

L.U.S.T.LINE



A Report On Federal & State Programs To Control Leaking Underground Storage Tanks

The Missouri Fund's \$1.3 Million Sting

by Carol Eighmey

The receptionist greeted the consultant, showed him to the conference room at the state tank fund office, and offered him coffee, which he politely declined.

Expecting to be joined by other technical experts, he perused his file in preparation for the scheduled discussion about a gnarly cleanup that had been vexing them all.

Meanwhile, behind closed doors, an FBI agent dialed her cell phone to give the "go ahead" to counterparts in another state, who immediately executed a search warrant at the consultant's home office. Simultaneously, an investigator for the county prosecuting attorney—recently retired from a career with the U.S. Treasury Department—contacted multiple financial institutions and instructed them to freeze the consultant's bank accounts according to court orders he had provided them earlier in the day.

Then the FBI agent and former Treasury agent walked into the conference room and closed the door.

Two Months Earlier...

A staff member had been reviewing a cost estimate for site characterization they'd received from a consultant who was well known to both the regulatory agency and the tank fund staff. He had a good reputation—he knew what the two state agencies required, wrote good reports, and was willing to waive any charges his clients incurred that were not reimbursed by the state tank fund.

On that spring day, however, the fund staff member was troubled by the unduly high drilling costs in the proposal, and—rather than call the consultant—he contacted the driller, with whom he had become acquainted while "in the field" observing other projects. As soon as the staff member brought up the subject of "unduly high drilling costs," the driller exploded into a diatribe about how the Missouri fund wouldn't pay as much as his home state's tank fund and he was already starving on the rates Missouri was reimbursing...

It quickly became obvious to the staff member that the two were talking (and shouting) about different cost figures.



Inside

- 3** The Consultant Who Played Foul
- 4** What's Up with Lead Scavengers
- 7** Will the West Virginia Chemical Spill Help Wake Us Up?
- 15** Forecasting Petroleum Cleanup Program Trends
- 17** NEIWPCC Expands Training
- 18** Repurposing Penalties to Improve UST Operations
- 20** Choices: The Good, the Difficult
- 21** Field Notes
- 21** USEPA Sets Cleaner Fuel Standards
- 22** 2013: The 20th Anniversary of NWGLDE

■ continued on page 2

■ Missouri Fund Sting *from page 1*

The staff member immediately notified his supervisor, who took over the conversation with the driller. What the two soon realized came as a shock to both of them.

The consultant—who, in the words of the driller, had been “a good friend for 20 years”—had clearly been lying to the driller about how much the Missouri tank fund would pay for drilling. They realized that, for years, he had been reimbursing “his friend” at a ridiculously low rate. He then provided his client and the fund with a fake invoice for the drilling work. The fraudulent invoice format was nearly identical to the driller’s real invoice but for substantially higher amounts of money.

Mutually horrified at their discovery, the driller and tank fund supervisor began exchanging documents from multiple files. What emerged was a picture of significant fraud—initially estimated at \$500,000.

That same day, the supervisor notified the tank fund’s executive

director, who contacted legal counsel, who contacted the governor’s office. A meeting with the governor’s staff ensued, followed by a meeting with the Attorney General’s Office, which, due to the circumstances of the case, promptly referred the matter to the local prosecuting attorney’s office.

Fortuitously, the retired Treasury Department agent with many years’ experience investigating “white collar crime” worked in that office. He immediately engaged investigators from the Highway Patrol, FBI, and IRS. A mere 16 days after the fraud was discovered, a plan was finalized for handling the matter as a joint state/federal case.

The Plot Thickens

In preparation for the “sting operation,” state fund staff spent countless hours scouring files, copying documents, and creating a spreadsheet to document the crime. They provided copies of checks, enabling the county investigator to locate the consultant’s bank accounts in preparation for freezing his assets. The Highway Patrol and FBI interviewed the driller and fund staff and took possession of the numerous documents they had assembled.

In less than two months, law enforcement officials were ready to confront the consultant. The fund staff set up “the meeting” at their office, then sat quietly at their desks while an unpleasant conversation took place down the hall.

The search warrant netted 30 boxes of records and two computers. The FBI agent, an accountant with excellent skills for this case, not only reconstructed the fraudulent billings for drilling, but discovered other aspects of the fraud, including charges for two trips to collect groundwater samples when the purging and sampling had, in fact, been done all on one day, lab discounts “whited out” on invoices, and charges for operation and maintenance of a remedial system for several months after a pump failed.

Ultimately, the fraud perpetrated on the state tank fund tallied \$1.3 million, including interest and costs to gather evidence for prosecution. The case was handled by the United States Attorney’s Office and involved negotiations with the consultant and his attorney over several months. All the

while, the county maintained control of sufficient funds in the consultant’s bank accounts to cover the fraud.

In the end, a plea agreement was negotiated and the consultant made full restitution to the state tank fund. On June 3, 2014, the consultant was sentenced to 30 months in federal prison, followed by a year of probation, and a \$50,000 fine.

Learning from Life’s Problems and Failures

One learns far more from life’s problems and failures than life’s successes. To wit:

- Most people are honest; a few are not.
- Crooks are good at conning people.
- Hindsight is always 20/20. (A newly instituted practice of verifying a randomly selected subset of subcontractor invoices might have prevented this fraud or detected it sooner.)
- Size matters. Don’t waste \$1,000 in time on \$100 in questionable charges, but...
- When it’s big, move fast and engage the best experts available.
- Document everything.
- Keep your attorney and management fully informed.

We thought we had procedures in place to prevent a fraud of this magnitude. Missouri’s tank fund has long required all costs to be pre-approved. Staff spends about half their time onsite, observing and documenting activities so they can more knowledgeably review invoices. Supporting documents are required for reimbursement, including such items as subcontractors’ invoices, waste manifests, chain of custody forms. Licensed professionals must attest in writing to the validity of their bills.

We were doing a lot of things right. Yet in spite of these protections, this consultant found a vulnerability and exploited it. Beware: It can happen to anyone. ■

Carol Eighmey is Executive Director of Missouri’s Petroleum Storage Tank Insurance Fund. She can be reached at pstif@sprintmail.com.



L.U.S.T.Line

Ellen Frye, *Editor*
Ricki Pappo, *Layout*

Marcel Moreau, *Technical Adviser*

Ronald Poltak, *NEIWPCC Executive Director*

Jaclyn Harrison, *NEIWPCC Project Officer*

Erin Knighton, *USEPA Project Officer*

LUSTLine is a product of the New England Interstate Water Pollution Control Commission (NEIWPCC). It is produced through cooperative agreements (US-8355901 and US-83556001) between NEIWPCC and the U.S. Environmental Protection Agency.

LUSTLine is issued as a communication service for the Subtitle I RCRA Hazardous & Solid Waste Amendments rule promulgation process.

LUSTLine is produced to promote information exchange on UST/LUST issues. The opinions and information stated herein are those of the authors and do not necessarily reflect the opinions of NEIWPCC.

This publication may be copied.
Please give credit to NEIWPCC.

NEIWPCC was established by an Act of Congress in 1947 and remains the oldest agency in the Northeast United States concerned with coordination of the multimedia environmental activities of the states of Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont.

NEIWPCC

Wannalancit Mills

620 Suffolk Street, Suite 410

Lowell, MA 01854

Telephone: (978) 323-7929

Fax: (978) 323-7919

lustline@neiwpcc.org



LUSTLine is printed on recycled paper.

The Consultant Who Played Foul with the California UST Cleanup Fund

by Kim Sellards

Imagine lying in a hammock, sipping a cool drink under a shade tree while overlooking a long stretch of a sunny Costa Rican beach and being paid for this lark by the State of California.

This is not a get-rich-quick scam story, it is the tale of a 54-year-old Southern California environmental consultant, Kurt Kane Hayden, who pled guilty in Santa Barbara Superior Court in 2013 to one felony count of filing a false claim in the form of submitting fraudulent invoices to the State Water Resources Control Board's Underground Storage Tank (UST) Cleanup Fund.

Hayden Environmental, Inc. (HEI) is a Santa Barbara, California-based environmental consulting firm that has been in business since 1992. The company has performed investigations and cleanups at 20 petroleum-contaminated UST sites, including eight sites in and around Santa Barbara. The consultant and his wife, Julie, are alleged to have received money from the state's UST Cleanup Fund for performing work during a time when they were known to be in Costa Rica.

The state's complaint alleged that the couple inflated invoices for other work, resulting in the Cleanup Fund overpaying up to 200 percent on some charges for equipment and payroll. The state alleged that at least 207 invoices at 20 sites were false or misleading, and that HEI knowingly submitted the false invoices.

Specifically, the complaint alleged that the Haydens billed for: hours not worked; equipment not used; markup on invoices from Julie Hayden's subcontracting company, Clean Earth Equipment Corporation; and visiting multiple sites in a day and then billing full, daily-rate vehicle charges for each of those sites.

On May 10, 2012, as part of the criminal complaint, Kurt Hayden was arrested at the couple's multi-million-dollar residence in Santa Barbara, and Julie Hayden was arrested during a traffic stop nearby. Both



were held in the county jail until a bail hearing on May 14, 2012, when they were released on their own recognizance and wearing ankle monitors.

As part of an ensuing plea agreement, Kurt Hayden will repay the state's Cleanup Fund \$1.6 million and serve 180 days in the county jail. He will serve three years of probation, during which time he will surrender his contractor's and professional geologist licenses. Charges were dismissed against Julie Hayden.

Nuts and Bolts

California set up its storage tank cleanup trust fund in 1989 to help owners and operators of petroleum USTs pay for cleaning up leaks. Tank owners pay the fund a storage fee of up to two cents per gallon for petroleum stored. The trust fund uses the money to reimburse owners or operators with leaking tanks up to \$1.5 million to clean up the spill.

The Hayden case unfolded in 2010 after the state investigated a complaint. After a thorough examination, the state now suspects that the defendants overbilled the Cleanup Fund from 2009 to early 2013 for work at the 20 sites.

The state said in its complaint: "Defendant Hayden Environmental Inc. has obtained almost \$12 million in payments from the Barry Keene Underground Storage Tank Cleanup Trust Fund, which is administered by the State Water Resources Control Board. A portion of the money received by defendants was based on false and misleading invoices, to which defendants were not entitled."

The complaint goes on: "Defendants, as participants in the industry of providing environmental cleanup services, were aware of the laws, regulations, and guidelines published by the fund. They knew that the money they received from claimants came from the fund. They knew that the claimants must verify under penalty of perjury that the amount of money for which they seek repayment is true and correct. They knew that the board would rely on the representation they made in the invoices they submitted to claimants to make disbursements from the fund."

Ferreting Out Financial Fraud

The Hayden case was prosecuted by the State Attorney General's Office on behalf of the People of the State of California. The three-year

■ continued on page 6

Wander LUST

a walkabout with Jeff Kuhn.....

We welcome Jeff Kuhn with the Montana Department of Environmental Quality (MDEQ) and a venerable veteran of petroleum remediation at the state and national levels as the new author of Wander LUST. He will be taking us on “walkabouts” across the fascinating world of underground storage tanks. He offered to continue this column, written for many years by the late Pat Ellis of the Delaware DNREC. The opinions expressed in this column are his and not necessarily those of MDEQ. Jeff welcomes your comments and suggestions and can be reached at jkuhn@mt.gov.



What Is “Wanderlust”?

My good friend, Pat Ellis, had a unique style in writing this column that reflected her intelligence and intense ability to absorb myriad details. That she could gather facts and spin them into a coherent story is an understatement of the highest order. I only hope that I can rise as high in my own way. Since German is my second language it's fitting that I define “Wanderlust” for you. It literally means “a strong desire to rove or travel about.” It's the German version of the Australian “walkabout”...less spiritual in its orientation. So let's “walk about” in this column. As one who frequently leads hikes in Montana in the summer, it's my pleasure to walk with you.

Jeff Kuhn

Reopening Pandora's Box

What's Up with the Lead Scavengers EDB and 1, 2-DCA?

A number of years ago, in the midst of the debate over methyl-tertiary butyl ether (MtBE) I presented a series of talks at various conferences entitled “Opening Pandora's Box.” I later reworked the presentations as a short paper that was further developed by Matt Small (USEPA) and Mike Martinson (Antea Group USA). My basic premise was that the use of MtBE in gasoline was akin to “Opening Pandora's Box” by imposing the use of a compound of unknown toxicity on the citizens of the United States, not to mention the environment. It was a grand experiment to see if air toxics from automotive emissions could be reduced and thereby improve air quality in USEPA-designated non-attainment areas. Unfortunately, the potential health effects of MtBE and other ether compounds in gas-

oline from Underground Storage Tank (UST) releases were largely unknown. The final paper (Small, Martinson, Kuhn 2002 ACS) was later published in the ASC Symposium Series 799 in *Oxygenates in Gasoline*, edited by Arthur Diaz and Donna Drogos.

Today the fate and transport characteristics of MtBE in groundwater are well known. However, the health effects of MtBE are still largely unknown as the USEPA IRIS evaluations of MtBE and another compound, Tertiary-butyl alcohol (TBA), languishes, await final analyses. What this means for the future evaluation of other compounds in refined petroleum is uncertain. And it is quite possible that other compounds in the backlog of compounds awaiting evaluation by IRIS will be found to be much more toxic than MtBE or TBA.

On a positive note, OUST has been working on assembling toxicity data for a suite of fuel constituents and will soon distribute this information to the states. (For more information, contact Hal White at White.Hal@epa.gov.)

However, as MtBE was placed under the magnifying glass of scrutiny following the widespread detection of MtBE in drinking water wells in the United States, concerns over other petroleum compounds were brought to light, and the knowledge of regulators, environmental consultants, and the general public grew. As a result, most states established specific groundwater cleanup standards and actively sought more innovative technologies capable of remediating MtBE and other oxygenates. They also began to consider aquifer vulnerability through the

use of GIS tools, a practice further refined in the release of the recent USEPA “Footprint” tool. Despite these changes, as well as the phase-out of MtBE in the U.S. and the heightened awareness of gasoline additives, discussion continues on two primary gasoline additives: the lead scavengers EDB (1,2-dibromoethane or ethylene dibromide) and 1,2-DCA (1,2 dichloroethane).

The Memory Lingers On

Both EDB & 1,2-DCA were used as octane enhancers in gasoline from the 1920s through the mid-1980s in most states, being replaced by MtBE as the primary octane enhancer. The use of leaded compounds was greatly reduced by 1986 and completely banned from most gasoline sold in the U.S. by 1996. In 2004, Reid Miner (South Carolina DHEC) presented data that raised the issue of lead scavengers as a major risk driver at LUST sites.

Around this time USEPA Region 4 contacted OUST urging action on lead scavengers. While the response wasn’t immediate, OUST and ORD collaborated with ASTSWMO to work with states to collect additional samples. For more information see OUST’s Lead Scavengers web pages at <http://www.epa.gov/oust/cat/leadscav.htm>.

Also during this time, Dr. Ronald Falta from Clemson University, South Carolina, published detailed research on the presence of leaded compounds in groundwater (“The Potential for Ground Water Contamination by the Gasoline Lead Scavengers Ethylene Dibromide and 1,2-Dichloroethane,” *Groundwater Monitoring & Remediation*, Volume 24, Issue 3, pages 76–87, August 2004).

From 2004 to 2008 an ASTSWMO LUST Task Force workgroup investigated the lead scavenger issue and concluded that these compounds were still an issue at LUST sites nationwide, with a greater prevalence in southeastern states. This work prompted a letter from ASTSWMO to the USEPA Office of Underground Storage Tanks (OUST) in 2009.

In May 2010, OUST Director Carolyn Hoskinson responded by issuing a memo encouraging states to begin (or continue) to monitor and report lead scavenger compounds

in groundwater at older LUST sites using appropriate analytical methods, and seek to aggressively remediate these compounds to prevent impacts to drinking water sources. The memo further suggests that states share information on the presence and remediation of these constituents.

The greater concern is for states that may not be testing for lead scavengers at older release sites where leaded fuels were used.

2008 USEPA ORD Study

Another very positive result of the ASTSWMO workgroup effort was a specific research focus on the issue by the USEPA Office of Research and Development (ORD). In 2008 a detailed paper on the presence of lead scavengers in groundwater was published by USEPA. The publication can be downloaded from USEPA’s website *Natural Attenuation of the Lead Scavengers 1,2-Dibromoethane (EDB) and 1,2-Dichloroethane (1,2-DCA) at Motor Fuel Release Sites and Implications for Risk Management*.

In this study, groundwater samples were collected from 102 old gasoline release sites spread across the 19 states that chose to participate in the investigation. The findings of the study are significant: “Both EDB and 1,2-DCA were present at concentrations above their respective Maximum Concentration Level (MCL) at a significant number of sites; EDB was detected above its MCL of 0.05 µg/L at 42% of the sites sampled, and 1,2-DCA was detected above its MCL of 5.0 µg/L at 15% of the sites sampled. Benzene (with an MCL of 5.0 µg/L) was present at 100% of the sites sampled and was the primary risk driver at 75% of the sites where both benzene and EDB were present in groundwater; EDB was the primary risk driver in the remaining 25% of sites.”

The study goes on to define a “vulnerability index,” comparing the quantity of EDB sold in each state (1951–1965) to the population (2000 census data) obtaining drinking water from shallow groundwater wells. The mid-Atlantic, New England, and Great Lake states rank high among the states potentially vulner-

able to EDB drinking water impacts. If 25 percent of all “old releases” nationally, as defined by this study, contain EDB at concentrations that represent a risk driver, state LUST programs have significant work remaining.

2013 ASTSWMO Survey on Lead Scavengers

A recent survey led by Richard Spiese (Vermont DEC) of the ASTSWMO LUST Task Force, adds another chapter to the discussion on lead scavengers. Despite the conclusions of the 2008 USEPA ORD report the ASTSWMO survey indicates that only a small number of states consistently test for these compounds in groundwater. The survey sought to determine the status of state testing and detection of lead scavengers. Preliminary results of the survey were presented at the September 18, 2013 meeting of the *Technical Forum on Fuel in Groundwater (TFFG)* held in conjunction with the 24th National Tanks Conference and Expo in Denver, Colorado.

The preliminary survey results demonstrate wide variation in state responses on the lead scavenger issue. But the basic conclusions are worthy of discussion:

- There is still great variation from state to state on how they are addressing the lead scavenger issue.
- Some states responded to the efforts of the ASTSWMO LUST Task Force and the 2010 USEPA OUST lead scavenger memo and began looking for lead scavengers at LUST sites.
- In most states surveyed the percentage of sites with lead scavengers as a contaminant of concern was less than 20 percent of their total site population.
- The prevalence of EDB and 1,2-DCA above a state’s standard is about equal among the states, with a little less than one-third of states saying they have more sites with EDB above their standard, a little less than one-third of states saying that have more sites with 1,2 DCA above their standards, and slightly more than one-third saying they have an equal number of sites with

■ *continued on page 6*

■ Reopening Pandora's Box

from page 5

EDB and 1,2 DCA above their standards.

- About one-third of the states are keeping hard data on the prevalence of lead scavengers. Most of these states are in Regions 4 and 7. Current remedial technologies appear to remediate the lead scavengers (with the possible exception of Monitored Natural Attenuation [MNA]).
- Lead scavenger remediation almost always occurred in connection with BTEX remediation.

So, despite a wide variety of state responses on the issue of lead scavengers, the good news is that the states responding to the ASTSWMO survey were certainly aware of the possible presence of lead scavengers at their sites and depend on existing remediation systems to address them along with BTEX and other petroleum compounds.

...And What About the States Still Not Testing?

Although the conclusions of the ASTSWMO survey seem to highlight the obvious to veteran petroleum remediation workers, the greater concern is for states that may not be testing for lead scavengers at older release sites where leaded fuels were used. And since that represents a significant data set, it's possible that some portion of the public in high vulnerability locations, defined by the 2008 USEPA study, are still being exposed to lead scavenger compounds that do not rapidly biodegrade.

It's critical for states to test for these compounds prior to closing petroleum release sites, and important to acknowledge other known factors that may mask them, such as downward gradients that create diving plumes. Only then can we say that we have completely defined the extent and magnitude of a release and adequately protected users of shallow groundwater from gasoline compounds such as lead scavengers.

Hal White, USEPA OUST, encourages state LUST contacts to submit state-specific lead scavenger occurrence data that OUST can use to help identify areas of concern. Hal can be reached at White.Hal@epa.gov. ■

■ Consultant Who Played Foul

from page 3

investigation was conducted by the Fraud, Waste, and Abuse Prevention (FWA) unit, a branch of the State Water Board's Office of Enforcement.

The FWA unit, originally a pilot program, was permanently created on April 1, 2013, to root out fraud, waste, and abuse by dishonest consultants and claimants submitting false, misleading, or inflated invoices for reimbursement to the UST Cleanup Fund.

The pilot program was launched on January 27, 2010, at the time a \$1.2 million settlement was being finalized against E2C Remediation Inc., a Central Valley California environmental consulting firm, to resolve litigation concerning alleged misrepresentations of reimbursable costs on its invoices.

The FWA staff follows up on complaints of alleged fraud against the Cleanup Fund, then investigates and develops cases to refer to the State Attorney General's Office for potential criminal and/or civil prosecution.

Deter, Deter, Deter

The ultimate goal of the FWA Unit is to safeguard the monies of the UST Cleanup Fund, which are used to protect the environment by cleaning up leaks from USTs. A component of this goal includes deterring claimants and contractors from submitting fraudulent claims to the fund in the first place. However, once fraud is identified, the State Water Board works with the State Attorney General's Office to prosecute criminally, where appropriate, and to pursue civil remedies, including fines and restitution of the fraudulently obtained funds.

■ There are approximately 2,500 active claims to the California UST Cleanup Fund for reimbursement.

■ Since 1992, the California UST Cleanup Fund has reimbursed \$3.3 billion for eligible cleanup costs.

■ Approximately 8,000 California UST Cleanup Fund sites have been cleaned up and closed since the program's inception in 1989.

Since 2010, the FWA Unit has referred cases to the State Attorney General's Office, which has filed one criminal and civil complaint and obtained search warrants for three California consultants' businesses. The FWA unit is a seven-person office with diverse professional backgrounds. Staff have experience working for the UST Cleanup Fund, consulting firms, regulatory agencies, laboratories, and enforcement.

A copy of the Hayden criminal plea is on the State Water Board's website at: www.waterboards.ca.gov/water_issues/programs/enforcement/orders_actions.shtml.

A fact sheet on the State Water Board's efforts to prevent, investigate, and prosecute cases of fraud against the Cleanup Fund is on the State Water Board's website at: www.waterboards.ca.gov/publications_forms/publications/factsheets/docs/fraud_efforts_factsheet.pdf. ■

Kim Sellards, CFE, PG, is Chief of the Fraud, Waste, and Abuse Prevention Unit with the California Water Resources Control Board.

She can be reached at Kim.Sellards@waterboards.ca.gov.

Check Out ASTSWMO's Publication, Compatibility of UST Systems with Biofuels

The Association of State and Territory Solid Waste Management Officials' (ASTSWMO's) Alternative Fuels Workgroup developed the *Compatibility of UST Systems with Biofuels* document to serve as a resource for states, UST owners and operators, and contractors and consultants for evaluating equipment compatibility when storing biofuels. The document includes an introduction to biofuels, discussion on biofuels storage and equipment compatibility, and Workgroup recommendations. It also includes resources from USEPA and other government/private parties, a compatibility evaluation checklist-template, and site-specific case summaries provided to ASTSWMO by individual state tanks programs. The publication is available at: www.astswmo.org/Pages/Policies_and_Publications/Tanks.htm.

There's a Hole in the Bucket, Dear Liza, Dear Liza...

Will the West Virginia Chemical Spill Help Wake Us Up?

By Ellen Frye

Given the world we live in, the old “Hole in the Bucket” song isn’t as silly as it sounds. Several verses into the song, after dear Liza about had it listening to dear Henry go on about the obstacles to mending the hole in his bucket, she replies: “Use your head then, dear Henry, dear Henry, use your head!”

Liza’s frustrated exhortation to “use your head” suggests that if a problem arises you think it through. You ask yourself: How do I mend it?

Do you ignore it in hopes it goes away? That’s denial. Do you put a band-aid on it? That’s a short-term “solution.” Or do you work through the problem in order to find a prudent solution that results in an effective and long-term outcome? That’s using your head.

To avoid that hole in the bucket in the first place, you might take measures to prevent it from corroding (i.e., appropriate operation and maintenance). If you are not into prevention, then at the least you need to notice the hole as soon as it develops and arrest it (e.g., do some leak detection). If the hole is so large it’s beyond repair, you’ve probably been “out to lunch” far too long (e.g., it’s time for corrective action and a stiff dose of enforcement).

The January 9, 2014, spill of some 10,000 gallons of crude 4-methylcyclohexanemethanol (4-MCHM) from tank 396, an aboveground storage tank (AST), into West Virginia’s Elk River is one example of our proclivity to ignore the holes in our buckets. Twelve days after the spill the terminal owner, Freedom Industries, disclosed that, actually, a second chemical, PPH, a mixture of polyglycol ethers, had also been stored in tank 396. Furthermore, they couldn’t provide the exact identity of the chemicals because it is “proprietary”—a word used time and again by chemical manufacturers. Proprietary components make it difficult for emergency responders to understand and respond to a release.

“There’s a hole in the bucket, dear Liza, dear Liza,
There’s a hole in the bucket, dear Liza, a hole.
Then mend it, dear Henry, dear Henry, dear Henry,
Then mend it, dear Henry, dear Henry, mend it.”



A storage tank with the chemical designation MCHM, 4-methylcyclohexanemethanol at Freedom Industries’ storage facility in Charleston, W.V.

And here’s the regulatory hole: Chemical ASTs in the United States are virtually unregulated!

Underground chemical storage tanks, of which there are relatively few, are covered under the federal UST rules (40 CFR Parts 280 and 281) adopted in 1988. These rules were designed to prevent and detect leaks and spills (including mandatory double-walled construction for chemical tanks, similar to the haz-

ardous waste storage rules), correct problems posed by leaks and spills, and make sure tank owners and operators can pay for cleanup costs (Part 280 does not require FR for USTs storing chemicals). States were given responsibility for creating storage tank regulatory programs as strict or stricter than the federal regulations. Due to these nationwide rules imposed 25 years ago, very few chemical USTs remained in service after the 1998 upgrade deadline.

There is no comparable program for chemical ASTs. So guess how the vast majority of liquid chemicals are stored these days?

Thankfully, four states (Delaware, Minnesota, New Jersey, New York) have adopted comprehensive chemical AST regulations that reflect the UST regulations in 40 CFR 280 and 281. Their foresight may serve as a beacon for other states.

On April 1, 2014, West Virginia Governor Tomblin signed into law WV Senate Bill 373, the Water Resources Protection Act, which, among other things, outlines a regulatory structure to ensure that all ASTs are meeting tank integrity standards (http://www.legis.state.wv.us/Bill_Text_HTML/2014_SESSIONS/RS/pdf_bills/SB373%20SUB2%20ENG%20PRINTED.pdf).

■ continued on page 8

■ West Virginia Chemical Spill from page 7

A Perfect Storm

The West Virginia spill originated from an aboveground storage tank (AST) housed at a chemical storage terminal owned by Freedom Industries. The facility is located on the bank of the Elk River, just outside the City of Charleston and about 1.5 miles upstream of the privately owned West Virginia American Water intake and treatment center, the state's largest public water system, serving some 300,000 people.

The 1938 vintage, 46,000 gallon steel AST had developed two small corrosion [presumably] holes at its bottom. The tank was welded on the bottom and riveted on the sides, or shell plates, common in the 1930s and '40s. It apparently had a hole on the side wall and another underneath. Today welding is the industry standard for these large tanks. (In Missouri all riveted tanks storing flammable and combustible liquids had to be removed by 2005.)

The tank's brick and concrete containment dike, supposedly the last line of defense against a spill into the environment, was not lined and had serious structural problems—which the owners were aware of. In addition, the tank was resting on a porous sand and gravel soil. At some point some settling among the 17 tanks at the Freedom Industries facility had been noted. Until about 2001 the site had been a bulk oil storage terminal.

The January 9 spill was fraught with failures at the federal, state, and local levels of government, not to mention Freedom Industries and American Water. There seemed to be an overall sense of shock...even on the part of the water company.

- To begin with, the only "alarm" that sounded was an odor, a potent licorice-like odor reported to the West Virginia Department of Environmental Protection (WVDEP) by nearby residents early that morning. WVDEP traced the odor to Freedom Industries, which had not self-reported any leak or accident.
- The water supply intake had not been shut, and 4-MCHM was passing through the drinking

“We have become a society that can't self-correct, that can't address its obvious problems, that can't pull out of its nosedive. And so to our list of disasters let us add this fourth entry: we have entered an age of folly that—for all our Facebooking and the twittling tweedle-dee-tweets of the twitterati—we can't wake up from.”

Thomas Frank

Political analyst, historian, journalist, and columnist for *Harper's Magazine*

water plant, contaminating the drinking water and the distribution-piping network.

- There was no plan on anybody's books for procedure and protocol, should one of those tanks happen to leak.
- No one at any level of government seemed to know much about what the tanks contained since there was no statewide reporting and registration system for chemical AST facilities.
- Neither Freedom Industries nor American Water had an emergency response plan.

Federal and state regulators had not inspected the site since 1991 when it was owned by Pennzoil and stored petroleum rather than chemicals—except for occasions when a smell was reported or when some inspector wandered onto the facility and realized he had no regulatory authority over it.

MCHM is a colorless liquid organic solvent used along with various other chemicals to wash coal. Such chemical or physical washes are commonly applied to most mined materials, whether minerals or ores. Because MCHM is used in industrial settings rather than in consumer products, its toxicity and other effects on humans are largely unknown (Dave Biello, January 10, 2014, *Scientific American*).

Bob Sattler, a retired emergency response team member at WVDEP, says he is all too familiar with the MCHM odor (which is detectable by smell at very low levels). It's been used throughout the state for decades and he has responded to many incidents where this chemical may have been present. He noted that since workers at the Freedom

Industries facility smell it all the time it is unlikely that they would assume there was a release merely based on odor.

What information did emergency responders have to go on? Freedom Industries had filed its "Tier 2" form, as required under the federal Emergency Planning and Community Right to Know Act (EPCRA) of 1986 (www2.epa.gov/sites/production/files/2013-08/documents/epcra_fact_sheet.pdf). EPCRA was designed to improve community access to information about chemical hazards and to facilitate the development of community emergency response plans by state/tribal and local governments. EPCRA Section 303 requires local emergency planning committees (LEPCs) to develop community emergency response plans for extremely hazardous substances (EHSs) present at facilities in their community.

The chemical 4-MCHM is not considered an extremely hazardous substance but it is a hazardous chemical defined under the Occupational Safety and Health Administration (OSHA) regulations, therefore the substance was reported on the Tier 2 form. LEPCs may include other facilities in their plan even if facilities may not have EHSs but have other chemicals on these sites that may pose risks to the community. Although West Virginia emergency response officials and Kanawha County emergency planners and responders had received copies of the Tier 2 form, it is likely that the Freedom Industries facility was not involved in the local emergency plan because the 4-MCHM is not an EHS.

Under OSHA regulations, employers must maintain a material safety data sheet (MSDS) for any hazardous chemicals stored or

used in the work place. Approximately 500,000 products are required to have MSDSs. This information is meant to characterize risk to employees who have both a need and a right to know the hazards and identities of the chemicals they are exposed to when working. The MSDSs also inform users of protective measures available to prevent adverse effects from occurring. (As of this year OSHA eliminated the MSDS term; they are now called Safety Data Sheets [SDSs].)

The MSDS for 4-MCHM, manufactured by Eastman Chemical Company in Tennessee, repeatedly says “no data available” for a host of toxicological properties, including chronic toxicity. In general it states very generally: Vapor may cause irritation of eyes and respiratory tract; harmful if swallowed; causes skin irritation; and causes serious eye irritation. The company admits the chemical has not been studied extensively. For example, its effects on cancer or inducing mutations in DNA are unknown. Many MSDSs provide such noninformation.

Muddledness

Almost immediately after the spill was discovered, Governor Tomblin declared a state of emergency with instructions not to use the water other than to flush toilets and fight fires. Needless to say, homes and businesses affected by the ensuing state of emergency, which remained in effect until February 28, were turned upside down. No water? Hard for most Americans to imagine.

Schools and many businesses had to close. As of this writing (April) there are many who still don't trust the safety of their water. Gil Sattler, retired WVDEP UST program manager, whose water comes from the American Water facility says she's gradually started drinking it through faucet filters. But among folks she's spoken with she says it's about half and half as to who is drinking it and who isn't.

Dick Basham, General Manager at IRPCO, a company in the Charleston area that manufactures gasoline delivery hoses, says the licorice odor in the water lingered for nearly ten days. Workers who test the hoses his company makes by submerging them in tubs of water to detect leaks



People wait in line for water from a 7,500 gallon tanker truck at a high school near Charleston, W.V. A chemical spill left the water for 300,000 people in and around West Virginia's capital city stained blue-green and smelling like licorice.

had to use additional protective aprons and long gloves to prevent exposure to the water.

The Charleston area has been awash in plastic water bottles. Large tanks containing water were driven in from Pennsylvania to distribution sites where people lined up to fill any containers they could get their hands on.

In the hours after the leak the U.S. Centers for Disease Control and Prevention (CDC) scrambled to come up with a public-health screening level for 4-MCHM. They came up with 1 part per million, based on limited information. Outside experts questioned the CDC's methods and whether agency officials had enough information about the chemical to make a judgment.

More than two days after the state began lifting the water use ban, the WV Department of Health and Human Resources issued an advisory for pregnant women, based on guidance from the CDC, which had obtained additional information about the chemical. The most common reported symptoms after the chemical leak were skin irritation, eye pain, nausea and headaches. All of this made residents even more uncomfortable. What if pregnant women had started drinking the water? What about children? What about bathing, cooking, washing dishes?

Our Chemical Cloud

Confusion about the public health screening level for 4-MCHM undermined public confidence in regulators, health officials, and politicians. The confusion was due in large part to the weaknesses associated with the federal chemical safety law, the Toxic Substances Control Act (TSCA), passed in 1976 to protect the public from potentially harmful chemicals.

There are some 85,000 chemical substances in use today, and we don't know all that much about most of them. Under TSCA, USEPA is required to compile, keep current, and publish a list of each chemical substance that is allowed to be manufactured in or imported into the United States, called the TSCA Inventory.

Of the 85,000 chemicals currently on the TSCA Inventory, some 62,000 chemicals were already being sold and used in 1976. TSCA allowed these “grandfathered” chemicals to remain on the market without testing, unless and until USEPA made a determination that a chemical or class of chemicals presented an “unreasonable risk,” in which case USEPA could require the manufacturer to conduct full testing in order to stay on the market. 4-MCHM was one of the grandfathered chemicals.

These old, untested chemicals in fact represent the vast bulk of

■ *continued on page 10*

■ West Virginia Chemical Spill from page 9

chemical usage today, because the process for broad-spectrum testing of any new chemical under TSCA is stringent and generally cost-prohibitive unless a high commercial value can be predicted.

According to the *New York Times* (April 13, 2013) TSCA is “the only major environmental statute whose core provisions have not been reauthorized or substantively updated since its adoption.” The current law is riddled with exceptions and widely viewed as dysfunctional. USEPA hasn’t even attempted to restrict an unsafe chemical since the courts overturned an asbestos ban in 1991. In May 2013, efforts to address TSCA’s virtual state of paralysis were introduced in the U.S. Senate (Senate Bill 1009). This would be the first major overhaul of the act in many years. The bill is still pending.

Chemical substances take many forms and are defined under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) by listing what is known about hazardous substances and their effects, helping responders act quickly and safely to reduce the risks from emergency situations. (See Appendix E of USEPA’s *Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-To-Know Act [EPCRA], Comprehensive Environmental Response, Compensation and Liability Act [CERCLA] and Section 112(r) of the Clean Air Act.*) EPCRA Section 302 lists “extremely hazardous” substances and Section 313 lists “toxic chemicals.”

To say there is not enough knowledge about chemicals is an understatement. For example, New York State began requiring the registration of AST chemical tanks in 1988. Technical regulations applicable to AST chemical tanks took effect in 1994. Program staff inspect facilities with tanks that store chemicals identified in Part 597 of the Hazardous Substance Bulk Storage regulations. The majority of the chemicals listed in Part 597 are on the CERCLA list of hazardous chemicals. But the CERCLA list doesn’t have all the chemicals that are listed on Tier 2 form. It is frustrating.

The list of substances under CERCLA (approx. 800) is only a subset of chemicals subject to reporting under EPCRA Section 312 (Tier 2 form). Section 312 requires reporting of hazardous chemicals defined under OSHA that are required to have available a Material Safety Data Sheet (MSDS). There are 500,000 products in commerce that are OSHA hazardous chemicals. There is no list of OSHA hazardous chemicals. Bottom line, 4-MCHM and PPH wouldn’t have been on New York’s list. In other words, responders in New York would have been just as clueless about 4-MCHM and PPH as their peers in West Virginia.

New York or any state would need to go through a long and expensive process to determine whether a chemical should be a listed chemical. So who’s going to step up to the plate to come up with needed information on chemicals? Who’s going to bear the costs? The Safety Data Sheets don’t tell us all a chemical’s details due to “confidential proprietary information.” So an end user will look at the chemicals referenced in Part 597 and if the chemical they are looking for is not on the list he will probably use it. And odds are he will believe that the chemical is safe because it is not regulated.

Then Mend It, Dear Henry

Can we mend it? USEPA’s Toxic Release Inventory (TRI) report for 2012 shows that 3.63 billion pounds of toxic chemicals were disposed or otherwise released into the environment nationwide through air, water, and land. For 2011, the TRI data amount to 4.09 billion pounds of toxic chemicals, and for 2010, 3.93 billion pounds, a 16 percent increase from 2009. These numbers just account for the chemical releases that have been officially reported.

Can we mend it? Or has our chemical mania spun out of control? Oil and chemical spills and explosions are happening with disconcerting frequency, although the public doesn’t hear about most of them. The nation is awash with new pipelines, old pipelines, rail lines, and semi-trailers that convey all kinds of potentially hazardous materials. Since humans don’t get high marks for regulating themselves, what regulatory tools do we have?

We have a few existing candidates, but...

- **Spill Prevention Control and Countermeasure (SPCC) and Facility Response Plan (FRP)**

The federal SPCC and FRP requirements address oil spill prevention and preparedness regarding oil discharges to navigable waterways. This includes operating procedures, control measures (such as secondary containment) and countermeasures for facilities storing oil, and FRPs, or emergency response plans, for a subset of facilities that can cause substantial harm to the environment.

Oddly, though, these regulations only apply to oil containers and equipment; substances stored in chemical ASTs are not subject to SPCC or FRP regulations. Additionally, these requirements are intended to protect surface waters and do not require measures, such as double-bottom tanks, to protect groundwater.

From a cleanup standpoint, all oils have similar physical, chemical, and biological properties that allow for similar response strategies. As a result, responders have gained the necessary expertise to respond to oil discharges, partly due to planning and preparedness regulations that require exercises and partly due to lessons learned responding to past oil spills.

- **The 1996 Safe Drinking Water Act Amendments (SDWA)**

These amendments provided essential first steps toward protecting sources of drinking water by requiring states to take a serious look at potential threats to public drinking water supply sources. The whole sense of source water protection is that prevention is the most effective and efficient method of assuring long-term safe water. As a first step public water systems were required to prepare Source Water Assessment Reports, which included delineating zones of critical concern (ZCCs) for each intake.

In his March 6, 2014, testimony before the U.S. Senate Commit-

tee on Environment and Public Works, Evan Hansen, of Downstream Strategies in West Virginia stated: "More than 300 such reports were created across West Virginia, including one for the Charleston intake, which was published in 2002. This report delineated the ZCC, identified 51 potential significant contaminant sources within the ZCC, and determined that the Charleston system was highly susceptible to contamination."

But the report is now 12 years old and information on potentially significant contaminant sources may well be out of date. At the time Freedom Industries did not even own the site. While the SDWA provided a good first step it placed no requirements on public drinking water facilities or communities to develop source water protection plans to build on the reports. According to Hansen, "while many Source Water Protection Plans have been written for public water systems across West Virginia, no such plan has been written for the Charleston system."

- **The National Pollutant Discharge Elimination System (NPDES)** Under the Clean Water Act, industrial stormwater NPDES permits are typically required for operations such as those with ASTs. These plans outline a series of stormwater management practices that, if a spill should occur, keep contamination out of surface waters. The permit application must list appropriate Best Management Practices (BMPs) and measurable goals. Permittees need to evaluate the effectiveness of their chosen BMPs to determine whether the BMPs are reducing the discharge of pollutants from their systems to the "maximum extent practicable" and to determine if the BMP mix is satisfying the water quality requirements of the Clean Water Act. In addition, these NPDES permits require immediate spill reporting.

According to Hansen, Freedom Industries held a general industrial stormwater NPDES permit for the site. However, they did

not appear to follow the management practices required by the permit, nor did they immediately report the spill. In addition, WVDEP did not enforce the permit, conduct inspections under NPDES, and review the plan as required.

What we are missing are enforceable requirements specifically designed to make sure aboveground chemical tank systems are operated and maintained such that they do not leak or spill into the environment—especially the surface water/groundwater connection.

- **Industry standards** – These are the guiding lights for both ASTs and USTs. American Petroleum Institute (API) standards 650, 653 and 620 are the primary industry practices by which most aboveground welded storage tanks are designed, constructed, and maintained. They address both newly constructed and existing aboveground storage tanks used in the petroleum, petrochemical, and chemical industries. They can serve as critical resources for storage tank regulatory programs and are referenced appropriately in federal SPCC and Pipeline Safety regulation, and some state regulations. In the absence of regulations, API-653 would be considered the prevailing voluntary good practice for chemical AST inspection and repair and the primary safeguard for ensuring the safety and reliability of ASTs. Unfortunately, chemical AST owners and operators don't necessarily follow good practices voluntarily.

What we are missing are enforceable requirements specifically designed to make sure aboveground chemical tank systems are operated and maintained such that they do not leak or spill into the environment—especially the surface water/ground-

water connection. Requirements designed to protect both human health and the environment. In other words, if we are going to mend the problem of leaks and spills, the first thing we must do is prevent them. Will the chemical industry allow us to do what needs doing?

Prevention, Prevention, Enforcement!

Why would any rational human being want to risk having a release from a big old or new chemical tank? It's a huge economic risk. A release can be very expensive, far more so than following the prevention track. Freedom Industries has filed for bankruptcy. West Virginia Governor Tomblin directed the company to dismantle and properly dispose of all 17 tanks at the spill site, including associated piping and machinery by March 15. The directive was included in a consent order issued on January 24 by WVDEP and signed by Freedom Industries. The company had already been ordered to remove almost 1 million gallons of chemicals from the plant.

So it stands to reason that a federal, state, or local government would want to take measures to avoid a release of the contents from an aboveground chemical tank (which may be storing 20, 30, 40 million gallons of liquid) into the environment in order to protect not only the environment but human health and any ground or surface drinking water sources. This was, after all, the thinking behind the UST/LUST program and the SPCC program.

It's about prevention—setting and enforcing standards and requirements for the installation, operation, retrofitting, maintenance, repair, abandonment, and/or removal of aboveground storage tanks to prevent releases. It's about employee training. If there is a release, it's about detecting it, having a release preparedness plan, and remediating it at the earliest possible stage, thus minimizing further degradation of soil, air, surface water, and groundwater and promoting public safety.

Also, as with USTs, it's about ensuring that owners and operators of ASTs demonstrate financial responsibility for taking corrective

■ *continued on page 12*

■ West Virginia Chemical Spill from page 11

action and for compensating third parties for bodily injury and property damage caused by any releases from these ASTs.

Finally, the most comprehensive AST regulations are next to useless if the regulated community knows that enforcement is lax. Rules need to be enforced, which in the case of any regulated AST or UST facility necessitates onsite inspections, be it for a new installation, an upgrade, routine facility operation and maintenance, closure, and so on.

So, Where's It at with State Action on Chemical ASTs?

New Jersey, New York, Minnesota, and Delaware have adopted regulations for chemical ASTs. New Jersey was the first of the four states to adopt its chemical ASTs program in 1981. According to Beth Reddy, Section Chief of New Jersey's Bureau of Release Prevention, over the years they have seen both reports of releases and volume of releases go down. In total, the state regulates about 8,000 tanks, both USTs and ASTs. By law, they must readopt their regulations every seven years—or the regulations expire. In the process they must review what has worked and what hasn't and make appropriate adjustments.

Delaware added chemical tanks to its AST program just this year. The move to regulate these tanks was prompted by a Motiva refinery chemical (sulfuric acid) tank explosion that killed a worker. In the process of writing their regulations they had the benefit of learning from not only the other three states with chemical AST programs but also from participation in the National Association of State AST Programs (NASAP), an association launched in 2001 in response to the growth in state AST programs with assistance provided by USEPA's Oil Spills Program.

NASAP is a coordination group of state and federal environmental officials responsible for developing, maintaining, and improving programs in the various states in order to help reduce the risk and incidence of leaks and spills from ASTs, including chemical ASTs.

Where to Find State Chemical AST Regulations

Delaware

<http://www.dnrec.delaware.gov/tanks/Documents/AST/Final%20AST%20Regulations%20Feb%202005.pdf>

Contact: Jill Hall, DNREC Senior Environmental Planner

Minnesota

<https://www.revisor.mn.gov/pubs/>

Search AST rules in MN Rules Chapter 7151

AST program webpage:

<http://www.pca.state.mn.us/index.php/waste/waste-and-cleanup/waste-management/tank-compliance-and-assistance/aboveground-storage-tanks-ast/aboveground-storage-tank-ast-systems.html>

Contact: Chris Bashor, MPCA Tanks Compliance and Assistance

New Jersey

<http://www.nj.gov/dep/rpp/brp/dp/index.htm>

Contact: Beth Reddy, NJDEP Bureau of Release Prevention

New York

<http://www.dec.ny.gov/chemical/287.html>

Contact: Russell Brauksieck, NYDEC Facility Compliance Section

According to Chris Bashor, of the Minnesota Pollution Control Agency (MPCA) Aboveground Storage Tank program, who serves as NASAP chairperson, there are only 13 states that have extensive AST regulatory programs, though they vary in size of tank/facility and substances (mostly petroleum) regulated. There are some 15 other states that have no specific rules but do have spill planning and response and/or AST registration requirements.

The states formed the association in part in order to fill the gap at USEPA between the USEPA Oil Spills Program focus on petroleum, spill response, and surface water protection and the Underground Storage Tank Program focus on release prevention, groundwater protection, and remediation.

"The recent Elk River spill illustrates that very gap in federal regulation and where it can lead," says Bashor. "Those of us from states that regulate chemical ASTs have a hard time imagining such an incident in our states. It's good to see West Virginia moving rapidly to fill the gap, and we stand ready to assist them in that process."

Through NASAP, states have the opportunity to share perspectives on AST issues, requirements, and program needs; mentor states initiating

new AST programs; share technical expertise; and promote state-to-state consistency.

While the group is not funded, they meet annually in conjunction with the national AST technical conference, though it is a challenge for state program personnel to secure travel approval. "At the technical conference we learn about up and coming technologies that can be applied to ASTs to prevent leaks and spills, what they cost, and if it is reasonable to expect or encourage, depending on our individual state approach, an owner/operator to use them," explains Bashor.

While routine visual inspection is the essential component in the chemical AST release prevention toolbox, the chemical industry is continually developing better ways to ensure tank integrity. For example, besides secondary-containment dikes, double-bottomed tanks with interstitial spaces that provide another line of defense and the ability to monitor for leaks are considered state-of-the-art.

"We see many older tanks being retrofitted that way," says Beth Reddy. "The NASAP conferences provide us the opportunity for dialogue with industry, allowing us to expand our awareness of new industry standards and give industry

input into their standards development and modification. We'll learn about a potential new leak detection method one year and see it's on the market one or two years later."

It Takes a Village

Wake-Up Calls: On December 4, 1984, methyl isocyanate, an extremely toxic chemical escaped from a Union Carbide chemical plant in Bhopal, India. Thousands died and many more were injured. Approximately six months later, a similar incident occurred at another Union Carbide plant in Institute, West Virginia, a town of 3,100 people about 10 miles north of Charleston. These two events raised concern about local preparedness for chemical emergencies and the availability of information on hazardous chemicals. In response to these concerns, Congress passed the Emergency Planning and Community Right-to-Know Act (EPCRA) in 1986.

EPCRA's Community Right-to-Know provisions were designed to help increase the public's knowledge and access to information on chemicals at individual facilities, their uses, and releases into the environment. They were designed so that states and communities, working with facilities, can use this information to improve chemical safety and protect public health and the environment. The Act established requirements for federal, state and local governments, Indian tribes, and industry regarding emergency planning and "Community Right-to-Know" reporting on hazardous and toxic chemicals.

Apparently, Charleston, West Virginia, and the surrounding nine-county area had the right to know but didn't know it, didn't act on it, or were simply used to seeing those tanks and didn't give them a second thought. In other words, even a well thought out act is only as good as a community makes it.

A woman named Jeanette Neagu from Michigan City, Indiana, could be bothered, and is really bothered! When she read about the West Virginia spill and its proximity to the drinking water intake she put herself in gear to learn as much as she could about a subject that had never before been on her radar. She lives near Lake Michigan, which is the water supply for many communities, including Chicago, and immedi-



AP photo/Sтивe Halber

The Freedom Industries site released 10,000 gallons of chemicals into the adjacent Elk River.

ately began finding out anything and everything about chemical tanks in three counties along the lake.

She learned that there are 888 ASTs in source water zones of concern and 285 in critical zones of concern, as defined under the federal Safe Drinking Water Act. (The intakes along Lake Michigan were apparently not considered a drinking water quality problem.) She learned that none of these ASTs were inspected by the state because they are not regulated.

Jeanette has e-mailed and spoken with many regulators and politicians across the country, and won't take "no" for an answer. She is an active member of the Indiana League of Women Voters and has given presentations on the subject to her local and state League and is preparing to take her findings to the League's national convention coming up in June 2014. Jeanette saw a serious problem and is working tirelessly to educate a network of people to take up the cause.

When all is said and done, it is the community that must be in the frontline of protecting its citizens and its environment. After all, the community stands to lose the most at the hands of carelessness. As West Virginia Senate Majority Leader John Unger put it: "This bill [the Water Resources Protection Act] would not have passed without the public,

because of the magnitude and what went into it—it kept all of us honest and focused on the public's interest."

Jeanette put together the following set of questions that citizens should be asking. These are part of an information sheet she hands out wherever she gives a talk.

Do You Know?

- How many above ground chemical storage tanks are in your state?
- Where are the tanks located? (State environmental agency has this information from Tier 2 Reports)
- Does the state or your community have a way to assure that chemical tanks comply with industry standards?
- What chemicals are stored in each tank?
- Is there a state or local AST inspection program?
- Are there consequences if a tank fails an inspection and if so what are they?
- Are facility emergency plans maintained and reviewed at the appropriate governmental level?
- Does your water supplier have an emergency plan and the wherewithal to implement the plan should there be a spill from a chemical AST?

■ continued on page 14

■ West Virginia Chemical Spill from page 13

Hello?...

Wake-Up Calls: In January 1988, a four-million gallon oil storage tank owned by Ashland Oil Company, Inc., split apart and collapsed at an Ashland oil storage facility in Floreffe, Pennsylvania, near the Monongahela River. The tank split while being filled to capacity for the first time after it had been dismantled and moved from an Ohio location and reassembled at the Floreffe facility. The oil flowed into the Ohio River, temporarily contaminating drinking water sources for an estimated one million people in Pennsylvania, West Virginia, and Ohio, contaminating river ecosystems, killing wildlife, damaging private property, and adversely affecting businesses in the area.

On March 24, 1989, 25 years ago, the Exxon Valdez spilled 11 million gallons of crude oil into the waters along Alaska's coastline, killing millions of animals and turning that ecosystem upside down...even to this day. Native Chief Walter Meganack was quoted as calling it "the day the water died."

These two events were catalysts for additional laws and regulations, including the Oil Pollution Act of 1990; amendments to the Spill Prevention Control and Countermeasure (SPCC) rule initially proposed in 1991; and promulgation of the Facility Response Plan (FRP) rule in 1994. The SPCC regulation has been modified many times since its inception, with major revisions in 2002, 2006, 2008, 2009 and 2011. The FRP requirements were last amended in 2000.

Wake-Up Call: On April 17, 2013, an explosion at a fertilizer plant in West Texas killed 15 people, injured more than 160, and damaged or destroyed more than 150 buildings. It seemed to be a wake-up call that the handling and storage of chemicals present serious risks that must be addressed. Investigators determined that ammonium nitrate was the trigger for the explosion. As a result, on August 1, 2013, President Obama signed Executive Order 13650, Improving Chemical Facility Safety and Security, directing the federal government to:

- improve operational coordination with state and local partners
- enhance federal agency coordination and information sharing

A Requiem for Water?

It's been said that water is the "oil of the 21st century" because the history of this century will in large measure be determined by the availability of this precious liquid. Are we setting our sights on doing our utmost to protect water and responsibly account for its health and availability? Or are we sucking water up with the same blind ferocity we have applied to the Earth's oil and gas reserves? Are we impairing Earth's aquatic circulatory system to such an extent that fresh, potable water won't be able to support our ever-burgeoning population?

We are playing a very dangerous game. We are currently riding roughshod over the richness and diversity of this planet and have an especially brazen and foolish disrespect for the effects of chemicals on our water.

It's not like people are out there asking themselves "What piece of earth can I muck up today?" Rather it is a combination of thoughtlessness, carelessness, greed, and laziness. We would much rather pester Liza with obstacles to fixing the hole than using our heads to solve the problem. As world populations grow, this attitude cannot be sustained. We would do well to remember the "seventh generation" principle taught by many Native American traditions where every decision must consider how our choice will affect our descendants seven generations into the future. How will our seventh generation fare if we decide to continue to ignore chemical storage in ASTs?



- modernize policies regulations and standards
- work with stakeholders to identify best practices.

On June 6, 2014, the status report to the President, *Actions to Improve Chemical Facility Safety and Security—A Shared Commitment*, was released. It summarizes the designated working group's progress, focusing on actions to date, findings and lessons learned, challenges, and short and long-term priority actions (www.osha.gov/chemicalexecutiveorder/final_chemical_eo_status_report.pdf).

Wake-Up Call: On January 9, 2014, some 10,000 gallons of crude 4-methylcyclohexanemethanol (4-MCHM) from tank 396, an aboveground storage tank (AST)... On April 1, 2014, West Virginia Governor Tomblin signed into law WV Senate Bill 373, the Water Resources Protection Act.

On April, 3, 2014, the Senate Environment and Public Works Committee advanced the "Chemical Safety and Drinking Water Protection Act of 2014," a bill introduced by Senators Joe Manchin, Barbara Boxer and Jay Rockefeller. The bill is an attempt to do something but is very narrow in focus—preventing "the release of chemicals into sur-

face water supplies of public water systems, including a covered chemical storage tank located in a source water area."

What about groundwater? What about the wellbeing of onsite groundwater-sourced drinking water? What about the local environment? Groundwater and surface water are the interconnected lifeblood of earth's circulatory system. Ultimately, the health of the environment has a lot to do with the health of us all.

Are We Awake Yet?

I fear not. There are so many buckets with holes. For example, in our quest to be energy independent, crude oil is spilling or exploding from rail lines and pipelines across the country. It's an oil feeding frenzy that has not been thought through.

We depend on liquids of all kinds, from milk to 4-MCHM to heaven-knows-what, and they need to be stored in some big old or new tank somewhere. But someone had better keep a watchful eye on them—see to it that they are properly operated and maintained. Of course it should be the owner/operator. But do we just take it for granted that all is well? ■

Cleanup Corner

A Neat Little Column by Gary Lynn

Gary Lynn is the MtBE Remediation Bureau Manager for the State of New Hampshire Department of Environmental Services (NHDES). He can be reached at Gary.Lynn@des.nh.gov



Forecasting Petroleum Cleanup Program Trends

"Partly cloudy with a chance of showers" or "Where in the world did that snowstorm come from?"

Petroleum cleanup programs have a long track record of successes and accomplishments. To continue to be successful, however, it is important to predict and react to change and new trends. As I examine my cleanup program barometer, I observe some rumbling on the horizon and an accurate forecast could help us stay dry if a storm front is rolling in.

Analysis of key trends that could impact our programs logically starts with the following questions:

- Will funding to address UST compliance and petroleum releases remain stable or continue to decrease?
- Will the rate that new releases are discovered continue to decline?
- Will the number of contaminated sites in the "backlog" continue to decline?

There are obviously many more trends to think about, but these three questions cover fundamental issues such as the demand for program services and the resources that will be available to meet these demands.

Program Funding

For states that operate a financial assurance fund, the biggest single source of program funding is a combination of motor fuel taxes/fees and annual fees on tanks. Information is available on potential trends impacting these key sources of revenue. For example, within the bowels of the Department of Energy there is a forecasting and information collection group called the Energy Information Administration (EIA). EIA publishes the *Annual Energy Outlook* (www.eia.gov/forecasts/aeo). In this document, the EIA analyzes trends and projects future consumption and production of energy.

As can be seen from the 2013 EIA Annual Energy Outlook Report (Figure 1 on page 16), gasoline consumption in the U.S. peaked in 2006 and will decline steadily through 2040. Diesel consumption will increase slightly because the market share for cars equipped with high-efficiency diesel motors is increasing. The increased diesel sales do not compensate for the overall decrease in gasoline consumption.

EIA made these projections based on data from the National Highway Transportation Safety Administration estimates on the

impact of more stringent Corporate Average Fuel Efficiency Standards (CAFE). Motor fuel consumption is directly related to car fuel efficiency and miles driven. Both trends will favor reduced motor fuel consumption because the more stringent CAFE standard will drive higher fleet-car efficiencies, and shifts in demographics/driving habits have already reduced the total miles driven in the U.S. (Figure 2 on page 16). (*Business Insider*, "US Vehicle Miles Driven Have Sunk to a New Post-Crises Low," February 25, 2013, Doug Short). Note: the total vehicle miles driven on all roads in the U.S. peaked in November 2007 and has declined 2.47 percent from that peak.

Declining Revenues

Financial assurance funds typically are funded by imposing a tax of a penny or two per gallon on motor fuels. When motor fuel consumption drops, revenues drop. The double whammy of higher fuel efficiency and fewer miles driven translates into declining revenues for the foreseeable future. (See Figures 1 and 2 on page 16.)

Tank fees are also a source of revenue that has declined over time. There are currently 581,000 federally

regulated USTs. Since 1984, more than 1.7 million USTs have been closed (USEPA UST Program Facts, May 2013). That is a lot of owners no longer paying tank fees. A significant national trend is toward the installation of multicompartmented tanks. One tank takes the place of two or three tanks—one fee paid instead of two or three.

The final pieces in the funding equation are federal program grants and general program funding. No complicated analysis is required. These two sources of funding have been significantly reduced and there is no sign that the trend will reverse. In fact, federal grants could be cut more deeply in the future. For example, more than 90 percent of the funding (from \$29 million to \$2 million) was cut in FY12 from federal childhood lead poisoning prevention programs (National Center for Healthy Housing, "State of Local Childhood Lead Poisoning Prevention Programs: The Impact of Federal Public Health Funding Cuts," July 2013). Basically, all sources of revenues—from grants to taxes to fees—are either currently declining or likely to decline in the future.

■ continued on page 16

FIGURE 1.
U.S. Motor Gasoline and Diesel Fuel Consumption, 2000–2040 (million barrels per day)

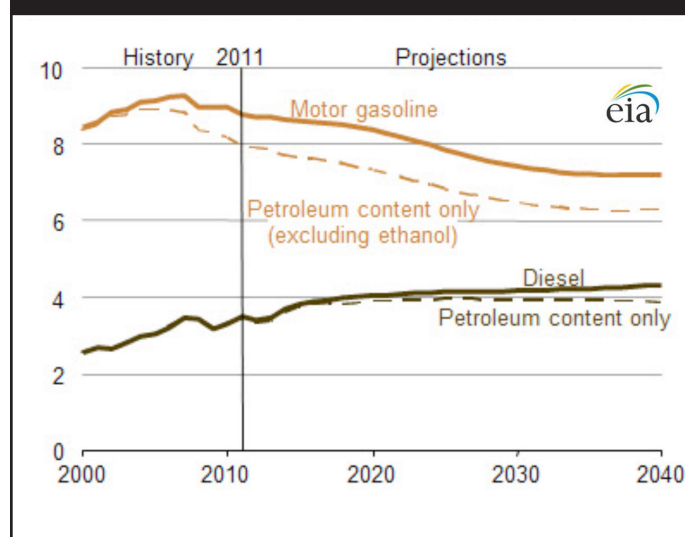
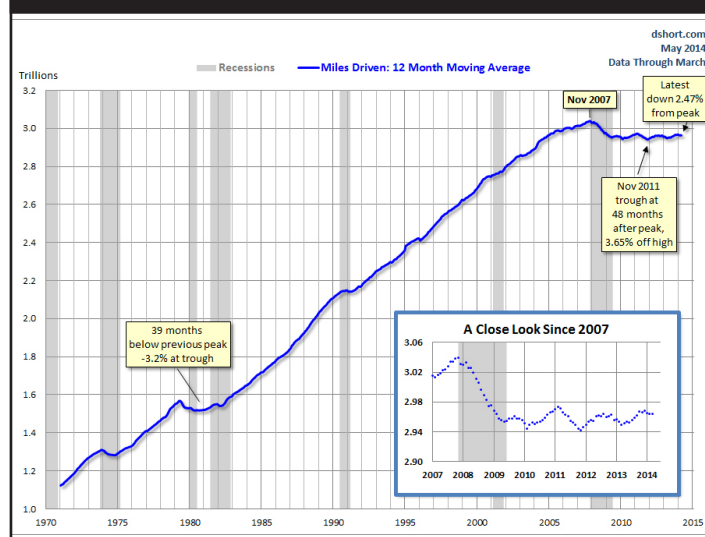


FIGURE 2.

Estimated Vehicle Miles Driven on All Roads



■ Forecasting Petroleum Cleanup from page 15

Funding is the first question discussed in this article because funding availability influences both the speed at which sites are removed from the backlog and the ability of prevention programs to successfully reduce new releases. There is nothing more fundamental to program success than the resources available to address releases and compliance.

New Release Rate

The impact of lower program revenue can be mitigated if lower revenue is coupled with lower program demand. So the next question is quite logical: Will the rate of new releases increase over the current extremely low release detection rate? To figure out likely trends on new release detection, I examined the last three years worth of new releases in New Hampshire to determine how new releases are typically identified. My findings mirror findings by the states of California, Florida, and New York. (See Marcel Moreau's interesting discussion in *LUSTLine Bulletin #72* "Why Are Releases Rarely Discovered at the Time They Occur?" for more details.)

In New Hampshire's case, 42 percent of the leaks were discovered during tank and piping upgrade/closure projects, 37 percent were discovered during brownfields or property sale due diligence inves-

tigations, 13 percent were discovered during utility and construction projects, and two other leaks were discovered when a water supply became impacted and when a tank suddenly ended up empty.

Individual states will vary somewhat from our statistics but the overall conclusion will remain similar, that the rate that releases are detected is dominated by the number of tank and piping upgrades conducted and the number of ongoing construction projects/property sales. Property sales and construction projects are dominated by the state of the economy. The U.S. is emerging from one of the most severe recessions in its history and real estate has been particularly impacted. Clearly, as the economy improves, more properties will turn over and more construction projects will start. Hence, one of the key drivers for detecting new releases will likely tick up.

What about the other driver—tank/piping upgrades? The LUST site backlog reached its peak in the 1990s. The 1998 tank upgrade deadline was a major factor that created this backlog surge. Nowadays, many tank systems that were installed around the time the UST rules were put into place in the 1980s or during the lead up to the 1998 deadline are approaching the end of their useful life.

Furthermore, deadlines for replacing single-walled tanks and/or piping are approaching in

Massachusetts (8/7/2017), New Hampshire (12/22/2015), Rhode Island (12/22/2017), and Vermont (1/1/2016). Other states have restrictions on the length of time that older tanks can be kept in temporary closure or have legislative study committees on the problem of aging USTs. For example, in 2013 Arizona's Governor signed SB 1080 which requires that the state's Underground Storage Tank Committee develop recommendations for the Governor and Legislature. This committee is considering recommending incentives for the replacement of older, single-walled tanks.

Arizona's Office of the Auditor General recently highlighted the problem of older tanks in its September 2013 Performance Audit Report (Report No. 13-06). This report notes that "many USTs may be approaching the end of their expected 30-year lifespan, after which the risk of leaks increases." The report indicates that 13 percent of Arizona USTs are older than 30 years of age and 56 percent of the USTs are older than 20 years. This UST age distribution is certainly not unique to Arizona and a similar age distribution would be expected nationally, based on the timing of the effective date of the original UST regulations and various upgrade deadlines.

If new release rates are driven, as New Hampshire data suggest by tank upgrade work and economy-related real estate sales trends, then

the forecast for future release rates is obvious. Based on the hopefully improving economy and a projected future uptick in older tank upgrades, it is likely that new release detections will increase significantly in a number of states and nationally, further steep declines in the number of new releases discovered each year are unlikely to continue.

Finally, there is the potential for increased leak rates resulting from changes in gasoline and diesel formulations. Recent research conducted by John Wilson and others indicate that the addition of ethanol to gasoline may result in increased corrosion and questions have been posed about ultra low sulfur diesel and corrosion. The full implications of existing and planned changes in gasoline formulations (e.g., E 15) will become clearer over time and are a variable likely to create a perturbation in the existing leak-rate trend.

Backlog

Backlog is highly dependent on new release-detection rates and resources available to cleanup releases. As discussed, revenue trends are not favorable and the clean up rate has already leveled off and is likely to decline unless key states significantly loosen cleanup standards. The new release rate is likely to increase as an improved economy and tank-upgrade work kick in. If these trends pan out as these data suggest, the backlog of sites requiring cleanup is likely to increase.

What's the Plan?

In my view, it's time to make plans to prepare for any stormy weather that comes our way by taking the following steps:

Prepare for declining future cleanup revenues by:

- preventing releases via upgrading tank systems
- cleaning up sites in the near term when more robust budgets are available
- improving program efficiencies.

Make a case for future increases in fees by:

- explaining to key decision makers the long-term revenue trends

- documenting the economic and environmental value of our programs
- demonstrating program efficiencies to blunt inevitable questions about cost cutting.

Being prepared for these trends will not prevent an upcoming bout of stormy weather but thinking ahead and wearing a raincoat will make it more comfortable when going through it. ■

NEIWPCC Expands Training to State Funds and FR

by Jaclyn Harrison

The New England Interstate Water Pollution Control Commission (NEIWPCC) has been working with USEPA's Office of Underground Storage Tanks (OUST) for over 25 years to enhance information sharing among state, territorial, and tribal UST, LUST, and Financial Responsibility programs. Funded through a cooperative agreement with USEPA OUST, NEIWPCC has been actively developing training opportunities since 2010. NEIWPCC is also pleased to report that UST programs have found training offerings to be very useful. Since June 2013, almost 500 people have attended five different NEIWPCC training events

NEIWPCC is excited to expand its training efforts into the world of State Funds and Financial Responsibility. On October 22–23, 2013, some 35 individuals from UST programs across the country met in Nashville, Tennessee, for a two-day workshop on “Fraud, Abuse, & Misuse of UST Funds.” Karen Stachowski, Tennessee Department of Environmental Conservation, and Kim Sellards, California State Water Resources Control Board, led the training and were joined by numerous speakers from both states. Topics on the agenda included: building a “red flag” list; creating an environment to detect and prevent fraud, abuse, and misuse; case development; and tailoring your agency's approach. Contact Jaclyn Harrison at jharrison@neiwpcc.org if you are interested in seeing this training repeated in the future.

A “Responsible Party (RP) Search Fundamentals” webinar was held on March 4, 2014 and over 150 people joined the live event. Nina Kondos, retired, Arizona Department of Environmental Quality, opened the webinar with an introduction to conducting RP searches and listing the various search resources available. Ruth Porter, West Virginia Department of Environmental Protection, went into more detail with case studies, discussing some of the interesting techniques they use in her office to contact RPs. NEIWPCC would like to continue offering webinars in this topic area. To share your training needs and ideas, contact Jaclyn Harrison at jharrison@neiwpcc.org.

Other classroom and webinar trainings offered since June 2013 include a “Corrosion Challenges Posed by Biofuels” webinar on June 20, 2013 with almost 250 people in attendance; “Region 7 Inspector Training” in Kansas City, Missouri, on October 9–10, 2013, with 25 in attendance; and “Region 10 Inspector Training” in Portland, Oregon, November 19–21, 2013, with 35 in attendance.

This will be a busy training year for NEIWPCC, so be on the lookout for more training offerings that enhance inspector efficiency, corrective action, and financial responsibility. In addition, NEIWPCC would like to continue offering training in responsible party searches and any topic that will be of use to state and Tribal UST programs. If you would like the opportunity to provide feedback and guidance on training needs, share your training needs and ideas, or if you are interested in seeing any of the previous training offerings repeated, contact Jaclyn Harrison, NEIWPCC's tanks program manager, at 978-349-2515 at jharrison@neiwpcc.org. For an upcoming training schedule, please visit <http://www.neiwpcc.org/ust/schedule.asp>. ■

Repurposing Penalties to Improve UST Operations

California UST Enforcement Goes Above and Beyond Mere Compliance...and Borders

by Ben McLernon and Mike Vizzier

In California the vast majority of underground storage tank (UST) annual inspections are done by Certified Unified Program Agencies or "CUPAs" that also enforce five other state environmental laws. The agencies are local, and certification is by Cal/EPA. Administrative penalties imposed by CUPAs are retained by the CUPAs, but can only be used to enforce CUPA programs. For the UST program, this restriction is even narrower—money can only be used to fund UST enforcement by the agency within that jurisdiction. (California Health and Safety Code section 25299(h).) Since violations of UST regulations carry a statutory minimum penalty of \$500 per violation per day, a big case can present the CUPA with a dilemma—what to do with the money.

The County of San Diego Department of Environmental Health's Hazardous Materials Division (HMD) is the CUPA for San Diego County. State law and policy allows CUPAs to offset a portion of assessed penalties in return for "supplemental environmental projects" (SEPs). Eligible projects must go above and beyond mere compliance. HMD makes frequent use of SEPs to help ensure that penalty money is put to a good use. In two large HMD UST enforcement cases, HMD has approved SEPs that addressed UST operations on a statewide or national (yes, national) basis, not just in San Diego County.

In a 2005 case against major oil companies (assisted by prosecutors), HMD allowed about \$2 million that would otherwise have been penalty money to be spent on tank system upgrades in San Diego County and about \$2 million more to be spent elsewhere in the state. The enforcement case addressed, among other

things, the issue of leak detection (float-type) sensors that had been raised above their proper locations in the system in order to prevent alarms (see Figure 1). The SEP money funded development and statewide use of a "position-indicating" leak detection sensor that would alarm if relocated.

The Con-way Freight Story

More recently, Con-way Freight Inc. (Con-way) owned a facility in Chula Vista, California, with a 15,000-gallon UST system. Con-way had stopped using the facility and leased the site to another business. They planned on eventually selling the property and the UST. The leaseholder was not using the UST, so Con-way requested temporary closure of the tank. HMD approved the temporary closure in January 2010 for one year per California UST regulations, and then for an additional year, expiring in January 2012.

After expiration of the second temporary closure period, California regulations require that the UST either be put back in operation or permanently closed. During a routine inspection for hazardous materials and hazardous waste management on July 18, 2012, the CUPA inspector observed that the UST owned by Con-way had been neither returned to service nor permanently closed. This was six months after the temporary closure status expired. Additionally, the last annual UST monitoring certification for the tank had been completed in November of 2010. The July 18, 2012, inspection report listed eleven UST violations and requested that corrective action be completed within 30 days.

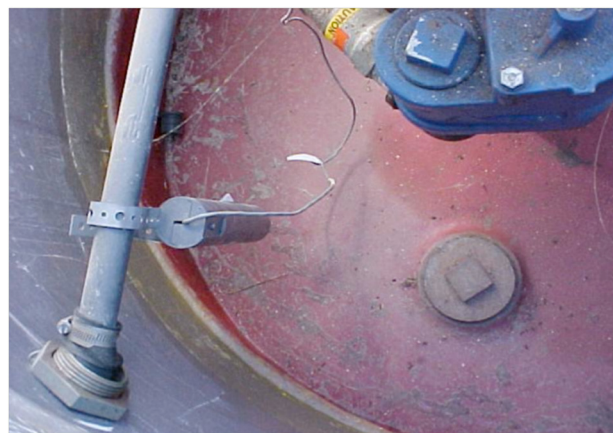


Figure 1. This sensor has been 'adjusted' so that its base is substantially elevated off the floor of the sump. This will delay the detection of a release and is counter to manufacturer's installation instructions and industry recommended practices.

The HMD inspector maintained contact with Con-way personnel to remind them of the need for compliance and encouraged them to submit evidence of corrective action. After 60 days, with only partial compliance, a Notice of Violation (NOV) was issued for nine remaining UST violations. These violations were not related to proper operation of the UST; Con-way had essentially abandoned the UST. Con-way had two corrective action options, either correct the violations and operate the UST or permanently close the UST. Con-way indicated that they intended to permanently close the tank. However, they failed to act in a timely manner and did not comply with the UST monitoring requirements and operating permit conditions until the UST was removed and permanently closed on November 11, 2012.

Con-way had been out of compliance for 11 months. The penalties for UST violations in California are \$500 to \$5000 per tank per day. HMD concluded that the appropriate penalty period would be from the date of the expiration of the temporary closure status until an application for a closure permit was submitted. In calculating an appropriate penalty the violations cited were counted as one because they stemmed from the act of not operating the UST. Using this approach, the potential penalties ranged from between a minimum

penalty of over \$100,000 to a maximum penalty of over \$1,000,000.

Effective Deterrence

It was decided that an administrative enforcement action was the appropriate enforcement option to resolve this violation. In the administrative enforcement process California law requires CUPAs to take into consideration the nature, circumstances, extent, and gravity of the violation, the violator's past and present efforts to prevent, abate, or clean up conditions posing a threat to the public health or safety or the environment, the violator's ability to pay the penalty, and the deterrent effect that the imposition of the penalty would have on both the violator and the regulated community when establishing a penalty amount in an administrative settlement.

The HMD considered that Con-way planned to sell the UST with the property; the UST's leak detection and containment of the UST were functional, and the UST was empty. The threat to public safety or the environment was minimal but Con-way was clearly in violation and failed to comply after multiple notices. Con-way understood HMD's position and both parties decided to enter into a Consent Order. It was agreed that an appropriate penalty was \$123,000 and that Con-way would also pay HMD's investigation costs of \$3,493.20.

It was also agreed that \$113,000 of the penalty was suspended if Con-way installed remote-alarming UST monitoring systems for approximately 170 of its fueling stations located throughout the United States. Con-way entered into a contract with a third-party vendor to provide continuous remote monitoring of all of its stations. The costs of that program were not documented, but are expected to far exceed the per-station allowance of about \$750 dollars. If Con-way failed to meet the conditions of the order within one year they would have to pay the \$113,000.

Enforcement with Added Value

CUPAs regularly and routinely conduct compliance inspections. The continual presence and knowledge

of the facility and its compliance history supports a flexible approach to environmental enforcement. When it is appropriate and effective, HMD considers suspending penalties if business uses that portion of the penalty in a manner that exceeds regulatory requirements and contributes to environmental protection as an effective path to compliance and environmental protection. Extending environmental protection beyond the border of San Diego County is a logical extension of this and in this case we were pleased that Con-way and HMD mutually agreed that suspending penalties that were used to enable expert monitoring of their UST leak detection systems throughout the United States was an appropriate resolution. ■

Ben McLernon and Mike Vizzier are with the San Diego County Department of Environmental Health's Hazardous Materials Division. They can be reached at michael.vizzier@sdcounty.ca.gov and Benjamin.McLernon@sdcounty.ca.gov.

A Note...

Laura Fisher
Chief, UST Leak Prevention
State Water Resources Control Board

The State Water Resources Control Board, Underground Storage Tank Program is pleased with the outcome of this enforcement case and the untiring efforts of the San Diego County Hazardous Materials Division.

While this is one of many enforcement cases here in California, this case is unique in that San Diego County was innovative in redirecting a significant portion of the financial penalties incurred by the defendant back into the defendant's underground storage tank infrastructure nationwide, thereby increasing environmental protection across many other states throughout the country.

This case in particular depicts how suspending a portion of incurred penalties in lieu of constructive and supportive action can be practical, effective, and highly advantageous.





What Do We Have Here?

An Inspector's Guide to Site Assessment at Tank Closure

Based off of the original 1990 publication, NEIWPCC has created a **brand new training video and companion booklet** that covers the nature of petroleum, site assessment at tank closure, inspection equipment, field observations and analysis, planning and decision-making, and site closure. It also covers the basics of sampling and handling soil and water for field testing and for transport to a laboratory for analysis.

Download Online for Free: www.neiwpcc.org/whatdowehavehere.asp

Hard Copy Price: \$10 per DVD with Companion Booklet



Mail Order Shipping Information:

Name: _____

Company: _____

Street: _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____

Email: _____

*includes S&H via U.S. Media Mail

Credit Card Information:

Type (circle one):

Credit Card No: _____

Exp. Date: ____/____/____ Amount: \$ _____

Cardholder Name: _____

Signature Required: _____

Checks Made Payable to: **NEIWPCC**

Mail Order Form and Payment to:

NEIWPCC
650 Suffolk Street, Suite 410
Lowell, MA 01854

Fax to:
978-323-7919

Scan and Email to:
mail@neiwpcc.org

A Message from Carolyn Hoskinson

Director, USEPA's Office of Underground Storage Tanks



Choices: The Good, the Difficult

We make hundreds of choices every day. Get up when the alarm sounds or hit the snooze button and sleep for a few more minutes? Wear a solid blue shirt or a green striped sweater? Slip into the brown loafers or the black boots? And so we begin another day of making choices and decisions, most of which—we think—are good ones. Many of our choices are automatic; others are voluntary and require thought.

In the underground storage tanks (UST) program, we make choices. We thoughtfully and carefully consider the perspectives of our UST partners and the effects of our choices on our partners. We must also ensure our choices fit within the scope of the UST program's legislation and regulations.

We are all well aware that as the budget trend continues downward, federal and state financial resources become increasingly precious. Staffing reductions and the inability to backfill vacancies are making our time increasingly precious. Nonetheless, we must continue to pursue our overarching mission and goals of preventing UST releases and cleaning up those that have already occurred. In order to do that, we must make difficult choices and focus our limited resources on the most promising areas of the UST program.

Connecting with government and industry colleagues is an important part of my job and a part that I particularly enjoy. I appreciate hearing others' experiences and thoughts about the UST program. Many *LUSTLine* readers participated in the extensive stakeholder outreach USEPA did to develop the proposed revisions to the UST regulations. Many of you submitted extremely helpful comments on the proposal. Indeed, we are continuing to incorporate all the insightful input we received as we move forward with developing the final UST regulations.

At last year's National Tanks Conference in Denver, many of you accepted my invitation to talk with me about your thoughts and perspectives on where you think we should focus the UST program's efforts going forward. As you might expect, the ideas shared covered a wide spectrum of choices, which I found quite interesting. Here are some of the ideas I heard.

- **Focus on financial responsibility and enforce it**
If private insurers and state fund managers have a financial

interest, they will ensure their clients prevent releases. This means there will be a reduced need for other resources, such as those from the government, to oversee prevention efforts.

- **Ensure UST owners and operators are being trained and retrained** This will provide owners and operators with necessary skills to properly operate and maintain their UST systems. It will also give them the skills they need to make their businesses better overall.
- **Incorporate increased technological expectations for UST systems** Technology today is significantly better than when leak rates were originally set in the 1988 UST regulations. Move the bar higher to require that UST system requirements keep pace with today's technology.
- **Foster sharing institutional program knowledge** Develop a systematic way for experienced people in the UST program to share their knowledge with people who are newer to the program.

Keep sharing! I love it. One of the most impressive things for me about the community of folks who work in the UST world is the passion we all have for what we do. When you share your ideas with us at USEPA, our work is richer for it. I've also seen the excitement between different stakeholders in the UST community when you share your ideas with each other. Of course, we can't do everything we wish we could; but with your input, we can carefully balance competing demands on our time and our decreasing budget. Ultimately, our choices and decisions are informed by what we think will make the greatest strides in achieving our mission of preventing and cleaning up UST releases.

USEPA's Office of Underground Storage Tanks began in 1985 with a great tradition of soliciting input from varied UST partners and earnestly taking it to heart. Over the years, I believe we have maintained that tradition. When we are together at state or tribal meetings, or when we gather at the National Tanks Conference, or when you are in the area and come by our offices for a visit, please continue to give me your input; your ideas help us make well-informed and carefully thought out choices about the UST program's future. ■

Field Notes

from Robert N. Renkes, Executive Vice President, Petroleum Equipment Institute (PEI)

Sulfur in Gasoline: How Low Can We Go?

Most LUSTLine readers are aware that a 15 parts per million (PPM) sulfur specification, known as Ultra Low Sulfur Diesel (ULSD), was phased in for highway diesel fuel from 2006 to 2010. Diesel engines equipped with advanced emission control devices (generally, 2007 and later model year engines and vehicles) must use ULSD fuel. As a result, exhaust emissions from these engines are decreased by more than 90 percent. And that is a good thing.

It was anticipated that the change to ULSD would impact lubricity, energy content, materials compatibility, and microbial growth. However, accelerated and increased corrosion of diesel storage equipment was not foreseen as a likely outcome. But, as we are all painfully aware, severe and rapid corrosion has been observed in systems storing and dispensing ULSD since 2007.

Now let's turn to gasoline. Under USEPA's existing Tier 2 standards, the vehicle standard for sulfur in motor gasoline was lowered in stages down to an average of 30 ppm with an absolute cap of 80 ppm in 2006, from the previous standard of 300 ppm, a 90 percent reduction. But in an effort to increase the effectiveness of the catalytic converter, which eliminates nitrogen oxides, hydrocarbons, and carbon monoxide, the new Tier 3 standards for gasoline sulfur content will reduce sulfur in gasoline even further. The new standards, which allow federal gasoline to contain no more than 10 ppm sulfur on an annual average basis by January 1, 2017, were finalized on March 3, 2014.

Talking to tank owners and contractors in the field, there were no adverse consequences to equipment when the country moved from 300 to 30. But what will

happen when we move from 30 to 10? Has the question been asked? Has the effect on equipment been studied? Do the people proposing the sulfur reduction in gasoline know about the industry's ULSD experience? Or are we just going to cross our fingers, hope for the best, and deal with it if equipment that stores 10 ppm sulfur gasoline also starts to corrode more quickly.

More questions than answers at this point.

Second Edition of Recommended Practices for the Installation of Marina Fueling Systems Now Available

The second edition of PEI's *Recommended Practices for the Installation of Marina Fueling Systems* (PEI/RP1000-14) is now available from PEI. The 2014 edition supersedes and replaces the 2009 edition of RP1000.

The 26-page manual provides authoritative guidance on how to deal with the challenges of constructing safe, environmentally protective marina fueling facilities that will allow reliable and economical service for many years. Several substantive changes were made in the 2014 edition, including revisions to the text and a diagram describing special requirements for underground and aboveground piping systems at marinas. Many editorial changes also were made that improve the readability of the document.

PEI has replenished the paper copies of the recommended practices destroyed in the recent fire at the PEI office building. Copies of all recommended practices published by PEI—paper or electronic—can be ordered online at www.pei.org/shopping. Price for members is \$40; nonmembers, \$95. ■

USEPA Sets Cleaner Fuel and Car Standards

On March 3, 2014, the USEPA finalized its Tier 3 rule on new emission standards for cars and setting new standards for gasoline. The new standards for vehicles and fuels will work together and are expected to quickly and effectively cut harmful soot, smog, and toxic emissions from cars and trucks. The gasoline standard will reduce gasoline sulfur levels by more than 60 percent—down from 30 to 10 parts per million (ppm) in 2017. According to USEPA, reducing sulfur in gasoline enables vehicle emission control technologies to perform more efficiently. New low-sulfur gas will provide significant and immediate health benefits because every gas-powered vehicle on the road built prior to these standards will run cleaner—cutting smog-forming NOx emissions by 260,000 tons in 2018.

The standards are based on input from a broad range of groups, including state and local governments, auto manufacturers, emissions control suppliers, refiners, fuel distributors and others in the petroleum industry, renewable fuels providers, health and environmental organizations, consumer groups, labor groups, and private citizens.

To meet the cleaner gasoline standards necessary to reduce tailpipe emissions and protect public health, the agency has built in flexibility and adequate time for refiners to comply. For those refineries that may need it, the program would provide nearly six years to meet the standards. To provide a smooth transition for refiners to produce cleaner gasoline, the program is structured in a way that allows the industry to plan any additional investments needed. In addition, the agency is giving special considerations to small refiners, while offering provisions for compliance assistance in the case of extreme hardship or unforeseen circumstances. ■

FAQs from the NWGLDE

...All you ever wanted to know about leak detection, but were afraid to ask.

2013: The 20th Anniversary of the NWGLDE

In this LUSTLine FAQs from the National Work Group on Leak Detection Evaluations (NWGLDE), the NWGLDE answers some questions related to its 20th anniversary. Note: The views expressed in this column represent those of the work group and not necessarily those of any implementing agency.

Q. What was the impetus for forming the NWGLDE?

A. The USEPA UST regulations that became effective December 22, 1998, required most UST leak detection equipment to detect either a 0.1 gph leak (annual test), or a 0.2 gph leak (monthly test) with a 95% probability of detection and a 5% probability of false alarm by no later than December 22, 1990. UST system owners and operators are required to meet any performance claims, and their manner of determination must be described in writing by the equipment manufacturer or installer.

Leak detection equipment manufacturers typically demonstrate that they meet established performance requirements by evaluating their equipment in accordance with USEPA protocol or equivalent protocol. Each USEPA protocol includes a discussion on how manufacturers can demonstrate that their leak detection equipment meets USEPA performance standards.

After review of the USEPA discussion, Curt Johnson (Alabama UST Program) was concerned that manufacturers were allowed to perform their own evaluations—only “encouraged” to perform third-party evaluations—and that no one was named to review the evaluations to ensure proper performance in accordance with the protocol requirements. As a result, Alabama began reviewing evaluations and immediately found one evaluation that had been performed directly by the equipment manufacturer, and several others that had not been properly evaluated.

Johnson soon learned that Alabama was not the only state reviewing evaluations and finding problems with them. It occurred to him that the formation of an evaluation-review work group, made up of members from other states that review evaluations, would eliminate a duplication of effort, as well as provide a list of reviewed evaluations that could be used by all states. Curt attended a USEPA regional meeting that Lisa Lund, Director of USEPA's Office of Underground Storage Tanks at that time, also happened to attend. He discussed the idea with her and was encouraged to write down the idea so that she would be able to consider it when she returned to Washington.



Curt wrote down the idea for a national work group, submitted it to Lisa Lund who approved the idea. The result was the first official meeting of the NWGLDE held on June 4, 1993 in Kansas City, Missouri.

Q. What have been the most significant accomplishments of the NWGLDE in the past 20 years?

A. The first significant accomplishment of the NWGLDE was the issuance of the first edition of the list. It was a daunting task because there were so many evaluations that had already been performed to meet the USEPA December 22, 1990, deadline. It took almost two and a half years to complete the First Edition List of Leak Detection Evaluations for Underground Storage Tank (UST) Systems, which was issued November 8, 1995. On January 31, 2013, the NWGLDE issued its 20th Edition List of Leak Detection Evaluations for Underground Storage Tank (UST) Systems.

Users of the NWGLDE List may not realize that the Work Group still issues “editions” of the list (see the “Downloads” at NWGLDE.org), since the NWGLDE established a website that continuously updates NWGLDE listings. The establishment of this website at NWGLDE.org was another major Work Group accomplishment, making the NWGLDE listings of leak detection equipment readily available to all interested parties in this country, as well as those interested in other countries around the world.

Prior to the NWGLDE website, distribution of NWGLDE listings was hit or miss because it depended initially on sending out copies of each edition of the list by e-mail, snail mail, and later

FAQs... continued from page 22

posting an electronic copy on a very hard to find location on USEPA's website. Since these editions were updated only annually in January of each year, by December of the following year, there were many additions and revisions to the list that remained unpublished for up to 12 months prior to the issuance of the next edition of the list.

Another significant accomplishment was the NWGLDE evolving into a work group that not only reviews third-party evaluations of leak detection equipment, but also reviews new protocols and new revisions to existing protocols to ensure they are at least as stringent as the original group of USEPA protocols. The resulting list of protocols that have been found to be acceptable by the NWGLDE can be found under "Protocols" on the website.

Probably the most significant NWGLDE accomplishment of all was gaining the respect of the UST regulatory community as well as the UST leak detection industry in not only this country, but in many other countries in the world that consider our list as the authority on whether or not underground storage tank leak detection equipment has been properly evaluated.

Q. *How many members did the NWGLDE have in the last 20 years; who were they; and with whom were they affiliated?*

A. The original work group consisted of 11 members—Curt Johnson (Alabama), Lamar Bradley (Tennessee), Mike Kadri (Michigan), Russ Brauksiek (New York), Harold Scott (USEPA Region 10), Beth DeHaas (Maine), Shahla Farahnak (California), Randy Nelson (USEPA Region 7), Allen Martinets (Texas), David Wiley (USEPA OUST), and Tony Ritcherson (Alabama). Members were added as others needed to leave the WG.

The members that were added and since left the NWGLDE are Ellen Van Duzee (USEPA Region

10), Jennifer Bravinder (USEPA Region 9), Scott Bacon (California), Jeff Tobin (Montana), Bill Fagert (USEPA OUST), Anton Roszypal (Texas), John Kneee (South Carolina), Tom Springer (Oklahoma), Jon Reeder (Manatee County, Florida), Edward Olson (Minnesota), Mark Lenox (Missouri), John Cernero (USEPA Region 6), and Sharon Sadlon (Alaska).

Current members of the NWGLDE are Curt Johnson, Chair (Alabama), Lamar Bradley, Vice Chair (Tennessee), Greg Bareta (Wisconsin), Mike Juranty (New Hampshire), Bill Moore (Utah), Marcia Poxson (Michigan), Shaheer Muhanna (Georgia), Helen Robbins (Connecticut), Peter Rollo (Delaware), Tim Smith (USEPA OUST), and Heather Peters (Missouri). The only original members still on the NWGLDE are Curt Johnson and Lamar Bradley. The only member who has been on the Work Group continuously since its inception is Curt Johnson, and to date has been the only Chair of the Work Group. ■

About the NWGLDE

The NWGLDE is an independent work group comprising eleven members, including ten state and one USEPA member. This column provides answers to frequently asked questions (FAQs) the NWGLDE receives from regulators and people in the industry on leak detection. If you have questions for the group, contact them at questions@nwglde.org.

NWGLDE's Mission

- Review leak detection system evaluations to determine if each evaluation was performed in accordance with an acceptable leak detection test method protocol and ensure that the leak detection system meets EPA and/or other applicable regulatory performance standards.
- Review only draft and final leak detection test method protocols submitted to the work group by a peer review committee to ensure they meet equivalency standards stated in the U.S. EPA standard test procedures.
- Make the results of such reviews available to interested parties.

**L.U.S.T.LINE Subscription Form**

Name _____ Company/Agency _____

Mailing Address _____ Email Address _____

One-year subscription: \$18.00

☐ **Federal, state, or local government:** Exempt from fee. (For home delivery, include request on agency letterhead.)

Please enclose a check or money order (drawn on a U.S. bank) made payable to NEIWPCC.

Send to: **New England Interstate Water Pollution Control Commission** Wannalancit Mills, 650 Suffolk Street, Suite 410, Lowell, MA 01854

Phone: (978) 323-7929 ■ Fax: (978) 323-7919 ■ lustline@neiwppcc.org ■ www.neiwppcc.org

L.U.S.T.LINE Index

Aug. 1985/Bulletin #1 -
June 2013/Bulletin #73

Download the Index at
www.neiwppcc.org/lustline/
and then click
LUSTLine Index.

L.U.S.T.LINE

New England Interstate Water
Pollution Control Commission
Wannalancit Mills
650 Suffolk Street, Suite 410
Lowell, MA 01854

Non-Profit Org.
U.S. Postage
PAID
Wilmington, MA
Permit No.
200



Toso and Devaull Honored at the September 2013 National Tanks Conference in Denver

Friends, colleagues, and past winners of the Tanks Conference Poster Session Lifetime Achievement Award (shown L to R: Bruce Bauman, API; Ellen Frye, *LUSTLine*; John Wilson, USEPA ORD; George Devaull, Shell; Robin Davis, Utah DEQ; Jeff Kuhn, Montana DEQ)

gathered in Denver to honor Mark Toso of the Minnesota Pollution Control Agency and George Devaull of Shell Global Solutions. George Devaull (holding award) received the award for his contributions to understanding the role of aerobic biodegradation on transport of vapors at LUST sites. Mark Toso (inset) received the award for his work on sites with lead scavenger contamination and biofuels releases, both biodiesel and ethanol-blended gasoline. ■