash, and litter should be removed from the Aquatic Bench immediately upon discovery.

d. Erosion Control

Soil slumpage, erosion of the Aquatic Bench embankment or around inlets or outlets, and cracking should be stabilized and repaired immediately upon identification.

5. BIO-RETENTION AREAS

a. Inspection

Bio-retention areas should be inspected periodically for the first few months after construction and then on a monthly basis. Bio-retention areas should be inspected after all major storm events. Items to check for include (but are not limited to):

i. Checking embankments for subsidence, erosion, cracking, undesirable tree and shrub growth and the presence of burrowing animals.

ii. Check inlet for erosion.

iii. Evidence of standing water (i.e. does it dewater between storms).

iv. Health and vigor of vegetation (trees, shrubs, grass, flowers, mulch).

v. Accumulation of sediment or yard waste.

vi. Evidence of clogging at inlets or outlets.

vii. Condition of the overflow spillway.

viii. Ensure grass is well established.

ix. Grass height not greater than six inches.

b. Mowing

Mow grass areas within bio-retention facility, so that grass height does not exceed 6-inches. Undesirable trees and shrubs should be removed. Resultant yard wastes shall be collected and disposed of off-site

c. Debris, Trash and Litter Control

Removal of debris and litter shall be accomplished during mowing operations. Inlet structures should be cleared of all debris and litter.

d. Structural Repairs and Replacement

Components of the bio-retention area, which require repair or replacement, should be addressed immediately following identification. This includes treating and or replacing diseased trees and shrub, fertilizing as necessary, replacing tree stakes and wires, replacing mulch where bare spots appear, replacing clogged underdrains, filter beds, and pea gravel diaphragm.

e. Erosion and Sediment Control

Sources of sedimentation, specifically eroded areas in upland drainage areas, should be stabilized immediately upon identification. Stabilization should be with vegetative practices or other erosion control practices when vegetative measures do not prove effective.

Soil slumpage, erosion of the embankments or around inlets/outlets, and cracking should be stabilized and repaired immediately upon identification.

f. Sediment Removal

Sediments which accumulate in the bio-retention area should be removed annually to prevent clogging of inlet or outlet structures. Disposal of material removed from bio-retention area shall be in accordance with local, state, and federal guidelines.

Appendix J:
SWPPP Inspection Report
(Sample Form)

Stormwater Pollution Prevention Plan
Inspection Report

Cricket Valley Energy
NYS Route 22
Town of Dover, Dutchess County, New York

A Qualified Inspector[1] shall prepare an inspection report subsequent to each and every inspection, as required in Part IV.C of the SPDES General Permit GP-0-010-001. All sections of this report are to be completed.

1. Inspection Information

Inspection number: _____

Date and Time of Inspection: _____

Weather Conditions: _____

Soil Conditions (e.g. dry, wet, saturated): _____

2. Inspector Information

Trained Inspector[1]

Printed Name:_____Date: _____

Signature:_____

Qualified Inspector[1]

Printed Name _____Date: _____

Signature:_____

3. On the included site plan, provide a sketch of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection. Provide additional descriptions below if necessary.

_____

_____

[1] A Qualified Inspector means a person that is knowledgeable in the principles and practices of erosion and sediment control, such as licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), licensed Landscape Architect, or other Department endorsed individual(s). It also means someone working under the direct supervision of the licensed Professional Engineer or licensed Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control (herein referred to as Trained Inspector." Training in the principles and practices of erosion and sediment control means that an individual performing a site inspection has received four (4) hours of training, endorsed by the Department, from a Soil and Water Conservation District, CPESC, Inc. or other Department endorsed entity in proper erosion and sediment control principles. After receiving the initial training, an individual working under the direct supervision of the licensed Professional Engineer or licensed Landscape Architect shall receive four (4) hours of training every three (3) years. Note: Inspections of any post-construction stormwater management practices that include structural components, such as a dam for an impoundment, shall be performed by a licensed Professional Engineer.

SAMPLE

4. In the following table, provide a description of the condition of the runoff at all points of discharge from the construction site, including conveyance systems (pipes, culverts, ditches, etc.) and overland flow. Identify any discharges of sediment from the construction site. Use additional sheets if necessary.

Description of Discharge Point	Condition of Runoff	Sediment Discharge Noted
		yes / no Estimated Quantity:
		yes / no Estimated Quantity:
		yes / no Estimated Quantity:
		yes / no Estimated Quantity:

5. For all erosion and sediment control practices listed in the previous report as "needs repair or maintenance" or "not installed properly", identify those that have been rectified (provide photos)

SAMPLE

6. In the following table, provide checkmarks in the appropriate columns to indicate the condition of all erosion and sediment control practices at the site.

Erosion & Sediment Control Practice	Not Applicable	Functioning as designed	Needs repair or maintenance	Not installed properly
Stabilized construction entrance				
Temporary parking areas				
Construction vehicle wash areas				
Silt fence				
Temporary swales and berms				
Stone check dams				
Slope protection measures				
Dewatering operations				
Sediment traps				
Inlet protection measures				
Soil stockpiles				
Dust control measures				
Other:				
Other:				

7. For all erosion and sediment control practices identified in the above table as "needs repair or maintenance" or "not installed properly", provide photos and detailed corrective actions that are required. Use additional sheets if necessary.

SAMPLE

8. In the following table, indicate the current phase of construction of all post-construction stormwater management practices and identify all construction that is not in conformance with the SWPPP and technical standards.

SWM Practice	Current Phase of Construction	Items not in conformance with the SWPPP

9. For all post-construction stormwater management practices which are identified in the above table as including "items not in conformance with the SWPPP", provide detailed corrective action(s) that are required to correct the deficiencies. Use additional sheets if necessary.

SAMPLE

Appendix K:
Contractor’s Certification Form

Stormwater Pollution Prevention Plan
Contractor or Subcontractor Certification Statement

Cricket Valley Energy
NYS Route 22
Town of Dover, Dutchess County, New York

Each Contractor and Subcontractor that will be responsible for installing, constructing, repairing, inspecting and/or maintaining the erosion and sediment control practices and post-construction stormwater management control practices included in the SWPPP is required to complete and sign this Certification Statement before commencing any construction activity at the site. The completed Certification Statement(s) shall be maintained at the construction site.

Contracting Firm Information

Name: _____

Address: _____

_____

Telephone & Fax: _____

Contractor's Responsibilities Regarding SWPPP Implementation

_____

_____

Trained Contractor(s) Responsible for SWPPP Implementation[1] (Provide name, title, and date of last training)

_____

_____

Contractor or Subcontractor Certification[2]

I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name: _____

Title/Position: _____

Signature: _____ Date: _____

[1] A Trained Contractor means an employee from a contracting (construction) firm that has received four (4) hours of training, which has been endorsed by the NYSDEC, from a Soil and Water Conservation District, CPESC, Inc. or other NYSDEC endorsed entity, in proper erosion and sediment control principles. After receiving initial training, the Trained Contractor shall receive four (4) hours of training every three (3) years. This individual will be responsible for implementation of the SWPPP.

[2] Signatory Requirements:

a. For a corporation, this form shall be signed by (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principle 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.

b. For a partnership or sole proprietorship, this form shall be signed by a general partner or the proprietor, respectively.

c. For a municipality, State, Federal, or other public agency, this form shall be signed by either a principal executive officer or ranking elected official. For purposes of this section, 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 Administrators of EPA).

Appendix L:
Record of Stabilization and Construction Activity Dates
(Sample Form)

Site Stabilization & Construction Activities Dates

Cricket Valley Energy
NYS Route 22
Town of Dover, Dutchess County, New York

Note: This form shall be completed by the Contractor and shall remain as part of the Storm Water Pollution Prevention Plan that is to remain at the project site for the duration of construction.

A record of dates when major grading activities occur, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures are initiated shall be maintained until final site stabilization is achieved and the Notice of Termination is filed.

MAJOR GRADING ACTIVITIES:

Page ____ of ____

Description of Activity:_____

Contractor:_____

Location:_____

Start Date:_____Finish Date:_____

Description of Activity:_____

Contractor:_____

Location:_____

Start Date:_____Finish Date:_____

Description of Activity:_____

Contractor:_____

Location:_____

Start Date:_____Finish Date:_____

Description of Activity:_____

Contractor:_____

Location:_____

Start Date:_____Finish Date:_____

Description of Activity:_____

Contractor:_____

Location:_____

Start Date:_____Finish Date:_____

SAMPLE