2013 MS4 Stormwater Management Newsletter Articles

Construction Site Management:

Erosion and subsequent sedimentation from unstable construction sites remains one of the most prevalent forms of nonpoint source pollution to our streams, lakes and wetlands. Sediment enters our waterways from construction sites in a variety of ways: mud from construction vehicles can be tracked onto roads, bare ground can easily wash into ditches or streams during a storm and steep bare slopes are very susceptible to failure. You may be asking, "So What?". Well, in addition to the water quality problems brought on by excessive sediment, uncontrolled erosion from construction sites reduces the capacity of ditches and stormwater systems. The result is flooding. If you're building a new house this Summer, please keep in mind that if you will be disturbing an acre of ground (43,560 square feet) you'll need to have an Erosion and Sediment Control Plan and a permit from the DEC and your local community. Here's some things to think about for your plan:

- Plan ahead and ask yourself if you really need to remove all of the vegetation from your site at the same time? Can you phase the project to reduce the amount of soil exposed to stormwater? How quickly can you re-establish vegetation once final grade is established?
- Look for opportunities to reduce the impervious areas on your new project. Can you get by with a smaller driveway? Or, can you use materials that are more likely to encourage infiltration rather than runoff?
- Have a stabilized construction entrance that tears the mud off of the construction vehicle tires.
- Protect streams, wetlands, ditches and storm drains from eroding soil.
- Are you prepared to counter dust if dry conditions occur?

If you're not sure how to do one or more of these items, please contact the Soil and Water Conservation District at 736-3334 and/or your local codes officer.

Water Conservation

10 Ways to Conserve Water (from http://www.americanrivers.org/take-action/other-ways/conserve/)

A family of four in the United States uses 400 gallons of water every day. That's a lot of water – enough to take 10 baths! By being smarter about our water use, not only can we save water, energy, and money, we can help our rivers, too. When we use water more efficiently, we leave more water in rivers and streams to support fish and wildlife and recreation.

Here are 10 simple tips for saving water and helping rivers. Got a new tip to share? Let us know!

1. Turn the water off while you brush your teeth and save over two gallons a minute.
2. Fix dripping faucets and running toilets. A leaky faucet that drips at a rate of one drop per second can waste up to 2,700 gallons a year.
3. Save water and money by choosing efficient showerheads, dishwashers, and other appliances. Look for the WaterSense label.
4. Only run your washing machine and dish washer when they are full.
5. Dispose of chemicals properly at a hazardous waste drop off center – don't pour them on the ground, into the sewer, or down the drain.
6. Avoid using pesticides or herbicides on your yard and garden -- the chemicals can contaminate groundwater and streams, and can also hurt kids and pets.
7. In the yard, use mulch to keep moisture from leaving the soil and minimize the need to water.

8. If you must water the lawn, water in the early morning or evening, and try to avoid watering on windy days. This will limit the amount of water that is evaporated by the sun or blown onto sidewalks and driveways.
9. Plant a rain garden to add beauty to your yard, while absorbing and filtering runoff. Water absorbed in a rain garden will filter pollution otherwise headed for streams.
10. Use a rain barrel to collect rain and help water your plants. Forty percent of the average homeowner's water use is outdoors. Rain barrels reduce the stress on municipal water systems during the dry, summer months.

Green Infrastructure Basics

(from US EPA at http://water.epa.gov/infrastructure/greeninfrastructure/gi_what.cfm)

Stormwater runoff is a major cause of water pollution in urban areas. When rain falls in undeveloped areas, the water is absorbed and filtered by soil and plants. When rain falls on our roofs, streets, and parking lots, however, the water cannot soak into the ground. In most urban areas, stormwater is drained through engineered collection systems and discharged into nearby waterbodies. The stormwater carries trash, bacteria, heavy metals, and other pollutants from the urban landscape, degrading the quality of the receiving waters. Higher flows can also cause erosion and flooding in urban streams, damaging habitat, property, and infrastructure.

Green infrastructure uses vegetation, soils, and natural processes to manage water and create healthier urban environments. At the scale of a city or county, green infrastructure refers to the patchwork of natural areas that provides habitat, flood protection, cleaner air, and cleaner water. At the scale of a neighborhood or site, green infrastructure refers to stormwater management systems that mimic nature by soaking up and storing water.

A large range of green infrastructure elements can be woven throughout a watershed, from the smaller scale elements that can be integrated into sites to the larger scale elements that span entire watersheds. Examples of Green Infrastructure projects include Downspout Disconnection, Rainwater harvesting, Rain Gardens, Planter Boxes, Bioswales, Permeable Pavement, Green Alleys, Green Parking, Green Rooftops, Urban Tree Canopy and Land Conservation.

Right here in the Mohawk Valley there are numerous examples of Green Infrastructure at work. There is the rain garden at the St. Luke's Rehabilitation Center, or the planters in the City of Utica. New construction projects are incorporating grass swales designed to infiltrate stormwater runoff from pavement. There's still a lot more to do but it's a start. Ask your local Soil and Water Conservation District about Green Infrastructure today. Call us at 736-3334.

***Hazardous Household Waste Disposal*:** The Herkimer-Oneida County Solid Waste Authority has published an easy-to understand brochure about what to dispose of and how. Please review their brochure at **http://www.ohswa.org/assets/Uploads/PublicationsBrochures/2012/HHW-Brochure.pdf.**

Illicit Discharge Detection and Elimination:

(from http://www.uri.edu/ce/wq/RESOURCES/STORMWATER/PDFS/Sept282007/Business/BusinessStrategy.pdf).
Illicit Discharge Detection and Elimination is a major component of a municipal stormwater management program. Every time someone uses the storm drain or a ditch as a disposal system, they're causing an impact downstream. That's because storm sewers and ditches don't go to wastewater treatment plants. Storm drains are separated in most instances from the sanitary system. That's by design. Our wastewater treatment facilities simply couldn't handle the volume of stormwater that is created in every storm. There are some areas that have Combined Sewers but they also have Combined Sewer Overflows meaning that the treatment plant couldn't

handle the stormwater volume and raw sewage was discharged into a stream or river. However, most stormwater systems are separated from the sanitary systems. Since this water is released unfiltered and untreated into streams, lakes and wetlands, municipalities are required to ensure that the water leaving their systems is as clean as possible. Part of that is knowing all of the sources that are flowing into the system and it's not always just water. Septic systems, used oil, carpet cleaning fluid, wastewater...you name it, someone has disposed of it into the storm system and that waste is now in our waterways. These are called illicit discharges to the storm system. Municipalities are required under the MS4 (Municipal Separate Storm Sewer System) regulations to identify and eliminate those illicit discharges. Here are 12 actions that homes and businesses can take to prevent illicit discharges into the storm sewer system.

Top 12 Actions - Dealing with the dirty dozen

1. **Eliminate connections to storm sewers.** Make sure that wastewater, spills or soapy water can't flow into a storm sewer by any drain or stormwater flow. Check with your city/ town to determine if clean water discharges to a storm sewer are allowed.
2. **Store hazardous materials properly, inside or under cover.**
3. **Make a current spill response plan and clean up kit accessible.**
4. **Train employees on spill response and good housekeeping practices**. Repeat training regularly.
5. **Use "dry" methods for clean up and spills**. Keep a broom, mop and kitty litter or other absorbent materials handy. Do not use water to rinse off a spill.
6. **Use a mop sink for cleaning floor mats and equipment.** Pour wash water in the sink, not outside.
7. **Ensure dumpsters remain covered and leak-proof.** Locate dumpsters away from storm drains.
8. **Wash vehicles at a commercial car wash.** If you must wash vehicles or equipment outdoors, use water only, or wash on grassy areas and divert soapy water from stormdrains.
9. **Keep parking lot and service areas clean.** Provide trash bins and empty them regularly. Divert water from loading docks.
10. **Keep wetlands and shoreline areas clean and in natural condition.** Keep these areas free of trash, yard waste, and debris that can pollute or obstruct water flow. If possible, allow vegetation to grow into a natural buffer instead of mowing to wetland edges.
11. **Water wisely and limit fertilizer use**. Keep water and fertilizer on the grass, not pavement. Consider replacing some lawn area with low-care plantings.
12. Design your site to infiltrate, filter or detain runoff. Divert roof leaders, foundation drains, air conditioning condensate and other clean water to grassy areas, away from pavement and stormdrains.

Recycling

Recycling is an essential stormwater and water quality protection practice. How does recycling tie into Stormwater? Well, stormwater is pretty dirty stuff when you think about it. During a rain event, the water that lands on paved surfaces like roads and parking lots picks up everything in its path. Everything. The plastic bag from the grocery store, the styrofoam cup from your local coffee shop, the plastic water bottle, the paper bag from the fast food place...they're not in your car anymore but that's not the end of their stories. Let's see where they go...The road or the parking lot drain to the ditch that drains to the creek that flows into the lake where you get your drinking water or the ocean that you are swimming or cruising....Hmmm. Apart from the low-life aspect of the litterbug, most of the items that are discarded are recycleable. Plastic bags can be recycled in any of the stores you visit. Many plastic water bottles have a nickel return now just like cans. Even if you can't return the plastic bottle, it can be added to your recycling bin. Check out the Herkimer-Oneida County Solid Waste Authority's One and Done program. Paper bags are recyclable or, at the very least, reusable. What about styrofoam cups? Please stop using them! They never break down and they are filling our oceans with trash. It takes 10 minutes to drink a cup of coffee but the cup lasts forever! Splurge for a re-usable coffee mug and know that you're helping protect and conserve our water resources.

Riparian Corridor Protection **(from: http://www.hrwc.net/riparianbuffers.htm)**

What is a riparian buffer? Riparian buffers are strips of land (up to 300 feet wide) bordering streams, lakes, and other bodies of water. The most functional riparian buffers are vegetated with a variety of native plants, including trees and shrubs.

Why are riparian buffers important? Benefits derived from vegetated riparian buffers, especially forested buffers, include: filtering pollution from runoff; trapping excess soil and taking up nutrients; shading the water, keeping water temperatures cooler; acting like a sponge, soaking up rainwater, reducing flooding down-stream and recharging groundwater; helping prevent erosion and loss of land; providing food and shelter for wildlife; absorbing noise from waterfront activity; and providing privacy and shade for picnicking and fishing.

The following list provides more detail about some of the primary functions riparian buffers provide in the landscape:

- **Trap sediment and take up nutrients.** Sediment that is filtered out of runoff from upland areas often carries contaminants that can be harmful to aquatic life and impair water quality. The soil also contains nutrients, excess concentrations of which can cause water quality and ecological health problems in the receiving waters. Riparian buffers can often break down these pollutants while utilizing the sediment and nutrients to improve soil conditions.
- **Protect and maintain stream banks.** Root mass from woody vegetation present in buffers helps to reduce soil loss from erosion along lake shorelines and stream banks. Vegetation from riparian buffers can also work in concert with stream channel functions to create new stream bank, balancing what erosion does occur within the stream channel.
- **Water storage and energy dissipation.** Riparian buffers can reduce damage to property during flood events by slowing floodwaters. The root mass present in riparian buffers also promotes the absorption of water and helps to recharge nearby aquifers. Riparian buffers play an important role in regulating surface water flows by helping to hold and slowly release water following storm events.
- **Reduce Nonpoint Source Pollution.** As noted in the first bullet, riparian buffers can filter various pathogens, pollutants and nutrients that are found in stormwater runoff. Often times, nutrients can be taken up by vegetation within the riparian area, which can promote additional vegetation in the buffer. This vegetation in turn can be used to process other potential pollutants before they enter the adjacent waterbody.
- **Provide wildlife habitat.** Riparian buffers offer a variety of mechanisms for habitat enhancement of both aquatic organisms and terrestrial wildlife. Areas where riparian buffers are intact can host a multitude of different organisms. When connected to other buffers and habitats, riparian areas can serve as corridors for the movement and distribution of wildlife. The continual cycle of nutrient uptake and recycling of compounds trapped aids in the diversity of vegetation present in the buffer and also helps create a varied age-class structure for vegetation present which in turn affects habitat features and organisms present in the buffer.

What is Low Impact Development?

(from the EPA's website: http://www.nrdc.org/water/pollution/storm/chap12.asp)

LID is simple and effective. Instead of large investments in complex and costly engineering strategies for stormwater management, LID strategies integrate green space, native landscaping, natural hydrologic functions, and various other techniques to generate less runoff from developed land. LID is different from conventional engineering. While most engineering plans pipes water to low spots as quickly as possible, LID uses micro-scale techniques to manage precipitation as close to where it hits the ground as possible. This involves strategic placement of linked lot-level controls that are "customized" to address specific pollutant load and stormwater timing, flow rate, and volume issues. One of the primary goals of LID design is to reduce runoff volume by infiltrating rainfall water to groundwater, evaporating rain water back to the atmosphere after a storm, and finding beneficial uses for water rather than exporting it as a waste product down storm sewers. The result is a

landscape functionally equivalent to predevelopment hydrologic conditions, which means less surface runoff and less pollution damage to lakes, streams, and coastal waters.

LID is economical. It costs less than conventional stormwater management systems to install and maintain, in part, because of fewer pipe and below-ground infrastructure requirements. But the benefits do not stop here. The associated vegetation also offers human "quality of life" opportunities by greening the neighborhood, and thus contributing to livability, value, sense of place, and aesthetics. This myriad of benefits include enhanced property values and re-development potential, greater marketability, improved wildlife habitat, thermal pollution reduction, energy savings, smog reduction, enhanced wetlands protection, and decreased flooding. LID is not one-dimensional; it is a simple approach with multifunctional benefits.
LID is flexible. It offers a wide variety of structural and nonstructural techniques to reduce runoff speed and volume and improve runoff quality. LID works in constrained or freely open lands, in urban infill or retrofit projects, and in new developments. In a combined sewer system, LID can reduce both the number and the volume of sewer overflows. Opportunities to apply LID principles and practices are infinite -- almost any feature of the landscape can be modified to control runoff (e.g., buildings, roads, walkways, yards, open space). When integrated and distributed throughout a development, watershed, or urban drainage area, these practices substantially reduce the impacts of development.

As urbanization continues to degrade our lakes, rivers, and coastal waters LID is increasingly being used to reverse this trend, resulting in cleaner bodies of water, greener urban neighborhoods, and better quality of life. LID offers a strong alternative to the use of centralized stormwater treatment. It aims to work within the developed and developing environment to find opportunities to reduce runoff and prevent pollution. LID controls stormwater runoff at the lot level, using a series of integrated strategies that mimic and rely on natural processes.[5] By working to keep rainwater on site, slowly releasing it, and allowing for natural physical, chemical, and biological process to do their job, LID avoids environmental impacts and expensive treatment systems.

Wetland Conservation **(from: http://water.epa.gov/type/wetlands/)**

Wetlands are part of the foundation of our nation's water resources and are vital to the health of waterways and communities that are downstream. Wetlands feed downstream waters, trap floodwaters, recharge groundwater supplies, remove pollution, and provide fish and wildlife habitat. Wetlands are also economic drivers because of their key role in fishing, hunting, agriculture and recreation.

Water storage. Wetlands function like natural tubs or sponges, storing water and slowly releasing it. This process slows the water’s momentum and erosive potential, reduces flood heights, and allows for ground water recharge, which contributes to base flow to surface water systems during dry periods. Although a small wetland might not store much water, a network of many small wetlands can store an enormous amount of water. The ability of wetlands to store floodwaters reduces the risk of costly property damage and loss of life—benefits that have economic value to us. For example, the U.S. Army Corps of Engineers found that protecting wetlands along the Charles River in Boston, Massachusetts, saved $17 million in potential flood damage.

Water filtration. After being slowed by a wetland, water moves around plants, allowing the suspended sediment to drop out and settle to the wetland floor. Nutrients from fertilizer application, manure, leaking septic tanks, and municipal sewage that are dissolved in the water are often absorbed by plant roots and microorganisms in the soil. Other pollutants stick to soil particles. In many cases, this filtration process removes much of the water’s nutrient and pollutant load by the time it leaves a wetland. Some types of wetlands are so good at this filtration function that environmental managers construct similar artificial wetlands to treat storm water and wastewater.