West Virginia Chemical Spill Could Lead to Changes Nationwide

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Tuesday, February 25, 2014 at 01:46 PM

The January 2014 chemical spill in Charleston, W. Va., that left 300,000 people without water for days could prompt significant new oversight of above ground storage tanks and more in-depth threat assessments for water infrastructure at both a state and federal level. Proponents of tighter safety standards will likely see the accident as an impetus to kick-start a larger regulatory conversation concerning chemicals and their storage facilities across the country.

More than 300,000 people in the Charleston, W. Va., metro area woke up on the morning of Jan. 10, 2014 to discover they had no safe water to consume. No water for drinking, cooking, bathing or commercial use was available until Jan. 13, and then for only a small segment of the population. The cause of this problem was the release of 7,500 gallons of a chemical used in processing coal, known by its acronym MCHM, into the Elk River, which is upstream from the municipal water intake system. The company responsible for the leak, Freedom Industries, notified state and federal authorities several days later, on Jan. 21, that the spill was actually 10,000 gallons and also included another chemical mixture of substances called PPH and DiPPH that had gone unreported.

Although both the state Department of Environmental Protection and the Centers for Disease Control and Prevention have confirmed water sampling and testing for the area meets approved human consumption standards, the resulting impact of the spill could ripple nationwide. William Cooper, a program director at the National Science Foundation, called the spill “one of the largest human-made environmental disasters in this century.” The impact could lead to substantial new changes in the inspection and regulation of chemical facilities sites, which in some cases may be escaping both federal and state oversight for source water protection.

Alphabet Soup—Why Were the Chemicals Used?  
Before the fateful events in January 2014, few could readily state the entire chemical name for crude MCHM (4-methylcyclohexanemethanol), PPH (propylene glycol phenyl ether) and DiPPH (dipropylene glycol phenyl ether), much less describe their industrial applications. The vast majority of the spill that leaked from a 1-inch hole in the storage tank was crude MCHM. The chemical is an organic solvent used to wash coal and separate burnable fuel from rocks and dirt.

Freedom Industries, which filed for bankruptcy after the Charleston spill, was one of many chemical companies that uses substances like MCHM in a froth flotation that attracts coal particles in slurry
that can then be sold as fuel. The site of the spill sits on a former gasoline and diesel fuel terminal where more than a dozen tanks built in the 1940s and 1950s are located. According to the Chemical Safety Board, the federal inspection agency, the containment wall surrounding the damaged tank had several visible cracks that let pooling liquid flow into the Elk River.¹

Exposure to MCHM can cause nausea and can be an irritant to the eyes and respiratory system, but scant toxicological information provides few other details and long-term exposure data. Those exposed to MCHM describe the presence of a licorice odor when they came into contact with contaminated water. According to the CDC, screening levels of MCHM at 1 part per million or below in water do not have adverse health effects on humans.² Witnesses at a recent congressional field hearing, however, were reluctant to say levels were safe in large part due to an absence of specific toxicological information and perceived different expectations of what “safe” means to different populations.³

Although MCHM is not explosive or flammable, the U.S. Occupational Safety and Health Administration considers it to be a hazardous substance. It is one of thousands of chemicals used in industrial processes where significant public health information is not readily available, which creates concerns among advocacy organizations and public health groups.

The Immediate Aftermath

Once the chemicals entered the water utility’s distribution system, the real public health complexities began. Gov. Earl Ray Tomblin issued a “Do Not Use” alert and declared a state of emergency in nine affected counties as a result of the spill. Once the contaminant infiltrated the distribution system, there was no way to get it out other than with large flushing operations, said Jeff McIntyre, president of West Virginia American Water at a February 2014 congressional field hearing. The utility already was experiencing serious service problems with pipe ruptures due to extremely cold temperatures, and the water treatment system was running at full capacity. In testimony before the U.S. House Transportation and Infrastructure Committee, McIntyre said completely shutting down the water system after the chemical leak was discovered would require at least a month—under optimal conditions—to replenish and re-pressurize its 1,700-mile pipeline network, meaning there would be no water at all, even for fire protection or basic sanitation, for 300,000 people.⁶

President Barack Obama on Jan. 10 declared the Elk River spill a disaster area for the nine counties affected, triggering federal assistance from the Federal Emergency Management Agency and assistance from National Guard units from surrounding states.² Downstream water systems and municipalities along the Ohio River, including Ashland, Ky., and Cincinnati, shut their water intake gates out of an abundance of caution to prevent the plume from entering their distribution systems.

Gaps in Oversight?

Since the Environmental Protection Agency considers the substances stored by Freedom Industries in its tanks non-hazardous, the structures were not regulated under the federal Spill Prevention Control and Counter Measure Program. Under those regulations, covered facilities—usually such things as petroleum storage facilities, refineries, pipelines and drilling sites—that could potentially discharge oil and hazardous substances into navigable waterways or shorelines are required to develop spill response plans that are certified by licensed professional engineers and subject to review by EPA. Should a release occur, an operator must notify the National Response Center immediately after he or she has knowledge of the discharge.⁴ MCHM also is not regulated under the Chemical Facility Anti-Terrorism Standards by the U.S. Department of Homeland Security, which issues standards for toxic,
flammable or explosive chemicals or materials that could pose a risk to life and public health.

The Elk River site has been subject to a patchwork of federal and state laws. As the spill investigation unfolded, media accounts characterized the oversight as haphazard, with little information sharing between Freedom Industries, state officials and the local water utility.

The West Virginia Department of Environmental Protection inspected the site in 1991, 2010 and 2012 to investigate incidental reports of odors coming from the storage tank and the usual inspections required to obtain air quality permits, which the facility received. Those inspections and permit processes did not, however, involve tank inspections where the leak occurred into the Elk River.

The tank that leaked had been used for more than 60 years for bulk oil storage, when the Pennzoil-Quaker State Corp. owned the facility. A Jan. 16, 2014, article by The Wall Street Journal featured outside engineering companies suggesting outdated construction and maintenance failures of the tank likely were contributing factors to the spill. The tank was riveted together, a technique used in the 1930s and 1940s, instead of applying advanced welding. Today, x-ray testing is used after construction to examine seals and the leaky tank also did not utilize layered bottoms, lined seals and leak detection equipment commonly found at modern sites. The interviewed experts went on to suggest that although using rivets is no longer in use for modern tank construction there is no known amount of older tanks still in service.

In addition, Rafael Moure-Eraso, chair of the U.S. Chemical Safety Board, testified at a Feb. 10, 2014, congressional field hearing that a certified corrosion engineer inspected the tank owned by Freedom Industries in 2013. The review found the tanks had “been maintained to some structural adequacy but not necessarily in full compliance with API-653 (current industry standard) or EPA standards.” Moure-Eraso went on to say, “The CSB (Chemical Safety Board) has determined that the secondary containment wall—which was composed of cinder blocks and surrounded tank 396 (where the chemical spill occurred)—provided very little protection from a possible release. Company documents further show that the (containment) wall was not lined and that tank 396 rested directly on porous material, including gravel and soil.”

Under state law, Freedom Industries was supposed to have submitted a groundwater protection plan to the West Virginia Department of Environmental Protection. Existing state regulations also require structures to have the capability of containing a spill for up to 72 hours. These regulations require at least quarterly inspections of facilities. The state had no record of a plan being filed. Further, the requirement by the federal Emergency Planning and Community Right-to-Know Act for facilities that store hazardous substances to supply that data annually to state agencies and local emergency response personnel does not apply to water utilities.

While the state had been collecting storage data on MCHM at the Freedom tank site, West Virginia American Water was unfamiliar with the chemical when it was responding to the spill. The local utility had last done a threat assessment under the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, but that review was based on terrorism threats, not potential environmental contamination. Overall, 12,000 utilities rely on surface water that also has industrial facilities and plants located on them. Despite this large number, a 2012 EPA report found only 40 percent of local water authorities had implemented a protection plan.
Scrutiny also is mounting on the potential gaps in notification requirements that companies must follow during a spill under West Virginia state law. Officials with the state Department of Environmental Protection believe the spill began at approximately 8:15 a.m. Jan. 9, but Freedom Industries did not officially report the release until 12:05 p.m., even though state officials were on the scene some 45 minutes earlier. Existing state law requires industrial facilities to report an emergency within 15 minutes to the Mine and Industrial Accident Emergency Operations Center; however, that requirement only applies to chemicals listed as extremely hazardous. Since MCHM has not been classified as hazardous, the company may likely have been exempt from the reporting requirement.

State Legislative Response
Two proposals introduced in the West Virginia Legislature address the Elk River spill. Gov. Earl Ray Tomblin, state Senate President Jeff Kessler and House of Delegates Speaker Tim Miley unveiled a proposal called the West Virginia Source Water Protection Act, which would create a new regulatory program for above-ground storage tanks. The bill (SB 417/HB 4258) would assess fees on storage tank facilities and public water systems as part of new statewide registration process. It would require all operators to report details on their construction and would require written annual reports outlining any changes to the tanks. State Environmental Protection Secretary Randy Huffman testified, "The AST (above ground storage tank) universe is not nearly as well known. Many of these facilities are regulated by registering under a general (federal) NPDES stormwater permit, because the only environmental impact these tanks were thought to have was stormwater runoff; they were not supposed to discharge, leak or otherwise emit pollutants into the environment. ASTs can also be found at facilities covered by individual NPDES permits, but that permit does not require integrity testing or leak detection monitoring, either." Companies must submit spill response plans that will be reviewed by the state, and before a facility owner can register an above ground storage tank for service, it must also prove that it can cover the costs of responding to a release in the environment through a surety bond. The proposal would create new ‘zones of critical concern’ near public water supplies that would also require water systems to submit source water protection plans to the state for review.

The governor’s proposal was merged with existing legislation (SB 373), which unanimously passed the state Senate on Jan. 28, 2014. Substantive changes were made to the original text introduced by Senate Majority Leader John Unger, despite the two bills largely mirroring each other. Those changes included amendments clarifying that tanks currently covered under federal Water Pollution Control Act and Clean Water Act would be excluded from additional regulation, as well as establishing July 1, 2015, as the deadline for public water systems to submit source water protection plans to state agencies. The bill also would grant the state Department of Environmental Protection the authority to write emergency rules to define penalty amounts for facilities with leaking tanks. The bill was awaiting action by the House of Delegates in mid-February, but the prospects appear very likely that a similar, if not identical action, would be considered.

Federal Legislative Response
Concern over potential gaps in enforcement and oversight led U.S. Sens. Joe Manchin and Jay Rockefeller, both of West Virginia, and Barbara Boxer of California to introduce the Chemical Safety and Drinking Water Protection Act in January 2014. The bill would require chemical facilities to give state regulators and water utilities more information on stored substances. The bill amends the Safe Drinking Water Act to add a new section with additional requirements for chemical facilities to protect surface water. According to a press release from Manchin, the bill includes four principles:

- Requiring regular state inspections of aboveground chemical storage facilities;
• Requiring industry to develop state-approved emergency response plans that meet at least minimum guidelines (as established in the bill);
• Allowing states to recoup costs incurred from responding to emergencies; and
• Ensuring managers of drinking water systems have the tools and information necessary to respond to emergencies.  

Covered facilities inside a source water assessment area would be required to conduct inspections at least every three years and at least every five years for any other site. These assessment areas are tailored to specific drinking water supplies that provide basic and topographical information on raw water supplies as well as outlines potential contamination threats. States also would face substantial new requirements to set up regulatory programs that would establish construction and design standards for chemical facilities, leak detection capability, overflow structures, and emergency response and training. Covered chemical storage facilities would be required to provide notice to EPA, state environmental and public health agencies and public water systems of the potential toxicity of stored chemicals, the standards in place to prevent the release of chemicals, and leak detection and mitigation precautions. Lastly, the bill establishes new financial liability standards for chemical facilities to allow the EPA and states to recover costs associated with spill remediation and new authority for public water systems to bring civil relief by petitioning the EPA to address any activity or facility that may present an imminent and substantial endangerment to the public’s health.

The Elk River spill has spurred separate action by members of Congress and advocacy organizations to push for what they believe are needed reforms to the Toxic Substances Control Act by expanding greater regulatory oversight of the chemicals used in commerce. U.S. Rep. Henry Waxman, ranking member of the House Energy and Commerce Committee, and Subcommittee Ranking Member Rep. Paul Tonko sent a letter days after the spill requesting new hearings as an impetus for restarting consideration of a reauthorization bill in the House of Representatives. The EPA maintains an inventory list of more than 84,000 chemicals used in industrial, manufacturing and consumer products. Chemical manufacturers and importers must notify the EPA prior to manufacturing or importing a new chemical not included on the EPA inventory. The EPA then has up to 90 days to determine whether the chemical may present an unreasonable risk of injury to health or the environment based on the information submitted. The agency also has authority to require notification 90 days prior to a significant new use of a chemical on the inventory list, however, the agency must produce a Significant New Use Rule naming the chemical and defining the uses for which notice is required. The EPA must decide from that notification whether the new use may present an unreasonable risk to the public.

Both the advocacy community and industry groups generally agree that the 37-year old law needs to be updated and reauthorized. There is, however, significant disagreement on the most appropriate way to do so. Critics of the current law—like the organization Safer Chemicals, Healthy Families, a coalition advocating an update of toxic chemicals laws—point out the EPA has required few chemicals on the inventory list to be tested for their impacts on human health and the environment. They and other groups are concerned with an existing presumption that chemical ingredients used in products are safe and that the agency has restricted only five chemicals. Further, they argue that manufacturers are allowed to keep ingredients out of the public eye and nearly 20 percent of the more than 80,000 chemicals used in consumer and manufacturing processes are deemed secret.

In essence, many nongovernmental organizations want the U.S. to adopt the general regulatory model used in Europe, where the manufacturers and importers of particular chemical substances
must overcome a presumption that substances are not safe by developing detailed technical information for each substance to fulfill registration obligations. Industry groups note the costs of these time-consuming studies are expensive and often redundant. For example, the Toy Industry Association estimates it spends $3 billion annually proving its products meet consumer safety standards in both the U.S. and the European Union.25

Many groups, however, recognize aspects of the current law need updating. According to the American Chemistry Council, reform efforts “must derive from core principles including: make sure chemicals are safe for intended use; make sure safety decisions are cost-effective and expeditious; prioritize chemicals to determine which substances warrant additional review and assessment; utilize all reliable information; and make safety information public while protecting intellectual property.”26

In May 2013, U.S. Sens. David Vitter and the late Frank Lautenberg introduced a bipartisan compromise bill called the Chemical Safety Improvement Act, which garnered support from an industry coalition called ReformTSCA.com. The group says the bill eventually will require all chemicals used in commerce to be systematically evaluated by the EPA using a risk-based framework for high-priority chemicals first. The EPA will be required to track which chemicals are actually being used in active commerce and in its determination it will review safety assessments, information submitted by a state, and economic cost and benefit information. The EPA will conclude if a chemical meets the current safety standards in place, whether it needs additional controls to meet the standard, or whether it cannot meet the safety standard even with additional controls.27

One key provision of the compromise bill has drawn scrutiny from opponents because it would revise pre-emption limits in existing law for state and municipal chemical regulations. Advocates argue this would reduce a state’s authority to safely regulate chemicals in consumer products, while industry groups contend this provision is necessary to provide a coherent regulatory framework when the EPA makes safety determinations.

**Conclusion**

Although the investigation into the Elk River spill is ongoing, state and federal action to help resolve some of the potential gaps in oversight have moved forward quickly. That may serve as a precursor of things to come nationwide. Policymakers should expect more activity in their state houses to re-examine existing inspection and information sharing requirements to ensure vulnerable infrastructure is being protected from future chemical spills.

References:


4 Centers for Disease Control and Prevention. “2014 West Virginia Chemical Release” [8].


6 Testimony of Jeffrey McIntyre, West Virginia American Water [9], before the Committee on Transportation and Infrastructure Field Hearing
11 Testimony of Chairperson Rafael Moure-Eraso [9], U.S. Chemical Safety Board, before the Committee on Transportation and Infrastructure Field Hearing in Charleston, WV. February 10, 2014.
12 Ibid [9].
24 “What is TSCA?” [23] Safer Chemicals, Healthy Families.
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27 “Summary of the Chemical Safety Improvement Act of 2013” [26].” ReformTSCA.com.

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