

Preparing for chemical spill containment in the 21st century

By Shachar Parran

The number of industrial chemical spills in North America is continuing unabated. According to the US National Response Center and Environment Canada, there are more than 40,000 reported spill events annually in North America. In Canada alone, 175,000 tons of chemicals were released into the water system in 2007 (as reported by the National Pollutant Release Inventory).

Despite industry having a best practice for managing these incidents, accidents will happen and managers must undertake due diligence to evaluate every possible contingency.

Whether spill containment planning requires redundant systems or external systems, response time is basic to minimizing the risk and its long-term effects. Many facilities entrust their spill containment procedures to off-site,



Figure 1. Photo of St. Marys Cement used in the containment control software. Each number correlates to a drain controlled by the system.

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third-party contractors, but that involves a time gap between a reported incident and the arrival of the off-site contractor. On-site, manually deployed solutions are most commonly used, but often do not have enough capacity and are not effective.

There are several reasons why companies should invest in spill containment technology:

- Fines have increased dramatically in the last five years. Ontario is one of numerous North American jurisdictions that have adopted aggressive measures. In 2005, the Ontario government amended its *Environmental Protection Act* of 1990, to include Bill 133 — the “you spill you pay” law — under which owner-operators and directors have legal liability in the event of chemical release and fines are up to millions of dollars.
- The cost of clean-up includes the cost of the contractor, chemical removal and facility downtime. Once the chemicals leave a facility and enter the envi-

ronment, the operator loses all control. The cost can reach hundreds of thousands of dollars.

- The regulator expects companies to have a solid plan and the ability to execute it. Failure to meet compliance or be merely reactive to dynamic situations can be very costly to the bottom line, affect shareholders and damage a company’s public image for a long time.
- Insurance costs are very high and will skyrocket for a site where a chemical spill has occurred.
- In today’s business environment, the bad press that follows a nasty spill often causes irreparable damage.
- Executives and directors are held personally liable for chemical spills. Directors have to ask themselves if they can defend their practices in court. Is having a pile of absorbents and rubber mats in the warehouses a defensible practice?

Two methods of containment

Currently, two methods are used to

contain chemical spills: manually deployed solutions and permanent immobile solutions, such as dikes, oil water separators and containment tanks. The most common solution is the “magic” spill kits, but these kits actually carry no magic. They take a long time to deploy, can only treat small quantities, and expose employees to hazardous chemicals. What would you use for a 10,000-litre spill?

Permanent immobile systems may offer a better solution, but they require a large investment in infrastructure. Moreover, although each type of system may provide adequate environmental protection in some circumstances, all have glaring weaknesses that limit their effectiveness.

For example, dikes are a good way to contain chemical spills around drains, but there is a need to leave an opening to allow rainwater to drain. Therefore, when a spill occurs, the opening has to be blocked with emergency mobile solutions. Other shortcomings of dikes are the space required and the high cost and time to complete the project.

If one could design the perfect chemical spill containment system, what features would it have?

- It would need to be able to contain the spill on-site within seconds of detection. As long as the release is contained within the facility, a release to the environment and its potential liability will be reduced or eliminated. Consider the difference between cleaning up 10,000 litres of oil from a parking lot versus remediation of a river or lake.

- Automation is crucial for large facilities. Automation will also decrease the amount of employee exposure to chemicals during spill containment.

- The containment system must be able to prevent any amount of chemicals from going down the drains and into the water system.

- Investment in infrastructure must be kept to a minimum. Most facilities will want to avoid digging and building on-site.

- Management capabilities — the perfect spill containment system would have C3 capabilities (command, control and communication). It should include

containment control over the entire site and a communication system (E-mail/text messages/phone), to enable the operator to contain and control the spill without leaving the operations room.

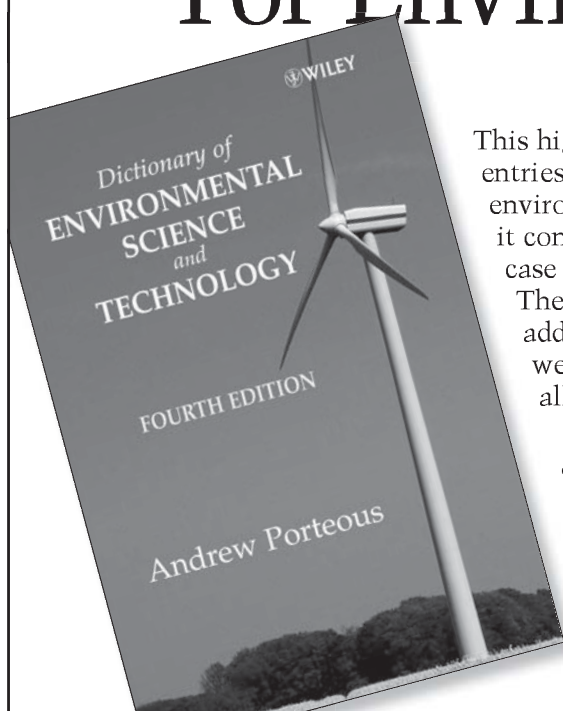
An example of a company that has successfully addressed these issues is St. Marys Cement, in St. Marys, Ontario. Following a thorough analysis of its chemical spill practices, it recently installed a state-of-the-art spill containment system.

An analysis led St. Marys to identify potential points of failure in its facility. The system it has installed enables drains to be plugged around the facility by pressing the numbers on the software map (Figure 1).

Chemical spills have not changed, but our society, awareness and rules have changed. We can no longer hide behind the “we didn’t know” excuse. The technology is available to deal with spills. All we have to do is to step out of the box and adopt new ideas!

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