



**RESTAURANT DEPOT**  
**Former Stateline Retail Center Project Site**  
**DEP Log #2006-EB-0522-SP.1**  
**Amended Stormwater Pollution Prevention Plan (ASWPPP)**  
**Town of Southeast, New York**  
**December 23, 2019**

## 1.0 INTRODUCTION

The subject property contains 44± acres located in the SR-6 Zoning District on U.S. Route 6 in the Town of Southeast. The subject lot contains a mixture of woods and meadow, watercourses and two (2) Town-regulated wetlands. The meadow areas have been historically, and are currently, mowed for hay. There is an existing trail and stream crossing in the eastern portion of the site and a paved apron off of U.S. Route 6 near the meadow across from Joe's Hill Road. There are no other improvements to the subject property, except two drilled wells.

A 2-lot commercial subdivision was approved for the subject properties and the plat was filed with the Putnam County Clerk's Office on March 23, 2010. This application proposes a 3-Lot subdivision from the existing 2-Lot subdivision. Proposed Lots 1 & 3 shall remain vacant for future development. Lot 2 consisting of 11 acres ± proposes a Large Retail Establishment, as defined in the Southeast Zoning Code, consisting of 57,500 s.f. building, associated parking, lighting, landscaping, subsurface sewage treatment system, well, and stormwater management areas.

The subject project is located in the East Branch Reservoir Basin. The on-site ground cover is characterized as a mixture of woods and meadow throughout the majority of the site. The property ranges in elevation from a high point of 534 in the central portion of the site adjacent to the southern property line, to elevation 442, in the Town regulated wetland on the northeastern portion of the site. The slopes throughout the proposed project range from flat to generally steep slopes. Soil types on the property vary from very deep, well-drained soils to moderately drained soils. Figures 2 and 3 provide a breakdown of the soil types and a listing of these soils in accordance with the *Soils Survey of Putnam and Westchester Counties*.

Additional physical features of the property include two (2) Town-regulated wetlands. One (1) Town-regulated wetland is located in the northwestern portion of the site. An intermittent watercourse and reservoir stem are located within this Town-regulated wetland. The second Town-regulated wetland is located on the eastern portion of the site. Stormwater runoff from Interstate 84 is discharged to an unnamed stream that flows through the Town-regulated wetland on the eastern portion of the site. The unnamed stream crosses under U.S. Route 6 and discharges to the East Branch Reservoir Basin.

A SWPPP approval for the previous Stateline Retail Center project, which was a much larger project in size and scope on the same property was granted by the NYCDEP in November of 2009. The SWPPP was prepared by Insite Engineering, Surveying & Landscape Architecture, P.C. and was dated October 28, 2009. This report specifically addresses the proposed site changes with the current proposed development and an assessment of the stormwater management practices within the framework of the previously approved SWPPP. The previously proposed development consisted of approximately 184,800 s.f. of retail and 14,800 s.f. of office buildings and associated roads, parking and landscaping. The original SWPPP used three design points to assess the stormwater runoff from pre to post-development. The proposed Restaurant Depot project consist of a single 59,000 s.f. building and uses two of the three original design points (Design Line 1 and Design Point 2) to analyze the stormwater runoff for both quality and quantity. Design Line 1 runs

north to south along an existing wetland edge on the eastern portion of the property. Design Point 2 is located at the culvert in the Town-regulated wetland in the northwestern portion of the property. This amendment of the original Stateline Retail Center SWPPP has been prepared to confirm that the proposed modifications associated with the development of site will function with the previously approved stormwater management practices with some modifications.

The primary change that impacts the stormwater infrastructure from the approved SWPPP is the types of stormwater management practice designs used upstream of Design Line 1 and Design Point 2. This SWPPP amendment compares the stormwater quality and quantity of the amended plan versus the previously approved plan and SWPPP.

To assess the stormwater quantity and quality requirements of state and local agencies found in the original SWPPP approval by others, the “HydroCAD” Stormwater Modeling System,” by HydroCAD Software Solutions LLC in Tamworth, New Hampshire, was used to model and assess the peak stormwater flows for the subject project. HydroCAD is a computer aided design program for modeling the hydrology and hydraulics of stormwater runoff. It is based primarily on hydrology techniques developed by the United States Department of Agriculture, Soil Conservation Service (USDA, SCS) TR-20 method combined with standard hydraulic calculations.

The input requirements for the HydroCAD computer program are as follows:

Subcatchments (contributing watershed/sub-watersheds)

- Design storm rainfall in inches
- CN (runoff curve number) values which are based on soil type and land use/ground cover
- Tc (time of concentration) flow path information

It should be noted that the Tc’s used in this modified analysis are the same as the original SWPPP as the contributing areas are very close to the areas in the original SWPPP.

Stormwater Basins

- Surface area at appropriate elevations
- Flood elevation
- Outlet structure information

The precipitation values for the 1-Year, 2-Year, 10-Year, 25-Year, and 100-Year 24-hour design storm events and rainfall distribution curves utilized for this report were consistent with the precipitation values utilized in the previously approved SWPPP. The values provided for all design storms analyzed have been listed below.

| Design Storm | 24-Hour Rainfall |
|--------------|------------------|
| 1-Year       | 3.2”             |
| 2-Year       | 3.5”             |
| 10-Year      | 5.5”             |
| 25-Year      | 6.0”             |
| 100-Year     | 10.0”            |

The CN (runoff curve number) values utilized in this report were referenced from the USDA, SCS publication *Urban Hydrology for Small Watersheds*. The following is a summary of the various land uses/ground covers and their associated CN values utilized in this report.

**Table 1.0.1 – Project Ground Cover and Associated Curve Numbers (CN)**

| Land Use/Ground Cover    | CN Value |
|--------------------------|----------|
| Woods, A Soil            | 30       |
| Meadow, A Soil           | 30       |
| >75% Grass Cover, A Soil | 39       |
| Woods, C Soil            | 70       |

| Land Use/Ground Cover    | CN Value |
|--------------------------|----------|
| Meadow, C Soil           | 71       |
| >75% Grass Cover, C Soil | 74       |
| Paved Parking and Roofs  | 98       |

The stormwater treatment practice types and sizes have been altered from the previously approved SWPPP. The practices have been relocated and the type of practice has been changed. The approved SWPPP utilized two (2) P-1 Micropool Extended Detention Pond upstream of Design Line 1 and a Permanent Dry Stormwater Basin and a W-4 Pocket Wetland upstream of Design Point 2. The amended SWPPP utilizes a single P-1 Micropool Extended Detention Pond upstream of Design Line 1 and both an Extended Detention/Pretreatment Basin and an I-2 Infiltration Basin upstream of Design Point 2. The practices were modeled in HydroCAD (Appendix B) to assess the treatment capacity in accordance with the stormwater requirements in place at the time of the approval. Preliminary testing was performed in the area of the proposed infiltration basin. The test results support the design requirements for infiltration practices.

## 2.0 STORMWATER QUALITY ASSESSMENT

The proposed stormwater quality treatment includes an I-2 Infiltration Basin and a P-1 Micropool Extended Detention Pond. The I-2 Infiltration Basin differs from the stormwater treatment practice approved in the original SWPPP. The previously approved SWPPP included grass swales and three (3) stormwater basins upstream of Design Point 2.

The NYCDEP regulations at the time of the original approval stated that the stormwater management systems must be designed to “capture and treat” the 2-year, 24-hour design storm for stormwater quality purposes. The accepted method to meet the NYCDEP quality regulations is to provide 24-hour plug flow detention time for the 2-year 24-hour design storm or storage and complete infiltration of the 2-year 24-hour design storm. The proposed Extended Detention/Pretreatment Basin (2.0 EDB) and the P-1 Micropool Extended Detention Pond (1.1 P) have been design to provide 24-hour plug flow detention time for the 2-year, 24-hour design storm and the I-2 Infiltration Basin (2.0 IB) has been designed to store and completely infiltrate the stormwater runoff from the 2-year, 24-hour design storm or more as required by the NYCDEP regulations.

The pollutant loading coefficient method was utilized to calculate the annual export of Biological Oxygen Demand (BOD), Total Phosphorus (TP), Total Nitrogen (TN), and Total Suspended Solids (TSS). The publication *Fundamentals of Urban Runoff Management: Technical and Institutional Issues* produced by the Terrene Institute was referenced to determine the appropriate loading rates for TP, TN, and TSS. The New York State Department of Environmental Conservation (NYSDEC) publication *Reducing the Impacts of Stormwater Runoff from New Development (Impacts)* was referenced to determine appropriate loading rates for BOD. The appropriate loading rates were then utilized to calculate the annual pollutant runoff values. The following table summarizes the pollutant loading rates utilized for the subject project.

**Table 2.0.1 - Summary of Pollutant Loading Rates (lbs/acre/year)**

| Land Use/Ground Cover | BOD   | TP   | TN  | TSS   |
|-----------------------|-------|------|-----|-------|
| Forest                | 7.0   | 0.10 | 1.8 | 76.5  |
| Pasture               | 32.0  | 0.11 | 3.7 | 305.3 |
| Grass                 | 6.0   | 0.12 | 3.7 | 308.0 |
| Commercial            | 163.0 | 0.71 | 4.6 | 716.5 |
| Road                  | 113.0 | 0.98 | 2.1 | 466.8 |

The proposed treatment for stormwater runoff discharging from the subject project will include a extended detention basin, infiltration basin and a micropool pond. The following pollutant removal efficiencies are referenced from *Impacts*. By meeting the requirements set forth by the NYCDEP, which exceed the requirements in *Impacts* for the Design 2 extended detention basins, the pollutant removal efficiencies for a Design 2 extended detention pond can be applied for the proposed Extended Detention Basin (2.0 EDB) and P-1 Micropool Extended Detention Pond (1.1 P) on the site. By meeting the

requirements set forth by the NYCDEP, which exceed the requirements in *Impacts* for the Design 9 infiltration basins, the pollutant removal efficiencies for a Design 9 infiltration basin can be applied for the proposed I-2 Infiltration Basin (2.0 IB) on the site.

**Table 2.0.2 - Long Term Pollutant Removal Efficiencies**

| <b>Treatment Method</b>          | <b>BOD</b> | <b>TP</b> | <b>TN</b> | <b>TSS</b> |
|----------------------------------|------------|-----------|-----------|------------|
| Design 2 Extended Detention Pond | 40%-60%    | 40%-60%   | 20%-40%   | 80%-100%   |
| Design 9 Infiltration Basin      | 80%-100%   | 60%-80%   | 60%-80%   | 80%-100%   |

The following tables summarize the estimated pre-development and post-development annual pollutant loads (calculated in Appendix C of this report) calculated for the subject project.

**Table 2.0.3 - Annual Pollutant Loading Summary to Design Point 1**

|   | <b>Annual Loads (lb/yr)</b> |            |            |               |
|---|-----------------------------|------------|------------|---------------|
|   | <b>BOD</b>                  | <b>TP</b>  | <b>TN</b>  | <b>TSS</b>    |
| Pre-Development Annual Pollutant Loads  | 442.8                       | 2.69       | 51.5       | 3,808.9       |
| Approved SWPPP                          | 650.1                       | 3.48       | 44.5       | 1,092.5       |
| Post-Development Annual Pollutant Loads | to<br>265.7                 | to<br>1.69 | to<br>25.0 | to<br>648.6   |
| Amended SWPPP                           | 400.1                       | 2.51       | 48.4       | 3,275.6       |
| Post-Development Annual Pollutant Loads | to<br>387.6                 | to<br>2.44 | to<br>47.4 | to<br>3,170.0 |

**Table 2.0.3 - Annual Pollutant Loading Summary to Design Point 2**

|   | <b>Annual Loads (lb/yr)</b> |            |            |               |
|---|-----------------------------|------------|------------|---------------|
|   | <b>BOD</b>                  | <b>TP</b>  | <b>TN</b>  | <b>TSS</b>    |
| Pre-Development Annual Pollutant Loads  | 237.1                       | 2.10       | 34.8       | 2,072.7       |
| Approved SWPPP                          | 441.9                       | 2.74       | 35.4       | 1,906.2       |
| Post-Development Annual Pollutant Loads | to<br>225.0                 | to<br>1.88 | to<br>25.9 | to<br>1,493.1 |
| Amended SWPPP                           | 280.4                       | 2.37       | 37.0       | 2,161.1       |
| Post-Development Annual Pollutant Loads | to<br>198.5                 | to<br>1.85 | to<br>31.4 | to<br>2,014.5 |

As seen by the above summaries, the post-development pollutant loads are within the range of the pre-development pollutants of concern as required by the NYCDEP regulations, which is consistent with the standards at the time of the original SWPPP Approval.

The NYSDEC SPDES General Permit GP-0-08-001, the permit in place at the time of the prior approval, requires that the Water Quality Volume (WQ<sub>v</sub>) be treated in order to provide pollutant removal. As previously stated, the subject project is located in the New York City Watershed, which is listed as a phosphorus-limited watershed. Therefore, the stormwater management practices have been designed in anticipation of the enforcement of the newly released Enhanced Phosphorus Removal Supplement (Chapter 10) of the NYSSMDM. As outlined in Chapter 10, the treatment volume for the WQ<sub>v</sub> is the runoff volume produced during the 1-year 24-hour design storm.

The treatment of the water quality volume for the stormwater discharging to Design Line 1 will be accomplished in the P-1 Micropool Extended Detention Pond (1.1 P). The treatment of the water quality volume for the stormwater discharging to Design Point 2 will be accomplished in the I-2 Infiltration Basin (2.0

IB). The Infiltration Basin and Micropool Extended Detention Pond have been designed per Chapter 10 of the NYSSMDM.

**Table 2.0.4 – Required Water Quality Volume Summary (Per NYSSMDM Chapter 10)**

| Subcatchment | A<br>(ac.) | WQ <sub>v</sub><br>(ac-ft) | WQ <sub>v</sub><br>(cf) |
|--------------|------------|----------------------------|-------------------------|
| 1.1S         | 1.25       | 0.029                      | 1,263                   |
| 2.0S         | 6.5        | 0.796                      | 34,674                  |

\*Information regarding contributing areas (A) and 1-year 24-hour Design Storm Volumes (WQ<sub>v</sub>) is shown in Appendix B

As shown in Appendix B, the storage volume in the infiltration basin (2.0 IB) below the weir in the outlet structure is greater than the water quality volume.

Pretreatment for the infiltration basin is provided through the Extended Detention/Pretreatment Basin (2.0 EDB). As shown in Appendix B, the volume in the basin below the weir in the outlet structure is greater than the WQ<sub>v</sub>. Although the Design Manual only requires pretreatment for 25% of the WQ<sub>v</sub> based on an infiltration rate less than 2 inches/hour in the infiltration basin, 100% pretreatment of the WQ<sub>v</sub> has been provided in the Extended Detention/Pretreatment Basin (2.0 EDB).

As previously stated, the water quality volume treatment for Design Line 1 will be treated with the design of the proposed Micropool Extended Detention Pond (P-1) per the NYSDEC design standards. The pond has been designed to meet the following required elements as specified in the Design Manual.

| Design Elements                             | Required   | Provided  | Remarks           |
|---|--|---|-------------------|
| Pond Location                               | Not within Jurisdictional Waters                   | Outside of Jurisdictional Waters                  | See Project Plans |
| Forebay Volume                              | 10% of WQ <sub>v</sub> (126 cubic feet)            | 62% of WQ <sub>v</sub> (785 cubic feet)           | See Appendix A    |
| Forebay Depth                               | 4' Min. – 6' Max.                                  | 4' Provided                                       | See Appendix A    |
| WQ <sub>v</sub> Storage                     | 20% Min. within Permanent Pool<br>(253 cubic feet) | 20% + within Permanent Pool<br>(4,230 cubic feet) | See Appendix A    |
| Minimum Length to Width Ratio               | 1.5 : 1  | Greater than 1.5 : 1                              | See Project Plans |
| Minimum Surface Area to Drainage Area Ratio | 1 : 100  | 1 : 5   | See Project Plans |
| Benches at Water Level                      | Aquatic Bench                                      | Aquatic Bench                                     | See Project Plans |
| Landscaping                                 | Pond and Buffer Plantings Required                 | Pond and Buffer Plantings Provided                | See Project Plans |

It is assumed that by meeting the water quality volume requirements as shown in the table above through employment of a micropool extended detention pond, the water quality objectives of the NYSDEC have been met to capture and treat 100% of the stormwater runoff.

By meeting the Water Quality Volume requirements through employment of I-2 Infiltration Basin and a P-1 Micropool Extended Detention Pond, the water quality objectives of the NYSDEC to treat the water quality volume has been met for Design Line 1 and Design Point 2.

The Stream Channel Protection (CP<sub>v</sub>) criterion is intended to protect stream channels from erosion and is accomplished by the 24-hour extended detention of the center-of-mass of the one-year, 24-hour storm event or fully infiltrating the 1-year, 24-hour storm event. By providing greater than 24-hours extended detention of the center-of-mass of the 1-year, 24-hour storm event in the proposed Extended Detention/Pretreatment Basin (2.0 EDB) and the P-1 Micropool Extended Detention Pond (1.1 P), The CP<sub>v</sub>

criterion is met. CPv is also achieved by fully infiltrating the stormwater runoff from the 1-year, 24-hour storm event in the infiltration basin (2.0 IB). As previously stated, the infiltration basin (2.0 IB) has been sized to fully infiltrate the 2-year, 24-hour storm event to meet the requirements of the NYCDEP.

### 3.0 STORMWATER QUANTITY ASSESSMENT

As previously described, the original Design Line 1 and Design Point 2 that was used in the approved SWPPP was used to assess the stormwater runoff from the proposed amendments to the site. The NYCDEP regulations require the attenuation of peak flows from the 2, 10, 25, and 100-year storms to pre-development levels. The attenuation of the peak flows from the proposed development is accomplished within the proposed stormwater management practices on the site. Table 3.0.1 and 3.0.2 below summarizes the pre and post development peak flows expected for the proposed amended project.

**Table 3.0.1 – Design Line 1 - Pre and Post-Development Peak Flows (cfs)**

| 24-HOUR DESIGN STORM |        |      |                 |      |         |      |                  |      |
|----------------------|--------|------|-----------------|------|---------|------|------------------|------|
| DESIGN LINE 1        | 2-YEAR |      | 10-YEAR<br>(Qp) |      | 25-YEAR |      | 100-YEAR<br>(Qf) |      |
|                      | Pre    | Post | Pre             | Post | Pre     | Post | Pre              | Post |
| Approved SWPPP       | 0.2    | 0.2  | 4.8             | 3.5  | 7.0     | 5.0  | 35.4             | 27.7 |
| Amended SWPPP        |        | 0.2  |                 | 4.8  |         | 7.0  |                  | 35.4 |

**Table 3.0.2 – Design Point 2 - Pre and Post-Development Peak Flows (cfs)**

| 24-HOUR DESIGN STORM |        |      |                 |      |         |      |                  |      |
|----------------------|--------|------|-----------------|------|---------|------|------------------|------|
| DESIGN POINT 2       | 2-YEAR |      | 10-YEAR<br>(Qp) |      | 25-YEAR |      | 100-YEAR<br>(Qf) |      |
|                      | Pre    | Post | Pre             | Post | Pre     | Post | Pre              | Post |
| Approved SWPPP       | 9.0    | 6.8  | 28.0            | 20.8 | 33.4    | 25.8 | 81.1             | 77.7 |
| Amended SWPPP        |        | 8.5  |                 | 28.0 |         | 33.4 |                  | 81.1 |

As seen by the above summaries, the post-development peak flows for the 2-, 10-, 25-, and 100-year design storms have been attenuated to be less than the pre-development peak flows, therefore the receiving drainage system will see a reduction in peak flows during the storm events shown above.

The stormwater conveyance systems for the project consist of swales, drain inlets, and HDPE pipe. The systems have been sized utilizing the Rational Method. The Rational Method is a standard method used by engineers to develop flow rates for sizing conveyance systems. The Rational Method calculates flows based on a one-hour design storm. The conveyance systems have been sized to convey, at a minimum, the 100-year design storm, as shown in the pipe and swale sizing calculations in Appendix D of this report.

Maintenance requirements for the proposed stormwater management practices are shown in Appendix E for the infiltration basin.

### 4.0 CONCLUSION

The proposed stormwater modifications to the previously approved SWPPP on the subject property have been assessed for both stormwater quantity and quality impacts with respect to the original approval issued by the NYCDEP in 2009. As seen in the analysis in this report, the proposed modifications have no impact on the stormwater quality and quantity from what was previously designed, and all modifications meet the requirements of the NYCDEP and NYSDEC within the framework of the original approved SWPPP.

**APPENDIX A**

**Stormwater Management Pre Development Computer Data**

**APPENDIX B**

**Stormwater Management Post Development Computer Data**

**APPENDIX C**  
**Pollutant Loading Calculations**

**APPENDIX D**  
**Pipe and Swale Sizing Calculations**

**APPENDIX E**

**NYSDEC Infiltration Practice Construction and Maintenance Checklist**

## **FIGURES**