What You Don't Know CAN HURT YOU

The ins & outs of site inspection in a new era

By Nathan Hardebeck

As NPDES permits strive to improve storm water runoff, site inspections and monitoring put an increasing demand on businesses and municipalities to evaluate and report their program performance. One of the primary goals of the permits is to gather additional data through site monitoring. The permits now are requiring sites to be monitored for additional pollutants, often to lower levels than historically have been measured. This increases the demand on the inspectors, laboratories and storm water managers to accurately determine pollutant types and sources so that appropriate, effective BMPs can be implemented. Inspections no longer involve just walking around the site looking for obvious infractions, but rather trying to identify where the parts-per-billion levels of certain contaminants could be coming from.

Inspections are a required element of any storm water permit. Storm water field monitoring is the baseline from which all storm water program decisions are made. Each permit type might have slightly different emphasis points that are being monitored, yet they share common points of evaluation. As permit benchmarks are being driven to ever lower levels, more attention must be paid to how sites are being inspected and how samples are being collected. Field staff and laboratories must employ clean techniques and sample analysis equipment to accurately interpret the water quality of the discharge. In many cases, sampling equipment used by laboratories measures only to the parts-per-million level and then estimates to the parts-per-billion level required by many permits. If samples are sent to laboratories that are using analytical instruments that do not have quantitation limits that can accurately and consistently measure the pollutant parameter, the entire storm water program could be built on a foundation of false information. Without accurate sample data, it is difficult to make the most cost-effective decisions on BMPs. Worse yet, if the sampler and laboratory do not adhere to clean practices in the sampling process, contaminants not related to the sampled discharge might create a trigger of corrective actions due to benchmark exceedance. Antiquated methodologies and laboratory equipment that measured storm

Left: Clean sampling procedures are crucial to any storm water program, as demonstrated by Robert Brunnette of Eurofins. Right: The use of tablets and inspection software is becoming more prevalent in the industry.

water pollutant levels 10 years ago often are not sophisticated enough to measure to the levels of today's benchmark standards.

It is crucial for sampling locations to accurately represent the drainage in question. Oftentimes commingled sources of runoff are represented in the discharge, and corrective actions may be applied inaccurately and may not truly represent the discharge in question. Old infrastructure, run-on (runoff that flows from another property onto a site), groundwater intrusions, and discharges to larger water bodies or impoundments create a challenge in determining a sample point that best represents the surface water runoff of many locations.

Construction Inspections

Pollutants from construction activity are identified either as "smoke signal" particles being thrown in the air due to dust, or "chocolate milk" running off the property visibly. Undesired inspections on poorly managed construction activity can easily happen in a drive-by fashion and are easy targets for enforcement or litigious action. Understanding how to prevent this type of situation requires a better understanding of BMPs and more diligent onsite inspections. Inspectors on construction sites should not only walk around the perimeter of the project, but also evaluate where risk from erosion or pollutants could occur from operations inside the project area of disturbance. Evaluating where run-on could affect the project and where downstream sensitivities may play a part also are good ideas.

Most permits now use electronic submissions for reporting to governing agencies. Likewise, many inspection reports now are done on an electronic platform. Inspectors are using tablets and other smart devices to document site performance. These devices have features such as photos, video and GPS data that can be directly imported into reports. No matter whether inspections are done electronically or on paper, rain will be the proof of whether the site is properly prepared for erosion and sediment control. All BMPs are tools, but not everyone knows how to use them appropriately. Inspecting BMPs before a rain event should be the No. 1 priority, as trying to control highly turbid runoff from discharging off the site is much more challenging.

Industrial Inspections

For some industries, the source of pollutants can be readily determined, but for others it might not be directly related to the industrial practice, such as the buildings or fencing on a site. Without a clear understanding of the source of the pollutants, control measures and BMPs are minimally effective for reaching benchmark standards.

Industrial storm water monitoring often focuses on contaminants such as total suspended solids and metals. Many BMPs are capable of reducing these contaminants in industrial discharge, yet they do not all work the same. Selecting

the most effective BMPs for a site often requires determining the nature of the contaminant—dissolved or solid, large or small particles, etc.—by first determining the sources of the contaminant and understanding the true nature of the pollutant. Then BMPs can be selected that will specifically reduce and remove the pollutant of concern rather than guessing with a "fix-all" solution at the end of the pipe.

Municipal Inspections

More is being asked of municipalities regarding performance of their storm water programs, in addition to inspections of permitted sites within their jurisdictions. Public works directors and city engineers are under pressure to increase field staff training and knowledge and still have the ability to maintain their budgets, especially when it comes to low-impact development (LID).

As more rain gardens, bioswales and permeable surfaces are installed, municipalities are faced with the ongoing maintenance of these features to sustain their performance. Municipal inspectors investigating the performance of bioswales or rain gardens are not just looking for erosion or trash and debris buildup within the feature, but they also have to determine whether the features are infiltrating as designed, and if the plants are healthy, or if invasive species are taking up residence within the feature. When inspectors look at erosion and sediment control on construction sites, they also have to evaluate whether the infiltration pond and permeable driveways are being adequately protected and will function appropriately in a post-construction environment. It is a new day for municipal crews with respect to storm water inspections on both public and private facilities.

Conclusion

The bottom line is this: As permits require lower benchmarks, more sophisticated inspections and monitoring are going to be necessary in order for management to make the most effective and efficient decisions. Inspectors need to continue their education and expand their experience. Storm water monitoring and inspections have changed dramatically from 10 years ago when we were looking for dirty water and rainbow sheen. Now we are evaluating BMP performance and plant health in LID structures, and sampling storm water contaminants in parts per billion. The success and compliance of our storm water programs are directly related to how well we understand and can communicate inspections from the field to make good BMP decisions. SWS

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