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# The dirt on EPA erosion control regulations

**Implemented in 2003, NPDES Phase II has direct effect on golf courses.**

The maintenance practices and management of golf courses are continuously scrutinized, within and outside the golf industry. The use of pesticides and herbicides, the volume of water used for irrigation, and new course construction have all been under the microscope of environmental organizations, golf industry groups and regulators.

Soil erosion has come to the forefront of environmental concerns. The government has enacted more stringent regulations on soil and sediment erosion and stormwater runoff, affecting course construction and renovation. In March 2003, under the EPA's Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) Storm Water Phase II regulations went into effect. NPDES Phase II regulations affect construction activity that disturbs one to

five acres of land (Phase I concerned construction activity of five or more acres), including on golf courses.

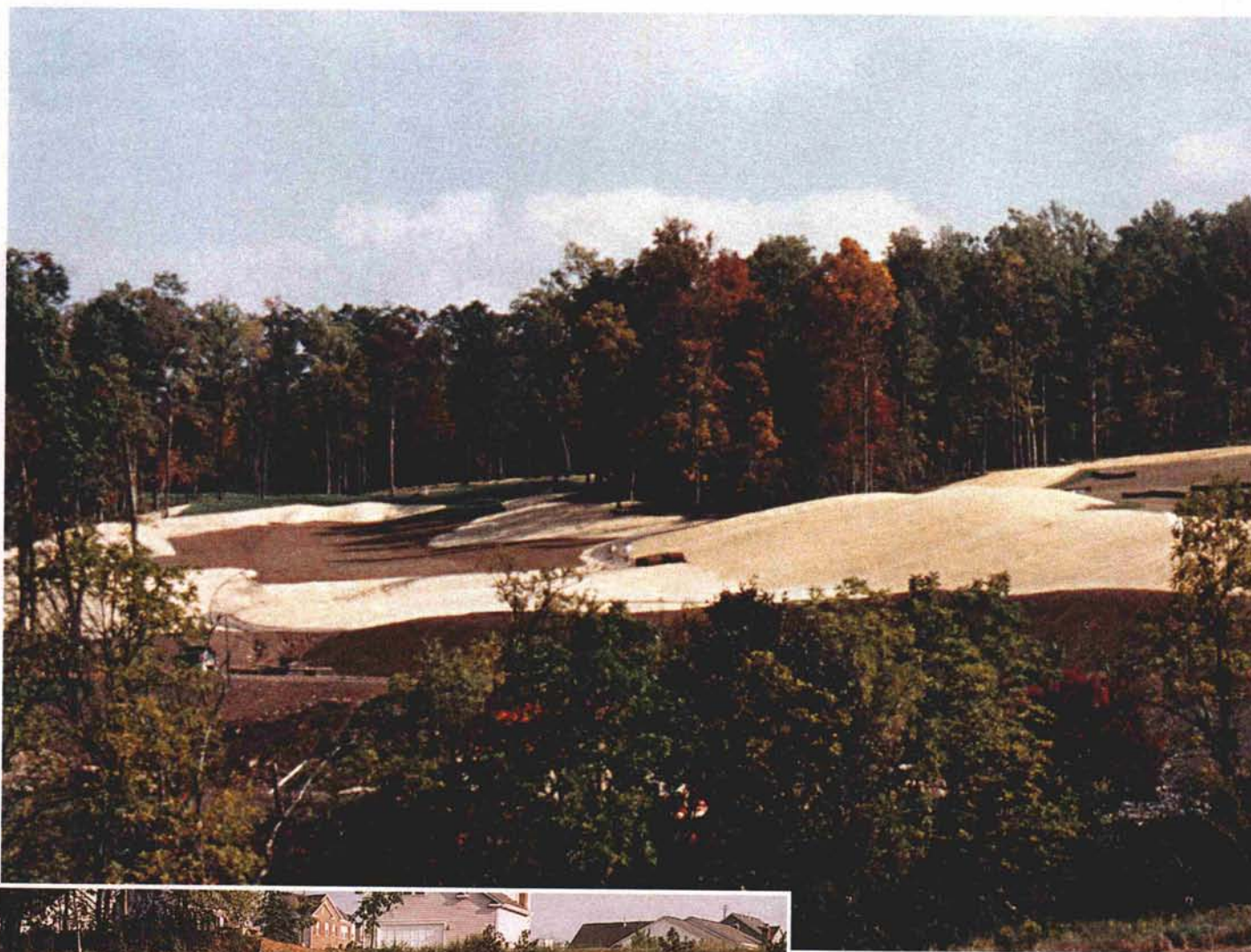
Superintendents, owners and management, therefore, have a responsibility for ensuring that these regulations are met. With all the daily responsibilities and challenges of golf course management, soil erosion and sediment control can be easily overlooked but they shouldn't be.

## **Protecting the soil**

New golf course development or renovation to an existing course increases the likelihood of soil erosion. As a result, sediment is carried away by stormwater or wind into waterways, causing pollution and posing health concerns.

NPDES Phase II regulations highlight the need to explore erosion control solutions for every type of construction

By Marc S. Theisen



Workers install flexible revegetation blankets, which are designed to prevent under-blanket washouts and seed migration.

NPDES Phase II regulations affect construction activity that disturbs up to five acres of land. Here, flexible revegetation blankets stabilize the slopes in construction of a new golf course.

project on the golf course. In addition to areas between one and five acres, NPDES Phase II regulations can apply to projects that cover less than one acre, including those near an impaired water body. Moreover, golf courses may lie in flood plains, so water contamination is a potential health hazard on many courses that undergo construction or renovation.

Despite the regulations imposed in 2003, the erosion control industry has not seen a boom in increased activity and business with the golf industry. This doesn't mean construction is down; while the development of courses is stagnant, renovation projects have increased.

Instead, this may indicate some slowness within the golf industry to recognize the importance of adhering to NPDES Phase II regulations. Educating the industry on the



regulations and the ramifications for not complying with them are key.

Failing to comply with regulations can result in severe penalties for the construction site operator, as well as the golf course and its managers.

#### **EPA enforcement**

The EPA has designated \$250 million for implementation and enforcement of the NPDES portion of the Clean Water Act to control polluted runoff. The three types of enforcement are administrative orders, civil actions and criminal prosecutions.

Under administrative orders, the EPA can impose fines and penalties without court action. Fines can range from \$11,000 to \$27,500 a day.

Civil suits also carry a maximum penalty of up to \$27,500 per day. The EPA can bring

a civil suit without an administrative order.

Criminal suits can be, and have been, brought against landowners. An example of a violation includes failure to maintain proper records or best management practices (BMPs).

In addition, private citizens and NPDES delegated states can initiate civil actions against alleged violators.

#### **Being compliant**

These enforcements speak to the importance of complying with NPDES Phase II regulations. So where do you begin in achieving compliance?

Planning for construction projects should include researching local legislation, ordinances and regulations, keeping in mind that these could differ from the federal regulations of NPDES Phase II.

In order to obtain a construction permit, NPDES Phase II requires the preparation of a Storm Water Pollution Prevention Plan that includes a detailed explanation of how pollution prevention BMPs will be implemented on the proposed project. A notice of intent must be submitted to the local administrative agency a minimum of two days prior to breaking ground, and include certification that any activity will not impact endangered or threatened species or critical habitat.

Some areas of the country require that a certified professional in erosion and sediment control be present on-site to inspect and monitor the project. Again, it's imperative that you check on local legislation to find out this information and to learn about other laws that apply to your area.

Before disturbing the site, it's important to have proper sediment control devices in place, such as silt fences and wood fiber filtration tubes. These are wise short-term solutions that can effectively keep sediment from migrating into waterways.

The best erosion control solution, however, is vegetation. Vegetation is a simple, effective and low-cost form of erosion control — one that makes sense for golf courses. Not only does vegetation provide permanent cover for the soil and reduce the detachment and transportation of soil particles, it also improves infiltration of water into the soil and reduces the amount of runoff.

#### **Modern solutions**

Numerous products and new technologies can be used for seed establishment and ero-

sion control on the golf course. Several variables should be considered when choosing the most appropriate product, including cost, type of application, site condition and level of effectiveness. Some products available include:

*Flexible revegetation blankets (FRBs).* FRBs have high slope erosion control effectiveness ratings and weigh 50 percent less than conventional blankets, resulting in faster installation. FRBs form a bond with the soil surface to create a continuous, porous, absorbent and erosion-resistant blanket that allows for rapid germination and accelerated plant growth. At the same time, they prevent under-blanket washouts and seed migration. Futerra FRBs were used for erosion control and seed germination during construction of FarmLinks in Sylacauga, Ala., a course designed to serve as a research and demonstration facility for golf course designers, superintendents, nursery managers and other turf professionals. The blankets used at FarmLinks meet the NPDES Phase II regulations and were manufactured by Profile Products LLC. They are bio/photodegradable, contain no growth-inhibiting additives and are free of noxious weed seed and any other contaminants. Covering between 20 and 25 acres, the blankets promoted seed germination on seeded sloped areas and on fairways on top of bermudagrass sprigs where washing was a problem.

*Flexible growth media (FGMs).* Hydraulically applied, FGMs are the strongest, loftiest hydraulically-applied matrices available for erosion control and rapid vegetation establishment. FGMs require no curing period and promote accelerated growth and establishment. Upon application, an FGM forms like a blanket to create a micro-environment for seed growth that helps effectively prevent erosion under rainy and windy conditions, and on steep slopes, for up to one year. Profile's Flexterra, an FGM, was used at Eagle's Nest Golf Course in Maple, Ontario, Canada, which opened this year. As a result of using the FGM, Eagle's Nest course management was pleased with the quick seed germination and the lack of soil loss from erosion.

"We had some really severe thunderstorms last year where heavy runoff in untreated areas even blew out some asphalt pavement in some locations, but the erosion control matrix performed well by preventing erosion," says Brent Rogers, director of golf

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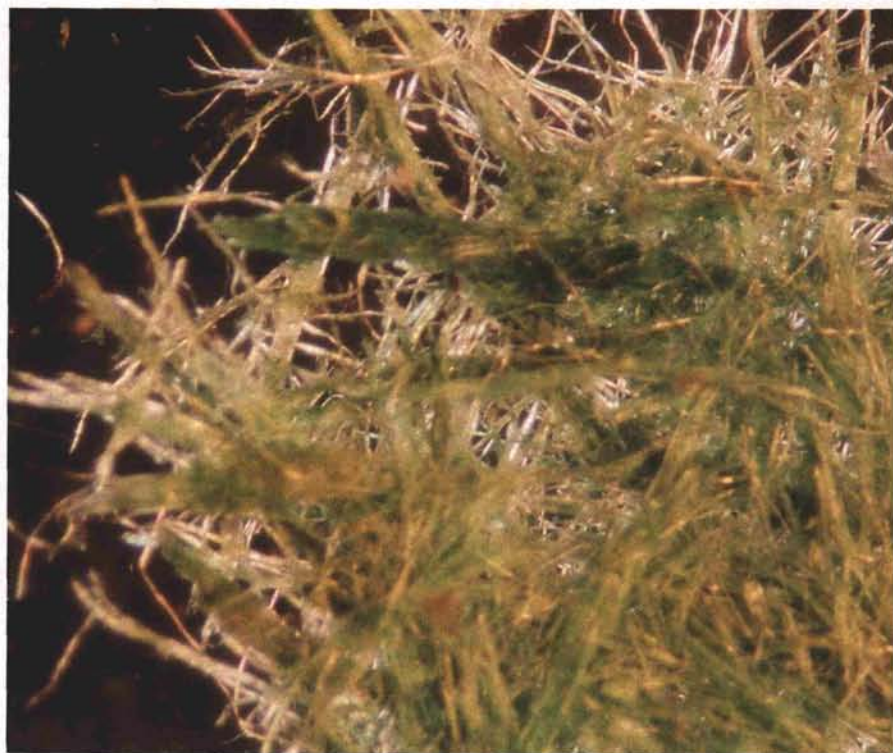
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FGMs are formed like a blanket to create a micro-environment for seed growth that helps prevent erosion on steep slopes.

course development and a six-year GCSAA member. "In addition, it produced exceptionally quick (four to six days) germination and maintained good growth because of its ability to hold reserve moisture."

**Bonded fiber matrices (BFMs).** Introduced in the 1990s to control erosion, BFMs have been used on steep slopes, proving highly effective for up to six months. BFMs are a cost-effective alternative to erosion control blankets and, unlike blankets, they may be applied over rough and uneven seedbeds. However, BFMs require certain site conditions due to a chemical binder that anchors the matrix to the soil surface and the fibers to one another. The BFM cure time is critical as it facilitates maximum performance and successful installations. The BFM cure rate is affected by weather and antecedent soil moisture conditions.

**Hydraulic mulches.** There are a wide variety of hydraulic mulches, including wood fiber, cellulose fiber and wood-cellulose blend mulches. The wood fiber mulches are generally the most effective, but the effectiveness of a particular product depends on several variables, such as application type and site conditions. These mulches are capable of controlling erosion under a wide range of conditions, all with an easy and time-efficient hydraulic application.

**Hydraulic mulch additives.** Additives with chemical and physical ingredients enhance

the performance of hydraulic mulches, allowing them to be better tailored to specific site conditions. A tackifier, for example, can be added to mulch mix to help ensure bonding to the soil and to enhance seed stabilization and germination.

The golf maintenance industry has risen to the challenge of addressing concerns over excessive water and fertilizer use, and working around native landscape in the development of new courses. By meeting NPDES Phase II regulations and implementing a soil erosion control program during construction or renovation, the industry can once again put another feather in its cap as an environmental steward. For more information on NPDES Phase II regulations, visit the International Erosion Control Association's Web site at [www.ieca.org](http://www.ieca.org) or call the organization at (970) 879-3010.

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