

**PUTNAM VALLEY
CENTRAL SCHOOL
DISTRICT
PUTNAM VALLEY, NY**

MS4PY4 STORMWATER PROGRAM

**NEWSLETTER # 1
NOVEMBER 2013**

**GREEN STORMWATER
INFRASTRUCTURE PLANNING
PRACTICES**

**FOR MORE INFORMATION CONTACT
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1. Shift to Green Stormwater Practices

Since the initiation of the program, there has been a full-scale shift to green stormwater practices. The traditional stormwater management practices have focused on end-of-pipe systems. These systems traditionally collected stormwater through a network of underground piping and discharged the collected runoff to a nearby drainage ditch or to an offsite municipal stormwater conveyance system.

As reported by USEPA, testing has shown significant amounts of pollutants are being discharged offsite. Therefore USEPA and state agencies, under Pollution Prevention (MCM6) require MS4s to adopt onsite treatment practices (green infrastructure management practices) that not only reduce the quantity of offsite stormwater runoff but also minimize the off-site long-term impacts of stormwater pollutants.

As a separate MS4 permittee, you are responsible for the onsite reduction and treatment of the stormwater volume and pollutants generated in your District.

2. Onsite Retrofit Projects

The practices to be incorporated at each site will vary according to available space, soil infiltration characteristics, slopes, water table and bedrock and proximity to building foundations. Commonly utilized onsite retrofit projects may include:

- Retrofit of existing parking lots
- Retrofit of recreational and athletic fields

3. Onsite Planting of Trees, Shrubs and Vegetation in Infrastructures

The newest sustainable strategy for clean stormwater has been the utilization of trees, shrubs and vegetation to improve onsite water quality. These infrastructure techniques include:

- Planting in Road Median Strips
- Landscaped Islands in Cu-de-Sacs
- Parking Lots/Athletic Fields, Perimeter Swales
- Planting in Parking Lot Islands

4. Potential Benefits of Onsite Planting

There are many potential benefits from the onsite planting of trees, shrubs and vegetation. These benefits vary from site to site, but typically include:

- **Stormwater Volume Reduction:** Studies indicate a large deciduous tree can remove up to 760 gallons of water per tree per year (CUFR, 2001) and up to 100 gallons through evapotranspiration (EPA, 1998)
- **Nutrient Uptakes:** Uptake by poplar trees have shown nutrient uptakes of up to 0.05 pounds of nitrogen per tree per year (Licht, 1990)
- **Pollutant Removals:** Plants have been known to remove metals, pesticides and other organic compounds
- **Phytoremediation:** This is the process of using plants to control the migration of contaminants (EPA 1998) in soil and groundwater. It has been cited that a sugar maple (1 foot in diameter) can retain 60 mg of cadmium, 140 mg of chromium, 820 mg of nickel and 5,200 mg of lead from the environment in one growing season (Coder, 1996)

- **Air Temperatures:** Air temperatures can be 4 to 8 degrees cooler in well-shaded (McPherson, 1998) parking lots than in un-shaded parking lots. Trees can reduce asphalt temperatures by up to 36 degrees (CUFR, 2001) and vehicle cabin temperatures by 47 degrees
- **Environmental Benefits:** Trees prevent water bank inundation, increase esthetic appeal, provide bird and wildlife habitat and increase shading (Shaw and Schmidt, 2003). Trees can also block up to 95% of incoming radiation, reduce wind speeds by 15% to 35% and reduce highway noise by 6 to 10 decibels, at a rate of almost 50% (Akbari and others, 1992)
- **Community Benefits:** Trees provide privacy, esthetic and psychological benefits and increase the overall livability of a community
- **Economic Benefits:** Trees reduce heating and cooling costs by 10% to 20% (Heat Island Group, 1996). Trees properly planted next to buildings can reduce summer air conditioning costs by 40% (Parker, 1983) and energy use in the house by 20% to 25% per year (Heisler, 1986)

5. Design and Planting Guidelines in Infrastructures

Traditional landscaping practices do not address the following green stormwater infrastructure practices:

1. Bio-retention and Bio-infiltration Practices (Rain gardens)
2. Alternating Side Slope Planting (Swales)

3. Tree Check Dams (Swales)
4. Treed Filter Strips (Swales)
5. Linear Stormwater Tree Pit

The ongoing stormwater fact sheets for your District will include conceptual design guidelines and ideas that have been successfully utilized by others to implement stormwater green infrastructures.

6. How Can the District Help?

The District can help by establishing the following Initiatives:

1. Green Infrastructure Steering Committee:

The District should create a steering committee consisting of representatives from:

- District Board
- Parents-Teachers-Association
- School Administrators from Superintendent, Business and Public Relations Offices
- Environmental/Conservation Student Groups
- Teaching Staff

2. Steering Committee Objectives: The objectives of the steering committee should be:

- Keeping students and staff informed of the committees initiatives, through the use of the stormwater website and student newsletters
- Establishing volunteer student groups to actively engage in promoting green infrastructure projects in the District
- Developing cost-effective programs that can be funded by the state or other grant funding agencies

- Identifying priority areas within the District suitable for capital green infrastructure projects
- Developing milestones for implementing these capital projects
- Establishing funding required for the implementation of these capital projects
- Ensuring that the District will keep its financial commitment to implement green infrastructure projects
- Developing staff and resources necessary to deliver the commitments laid out in the District Green Infrastructure Program

3. Community Outreach Program: A Community Outreach Program should be created to develop:

- An awareness in the community of green infrastructure initiatives taken by the District
- Cooperation with nearby MS4s to determine how nearby MS4s are implementing green infrastructure projects in their communities
- Green Infrastructure Citizens Group that meets on a periodic basis to discuss the community outreach program and engage the community in the ongoing implementation of the Green Infrastructure Program
- An exchange of information by conducting community workshops and generating fact sheets and newsletters on the Green Infrastructure Program