

SOIL EROSION AND SEDIMENTATION CONTROL



Soil erosion from construction sites is a challenge for Southeast Michigan's growing communities.

Erosion and sedimentation occurs when wind, water, or gravity runoff carries soil particles from an area (e.g., a construction site) and transports them to a water body. As noted in the *Water Quality Management Plan for Southeast Michigan*, excessive erosion and sedimentation leads to various water quality problems that diminish the quality of life in our communities. These include:

- Lost fishing opportunities because of decreasing fish diversity and disturbing the food chain by burying eggs and bottom-dwelling species.
- Interference with light penetration and photosynthesis, reducing water depth, and increasing water temperature, thereby disrupting the water ecosystem.
- Lost recreational opportunities because of pollution from other sources such as phosphorus, bacteria, and heavy metals which attach to soil particles and are deposited in the water bodies with the sediment.
- Disrupting the ecosystem when removing sediment from streams and storm water conveyance systems (this can also be expensive).

Although erosion and sedimentation control programs are required throughout the region, the quality of our water resources is still threatened. Much of the erosion and sedimentation problem is associated with construction site activities. We have a choice. The growth in households and commercial development in the region can result in new pollution or can be an opportunity to implement practices that prevent pollution, making growth and environmental protection compatible.

State law regarding soil erosion and sedimentation control was amended in 2000 in response to this threat. This section details changes to the state law and

provides communities with specific tools to prevent erosion and sedimentation. These include amending the site plan review process and incorporating soil erosion control into an overall storm water management program.

KEEPING IT CONNECTED

Because soil erosion often comes from construction sites, growing communities have a significant challenge. However, economic development can still occur while protecting against soil erosion. Clustering (or open space subdivisions) as a residential development option can considerably reduce clearing and grading of a site, which reduces soil erosion coming from the development.

Planning and Regulatory Considerations

Part 91 of the Natural Resources and Environmental Protection Act (PA 451 of 1994), as amended, establishes a program to control soil erosion from most land-use earth-change activities. Permits are primarily required for construction activity occurring within 500 feet of the state's receiving waters or if the disturbed area is greater than one acre. The applicant applies for the permit directly with the enforcing agency.

The enforcing agency can be either the state, county, city, village, charter township, or general law township in counties with population over 200,000. The statute requires counties to administer the soil erosion program within their jurisdiction. However, the above mentioned municipalities can administer the program by adopting an ordinance that has been approved by the Michigan Department of Environmental Quality (MDEQ). MDEQ is required to review enforcing agencies every five years to ensure that their programs are meeting state requirements.

In some instances, permits are not required. Instead, state, county, or local agencies may undertake earth-change activities without obtaining a permit if they are Authorized Public Agencies (APA) designated by MDEQ. Designation is dependent upon having acceptable operating procedures for controlling erosion and off-site sedimentation.

In addition to the program administered under Part 91 of state law, MDEQ also administers the federal National Pollutant Discharge Elimination System (NPDES)

program, which is part of the Clean Water Act. Under this federally mandated program, permits are required for construction sites greater than one acre in size. The state has adopted a process called ‘permit-by-rule’ for issuing the necessary coverage. First, a permit must be obtained from the local enforcing agency (as required under state law). Once the permit is obtained, the applicant must submit a notice-of-coverage form directly to MDEQ, which provides for compliance with the federal requirement.

Tools to Implement Soil Erosion and Sedimentation Control

Local communities can employ the following to prevent soil erosion and sedimentation:

- incorporate soil erosion protection measures into ordinances.

Incorporate soil erosion protection measures into ordinances

As part of a site plan review process or a local soil erosion ordinance, communities can require developers to submit and comply with a plan that contains measures to reduce soil erosion and control sediments that do erode. In addition, the regulations may include specific requirements for clearing and grading a site.

Following is specific guidance that should be included in soil erosion ordinance or site plan review requirements:

- **Minimize needless clearing and grading.** Clearing and grading should only be performed in those areas actually needed to build structures and provide access. Restrictions on any clearing and grading should be put on the following areas: stream buffers, forest conservation areas, wetlands, highly erodible soils, steep slopes, storm water infiltration areas, and other environmental features. These areas should be delineated on site plans and must be clearly visible in the field through signage, staking, flagging, or most preferably, fences (i.e., silt fence, temporary safety/snow fence).
- **Incorporate buffers into local plans and ordinances.** Stream buffers are an important tool in reducing pollutants and soil erosion from entering our lakes and streams. (See chapter on stream corridor protection for more information on implementing this technique).
- **Protect waterways and stabilize drainage ways.** The site plan should contain information on location of existing and future streams and drainage ways. The regulations should ensure that no clearing occurs adjacent to the waterway. As a secondary form of protection, a line of silt fence should be installed along the perimeter of the waterway buffer.

- **Include drainage patterns on site plan.** Drainage ways are not only the major route that eroded sediments take to reach streams and waterways, they are also prone to severe erosion due to the velocity of the runoff channeled into them. Including the drainage patterns on the site plan helps assure that erosion practices are incorporated at the proper locations on the site.
- **Phase construction to limit soil exposure.** Mass grading of larger construction sites should be avoided because it maximizes both the time and area that disturbed soils are exposed to rainfall and, therefore subject to soil erosion. Communities should coordinate with developers to ensure new phases are not initiated until the previous phase is stabilized.
- **Immediately stabilize exposed soils.** Regulations should clearly define time limits to establish grass and/or mulch on exposed soils. They should also include the acceptable types of materials and a method to permanently stabilize disturbed soils with vegetation at the conclusion of each phase of construction.
- **Avoid disturbing steep slopes.** Steep slopes are the most highly erodible surface of a construction site and require special attention. Wherever possible, clearing and grading of existing steep slopes should be avoided. If clearing cannot be avoided, techniques (e.g., diverting upland flow around slope) should be used to prevent upland runoff from flowing down a slope. (Temporary seeding or mulch, by themselves, are not as effective in preventing erosion on the exposed soils of a slope.)
- **Install perimeter controls to filter sediments.** Perimeter controls should be established at the edge of a construction site to retain or filter concentrated runoff from relatively short distances before it leaves the site. One of the most common options is a silt fence. Silt fences are moderately effective in filtering sediment, but only when properly installed, located, and maintained. Chronic problems have been reported in installing and maintaining silt fences. If your community is the enforcing agency for soil erosion, local soil erosion inspectors should monitor silt fences closely. If the community is not the enforcing agency, other local inspectors (e.g., building inspectors) should be trained to quickly review the adequacy of a site’s soil erosion practices. Any problems should be reported to the county enforcing agency.
- **Employ advanced sediment settling controls.** Even when pollution prevention practices are employed, construction sites are prone to discharge high concentrations of suspended sediments during large storms. Therefore, a community’s erosion regulations or storm water management program should include a trap or basin to capture sediments and allow them time to settle out. In addition, the requirements should include a detailed inspection and clean-out schedule for the basin, along with procedures for converting the basin

into a permanent storm water management facility.

- **Link necessary development approvals to compliance with soil erosion protections.** Numerous opportunities exist for local communities to link compliance with soil erosion regulations with further development of the site. One option for local communities is requiring soil erosion regulations are met before granting the building permit. In addition, upon completion of construction, local communities can assure that all erosion control permit requirements have been satisfied before issuing the local occupancy permit.
- **Protect storm water management features from soil erosion.** Make certain that storm water management features, such as infiltration devices, are well protected from eroded soil during construction. Excessive sedimentation could cause the stormwater practices to clog and fail to perform as designed.

Source: Center for Watershed Protection, *Water Quality Management Plan for Southeast Michigan*.

CASE EXAMPLE

Soil Erosion and Sedimentation Control Program

Community: Washtenaw County

Contact: Bev Barton, (734) 222-3863

Washtenaw County is implementing an innovative soil erosion and sedimentation control program.

Additional Resources

Center for Watershed Protection. "The Architecture of Urban Stream Buffers." *Watershed Protection Techniques*. Volume 1 (Summer, 1995): 155-163.

Center for Watershed Protection. "Clearing and Grading Regulations Exposed." (Technical note) #40 *Watershed Protection Techniques*. 1(3):141-142.

Center for Watershed Protection. "Construction Practices: The Good, the Bad and the Ugly." (Feature article) *Watershed Protection Techniques*. 1(3):95-99.

Center for Watershed Protection. "Impact of Suspended and Deposited Sediment." (Technical note) # 86 *Watershed Protection Techniques*. 2(3):443-444.

Center for Watershed Protection. "Keeping Soil in Its Place." (Technical note) #81 *Watershed Protection Techniques*. 2(3):418-423.

Center for Watershed Protection. "Muddy Water In-Muddy Water Out?" (Feature article) *Watershed Protection Techniques*. 2(3):393-403.

Center for Watershed Protection. "Strengthening Silt Fence." (Feature article) *Watershed Protection Techniques*. 2(3):424-428.

Michigan Department of Environmental Quality Soil Erosion and Sedimentation Control. www.michigan.gov/deq/0,1607,7-135-3311_4113---,00.html

Key elements of the program include:

- **Certificate of occupancy transfer.** Allows the builder to transfer their permit to the new homeowner, saving the new homeowner the money in securing their own permit. This releases the builder from responsibility for their part of the permit when occupancy occurs, resulting in a permit holder who actually owns the property.
- **Partnership with the homebuilders association.** Washtenaw County works with the Homebuilders Association by asking for their input on program changes that affect their members, clearly outlining the requirements and regulations, and providing consistent enforcement. This has led to an increase in compliance.
- **Partnership with communities.** The county provides staff at various locations around the county in order to know the community and customer in that community better. This has also led to an increase in compliance.
- **Filing and billing systems.** The county keeps detailed files that are color-coded by major or minor projects and filed under the next inspection date and township for easy retrieval. This has led to an increase in inspections, more contact with the applicant, and an increase in compliance. The billing has allowed a choice for the customer in terms of a permit fee. For example, the less land disturbed or more stabilized, the less the fee.