

Hampton Manor Lake Water Quality Improvement Project

Town of East Greenbush
Rensselaer County, NY



New York State Dept. of Environmental Conservation
Water Quality Improvement Grant - 2009
NYS WQI # C304379



Photo provided through the courtesy of and as a public service by, Jay S. McLean

Aerial View Of Hampton Manor

This outstanding aerial view of Hampton Manor provides readers with an excellent picture of the actual number of families that may drive onto Columbia Turnpike. This picture is related to the present discussion of a traffic light at the Hampton Avenue intersection.



Why Be Concerned About Water Quality ?

- “ Health and the Environment
- “ Recreational Uses
- “ Aquatic Life
- “ Aesthetics and Enjoyment

Urban Runoff: What is it and What is its Impact on Water Quality?

- Storm Water Runoff
- Contains Contaminants
- Causes Poor Water Quality
- Diminishes Potential Use of Surface Waters
- Can Negatively Affect our Living Environment

How is Hampton Manor Lake Water Quality Affected?

High Density of Residential Lots and Associated Activity

 Storm Water Point Discharges



Why is Stormwater Runoff a Problem?

Stormwater can pick up debris, chemicals, dirt, and other pollutants and flow into a storm sewer system or directly to a lake, stream, river, wetland, or coastal water. Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing and providing drinking water.

Polluted stormwater runoff can have many adverse effects on plants, fish, animals and people.

Sediment can cloud the water and make it difficult or impossible for aquatic plants to grow. Sediment also can destroy aquatic habitats.

Excess nutrients can cause algae blooms. When algae die, they sink to the bottom and decompose in a process that removes oxygen from the water. Fish and other aquatic organisms can't exist in water with low dissolved oxygen levels.



Bacteria and other pathogens can wash into swimming areas and create health hazards, often making beach closures necessary.

Debris - plastic bags, six-pack rings, bottles, and cigarette butts . washed into waterbodies can choke, suffocate, or disable aquatic life like ducks, fish, turtles, and birds.

Household hazardous wastes like insecticides, pesticides, paint, solvents, used motor oil, and other auto fluids can poison aquatic life. Land animals and people can become sick from eating diseased fish and shellfish or ingesting polluted water.



Goals and Objectives

On the Town Level

- “ Construct Stormwater Management Facilities
- “ Education Residents and Enforce Rules
- “ Adopt a Long Term Plan

On the Residential Level

- “ Apply Good Practices to Minimize Pollution Potential
- “ Educate Family and Others

Major Impacts to Water Quality Identified

- “ Leaking Sanitary Sewers
- “ Numerous Storm Water Discharges
- “ High Density Land Development
- “ Limited Capacity of the Lake



Three Major Project Tasks Were Selected

1. Replacement of 1000 feet of Leaking Sewers and Manholes
2. Installation of Storm Water Management Facilities
3. Installation of Deep Sump Catch Basins and Outlet Sediment Traps

Phase One Project:

Installation of New Sanitary Sewer and Manholes along Lakeshore Drive

Old sewer and manholes were leaking.

Sewage could either leak into the Lake, or water could leak into the sewer, either way it was bad situation.

Condition of Typical Manhole Along Lakeshore Drive









Phase Two Project: Installation of Stormwater Management Facilities

Planning and Design Criteria:

Quantity of Runoff

Quality of Receiving Waters

DEC Guidelines

Location and Area Limitations

Maximize Collection of Runoff

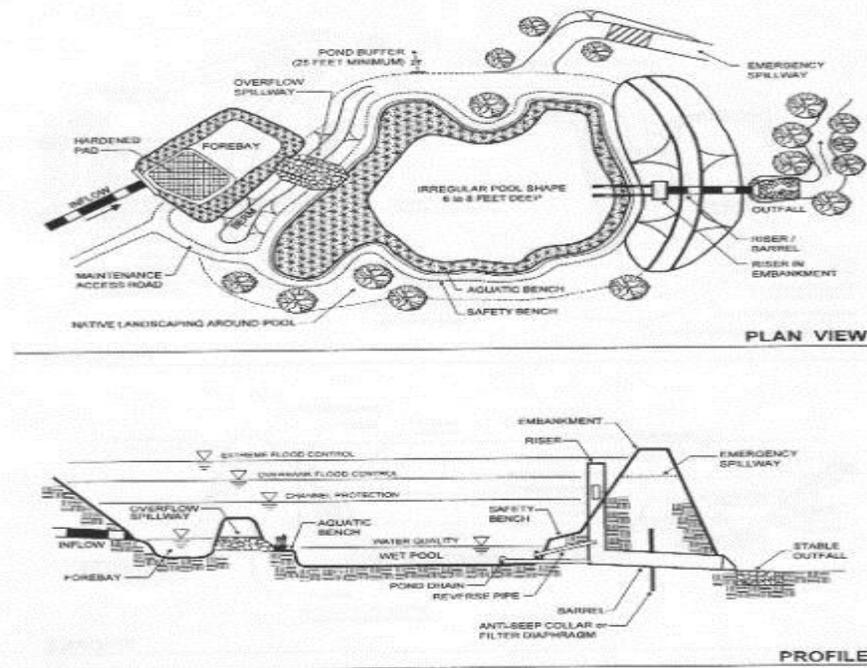
Cost Factors

NYSDEC Design Criteria and Guidance - Wet Pond

New York State Stormwater Management Design Manual

Chapter 6: Pond

Figure 6.2 Wet Pond (P-2)



Pollutant Loadings

The Simple Method Loading Calculation and Reduction Calculation Worksheet
 Comprehensive Environmental Inc.

1 of 2

| No. | Watershed Name | Landuse | Area (acres) | Sanded? | Sanded Area (acres) | % Impervious | Runoff (in) | Annual Runoff (cft) | Annual TSS (lbs) | Annual TP (lbs) | Annual TN (lbs) |
|-------|--------------------------|--------------------------|--------------|---------|---------------------|--------------|-------------|---------------------|------------------|-----------------|-----------------|
| 1 | Hampton Manor Lake East | Residential-Med. Density | 16.00 | no | 3.79 | 30 | 13.8 | 602,698 | 4,999 | 20.00 | 110.0 |
| 2 | Hampton Manor Lake West | Residential-Med. Density | 50.00 | no | 10.00 | 30 | 13.8 | 2,009,058 | 16,621 | 62.48 | 343.7 |
| 3 | Hampton Manor Lake South | Open Urban Land | 24.00 | No | 0.00 | 9 | 5.7 | 483,000 | 1,499 | 9.52 | 22.7 |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |
| 6 | | | | | | | | | | | |
| 7 | | | | | | | | | | | |
| 8 | | | | | | | | | | | |
| 9 | | | | | | | | | | | |
| 10 | | | | | | | | | | | |
| 11 | | | | | | | | | | | |
| 12 | | | | | | | | | | | |
| 13 | | | | | | | | | | | |
| 14 | | | | | | | | | | | |
| 15 | | | | | | | | | 0 | | |
| Total | | | 90 | | | | | 3,094,756 | 22,109 | 62.0 | 476.4 |

| Landuse | % Impervious | TSS (mg/l) | TP (mg/l) | TN (mg/l) |
|--------------------------|--------------|------------|-----------|-----------|
| Commercial | 85 | 75 | 0.2 | 2 |
| Industrial | 75 | 120 | 0.4 | 2.5 |
| Multifamily | 60 | 100 | 0.4 | 2.2 |
| Open Urban Land | 5 | 48.5 | 0.31 | 0.74 |
| Residential-High Density | 45 | 100 | 0.4 | 2.2 |
| Residential-Low Density | 16 | 100 | 0.4 | 2.2 |
| Residential-Med. Density | 30 | 100 | 0.4 | 2.2 |
| Residential-Roof | 100 | 19 | 0.11 | 1.5 |
| Roadway/Parking Lot | 80 | 150 | 0.5 | 3 |

High density residential (<1/4 acre lots); Medium density residential (1/4 to 1/2 acre lots); Low density residential (>1/2 acre lots); Multifamily (>7 buildings per acre)

| | | |
|----------------------|-----|------------------------|
| Annual Rainfall | 48 | inches; user specified |
| P _i | 0.9 | %; default |
| Sanding Rate | 150 | lbs/acre; default |
| Sanding Applications | 10 | times/year; default |

Simple Method Equations:

$$L = 0.226 * R * C * A$$

Where:

L = Annual Load (lbs)

R = Annual Runoff (inches)

C = Pollutant Concentration (mg/l)

A = Area (acres)

0.226 = Unit Conversion Factor

$$R = P * P_i * R_v$$

Where:

R = Annual Runoff (inches)

P = Annual Rainfall (inches)

P_i = % of rainfall events producing runoff

R_v = Runoff Coefficient

$$R_v = 0.99 + 0.9 * I_a$$

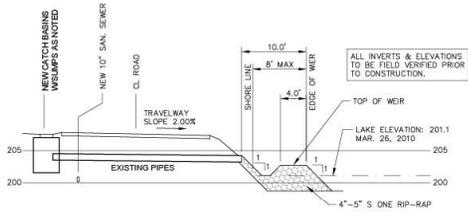
I_a = Impervious Fraction (%)

References

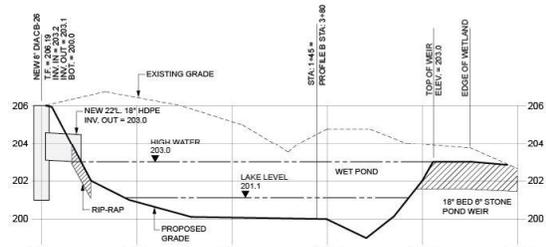
NO. 2006-2006, February 16. The National Sanitation Foundation (NSF), January 1, 2006. Available: <http://www.nsf.org>.
 The San Francisco Municipal Water Agency (MWA) San Francisco, California. Available: <http://www.sfmwa.org>.
 The Simple Method is Calculated Using: Environmental Loads, Revised July 20, 2005. Available: <http://www.comcast.net/~johndevine/epa/epa.html>.

| No. | Watershed Name | BMP ID | BMP Type | BMP Drains Area (acres) | TSS Removal (%) | TP Removal (%) | TN Removal (%) | Annual TSS Removed (lbs) | Annual TP Removed (lbs) | Annual TN Removed (lbs) |
|-------|--------------------------|--------|---------------------|-------------------------|-----------------|----------------|----------------|--------------------------|-------------------------|-------------------------|
| 1 | Hampton Manor Lake West | 1 | Foralby | 16 | 20% | 10% | 10% | 1,250 | 2,000 | 10,000 |
| 2 | Hampton Manor Lake East | 2 | Constructed Wetland | 50 | 80% | 40% | 30% | 12,497 | 24,994 | 103,110 |
| 3 | Hampton Manor Lake South | 2 | Constructed Wetland | 24 | 80% | 40% | 50% | 1,191 | 2,382 | 8,811 |
| 4 | | | | | | | | | | 0.00 |
| 5 | | | | | | | | | | 0.00 |
| 6 | | | | | | | | | | 0.00 |
| 7 | | | | | | | | | | 0.00 |
| 8 | | | | | | | | | | 0.00 |
| 9 | | | | | | | | | | 0.00 |
| 10 | | | | | | | | | | 0.00 |
| 11 | | | | | | | | | | 0.00 |
| 12 | | | | | | | | 0.000 | 0.000 | 0.000 |
| 13 | | | | | | | | 0.000 | 0.000 | 0.000 |
| 14 | | | | | | | | 0.000 | 0.000 | 0.000 |
| 15 | | | | | | | | 0.000 | 0.000 | 0.000 |
| Total | | | | | | | | 14,938 | 30.0 | 120.0 |

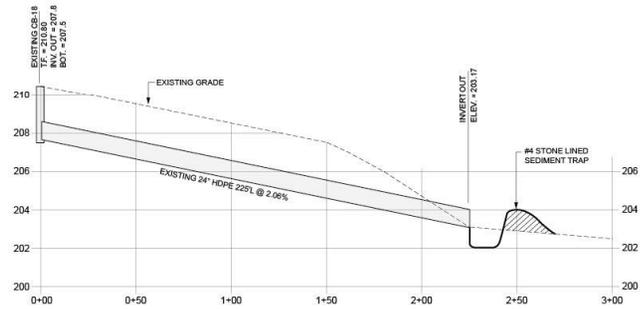




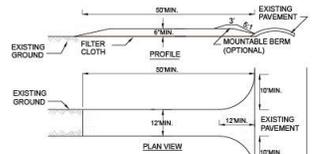
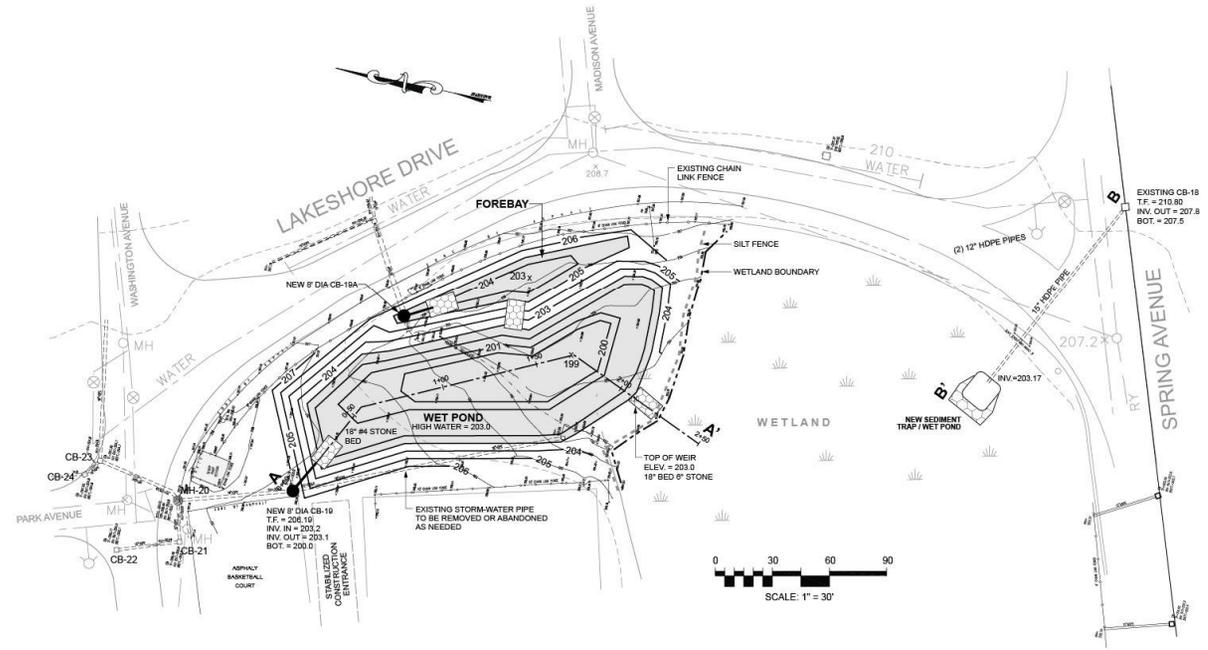
TYPICAL STORM-WATER STONE OUTLET SEDIMENT TRAP
SCALE: NONE



POND PROFILE A
SCALE - HORIZONTAL: 1" = 30'
VERTICAL: 1" = 3'



PROFILE B SPRING AVE. SEDIMENT TRAP / WET POND
SCALE - HORIZONTAL: 1" = 30'
VERTICAL: 1" = 3'



- CONSTRUCTION SPECIFICATIONS**
1. STONE SIZE - USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
 2. LENGTH - NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
 3. THICKNESS - NOT LESS THAN 8" INCHES.
 4. WIDTH - TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
 5. FILTER CLOTH - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
 6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE, IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 6:1 SLOPES WILL BE PERMITTED.
 7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, GROPPED, WASHED OR TRACTED ONTO PUBLIC RIGHTS-OF-WAY.
 8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
 9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

STABILIZED CONSTRUCTION ENTRANCE
SCALE: NONE

RECORD DRAWING
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Consulting Environmental Engineers

100 Trillium Lane
Albany, NY 12203

518-456-0006
518-456-3465 FAX

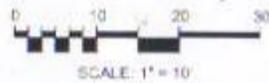
| NO. | DATE | DESCRIPTION | BY | CHKD BY |
|-----|----------|-----------------------------|----|---------|
| 1 | 11/28/12 | SCALE CROSS SECTION CONTOUR | | |
| 2 | 11/28/12 | AS-BUILT INFORMATION ADDED | | |

DATE: MAY 2012
DRAWN BY: H.V.L.
CKD BY: H.V.L.

PLAN & PROFILES
WATER QUALITY IMPROVEMENTS
HAMPTON LAKE, TOWN OF EAST GREENBUSH
RENSELAER COUNTY, N.Y.



- | | | |
|------------------------|------|------------------------------------|
| Sub | 1 • | Elgrass |
| | 2 • | White Lily |
| 200- 201 WETLAND | 3 • | Soft stem bulrush |
| | 4 • | Pickweed |
| | 5 • | Common Three S. |
| | 6 • | Amar bur-vee |
| 201- 202 | 7 • | Sunny milkweed |
| | 8 • | White flower |
| | 9 • | Common Cowslip (Cover com. OAS) |
| | 10 • | Monkey Flower |



**WET POND
VEGETATIVE PLAN**
WATER QUALITY IMPROVEMENTS















Phase Three Project: Installation of Deep Catch Basins and Sediment Traps

A Total of 13 New Catch basins were installed in 2010 and 2012 with deep sumps to aid in collecting or trapping sediments before they can enter the lake.

At each of the storm water discharge points, (outfalls) sediment traps were installed to decrease erosion and further contain debris and solids from reaching the lake.









What Can I Do As a Concerned Citizen?

Stormwater Pollution Solutions

Residential

Recycle or properly dispose of household products that contain chemicals, such as insecticides, pesticides, paint, solvents, and used motor oil and other auto fluids. Don't pour them onto the ground or into storm drains.



Lawn Care

Excess fertilizers and pesticides applied to lawns and gardens wash off and pollute streams. In addition, yard clippings and leaves can wash into storm drains and contribute nutrients and organic matter to streams.

Lawn, Garden and Landscaping

- Don't overwater your lawn. Consider using a soaker hose instead of a sprinkler.
- Use pesticides and fertilizers sparingly. When use is necessary, use these chemicals in the recommended amounts. Use organic mulch or safer pest control methods whenever possible.
- Compost or mulch yard waste. Don't leave it in the street or sweep it into storm drains or streams.
- Cover piles of dirt or mulch being used in landscaping projects.



Car Washing

Washing your car and degreasing auto parts at home can send detergents and other contaminants through the storm sewer system. Dumping automotive fluids into storm drains has the same result as dumping the materials directly into a waterbody.

Use a commercial car wash that treats or recycles its wastewater, or wash your car on your yard so the water infiltrates into the ground.

Repair leaks and dispose of used auto fluids and batteries at designated drop-off or recycling locations.



Pet Waste

Pet waste can be a major source of bacteria and excess nutrients in local waters.

When walking your pet, remember to pick up the waste and dispose of it properly.

Flushing pet waste is the best disposal method. Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain and eventually into local waterbodies.

Education is essential to changing people's behavior. Signs and markers near storm drains warn residents that pollutants entering the drains will be carried untreated into a local waterbody.



Residential Landscaping

Permeable Pavement - Traditional concrete and asphalt don't allow water to soak into the ground. Instead these surfaces rely on storm drains to divert unwanted water. Permeable pavement systems allow rain and snowmelt to soak through, decreasing stormwater runoff.

Rain Barrels - You can collect rainwater from rooftops in mosquito-proof containers. The water can be used later on lawn or garden areas.

Rain Garden - Rain Gardens and Grassy Swales—Specially designed areas planted with native plants can provide natural places for rainwater to collect and soak into the ground. Rain from rooftop areas or paved areas can be diverted into these areas rather than into storm drains.

Vegetated Filter Strips—Filter strips are areas of native grass or plants created along roadways or streams. They trap the pollutants stormwater picks up as it flows across driveways and streets.

The Future

- “ Monitoring and Surveillance
- “ Maintenance and Prevention
- “ Continuing Education
- “ Establish a Lake Association
- “ ?