STORMWATER POLLUTION PREVENTION PLAN

FOR COMPLIANCE WITH THE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION INDIVIDUAL SPDES PERMIT FOR STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES

Project Location: NYPA's Marcy South Series Compensation (MSSC) Project
(PSC Case Number 13-T-0515)
Town of Delhi
County of Delaware
State of New York

Owner: New York Power Authority
123 Main Street
White Plains, NY 10601

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Date: May 2015

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1.0 Introduction

On behalf of the New York Power Authority (NYPA) and New York Electric and Gas (NYSEG), ABB Inc., Power Systems (ABB), has commissioned Stantec Consulting Services Inc. to prepare this Stormwater Pollution Prevention Plan (SWPPP) for construction activities associated with the planned NYPA's Marcy South Series Compensation Project in Delhi, New York.

The Compensation facility will be designed and built by ABB on land that is owned by the New York State Electric and Gas Corporation (NYSEG). An existing electric substation (Frasers Substation) currently occupies a portion of the NYSEG parcel. The facility (to be approximately 3 acres in size) will be constructed on the same property, but on undeveloped land within the back (northern) area of the parcel. It is for that reason that this project is considered to be "New Construction".

The project is being progressed as a New York State Public Service Commission (PSC) Article VII action, and will include a detailed Environmental Management and Construction Plan (EM&CP) that encompasses all applicable environmental investigations, studies, controls and permits.

The project site also falls within a New York City (Cannonsville) reservoir system watershed. Although the project does not meet the criteria for requiring the New York City Department of Environmental Protection (DEP) review and approval, the PSC has mandated that this SWPPP be submitted to the DEP for its review prior to submitting the Notice of Intent (NOI) and Form NY-2C to the New York State Department of Environmental Conservation (NYSDEC), requesting State Pollutant Discharge Elimination System (SPDES) Permit coverage. It is noted that this SWPPP has also been developed in general conformance with the "Rules and Regulations for the Protection from Contamination, Degradation and Pollution of the New York City Water Supply and its Sources", dated April 4, 2010.

1.1 SPDES Coverage

SPDES Permit coverage is required because the project proposes the disturbance of greater than 1 acre of soil, while the entire project area discharges surface stormwater runoff to jurisdictional waters of the United States. After consultation with NYSDEC regarding the ineligibility criteria contained in Part I.F.6. of the SPDES General Permit (GP-0-15-002), it was determined that the project is ineligible for coverage under the General Permit for the following reasons:

- Discharges from the project construction activities are tributary to Class AA waters; and

- The project will result in the disturbance of more than 1 acre of land with no existing impervious cover; and

- The project will be constructed on soils with a Soil Slope Phase E or F.

Therefore, an Individual SPDES permit is required. However, in the absence of Individual SPDES Permit Design criteria, this SWPPP has been prepared in general accordance with the SPDES General Permit. Refer to **Appendix B** for a copy of the SPDES General Permit.

This SWPPP, prepared as part of the conditions for SPDES Permit coverage, will be included in the aforementioned Article VII EM&CP. Upon completion of DEP's review of this SWPPP, a Form NY-2C (SPDES Industrial Application Form – use for Individual SPDES permitting), accompanied by a Notice of Intent (NOI) will be submitted to NYSDEC, requesting permit coverage (Refer to **Appendix K**).

As this project is considered to be "New Construction" and is clearly a Table 2 action (per the SPDES General Permit, Appendix B), post-construction stormwater management controls will be included in order to provide water quality treatment, runoff reduction and peak flow attenuation in general conformance with both NYSDEC and DEP requirements.

1.2 Additional Requirements and Permit Coverage Conditions

On December 1, 2009, the US Environmental Protection Agency (EPA) published effluent limitation guidelines (ELGs) and new source performance standards to control the discharge of pollutants from construction sites. The new regulations, Part 450.21 of Title 40 CFR, became effective on February 1, 2010 and were subsequently added to the SPDES General Permit for Construction Activity as part of the recent renewal (see Part I.B.1.a.- f. in GP-0-15-002). The Department must ensure that the criteria are adequately addressed in all SPDES permits issued for construction activity, **including Individual SPDES permits**. Therefore, the SWPPP has been developed to address the new criteria.

The following provides a quick reference to the locations within this SWPPP where the requirements listed in GP-0-15-002, Part I.B.a-f have been addressed:

a. Erosion and Sediment Controls: Refer to Section 4.2 and Appendix F Drawings

b. Soil Stabilization: Refer to Sections 3.7 and 4.2, as well as Appendix F Drawings

c. Dewatering: Refer Section 4.2 and Appendix F Drawings

d. Pollution Prevention Measures: Refer to Section 5.1, 5.2 and 5.3

e. Prohibited Discharges: Refer to Section 5.1

f. Surface Outfalls: Refer to Appendix F Drawings

NYSDEC will require the owner (NYPA) to maintain coverage under the Individual SPDES permit for one year from the date that the Regional Office confirms that the project is complete in order to ensure that the site stabilization measures are effective.

For additional information:
NYSDEC Contact - David Gasper at 518-402-8114
or by email at david.gasper@dec.ny.gov.

2.0 Executive Summary

2.1 Project Name and Involved Entities

NYPA's Marcy South Series Compensation Project

Property Owner:	NYSEG
Builder/Contractor:	ABB
Equipment (Project) Owner/Operator:	NYPA (via easement)
Future Maintenance Responsibility:	NYPA

2.2 Project Overview

The project includes the construction of an approximate 3 acre fenced-in gravel pad on existing undisturbed land comprised of woods and hayfields/pastures. The pad will serve to support the installation of a number of capacitor banks (and associated hardware) that will be connected to the adjacent Marcy-Cooper Corners and Edic-Fraser Transmission lines. To facilitate the connection to the existing transmission lines, five (5) new steel tower structures will be installed beyond the station perimeter fence in the general vicinity of the station.

Since post-construction stormwater management controls are required, the project also includes the construction of a new Infiltration Basin/Extended Detention Pond with connecting open vegetated channels in order to provide the requisite water quality treatment, runoff reduction and peak flow attenuation. Refer to **Appendix F** for the Site Plan/Stormwater Management Design Plans.

2.3 Project Location

The project is located at 1068 Hamden Hill Road Spur in the Hamlet of Fraser, Town of Delhi, Delaware County, New York. It is located entirely within the NYSDEC Region 4 jurisdiction.

Given the relative remote location of the work, there is no formal local MS4 review and approval authority involved with this project. Refer to the following figures for the project location and the NYSDEC regional boundaries. Also refer to **Appendix C** for additional maps and project photos.

2.3.1 Project Location Map

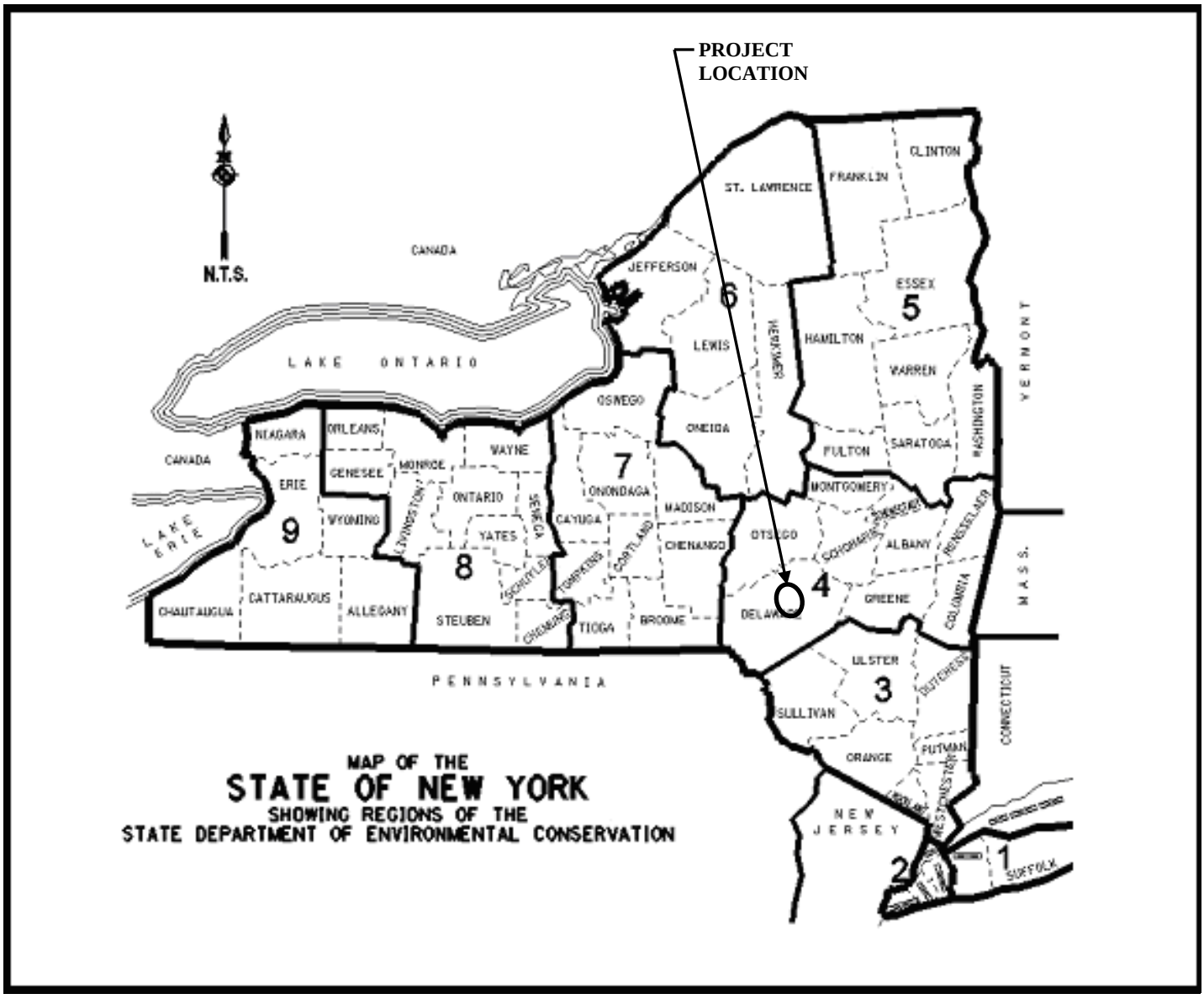

Figure 1: Project Location Map with NYSDEC Regional Boundaries Shown

2.3.2 Project Location (Aerial & Road Map Background)

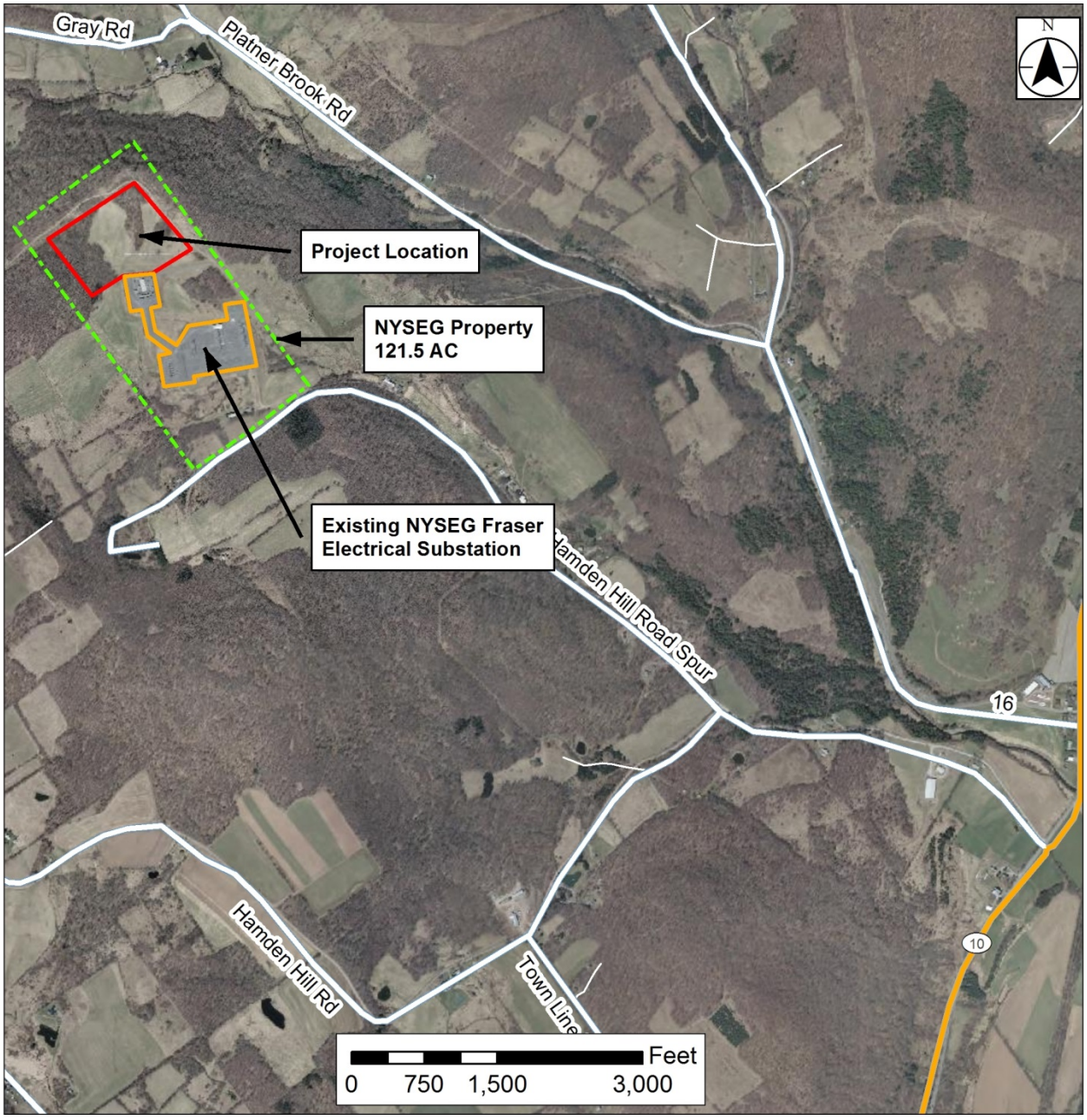

Figure 2: Project Location Map with Aerial & Road Map Background

2.3.3 Project Contacts

The construction site personnel contact list for this project is provided in **Appendix A**. These personnel have day-to-day operational control of stipulated activities to ensure compliance with the SWPPP and Permit Conditions. The duties of these personnel include one or more of the following:

- Implementation of the SWPPP
- Oversight of temporary maintenance practices identified in the SWPPP
- Conduct or provide for inspection and monitoring activities
- Identify other (unanticipated) potential erosion, sediment and pollutant sources during construction and ensure they are appropriately addressed
- Identify any amendments to the SWPPP necessitated by field conditions and ensure they are implemented
- Document all activities associated with implementation of this SWPPP and the supporting documents

2.3.4 Project Responsibilities

All Contractors and NYPA/NYSEG personnel shall comply with the requirements of this SWPPP, and shall perform their operations in conformance with the New York State Standards and Specification for Erosion and Sediment Control and the New York State Stormwater Management Design Manual (latest edition).

NYPA will be considered the Owner/Operator of the project. Any contractor involved with the project to perform soil-disturbing activities (including but not limited to clearing and grubbing, earth grading, excavating, and installation of erosion and sediment controls), will be required to acknowledge their understanding of the contents of this SWPPP, as well as to certify (via their signature within Section 10.1 of this document) their commitment to perform all construction operations in conformance with all technical requirements included herein.

3.0 Project Scope and Conditions

3.1 Existing Site Conditions

The subject NYSEG property is approximately 121.5 acres in size and currently accommodates the existing 15.6 acre Fraser Substation. (Refer to Figure 2). The overall parcel consists of rolling terrain that for the most part slopes from north to south. A relatively small portion of the parcel along the northern property line adjacent to the existing transmission line corridor drains to the northeast.

The site therefore has two (2) distinct stormwater runoff discharge points, herein also referred to as Analysis Points. As described above, the first discharge/Analysis Point drains most of the site to the southeast, while a small percentage of the site drains to the northeast via a second discharge./Analysis Point.

The site is relatively remote with no noteworthy man-made developments (industrial, commercial or institutional) in the area, except for the aforementioned substation and a few isolated residences adjacent to or near the site.

Existing ground cover within the proposed area of disturbance consists of turf (8.0 acres) and moderately dense woody vegetation (2.5 acres). There are also numerous large boulders and rock outcrops present on the site. Based on soil borings performed on the site, bedrock is generally within 4.5 feet of the existing ground surface (Refer to **Appendix D** for a detailed Geotechnical Report)

With the southerly sloping terrain, stormwater runoff flows overland via non-concentrated sheet flow and/or shallow swales to an existing regulated and protected NYSDEC Class C(T) stream, the Sub-Tributary of the West Branch of the Delaware River. This Class C(T) stream ultimately drains to the Cannonsville Reservoir, a Class AA water body, in Deposit, New York, approximately 30 miles downstream. The Cannonsville Reservoir serves as one of New York City's potable water supply facilities.

Finally, based on prior on-site field studies during the project planning phase, a small "wet" potential unmapped wetland exists south of and beyond the limits of the series capacitor bank site improvements. The area will therefore not be impacted by construction activities. Its perimeter however will be clearly delineated and physically marked with construction fence prior to the commencement of construction activities in order to restrict personnel, equipment and vehicles from entering and disturbing the area. A portion of the existing site runoff currently drains to this area, where it either infiltrates or, once it reaches its storage capacity, discharges overland and continues down-gradient to a shallow existing swale, and then ultimately discharging to the aforementioned tributary. The suspect wetland and surface water bodies located in the vicinity of the project site are shown on the aerial graphic in **Appendix C.**

3.2 Purpose of the Stormwater Pollution Prevention Plan Report

In the absence of Individual SPDES Permit technical standards, the SPDES General Permit serves as the design basis for this SWPPP. To that end and assuming the requirements of each permit are similar, the SWPPP was created to ensure that this project has been progressed and developed in general conformance with the NYSDEC SPDES General Permit for Stormwater Discharges Associated with Construction Activities (GP-0-15-002), as well as DEP Stormwater Regulations. It defines existing and proposed site conditions, how stormwater will be managed during and after construction, the timing of soil disturbing and stabilization practices, and designates who will be responsible for implementing and maintaining the erosion and sediment control practices.

All involved contractors are strongly advised to minimize their ground disturbance whenever possible.

This SWPPP covers the common construction activities that will or may result in ground disturbance and/or affect stormwater quality discharge conditions and (in addition to the detailed Erosion and Sediment Control Plans included in **Appendix F**) provides the contractor and owner with a "toolbox" of acceptable practices that could be employed to address unforeseen adverse site conditions.

NYSDEC's Best Management Practices (BMP's) are the primary components of this SWPPP and specifically the Erosion and Sediment Control (E&SC) Plans, and as such, have been included in order to mitigate for potential pollutants, sediments, and stormwater peak flows, and to dissipate stormwater velocities.

This SWPPP serves as the minimum requirements necessary for proper stormwater management during construction. If unanticipated site conditions warrant additional methods of control, then the crews and/or contractor, in consultation with the project SWPPP inspector, will be required to implement those measures in accordance with the NYSDEC's Standards and Specifications for Erosion and Sediment Control.

The purpose of stormwater management is to prevent erosion both on the construction site itself and on adjacent undisturbed areas, and to prevent sedimentation of natural watercourses and vegetated areas. This is generally accomplished through soil stabilization and structural stormwater management control practices. Stormwater Management also addresses pollution prevention using measures to reduce pollutants in stormwater as well as by using good housekeeping practices on the construction site. Of particular importance is the need to minimize water quality violations (that result from the release of sediments and other pollutants transported in stormwater runoff to waterbodies and/or streams),

Although the project will be covered by and Individual SPDES Permit, a copy of the NYSDEC SPDES (GP-0-15-002) General Permit is included in **Appendix B** for

informational purposes. Unless otherwise noted in this SWPPP, it is assumed that the requirements of the Individual and General Permits are similar.

3.3 Inspection Reports

In general conformance with the General Permit and as directed by NYSDEC, two (2) site inspections (separated by no less than 2 calendar days) by a *Qualified SWPPP Inspector* will be performed every seven (7) calendar days to confirm that all required erosion and sediment control measures are in place, properly positioned, and in good condition. Semi-weekly inspections will be performed until earth-disturbing construction activities are complete and stabilization has been achieved. One particularly noteworthy requirement of the General Permit requires that digital photographic documentation be included with inspection reports. The *Qualified SWPPP Inspector* shall attach date stamped color copies of digital photographs showing the condition of practices that have been identified as needing corrective actions to each inspection report within seven (7) calendar days of the date of the inspection. The *Qualified SWPPP Inspector* shall also attach date stamped color copies of digital photographs clearly showing the condition of the practice(s) after corrective action has been completed within seven (7) calendar days of the date of that inspection. A sample inspection report to be utilized by the SWPPP Inspector during weekly site inspections has been included in **Appendix H**.

This project will not permit the disturbance of more than 5 acres of soil at any given time. To protect water quality and reduce the impacts of sediment and erosion due to construction activities, every practical effort to stabilize disturbed areas must be made to maintain an overall disturbance area of less than five (5) acres at any given time.

As required by the current SPDES General Permit while also applicable to the Individual SPDES Permit, within one business day of the completion of an inspection, the *Qualified SWPPP Inspector* shall notify the *owner or operator* and Contractors or Subcontractor identified in **Appendix A** of any corrective actions that need to be taken. The Contractor or Subcontractor shall begin implementing the corrective action within one business day of this notification and shall complete the corrective actions in a reasonable timeframe.

3.4 Soil Characteristics

Soil survey maps and soil descriptions for all portions of the project site have been included in **Appendix D** of this report. The soils within the project work area consist of a variety of different soil series. A detailed soil survey plot has been prepared and a breakdown of the soils within this area is included in **Appendix D** as well.

Based on NRCS Soil Survey maps, 11.7% of the existing soils are classified as well-draining Hydrologic Soil Type B and 87.8% of the soils along the project corridor are classified as moderate to poorly draining Hydrologic Soil Type C. Hydrologic soil Type B is classified as well to very well infiltrating when thoroughly wet, while Hydrologic Type C soils are defined as slowly to very slowly infiltrating when thoroughly wet.

Hydrologic soil Type B consists of soils having a high infiltration rate and consist of mainly deep, well drained to excessively drained sands or gravely sands. Hydrologic soil Type C consists of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. There is also a small trace (0.5%) of the site soils that are classified as Hydrologic Soil Type D.

The soil survey would imply that the majority of the soils within the project area are slow draining. The soils within the area of the proposed stormwater management facility were observed to be somewhat rocky. Based on a geotechnical evaluation of the site, to include an extensive soil boring program, the depth of bedrock on the entire site is within 4.5 feet of the existing ground surface and within 2.5-3.0 feet of the ground surface in the immediate area of the proposed stormwater management facility. Groundwater was not observed within the bore holes near the proposed stormwater management facility. A copy of the Geotechnical Report, including on-site soil boring logs (**Appendix D**) and percolation test results (**Appendix E**) performed near the proposed stormwater management practice on 01-22-2015 are included**.**

Infiltration tests near and within the proposed stormwater management facility were performed on 4-20-2015 and 4-21-2015. The results of those tests are also included in **Appendix E**

Approximately 5.0 acres of the site improvements will result in disturbance of of soils classified as Slope Phase E. The limits of the work in this area are shown on the soil map in **Appendix D**.

3.5 Description of Proposed Work

The proposed compensation project work and associated stormwater management practices will be constructed entirely within the existing NYSEG Substation parcel. Although most of the permanent access route to the facility will utilize existing access drives within the NYSEG property, temporary construction access directly off of Hamden Hill Road Spur will partially utilize an adjoining property's farm access drive (to the east) via a permanent easement from the property owner. This project will also construct new porous access drives in the vicinity of the proposed pad in order to ensure accessibility to various electrical system components.

The proposed work will consist of the creation of a new 265ft x 500ft (3.0 acre) relatively level terraced gravel pad on existing rolling terrain that is presently comprised of turf and moderately dense woods. The pad will house the new capacitor banks, control building and associated hardware components. Earth-grading and tree removals within the disturbance area will be necessary to facilitate the development of the new pad.

To reduce the grading limits/disturbance area, while ensuring that the required earthwork falls within the NYSEG property, retaining walls will be constructed along the

northeastern perimeter of the pad, as well as within the pad itself, and the pad will be terraced.

Finally, a stormwater treatment facility (infiltration basin/extended detention pond) will be constructed just south of and down-gradient from the new gravel pad. To facilitate stormwater collection, the pad will be pitched at a 1% slope to the south. Vegetated swales will be constructed along the southern perimeter of the pad to ensure runoff is adequately collected and conveyed to the stormwater treatment facility. Interceptor ditches will also be constructed along the western portion of the site to redirect "clean" off-site runoff around the proposed project, thus allowing for the optimization of the proposed treatment practices.

The total area of disturbance associated with the proposed improvements is estimated to be 10.5 acres. The total area of new impervious surface (as defined by NYSDEC) to be constructed is approximately 3.5 acres, and includes both the gravel pad and access drives directly adjacent to the pad.

The stormwater management design plans, developed for this project have been included in **Appendix F**. Representative aerial and surface photographs depicting the overall project area surrounding the site are included in **Appendix C**.

With the exception of the station pad and access drives (which will be comprised of gravel material), the final ground surface in all other areas of disturbance will be grass/turf. At no time during construction will more than 5 acres of ground disturbance be permitted at any given time. (Refer also to the stabilization requirements summarized in Section 4.2 of this document.)

3.6 Waterbodies, Wetlands, TMDL Watersheds and 303(d) Waters

Aerial graphics included in **Appendix C** reveal the presence of one (1) regulated NYSDEC-Protected stream, located approximately 2,000 ft down-gradient from the site, near Hamden Hill Road Spur. This Class C(T) stream (Sub-Tributary of the West Branch of the Delaware River) receives runoff from the project area. In addition, a single mapped Federal wetland exists along the north side of the stream in the vicinity of the existing substation and another "suspect" unmapped wetland was identified just south of the wood line, but south of the new stormwater treatment facility. There are no State-regulated wetlands present within the project area.

This project proposes no improvements within the vicinity of the stream or wetlands, and thus will have no impacts to either resource.

The project does not encompass and/or adjoin any streams or water bodies listed as 303(d) waters and the project is not located within a designated TMDL watershed.

The project falls within a New York City reservoir system watershed and specifically the Cannonsville Reservoir watershed. The aforementioned Class C(T) stream changes to a Class A stream approximately 20 miles downstream, then changes again to a Class AA stream approximately 1 mile upstream of the Cannonsville Reservoir in Deposit, New York. Deposit is located approximately 30 miles away from the project site. Refer also to **Appendix D** for the Watershed Data Plan.

3.7 Sequence and Timing of Construction Activities

It is anticipated that this project will be performed in one phase, and the work (as discussed above) on any particular segment will be preceded by the installation of the appropriate BMP's, temporary erosion and sediment control measures. Stabilization of disturbed areas will occur continuously throughout construction in order to maintain an overall disturbance area of less than five (5) acres at any one time.

Non-soil disturbing tree removal activities that utilize a "lop and drop" (no grubbing/stump removals) approach precede the finalization of this SWPPP. Upon acceptance of this SWPPP, those trees that were dropped in place, will be skidded, chipped and/or removed as part of the clearing operation described below.

The following describes general required sequence of operations:

1. Install stabilized construction entrance(s).

2. Install perimeter erosion and sediment controls (including silt fence and check dams), and install orange construction fence along the perimeter of the "suspect" wetland, located just south of the proposed infiltration basin.

3. Once perimeter controls are installed, clearing, retaining wall construction, foundation work and earth-grading work may commence except as noted below.

   a. Prior to any excavations necessitating dewatering activities, appropriate temporary controls (i.e. silt traps, silt bags and/or sediment basins) must be in-place and functional.

   b. Prior to any concrete placement, suitable concrete wash-out facilities shall also be in place and functional

4. Install any additional erosion and sediment controls in accordance with the plans and/or to accommodate unforeseen adverse conditions.

5. In areas where soil disturbance activity has temporarily or permanently ceased, the soil stabilization measures must be initiated by the end of the next business day and completed within seven (7) days. (Refer to Section 4.2 for additional requirements

that also include temporary stabilization requirements).

6. Once soils are permanently stabilized, then all temporary erosion and sediment control measures may be removed as directed by the SWPPP Inspector.

4.0 Stormwater Management Controls

4.1 Permanent Water Quality and Quantity Controls

This project will result in the creation of approximately 3.5 acres of new impervious ground surface consisting of crushed and graded gravel. As this project is considered to be "New Construction", Post-Construction Controls to collect and treat stormwater runoff are therefore required.

4.1.1 Hydrologic Storm Events

The USDA, Soil Conservation Service's hydrologic analysis methodology uses synthetic storm events when calculating rainfall runoff hydrographs. The synthetic storm events are based on statistical analysis of actual storm events for different durations over a broad geographical area. The Soil Conservation Service categorizes rainfall by distribution type ascribed to a geographical area, and by the total number of inches of precipitation that are assumed to occur over a 24-hour duration

The project site lies within the geographical boundary categorized as having a Type II rainfall distribution. NYSDEC as well as DEP have identified rainfall depths for each design storm. DEP guidelines refer back to the NYSDEC Stormwater Management Design Manual issued in August 2010. NYSDEC has updated the data in the Stormwater Management Design Manual effective January 2015. For the Hydrologic Analysis the rainfall depths from the 2015 NYSDEC Design Manual will be used and are identified in Table 1:

TABLE 1

RAINFALL DEPTH FOR DESIGN STORM EVENT

Design Storm Event Frequency (24-hour duration)	Total Rainfall Depth (Inches)
1 – Year	2.2
10 – Year	4
100 – Year	6.5

4.1.2 Description of Existing Hydrologic Conditions

The project site contributing watershed was delineated using topographic survey design mapping, supplemented with USGS Topographic Maps for off-site areas. As previously stated, the site stormwater runoff discharges at two (2) distinct locations that will serve as Analysis Points for the project.

Existing Analysis Point #1 is divided into 2 sub-watersheds or drainage areas (ECDA-1 and ECDA-5), while Existing Analysis Point #2 is divided into 3 sub-watersheds or drainage areas (ECDA-2 thru ECDA-4). The proposed improvements to the site will have no appreciable impact on the hydrologic surface conditions of 3 of the 5 sub-drainage areas (ECDA-3 thru ECDA-5).

The disturbance will occur in all 5 existing drainage areas. But the proposed improvements will occur within Drainage Areas ECDA-1 and ECDA-2, and as such, this SWPPP focuses primarily on those two (2) areas of the site. As stated, ECDA-3 thru ECDA-5 will remain essentially unchanged (pre- vs. post-construction).

Analysis Point #1 discharges site runoff from ECDA-1 and ECDA-5 overland to the southeast into a shallow natural swale before entering an existing 24" diameter culvert that conveys surface flows under an existing access road. Analysis Point #2 discharges runoff from ECDA- 2 thru ECDA-4 overland to the northeast.

Detailed hydrologic calculations and maps are included in **Appendix E** of this report, and summaries are provided in subsequent sections of this document.

4.1.2.1 Existing Conditions Hydrologic Analysis Data

The following table summarizes the "Existing Conditions" hydrologic analysis data used to calculate the peak discharge rates at each analysis point:

TABLE 2				
EXISTING CONDITIONS DRAINAGE PARAMETERS				
Drainage Area	**Drainage Area Description**	**Area** (Acres)	**Cn**	**Tc** (Min.)
ECDA 1	**See Drawing EC-1 in Appendix E**	24.83	75	34.3
ECDA 2	**See Drawing EC-1 in Appendix E**	4.31	77	15.6

Note: All other existing drainage areas (not listed) will remain effectively unchanged by proposed improvements.

4.1.3 Findings of the Existing Conditions Hydrologic Analysis

The existing peak discharge rates at Analysis Point #1 and Analysis Point #2 are summarized in the following table:

TABLE 3			
EXISTING PEAK DISCHARGE FLOW RATES* SCS RESULTS			
Area of Analysis	**Design Storm Frequency**	**Existing Peak Flow Rates** (CFS)	**Existing Discharge Volume** (Acre-Feet)
Analysis Point #1 Discharge	1 Year	7.93	1.050
	10 Year	33.06	3.666
	100 Year	75.96	8.215
Analysis Point #2 Discharge	1 Year	2.37	0.329
	10 Year	10.91	1.153
	100 Year	26.84	2.593

* Flowrates represent the cumulative totals from all contributing drainage areas.

4.1.4 Description of Proposed Conditions

The proposed conditions of the site will include the construction of a new series compensation bank gravel pad, small control building and new access drives. The project will also include the construction of a stormwater infiltration/extended detention basin, vegetated swales, diversion swales, and in key locations, porous access drives.

The capacitor bank pad work will involve the installation of approximately 3.5 acres of new impervious cover within an existing 35.5 acre contributing watershed. However, since a diversion ditch is proposed that will divert (or due to topography naturally drain away from the site) approximately 26.7 acres of the watershed around the site, the remaining contributing area, or 8.8 acres, is considered to be the "Site Area" for the Water Quality/Runoff Reduction volume sizing calculation. For this project, the site area is equal to the contributing watershed. The bulk of the new imperviousness will occur along the northeast portion of existing drainage area ECDA-1. The pad however will extend into drainage area ECDA-2 as well. Refer to **Appendix E** for specific details and plans of the proposed improvements.

To accommodate stormwater runoff from the new series capacitor bank pad, a new stormwater infiltration basin/extended detention pond with connecting vegetated swales is proposed to help collect, convey and treat runoff from the area of the proposed improvements. The station pad will be pitched to the south at a 1% slope toward the vegetated swale system and infiltration basin. By pitching the entire pad to the south, 100% of the runoff from all proposed impervious cover (pad and access roads) will be directed to and treated by the vegetative swales and/or infiltration basin.

Worth noting is that by pitching the entire pad to the south, a portion of the existing drainage area ECDA-2 (which currently drains to Analysis Point #2) will discharge to Analysis Point #1 (post-construction), resulting in an increase in contributing area and a corresponding decrease in area and flowrates to Analysis Point #2.

4.1.5 Proposed Detention Facilities and Hydraulic Control Structures

A stormwater infiltration basin/extended detention pond for peak flow attenuation and water quality treatment has been proposed and will be situated down-gradient from the bulk of the site improvements (to include 100% of the proposed impervious ground cover). The water quality component associated with this facility is described in subsequent sections of this report, and the overall size has been designed to provide stormwater detention storage depth of approximately 3.92 feet for the 100-year storm event. The facility will also provide at least 1.0 foot. of freeboard for the 100-year storm event.

The proposed infiltration basin/extended detention pond has been analyzed and designed to provide peak flow attenuation in accordance with NYSDEC Stormwater Management Design Manual. During storm events, runoff will be temporarily stored in the basin and allowed to both infiltrate into the underlying soils and discharge through an outlet control structure. The basin will have an outlet control structure designed to pass the 10 and 100-year storms, and will also have a stone-lined emergency spillway that discharges to a

level spreader in order to accommodate extreme storm events (i.e. greater than and including the 100-year storm event).

The proposed stormwater infiltration basin design plans are included in **Appendix E**.

4.1.6 Proposed Conditions Hydrologic Analysis Data

The following table summarizes the "Proposed Conditions" hydrologic analysis data used to calculate peak discharge rates at the project Analysis Points:

TABLE 4

PROPOSED CONDITIONS DRAINAGE PARAMETERS

Drainage Area Designation	Drainage Area Description	Area (Acres)	Cn	Tc (Min.)
PCDA 1A	**See Drawing PC-1 in Appendix E**	20.450	75	34.30
PCDA 1B	**See Drawing PC-1 in Appendix E**	4.980	87	10.70
PCDA 1C	**See Drawing PC-1 in Appendix E**	1.310	92	4.10
PCDA 2	**See Drawing PC-1 in Appendix E**	2.520	72	5.30

Note: Proposed Condition Drainage Area (PCDA) #1B is a new sub-drainage area that is comprised of parts of Existing Conditions Drainage Area ECDA-1, 2 and 3. This reconstitution of contributing drainage areas was necessary due to the need to pitch the new gravel pad to the south toward the proposed treatment facility, even though portions of the existing terrain slope to the northeast.

4.1.7 Additional Investigations and Findings of the Proposed Conditions Hydrologic Analysis

An on-site investigation and soil percolation tests were performed on January 22, 2015 to determine if the underlying soils in the area of the proposed infiltration basin would be conducive to infiltration. The test results obtained were determined to be adequate to promote infiltration, as an in-situ stabilized percolation rate of 34 minutes/inch was recorded where the proposed infiltration basin will be situated. This percolation rate is equivalent to an infiltration rate of 1.78 inches per hour. However, for this project, a conservative infiltration rate of 0.89 inches per hour (or half of the observed rate) was used to analyze and design the proposed facility in March 2015.

On April 20th and 21st, 2015 subsequent infiltration tests were performed by Stantec, which were performed in general conformance with the procedures in the 2015 NYSDEC Stormwater Management Design Manual. On April 20th, the holes were dug to the required depth of the infiltration facility, casings were installed, backfilled around the casing, clean aggregate was placed to a depth of two (2) inches at the bottom of the casing, and then the casings were presoaked to the top of the casing. On April 21st, the casings were re-filled with water, and the infiltration rates over a four (4) hour period were observed. Infiltration rates ranged from 5.8 inches per hour to 11.0 inches per hour. The lowest rate of 5.8 inches per hour was used for the design basis for the infiltration facility, and the preliminary design was modified accordingly. The proposed stormwater infiltration basin test results, design plans and calculations are included in **Appendix E**.

The proposed infiltration basin/extended detention pond has been designed to accommodate the proposed runoff from the contributing areas for all storm events (up to and including the 100 year design storm event) based on the above infiltration tests that were observed. The need to have proper separation to bedrock from the bottom of the infiltration basin was addressed in the revised design as well.

The proposed peak discharge flow rates for Analysis Points #1 and #2 are summarized in the following table:

TABLE 5

PROPOSED PEAK DISCHARGE FLOW RATES
SCS RESULTS

Analysis Area	Design Storm Frequency	Proposed Peak Flow Rates (CFS)	Proposed Discharge Volume (Acre-feet)	Proposed Volume Infiltrated (Acre-feet)
Analysis Point #1	1 Year	6.59	0.89	0.597
	10 Year	29.10	3.36	1.172
	100 Year	75.50	8.10	1.529
Analysis Point #2	1 Year	0.94	0.21	
	10 Year	7.08	0.79	
	100 Year	19.38	1.83	

4.1.8 Hydraulic Design Analysis Summary

The following table identifies the estimated peak ponding elevation, storage capacity and anticipated peak discharge rate for the proposed infiltration basin:

TABLE 6

ESTIMATED PEAK PONDING ELEVATION, STORAGE CAPACITY, AND ANTICIPATED PEAK DISCHARGE RATE FOR THE STORMWATER MANAGEMENT FACILITY (INFILTRATION BASIN)

Proposed Facility	Design Storm Frequency	Local Captured Peak Inflow Rate (CFS)	Proposed Facility Peak Discharge Rate (CFS)	Proposed Peak Water Surface Elevation (ft)	Proposed Storage Facility Volume (acre feet)
Infiltration Basin	1 Year	9.72	0.00	1951.99	0.322
	10 Year	23.31	4.10	1953.25	0.714
	100 Year	42.59	13.01	1954.42	1.206

4.1.9 Stormwater Pollution Prevention Facility Water Quality Design Features

This project has been designed in accordance with the NYSDEC Stormwater General Permit as well as the Stormwater Management Design Manual. As such the initial step of developing the site included the NYSDEC Green Infrastructure (GI) Five Step Planning Process to determine appropriate future land uses on-site as well as suitable green related controls that could be incorporated into the project. Refer to **Appendix E** for a summary of the NYSDEC Five Step GI Planning Process used for completion of this project.

Based upon the results of the GI Five Step Planning Process, three (3) primary "Green" concepts or practices were identified as practical and suitable, which are as follows:

1. Porous pavement at key locations for the new proposed access roads.
2. Vegetated Swales for stormwater conveyance and infiltration.
3. Infiltration Basin/Extended Detention with runoff reduction capacity.

In addition, Green Infrastructure design also incorporates the concept of runoff reduction (RRv). The intention of the RRv concept is to reduce the volume of post-construction stormwater runoff to replicate pre-construction conditions. In essence, the amount of required runoff reduction is equivalent to the project Water Quality volume (WQv).

For this project, a modified infiltration basin (providing both infiltration and extended detention) has been selected as the preferred manner in which stormwater runoff will be treated. To mitigate for the lack of separation to existing bedrock (as required by NYSDEC), the basin will be constructed on suitable fill material that emulates the infiltration rate of the surrounding existing soils (based on the data obtained from the infiltration tests). With the introduction of the new fill material within the basal area of the basin, the infiltration practice has been designed to provide the required runoff reduction benefits. The infiltration practice for this project has been designed to infiltrate 100% of the total RRv and the project will treat 100% of the new impervious cover on-site.

In accordance with NYSDEC standards, the Water Quality Treatment volume (i.e. the quantity of runoff that must be treated) is determined using the following empirical equation:

WQv = (P)(Rv)(A)/12

Where:
WQv = water quality volume (in acre-feet)
P = 90% rainfall event # (Fig. 4.1 of the NYSDEC SW Management Design Manual)
Rv = 0.05 + 0.009(I), where I is the percent impervious cover
A = Site area (in acres) equals contributing watershed area

The estimated water quality treatment volume that will be provided by the proposed infiltration basin is summarized in the following table:

TABLE 7

WATER QUALITY TREATMENT VOLUME (OVERALL SITE)

Proposed Facility	Theoretical Water Quality Volume (Acre-Feet)	Proposed Water Quality Treatment Volume (Acre-Feet)	Theoretical Runoff Reduction Volume (Acre-Feet)	Proposed Runoff Reduction Volume (Acre-Feet)
Infiltration Basin	0.316	0.323	0.316	0.323
Vegetated Swale*				0.032
			Total	**0.355**

* Vegetated swales will provide the required pre-treatment of stormwater runoff prior to entering the water quality treatment facility (i.e. infiltration basin).

4.1.10 Summary of Findings

Finally, as required by DEP, a coliform analysis was performed to determine the potential impact on coliform loadings within stormwater discharge flows. In accordance the NYSDEC's "Simple Method to Calculate Urban Stormwater Loads", the project runoff will theoretically experience a higher level of coliform loading due in large part to the increase in impervious cover, even though the proposed electric power facility will not generate or otherwise be a source of coliform loading. Regardless, the theoretical increase in coliform loading will be mitigated by the proposed infiltration basin/extended detention pond, which has been sized to accommodate the 1-year storm (100% infiltration) and a portion of the 10- and 100-year storm events. As such, this project will have a negligible impact, if any, on coliform loadings within the effective watershed. **Appendix E** includes the Coliform Analysis for the project.

Upon completion of the project, the full water quality treatment train for stormwater runoff discharging from all impervious surfaces will be as follows:

1. Surface runoff will enter the adjacent vegetated swales for pre-treatment
2. The vegetated swales then discharge to the proposed infiltration basin/extended detention pond for primary treatment and peak flow attenuation
3. The infiltration basin/extended detention pond retains runoff and allows for infiltration. An outlet control structure and emergency weir would then slowly release excess impounded stormwater to a level spreader
4. The level spreader would then release non-concentrated sheet flow down-gradient where it will enter an existing federal wetland for additional treatment benefits
5. Once the wetland reaches its storage capacity, it will discharge excess non-concentrated flow down-gradient to existing swales and ultimately to the existing stream near Hamden Hill Road Spur

The proposed Stormwater Pollution Prevention Plan mitigates peak flow rates, provides detention of all the design storm events, provides opportunities for infiltration of surface runoff, incorporates porous/permeable finished surfaces where appropriate and reduces the potential for soil erosion and degradation of downstream water bodies.

Given the inherent limitations of the site conditions, this SWPPP demonstrates that the proposed stormwater management facilities will meet or exceed the performance specifications, as defined in the Stormwater Management Design Manual, by eliminating or reducing the 1-, 10- and 100-year Storm event stormwater discharges, providing water quality treatment for the Total WQv and fully meeting the "Green" RRv (runoff reduction) requirement.

4.2 Temporary Erosion and Sediment Control

Based on observed site conditions as well as temporary conditions that are anticipated due to the various construction-related operations, the following summarizes the likely BMP's that would be appropriate and necessary to address erosion and sediment control during construction (Refer to **Appendix F** for Erosion and Sediment Control Plans).

The temporary controls that will be required for this project will include the following:

- Stabilized Construction Entrance to the construction site from Public Roadway(s).
- Silt fence as a temporary perimeter protection and isolated areas downstream of exposed soils
- Check Dams to control and reduce concentrated surface flow velocities within swales and ditches, thus reducing the potential of soil erosion and subsequent sedimentation.
- Sediment Traps and/or Basins to capture suspended sediments carried in surface runoff.
- Dust Controls to reduce surface and air movement of dust from disturbed soil surfaces that may cause off-site damage, health hazards and traffic safety problems.
- Concrete Wash-out Facilities to provide a designated area where concrete trucks and equipment may be washed. The designated area(s) have been located away from sensitive and/or protected water bodies.

Additional requirements for the control of erosion and sediment during construction are as follows:

- Temporary stockpiling of granular material (gravel, excavated spoils, select backfill, topsoils, etc.) is expected on-site. Stockpiling of granular material will not be permitted where it may pose a health or safety risk to the general public or risk to the water quality of any water body within the vicinity of the project (as determined by the project SWPPP Inspector). At all times during construction, any stockpiled material susceptible to erosion and sedimentation off of the project site will be appropriately protected with a perimeter silt fence.
- In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with this SWPPP and the technical standard, New York State

Standards and Specifications for Erosion and Sediment Control, dated August 2005.

- Existing topsoil onsite shall be stripped and stockpiles, as needed, for use in turf establishment. With the exception of existing topsoil stockpiling, all excess excavated material shall be disposed of offsite.

- Bright orange construction fence shall be installed along the perimeter of the "suspect" wetland located just south of the proposed stormwater treatment basin prior to commencement of construction activities.

- When dewatering is required in areas of soil excavation, the contractor shall pump turbid groundwater to temporary sediment traps for filtering. When sediment traps are infeasible, the contractor shall use portable sediment bags. Bags shall be placed in upland areas away from sensitive water bodies or other resources.

Refer to **Appendix F** for Stormwater Design and Erosion and Sediment Control Plans for typical seed mix and other requirements associated with temporary and permanent soil stabilization groundcover. Grass/turf will be the predominant vegetative groundcover within the project site.

Temporary Stabilization is established when all 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 exposed soil from eroding. The materials can include, but are not limited to, mulch, seed and mulch, and rolled erosion control mats (e.g. jute twisted yarn, excelsior wood fiber mats).

Final Stabilization is established when 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.

5.0 Spill Prevention and Solid Waste Management

5.1 Management of Spills and Releases

Should a fuel, lubricant, or chemical spill occur, the ABB Construction Supervisors and NYPA's Construction Project Manager identified in **Appendix A** shall be notified immediately to ensure proper reporting and clean-up occur.

The Construction Contractor shall comply with all federal, state and local laws, regulations and regulatory agreements pertaining to immediate and follow-up reporting of environmental spills or releases of petroleum products or hazardous substances. Any small-scale fuel or oil spills must be remedied immediately and contaminated soils shall be disposed of appropriately. A licensed spill prevention and response team shall handle large-scale fuel spills.

Notification and Reporting. An unintentional or accidental spill or release of any oil or chemical in any quantity on land, water or to the air must be reported to the ABB Construction Supervisor and NYPA's Construction Manager.

Reporting Requirements. NYPA's Construction Manager shall be responsible for making all contacts to the local, state and federal agencies relative to a reportable spill. Within two hours of a discharge, the DEC shall be notified during working hours by telephoning the DEC Region 4 office at (585-226-2466 or the DEC hotline at 1-800-457-7362 after working hours.

Prohibited Discharges:

- Wastewater from washout of concrete
- Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials
- Fuels, oils or other pollutants used in vehicle and equipment operation and maintenance
- Toxic or hazardous substances from a spill or other release

5.2 Refueling, Vehicle Lubrication and Vehicle/Equipment Washing

Vehicles requiring refueling or lubrication shall be brought to a portion of the site away from environmentally sensitive areas (such as wetlands, storm drains, culverts, wells, etc.). The operator shall take precautions to ensure that drips, spills, or seeps do not enter the ground. The use of absorbent towels beneath the fuel tank and all refueling connections is required.

All washing operations shall use clean water only. Soaps, detergents and solvents are prohibited from use on the project site.

5.3 Solid Waste Management

Solid waste materials generated by the contractor's operations and personnel shall be carefully and securely stored and protected in acceptable upland locations, away from environmentally sensitive areas. As soon as practicable, solid waste materials will be transported to an approved designated repository for proper disposal off-site.

Portable self-contained chemical toilets shall be provided for all workers when permanent toilets are not available. The portable toilets shall be maintained and cleaned regularly, and the waste shall be properly disposed of. In additional, the toilet units shall be tip-proof, and shall be located away from any environmentally sensitive areas.

5.4 Maintenance and Inspections

Semi-weekly visual inspections of all BMP's on the construction site (separated by no less than two (2) calendar days) will be performed by the project's designated SWPPP Inspector at every 7 calendar days. The inspection personnel designated in **Appendix A** of this SWPPP will conduct the inspections and will have the authority to assess the appropriateness and adequacy of all required stormwater management controls during construction.

As required by the General Permit, the Contractor shall perform daily inspections of all temporary controls, and shall perform any required remedial actions identified as a result of those inspections.

The semi-weekly inspections by the SWPPP Inspector are intended to verify that the in-place BMP's are in good condition and are minimizing erosion and sedimentation. These inspections will also recommend whether corrective actions to established BMP's are required or whether additional BMP's are necessary to prevent stormwater contamination (based on unanticipated site conditions). A sample copy of the weekly inspection report form is provided in the Construction Site Logbook contained within **Appendix H**. Completed forms will be provided to the on-site Construction Supervisor and maintained at the Field Office and/or an appropriate on-site receptacle during the entire construction project.

If construction activities or design modifications are made to the project that could impact stormwater, then this SWPPP document will be amended appropriately. The amended SWPPP will then include a description of the new activities, their associated impacts, and a summary of the appropriate and applicable BMP's to minimize those impacts.

If a portion of the site/project area is permanently stabilized, then inspections can cease in that area as long as the condition has been documented.

As previously noted in section 3.3, within one business day of the completion of an inspection, the *Qualified SWPPP Inspector* shall notify the *owner or operator* and Construction Supervisor identified in **Appendix A** of any corrective actions that need to be taken. The Contractors shall begin implementing the corrective action within one business day of this notification and shall complete the corrective actions in a reasonable timeframe.

Amendments to this document will be added to **Appendix L**.

6.0 Compliance with Federal, State and Local Regulations

6.1 Endangered Species

Based on input received from NYSDEC Division of Fish, Wildlife and Marine Resources, there are no records of rare or state-listed animals or plants, or significant natural communities at the site or in its immediate vicinity

6.2 Cultural resources

Refer also to Section 8.0 of this report.

6.3 Other Permits and Regulations

This project is being progressed as a Public Service Commission (PSC) Article VII action. As such, all other requirements identified in the project Environmental Management and Construction Plan (EM&CP) shall apply.

6.4 Retention of Records

Once the project is complete, ABB crews or contractors will submit a complete copy of all inspection records to the owner/operator (NYPA). The owner/operator must maintain a copy of the SWPPP, Inspection Reports, NOI, NOT, and NOI Acknowledgement letter for a period of five (5) years from the date of final site stabilization.

7.0 Post-Construction Storm Water Management Measures

The single stormwater management facility has been proposed as part of this project will require a long-term operation and maintenance (O/M) plan. The owner/operator (NYPA) will be required to monitor the facility on a continual basis to ensure the facility is functioning properly.

The owner/operator (NYPA) will be required to inspect the facility at least once per calendar year. At a minimum, the inspections will include inspecting impoundment areas and feeder swales for accumulation of silts and debris or any other blockage.

Refer to **Appendix J** for the long-term O/M Plan. The O/M Plan provides more detail such as the specific component to be inspected and maintained, what to consider during the inspections, the responsible entity for O/M compliance and the frequency of the periodic inspections.

8.0 NYS Office of Parks, Recreation and Historic Preservation

A review of properties listed or eligible for listing on the State or National Register of Historic Places or Archeologically Sensitive Areas was completed for the entire project area using the GIS online resource provided by the NYS Office of Parks, Recreation and Historic Preservation (OPRHP). A copy of the NYS OPRHP "Letter of No Effect" is included in **Appendix G**.

9.0 NYSDEC Notice of Intent (NOI) and NYSDEC Acknowledgement (Letter) of Receipt of the NOI

The signed NYSDEC Notice of Intent (NOI) and a copy of the acknowledgment letter verifying receipt of the NOI by the NYSDEC are contained in **Appendix K**.

10.0 Certifications

10.1 Contractor's Certification

"I hereby certify under penalty of law 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 *discharge*s from *construction activities* and that it is unlawful for any person to cause or contribute to a violation of *water quality standards*. Furthermore, I am aware that there are significant penalties for submitting false information that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations".

_____
Name of Construction Company

_____
Construction Company Address and Telephone Number

_____
Printed Name of Authorized Representative (including Title)

_____
Printed Name of Trained Individual (including Title)

_____ _____
Signature of Authorized Representative Date