Compliance Quandary

Storm water controls for industrial redevelopment projects

By Jennifer Allen Newton

Increasingly stringent storm water standards are being set in states and cities around the country as they strive to meet the requirements of the Clean Water Act. Any city in the U.S. that discharges a significant amount of storm water runoff and pollutants into surface water bodies is required to hold Municipal Separate Storm Sewer System (MS4) permits. These permits govern the amount of storm water discharged into local waterways, and therefore govern every industrial site that sits within the city limits and—in some cases—the surrounding metropolitan area as well.

Multiple Storm Water Standards

The MS4 permits require the utilization of post-construction storm water treatment best management practices (BMPs) for any new or redeveloped project that impacts more than 500 sq ft. Engineers and contractors working on these projects generally must choose a prequalified storm water treatment BMP for this application, and most cities publish an approved list of treatment options, which might include low impact development (LID) options such as direct infiltration and bioswales, or canister media filtration systems. This level of treatment may be adequate for commercial storm water applications, but industrial sites often generate more concentrated and complex mixtures of storm water pollutants that include heavy metals, suspended solids, hydrocarbons and toxic organics that would overwhelm—or even kill—a bioswale system, according to Calvin Noling, P.E., a principal of StormwateRx LLC, a Portland, Ore.-based provider of industrial storm water treatment systems.

"If you operate an industrial facility and plan to repave more than 500 sq ft of land area, be aware that you may be subject to multiple storm water standards," Noling said. "Most medium and large municipalities require implementation of post-construction storm water pollution reduction treatment controls for urban development or redevelopment projects. If the project happens to be at one of 10 broad categories of industrial facilities, the engineer or facility staff should use care to choose a solution that is robust enough to address the state industrial storm water permit requirements, which will generally exceed the city's storm water standards."

In order to comply with the U.S. Environmental Protection Agency's National Pollutant Discharge Elimination System (NPDES) regulations, all states are required to enforce industrial storm water permits that restrict the levels of pollutants in storm water runoff from 10 broad categories of heavy and light industrial sites. These requirements generally are more restrictive than MS4 permits. According to Noling, LID storm water controls have their place in treating runoff from parking lots and low-traffic roadways, but more effective and efficient treatment is appropriate for areas with truck or forklift traffic, where manufacturing materials or finished products are stored, and in production or maintenance areas. Furthermore, runoff from industrial rooftops also may require treatment before discharge to remove pollutants such as zinc.

A retrofit storm water treatment system installed for an industrial redevelopment project protects the river in the distance and meets city and state permitting requirements.

"Unfortunately, many industrial companies do not realize they must comply with both city and state permits," said Noling, who has more than 20 years of experience developing water purification and storm water treatment systems for industrial applications.

A typical scenario would be an industrial company within city limits seeking permits to make site improvements at one of its facilities, such as paving a gravel area. The paved area exceeds the 500-sq-ft limit and triggers the need for post-construction storm water controls as a requirement of the city's MS4 permit.

A recycling and garbage collection company installed a belowground oil/grit/storm water separator (foreground) and an enhanced storm water filtration system for a repaving project, which met both city and state storm water permit requirements.

"Thinking they are meeting their requirements, the company simply follows the city's permit and installs a city-approved storm water treatment system that meets MS4 standards—only to find out later that this system is not robust enough to meet the state's more restrictive standards for a wider range of pollutants," Noling said. "This is a costly mistake that usually involves installation of a second, more protective system or a complete rip-and-replace of their storm water treatment system."

It is an easy mistake to make—MS4 post-construction performance standards can seem high for certain pollutants. A typical post-construction storm water pollution control BMP standard for suspended solids reduction is 70% from 90% of the annual average runoff. All industrial facilities, however, must also comply with federal or state concentration-based benchmarks, and the performance necessary to meet the industrial permit benchmarks is usually higher and would require 90% to 95% total suspended solids reduction, for example, to meet the metals

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benchmarks in the state permits. This would require a storm water treatment BMP that provides higher efficiency and higher removal efficiency than standard post-construction storm water pollution control BMPs. Some industry sectors would require even greater pollutant reduction. In addition, many cities restrict or discourage the infiltration of storm water in industrial areas, fearing legacy soil pollution could contaminate the groundwater.

Robust Treatment

Fortunately, it is an easy mistake to avoid. Noling advised that all industrial companies and their redevelopment engineers should do their research to ensure they understand the storm water permit requirements for their area. Usually the simplest and most cost-effective way to meet storm water benchmarks is to choose storm water pollution reduction treatment that is robust enough to meet the strictest state permit benchmarks. "This usually guarantees that it will also meet or exceed requirements for the city's storm water permit," Noling said. **iWWD**

A national food processor building a new terminal facility installed a storm water filtration system to comply with requirements for two separate storm water permits: the city of Portland's MS4 permit and Oregon's Industrial Stormwater General Permit.

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