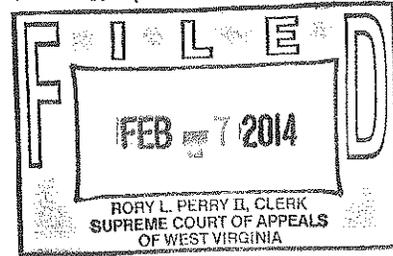


IN THE SUPREME COURT OF APPEALS OF WEST VIRGINIA
Upon Original Jurisdiction

No. 14-0112



STATE OF WEST VIRGINIA
ex rel. COVENANT HOUSE,
WEST VIRGINIA COALITION
AGAINST DOMESTIC VIOLENCE,
MONIQUE WATKINS, and
VIRGINIA GARDNER,

Petitioners,

v.

RANDY C. HUFFMAN, Secretary of the West Virginia
Department of Environmental Protection,
LETITIA TIERNEY, Commissioner of the Bureau for Public Health,
and KAREN L. BOWLING, Secretary of the West Virginia
Department of Health and Human Resources,

Respondents.

APPENDIX

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Counsel for Petitioners

CERTIFICATION

I, Jennifer Wagner, counsel for the Petitioners, certify that the contents of this appendix are true and accurate copies of the original documents, and that the appendix as a whole is sufficient to permit the Court to fairly consider the questions presented in the petition.



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Counsel for Petitioners

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COMPLAINT INVESTIGATION FORM
Department of Environmental Protection
Air Quality

Complaint Number:
CH-2014-0193

Assigned to Baucle, Dan

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|----------|---|----------------|------------|
| Source : | Pennzoil-Quaker State Company, Char/ton/Etowah Te | Facility/City: | CHARLESTON |
| County: | Kanawha | Source ID: | 039-00035 |
| | | Filed: | |

Source Address: ETOWAH TERMINAL

 County: Kanawha

 Contact: _____
 Phone: _____

Date & Time of Complaint: 1/9/2014 08:16:00
 Cause: Odor
 Who took call: HAMMONDS, STEPHANIE NM
 Date & Time of Occurence: 01-09-2014 EACH MORNING

CONFIDENTIAL

Anonymous REGION:
 Address: 'XXXXXX' Phone: () - () -
 Anonymous Email: 'XXXXXX'
 Comm: 'XXXXXX'

- Applicable regulations
- AIR Programs
- Regulated Pollutants

Nature of Complaint:

PLEASE SEE ATTACHED EMAIL FROM STEPHANIE HAMMONDS DATED 1/9/14.

SOMETHING IN THE AIR AT THE 77-79 SPLIT EACH MORNING WHEN COMPLAINANT COMES INTO WORK. COMPLAINANT SAID IT IS COATING HIS WIFE'S THROAT.

Resolution

Post Office: CHARLESTON

Location: 77-79 SPLIT IN CHARLESTON.

Weather Conditions

Temp: _____ Sky: _____ Wind: _____

Assigned 1/9/2014 00:00:00

Printed 1/13/2014

Printed by Spradling, Wanda (O&Q)

COMPLAINT INVESTIGATION FORM

Department of Environmental Protection

Air Quality

Complaint Number:

CH-2010-0261

Assigned to Kolb, Michael D

| | | | |
|---------|---|----------------|------------|
| Source: | Pennzoil-Quaker State Company, Charleston/Etawah Tc | Facility/City: | CHARLESTON |
| County: | Kanawha | Source ID: | 039-00035 |
| | | Filed: | |

Source Address: ETOWAH TERMINAL Date & Time of Complaint: 4/7/2010 14:13:00 Cause: Odor

County: Kanawha Who took call: SPRADLING, WANDA E

Contact: _____ Date & Time of Occurrence: _____

Phone: _____ 04-06-2010 ONGOING

CONFIDENTIAL

Anonymous REGION:
Address: 'XXXXXX' Phone: () - () -
Anonymous Email: 'XXXXXX'
Comm: 'XXXXXX'

Applicable regulations
AIR Programs
Regulated Pollutants

Nature of Complaint:

COMPLAINING OF AN ODOR THAT SMELLS LIKE "LICORICE". LEAVES BAD TASTE IN YOUR MOUTH. THINKS THE ODOR IS COMING FROM THE OLD PENN OIL PLANT ON BARLOW DRIVE.

COMPLAINANT SMELLS THE ODOR FROM HIS HOUSE ON KEYSTONE DRIVE BUT HE WAS AT HIS BROTHER'S _____ YESTERDAY EVENING AND SMELLED ODOR THERE AS WELL. WANTS SOMEONE TO CHECK IT OUT.

Resolution

Post Office: CHARLESTON

Location: THE OLD PENN OIL PLANT ON BARLOW DRIVE - CHARLESTON.

Investigation Date: 4/12/2010 00:00:00 Status: Terminated Date Form provided to Complainant

Contact: Roger Arthur Phone: 3047208063

Comments: On April 12 2010 @ 4:00 pm I went to said facility and did smell a slight odor. On 04/13/2010 Robert Keatley and myself went to the facility and requested an MSDS sheet for the product causing the odor. Once back at the office we found out that a permit determination was not completed for this product. I called the complainant @ 3:19 pm and left a message. On May 5, 2010 forms were taken to the facility and given to Roger Arthur (Facility Manager) and asked him to complete permit determination forms for any product on site that was not in the first determination. He said he will start on it the next day. On May the 10th the company came in to review files and to complete the said forms. No further action at this time but we will need to see what comes out of the determinations. The MSDS will be placed in the company file.

Weather Conditions

Temp: _____ Sky: _____ Wind: _____

Assigned 4/7/2010 00:00:00

Printed 1/13/2014

Printed by Spradling, Wanda (OAQ)



January 10, 2014

DEP cites Freedom Industries for chemical spill

by Ken Ward Jr.
Staff writer

CHARLESTON, W.Va. -- When state inspectors arrived at Freedom Industries late Thursday morning, they discovered that the company had so far taken "no spill containment measures" to combat a chemical spill that has put drinking water supplies off-limits for hundreds of thousands of residents.

The state Department of Environmental Protection said that Freedom Industries violated both the state's Air Pollution Control Act and the Water Pollution Control Act by allowing the chemical "Crude MCHM," consisting mostly of 4-methylcyclohexanemethanol, to escape its facility, just upstream from West Virginia American Water's regional intake.

DEP officials have said that between 2,000 gallons and 5,000 gallons of the material leaked from a hole in a storage tank. A concrete block dike, meant to serve as secondary containment, also leaked, allowing an undetermined amount of the chemical into the Elk River.

"It's a bad situation," said Mike Dorsey, chief of DEP's homeland security and emergency response division.

Dorsey said that tank contained about 30,000 gallons of material at the time of the leak, and that the company had pumped the rest of the material out and shipped it to another of its operations.

Dorsey has said that DEP officials began an investigation after receiving odor complaints from nearby residents starting at about 8:15 a.m. Both DEP officials and Kanawha County emergency officials traced the odors to Freedom Industries, which had not self-reported any sort of leak or accident, officials said.

In an air quality enforcement order, DEP said that air quality officials who arrived at the site at 11:10 a.m. "discovered that no spill containment measures had been initiated and that an accumulating MCHM leak pool was seeping thru a dike wall adjacent to the Elk River and a downstream oil sheen was observed."

DEP Secretary Randy Huffman said more information needs to be gathered, but that it seems possible that the spill into the river might not have been as bad if Freedom Industries had acted more quickly.

"Depending on when they knew [about the leak], had they put containment measures in place the instant they knew, it's logical to deduce that there wouldn't have been as much product in the stream," Huffman said.

Huffman said that DEP plans to issue a third enforcement order which requires the company to removal all materials from all of the tanks at the operation, because of problems with the facility's secondary containment.

"Everything in that tank farm is going to have to be removed," Huffman said.

Air quality inspectors cited Freedom Industries for violating a state regulation that says, "No person shall cause, suffer, allow, or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public."

The company was ordered to provide a "detailed explanation" of what happened, how long the violation existed, and what remedial measures the operation plans to take.

DEP water quality officials cited the company, saying the spill had created "conditions now allowable in the Elk River by creating odors in the vicinity of state waters, by requiring an unreasonable degree of treatment of state waters, and by creating a sheen on the surface of the water."

APP000003



January 13, 2014

DEP inspectors describe early scene at Freedom leak site

by Ken Ward Jr.
Staff writer

CHARLESTON, W.Va. -- When state inspectors arrived at the Freedom Industries tank farm late last Thursday morning, they found a 400-square-foot pool of clear liquid had collected outside a white tank marked as number 396.

A 4-foot wide stream of the liquid -- thicker than water, but not as heavy as syrup -- was flowing across the bottom of a containment dike. The flow disappeared right at the joint where the dike's wall connected to its floor.

Frontier Industries had set up one cinder block and used one 50-pound bag of some sort of safety absorbent powder to try to block the chemical flow, state Department of Environmental Protection inspectors say.

"This was a Band-Aid approach," said DEP air quality inspector Mike Kolb. "It was apparent that this was not an event that had just happened."

In an interview Monday with The Charleston Gazette, Kolb and DEP air quality engineer Dan Bauerle described discovering the leak of "Crude MCHM" that fouled the drinking water supply that serves hundreds of thousands of West Virginians.

Kolb and Bauerle provided new details of what they found at the site, and also revealed that the facility had been the subject of at least one odor complaint "several years ago" that DEP officials determined at the time was unfounded.

In public briefings so far, DEP officials have explained that the Elk River leak last week was identified only after they received odor complaints from area residents at about 8:15 a.m. Thursday.

When those complaints -- and notice of the odor from two different DEP employees -- came in to the agency's Kanawha City headquarters, Kolb and Bauerle were dispatched to investigate. They discovered odors that rated as "objectionable" under state standards at spots where Bigley Avenue intersects Westmoreland Drive and Pennsylvania Avenue.

Based on the smell, the pair say, they suspected something had happened at Freedom Industries.

While DEP has said it hasn't inspected the site since 1991, when it was owned by Pennzoil, Kolb and Bauerle said Monday that the agency had looked into a previous odor complaint at the site and another odor complaint in St. Albans related to a company called Diversified Services, which handles shipping of materials for Freedom Industries.

Kolb and Bauerle arrived at the operation shortly after 11 a.m. In the parking lot, they met Kanawha County fire coordinator C.W. Sigman, whose office was also looking into residents' odor complaints.

The DEP officials went to the office, where Dennis P. Farrell, who identified himself as president of the company, greeted them. They told Farrell about the odors and asked if the facility was having any problems.

"He said as far as he knew this was a busy time of year. They were just handling a lot of trailers," Kolb said. "As far as he knew, there weren't any problems."

The DEP officials asked Kolb to show them around the facility. When they went outside, an employee asked to speak to Farrell. After that conversation, Farrell told the DEP officials there was a problem, and led them to tank 396.

APP000004

There, the DEP officials said, they found a 400-square-foot pool of chemical that had leaked from the tank into a block containment area. Pressure from the material leaking out of the tank created what DEP officials called an "up-swelling," or an artesian well, like a fountain of chemical coming up from the pool.

They saw a 4-foot-wide stream of chemicals heading for the containment area's wall, and disappearing into the joint between the dike's wall and floor.

Initially, no one saw the chemical pouring into the Elk River. DEP officials say that part of the river still had a layer of ice on top, which made the spill difficult to notice.

Once the DEP officials saw the leak though, they called their superiors and got DEP's emergency response, water pollution and hazardous materials crews headed to the site.

In one enforcement order, DEP officials allege that the company had taken "no spill containment measures" prior to agency staffers arriving at the site and discovering the leak.

"The facility did not give any real attention to containment," Bauerle said.

State and county officials have described the Freedom facility's spill containment dike as full of cracks and holes.

"It's a very old dike," Sigman said. "If it had been my home's foundation, I would be concerned."

DEP emergency response director Mike Dorsey has said he learned the company at some point had put \$1 million into an escrow account for repairs. It's not clear when that account was created or what -- if any -- timeline Freedom officials had for the fixes.

But questions continue about how Freedom's problems received no attention from regulators prior to the leak.

DEP Secretary Randy Huffman has said that the facility fell through the cracks. It made no chemicals on site, Huffman said, and was not regularly inspected because it only stored and shipped products.

But DEP officials have given the facility a storm water plan, under a "general permit" program that is less rigorous than obtaining a site-specific pollution permit.

Under the permit, the company was required to have a spill prevention plan and to immediately report potentially dangerous spills to the state. DEP had authority to inspect the site to ensure compliance with the period.

DEP officials, though, say that Freedom Industries didn't report the leak to them until 12:05 p.m. Thursday, and even then did so only because DEP officials told them they had to do so.

"Freedom Industries was explicitly required to report the spill immediately to DEP," said Jennifer Chavez, a lawyer with the group Earthjustice. "The company's failure to do so was a violation of its storm water permit."

At the federal government's National Response Center, which takes reports of hazardous material spills around the country, a report is on file about the incident. But officials there say it didn't come from Freedom Industries or from West Virginia American Water. Instead, National Response Center staff typed up the report based on local media reports pulled from the Internet.

On Monday, U.S. Attorney Booth Goodwin issued a second statement, repeating his promise of a criminal investigation, and said the probe would include issues about the company's compliance with chemical accident reporting laws.

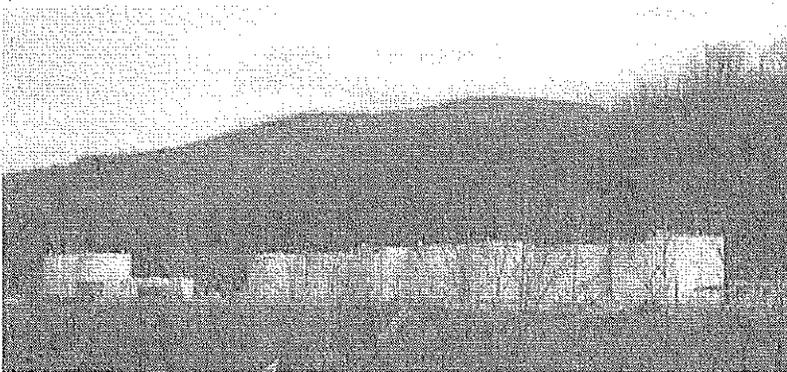
"As the immediate water crisis begins to ease and West Virginians regain access to drinkable water, I want to make three things clear," Goodwin said.

"One, my office will continue working as quickly as possible to find out exactly what happened here, including the complete timeline of the release and what was done -- or not done -- before and after it," he said. "Two, if our investigation reveals that federal criminal laws were violated, we will move rapidly to hold the wrongdoers accountable. And three, companies whose facilities could affect the public water supply should be on notice: If you break federal environmental laws, you will be prosecuted. Our drinking water is not something you can take chances with, and this mess can never be allowed to happen again."

Reach Ken Ward Jr. at kw...@wv Gazette.com or 304-348-1702.

The Freedom Industries Spill

Lessons Learned and Needed Reforms



Photos: Marc Glass.

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**Downstream
Strategies**
building capacity for sustainability



January 20, 2014

The Freedom Industries Spill: Lessons Learned and Needed Reforms

Evan Hansen, Marc Glass, Ben Gilmer, Angie Rosser

ABOUT THE AUTHORS

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Marc Glass, Principal, Monitoring and Remediation Program, Downstream Strategies. Mr. Glass manages projects involving field monitoring of air, surface water, groundwater, soil, and indoor environments. During his more than 14 years of consulting experience, his work has focused on investigating the environmental fate and transport of petroleum hydrocarbons, chlorinated solvents, heavy metals, polychlorinated biphenyls, and other environmental contaminants. He is a West Virginia Licensed Remediation Specialist.

Ben Gilmer, M.S., Project Manager, Downstream Strategies. Mr. Gilmer is a geographer with 10 years of experience. He has specialties in geographic information systems, decision support systems, environmental modeling, and water resource management. He has served as the environmental and geographic information team lead for habitat modeling, water management, and climate change adaptation projects in the United States, Latin America, Asia-Pacific, and the Caribbean.

Angie Rosser, M.A., Executive Director, West Virginia Rivers Coalition. Ms. Rosser directs the West Virginia Rivers Coalition, a statewide nonprofit organization focused on water quality issues. Angie has 18 years of experience working on social and environmental justice issues in West Virginia. She specializes in policy advocacy, statewide organizing, and strategic communications. Angie resides along the Elk River in Clay County, West Virginia and dedicates her work to advocating for fishable, swimmable, and drinkable West Virginia rivers and streams.

This report was supported with funding from the Virginia Environmental Endowment.

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KEY FINDINGS AND RECOMMENDATIONS

On January 9, 2014, the West Virginia Department of Environmental Protection received an odor complaint for the Freedom Industries Etowah River Terminal site—a bulk storage distribution center holding thousands of gallons of chemicals along the Elk River, approximately 1.5 miles above the drinking water intake for West Virginia American Water’s treatment plant. West Virginia American Water supplies drinking water to a nine-county area, including Charleston. MCHM and other chemicals are stored at this site.

The vigor with which elected officials, agency heads, and members of the Legislature seek to protect human health and the environment underlies the findings of this report. In recent years, the tone of many of our state leaders has been clear—too much regulation and too much involvement by the United States Environmental Protection Agency. Any serious recognition of the link between protecting the environment and promoting a healthy, diversified economy is often lost.

Clean Water Act

Freedom Industries holds a West Virginia/National Pollutant Discharge Elimination System permit under the Clean Water Act—a registration under the state’s general multi-sector industrial stormwater permit. WVDEP issues and enforces these permits. This permit includes many items related to spills. It also requires immediate reporting of noncompliance that may endanger health or the environment.

Recommendations:

- ***Elected officials, agency heads, and members of the Legislature should change their tone and expectations to hold the West Virginia Department of Environmental Protection accountable for fully and consistently enforcing its permits and all environmental laws.***
- ***The governor and Legislature should require that the West Virginia Department of Environmental Protection inspect all National Pollutant Discharge Elimination System-permitted sites, and should immediately inspect the most critical sites.***
- ***The governor and Legislature should prohibit coverage under the general multi-sector industrial stormwater permit for facilities that are located in zones of critical concern, upstream from public water supply intakes.***
- ***The governor and Legislature should require additional permit conditions for facilities such as the Freedom Industries site.***
- ***The governor and Legislature should increase funding and staffing for the West Virginia Department of Environmental Protection’s National Pollutant Discharge Elimination System and environmental enforcement programs.***

Safe Drinking Water Act

The West Virginia Bureau for Public Health wrote a Source Water Assessment Report for West Virginia American Water's Charleston system in 2002. According to this report, the system is highly susceptible to contamination. The report delineates a zone of critical concern—a corridor along the Elk River and its tributaries that warrant more detailed management because spills that occur in this zone would reach the public water supply intake very quickly. Approximately 50 potential significant contaminant sources were identified in this zone, including the Freedom Industries site.

While the Source Water Assessment Report was an important first step, it simply presents information. A Protection Plan is needed to develop protective strategies in order to minimize the risk of contamination of the water supply. Such a plan should include contingency planning, alternative sources, and management planning. No Protection Plan for this facility appears to have been written.

Recommendations:

- ***WVBPH should update Charleston's Source Water Assessment Report, and all Source Water Assessment Reports across the state.***
- ***The governor and Legislature should mandate that the West Virginia Bureau for Public Health or other appropriate state or local entities write Protection Plans and should provide for funding.***
- ***The governor and Legislature should provide for state-specific protective standards for chemicals used in large quantities in West Virginia.***
- ***Local emergency planning committees should carefully review Source Water Assessment Reports and take all necessary actions.***

Emergency Planning and Community Right-To-Know Act

The Emergency Planning and Community Right-to-Know Act helps communities plan for emergencies involving hazardous substances. It requires hazardous chemical emergency planning by federal, state and local governments, Indian tribes, and industry. It also requires industry to report on the storage, use and releases of hazardous chemicals to federal, state, and local governments.

Freedom Industries filed Tier Two Emergency and Hazardous Chemical Industry forms in recent years, which specifically listed MCHM along with 16 other chemicals since 2007. These forms list MCHM as being an "immediate (acute) physical and health hazard" and note the quantity of MCHM stored onsite: between 100,000 and 999,999 pounds on an average daily and maximum daily basis.

Recommendations:

- ***The governor and Legislature should support local emergency planning committees and local governments in their planning efforts to manage and minimize risk.***
- ***Local emergency planning committees should utilize the information submitted on Tier Two forms to manage and minimize risk.***

1. INTRODUCTION

On January 9, 2014 at 8:16 AM, the West Virginia Department of Environmental Protection (WVDEP) received an odor complaint (WVDEP, 2014a) for the Freedom Industries Etowah River Terminal¹ site—a bulk storage distribution center holding thousands of gallons of chemicals along the Elk River, approximately 1.5 miles above the drinking water intake for West Virginia American Water's (WVAW's) treatment plant (See Figure 1) (WVDEP, 2014b and c). WVAW supplies drinking water to a nine-county area, including Charleston.

The site includes three above-ground storage tanks containing MCHM and 11 additional tanks that contain materials with the potential to cause harm to human health and the environment (WVDEP, 2014c). According to the most recent Tier Two Emergency and Hazardous Chemical Industry form filed for the site, MCHM was stored in two tanks at the facility. This form also lists nine additional chemicals that were stored onsite in reportable quantities in 2012 (Etowah River Terminal, 2013).

In responding to the odor complaint, WVDEP discovered that 4-methylcyclohexane methanol (4-MCHM) had leaked from above-ground storage tanks, breached the secondary containment, and entered the Elk River (WVDEP, 2014 a and b). In more recent communications, the term "crude MCHM" has been used to describe the chemical that has leaked. According to its Material Safety Data Sheet, crude MCHM is a mixture of water plus six chemicals:

- 4-MCHM,
- 4-(methoxymethyl)cyclohexanemethanol,
- methyl 4-methylcyclohexanecarboxylate,
- dimethyl 1,4-cyclohexanedicarboxylate,
- methanol, and
- 1,4-cyclohexanedimethanol (Eastman, 2011).²

This report summarizes key issues, information gaps, and policy remedies as they relate to three key environmental laws:

- Clean Water Act,
- Safe Drinking Water Act, and
- Emergency Planning and Community Right-to-Know Act.

Other laws and policies are also important. For example, the Comprehensive Environmental Response, Compensation, and Liability Act addresses the response to the release of hazardous substances that may endanger public health or the environment. The Toxics Substances Control Act provides USEPA with the authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemicals. The Oil Pollution Act helps prevent and respond to oil spills. Also, in response to incidents at chemical facilities in West Virginia, the Chemical Safety Board has offered recommendations.

While these laws and recommendations are important, this report focuses on three laws that provide the context for state and local governments to take forceful and immediate action to help prevent catastrophic spills from occurring and to plan effectively should they occur.

¹ Freedom Industries purchased this facility from Etowah River Terminal, LLC on December 9, 2013 (WVDEP, 2014b).

² This distinction between crude MCHM and 4-MCHM is important. If 4-MCHM were the only chemical to have leaked, then it would be appropriate to test for 4-MCHM and to establish a safe threshold for this single chemical. However, if crude MCHM leaked, then six different chemicals would have impacted the water supply. Safe thresholds would be required to be developed for all six chemicals, and testing would be needed for all six chemicals or their break-down products.

Figure 1: The Freedom Industries site and West Virginia American Water facility



Source: Zone of critical concern from WVBPH (2002).

2. STATE LEADERS' ATTITUDES TOWARD ENVIRONMENTAL REGULATIONS

In West Virginia, the vigor with which agencies seek to protect human health and the environment is impacted by actions and statements by state leaders. In recent years, their tone has been clear—too much regulation and too much involvement by the United States Environmental Protection Agency (USEPA). Any serious recognition of the link between protecting the environment and promoting a healthy, diversified economy appears lost in these statements.

Leaders have made numerous public statements to this effect. For example, in a 2012 press release announcing that the state is moving forward with its lawsuit against USEPA, Governor Tomblin is quoted as stating:

This lawsuit is about the rights of our state to regulate itself within the scope of the existing federal and state laws. The EPA has overstepped its bounds, taken that right away and we're simply fighting to get it back. (Office of the Governor, 2012)

In 2013, the attorney general commented on West Virginia's lawsuit against USEPA for its enforcement of the Clean Water Act against a coal mine:

At its essence, this lawsuit is about jobs in West Virginia and elsewhere...But this case is about more than coal mining. It's about the ability of states such as West Virginia to be able to engage and promote economic development, highway construction, and other needed investments without fearing a federal agency will step in years later and halt the project. That is why we strongly support Mingo Logan Coal Co.'s appeal to the U.S. Supreme Court. (Office of the Attorney General, 2013)

In 2009, before a subcommittee of the United States Senate Committee on Environment & Public Works, the WVDEP Cabinet Secretary turned the role of his agency upside-down, stating that the "greater concern" for WVDEP is not protecting human health and the environment, but limiting regulation:

Coal production is the leading revenue generator for West Virginia, and many in the State are concerned about losing the opportunities for future economic development associated with mountaintop mining. The greater concern for the Department of Environmental Protection, however, as protector of the State's water resources, is the unintended consequences of the Environmental Protection Agency's recent actions that have the potential to significantly limit all types of mining. (Huffman, 2009)

When confronted by protestors asking Governor Tomblin to better prepare for a decline in coal production in West Virginia, he chose not to meet with the protestors and, instead, issued a statement via his communications director:

Governor Tomblin has been clear, as have several federal judges, on the overreaching demands of the [U.S. Environmental Protection Agency] from this administration...Governor Tomblin's primary focus has always been job preservation and job creation...Governor Tomblin believes strongly that West Virginia coal and natural gas play a critical role in energy independence—and he will continue to fight for those industries and the jobs they create." (Ward, 2012)

It is within this context that the Freedom Industries spill must be understood—elected officials, agency heads, and members of the Legislature have made it clear that protecting human health and the environment will take a back seat to supporting lax regulation of industry.

3. CLEAN WATER ACT

Freedom Industries holds a West Virginia/National Pollutant Discharge Elimination System (NPDES) permit under the Clean Water Act, which is a registration under the state's general multi-sector industrial stormwater permit: Permit WVG610920, issued to Etowah River Terminal, LLC on 11/17/2009. The general permit itself is Permit WV0111457 (WVDEP, 2009a), and is included in Appendix C. WVDEP issues and enforces these permits.

General NPDES permits are intended to be reserved for categories of activities with minimal environmental impact and are used to make permitting more efficient. This particular general permit is designed for establishments with discharges composed entirely of stormwater associated with industrial activity. While this permit includes "benchmark" discharge limitations for certain pollutants, which depend on the type of facility covered, it is largely based on the prevention or reduction of pollutant discharges through the implementation of best management practices.

In order to register under the general permit, WVDEP must approve two key documents submitted by the permittee: a stormwater pollution prevention plan (SWPPP) and groundwater protection plan (GPP). These plans are then enforceable aspects of the permit. The SWPPP and GPP provide details on the practices that the permittee will implement to ensure that discharges from the site limit potentially harmful discharges to the environment.

3.1 Stormwater pollution prevention plan

The SWPPP must contain many items that are related to spills:

Risk identification and Assessment/Material Inventory - The stormwater pollution prevention plan shall assess the potential of various sources at the facility to contribute pollutants to stormwater discharges associated with industrial activity. The plan shall inventory the types of materials handled, the location of material management activities, and types of material management activities. Factors to consider when evaluating the pollution potential of runoff from various portions of an industrial plant include: loading and unloading operations; outdoor storage activities; outdoor manufacturing or processing activities; dust or particulate generating processes; and waste disposal practices. Other factors to consider are the toxicity of chemicals; quantity of chemicals used, produced, or discharged; history of water quality violations; history of significant leaks or spills of toxic or hazardous pollutants; and nature and uses of the receiving waters. (WVDEP, 2009a, p. 32)

Spill Prevention and Response Procedures - Areas where potential spills can occur, and their accompanying drainage points shall be identified clearly in the stormwater pollution prevention plan. Where appropriate, specifying material handling procedures and storage requirements in the plan should be considered. Procedures for cleaning up spills shall be identified in the plan and made available to the appropriate personnel. The necessary equipment to implement a cleanup should be available to all personnel. (WVDEP, 2009a, p. 32)

Employee Training - Employee training programs shall inform personnel at all levels of responsibility of the components and goals of the stormwater pollution prevention plan. Training should address topics such as spill response, good housekeeping, and material management practices. A pollution prevention plan shall identify periodic dates for such training. (WVDEP, 2009a, p. 33)

Visual Inspections - Qualified company personnel shall be identified to inspect designated equipment and plant or other appropriate areas. Material handling areas shall be inspected for evidence of, or the potential for pollutants entering the drainage system. A tracking or follow-up

procedure should be used to ensure that adequate response and corrective actions have been taken in response to the inspection. Records of inspections shall be maintained. (WVDEP, 2009a, p. 33)

Record keeping and Internal Reporting Procedures - Incidents such as spills, leaks, and improper dumping, along with other information describing the quality and quantity of stormwater discharges should be included in the records. Inspections and maintenance activities such as cleaning oil and grit separators or catch basins should be documented and recorded. (WVDEP, 2009a, p. 33)

Consistency with Other Plans and Programs - Stormwater management plans and programs may reflect requirements for Spill Prevention Control and Countermeasure (SPCC) plans under section 311 of the Clean Water Act (CWA) or Best Management Practices (BMP) plans otherwise required by a WV/NPDES permit, and may incorporate any part of such plans into the stormwater pollution prevention plan by reference. (WVDEP, 2009a, p. 34)

The paragraphs quoted above are included in WVDEP's general permit itself (WV0111457); WVDEP has not fulfilled a Freedom of Information Act Request filed by Downstream Strategies on January 13, seeking Freedom Industries' SWPPP.

3.2 Groundwater protection plan

The GPP also must include information specifically related to spills:

A thorough and detailed summary of all activities carried out under other regulatory programs which have relevance to groundwater protection (for example: RCRA, CERCLA, Stormwater Permit, Spill Prevention Control and Countermeasures plans, Toxic Substances Control Act, DOT training requirements, Management of Used Oil, etc.) (WVDEP, 2009a, p. 34)

This paragraph is included in WVDEP's general permit itself (WV0111457); WVDEP has not fulfilled a Freedom of Information Act Request filed by Downstream Strategies on January 13, seeking Freedom Industries' GPP.

3.3 Immediate reporting of spills

In addition to the SWPPP and GPP, this permit clearly requires permittees to report spills immediately:

Immediate Reporting. The permittee shall report any noncompliance which may endanger health or the environment immediately after becoming aware of the circumstances by using the Agency's designated spill alert telephone number. (WVDEP, 2009a, p. 43)

An odor complaint was filed with WVDEP at 8:16 AM on January 9, but Freedom did not report the spill until 12:05 PM that day—almost four hours later (WVDEP, 2014b). The complaint noted that "...there is something in the air at the [Interstate] 77-79 split *each morning* when he comes into work. He said it's coating his wife's throat." (WVDEP, 2014b) This suggests that, even though the complaint was filed on the morning of January 9, the spill had occurred before that date. Clearly, Freedom Industries did not immediately report this spill.

Press reports indicate that WVDEP did not recognize this permit requirement to immediately report noncompliance. According to a January 13 article from CNN, WVDEP Cabinet Secretary Randy Huffman stated: "Basically they had to monitor the runoff from the rain and send us the results every quarter. Those were the only regulatory requirements," Huffman said. "The materials they were storing there is not a hazardous material." (Field et al., 2014)

3.4 Prohibition of discharges that violate water quality standards

The permit also clearly prohibits discharges that violate water quality standards:

Water Quality Standards. The effluent or effluents covered by this permit are to be of such quality so as to not cause violations of applicable water quality standards. (WVDEP, 2009a, p. 28)

The most likely water quality standards that this spill may have violated include six of the state's narrative standards, which prohibit certain conditions in state waters:

No sewage, industrial wastes, or other wastes present in any of the waters of the state shall cause therein or materially contribute to any of the following conditions thereof:

- Distinctly visible floating or settleable solids, suspended solids, scum, foam, or oily slicks;
- Odors in the vicinity of the waters;
- Taste or odor that would adversely affect the designated uses of the affected waters;
- Materials in concentrations which are harmful, hazardous or toxic to man, animal or aquatic life;
- Requiring an unreasonable degree of treatment for the production of potable water by modern water treatment processes as commonly employed; and
- Any other condition, including radiological exposure, which adversely alters the integrity of the waters of the State including wetlands; no significant adverse impact to the chemical, physical, hydrologic, or biological components of aquatic ecosystems shall be allowed.³

The relevance of these narrative standards is acknowledged by WVDEP. In WVDEP's Order 8028, issued to Freedom Industries on January 10, 2014 after responding to an odor complaint and discovering the leak, WVDEP states:

The release of this spilled material has caused conditions not allowable in the Elk River by creating odors in the vicinity of state waters, by requiring an unreasonable degree of treatment for the production of potable water, and by creating a sheen on the surface of the water, a violation of 47 CSR 2, Section 3. (WVDEP, 2014c, Section 3.c)

3.5 Permit enforcement

WVDEP issues and is the primary enforcement agency for all NPDES permits, including this one. USEPA maintains oversight of the state's NPDES program and can also play a role in enforcement.

Tools available to WVDEP for enforcement include inspections. According to numerous press accounts, WVDEP had not inspected this site since 2001 (See, for example, Mattise and Weiss, 2014 and Daily News, 2014).

However, WVDEP has released documentation of air inspections at this site in 2005, 2009, and 2012; no violations were noted in these inspections (WVDEP, 2005; 2009b; and 2012). WVDEP also performed Hazardous Waste Compliance Evaluation Inspections in 1990, 1991, 1999, and 2002 (WVDEP, 1990; 1991; 1999; and 2002a) and Voluntary Remediation Inspections in 2002 and 2003 (WVDEP, 2002b; 2002c; 2003).

None of these inspections, however, enforced the industrial stormwater NPDES permit.

WVDEP maintains discretion regarding how often to inspect facilities regulated under this permit. WVDEP's Memorandum of Understanding with USEPA documents how the agencies will work together to implement West Virginia's NPDES Program. According to this document, major facilities are to be inspected at least

³47 CSR 2 §3.2.

annually, but for other facilities such as the Freedom Industries site, “The number and type of other inspections will be determined by [WVDEP], depending upon the need to assess permit compliance.” (WVDEP and USEPA, 1982, p. 28)

WVDEP’s power to inspect and enforce this permit is demonstrated by the actions the agency took after the spill was discovered. WVDEP issued two orders: 8027 and 8028 (WVDEP, 2014b and c). These orders specifically enforce the NPDES stormwater permit described in this section, and specifically mention violations of several of the state’s narrative water quality standards described above.

Also, according to a recent compliance review of WVDEP’s NPDES Program conducted by USEPA, WVDEP performed 2,136 inspections at storm water construction sites, which are permitted under a different general stormwater permit (USEPA, Undated). This confirms that WVDEP has the authority to perform inspections of its general NPDES permits.

3.6 State recommendations

Elected officials, agency heads, and members of the Legislature should change their tone and expectations to hold WVDEP accountable for fully and consistently enforcing its permits and all environmental laws.

Funding and staffing at WVDEP is not enough to prevent such a spill from happening in the future. Our leaders must make it absolutely clear to agency employees that their expectation is to fully and consistently enforce all permits, including those directly or indirectly related to the coal industry.

The governor and Legislature should require that WVDEP inspect all NPDES-permitted sites, and should immediately inspect the most critical sites. Enforcement of NPDES permits requires inspections, whether permitted with an individual or general permit, whether located in a large city or rural area, and whether involving hazardous chemicals or sediment discharges. Given the large number of sites across the state, the most critical sites, such as the Freedom Industry facility, should be inspected immediately.

The governor and Legislature should prohibit coverage under the general multi-sector industrial stormwater permit for facilities that are located in zones of critical concern, upstream from public water supply intakes. General NPDES permits are intended to be reserved for categories of activities with minimal environmental impact and are used to make permitting more efficient. The multi-sector industrial stormwater permit lists certain exclusions, which would require the issuance of an individual permit. None of these existing exclusions appear to apply to the Freedom Industries site. If an individual permit had been required for this site, then the permit would have received an extra level of scrutiny and analysis because it would have been put out for public notice and comment and because WVDEP would be free to include site-specific requirements. For facilities located within zones of critical concern delineated in Source Water Assessment Reports, prohibiting coverage under general permits would ensure that this extra level of scrutiny is provided.

The governor and Legislature should require additional permit conditions for facilities such as the Freedom Industries site. Facilities that utilize, store, or otherwise handle large quantities of potentially toxic chemicals capable of adversely impacting public water supplies, and specifically those located within zones of critical concern, should receive additional permit conditions.

The governor and Legislature should increase funding and staffing for WVDEP’s NPDES and environmental enforcement programs. More funding for WVDEP stormwater program is necessary to ensure that, when permit applications are submitted, WVDEP holds permittees accountable for submitting accurate and comprehensive SWPPPs and GPPs. WVDEP staff responsible for enforcement of these industrial stormwater permits also must have the resources available to perform inspections.

4. SAFE DRINKING WATER ACT

The Safe Drinking Water Act protects the quality of public drinking water supplies by setting enforceable standards to protect human health and by providing a planning process to ensure that drinking water sources, such as the Elk River, are not polluted.

4.1 Maximum contaminant levels and maximum contaminant level goals

Federal drinking water standards are set for a wide variety of pollutants, including numerous organic chemicals (USEPA, 2014a). While 4-MCHM is an organic chemical, no federal standards have been set for this chemical.

For many other organic chemicals, however, maximum contaminant level goals (MCLGs) have been established. MCLGs are non-enforceable levels set at a level at which no known or anticipated adverse effect on the health of persons would occur. MCLGs for many organic chemicals are zero.

Maximum contaminant levels (MCLs) are enforceable and may be less stringent than MCLGs. MCLs are the maximum permissible level of a contaminant in water which is delivered to any user of a public water system. In other words, MCLs must be met at customers' taps. Many MCLs for organic chemicals are in the parts per billion, or micrograms per liter.

States can independently develop and mandate protective standards for chemicals within their borders when USEPA has not. Pennsylvania, for example, has developed medium-specific concentrations for organic and inorganic substances in groundwater (PADEP, 2014). California has developed MCLs (California Department of Public Health, 2008).

4.2 Source water assessment report

Because MCLs and MCLGs have not been set for 4-MCHM or many other chemicals that may harm human health, the Safe Drinking Water Act's source water protection processes are extremely important. West Virginia's Source Water Assessment and Wellhead Protection Program is coordinated by the Bureau for Public Health, Office of Environmental Health Services, within the Department of Health and Human Resources (WVBPH, 2014a).

According to WVBPH, the goal of this program is:

...to assess, preserve, and protect the state's source waters which are used to supply water for the state's public drinking water supply systems (PWSS) and to provide a long term availability of an abundant supply of safe water in sufficient quantity for present and future citizens of West Virginia. Also, to enable the water supply owners, consumers, and others to initiate and promote actions to protect their drinking water supplies with the developed information. (WVBPH, 1999, p. 7)

The first step in this process, as mandated by the Safe Drinking Water Act, is to develop Source Water Assessment Reports (SWARs) for public water supplies. Preparation of SWARs was eligible to be funded via state Drinking Water State Revolving Fund set-asides (USEPA, 2014b).

This SWAR for WVAW's Charleston system was written in 2002 (WVBPH, 2002); a copy of this report is included in Appendix B.

This SWAR assigns a susceptibility ranking of "high" to WVAW's system. According to this report:

Susceptibility is a measure of your intake's potential for contamination from land uses and activities within the SWPA at concentrations that pose a concern. The purpose of the susceptibility analysis is to provide a pointer to what action a public water system should take to further define and reduce susceptibility. (WVBPH, 2002, p. 2)

The report also delineates the Zone of Critical Concern (ZCC):

The ZCC is a corridor along streams within the [watershed delineation area] that warrants a more detailed inventory and management due to its proximity to the surface intake and to the susceptibility to potential contaminants. (WVBPH, 2002, p. 2)

The ZCC for Charleston's public water supply is shaded green in Figure 1. It includes the land within 1,000 feet of the Elk River and within 500 feet of tributaries of the Elk River, upstream from the drinking water intake.

The SWAR then lists numerous potential significant contaminant sources (PSCSs) within the ZCC:

- 7 industrial,
- 39 commercial,
- 4 municipal, and
- 1 agricultural source.

Among the industrial PSCSs, it lists two by name: Allegheny Power Company and the Pennzoil Manufacturing Plant. Freedom Industries currently occupies the Pennzoil Manufacturing Plant site.

Therefore, it was known, at least as far back as 2002, that this chemical storage facility, which was then used to store petroleum products, was a PSCS within the ZCC.

This SWAR is 12 years old and is out of date. Since 2002, the Pennzoil site has changed ownership to Etowah River Terminal, LLC and then to Freedom Industries. The types of materials stored at the site have changed as well. Effective management of the risk of source water contamination requires accurate, up-to-date information about potential hazards.

4.3 Protection plan

While the 2002 SWAR was an important first step, it simply presents information. According to the SWAR:

A detailed risk-assessment of the PSCSs was beyond the scope of this survey because of minimal data and resources. Local decision makers should do the detailed risk analysis because they are better suited to make the bridge from assessment work to protective strategies. The West Virginia SWAP program can provide guidance to the decision makers and help in prioritizing the PSCS sources. (WVBPH, 2002, p. 5)

It is therefore the responsibility of local decision makers to use the information presented in the SWAR to write a Protection Plan to actually protect the intake. The SWAR provides additional information on the contents of a Protection Plan:

NEXT STEP – SWAP Protection Plan. The next step in source water protection planning is to prepare a SWAP protection plan. The SWAP protection plan incorporates this source water delineation assessment report and three additional sections: Contingency Planning, Alternative Sources, and Management Planning. (WVBPH, 2002, p. 7)

Contingency Planning. A contingency plan documents the system's planned response to interruption of the source water supply. (WVBPH, 2002, p. 7)

Alternative Sources. Information pertaining to alternative water sources focusing on long-term source replacement should the system be required to develop a new source of water due to contamination (or other reasons). This section outlines the most likely sources that can be used as an alternate water source. (WVBPH, 2002, p. 7)

Management Planning. Management planning is the most important element of SWAP. The management plan identifies specific activities that will be pursued by the system to protect their water resources. The system will benefit by taking a proactive approach to source water protection in their watersheds. It is anticipated that most of the management effort will focus on coordination with government agencies and periodic surveys of the watersheds. It may be necessary to conduct a limited number of special studies to determine actual risk and consequences for selected contaminant sources. This information may be needed before decisions can be made on management activities. (WVBPH, 2002, p. 7)

No Protection Plan for this facility appears to have been written.

While the development of the SWAR was legally mandated and funded via the Drinking Water State Revolving Fund, the development of Protection Plans was not legally mandated nor funded.

4.4 State recommendations

WVBPH should update Charleston's SWAR, and all SWARs across the state. Many SWARs written in 2002 are likely to be outdated. In Charleston, since 2002, the Pennzoil site has changed ownership and the types of materials stored at the site have changed. Effective management of the risk of source water contamination requires accurate, up-to-date information about potential hazards.

The governor and Legislature should mandate that WVBPH or other appropriate state or local entities write Protection Plans and should provide for funding. SWARs simply describe the risks; Protection Plans are needed to manage and minimize those risks. These plans should include contingency planning, alternative sources, and management planning. These plans take time and effort and, to be most effective, require a community-wide process and buy-in. A good first step would be to mandate these plans for Class I and Class II cities: those with populations greater than 10,000 people. State matching funds would help local communities afford to pay for the development of these plans.

The governor and Legislature should provide for state-specific protective standards for chemicals used in large quantities in West Virginia. Other states have moved independently to develop and mandate protective standards for chemical within their borders when USEPA has not. Such efforts are particularly important for West Virginia, where a diversity of potentially toxic substances are generated or utilized by major economic engines in the state: the chemical manufacturing and carbon-based energy production industries.

4.5 Local recommendations

Local emergency planning committees should carefully review SWARs and take all necessary actions. While SWARs are only a first step, they do delineate ZCCs and inventory PSCSs within these zones. Sources of pollution that, if spilled, would drain quickly to public water supply intakes are known. Whether or not a formal Protection Plan has been developed, local emergency planning committees need to be aware of all sites and chemicals within these critical zones and must take all necessary actions to minimize the risk of spills and to be prepared in case such spills do take place.

5. EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT

The Emergency Planning and Community Right-to-Know Act (EPCRA) helps communities plan for emergencies involving hazardous substances. EPCRA requires hazardous chemical emergency planning by federal, state and local governments, Indian tribes, and industry. It also requires industry to report on the storage, use and releases of hazardous chemicals to federal, state, and local governments. (USEPA, 2014c)

5.1 Tier Two Emergency and Hazardous Chemical Industry forms

EPCRA requires facilities that store hazardous chemicals to annually submit Tier Two Emergency and Hazardous Chemical Industry forms to local emergency planning committees, the state emergency response commission, and the local fire department (WVDHSEM, 2014). Reporting is required when 500 pounds of "Extremely Hazardous Substances" or 10,000 pounds of "all other hazardous chemicals" are present at the facility (WVDHSEM, 2014).

Etowah River Terminal (predecessor of Freedom Industries) has filed these Tier Two forms. Forms are now publicly available for reporting periods from 2007 through 2012 (Etowah River Terminal, 2008-13).

All six of these forms list MCHM as being an "immediate (acute) physical and health hazard." (Etowah River Terminal, 2008-13). The forms also note the quantity of MCHM stored onsite: between 100,000 and 999,999 pounds on an average daily and maximum daily basis.

MCHM is not the only chemical stored at the Freedom Industries site. As shown in Table 1, 16 other chemicals have been disclosed in Tier Two forms since 2007.

Table 1: Chemicals stored at the Freedom Industries site in reportable quantities, 2007-2012

| Chemical | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---------------------------|------|------|------|------|------|------|
| Ammonium lignosulfonate | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Calcium chloride | | | | | ✓ | ✓ |
| Calcium chloride solution | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| FFC-10 | ✓ | ✓ | | | | |
| Glycerin | | ✓ | ✓ | | | |
| Crude glycerin, recovered | | | ✓ | ✓ | ✓ | ✓ |
| Glycerin rework | ✓ | | | | | |
| Fatty acids, recovered | | | ✓ | ✓ | ✓ | |
| Magnafloc 156 | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Magnafloc 368 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Magnafloc 455 | | | | | | ✓ |
| Magnasol CN2 | ✓ | | | | | |
| MCHM | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| PDO concentrate | | | ✓ | | | |
| RDC-777 | | | | | ✓ | ✓ |
| Soda ash | | | ✓ | ✓ | ✓ | ✓ |
| Zetag 7645 | | ✓ | ✓ | ✓ | ✓ | |

Source: Etowah River Terminal (2008-2013). Note: Freedom Industries lists "MCHM" in these forms and does not specify whether this chemical is crude MCHM or 4-MCHM. These listings include the CAS number for 4-MCHM.

5.2 State recommendations

The governor and Legislature should support local emergency planning committees and local governments in their planning efforts to manage and minimize risk. If funding is needed to allow these committees and local government entities to engage in proper planning, then the governor and Legislature should provide it.

5.3 Local recommendations

Local emergency planning committees should utilize the information submitted on Tier Two forms to manage and minimize risk. Tier Two forms provide critical information about the potential for environmental emergencies. Local emergency planning committees should use this information, together with information provided in Source Water Assessment Plans (and, in the future, Protection Plans), to identify, map, and manage potential risks.

6. CONCLUSIONS

The leak at the Freedom Industries site and contamination of the water supply for WVAW's customers in a nine-county area demonstrates failures at multiple levels of government, and within WVAW itself.

Federal, state, and local governments and agencies could have taken steps that would have significantly reduced the risk of this spill occurring or made it easier to effectively respond to the spill. This report focuses on recommendations for state and local governments in West Virginia.

Implementing the recommendations in this report will help ensure that facilities prevent the release of chemicals into waterways, especially immediately upstream from public drinking water supply intakes.

These recommendations will also help ensure that local governments create Protection Plans to perform contingency planning, identify alternative water sources, and perform management planning to address the most immediate and critical risks to public water supplies already identified in Source Water Assessment Reports.

This report focuses on three laws that provide the context for state and local governments to take forceful and immediate action to help prevent catastrophic spills from occurring and to plan effectively should they occur. As more information is brought to light regarding the spill and the response of government agencies, it is likely that additional and more comprehensive recommendations will be warranted.

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APPENDIX A: SOURCE WATER ASSESSMENT REPORTS COMPLETED IN WEST VIRGINIA

According to WVBPH's searchable online database, 342 SWARs have been completed in West Virginia. These SWARs are listed in Table 2.

Table 2: Source Water Assessment Reports completed in West Virginia

| City | County | Code | System Name |
|--------------------------------------|------------|-----------|--|
| <u>Systems in ten largest cities</u> | | | |
| Beckley | Raleigh | WV3304104 | Beckley Water Company |
| Charleston | Kanawha | WV3302016 | WVAWC-Kanawha Valley Dist |
| Clarksburg | Harrison | WV3301705 | Clarksburg Water Board |
| Fairmont | Marion | WV3302502 | Fairmont City of |
| Huntington | Cabell | WV3300608 | WVAWC - Huntington Dist |
| Martinsburg | Berkeley | WV3300212 | Martinsburg City of |
| Martinsburg | Berkeley | WV3300218 | Berkeley County Pswd-Potomac River |
| Martinsburg | Berkeley | WV3300227 | VA Medical Center |
| Martinsburg | Berkeley | WV3300230 | Valley Water And Sewer-Deerwood |
| Martinsburg | Berkeley | WV3300231 | Rocky Glen Manufactured Housing Communit |
| Martinsburg | Berkeley | WV3300236 | Chestnut Ridge Water System |
| Martinsburg | Berkeley | WV3300238 | Powells Patch |
| Morgantown | Monongalia | WV3303111 | Morgantown Utility Board |
| Parkersburg | Wood | WV3305402 | Claywood Park PSD |
| Parkersburg | Wood | WV3305407 | Parkersburg Water Department |
| Weirton | Brooke | WV3300516 | Weirton Area Water Board |
| Wheeling | Ohio | WV3303516 | Wheeling |
| <u>Other systems</u> | | | |
| Albright | Preston | WV3303923 | Preston County PSD 4 |
| Alderson | Greenbrier | WV3301315 | Alderson Water |
| Allen Junction | Wyoming | WV3305523 | Welton Wtr- Logan Co PSD |
| Alum Creek | Lincoln | WV3302205 | Lincoln PSD |
| Amherstdale | Logan | WV3302347 | Buffalo Creek PSD |
| Anawalt | McDowell | WV3302416 | Anawalt Municipal Water |
| Anawalt | McDowell | WV3302451 | Otoole Water |
| Arthurdale | Preston | WV3303902 | Arthurdale Water Assoc. |
| Ashland | McDowell | WV3302417 | Ashland Community |
| Athens | Mercer | WV3302801 | Athens Town of |
| Baker | Hardy | WV3301606 | Ea Hawse Cont Care Center |
| Bakerton | Jefferson | WV3301947 | Potomac Farms Water Co |
| Bartley | McDowell | WV3302434 | McDowell County PSD- Bartley |
| Beech Bottom | Brooke | WV3300502 | Beech Bottom Water Dept |
| Belington | Barbour | WV3300101 | Belington Town of |
| Bellwood | Fayette | WV3301005 | Bellwood Community Facil Imp |
| Belmont | Pleasants | WV3303701 | Belmont |
| Benwood | Marshall | WV3302618 | Benwood Water Department |
| Berkeley Springs | Morgan | WV3303301 | Berkeley Springs City of |
| Berkeley Springs | Morgan | WV3303306 | Waughs Community Home Park |
| Berkeley Springs | Morgan | WV3303310 | Sky Line Village MHP |
| Berkeley Springs | Morgan | WV3303313 | Berkeley Springs Rehab And Nursing-Upper |
| Berkeley Springs | Morgan | WV3303314 | Apple Orchard Acres |
| Berkeley Springs | Morgan | WV3303315 | Berkeley Springs Rehab And Nursing-Lower |
| Berkeley Springs | Morgan | WV3303317 | Tri Lake Holdings, Inc. |
| Berwind | McDowell | WV3302435 | McDowell County PSD-Berwind |

| City | County | Code | System Name |
|--------------------------------|------------|-----------|--|
| Beverly | Randolph | WV3304202 | Beverly Town of |
| Big Sandy | McDowell | WV3302427 | Hampton Roads Water System |
| Bluefield | Mercer | WV3302835 | WVAWC-Bluefield District |
| Bluestone | Mercer | WV3302852 | Pocahontas Water System |
| Bluewell | Mercer | WV3302804 | Bluewell PSD |
| Bradshaw | McDowell | WV3302437 | Bradshaw Water Works |
| Brandywine | Pendleton | WV3303613 | Pendleton Co PSD (Brandywine) |
| Brenton | Wyoming | WV3305504 | Brenton PSD |
| Brenton | Wyoming | WV3305532 | Green Camp PSD |
| Bruceton Mills | Preston | WV3303903 | Bruceton Mills Water Dept |
| Bruceton Mills | Preston | WV3303916 | Big Sandy MHP |
| Buckhannon | Upshur | WV3304902 | Buckhannon Water Board |
| Buckhannon | Upshur | WV3304910 | Grand Badger Community Water System |
| Bud | Wyoming | WV3305502 | Alpoca Water Works Inc |
| Burlington | Mineral | WV3302905 | Burlington Methodist Home - C H |
| Burlington | Mineral | WV3302935 | Burlington Meth Home - R H C |
| Burlington | Mineral | WV3302936 | Burlington Meth Home - K C |
| Burnsville | Braxton | WV3300408 | Burnsville Public Utility |
| Cameron | Marshall | WV3302603 | Cameron Water |
| Canaan Valley | Tucker | WV3304711 | Timberline Four Season Resort Management |
| Capon Bridge | Hampshire | WV3301402 | Capon Bridge |
| Cass | Pocahontas | WV3303802 | Cass Scenic Railroad |
| Cedar Grove | Kanawha | WV3302009 | Cedar Grove, Community of |
| Chapmanville | Logan | WV3302317 | Chapmanville Water Plant |
| Charles Town | Jefferson | WV3301904 | Cave Quarter Estates |
| Charles Town | Jefferson | WV3301905 | Charles Town Water Dept |
| Charles Town | Jefferson | WV3301919 | Kratzs MHP |
| Charles Town | Jefferson | WV3301940 | Charles Town-Tuscowilla-Locust Hills |
| Charles Town | Jefferson | WV3301942 | Walnut Grove Utilities |
| Charles Town | Jefferson | WV3301943 | Westridge Water Dept |
| Charles Town | Jefferson | WV3301966 | Parkview Woodland MHP |
| Charles Town | Jefferson | WV3301979 | Deerfield Village Subdivision |
| Chester | Hancock | WV3301504 | Chester |
| Chester | Hancock | WV3301520 | Mountaineer Park Inc |
| Clay | Clay | WV3300801 | Clay Water Dept |
| Clendenin (RR Name Clendennin) | Kanawha | WV3302010 | Clendenin Water Dept |
| Clifftop | Fayette | WV3301041 | Clifftop Community Water |
| Coal City | Raleigh | WV3304123 | Raleigh Co PSD-Coal City |
| Coal Mountain | Wyoming | WV3305527 | Coal Mountain Water |
| Coalwood | McDowell | WV3302439 | McDowell County PSD-Coalwood |
| Colcord | Raleigh | WV3304136 | Ral Co PSD-Sycamore Dist |
| Cottageville | Jackson | WV3301804 | Cottageville PSD |
| Covel | Wyoming | WV3305512 | Covel Water Works |
| Cowen | Webster | WV3305103 | Cowen PSD |
| Craigsville | Nicholas | WV3303402 | Craigsville PSD |
| Crichton | Greenbrier | WV3301302 | Greenbrier County PSD #2 |
| Crumpler | McDowell | WV3302446 | Upcc Indian Ridge |
| Crumpler | McDowell | WV3302448 | Crumpler Community Water |
| Danese | Fayette | WV3301008 | Danese PSD |
| Danville | Boone | WV3300326 | Chambers MHP |
| Danville | Boone | WV3300339 | Whispering Pines MHP |
| Davis | Tucker | WV3304701 | Davis Water Works |
| Davy | McDowell | WV3302425 | Davy Municipal Water Works |
| Deep Water | Fayette | WV3301009 | Deepwater PSD |
| Durbin Fr Bart | Pocahontas | WV3303812 | Pocahontas County PSD |
| Eckman | McDowell | WV3302405 | McDowell County PSD - Eckman |
| Elkhorn | McDowell | WV3302464 | McDowell County PSD - Ennis |

| City | County | Code | System Name |
|-------------------------------|-----------|-----------|--|
| Elkins | Randolph | WV3304203 | Elkins City of |
| Fairview | Marion | WV3302503 | Fairview Town of |
| Falling Waters | Berkeley | WV3300214 | Midway MHP |
| Falling Waters | Berkeley | WV3300241 | Broad Lane MHP |
| Flatwoods | Braxton | WV3300402 | Flatwoods Canoe Run PSD |
| Follansbee | Brooke | WV3300506 | Follansbee Municipal |
| Follansbee | Brooke | WV3300512 | Follansbee Hooverson Heights |
| Fort Ashby | Mineral | WV3302911 | Fort Ashby PSD |
| Fort Gay (Cassville) | Wayne | WV3305004 | Fort Gay Water Works |
| Framestown | Braxton | WV3300404 | Sugar Creek PSD |
| Franklin | Pendleton | WV3303602 | Municipality of Franklin |
| Franklin | Pendleton | WV3303607 | Sherwood Forest Estates |
| Franklin | Pendleton | WV3303609 | Pendleton Co PSD-Circleville |
| Friendly | Tyler | WV3304801 | Friendly PSD |
| Gap Mills | Monroe | WV3303204 | Gap Mills PSD |
| Garwood | Wyoming | WV3305519 | Garwood Community Water |
| Gary | McDowell | WV3302420 | Gary City of |
| Gassaway | Braxton | WV3300406 | WVAWC- Gassaway |
| Gauley Bridge | Fayette | WV3301037 | Kanawha Falls PSD |
| Gerrardstown | Berkeley | WV3300209 | Berkeley Co PSWD-Glenwood Forest |
| Gilbert | Mingo | WV3303002 | Gilbert Water Works |
| Gilbert | Mingo | WV3303024 | Gilbert Heights Apartments |
| Glen Dale | Marshall | WV3302605 | Glen Dale Water Works |
| Glen Rogers | Wyoming | WV3305508 | Glen Rogers PSD |
| Glenville | Gilmer | WV3301104 | Glenville Utility |
| Glover | Wyoming | WV3305528 | Glover Community Wtr - Tn of Pineville |
| Grafton | Taylor | WV3304605 | Taylor County PSD |
| Grantsville | Calhoun | WV3300701 | Grantsville Municipal |
| Green Spring | Hampshire | WV3301407 | Green Spring PSD (Springfield) |
| Green Spring | Hampshire | WV3301412 | Green Spring Valley PSD |
| Greenville | Logan | WV3302357 | Logan Co PSD-Greenville System |
| Greenville | Monroe | WV3303205 | Greenville Water Co |
| Harman | Randolph | WV3304204 | Harman Town of |
| Harpers Ferry | Jefferson | WV3301912 | Harpers Ferry Water Works |
| Harpers Ferry | Jefferson | WV3301915 | Harpers Ferry Job Corps |
| Harpers Ferry | Jefferson | WV3301918 | Keyes Ferry Acres - South |
| Harpers Ferry | Jefferson | WV3301941 | Valley View MHP |
| Harpers Ferry | Jefferson | WV3301949 | Oak Hill Mobile Home Community LLC |
| Harpers Ferry | Jefferson | WV3301960 | Harpers Ferry Campsite |
| Harpers Ferry | Jefferson | WV3301963 | Harpers Ferry Campsites |
| Harpers Ferry | Jefferson | WV3301965 | Keyes Ferry Acres-North Section |
| Harpers Ferry | Jefferson | WV3301974 | Potomac Terrace Water HOA |
| Harpers Ferry | Jefferson | WV3301976 | Keyes Ferry Acres - Central Section |
| Harpers Ferry | Jefferson | WV3301977 | Allens Wonderland |
| Harpers Ferry | Jefferson | WV3301978 | Meadow Brook Water System |
| Harrisville | Ritchie | WV3304307 | Hughes River Water |
| Hartford City (Corporate Name | Mason | WV3302704 | Hartford Town of |
| Hedgesville | Berkeley | WV3300204 | Judy Lynn MHP |
| Hedgesville | Berkeley | WV3300223 | Woods HOA, The |
| Hedgesville | Berkeley | WV3300229 | Cherry Run MHP |
| Hedgesville | Berkeley | WV3300237 | Woods Home Owners Assoc #2 |
| Hedgesville | Berkeley | WV3300243 | Springer Run Park LLC |
| Hedgesville | Berkeley | WV3300244 | Austin Mobile Home Court |
| Hedgesville | Morgan | WV3303334 | Morgan Village MHP |
| Helen | Raleigh | WV3304113 | Ral Co PSD-Helen District |
| Hendricks | Tucker | WV3304704 | Hamrick PSD |
| Herndon | Wyoming | WV3305535 | Herndon Community Water |

| City | County | Code | System Name |
|------------------------------|------------|-----------|---------------------------------------|
| Herndon | Wyoming | WV3305539 | Herndon Heights Community Water Assoc |
| Hiawatha | Mercer | WV3302814 | Hiawatha Water |
| Hillsboro | Pocahontas | WV3303804 | Denmar Correctional Center |
| Hillsboro | Pocahontas | WV3303815 | Hillsboro Town of |
| Hinton | Summers | WV3304513 | WVAWC-Bluestone Plant |
| Holden | Logan | WV3302339 | Logan County PSD - Holden |
| Hundred | Wetzel | WV3305202 | Hundred Littleton PSD |
| Hurricane | Putnam | WV3304005 | Hurricane Town of |
| Huttonsville | Randolph | WV3304205 | Huttonsville Correctional Center |
| Jaeger | McDowell | WV3302429 | McDowell County PSD-Jaeger |
| Inwood | Berkeley | WV3300201 | G & E MHP |
| Inwood | Berkeley | WV3300202 | Berkeley Co Pswd-Bunker Hill |
| Inwood | Berkeley | WV3300239 | Cardinal Ventures LLC |
| Itmann Division | Wyoming | WV3305513 | Mullens Water Works-Itman |
| Jane Lew | Lewis | WV3302103 | Jane Lew PSD |
| Jenkinjones | McDowell | WV3302476 | Jenkinjones Community Water |
| Kanawha Falls | Fayette | WV3301040 | Kanawha Falls Community Water |
| Kearneysville | Jefferson | WV3301908 | Fox Glen Utilities |
| Kearneysville | Jefferson | WV3301911 | Green Acres MHP |
| Kearneysville | Jefferson | WV3301920 | Leights MHP |
| Kearneysville | Jefferson | WV3301929 | Russells MHP |
| Kenova | Wayne | WV3305009 | Kenova Municipal Water |
| Kermit | Mingo | WV3303003 | Kermit Water Works |
| Keyser | Mineral | WV3302915 | Keyser City of |
| Keyser | Mineral | WV3302942 | Fountain PSD |
| Keystone | McDowell | WV3302430 | Keystone Municipal Water |
| Kimball | McDowell | WV3302431 | McDowell County PSD - Kimball |
| Kimberly | Fayette | WV3301004 | Armstrong PSD |
| Kincaid | Fayette | WV3301036 | Page Kincaid PSD |
| Kingwood | Preston | WV3303908 | Kingwood Water Board |
| Lakin (Lakin State Hospital) | Mason | WV3302712 | Mason Co PSD-Lakin Dist |
| Letart | Mason | WV3302713 | Mason Co PSD-Letart |
| Lewisburg | Greenbrier | WV3301303 | Davis Stuart Inc |
| Lewisburg | Greenbrier | WV3301307 | Lewisburg |
| Lewisburg | Greenbrier | WV3301316 | Cardinal MHP |
| Logan | Logan | WV3302331 | Logan Water Board City of |
| Logan | Logan | WV3302364 | Logan County PSD - Northern Regional |
| Lumberport | Harrison | WV3301714 | Lumberport Town of |
| Maben | Wyoming | WV3305536 | Pierpoint PSD |
| Man | Logan | WV3302336 | Man Water Works |
| Mannington | Marion | WV3302513 | Mannington City of |
| Marianna | Wyoming | WV3305529 | Marianna Community Water |
| Marlinton | Pocahontas | WV3303803 | Marlinton Town of |
| Mason (RR Name Mason City) | Mason | WV3302708 | Mason Water Dept |
| Masontown | Preston | WV3303909 | Masontown Water Works |
| Matewan | Mingo | WV3303005 | Matewan Water Works |
| Matheny | Wyoming | WV3305511 | Matheny PSD |
| Matoaka | Mercer | WV3302819 | Matoaka Water System |
| Matoaka | Mercer | WV3302836 | Piedmont Community Water Assoc. |
| Matoaka | Mercer | WV3302851 | Weyanoke- Giatto Water System |
| Maybeury | McDowell | WV3302460 | McDowell County PSD - Maybeury |
| Mccomas | Mercer | WV3302828 | Pinnacle Water Association |
| Mcgraws | Wyoming | WV3305518 | Ravencliff/Mcgraws/Saulsville PSD |
| Mcmechen | Marshall | WV3302610 | Mcmechen Municipal Water |
| Meadow Bridge | Fayette | WV3301022 | Meadow Bridge Town of |
| Middlebourne | Tyler | WV3304802 | Middlebourne Water Works |
| Mill Creek | Randolph | WV3304209 | Mill Creek Water Dept |

| City | County | Code | System Name |
|--------------------------------|------------|-----------|---|
| Millville | Jefferson | WV3301973 | Shenandoah Mini Homes |
| Milton | Cabell | WV3300609 | Milton Water |
| Minden | Fayette | WV3301003 | Arbuckle PSD |
| Monongah | Marion | WV3302515 | Monongah Town of |
| Montgomery | Fayette | WV3301029 | WVAWC-Montgomery District |
| Moorefield | Hardy | WV3301601 | Moorefield Municipal Water |
| Moundsville | Marshall | WV3302607 | Marshall County PSD 2 |
| Moundsville | Marshall | WV3302611 | Moundsville |
| Moundsville | Marshall | WV3302617 | Iskcon - New Vrindaban |
| Mount Hope | Fayette | WV3301024 | Mount Hope Water |
| Mount Nebo | Nicholas | WV3303405 | Wilderness PSD |
| Mt Storm | Grant | WV3301205 | Mountain Top PSD |
| Mullens | Wyoming | WV3305505 | Brookside-Otsego Community Water |
| Mullens | Wyoming | WV3305514 | Eastern Wyoming PSD Mullens |
| Mullens | Wyoming | WV3305521 | Eastern Wyoming PSD - Stephenson WTP |
| Mullens | Wyoming | WV3305538 | Eastern Wyoming PSD Nuriva |
| Naugatuck | Mingo | WV3303029 | Mingo County PSD - Naugatuck |
| Neola | Greenbrier | WV3301317 | Anthony Correctional Center |
| Neola | Greenbrier | WV3301326 | End of The Trail Central |
| Nettie | Nicholas | WV3303403 | Nettie-Leivasy PSD |
| New Cumberland | Hancock | WV3301515 | New Cumberland |
| New Cumberland | Hancock | WV3301517 | Oakland PSD |
| New Haven | Mason | WV3302709 | New Haven Water Dept |
| New Martinsville | Wetzel | WV3305203 | New Martinsville |
| Newburg | Preston | WV3303920 | Newburg Town of |
| Newell | Hancock | WV3301516 | Newell Company |
| Newtown | Mingo | WV3303023 | Creekwood Apartments-Newtown |
| Northfork (RR Name North Fork) | McDowell | WV3302413 | Northfork Water Works |
| Northfork (RR Name North Fork) | McDowell | WV3302465 | McDowell Count PSD - Greenbriar |
| Norton | Randolph | WV3304213 | Norton Jimtown Harding PSD |
| Oak Hill | Fayette | WV3301046 | WVAWC-New River Regional Wtr Trtmt Plt |
| Oceana | Wyoming | WV3305516 | Oceana Community of |
| Paden City | Wetzel | WV3305204 | Paden City |
| Parsons | Tucker | WV3304707 | Parsons Town of |
| Paw Paw | Morgan | WV3303308 | Paw Paw Water Works |
| Petersburg | Grant | WV3301204 | Petersburg Town of |
| Philippi | Barbour | WV3300104 | Philippi City of |
| Piedmont | Mineral | WV3302921 | Piedmont Municipal Wtr Wks |
| Pine Grove | Wetzel | WV3305205 | Pine Grove Water |
| Pineville | Wyoming | WV3305517 | Pineville Municipal |
| Pineville | Wyoming | WV3305534 | Ramey Addition |
| Point Pleasant | Mason | WV3302710 | Point Pleasant Water Works |
| Point Pleasant | Mason | WV3302714 | Mason Co PSD-Crab Creek |
| Pratt | Kanawha | WV3302024 | Pratt Town of |
| Princeton | Mercer | WV3302849 | Green Valley-Glenwood PSD(Glenwood) |
| Prociuous | Clay | WV3300806 | Clay-Roane PSD (Prociuous District) |
| Proctor | Wetzel | WV3305206 | Grandview - Doolin PSD |
| Rainelle | Greenbrier | WV3301309 | Rainelle Water Dept |
| Rainelle | Greenbrier | WV3301312 | Rainelle Water Treatment Plant #2 |
| Ranson | Jefferson | WV3301909 | Glen Haven Utilities - Jefferson Co PSD |
| Ravenswood | Jackson | WV3301810 | Ravenswood Municipal Water Works |
| Ravenswood | Jackson | WV3301820 | Wilding Acres MHP |
| Red Jacket | Mingo | WV3303012 | Red Jacket PSD |
| Red Jacket | Mingo | WV3303021 | Newtown H O A |
| Reedsville | Preston | WV3303912 | Preston County PSD 1 |
| Rhodell | Raleigh | WV3304119 | Rhodell Water Works |
| Richwood | Nicholas | WV3303401 | Richwood Water Dept |

| City | County | Code | System Name |
|--------------------------------|------------|-----------|---|
| Ridgeley (RR Name Ridgely) | Mineral | WV3302946 | Mountain View Water System |
| Ridgeley (RR Name Ridgely) | Mineral | WV3302947 | Carpendale Town of |
| Ripley | Jackson | WV3301811 | Ripley City of |
| Rock | Mercer | WV3302848 | Hoot Owl Hollow Comm Wtr Assoc |
| Rock | Mercer | WV3302853 | Windmill Gap Water System |
| Roderfield | McDowell | WV3302481 | Ciampanella Rental Property |
| Rolfe | McDowell | WV3302403 | McDowell County PSD - Rolfe |
| Romney | Hampshire | WV3301405 | Romney Water Dept |
| Ronceverte | Greenbrier | WV3301310 | Ronceverte Water |
| Rowlesburg | Preston | WV3303914 | Rowlesburg Water Works |
| Rupert | Greenbrier | WV3301304 | Duo Water Works |
| Rupert | Greenbrier | WV3301311 | Rupert Water |
| Salem | Harrison | WV3301720 | Salem Water Board |
| Salem | Harrison | WV3301740 | Miracle Meadows School |
| Scott Depot (RR Name Scott) | Putnam | WV3304011 | Putnam PSD |
| Seneca Rocks | Pendleton | WV3303610 | Woods Edge MHP |
| Seth | Boone | WV3300310 | Prenter Water Company |
| Sharples | Logan | WV3302315 | Logan County PSD - Sharples |
| Shenandoah Junction | Jefferson | WV3301931 | Shenandoah Junction M H P |
| Shepherdstown | Jefferson | WV3301933 | Shepherdstown Water |
| Shepherdstown | Jefferson | WV3301972 | Cavaland Subdivision - Jefferson Co PSD |
| Shinnston | Harrison | WV3301721 | Shinnston City of |
| Sistersville | Tyler | WV3304803 | Sistersville Municipal Water |
| Slatyfork (RR Name Laurel Bank | Pocahontas | WV3303814 | Alpine Brook MHP |
| Snowshoe Resort | Pocahontas | WV3303808 | Snowshoe Water And Sewer |
| Sophia | Raleigh | WV3304124 | Ral Co PSD-Stotesbury |
| Spencer | Roane | WV3304405 | Spencer Water Dept |
| Springfield | Hampshire | WV3301401 | Buffalo Hollow MHP |
| St. Albans | Kanawha | WV3302031 | St Albans Water |
| St. Marys | Pleasants | WV3303704 | Saint Marys |
| Sugar Grove | Pendleton | WV3303604 | Navy Information Operations Comand/Mb |
| Summersville | Nicholas | WV3303404 | Summersville Municipal Water |
| Summersville | Nicholas | WV3303407 | Briarwood Acres |
| Talcott | Summers | WV3304507 | Big Bend PSD |
| Terra Alta | Preston | WV3303917 | Terra Alta Water Works |
| Terra Alta | Preston | WV3303921 | Alpine Lake Public Utilities |
| Thomas | Tucker | WV3304709 | Thomas City of |
| Tioga | Nicholas | WV3303409 | Tioga Water Work Inc |
| Tunnelton | Preston | WV3303918 | Tunnelton Town of |
| Union | Monroe | WV3303207 | Union Town of |
| Upland | McDowell | WV3302404 | McDowell County PSD - Upland |
| Upper Tract | Pendleton | WV3303611 | Pendleton Co PSD-Upper Tract |
| Vienna | Wood | WV3305411 | Vienna |
| Vivian | McDowell | WV3302407 | McDowell County PSD - Tidewater |
| Walton | Roane | WV3304407 | Walton PSD |
| War | McDowell | WV3302449 | War Water Works-Excelsior |
| War | McDowell | WV3302472 | War Water Works/City Realty |
| Wardensville | Hardy | WV3301603 | Town of Wardensville |
| Washington | Wood | WV3305404 | Lubeck PSD |
| Waverly | Wood | WV3305410 | Union Williams PSD |
| Wayne | Wayne | WV3305007 | Wayne Water Town of |
| Webster Springs (Corporate Nam | Webster | WV3305104 | WVAWC - Webster Springs |
| Welch | McDowell | WV3302421 | Welch City of |
| Welch | McDowell | WV3302471 | McDowell Co PSD - Big Four |
| Wellsburg | Brooke | WV3300517 | Wellsburg |
| West Hamlin | Lincoln | WV3302203 | West Hamlin, City of |
| West Union | Doddridge | WV3300901 | West Union |

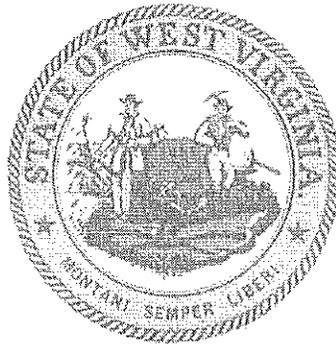
| City | County | Code | System Name |
|--------------------------------|------------|-----------|--------------------------------------|
| Weston | Lewis | WV3302104 | WVAWC- Weston |
| White Sulphur Springs | Greenbrier | WV3301305 | CSX Hotels Inc |
| White Sulphur Springs | Greenbrier | WV3301314 | White Sulphur Springs Water |
| Whitesville | Boone | WV3300315 | Boone Raleigh PSD |
| Whitmer | Randolph | WV3304216 | Whitmer Public Water System |
| Williamson | Mingo | WV3303009 | Williamson Utility Board |
| Williamstown | Wood | WV3305412 | Williamstown Water Dept |
| Windsor Heights | Brooke | WV3300508 | Hammond PSD |
| Womelsdorf (Corporate Name For | Randolph | WV3304212 | Coalton Water System |
| Wyco | Wyoming | WV3305525 | Wyco Co Wtr - Logan Co PSD |
| Wyoming | Wyoming | WV3305530 | Wyo Co Wtr - Tn of Pineville |
| | Kanawha | WV3302067 | County Water #2 |
| | Mercer | WV3302813 | Green Valley-Glenwood PSD (Bulltail) |
| | Monroe | WV3303206 | Red Sulphur PSD |

Source: WVBPB (2014b).

APPENDIX B: THE SOURCE WATER ASSESSMENT REPORT FOR WEST VIRGINIA AMERICAN WATER – KANAWHA VALLEY, KANAWHA COUNTY

**State of West Virginia
Source Water Assessment and
Protection Program
Source Water Assessment Report**

**WVAWC - Kanawha Valley
Kanawha County
PWSID: WV3302016**



Prepared by:

**West Virginia Department of Health and Human Resources
Bureau for Public Health
Office of Environmental Health Services
Source Water Protection Unit**

Date: April 2002

**Surface Water Public Water Supply Systems
Source Water Assessment and Protection Program (SWAPP)
Susceptibility Report**

Prepared by the West Virginia Bureau for Public Health, Source Water Assessment and Protection Unit

What is the Purpose of a Susceptibility Report?

A susceptibility report identifies the most significant potential contaminant sources that could threaten the quality of your public water supply. Your susceptibility ranking does not imply poor water quality. Regular water tests best reflect actual water quality. This report will be used by public water supply systems with a surface water source. In addition, this report will enhance West Virginia's existing watershed approach to water quality improvement and protection. Table 1 provides you information on your public water supply.

Date Prepared: Thursday, April 25, 2002

What is SWAPP?

The SWAPP, established under the Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supplies;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

Table 1: Public Water Supply (PWS) Information

| | |
|---------------|-----------------------------------|
| PWS Name | WVAWC-Kanawha Valley |
| PWS Address | P.O. Box 1906 Charleston WV 25301 |
| PWS ID Number | WV3302016 |
| County | Kanawha |
| System Type | Community |

The West Virginia Bureau for Public Health (BPH) is undertaking this task. The rankings of susceptibility of your intake (s) to potential contamination are listed in Table 2.

Table 2: Intake Information

| Facility Name | Source Name | Design Meets Regulations | Susceptibility Ranking |
|----------------------|-------------|--------------------------|------------------------|
| WVAWC-Kanawha Valley | Elk River | Yes | High |

The BPH Central Office assessed the source, West Virginia American Water Company (WVAWC)-Kanawha Valley. A file review and field survey were used to conduct the assessment.

What is my Source Water Protection Area (SWPA)?

Unlike ground water aquifers, which have a natural protective layer above them, all surface waters are susceptible to contamination because they are exposed at the surface and lack a protective barrier from contamination. Accidental spills, releases, sudden precipitation events that result in overland runoff, or storm sewer discharges can allow pollutants to readily enter the source water and potentially contaminant the drinking water at the intake. Because of this, the SWPA consists of two types of delineations.

- **Watershed Delineation Area**

The first type of delineation is the Watershed Delineation Area (WSDA). Figure 1 shows the extent of the WSDA, which covers approximately 1,527 square miles in the Elk River Watershed. The WSDA includes the entire watershed area upstream of the intake up to the boundary of the West Virginia state border, or a topographic boundary. The perimeter of the catchment area provides the water to the water supply intake.

- **Zone of Critical Concern**

The second type of delineation is the Zone of Critical Concern (ZCC). Figure 2 shows the ZCC area, which covers approximately 5,969 acres. The ZCC is a corridor along streams within the WSDA area that warrants a more detailed inventory and management due to its proximity to the surface intake and to the susceptibility to potential contaminants. The ZCC is calculated using a mathematical model that accounts for stream flows, gradient, and area topography. The length of the ZCC is based on a five hour time of travel. The ZCC width is 1000 feet from each bank of the principal stream and 500 feet from each bank of the tributaries draining into the principal stream.

What is Susceptibility?

Susceptibility is a measure of your intake's potential for contamination from land uses and activities within the SWPA at concentrations that pose a concern. The purpose of the susceptibility analysis is to provide a pointer to what action a public water system should take to further define and reduce susceptibility. This may include recommendations for a more detailed inventory and assessment, monitoring work, or an indication of the type and intensity of source water and other protection activities needed.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMP's) are used. However, the susceptibility determination for your intake did not take into account whether BMP's are being used.

Susceptibility of a drinking water intake does not mean a customer will drink contaminated water. Water Suppliers protect drinking water by monitoring and treating water supplies, and using BMP's and source water protection measures to ensure that safe water is delivered to the tap.

How Was The Water Supply Susceptibility Determined?

Your intake (s) susceptibility is based on the following:

Resource Characterization

The purpose for conducting the Resource Characterization analysis of the delineated SWPA is to obtain an understanding of its physical, biological, chemical, and hydrological characteristics. Four resource characteristics were evaluated:

- The potential for surface runoff to occur;
- The ease that surface runoff transport material can be delivered into the stream;
- The movement through the SWAP area; and
- The biological and chemical health of the surface water resource in the SWAP area.

- **Potential for Surface Runoff to Occur**

The soil types present in the watershed area and the associated soil properties have a direct influence on the potential for surface runoff to occur. As infiltration rate of soil increases, (more precipitation soaking in rather than running off) the contaminant load associated with the reduced runoff should decrease. Table 3 provides a summary of the associated soil groups.

Table 3: Summary of Soil Associations in the WSDA

| Soil Associations | Soil Drainage | Topographic Setting |
|---------------------------|--------------------------|--------------------------------|
| Kanawha-Hackers | Well drained | Gently sloping |
| Gilpin-Upshur-Vandalia | Well drained | Gently sloping to very steep |
| Clymer-Gilpin-Dekalb | Well drained | Very steep |
| Buchanan-Chavies-Pope | Moderate to Well drained | Steep to nearly level |
| Gilpin-Upshur-Buchanan | Moderate to Well drained | Very steep |
| Gilpin-Dekalb-Buchanan | Moderate to Well drained | Very steep |
| Calvin-Belmont-Mecksville | Well drained | Gently sloping to very steep |
| Potomac-Tioga-Holly | Well and Poorly drained | Nearly level |
| Mandy-Snowdog-Gauley | Moderate to Well drained | Strongly sloping to very steep |
| Cateache-Shours-Belmont | Well drained | Gently sloping to very steep |

- **Ease of movement of material into the Stream System (Rate of Overland Material Transport):**

The size, shape, and slope of the SWAP area have a direct influence on material transported by surface runoff. In general, the longer the overland travel distance and travel time that surface runoff has taken in order to reach a stream channel, the greater the chance it has to deposit and filtrate the contaminants that may occur. Table 4 provides an analysis of the size, shape, and slope.

Table 4: Hydrologic Setting

| | |
|--------------------------------------|---------------|
| Size of WSDA Area (mi ²) | 1,527 |
| Shape of WSDA Area | Long & Narrow |
| Stream Length (Main Stem) (mi) | 186 |
| Average Watershed Slope | 10 to 30 % |

- **Movement of Water through the Watershed Area**

A number of physical and natural factors can influence the movement of water through the SWAP area. The pattern and development of the drainage network of the SWAP area directly influence the rate of water movement. Evaluation of the hydrologic cycle will provide an indication of the amount of annual rainfall that is absorbed into the ground or becomes runoff. Table 5 summarizes the total mileage of streams contained in the WSDA, average stream gradients of the main stem, average rainfall, the nearest relevant USGS stream gauge, distance to gauge, topographic position of gauge, annual mean discharge, high flow, and low flow.

Table 5: Movement of Water

| | |
|---|-------------|
| Number of Stream Miles | 2,051 |
| Average Stream Gradient (Main Stem) | 11.13 ft/mi |
| Average Rainfall | 44 |
| Nearest Relevant USGS Stream Gauge | 031197000 |
| Distance to Relevant USGS Stream Gauge (mi) | 22 |
| USGS Stream Gauge Topographic Position | Upstream |
| Annual Mean Discharge (cfs) | 3,259 |
| High Flow (cfs) | 158,000 |
| Low Flow (cfs) | 595 |

- **Review of Water Quality Data**

In order to characterize the condition of the surface water within the watershed, the available chemical and biological water quality data was reviewed. This data was collected as part of the BPH and the West Virginia Department of Environmental Protection (DEP) implementation of the federal Safe Drinking Water Act and Clean Water Act. Water quality data was evaluated to help provide direct pointers to a source of contamination and to direct the focus for additional source evaluations. Additionally, immediate source water protection efforts will be identified by this review.

Available water quality data includes test results from treated drinking water, finished water, and untreated source water (raw water) conducted by the water supplier; ambient water chemistry; biological criteria and monitoring (bacteria, macroinvertebrates and fish); and habitat evaluation. The sampling requirements for public water systems vary depending on the type of system and the federal regulated testing requirements. Therefore, a lack of water quality impacts may indicate the lack of a certain type of sampling rather than a lack of contamination.

Summary of Raw and Finished Water Quality Results from Public Water System

Water sampling conducted by West Virginia American Water Company indicates that raw water turbidity maximums appear to have increased significantly over the past two years, based on the five years of data reviewed. The WVAWC-Kanawha Valley Plant takes a raw water bacteriological sample almost on a daily basis; which is not required by regulation. These tests indicate elevated levels during periods of high water.

There have been no occasions when the observed concentrations have been above the established MCLs for these parameters in the finished water. For additional information on the finished water quality, please review the consumer confidence report for a yearly summary of the water quality.

Summary of Chemical and Biological Water Quality Results from the West Virginia DEP

In 2000, the DEP conducted biological and chemical water quality monitoring on 153 streams totaling 832 miles in the Elk River watershed for the 305b report, as a requirement of the federal Clean Water Act. Two hundred and twenty miles (26%) were fully supporting their overall designated uses. Considering major and moderate/minor impacts, the principal causes of impairment in the watershed are metals, siltation, and habitat alteration (non-flow). Additional significant causes of impairment are pH and Fecal Coliform. Considering major and moderate/minor impacts, the principal sources of pollution in the watershed are unknown source, petroleum activities, and abandoned mining. During this reporting cycle, 460.41 miles of stream in the Elk River watershed were monitored for toxics. Of these, 65.09 miles (14.1%) had elevated levels of toxics.

The DEP performed an ecological assessment of the Elk River and its tributaries in 1997. Assessments at each site included measurements of physical attributes of the stream and riparian zone, observations of activities and disturbances in the surrounding area, water quality analysis, and benthic macroinvertebrate collection. Of the 145 sites sampled, 26 were impaired, 14 were potentially impaired, 95 were unimpaired, and 10 were collected by incomparable methods and could not be scored.

Summary of Other Available Chemical and Biological Water Quality Data Not Available

POTENTIAL SIGNIFICANT CONTAMINANT SOURCES (PSCS'S):

Inventory of Potential Significant Contaminant Sources

The purpose of providing an inventory of certain types of land uses, potential significant contaminant sources, and activities within the SWAP area is to aid in reducing the risk posed to the public drinking water supply. The following subsections provide information regarding the methodology used to generate the inventories.

The inventory portion of the SWAP consists of two steps:

- The first step is the broad inventory based primarily on regulated and existing databases. The inventory consists of a general land use analysis, the identification of regulated activities in the delineated WSDA areas, and an analysis of road and rail crossings adjacent to the streams in the WSDA area.
- The second step is the detailed inventory of PSCS's in the ZCC. The detailed source inventory is conducted to identify PSCS's that were not captured in the broad regulated source inventory and to field verify the PSCS's in the ZCC. PSCS's located during the inventory are found on Figure 2.

A detailed risk-assessment of the PSCS's was beyond the scope of this survey because of minimal data and resources. Local decision makers should do the detailed risk analysis because they are better suited to make the bridge from assessment work to protective strategies. The West Virginia SWAP program can provide guidance to the decision makers and help in prioritizing the PSCS sources.

- **Existing (primarily regulated) Database Review**

Table 6: Summary of existing (primarily regulated) PSCS's

Table 6 is a summary of existing PSCS's based on public information obtained from various federal, state, and local agencies that maintain environmental regulatory databases. These databases provide information about the regulatory status of a property and incidents involving use, storage, spilling or transportation of oil, and hazardous materials.

| | NUMBER | PERCENT |
|------|--------|---------|
| WSDA | 53 | 100 |
| ZCC | 26 | 49 |

- **Summary of the Detailed Inventory**

Table 7: Summary of PSCS within the ZCC

Table 7 is a summary of the detailed inventory of potential contaminant sources in the ZCC. The detailed source inventory was conducted to identify PSCS's that were not identified in the existing database review and to verify the location of the PSCS within the ZCC. Additional potential significant contaminant sources that were identified in detailed inventories of the ZCC consist of commercial activities (Shell Gas Station, Sun Belt Rentals), municipal operations (City of Charleston Sewage Lift Station, Road Salt Storage), and industrial operations (Allegheny Power Company, Pennzoil Manufacturing Plant). Of these PSCS's, some of the industrial sources may have large volumes of potential contaminant stored.

| Potential Contaminant Source | TOTAL PSCS'S | PERCENT |
|------------------------------|--------------|---------|
| AGRICULTURE | 1 | 2 |
| RESIDENTIAL | 0 | 0 |
| MUNICIPAL | 4 | 8 |
| COMMERCIAL | 39 | 76 |
| INDUSTRIAL | 7 | 14 |

- **Transportation Network**

A summary of the transportation network is shown in Table 8. This information can be used to aid in planning for transportation related accidents that could result in contamination of the source water in the delineated WSDA. Table 9 is a summary of the transportation network stream crossings in the WSDA. Please note that miles of train tracks could be less due to decommissioning of tracks.

Table 8: Transportation Network Summary for WSDA

| | Within 100 feet of stream | Total |
|---------------------|---------------------------|-------|
| Miles of Interstate | 0.08 | 83 |
| Miles of Primary | 0.05 | 71 |

| | | |
|-----------------------|-----|-----|
| Miles of Secondary | 1.4 | 379 |
| Miles of Train Tracks | 21 | 212 |

Table 9: Transportation Network Stream Crossings in the WSDA

| | Train Tracks | Interstate | Primary Roads | Secondary Roads |
|----------------------------|--------------|------------|---------------|-----------------|
| Number of Stream Crossings | 180 | 47 | 44 | 224 |

- **General Land Use**

The general land use analysis will provide an indication of which land uses predominate throughout the SWAP area, near the intake, or adjacent to the rivers, streams, lakes, and reservoirs. The land use in the SWAP area is shown in Table 10.

Table 10: General Land Use

| LAND USE | WSDA Area (Acres) | WSDA % of Total | ZCC Area (Acres) | ZCC % of Total |
|-------------|-------------------|-----------------|------------------|----------------|
| Shrub Land | 11,343 | 1.00 | 102 | 2.00 |
| Woodland | 888,568 | 91.00 | 2,754 | 46.00 |
| Water | 10,314 | 1.00 | 797 | 13.00 |
| Roads | 1,201 | 0.10 | 133 | 2.00 |
| Power lines | 2,312 | 0.20 | 16 | 0.30 |
| Urban | 11,633 | 1.00 | 1,745 | 29.00 |
| Agriculture | 46,476 | 5.00 | 406 | 7.00 |
| Barren | 5,250 | 0.50 | 15 | 0.30 |
| Wetland | 401 | 0.04 | 1 | 0.02 |

SWAPP Area Assessment and Protection Activities

Analysis of the Resource Characterization and potential significant contaminant sources of the SWAP area for the WVAWC-Kanawha Valley indicates that the water supply is susceptible to possible future contamination based on the following:

- ✓ The long narrow shape, steep topographic setting, and the large size of the WSDA present an increased potential for contamination. An important flood control/recreational impoundment is located on the Elk River at Sutton in Braxton County approximately 100 miles upstream of the intake. In addition, the large number of stream crossings (495 total) provides the opportunity for an accidental release/spill of material to easily get directly into the stream drainage network. Source water protection efforts should be directed toward the establishment of an effective and efficient emergency response plan if one does not currently exist.
- ✓ Current land use practices appear to be having an adverse impact on the ecological health of the Elk River Watershed. Coal, oil, gas, timbering, and sandstone quarries are among the industries present. Agriculture is dominated by livestock and related products. This is evidenced by of the 832.41 miles assessed in the DEP 303b report; only 26.5% were fully supporting the overall designated use. Higher bacteria levels are generally concentrated around populations centers, caused by regulated or unregulated discharges. In addition, the health of the Elk River may be impacted by a number of regulated and unregulated point and non-point sources in the ZCC and WSDA.

Recommendations:

- ✓ Protection efforts should focus on the collection of additional information on the point and non-point sources present to evaluate the risk;
- ✓ Work with the Department of Health and Human Resources, other state agencies and local officials to make sure your intake is included in local regulations and inspections efforts;
- ✓ Restrict access to the intake area and post the area with Drinking Water Protection Area signs;
- ✓ Address any biological contaminant issues; and
- ✓ Protection options need to be actively considered to further evaluate and manage all potential contaminant sources and the WVAWC-Kanawha Valley public water supply should place a high priority on protecting its supply source.

NEXT STEP – SWAP Protection Plan

The next step in source water protection planning is to prepare a SWAP protection plan. The SWAP protection plan incorporates this source water delineation assessment report and three additional sections: Contingency Planning, Alternative Sources, and Management Planning.

Contingency Planning

A contingency plan documents the system's planned response to interruption of the source water supply.

Alternative Sources

Information pertaining to alternative water sources focusing on long-term source replacement should the system be required to develop a new source of water due to contamination (or other reasons). This section outlines the most likely sources that can be used as an alternate water source.

Management Planning

Management planning is the most important element of SWAP. The management plan identifies specific activities that will be pursued by the system to protect their water resources. The system will benefit by taking a proactive approach to source water protection in their watersheds. It is anticipated that most of the management effort will focus on coordination with government agencies and periodic surveys of the watersheds. It may be necessary to conduct a limited number of special studies to determine actual risk and consequences for selected contaminant sources. This information may be needed before decisions can be made on management activities.

Need additional information?

Additional information or sources of information can be obtained by calling or visiting the BPH web site at www.wvdhhr.org/bph/swap or phoning 304-558-2981.

Glossary:

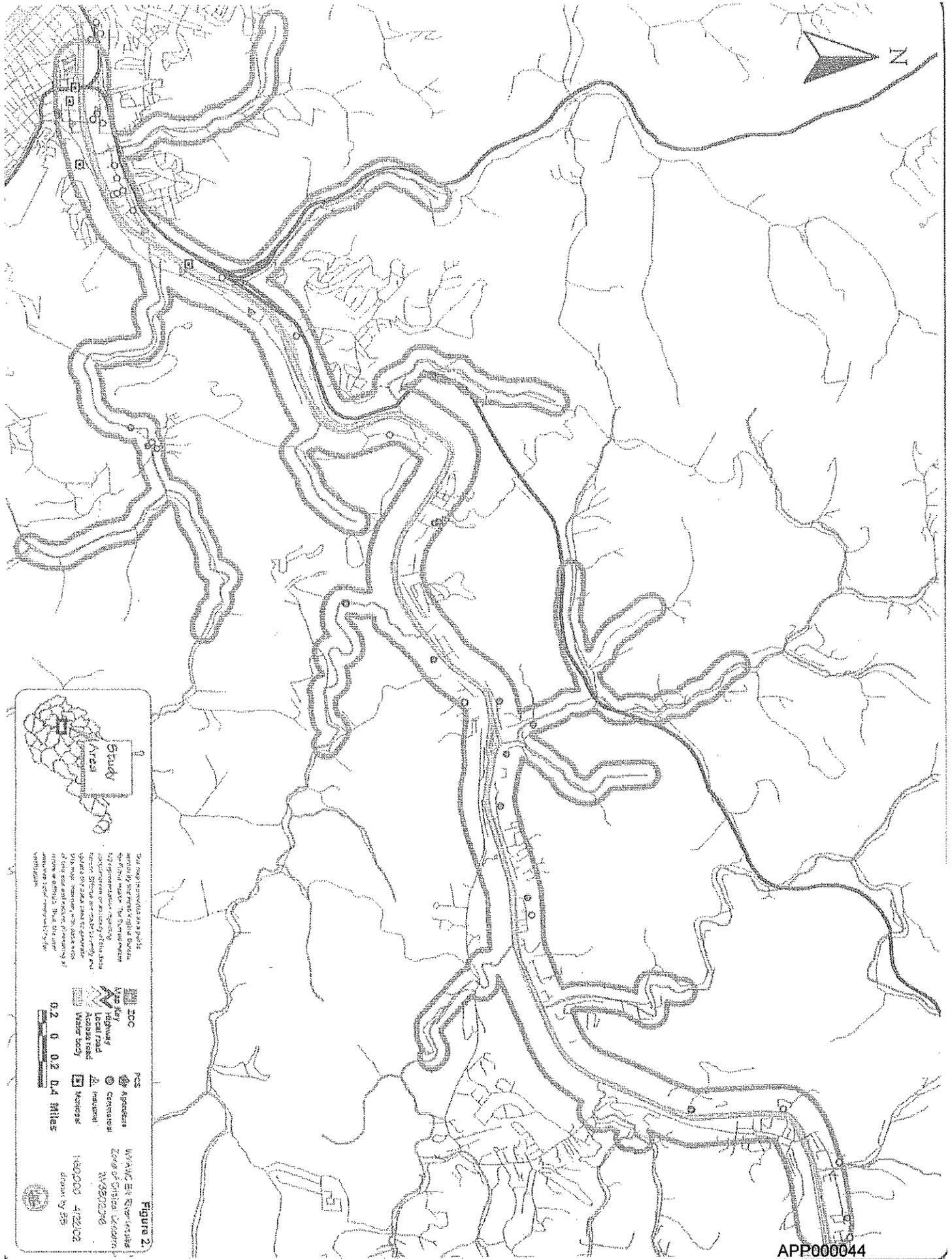
Best Management Practices (BMP's) are operational procedures used to prevent or reduce pollution.

Public Water System (PWS) is a system for the provision to the public of pipe water for human consumption, if such system has at least 15 service or regularly serves an average of at least 25 individuals daily at least 60 days of the year.

Water Quality Data is used to help assess both the potential pathogen contamination and other compliance monitoring (Nitrates) parameters associated with public water supply wells.

Potential Significant Contaminant Source (PSCS) is a facility or activity that stores, uses, or produces chemicals or elements, and has the potential to release contaminants identified in the state program within a source water protection area in an amount, which could contribute significantly to the contaminants of the source waters of the public water supply.

Disclaimer - The coverage's presented in this program are under constant revision as new sites or facilities are added. They may not contain all the potential or existing sites or facilities. The West Virginia Bureau for Public Health is not responsible for the use or interpretation of this information. Please report any inaccuracies on either the map or inventory by phoning 304-558-2981.



The map is provided as a guide to the study area. It is not intended to be used for navigation or other purposes. The Department of Transportation is not responsible for any errors or omissions in this map. The Department of Transportation is not responsible for any damages or injuries resulting from the use of this map. The Department of Transportation is not responsible for any claims or liabilities arising from the use of this map.

- | | | | |
|--|------------|--|--------------|
| | IBC | | PCS |
| | Highway | | Access road |
| | Water body | | Municipality |

US Army Corps of Engineers
 Zone of Critical Concern
 WY2002-2006
 1:80,000 4/22/02
 drawn by SP

Figure 2

APPENDIX C: THE GENERAL MULTI-SECTOR INDUSTRIAL STORMWATER PERMIT



STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER AND WASTE MANAGEMENT
601 57th STREET SE
CHARLESTON, WV 25304

WEST VIRGINIA/NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
MULTI-SECTOR GENERAL WATER POLLUTION CONTROL PERMIT

Permit No. WV0111457

Issue Date: April 1, 2009
Effective Date: May 1, 2009
Expiration Date: March 31, 2014

Supersedes WV/NPDES General
Water Pollution Control Permit
Issued April 1, 2004

Subject: Stormwater Associated
With Industrial Activity

This is to certify that any establishment with discharges composed entirely of stormwater associated with industrial activity, and who has satisfied the registration requirements, and agreeing to be regulated under the terms of this general permit except for:

1. Stormwater discharges associated with industrial activity from facilities with existing effluent guideline limitations for stormwater, as listed herein.

Cement Manufacturing (40 CFR 411)
Feedlots (40 CFR 412)
Fertilizer Manufacturing (40 CFR 418)
Petroleum Refining (40 CFR 419)
Phosphate Manufacturing (40 CFR 422)
Steam Electric (40 CFR 423)
Coal Mining (40 CFR 434)
Mineral Mining and Processing (40 CFR 436)
Ore Mining and Dressing (40 CFR 440)
Asphalt Emulsion (40 CFR 443)
Oil and Gas Extraction (SIC Major Group 13)

2. Stormwater discharges associated with the following activities.

Wood Preserving Facilities (SIC 2491)
Publicly Owned Treatment Works (SIC 33)
Landfills
Land Application Sites
Hazardous Waste Treatment, Storage, or Disposal Facilities
Leather Tanning and Finishing
Water Transportation Facilities (SIC 4412-4499)
Ship and Boat Building or Repairing Yards (SIC 3731, 3732)
*Primary Metals

*Primary Metals facilities are eligible for coverage under this general permit, if the facility is providing pretreatment for the industrial wastes, in accordance with the regulations and is transferring the wastes to a POTW which has been granted the proper permit or authority to accept such wastes and the facility has a discharge composed entirely of stormwater.

3. Stormwater discharges associated with industrial activity from facilities with an existing individual NPDES permit which covers the stormwater discharges or which are issued a permit in accordance with Section B.1. of this permit.
4. Stormwater discharges associated with industrial activity that the Director has shown to be or may reasonably be expected to be contributing to a violation of a water quality standard.
5. Stormwater discharges associated with construction activities.
6. Registrations issued on or after September 1, 2008 are hereby granted coverage under this permit.

is hereby granted coverage under the General WW/NPDES Water Pollution Control Permit to allow stormwater discharges into the waters of the State.

This permit is subject to the following terms and conditions:

The information submitted on and with the Site Registration Application Form or any information presently incorporated in the permittee's previous WW/NPDES permits is hereby incorporated with like effect as if all such information was set forth herein, and other conditions set forth in Sections A, B, Appendix A and the site approval letter.

The validity of this permit is contingent upon the payment of the applicable annual permit fee, as required by Chapter 22, Article 11, Section 10 of the Code of West Virginia.

Continuation of this general permit

If this general permit is not reissued or replaced prior to the expiration date, it will be administratively continued in accordance with 47 CSR 10 and remain in force and effect. If you were authorized to discharge under this general permit prior to the expiration date, any

discharges authorized under this permit will automatically remain covered by this general permit until the earliest of:

- Your authorization for coverage under a reissued general permit or a replacement of this general permit following your timely and appropriate submittal of a complete application requesting authorization to discharge under the new general permit and compliance with the requirements of the new permit; or
- Your submittal of notification that the facility has ceased operations; or
- Issuance or denial of an individual permit for the facility's discharge; or
- A formal permit decision by DWWM not to reissue this general permit, at which time DWWM will identify a reasonable time period of covered dischargers to seek coverage under an alternative general permit or individual permit. Coverage under this permit will cease at the end of this time period.

SECTION A

This portion of the General Permit identifies industrial activity eligible for coverage and associated monitoring requirements.

Sector A. Stormwater Discharges Associated With Industrial Activity From Timber Products Facilities

1. Discharges Covered Under this Sector. The requirements listed under this section shall apply to stormwater discharges from the following activities: establishments [generally classified under Standard Industrial Classification (SIC) Major Group 24] that are engaged in merchant sawmills, lath mills, shingle mills, cooperage stock mills, planing mills, and plywood and veneer mills engaged in producing lumber and wood basic materials; and establishments engaged manufacturing finished articles made entirely of wood or related materials, except for wood preserving facilities (SIC code 2491), wood kitchen cabinet manufacturers (SIC Code 2434), and timber cutting operations.

2. Monitoring Requirements

Table A-1
Monitoring Requirements for General Sawmills and Planing Mills Facilities

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------|----------------------------------|-----------------------|
| Chemical Oxygen Demand | 120.0 mg/l | 1/6 Months |
| Total Suspended Solids | 100 mg/l | 1/6 Months |
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |

| | | |
|---------------------------|----------|------------|
| Biochemical Oxygen Demand | 30 mg/l | 1/6 Months |
| Iron, Total | 1.0 mg/l | 1/6 Months |

**Table A-2
Monitoring for Log Storage and Handling Facilities**

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------|----------------------------------|-----------------------|
| Total Suspended Solids | 100 mg/l | 1/6 Months |

**Table A-3
Monitoring Requirements for
Hardwood Dimensions and Flooring Mills; Special Products Sawmills, not elsewhere
classified; Millwork, Veneer, Plywood and Structural Wood; Wood Containers; Wood
Buildings and Mobile Homes; Reconstituted Wood Products; and Wood Products
Facilities not elsewhere classified**

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------|----------------------------------|-----------------------|
| Chemical Oxygen Demand | 120 mg/l | 1/6 Months |
| Total Suspended Solids | 100 mg/l | 1/6 Months |

Sector B. Stormwater Discharges Associated With Industrial Activity From Paper and Allied Products Manufacturing Facilities

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to stormwater discharges from the following activities: facilities engaged in the manufacture of pulps from wood and other cellulose fibers and from rags; the manufacture of paper and paperboard into converted products, such as paper coated off the paper machine, paper bags, paper boxes and envelopes; and establishments primarily engaged in manufacturing bags of plastic film and sheet. These facilities are commonly identified by Standard Industrial Classification (SIC) Major Group 26.

2. Monitoring Requirements

Table B-1
Monitoring Requirements for Paper and Allied Products Mfg. Facilities

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------|----------------------------------|-----------------------|
| Chemical Oxygen Demand | 120 mg/l | 1/6 Months |

Sector C. Stormwater Discharges Associated With Industrial Activity From Chemical and Allied Products Manufacturing Facilities

1. Discharges Covered Under this Section. The requirements listed under this section shall apply to stormwater discharges associated with industrial activity from a facility engaged in manufacturing the following products and generally described by the SIC code shown:

- a) Basic industrial inorganic chemicals (including SIC 281).
- b) Plastic materials and synthetic resins, synthetic rubbers, and cellulosic and other human made fibers, except glass (including SIC 282).
- c) Soap and other detergents and in producing glycerin from vegetable and animal fats and oils; specialty cleaning, polishing, and sanitation preparations; surface active preparations used as emulsifiers; wetting agents, and finishing agents, including sulfonated oils; and perfumes, cosmetics, and other toilet preparations (including SIC 284).
- d) Paints (in paste and ready-mixed form); varnishes; lacquers; enamels and shellac; putties, wood fillers, and sealers; paint and varnish removers; paint brush cleaners; and allied paint products (including SIC 285).
- e) Industrial organic chemicals (including SIC 286).
- f) Nitrogenous and phosphatic basic fertilizers, mixed fertilizer, pesticides, and other agricultural chemicals (including SIC 287).
- g) Industrial and household adhesives, glues, caulking compounds, sealants, and linoleum, tile, and rubber cements from vegetable, animal, or synthetic plastics materials; explosives; printing ink, including gravure ink, screen process ink, and lithographic; miscellaneous chemical preparations, such as fatty acids, essential oils, gelatin (except vegetable), sizes, bluing, laundry soaps, writing and stamp pad ink, industrial compounds, such as boiler and heat insulating compounds, and chemical supplies for foundries (including facilities with SIC 289).
- h) Ink and paints, including china painting enamels, india ink, drawing ink, platinum paints for burnt wood or leather work, paints for china painting, artists' paints and artist's water colors (SIC 3952, limited to those listed).

2. Monitoring Requirements

Table C-1A
Agricultural Chemicals Monitoring Requirements

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|-------------------------------|----------------------------------|-----------------------|
| Nitrate plus Nitrite Nitrogen | 0.68 mg/l | 1/6 Months |
| Total Recoverable Lead | 0.0816 mg/l | 1/6 Months |
| Total Recoverable Iron | 1.0 mg/l | 1/6 Months |
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |
| Phosphorus | 2.0 mg/l | 1/6 Months |

Table C-1B
Agricultural Chemicals Effluent Limits Based on Effluent Limitations Guidelines

| Industrial Activity | Parameter | Effluent Limit | Monitoring Frequency |
|--|-----------|---------------------------|----------------------|
| Discharges from phosphate fertilizer manufacturing facilities (SIC 2874) | Fluoride | 75.0 mg/l daily maximum | 1/year |
| | | 25.0 mg/l average monthly | |

Table C-2
Industrial Inorganic Chemicals Monitoring Requirements

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|-------------------------------|----------------------------------|-----------------------|
| Total Rec. Aluminum | 0.75 mg/l | 1/6 Months |
| Total Recoverable Iron | 1.0 mg/l | 1/6 Months |
| Nitrate plus Nitrite Nitrogen | 0.68 mg/l | 1/6 Months |

**Table C-3
Soaps, Detergents, Cosmetics, and Perfumes Monitoring Requirements**

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|-------------------------------|---|------------------------------|
| Nitrate plus Nitrite Nitrogen | 0.68 mg/l | 1/6 Months |
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |
| Surfactants | Monitor Only | 1/6 Months |

**Table C-4
Plastics, Synthetics, and Resins Monitoring Requirements**

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------------|---|------------------------------|
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |

Sector D. Stormwater Discharges Associated With Industrial Activity From Asphalt Paving and Roofing Materials and Lubricant Manufacturers

1. Discharges Covered Under This Section

a) The requirements listed under this section shall apply to stormwater discharges from facilities engaged in manufacturing asphalt paving and roofing materials, including those facilities commonly identified by Standard Industrial Classification (SIC) codes 2951 and 2952.

b) The requirements listed under this section shall apply to stormwater discharges from portable asphalt plant facilities (also commonly identified by SIC Code 2951).

c) The requirements listed under this section shall apply to stormwater discharges from facilities engaged in manufacturing lubricating oils and greases, including those facilities classified as SIC Code 2992.

d) **Limitations on Coverage.** The following stormwater discharges associated with industrial activity are not authorized by this section of the permit.

(1) Stormwater discharges from petroleum refining facilities, including those that manufacture asphalt or asphalt products and that are classified as SIC Code 2911.

(2) Stormwater discharges from oil recycling facilities, and

- (3) Stormwater discharges associated with fats and oils rendering.

2. Monitoring Requirements

**Table D-1A
Monitoring Requirements for Asphalt Paving and
Roofing Materials Mfg. Facilities**

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------------|---|------------------------------|
| Total Suspended Solids | 100 mg/l | 1/6 Months |
| Chemical Oxygen Demand | 120 mg/l | 1/6 Months |
| Oil and Grease | 15 mg/l | 1/6 Months |

**Table D-2B
Asphalt Paving and Roofing Materials Mfg. Facilities
Effluent Limits Based on Effluent Limitations Guidelines**

| Industrial Activity | Parameter | Effluent Limit | Monitoring Frequency |
|---|------------------|-------------------------|-----------------------------|
| Discharges from asphalt emulsion facilities | TSS | 23 mg/l max daily | 1/year |
| | | 15 mg/l average monthly | |
| | pH | 6.0 – 9.0 s.u. | |
| | Oil and Grease | 15 mg/ max daily | |
| | | 10 mg/l average monthly | |

Sector E. Stormwater Discharges Associated With Industrial Activity From Glass, Clay, Cement, Concrete, and Gypsum Product Manufacturing Facilities

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to stormwater discharges from the following activities: manufacturing flat, pressed, or blown glass or glass containers, manufacturing hydraulic cement; manufacturing clay products including tile and brick; manufacturing of pottery and porcelain electrical supplies; manufacturing concrete products; manufacturing gypsum products; nonclay refractories; and grinding or otherwise treating minerals and earths. This section generally includes the following types of manufacturing operators: flat glass, (SIC Code 3211); glass containers, (SIC Code 3221); pressed and blown glass, not elsewhere classified, (SIC Code 3229); hydraulic cement, (SIC Code 3241); brick and structural clay tile, (SIC Code 3251); ceramic wall and floor tile, (SIC Code 3253); clay refractories, (SIC Code 3255); structural clay products not elsewhere classified (SIC Code 3259); vitreous china table and kitchen articles (SIC Code 3262); fine earthenware table and kitchen articles (SIC Code 3263); porcelain electrical supplies, (SIC Code 3264); pottery products, (SIC Code 3269); concrete block and brick, (SIC Code 3271); concrete products, except block and brick (SIC Code 3272); gypsum products, (SIC Code 3275); minerals and earths, ground or otherwise treated, (SIC Code 3295); mineral wool and mineral wool insulation products (SIC 3296). and nonclay refractories, (SIC Code 3297).

Facilities engaged in the following activities are not eligible for coverage under this section; lime manufacturing (SIC 3274); cut stone and stone products (SIC 3281); abrasive products (SIC 3291); asbestos products (SIC 3292).

2. Monitoring Requirements

Table E-1
Monitoring Requirements for Clay Product Manufacturers

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|-----------------------|----------------------------------|-----------------------|
| Total Rec. Aluminum | 0.75 mg/l | 1/6 Months |
| PH | 6.0 to 9.0 s.u. | 1/6 Months |

Table E-2
Monitoring Requirements for Concrete and Gypsum Product Manufacturers

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------|----------------------------------|-----------------------|
| Total Suspended Solids | 100 mg/l | 1/6 Months |
| Total Recoverable Iron | 1 mg/l | 1/6 Months |
| PH | 6.0 to 9.0 s.u. | 1/6 Months |

**Table E-3
Material Storage Piles at Cement Manufacturing Facilities
Effluent Limits Based on Effluent Limitations Guidelines**

| Industrial Activity | Parameter | Effluent Limit | Monitoring Frequency |
|---|------------------|-----------------------|-----------------------------|
| Discharges from material storage piles at cement manufacturing facilities | TSS | 50 mg/l max daily | 1/year |
| | pH | 6.0 – 9.0 s.u. | |

Sector F. Stormwater Discharges Associated With Industrial Activity From Automobile Salvage Yards

1. Discharges Covered Under This Section

The requirements listed under this section shall apply to stormwater associated with industrial activity from facilities engaged in dismantling or wrecking used motor vehicles for parts recycling or resale and for scrap (SIC Code 5015).

2. Monitoring Requirements

**Table F-1
Monitoring Requirements**

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------------|---|------------------------------|
| Total Suspended Solids | 100 mg/l | 1/6 Months |
| Total Rec. Aluminum | 0.75 mg/l | 1/6 Months |
| Total Recoverable Iron | 1 mg/l | 1/6 Months |
| Total Recoverable Lead | 0.0816 mg/l | 1/6 Months |
| Oil and Grease | 15 mg/l | 1/6 Months |
| Chemical Oxygen Demand | 120 mg/l | 1/6 Months |

Sector G. Stormwater Discharges Associated With Industrial Activity From Scrap Recycling and Waste Recycling Facilities

- Discharges Covered Under this Section. The requirements listed under this section are applicable to stormwater discharges from the following activities: facilities that are engaged in the processing, reclaiming and wholesale distribution of scrap and waste materials such as ferrous and nonferrous metals, paper, plastic, cardboard, glass, animal hides (these types of activities are typically identified as SIC Code 5093). Facilities that are engaged in reclaiming and recycling liquid wastes such as used oil, antifreeze, mineral spirits, and industrial solvents (also identified as SIC Code 5093) are also covered under this section.
- Monitoring Requirements

**Table G-1
Industry Monitoring Requirements for Scrap Recycling and Waste Recycling Facilities (non-source separated only)**

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------------|---|------------------------------|
| Chemical Oxygen Demand | 120 mg/l | 1/6 Months |
| Total Suspended Solids | 100 mg/l | 1/6 Months |
| Total Rec. Aluminum | 0.75 mg/l | 1/6 Months |
| Total Recoverable Copper | 0.0636 mg/l | 1/6 Months |
| Total Recoverable Iron | 1 mg/l | 1/6 Months |
| Total Recoverable Lead | 0.0816 mg/l | 1/6 Months |
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |
| Oil and Grease | 15 mg/l | 1/6 Months |

Sector H. Stormwater Discharges Associated With Industrial Activity From Vehicle Maintenance Areas, Equipment Cleaning Areas, or Deicing Areas Located at Air Transportation Facilities

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to stormwater discharges from establishments and/or facilities including airports, air terminals, air carriers, flying fields, and establishments engaged in servicing or maintaining airports and/or aircraft (generally classified under SIC Code 45) which have vehicle maintenance shops, material handling facilities, equipment cleaning operations or airport and/or aircraft deicing/anti-icing operations. For the purpose of this permit, the term

"deicing" is defined as the process to remove frost, snow, or ice and "anti-icing" is the process which prevents the accumulation of frost, snow, or ice.

2. Monitoring Requirements

Table H-1
Monitoring Requirements

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|---------------------------|----------------------------------|-----------------------|
| Biochemical Oxygen Demand | 30 mg/l | 1/6 Months |
| Chemical Oxygen Demand | 120 mg/l | 1/6 Months |
| Ammonia | 4 mg/l | 1/6 Months |
| pH | 6.0 to 9 s.u. | 1/6 Months |
| Oil and Grease | 15 mg/l | 1/6 Months |
| Total Suspended Solids | 100 mg/l | 1/6 Months |

Sector I. Stormwater Discharges Associated With Industrial Activity From Motor Freight Transportation Facilities, Passenger Transportation Facilities, Petroleum Bulk Oil Stations and Terminals, Rail Transportation Facilities, and United States Postal Service Transportation Facilities

1. Discharges Covered Under This Section. Stormwater discharges from ground transportation facilities and rail transportation facilities (generally identified by SIC Codes 40, 41, 42, 43, and 5171), that have vehicle and equipment maintenance shops vehicle and equipment rehabilitation, mechanical repairs, painting, fueling and lubrication) and/or equipment cleaning operations are eligible for coverage under this section.

Table I-1
Monitoring Requirements for Motor Freight Transportation Facilities, Passenger Transportation Facilities, Petroleum Bulk Oil Stations and Terminals, Rail Transportation Facilities and United States Postal Service Transportation Facilities.

Table I-1
Monitoring Requirements

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------|----------------------------------|-----------------------|
| Total Suspended Solids | 100 mg/l | 1/6 Months |

| | | |
|------------------------|----------|------------|
| Chemical Oxygen Demand | 120 mg/l | 1/6 Months |
| Oil and Grease | 15 mg/l | 1/6 Months |

Sector J. Stormwater Discharges Associated With Industrial Activity From Food and Kindred Products Facilities

1. Discharges Covered Under This Section. This section covers all stormwater discharges from food and kindred products processing facilities (commonly identified by SIC Code 20), including: meat products; dairy products; canned, frozen and preserved fruits, vegetables, and food specialties; grain mill products; bakery products; sugar and confectionery products; fats and oils; beverages; and miscellaneous food preparations and kindred products and tobacco products manufacturing (SIC Code 21), where industrial plant yards; material handling sites; refuse sites; sites used for application or disposal of process wastewater; sites used for storage, or disposal; shipping and receiving areas; manufacturing buildings; and storage areas for raw material and intermediate and finished products are exposed to stormwater and areas where industrial activity has taken place in the past and significant materials remain. For the purpose of this paragraph, material handling activities include the storage, loading, and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product or waste product.

2. Monitoring Requirements

Table J-1
Grain Mill Products

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------|----------------------------------|-----------------------|
| Total Suspended Solids | 100 mg/l | 1/6 Months |

Table J-2
Fats and Oils Products Monitoring Requirements

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|-------------------------------|----------------------------------|-----------------------|
| Biochemical Oxygen Demand | 30 mg/l | 1/6 Months |
| Chemical Oxygen Demand | 120 mg/l | 1/6 Months |
| Nitrate Plus Nitrite Nitrogen | 0.68 mg/l | 1/6 Months |
| Total Suspended Solids | 100 mg/l | 1/6 Months |

Sector K. Stormwater Discharges Associated With Industrial Activity From Textile Mills, Apparel, and Other Fabric Product Manufacturing Facilities

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to stormwater discharges from the following activities: textile mill products, of and regarding facilities and establishments engaged in the preparation of fiber and subsequent manufacturing of yarn, thread, braids, twine, and cordage, the manufacturing of broad woven fabrics, narrow woven fabrics, knit fabrics, and carpets and rugs from yarn; processes involved in the dyeing and finishing of fibers, yarn fabrics, and knit apparel; the integrated manufacturing of knit apparel and other finished articles of yarn; the manufacturing of felt goods (wool), lace goods, nonwoven fabrics, miscellaneous textiles, and other apparel products (generally described by SIC Code 22 and 23).

2. Monitoring Requirements. There are no chemical analysis to be performed for this industry sector.

Sector L. Stormwater Discharges Associated With Industrial Activity From Wood and Metal Furniture and Fixture Manufacturing Facilities

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to stormwater discharges associated with industrial activities from facilities involved in the manufacturing of: wood kitchen cabinets(generally described by SIC Code 2434); household furniture (generally described by SIC Code 251); office furniture (generally described by SIC Code 252); public buildings and related furniture (generally described by SIC Code 253); partitions, shelving, lockers, and office and store fixtures (generally described by SIC Code 254); and miscellaneous furniture and fixtures (generally described by SIC Code 259) if waste wood products are exposed to stormwater.

2. Monitoring Requirements.

Table L-1
Monitoring Requirements for furniture and cabinet manufactures

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------|----------------------------------|-----------------------|
| Total Suspended Solids | 100 mg/l | 1/6 Months |
| Chemical Oxygen Demand | 120 mg/l | 1/6 Months |

Sector M. Stormwater Discharges Associated With Industrial Activity From Printing and Plate making Facilities

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to stormwater discharges associated with industrial activity from the following types of facilities: book printing (SIC Code 2732); commercial printing, lithographic (SIC Code 2752); commercial printing, gravure (SIC Code 2754); commercial printing, not elsewhere classified (SIC Code 2759); and platemaking and related services (SIC Code 2796).

2. Monitoring Requirements. There are no chemical analysis to be performed for this industry sector.

Sector N. Stormwater Discharges Associated With Industrial Activity From Rubber, Miscellaneous Plastic Products, and Miscellaneous Manufacturing Industries

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to all stormwater discharges associated with industrial activity from rubber and miscellaneous plastic products manufacturing facilities (SIC major group 30) and miscellaneous manufacturing industries, except jewelry, silverware, and plated ware (SIC major group 39, except 391).

2. Monitoring Requirements

**Table N-1
Monitoring Requirements**

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------------|---|------------------------------|
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |

Sector O. Stormwater Discharges Associated With Industrial Activity From Fabricated Metal Products Industry

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to stormwater discharges associated with industrial activity from the fabricated metals industry listed below, except for electrical related industries: fabricated metal products, except machinery & transportation equipment, SIC 34 (3429, 3441, 3442, 3443, 3444, 3451, 3452, 3462, 3471, 3479, 3494, 3496, 3499); and jewelry, silverware, and plated ware (SIC Code 391).

2. Monitoring Requirements

**Table O-1
Monitoring Requirements for Fabricated Metal Products Except Coating**

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|-------------------------------|---|------------------------------|
| Total Rec. Aluminum | 0.75 mg/l | 1/6 Months |
| Total Recoverable Iron | 1 mg/l | 1/6 Months |
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |
| Nitrate plus Nitrite Nitrogen | 0.68 mg/l | 1/6 Months |

**Table O-2
Monitoring Requirements for Fabricated Metal Coating and Engraving**

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|-------------------------------|---|------------------------------|
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |
| Nitrate plus Nitrite Nitrogen | 0.68 mg/l | 1/6 Months |

Sector P. Stormwater Discharges Associated With Industrial Activity From Facilities That Manufacture Transportation Equipment, Industrial, or Commercial Machinery

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to stormwater discharges associated with transportation equipment, industrial or commercial machinery manufacturing facilities (commonly described by SIC Major Group 35 except SIC 357. And SIC Major Group 37, except SIC 373). Common activities include: industrial plant yards; material handling sites; refuse sites, sites used for application or disposal of process wastewater; sites used for storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas for raw material and intermediate and finished products; and area where industrial activity has taken place in the past and significant materials remain and are exposed to stormwater.

**Table P-1
Monitoring Requirements for Transportation Equipment, Industrial, or Commercial Machinery Manufacturing facilities.**

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------------|---|------------------------------|
| Total Suspended Solids | 100 mg/l | 1/6 Months |
| Oil and Grease | 15 mg/l | 1/6 Months |
| Chemical Oxygen Demand | 120 mg/l | 1/6 Months |

Sector Q. Stormwater Discharges Associated With Industrial Activity From Facilities That Manufacture Electronic and Electrical Equipment and Components, Photographic and Optical Goods

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to all stormwater discharges associated with industrial activity from facilities that manufacture: electronic and other electrical equipment and components, except computer equipment (SIC major group 36); measuring, analyzing, and controlling instruments; photographic, medical and optical goods; watches and clocks (SIC Major Group 38) and computer and office equipment (SIC Code 357).

2. Monitoring Requirements. There are no chemical analysis to be performed for this industry sector.

Sector R. Stormwater Discharges Associated With Industrial Activity From Primary Metals Facilities

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to all stormwater discharges from the primary industry, which includes the following types of facilities:

- a) Steel works, blast furnaces, and rolling and finishing mills including: steel wiredrawing and steel nails and spikes, cold-rolled steel sheet, strip, and bars; and steel pipes and tubes (SIC code 331).
- b) Iron and steel foundries, including: gray and ductile iron, malleable iron, steel investment, and steel foundries not elsewhere classified (SIC code 332).
- c) Primary smelting and refining of nonferrous metals, including: primary smelting and refining of copper, and primary production of aluminum (SIC code 333).
- d) Secondary smelting and refining of nonferrous metals (SIC code 334).
- e) Rolling, drawing, and extruding of nonferrous metals, including: rolling, drawing, and extruding of copper; rolling, drawing, and extruding of nonferrous metals, except copper and aluminum; and drawing and insulating of nonferrous wire (SIC code 335).
- f) Nonferrous foundries (Castings, including: aluminum die-castings, nonferrous die-castings, except aluminum, aluminum foundries, and nonferrous foundries, except copper and aluminum (SIC code 336).
- g) Miscellaneous primary metal products, not elsewhere classified, including: metal heat treating, and primary metal products, not elsewhere classified (SIC code 339).

Activities covered include, but are not limited to, stormwater discharges associated with coking operations, sintering plants, blast furnaces, smelting operations, rolling mills, casting operations, heat treating, extruding, drawing, or forging of all types of ferrous and nonferrous metals.

2. Monitoring Requirements.

Table R-1
Steel Works, Blast Furnaces, and Rolling and Finishing Mills (SIC 331)
Monitoring Requirements

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------|----------------------------------|-----------------------|
| Total Rec. Aluminum | 0.75 mg/l | 1/6 Months |
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |

Table R-2
Iron and Steel Foundries (SIC 332) Monitoring Requirements

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|--------------------------|----------------------------------|-----------------------|
| Total Rec. Aluminum | 0.75 mg/l | 1/6 Months |
| Total Suspended Solids | 100 mg/l | 1/6 Months |
| Total Recoverable Copper | 0.0636 mg/l | 1/6 Months |
| Total Recoverable Iron | 1 mg/l | 1/6 Months |
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |
| Oil and Grease | 15 mg/l | 1/6 Months |
| Lead, Total | 0.0816 mg/l | 1/6 Months |

Table R-3
Rolling, Drawing, and Extruding of Non-Ferrous Metals (SIC 335) Monitoring Requirements

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|--------------------------|----------------------------------|-----------------------|
| Total Recoverable Copper | 0.0636 mg/l | 1/6 Months |
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |

**Table R-4
Non-Ferrous Foundries (SIC 336) Monitoring Requirements**

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------------|---|------------------------------|
| Total Recoverable Copper | 0.0636 mg/l | 1/6 Months |
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |
| Oil and Grease | 15 mg/l | 1/6 Months |
| Lead, Total | 0.0816 mg/l | 1/6 Months |

Sector S. Stormwater Discharges Associated With Industrial Activity From Facilities engaged in Motorsports including Motorcycles, All Terrain Vehicles and Automobiles

1. Discharges Covered Under this Section Stormwater discharges from Motorsport complexes that involve the racing of Motorcycles, All Terrain Vehicles, Automobiles or other motorized vehicle (generally identified by SIC Code 7948).

Automobile, Motorcycle, ATV and all other Motorsports Complexes

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------------|---|------------------------------|
| Oil and Grease | 15 mg/l | 1/6 Months |
| Total Suspend Solids | 100 mg/l | 1/6 Months |

Sector T. Stormwater Discharges Associated With Industrial Activity From Facilities engaged in the Mining of Shale for NON MANUFACTURING PURPOSES.

1. Discharges Covered Under This Section. Stormwater discharges from facilities engaged in the mining of shale for NON MANUFACTURING PURPOSES ONLY (generally identified by SIC Code 1459)
2. Monitoring Requirements

Table T-1
Monitoring Requirements

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------|----------------------------------|-----------------------|
| Total Suspended Solids | 100 mg/l | 1/6 Months |
| Total Iron | 1.0 mg/l | 1/6 Months |

Sector U. Stormwater Discharges Associated With Industrial Activity From Facilities engaged in the Storage of Salt (Less than 50,000 tons only)

1. Discharges Covered Under This Section. Stormwater discharges from facilities engaged in the storage of salt (generally identified by SIC Code 5169)
2. Monitoring Requirements

Table U-1
Monitoring Requirements

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------|----------------------------------|-----------------------|
| Total Suspended Solids | 100mg/l | 1/6 Months |
| Chloride | 860mg/l | 1/6 Months |
| Cyanide | Monitor Only | 1/6 Months |
| Total Iron | 1.0mg/l | 1/6 Months |

The Following special conditions apply to Sector U.

Salt piles must be covered at all times by an impervious cover. The only time this cover may be removed is when product is being added or removed. All salt must be entirely stored on an impervious pad. All ponds and diversion ditches must have an impervious liner with a minimum imperviousness of 10 to the negative 7.

Sector V. Stormwater Discharges Associated With Industrial Activity From Facilities engaged in the transloading of Ammonia Nitrate.

1. Discharges Covered Under This Section. Stormwater discharges from facilities engaged in the transloading of ammonia nitrate between trucks, barges, and rail cars. (generally identified by SIC Code 5169)
2. Monitoring Requirements

**Table V-1
Monitoring Requirements**

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|-------------------------------|---|------------------------------|
| Total Suspended Solids | 100 mg/l | 1/6 Months |
| Ammonia Nitrogen | 4 mg/l | 1/6 Months |
| Nitrite Plus Nitrate Nitrogen | 0.68 mg/l | 1/6 Months |
| Oil and Grease | 15 mg/l | 1/6 Months |
| pH | 6.0-9.0 s.u. | 1/6 Months |

Sector W. Stormwater Discharges Associated With Industrial Activity From Facilities That Are Not Covered Under Sectors A Thru V.

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to stormwater discharges associated with industrial activity from those facilities that are not covered for such discharges under Sectors A thru V. It is the intent of the Division that this sector include those stormwater discharges which Stormwater are not covered under Sectors A thru V as well as those facilities which had no previous stormwater permit that are applying for the first time and will not be covered under Sectors A thru V.

2. Monitoring Requirements

Table W-1
Monitoring Requirements

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------------|---|------------------------------|
| Biochemical Oxygen Demand | 30 mg/l | 1/6 Months |
| Chemical Oxygen Demand | 120 mg/l | 1/6 Months |
| Total Suspended Solids | 100 mg/l | 1/6 Months |
| Ammonia Nitrogen | 4 mg/l | 1/6 Months |
| Oil and Grease | 15 mg/l | 1/6 Months |
| pH | 6.0-9.0 s.u. | 1/6 Months |

SECTION B. OTHER REQUIREMENTS

1. Requiring an individual permit.

The Director may require any person authorized by this permit to apply for and obtain an individual NPDES permit. Any interested person may petition the Director to take action under this paragraph. The Director may require any owner or operator authorized to discharge under this permit to apply for an individual NPDES permit only if the owner or operator has been notified in writing that a permit application is required. This notice shall include a brief statement of the reasons for this decision, an application form, a statement setting a deadline for the owner or operator to file the application, and a statement that on the effective date of the individual NPDES permit, coverage under this general permit shall automatically terminate. The Director may grant additional time to submit the application upon request of the applicant. If an owner or operator fails to submit in a timely manner an individual NPDES permit application required by the Director under this paragraph, then the applicability of this permit to the individual NPDES permittee is automatically terminated at the end of the day specified for application submittal.

2. Prohibition on non-stormwater discharges.

All discharges covered by this permit shall be composed entirely of stormwater except for the following listed below.

The following non – stormwater discharges that are mixed with stormwater are allowed.

a. Mist discharges which originate from cooling towers and which are deposited at an industrial facility.

Mist discharges must meet the following requirements: 1. The permittee has evaluated the potential for the discharges to be contaminated by chemicals used in the cooling tower and determined that the levels of such chemicals in the discharges would not cause or contribute to a violation of an applicable water quality standard and 2. The permittee has addressed this source of pollutants with appropriate BMPs in the SWPPP.

- b. Discharges from fire fighting activities
- c. Fire hydrant flushings
- d. Potable water sources including waterline flushings
- e. Irrigation drainage
- f. Lawn watering
- g. Routine external building washdown without detergents
- h. Pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred and where detergents are not used
- i. Air conditioning condensate
- j. Compressor condensate
- k. Uncontaminated ground water or spring water and foundation and footing drains where flows are not contaminated with process materials

These other sources of non – stormwater must be identified in the facility's Stormwater pollution prevention plan.

3. Releases in excess of Reportable Quantities.

This permit does not relieve the permittee of the reporting requirements of 40 CFR 117 and 40 CFR 302. The discharge of hazardous substances in the stormwater discharge(s) from a facility shall be minimized in accordance with the applicable stormwater pollution prevention plan for the facility, and in no case, during any 24-hour period, shall the discharge(s) contain a hazardous substance equal to or in excess of reporting quantities.

4. Low Concentration Waiver.

When the average concentration for a pollutant calculated from all monitoring data, with a minimum of four(4) consecutive samples, is less than the corresponding listed cut-off concentration for that pollutant, additional monitoring for that pollutant in Section A, is not required. The facility must submit each year, to the Division of Water and Waste Management in lieu of the monitoring data, a certification (form provided) that there has not been a significant change in the industrial activity or the pollution prevention measures in the area of facility that drains to the outlet for which sampling was waived.

The waiver is valid only for the term of the facilities current registration. If a facility would like to continue its waiver after this date it must reapply at the time of reissuance. The sampling required for a waiver extension consists of one(1) sample of each pollutant. If the sample is less than the corresponding listed cut-off concentration, then the waiver may be extended for the term of the facilities next registration.

5. Natural Background Pollutant Levels

Following the first two semi-annual benchmark monitoring, if the average concentration of a pollutant exceeds a benchmark value, and the permittee determines that exceedence of the benchmark is attributable solely to the presence of that pollutant in the natural background, the permittee is not required to perform corrective action or additional benchmark monitoring provided that:

- The average concentration of your benchmark monitoring results is less than or equal to the concentration of that pollutant in the natural background;
- The permittee documents and maintains with the SWPPP the supporting rationale for concluding that benchmark exceedences are in fact attributable solely to natural background pollutant levels. You must include in your supporting rationale any data previously collected by you or others (including literature studies) that describe the levels of natural background pollutants in your stormwater discharge; and
- The permittee notifies the DWWM on its final (second) semi-annual benchmark monitoring report that the benchmark exceedences are attributable solely to natural background pollutant levels.

Natural background pollutants include those substances that are naturally occurring in soils or groundwater. Natural background pollutants do not include legacy pollutants from earlier activity at the facility, or pollutants in run-on from neighboring sources which are not naturally occurring.

6. Benchmark Monitoring

All monitoring in this permit is benchmark monitoring. The "benchmarks" are the pollutant concentrations above which the DWWM determined represents a level of concern. The level of concern is a concentration at which a stormwater discharge could potentially impair, or contribute to impairing water quality or affect human health from ingestion of water or fish. The benchmarks are also viewed by the DWWM as a level, that if below, a facility represents little potential for water quality concern. As such, the benchmarks also provide an appropriate level to determine whether a facility's stormwater pollution prevention measures are successfully implemented. The benchmark concentrations are not effluent limitations and should not be interpreted or construed as such. These values are merely levels which the DWWM is using to determine if a stormwater discharge from any given facility merits further monitoring to insure that the facility has been successful in implementing a stormwater pollution prevention plan. As such, these levels represent a target concentration for a facility to achieve through implementation of pollution prevention measures at the facility.

The United States Environmental Protection Agency's NPDES Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity subjects Sectors C, D, and E to effluent limitation guidelines. These Sectors must monitor once per year at each outfall the parameters specified in the sector specific section of Section A.

7. Stormwater Pollution Prevention Plan practice review

Permittee shall review its stormwater pollution prevention practices each year and revise the plan (required in Section B-17), if this average concentration for any indicator pollutant in the previous year's sampling was greater than the corresponding cut-off value for that pollutant. This plan must be revised within thirty (30) days of finding the previous year's sampling results being over the cut-off value.

8. Alternative Certification

A discharge is not subject to the monitoring requirements of Section "A" provided the discharger makes a certification (form provided) for a given outlet, or on a pollutant-by-pollutant basis in lieu of monitoring reports, under penalty of law, signed in accordance with Signatory Requirements as specified in the Appendix; that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial, machinery or operations, or significant materials from past industrial activity, that are located in areas of the facility within the drainage area of the outlet are not presently exposed to stormwater and are not expected to be exposed to stormwater for the certification period.

9. No Exposure Certification

A facility that has a SIC code listed in section A requiring them to be covered under this permit is exempt from permitting requirements if they meet the following requirements consistent with the Code of Federal Regulations Section 122.26(g).

A condition of no exposure exists at an industrial facility when all industrial materials and activities are protected by a storm resistant shelter to prevent exposure to rain, snowmelt, and/or runoff. Industrial materials include, but are not limited to, material handling equipment or activities, industrial machinery, raw materials, intermediate products, by-

products, final products, or waste products. Material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product or waste product. A storm resistant shelter is not required for the following industrial materials and activities:

- drums, barrels, tanks, and similar containers that are tightly sealed, provided those containers are not deteriorated and do not leak. "Sealed" means banded or otherwise secured and without operational taps or valves;
- adequately maintained vehicles used in material handling; and
- final products, other than products that would be mobilized in stormwater discharges (e.g. rock salt).

A No Exposure Certification must be provided for each facility qualifying for the no exposure exclusion. In addition, the exclusion from NPDES permitting is available on a facility-wide basis only, not for individual outfalls. If any industrial activities or materials are or will be exposed to precipitation, the facility is not eligible for the no exposure exclusion. The certification must be submitted once every five years along with the required fee determined by the Division of Water and Waste Management (DWWM).

If circumstances change and industrial materials or activities become exposed to rain, snow, snow melt, and / or runoff. The conditions for this exclusion no longer apply. In such cases, the discharge becomes subject to enforcement and / or un-permitted discharge. Any conditionally exempt discharger who anticipates changes in circumstances should apply for and obtain permit authorization prior to the change of circumstances.

Notwithstanding the provisions of this paragraph, the DWWM retains the authority to require permit authorization (and deny this exclusion) upon making a determination that the discharge causes, has a reasonable potential to cause, or contributes to an instream excursion above an applicable water quality standard including designated uses.

10. Representative Discharge.

When a facility has two or more outlets that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outlet, the permittee reasonably believes discharges substantially identical effluents, the permittee may test the effluent of one of such outlets and report that the quantitative data also applies to the substantially identical outlet(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outlets and explains in detail why the outlets are expected to discharge substantially identical effluents. In addition, for each outlet that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g. low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan. The permittee shall include the description of the location of the outlets, explanation of why outlets are expected to discharge substantially identical effluents, and estimate of the size of the drainage area and runoff coefficient with the Stormwater Monitoring Report.

11. Visual Examination of Stormwater Quality

Permittee shall perform and document a visual examination of a stormwater discharge associated with industrial activity for each outlet during each monitoring period. Examination shall be made of samples collected within the first 30 minutes (or as soon thereafter as practical, but not exceed one hour) of when the runoff or snowmelt begins discharging. The examinations shall document observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of stormwater pollution. Visual examination reports must be maintained onsite in the stormwater pollution prevention plan.

12. Water Quality Standards.

The effluent or effluents covered by this permit are to be of such quality so as to not cause violations of applicable water quality standards.

13. TMDL and 303D Impaired Waters Requirements.

Permittees discharging pollutants of concern to waters for which there is a total maximum daily load (TMDL) established or approved by EPA are not eligible for coverage under this general permit, unless the permit conditions of this general permit are consistent with the assumptions and requirements of such TMDL. The permittee should consult with the State or EPA TMDL authority to confirm if his/her facility is subject to an approved TMDL. If you discharge to an impaired water body without an approved TMDL you must meet all applicable water quality standards for that receiving waterbody. You must also monitor for all pollutants for which the waterbody is impaired. If the pollutant for which the water is impaired is not present and not expected to be present in your discharge, or is present but you have determined that its presence is caused solely by natural background sources, you should include a notification to this effect in your first monitoring report, after which you may discontinue annual monitoring. To support a determination that the pollutant's presence is caused solely by natural background sources, you must keep the following documentation with your SWPPP records.

- 1. An explanation of why you believe that the presence of the pollutant causing the impairment in your discharge is not related to the activities at your facility; and**
- 2. Data and/or studies that tie the presence of the pollutant causing the impairment in your discharge to natural background sources in the watershed.**

Natural background pollutants include those substances that are naturally occurring in soils or groundwater. Natural background pollutants do not include legacy pollutants from earlier activity on your site, or pollutants in run-on from neighboring sources which are not naturally occurring.

If you are a new discharger you must also meet the following requirements to discharge into a 303D impaired water.

- 1. Prevent all exposure to stormwater of the pollutant(s) for which the waterbody is impaired, and retain documentation of procedures taken to prevent exposure onsite with your SWPPP; or**

2. Document that the pollutant(s) for which the waterbody is impaired is not present at your site, and retain documentation of this finding with your SWPPP; or
3. In advance of submitting your application, provide to DWWM data to support a showing that the discharge is not expected to cause or contribute to an exceedance of a water quality standard, and retain such data with your SWPPP. This data must demonstrate that the discharge of the pollutant for which the water is impaired will meet instream water quality criteria at the point of discharge.

14. Endangered and Threatened Species Requirements.

If a site discharges to a stream where a Federally endangered or threatened species or its habitat are present, the applicant should contact the US Fish and Wildlife Service to insure that requirements of the Federal Endangered Species Act are met.

15. Reopener Clause

If there is evidence indicating potential or realized impacts on water quality due to any stormwater discharge associated with industrial activity covered by this permit, the owner or operator of such discharge may be required to obtain an individual permit in accordance with Section B.1. of this permit or the permit may be modified to include different limitations and/or requirements.

16. Other Statutes or Regulations

No condition of this permit shall release the permittee from any responsibility or requirements under other environmental statutes or regulations.

17. Stormwater Pollution Prevention Plans (SWPPP) and Groundwater Protection Plan (GPP).

Each facility covered by this permit shall have a stormwater pollution plan and a groundwater protection plan. These two plans may be combined into one plan so long as all requirements for both plans are met. Alternatively, they may be developed and maintained as separate stand-alone documents. Stormwater pollution prevention plan shall be prepared in accordance with good engineering practices. The plan shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater discharges associated with industrial activity from the facility. In addition the plan shall describe and ensure the implementation of practices which are to be used to reduce the pollutants in stormwater discharges associated with industrial activity at the facility and to assure compliance with the terms and conditions of this permit.. The SWPPP and the GPP shall be signed in accordance with Section I.6, Appendix A of this permit and shall be retained on site. Plans shall provide for compliance with the terms of the plan prior to submitting a registration form to be covered under this permit. The permittee shall make plan(s) available, upon request, to the Director or authorized representative. All facilities wishing to be covered by this permit for the first time must submit a copy of the SWPPP and GPP with the application for review.

If the plan(s) are reviewed by the Director or authorized representative, that individual

may notify the permittee at any time that either the SWPPP and/or the GPP does not meet one or more of the minimum requirements of this section. After such notification, the permittee shall make changes to the plan in accordance with the time frames established below, and shall submit to the Director, a written certification that the requested changes have been made. The permittee shall have 30 days after such notification to make the changes necessary.

All SWPPPs and GPPs required under this permit are considered reports that shall be available to the public under Section 308 (b) of the CWA. The owner or operator of a facility with stormwater discharges covered by this permit shall make plans available to members of the public upon request by the public. However, the permittee may claim any portion of a stormwater pollution plan as confidential in accordance with 46 CSR 2-12.7.

If representative organization of a significant number of facilities in a particular SIC code can develop and demonstrate an acceptable stormwater pollution prevention plan, and/or groundwater protection plan, the DWWM will review this approach for considering those facilities for coverage under this general permit and in compliance with this section.

A. Stormwater Pollution Prevention Plan Requirements

a) Contents of Plan. The plan shall include, at a minimum, the following items:

(1) Description of Potential Pollutant Sources. Each plan shall provide a description of potential sources which may be reasonably expected to add significant amounts of pollutants to stormwater discharges or which may result in the discharge of pollutants during dry weather from separate storm sewers draining the facility. Plans shall identify all activities which may potentially be significant pollutant sources, including: 1) loading or unloading of dry bulk materials or liquids, 2) outdoor storage of raw materials, intermediary products or products, 3) outdoor process activities, 4) dust or particulate generating processes, 5) illicit connections or management practices, and 6) waste disposal practices. To facilitate this process, each plan, shall at a minimum, include:

(A) A site map indicating, at a minimum: each drainage and discharge structure; an outline of the drainage area of each discharge point, each past or present area used for outdoor storage or disposal of significant materials; each existing structural control measure to reduce pollutants in stormwater runoff; materials loading and access area; each hazardous waste storage or disposal facility (including each area not required to have a RCRA permit which is used for accumulating hazardous waste under 40 CFR 262.34); each well where fluids from the facility are injected underground; sinkholes; springs; and other surface water bodies;

(B) An estimate of the area of impervious surfaces (including paved areas and building roofs) relative to the total area drained by each outlet;

(C) A topographic map (or other map if a topographic map is unavailable), extending one mile beyond the property boundaries of the facility, depicting the facility and each of its intake and discharge structures, springs, other surface water bodies, and drinking water wells listed in public records or otherwise known to the applicant in the map area. The requirements of this paragraph may be included in the site map required under Section G.5.d) (1) (A).

(D) A narrative description of significant materials that have been treated, stored or disposed in a manner to allow exposure to stormwater between the time of three years prior to the date of the coverage under this permit and the present; method of on-site storage or disposal; materials management practices employed to minimize contact of these materials with stormwater runoff between the time of three years prior to the date of issuance of this permit and the present; materials loading and access areas; the location and a description of existing structural and nonstructural control measures to reduce pollutants in stormwater runoff; and description of any treatment the stormwater receives.

(E) A list of significant spills and leaks of toxic or hazardous pollutant that occurred at the facility after the date of three (3) years prior to coverage under this permit and the present. Such list shall be updated when a significant spill or leak of toxic or hazardous pollutants occurs and shall include a description of the materials released, an estimate of the volume of the release, the location of the release, and a description of any remediation or cleanup measures taken;

(F) For each area of the plant that generates stormwater discharges associated with industrial activity with a reasonable potential for containing significant amounts of pollutants, a

prediction of the direction of flow, and an estimate of the types of pollutants which could be present in stormwater discharges associated with industrial activity; and

(G) A summary of existing sampling data describing pollutants in stormwater discharges.

(2) Stormwater Management Controls

Each facility covered by this permit shall develop a description of stormwater pollution controls appropriate for the facility, and implement such controls. Priorities developed in a plan for implementing controls shall reflect the nature of identified potential sources of pollutants at the facility. The description of stormwater pollution controls shall address the following minimum components, including a schedule for implementing such controls:

(A) **Pollution Prevention Committee** - The description of the stormwater Pollution Prevention Committee shall identify specific individuals within the organization who are responsible for developing the stormwater pollution prevention plan and assisting the manager in its implementation, maintenance, and revision. The activities and responsibilities of the committee should address all aspects of the facility's stormwater pollution prevention plan.

(B) **Risk identification and Assessment/Material Inventory** - The stormwater pollution prevention plan shall assess the potential of various sources at the facility to contribute pollutants to stormwater discharges associated with industrial activity. The plan shall inventory the types of materials handled, the location of material management activities, and types of material management activities. Factors to consider when evaluating the pollution potential of runoff from various portions of an industrial plant include: loading and unloading operations, outdoor storage activities; outdoor manufacturing or processing activities; dust or particulate generating processes; and waste disposal practices. Other factors to consider are the toxicity of chemicals; quantity of chemicals used, produced, or discharged; history of water quality violations; history of significant leaks or spills of toxic or hazardous pollutants; and nature and uses of the receiving waters.

(C) **Preventive Maintenance** - A preventive maintenance program shall involve inspection and maintenance of stormwater pollution prevention devices (e.g., cleaning oil/water separators, catch basins, etc.) as well as inspecting and testing plant equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters.

(D) **Good Housekeeping** - Good housekeeping requires the maintenance of a clean, orderly facility.

(E) **Spill Prevention and Response Procedures** - Areas where potential spills can occur, and their accompanying drainage points shall be identified clearly in the stormwater pollution prevention plan. Where appropriate, specifying material handling procedures and storage requirements in the plan should be considered. Procedures for cleaning up spills shall be identified in the plan and made available to the appropriate personnel. The necessary equipment to implement a cleanup should be available to all personnel.

(F) **Stormwater pollution prevention** - After measures have been taken to minimize pollutant sources to stormwater, traditional stormwater pollution prevention practices should be considered.

(G) Sediment and Erosion Prevention - The plan shall identify areas which, due to topography, activities, or other factors, have a high potential for soil erosion, and identify measures to limit erosion. Some sectors may be required to submit a sediment and erosion control plan.

(H) Employee Training - Employee training programs shall inform personnel at all levels of responsibility of the components and goals of the stormwater pollution prevention plan. Training should address topics such as spill response, good housekeeping, and material management practices. A pollution prevention plan shall identify periodic dates for such training.

(I) Visual Inspections - Qualified company personnel shall be identified to inspect designated equipment and plant or other appropriate areas. Material handling areas shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. A tracking or follow-up procedure should be used to ensure that adequate response and corrective actions have been taken in response to the inspection. Records of inspections shall be maintained.

(J) Record keeping and Internal Reporting Procedures - Incidents such as spills, leaks, and improper dumping, along with other information describing the quality and quantity of stormwater discharges should be included in the records. Inspections and maintenance activities such as cleaning oil and grit separators or catch basins should be documented and recorded.

(K) Non-Stormwater Discharges - A certification that the discharge has been tested for the presence of non-stormwater discharges. The certification shall include a description of the results of any test for the presence of non-stormwater discharges, the method used, the date of any testing, and the on-site drainage points that were directly observed during the test. Such certification may not be feasible if the facility operating the stormwater discharge associated with industrial activity does not have access to an outlet, manhole, or other point of access to the ultimate conduit which receives the discharge. In such cases, the source identification section of the stormwater pollution plan shall indicate why the certification required by this section was not feasible.

b) Site Inspection

A site inspection shall be conducted annually by appropriate personnel named in the stormwater pollution prevention plan to verify that the description of potential pollutant sources required under Section B.11.A.a)(1) is accurate; the drainage map has been updated or otherwise modified to reflect current conditions; and the controls to reduce pollutants in stormwater discharges associated with industrial activity identified in the stormwater pollution prevention plan are being implemented and are adequate. Records documenting significant observations made during the site inspection shall be retained as part of the stormwater pollution prevention plan for three years.

c) A facility which has experienced one or more releases of a hazardous substance in excess of reporting quantities established at 40 CFR 117.3 or 40 CFR 302.4 within twelve months prior to the effective date of this permit, or after the effective date of this permit, shall include as part of the stormwater pollution prevention plan for the facility a written

(G) **Sediment and Erosion Prevention** - The plan shall identify areas which, due to topography, activities, or other factors, have a high potential for soil erosion, and identify measures to limit erosion. Some sectors may be required to submit a sediment and erosion control plan.

(H) **Employee Training** - Employee training programs shall inform personnel at all levels of responsibility of the components and goals of the stormwater pollution prevention plan. Training should address topics such as spill response, good housekeeping, and material management practices. A pollution prevention plan shall identify periodic dates for such training.

(I) **Visual Inspections** - Qualified company personnel shall be identified to inspect designated equipment and plant or other appropriate areas. Material handling areas shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. A tracking or follow-up procedure should be used to ensure that adequate response and corrective actions have been taken in response to the inspection. Records of inspections shall be maintained.

(J) **Record keeping and Internal Reporting Procedures** - Incidents such as spills, leaks, and improper dumping, along with other information describing the quality and quantity of stormwater discharges should be included in the records. Inspections and maintenance activities such as cleaning oil and grit separators or catch basins should be documented and recorded.

(K) **Non-Stormwater Discharges** - A certification that the discharge has been tested for the presence of non-stormwater discharges. The certification shall include a description of the results of any test for the presence of non-stormwater discharges, the method used, the date of any testing, and the on-site drainage points that were directly observed during the test. Such certification may not be feasible if the facility operating the stormwater discharge associated with industrial activity does not have access to an outlet, manhole, or other point of access to the ultimate conduit which receives the discharge. In such cases, the source identification section of the stormwater pollution plan shall indicate why the certification required by this section was not feasible.

b) Site Inspection

A site inspection shall be conducted annually by appropriate personnel named in the stormwater pollution prevention plan to verify that the description of potential pollutant sources required under Section B.11.A.a)(1) is accurate; the drainage map has been updated or otherwise modified to reflect current conditions; and the controls to reduce pollutants in stormwater discharges associated with industrial activity identified in the stormwater pollution prevention plan are being implemented and are adequate. Records documenting significant observations made during the site inspection shall be retained as part of the stormwater pollution prevention plan for three years.

c) A facility which has experienced one or more releases of a hazardous substance in excess of reporting quantities established at 40 CFR 117.3 or 40 CFR 302.4 within twelve months prior to the effective date of this permit, or after the effective date of this permit, shall include as part of the stormwater pollution prevention plan for the facility a written

description of each release, corrective actions taken and measures taken to prevent recurrence. (Note: Section B.3. if this permit prohibits stormwater discharges which, during any 24-hour period, contain a hazardous substance equal to or in excess of the reporting quantities of 40 CFR 117 and 40 CFR 302.)

d) Consistency with Other Plans and Programs

Stormwater management plans and programs may reflect requirements for Spill Prevention Control and Countermeasure (SPCC) plans under section 311 of the Clean Water Act (CWA) or Best Management Practices (BMP) plans otherwise required by a WW/NPDES permit, and may incorporate any part of such plans into the stormwater pollution prevention plan by reference.

B. Groundwater Protection Plan Requirements

Groundwater Protection Plans (GPPs) shall be prepared in accordance with this Section and the requirements of Title 47, Series 58, Section 4.11., et. seq. (Groundwater Protection Regulations). If the GPP is combined with the SWPPP into a single plan it may not be necessary to repeat some of the information required by the following subsections. However, stand alone GPPs must contain the following information at a minimum:

(1) The GPP shall include an inventory of all operations which may reasonably be expected to contaminate the groundwater resources with an indication of the potential for soil and groundwater contamination from those operations. The following potential sources must be considered: Outside materials storage areas; Disposal areas; Loading and unloading areas; Bulk storage and distribution areas; Drums; Sumps; Pumps; Tanks; Impoundments; Ditches; and Underground Pipelines. In addition the GPP shall provide a thorough and detailed description of procedures designed to protect groundwater from the identified potential contamination sources. Specific attention must be given to manufacturing facilities, materials handling, equipment cleaning, construction activities, maintenance activities, pipelines, sumps, and tanks containing contaminants.

(2) Facilities which have areas that require remedial action to install, implement, or develop procedures or control equipment to protect groundwater shall include in their GPP a schedule of compliance listing such areas, the remedial actions necessary, and the projected date such remedial actions will be completed. The schedule of compliance is a part of the GPP and enforceable under Title 47, Series 58, Section 4.12.e.1.

(3) A thorough and detailed list of groundwater protection procedures to be employed in the design of new equipment or operations.

(4) A thorough and detailed summary of all activities carried out under other regulatory programs which have relevance to groundwater protection (for example: RCRA, CERCLA, Stormwater Permit, Spill Prevention Control and Countermeasures plans, Toxic Substances Control Act, DOT training requirements, Management of Used Oil, etc.)

(5) All reasonably available information groundwater quality at the site. This should include any known sampling in the area, other potential sources of contamination, depth to groundwater, and any other information available.

(6) A statement that no wastes will be used for deicing, fills, or for other uses on the site unless provided for in existing rule.

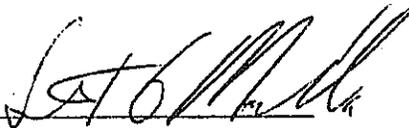
(7) Provisions for training all employees and contractor personnel on their responsibility to ensure groundwater protection. Job procedures shall provide direction on prevention of groundwater contamination.

(8) Provisions for quarterly inspections of the facility to ensure that all elements and equipment of the groundwater protection programs are in place, functioning properly, and are appropriately managed.

The herein described activity is to be constructed or installed, and operated, used and maintained strictly in accordance with the terms and conditions of this permit; with all plans and specifications previously submitted with the individual site registration application form or individual permit application; with a plan of maintenance and method of operation thereof; and with any applicable rules and regulations promulgated by the State Environmental Quality Board.

Failure to comply with the terms and conditions of this permit, with the plans and specifications previously submitted with individual site registration application form or individual permit application, and with a plan of maintenance and method of operation thereof shall constitute grounds for the revocation or suspension of this permit and for the invocation of all the enforcement procedures set forth in Chapter 22, Article 11 of the Code of West Virginia.

This permit is issued in accordance with the provisions of Chapter 22, Article 11 of the Code of West Virginia

BY: 

Director

WV/NPDES Permit No. WV0111457

Appendix A

I. MANAGEMENT CONDITIONS:

1. Duty to Comply

- a) The permittee must comply with all conditions of this permit. Permit noncompliance constitutes a violation of the CWA and State Act and is grounds for enforcement action; for permit modification, revocation and reissuance, suspension or revocation; or for denial of a permit renewal application.
- b) The permittee shall comply with all effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

2. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Division of Water and Waste Management will provide the permittee with an application package at such time as they will need to reapply. Applicants will have 30 days from when they receive the application to reapply.

3. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit, which has a reasonable likelihood of adversely affecting human health or the environment.

4. Permit Actions

This permit may be modified, revoked and reissued, suspended, or revoked for cause. The filing of a request by the permittee for permit modification, revocation and reissuance, or revocation, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

5. Property Rights

This permit does not convey any property rights of any sort or any exclusive privilege.

6. Signatory Requirements

All applications, reports, or information submitted to the Director shall be signed and certified as required in Title 47, Series 10, Section 4.6 of the West Virginia Legislative Rules.

7. Transfers

This permit coverage is not transferrable to any person except after notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary.

8. Duty to Provide Information

The permittee shall furnish to the Director, within a reasonable specified time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, suspending, or revoking this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

9. Other Information

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information.

10. Inspection and Entry

The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

- a) Enter upon the permittee's premises in which an effluent source or activity is located, or where records must be kept under the conditions of this permit;
- b) Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit;
- c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
- d) Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the State Act, any substances or parameters at any location.

11. Permit Modification

This permit may be modified, suspended, or revoked in whole or in part during its term in accordance with the provisions of Chapter 22-11-12 (of the Code of West Virginia).

12. Water Quality

The effluent or effluents covered by this permit are to be of such quality so as not to cause violation of applicable water quality standards adopted by the Environmental Quality Board.

13. Outlet Markers

A permanent marker at the establishment shall be posted in accordance with Title 47, Series 11, Section 9 of the West Virginia Legislative Rules.

14. Liabilities

- a) Any person who violates a permit condition implementing sections 301, 302, 306, 307, 308, 318, or 405 of the Clean Water Act is subject to a civil penalty not to exceed \$10,000 per day of such violation. Any person who willfully or negligently violates permit conditions implementing sections 301, 302, 306, 307, or 308 of the Clean Water Act is subject to a fine of not less than \$2,500 nor more than \$25,000 per day of violation, or by imprisonment for not more than 1 year, or both.
- b) Any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.
- c) Any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.
- d) Nothing in C.14 a), b), and c) shall be construed to limit or prohibit any other authority the Director may have under the State Water Pollution Control Act, Chapter 22, Article 11.

15. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Clean Water Act.

II. OPERATION AND MAINTENANCE:

1. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls, and appropriate quality assurance procedures. Unless otherwise required by Federal or State law, this provision requires the operation of back-up auxiliary facilities or similar systems which are installed by the permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

2. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of the permit.

3. Bypass

a) Definitions

- (1) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility; and
- (2) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b) Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provision of II.3.c) and II.3.d) of this permit.

- (1) If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten (10) days before the date of the bypass;
- (2) If the permittee does not know in advance of the need for bypass, notice shall be submitted as required in IV.2.b) of this permit.

d) Prohibition of bypass

- (1) Bypass is permitted only under the following conditions, and the Director may take enforcement action against a permittee for a bypass, unless:
 - (A) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
 - (B) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgement to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and
 - (C) The permittee submitted notices as required under II.3.c) of this permit.
- (2) The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed in II.3.d.(1) of this permit.

4. Upset

a) Definition. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

b) Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitation if the requirements of II.4.c) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

c) Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

- (1) An upset occurred and that the permittee can identify the cause(s) of the upset;
- (2) The permitted facility was at the time being properly operated;
- (3) The permittee submitted notice of the upset as required in IV.2.b) of this permit.
- (4) The permittee complied with any remedial measures required under I.3. of this permit.

d) Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

5. Removed Substances

Where removed substances are not otherwise covered by the terms and conditions of this permit or other existing permit by the Director, any solids, sludge, filter backwash or other pollutants (removed in the course of treatment or control of wastewater) and which are intended for disposal within the State, shall be disposed of only in a manner and at a site subject to the approval by the Director. If such substances are intended for disposal outside the State or for reuse, i.e., as a material used for making another product, which in turn has another use, the permittee shall notify the Director in writing of the proposed disposal or use of such substances, the identity of the prospective disposer or users, and the intended place of disposal or use, as appropriate.

III. MONITORING AND REPORTING

1. Representative Sampling, Sample Type and Sampling Period

Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. For discharges from holding ponds or other impoundments with a retention period greater than 24 hours, (estimated by dividing the volume of the retention pond by the estimated volume of water discharged during the 24 hours previous to the time that the sample is collected) a grab sample may be taken at any time within 24 hours from the beginning of rainfall. For all other discharges, samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. Where once per six(6) month sampling is required, the samples for each six(6) month period shall be collected at least three(3) months apart. The grab sample shall be taken during the first thirty minutes of the discharge. If the collection of a grab sample during the first thirty minutes is impractical, a sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first thirty minutes was impractical

Permittee shall monitor samples collected during the sampling period of January through June and July through December.

2. Reporting

- a) Permittee shall submit each year, according to the enclosed format, a Discharge Monitoring Report (DMR) indicating in terms of concentration, the values of the constituents listed in Part A analytically determined to be in the effluent(s).
- b) The required DMRs should be mailed no later than 20 days following the end of the reporting period and be addressed to:

Director
Division of Water and Waste Management
601 57th Street SE
Charleston, WV 25304
Attention: Permitting Section

and Supervisor Environmental Enforcement
(General Permit Registration shall contain Regional
address)

3. Test Procedures

Samples shall be taken, preserved and analyzed in accordance with the latest edition of 40 CFR Part 136, unless other test procedures have been specified elsewhere in this permit.

4. Recording of Results

For each measurement or sample taken pursuant to the permit, the permittee shall record the following information.

- a) The date, exact place, and time of sampling or measurement;
- b) The date(s) analyses were performed;
- c) The individual(s) who performed the sampling or measurement;
- d) The individual(s) who performed the analyses; if a commercial laboratory is used, the name and address of the laboratory;
- e) The analytical techniques or methods used, and
- f) The results of such analyses. Information not required by the DMR form is not to be submitted to this agency, but is to be retained as required in III.6.

5. Additional Monitoring by Permittee

If the permittee monitors any pollutant at any monitoring point specified in this permit more frequently than required by this permit, using approved test procedures or others as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the Discharge Monitoring Report Form. Such increased frequency shall also be indicated. Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in the permit.

6. Records Retention

The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for the permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

7. Definitions

- a) "Daily discharge" means the discharge of a pollutant measured during a calendar day or within any specified period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the average measurement of the pollutant over the day.
- b) "Average monthly discharge limitation" means the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.
- c) "Maximum daily discharge limitation" means the highest allowable daily discharge.
- d) "Composite Sample" is a combination of individual samples obtained at regular intervals over a time period. Either the volume of each individual sample is proportional to discharge flow rates or the sampling interval (for constant volume samples) is proportional to the flow rates over the time period used to produce the composite. The maximum time period between individual samples shall be two hours.
- e) "Grab Sample" is an individual sample collected in less than 15 minutes.
- f) "is" = immersion stabilization - a calibrated device is immersed in the effluent stream until the reading is stabilized.

III. MONITORING AND REPORTING CONTD.

- g) The "daily average temperature" means the arithmetic average of temperature measurements made on an hourly basis, or the mean value plot of the record of a continuous automated temperature recording instrument, either during a calendar month, or during the operating month if flows are of shorter duration.
- h) The "daily maximum temperature" means the highest arithmetic average of the temperatures observed for any two (2) consecutive hours during a 24 hour day, or during the operating day if flows are of shorter duration.
- i) The "daily average fecal coliform" bacteria is the geometric average of all samples collected during the month.
- j) "Measured Flow" means any method of liquid volume measurement, the accuracy of which has been previously demonstrated in engineering practice, or which a relationship to absolute volume has been obtained.
- k) "Estimate" means to be based on a technical evaluation of the sources contributing to the discharge including, but not limited to pump capabilities, water meters and batch discharge volumes.
- l) "Non-contact cooling water" means the water that is contained in a leak-free system, i.e., no contact with any gas, liquid, or solid other than the container for transport; the water shall have no net poundage addition of any pollutant over intake water levels, exclusive of approved anti-fouling agents.
- m) "Best Management Practices" (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.
- n) "CWA" means Clean Water Act or the Federal Water Pollution Control Act.
- o) "Director" means the Director of the Division of Water and Waste Management, Department of Environmental Protection or their designated representative.
- p) "Runoff coefficient" means the fraction of total rainfall that will appear at the conveyance as runoff.
- q) "Salt Piles" means the commercial storage of common salt (sodium chloride).
- r) "Section 313 water priority chemicals" means a chemical or chemical categories which are:
 - (1) Are listed at 40 CFR 372.65 pursuant to section 313 of Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986, also titled the Emergency Planning and Community Right-to-Know Act of 1986;
 - (2) Are present at or above threshold levels at a facility subject to SARA Title III, section 313 reporting requirements; and
 - (3) That meet at least one of the following criteria: (i) Area listed to appendix D of 40 CFR part 122 on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols) or Table V (certain toxic pollutants and hazardous substances); (ii) Are listed as a hazardous substance pursuant to Section 311 (b)(2)(A) of the CWA at 40 CFR 116.; or (iii) are pollutants for which EPA has published acute or chronic water quality criteria.
- s) "Significant materials" includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under Section 101(14) of CERCLA; any chemical the facility is required to report pursuant to Section 313 of III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with stormwater discharges.
- t) "Site Registration Application Form" means the form(s) designed by the Director for the purpose of making application for coverage under a general permit.
- u) "Significant spills" includes, but is not limited to: releases of oil or hazardous substances in excess of reportable quantities under section 311 of the CWA (see 40 CFR 110.10 and CFR 117.21) or section 102 of CERCLA (see 40 CFR 302.4).
- v) "Stormwater" means stormwater runoff, snow melt runoff and surface runoff and drainage.
- w) "Stormwater Associated with Industrial Activity" means the discharge from any conveyance which is used for collecting and conveying stormwater and which is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program. For the categories of industries identified below in (i) through (xi), the term includes, but is not limited to stormwater discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites, refuse sites, sites used for the application or disposal of process wastewater (as defined at 40 CFR 401); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to stormwater. For the categories of industries identified below in (xi) the term includes only stormwater discharges from all areas listed in the previous sentence (except access roads) where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products or industrial machinery are exposed to stormwater. For the purposes of the stormwater regulations (40 CFR Part 122.26), material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with stormwater drained from the above described areas. Industrial facilities (including industrial facilities that are Federally or municipally owned or operated that meet the description of the facilities listed in the paragraph (i)-(xi)) include those facilities designated under 122.26(a)(i)(v). The following categories of facilities are considered to be engaging in "industrial activity" for purposes of these regulations

III. MONITORING AND REPORTING CONTD.

- (i) Facilities subject to stormwater effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR Subchapter N (except facilities with toxic pollutant effluent standards which are exempted under category (xi));
 - (ii) Facilities classified as Standard Industrial Classifications 24 (except 2434), 26 (except 265 and 267), 28, 29, 30, 311, 32, 33, 3441, 373;
 - (iii) Facilities classified as Standard Industrial Classifications 10 through 14 (mineral industry) including active or inactive mining operations (except for areas of coal mining operations meeting the definition of a reclamation area under 40 CFR 434.11 (1)) and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge stormwater contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations; inactive mining operations are mining sites that are not being actively mined, but which have an identifiable owner/operator;
 - (iv) Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of RCRA;
 - (v) Landfill and land application sites, and open dumps that have received any industrial wastes (waste that is received from any of the facilities described under this subsection) including those that are subject to regulation under Subtitle D of RCRA;
 - (vi) Facilities involved in the recycling of materials, including metal scrap yards, battery reclaimers, salvage yards, and automobile junkyards, including but limited to those classified as Standard Industrial Classification 5015 and 5093;
 - (vii) Steam electric power generating facilities, including coal handling sites;
 - (viii) Transportation facilities classified as Standard Industrial Classifications 40, 41, 42, 43, 44, 45, and 5171 which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling and lubrication), equipment cleaning operations, airport deicing operations, or which are otherwise identified in (i)-(vii) or (ix)-(x) are associated with industrial activity;
 - (ix) Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with the design flow of 1.0 MGD or more, or required to have an approved pretreatment program under 40 CFR 403. Not included are farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with 40 CFR Part 503;
 - (x) Construction activities, including clearing, grading and excavation activities except: operations that result in the disturbance of less than three acres of total land area which are not part of a larger common plan of development or sale;
 - (xi) Facilities under Standard Industrial Classifications 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 323, 34 (except 3441), 35, 26, 27 (except 373), 38, 39, 4221-25), (and which are not otherwise included within categories (i)-(xi)).
- (x) "Trout Streams" means any waters which meet the definition of Section 2.18 of 46 CSR1.
 - (y) "Waste pile" means any noncontainerized accumulation of solid, nonflowing waste that is used for treatment or storage.
 - (z) "25-year, 24-hour precipitation event" means the maximum 24-hour precipitation event with a probable reoccurrence interval of once in 25 years. This information is available from the National Climatic Center of the Environmental Data Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.
 - (aa) "10-year, 24-hour precipitation event" means the maximum 24-hour precipitation event with a probable reoccurrence interval of once in 10 years. This information is available from the National Climatic Center of the Environmental Data Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

IV. OTHER REPORTING

1. Reporting Spills and Accidental Discharges
Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities or penalties established pursuant to Title 47, Series 11, Section 2 of the West Virginia Legislative Rules promulgated pursuant to Chapter 22, Article 11.

Attached is a copy of the West Virginia Spill Alert System for use in complying with Title 47, Series 11, Section 2 of the Legislative rules as they pertain to the reporting of spills and accidental discharges.

2. Immediate Reporting
a) The permittee shall report any noncompliance which may endanger health or the environment immediately after becoming aware of the circumstances by using the Agency's designated spill alert telephone number. A written submission shall be provided within five (5) days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.
b) The following shall also be reported immediately:
(1) Any unanticipated bypass which exceeds any effluent limitation in the permit;
(2) Any upset which exceeds any effluent limitation in the permit; and
(3) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in the permit to be reported immediately. This list shall include any toxic pollutant or hazardous substance, or any pollutant specifically identified as the method to control a toxic pollutant or hazardous substance. The Director may waive the written report on a case-by-case basis if the oral report has been received in accordance with the above.
c) Compliance with the requirements of IV.2 of this section, shall not relieve a person of compliance with Title 47, Series 11, Section 2.

3. Reporting Requirements
a) Planned changes. The permittee shall give notice to the Director of any planned physical alterations or additions to the permitted facility which may affect the nature or quantity of the discharge.
b) Anticipated noncompliance. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
4. Other Noncompliance
The permittee shall report all instances of noncompliance not reported under the above paragraphs at the time monitoring reports are submitted. The reports shall contain the information listed in IV.2.a).



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Freedom Industries provides scant details about WV chemical leak

by Dave Boucher
Daily Mail Capitol Bureau Chief

CHARLESTON, W.Va. -- The head of the company responsible for a chemical leak that's leaving up to 300,000 West Virginians without drinkable tap water gave few answers to the causes of the spill.

Gary Southern, president of Freedom Industries, did say he was sorry.

"Our friends and our neighbors, this incident is extremely unfortunate, unanticipated and we are very, very sorry for the disruption to everybody's daily life that this incident has caused," Southern said.

Repeatedly trying to leave what turned out to be a brief press conference outside the gates of Freedom's storage facility on the Elk River, Southern provided little new information about why more than 15 percent of the state's population can't use their tap water.

"Look guys, it has been an extremely long day, I'm having trouble talking at the moment. I would appreciate it if we could wrap this thing up," Southern said, roughly five minutes into the press conference.

He stayed about 10 minutes, trying to leave another time before a public relations specialist successfully stepped in to take him away.

With the black licorice odor of the spilled chemical still heavy on the air more than a full day after the leak, Southern coughed several times while giving a brief timeline of events.

The company learned of the spill of MCHM at about 10:30 a.m. Thursday, Southern said. Some of the chemical, used as a frothing agent in the coal refining process, leaked from the bottom of a 35,000 gallon steel tank, he said. The chemical made it through the secondary barrier and into the Elk River, Southern said.

"We have mitigated the risk we believe in further material leaving this facility, and our mission now is to clean up..."

He paused, taking a drink from a bottle of water.

"Our mission now is to move to the next phase of remediation, which would be to take the dirt which is in the storage area off-site for the appropriate disposal."

They don't know how much of the chemical leaked into the river, but Southern quantified it as not a "subleak." He

declined to elaborate on an amount.

State Department of Environmental Protection officials estimate 2,000 to 5,000 gallons leaked from the container, and an unknown portion of that amount escaped through the secondary barrier into the river.

Southern said Freedom removed the rest of the chemical from the storage tanks at the site with large vacuum trucks.

The chemicals tainted nearly 1,500 miles of pipeline used by West Virginia American Water. The company, with a treatment facility on the Elk River near the leak, issued its largest ever "do not drink" advisory at about 4 p.m. Thursday.

Shortly before the press conference the DEP issued a "cease operations" order on Freedom.

"At 11:10 a.m., DAQ personnel discovered the source of these odors was from a leaking Crude MCHM tank and that no spill containment measures had been initiated," stated a news release from the DEP.

"The crew also observed that an accumulated pool of MCHM was seeping through a containment dike."

Public officials and the president of the water company delivered statements earlier Friday, answering reporters questions. They provided essentially the same information as Southern while going into greater detail about efforts to remove the chemical from the water.

Several government and water company officials -- including the president of West Virginia American Water and Gov. Earl Ray Tomblin -- said they had not spoken with anyone from Freedom. A Kanawha County emergency services officer said the company was not very helpful in showing officials where the leak might have been.

It took Southern more than 24 hours after the leak to issue any statement. Eventually, press calls to the facility were referred to Susan Lavenski, managing partner at well-known Charleston public relations firm Charles Ryan Associates.

Southern issued a brief statement via email Friday afternoon, again providing few details about how the leak happened, how much chemical leaked into the river or potential dangers.

During the press conference Southern argued the company has worked hand-in-hand with the DEP and other officials. He said they're working to find a solution, and it's been rough going for everyone.

He declined to answer questions about any systems on site that might have alerted the company to a leak or if the material might have leaked earlier than Thursday morning.

He said he didn't know how the steel storage tank managed to get a hole. He said it was pointless to guess, but mentioned a theory that recent extremely cold temperatures might have affected the integrity of the structure.

Southern repeatedly said the chemical has a "very, very low toxicity," adding the chemical alone does not pose a risk to fish or area wildlife.

When asked if mixing the chemical with water changed any potential dangers, Southern said "we're not in the business of producing drinking water."

Local health officials agree it would take consuming a considerable amount of the chemical before it poses a critical health risk. However, officials have warned of potential negative health effects like nausea, itchy eyes and throat irritation.

A spokesman for Charleston Area Medical Center said four people were admitted to the hospital for observation after complaining of such symptoms. The spokesman, and several other officials, said they could not definitively tie those

conditions to the leak.

There is no information as to when Freedom might provide another update on the situation.

Check back at dailymailwv.com throughout the night and weekend for updates as they become available.

Contact writer Dave Boucher at 304-348-4843 or david.bouch...@dailymailwv.com. Follow him at www.Twitter.com/Dave_Boucher1.

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For decades, this industry has ravaged the environment as well as not contribute to the overall growth of West Virginia. As a major industry to my home state, there is the issue of corporate responsibility and accountability. They have to be responsible and accountable to the environment, communities within they operate, and contribute to sustainable economic growth in the state. The industry has spent millions on advertising and public relations campaigns to shape the overall perception of West Virginia citizens. And very little on economic growth. There are numerous stalled mines within the state that without jobs. Politicians within the state align themselves with those special interest groups that support this industry not the citizens.

During all of these strategy meetings and political discussions, it would have made sense for someone to say that it might be a good idea to invest new industries within the state and retrained some of these miners. They have been riding on a "good thing" for decades. Like all "good things," they do come to an end. Unfortunately, it had to come at the expense of the environment and health of others.

Look forward to the day that all of this will change and West Virginia becomes a thriving economic center and I can return home.

Reply · Like · Follow Post · January 16 at 10:23am



Kathryn Ranieri · Top Commenter

You'll know soon enough when citizens die of mysterious cancers, when children are born with birth defects, when your livestock are fine at night and dead in the morning. You may dislike government intrusion but consider that the EPA, when it's allowed to do its job, is government protecting its citizens from corporations who have no moral compass. Corporations are driven by money. Period.

Reply · Like · Follow Post · January 11 at 12:33pm



Andreas Henriksen · Follow · Top Commenter · Kirkenes videregående skole

Don't trust ANYTHING with the word Freedom in it, it's a word big corporations and governments use to distract people from their dirty business. When let's say a company or a government calls a project something along the lines of "Harran Freedom" They are usually referring to their freedom to abuse/take away/trample on people's rights.

Reply · Like · Follow Post · January 11 at 3:00am



Kris Casdorff · West Virginia University College of Law

Like Patriot Act, right?

Reply · Like · Follow Post · January 11 at 7:22am



Andreas Henriksen · Follow · Top Commenter · Kirkenes videregående skole

That would be something I'd say would fall into that category, in reality it took away ALL your civil, human and constitutional rights, in the name of fighting terrorism and preserving freedom. Some would argue that it's a price worth paying, others, that it takes away what you were fighting to preserve in the first place. Of course, I am on the outside looking in since I live in Norway. So I might have the wrong picture. The name itself sort of suggests that if you are against taking away those rights, you are being non-patriotic. But I do agree calling something "Operation Iraq Freedom" in stead of "Operation making the weapons industry happy" sounds a little better.

Reply · Like · Edited · January 11 at 9:56am

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Company increases chemical leak estimate

By Staff, wire reports

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Corporate Investigations

CHARLESTON, W.Va. -- West Virginia regulators say a company has increased its estimate of a chemical mixture that leaked from a storage tank.

The Department of Environmental Protection says Freedom Industries now says about 10,000 gallons leaked from the Charleston plant, up from an initial estimate of about 7,500 gallons.

"We are not making any judgment about [the estimate's] accuracy," WVDEP Cabinet Secretary Randy Huffman said in a prepared statement. "We felt it was important to provide to the public what

the company has provided the WVDEP in writing. We are still reviewing the calculation and this is something that will be researched further during the course of this investigation.

"This is the first calculation that has been provided concerning the amount of materials that spilled on Jan. 9," Huffman said. "This new calculation does not change any of our protocols in dealing with this spill, nor does it affect the ongoing remediation efforts. Our actions have never been dependent on what Freedom has reported to us. From the start, we have acted aggressively to contain the spill and remediate the site."

The DEP says it's still unknown how much of the chemical mixture spilled into the Elk River and forced 300,000 residents in nine counties to stop using their tap water for up to a week except for flushing toilets.

After the initial leak, Freedom Industries later said a second chemical was mixed with the coal-cleaning agent that spilled on Jan. 9.

On Saturday, Gov. Earl Ray Tomblin ordered the company to remove all 17 of its above-ground storage tanks.

CHARLESTON, W.Va. -- West Virginia regulators say a company has increased its estimate of a chemical mixture that leaked from a storage tank.

The Department of Environmental Protection says Freedom Industries now says about 10,000 gallons leaked from the Charleston plant, up from an initial estimate of about 7,500 gallons.

"We are not making any judgment about [the estimate's] accuracy," WVDEP Cabinet Secretary Randy Huffman said in a prepared statement. "We felt it was important to provide to the public what the company has provided the WVDEP in writing. We are still reviewing the calculation and this is something that will be researched further during the course of this investigation.

"This is the first calculation that has been provided concerning the amount of materials that spilled on Jan. 9," Huffman said. "This new calculation does not change any of our protocols in dealing with this spill, nor does it affect the ongoing remediation efforts. Our actions have never been dependent on what Freedom has reported to us. From the start, we have acted aggressively to contain the spill and remediate the site."

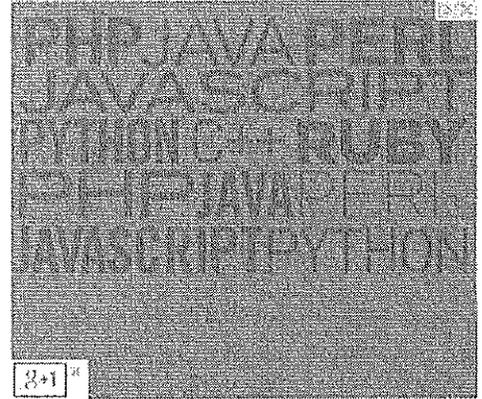
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Expert says tank leaked for at least 20 hours

by Dave Boucher
Daily Mail Capitol Bureau Chief

CHARLESTON, WV -- A faulty storage tank near the Elk River leaked a chemical cocktail for at least 20 hours, according to an updated analysis from Paul Ziemkiewicz, director of the West Virginia Water Research Institute. More time leaking means more of a chance the chemical entered the river earlier than Jan. 9, the day officials learned of the spill.

"That's a pretty safe bet," Ziemkiewicz said Tuesday afternoon.

Using a math formula, Ziemkiewicz recently told state lawmakers it took at least 15 hours for the chemicals involved in the Freedom Industries spill to leak out of a tank.

At the time officials thought as much as 7,500 gallons seeped out of a reported one-inch hole in the bottom of a steel tank. Monday night the DEP announced new Freedom calculations show more than 10,000 gallons could have leaked from the tank.

"That 20 hours is a minimum," Ziemkiewicz said.

"And in reality, the ground could have been saturated with MCHM for months and months in advance of the actual material welling up around the base of the tanks."

See more coverage of WV chemical spill

The state Department of Environment Protection received the new calculations from Freedom on Thursday, according to the letter submitted by Freedom President Gary Southern.

But they didn't release the data until Monday because they were busy working with Freedom on an order to dismantle the tanks at the site, DEP spokesman Tom Aluise said.

Complaints of a black licorice odor led DEP workers to inspect Freedom's site on the Elk River on Jan. 9. They found pooled chemicals — later determined to be crude MCHM and PPH — seeping through an old concrete wall and into the river.

The chemicals made their way roughly 1.5 miles downstream to a West Virginia American Water Co. treatment plant. By the end of the day 300,000 West Virginians were told they shouldn't drink their tap water.

Aluise said the DEP investigation is ongoing, so officials are "not ready to say" when exactly the leak started or the chemical entered the river.

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Alluding to continued trust issues between the company and the state, Aluisse said the DEP also isn't ready to take Freedom's new calculations as gospel.

"These are just numbers they gave us," he said.

"We're not saying they're right or wrong, they're just numbers they gave us."

Southern outlined in his letter how Freedom determined the larger estimate.

On Jan. 6, three tanks held 113,621 gallons of crude MCHM, each with a storage capacity of about 46,000 gallons, Aluisse said. The tank that leaked held 34,466 gallons until Jan. 8, when the company removed 3,246 gallons as part of a shipment.

That left 110,375 gallons total in the three tanks on the day the spill was reported, according to Freedom.

After moving the chemical and some contaminated water from the Elk River site, Freedom "measured" 100,233 gallons of crude MCHM mixed with PPH stored at the new location. It also includes "residual released" chemicals that were "recovered," according to the letter.

The DEP previously said Freedom moved all of these chemicals and contaminated water to the company's Nitro location, called Poca Blending LLC. Southern's letter states the company was also storing some of the chemical at a property "adjacent" to the Poca Blending site as of last week.

The Nitro site doesn't have adequate emergency containment measures and some of the chemical is still sitting in tanks deemed inappropriate by the DEP. Aluisse said he didn't know how much of the chemical was stored at the adjacent property.

"Freedom confirmed to us that it had entered into a lease agreement with the property owner," Aluisse said.

"We make daily visits to Poca Blending and this adjacent property."

Although the letter states Freedom plans to ship some of the contaminated water from the Nitro site to the Big Run Landfill in Ashland, Ky., Aluisse said, "Apparently, that's not going to happen."

The letter also describes ongoing efforts to remediate the site of the spill.

As of Jan. 20 the company had removed about 270,000 gallons of other chemicals from the Elk river site. There was still more than 1 million gallons stored in as many as 14 other tanks as of that date, according to the letter.

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Ziemkiewicz described his formula as "crude," but it provides some context for the amount of time the tank could have leaked.

The formula divides the 10,000 gallon estimate by a "flow rate" of about 8.22 gallons per minute.

He calculated the flow rate using a variety of factors, including the "head pressure" of the chemical's weight pushing down toward the hole, as well as pressure and resistance from other substances outside, like dirt or other fluids.

"The more head pressure you have, the faster your product wants to leave the hole," he explained.

The formula assumes the chemicals' density — 0.88 grams per milliliter, compared to 1 gram per milliliter for water, he said — is the same as water, a negligible difference.

The 20-hour estimate also assumes the DEP accurately reported the size of the hole, and the entire hole appeared at once. But the sudden appearance of a one-inch hole is unlikely, Ziemkiewicz said.

Water company officials have said the filtration system at the Charleston plant wasn't overwhelmed with the chemical until 4 p.m. Jan. 9.

Professor Anthony Szwilski, Director of the Center for Environmental, Geotechnical and Applied Sciences at Marshall University, agreed.

"Sometimes that hole might extend and that rate may change, just like a dam break," Szwilski said.

Although he said he had not done similar calculations, Szwilski said he's worked with Ziemkiewicz before and he's an expert.

Like the DEP, Ziemkiewicz downplayed the idea that extreme cold weather played a significant role in how long the chemical leaked.

"I'm willing to say the ground underneath the tank probably has never frozen, not in this climate," he said. "And
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having a couple days of minus-zero weather is not going to change that fact."

While the temperature did dip as low as minus 3 degrees in the days before the discovery of the leak, the National Oceanic and Atmospheric Administration recorded temperatures in the 50s at nearby Yeager Airport on Jan. 5 and 6. On Jan. 9 the temperature reached 48 degrees, according to the NOAA data.

"If the stuff in the tank froze, then my guess is that it wouldn't have leaked," Ziemkiewicz added. "It would have been solid."

DEP officials have said the chemical has the ability to freeze, and there was a small amount of water in the tank.

Both Ziemkiewicz and Szwilski said there are still plenty of details that remain unknown surrounding the leak. It's still clear to both that the leak never should have happened.

"It shouldn't be taking us by surprise," Szwilski said.

"Of course, where you get an incident like this, then it tends to force changes."

The state Senate unanimously approved a bill Tuesday that would institute more regulations for aboveground storage tanks and enhance emergency preparedness measures for local officials and water companies.

Contact writer Dave Boucher at 304-348-4843 or david.bouc...@dailymailwv.com. Follow him at www.Twitter.com/Dave_Boucher1.

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STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER AND WASTE MANAGEMENT
601 57th STREET SE
CHARLESTON, WV 25304

WEST VIRGINIA/NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
MULTI-SECTOR GENERAL WATER POLLUTION CONTROL PERMIT

Permit No. WV0111457

Issue Date: April 1, 2009
Effective Date: May 1, 2009
Expiration Date: March 31, 2014

Supersedes WV/NPDES General
Water Pollution Control Permit
Issued April 1, 2004

Subject: Stormwater Associated
With Industrial Activity

This is to certify that any establishment with discharges composed entirely of stormwater associated with industrial activity, and who has satisfied the registration requirements, and agreeing to be regulated under the terms of this general permit except for:

1. Stormwater discharges associated with industrial activity from facilities with existing effluent guideline limitations for stormwater, as listed herein.

Cement Manufacturing (40 CFR 411)
Feedlots (40 CFR 412)
Fertilizer Manufacturing (40 CFR 418)
Petroleum Refining (40 CFR 419)
Phosphate Manufacturing (40 CFR 422)
Steam Electric (40 CFR 423)
Coal Mining (40 CFR 434)
Mineral Mining and Processing (40 CFR 436)
Ore Mining and Dressing (40 CFR 440)
Asphalt Emulsion (40 CFR 443)
Oil and Gas Extraction (SIC Major Group 13)

2. Stormwater discharges associated with the following activities.

Wood Preserving Facilities (SIC 2491)
Publicly Owned Treatment Works (SIC 33)
Landfills
Land Application Sites
Hazardous Waste Treatment, Storage, or Disposal Facilities
Leather Tanning and Finishing
Water Transportation Facilities (SIC 4412-4499)
Ship and Boat Building or Repairing Yards (SIC 3731, 3732)
*Primary Metals

*Primary Metals facilities are eligible for coverage under this general permit, if the facility is providing pretreatment for the industrial wastes, in accordance with the regulations and is transferring the wastes to a POTW which has been granted the proper permit or authority to accept such wastes and the facility has a discharge composed entirely of stormwater.

3. Stormwater discharges associated with industrial activity from facilities with an existing individual NPDES permit which covers the stormwater discharges or which are issued a permit in accordance with Section B.1. of this permit.
4. Stormwater discharges associated with industrial activity that the Director has shown to be or may reasonably be expected to be contributing to a violation of a water quality standard.
5. Stormwater discharges associated with construction activities.
6. Registrations issued on or after September 1, 2008 are hereby granted coverage under this permit.

is hereby granted coverage under the General WV/NPDES Water Pollution Control Permit to allow stormwater discharges into the waters of the State.

This permit is subject to the following terms and conditions:

The information submitted on and with the Site Registration Application Form or any information presently incorporated in the permittee's previous WV/NPDES permits is hereby incorporated with like effect as if all such information was set forth herein, and other conditions set forth in Sections A, B, Appendix A and the site approval letter.

The validity of this permit is contingent upon the payment of the applicable annual permit fee, as required by Chapter 22, Article 11, Section 10 of the Code of West Virginia.

Continuation of this general permit

If this general permit is not reissued or replaced prior to the expiration date, it will be administratively continued in accordance with 47 CSR 10 and remain in force and effect. If you were authorized to discharge under this general permit prior to the expiration date, any

discharges authorized under this permit will automatically remain covered by this general permit until the earliest of:

- Your authorization for coverage under a reissued general permit or a replacement of this general permit following your timely and appropriate submittal of a complete application requesting authorization to discharge under the new general permit and compliance with the requirements of the new permit; or
- Your submittal of notification that the facility has ceased operations; or
- Issuance or denial of an individual permit for the facility's discharge; or
- A formal permit decision by DWWM not to reissue this general permit, at which time DWWM will identify a reasonable time period of covered dischargers to seek coverage under an alternative general permit or individual permit. Coverage under this permit will cease at the end of this time period.

SECTION A

This portion of the General Permit identifies industrial activity eligible for coverage and associated monitoring requirements.

Sector A. Stormwater Discharges Associated With Industrial Activity From Timber Products Facilities

1. Discharges Covered Under this Sector. The requirements listed under this section shall apply to stormwater discharges from the following activities: establishments [generally classified under Standard Industrial Classification (SIC) Major Group 24] that are engaged in merchant sawmills, lath mills, shingle mills, cooperage stock mills, planing mills, and plywood and veneer mills engaged in producing lumber and wood basic materials; and establishments engaged manufacturing finished articles made entirely of wood or related materials, except for wood preserving facilities (SIC code 2491), wood kitchen cabinet manufacturers (SIC Code 2434), and timber cutting operations.

2. Monitoring Requirements

Table A-1
Monitoring Requirements for General Sawmills and Planing Mills Facilities

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------|----------------------------------|-----------------------|
| Chemical Oxygen Demand | 120.0 mg/l | 1/6 Months |
| Total Suspended Solids | 100 mg/l | 1/6 Months |
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |

| | | |
|---------------------------|----------|------------|
| Biochemical Oxygen Demand | 30 mg/l | 1/6 Months |
| Iron, Total | 1.0 mg/l | 1/6 Months |

Table A-2
Monitoring for Log Storage and Handling Facilities

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------------|---|------------------------------|
| Total Suspended Solids | 100 mg/l | 1/6 Months |

Table A-3
Monitoring Requirements for
Hardwood Dimensions and Flooring Mills; Special Products Sawmills, not elsewhere
classified; Millwork, Veneer, Plywood and Structural Wood; Wood Containers; Wood
Buildings and Mobile Homes; Reconstituted Wood Products; and Wood Products
Facilities not elsewhere classified

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------------|---|------------------------------|
| Chemical Oxygen Demand | 120 mg/l | 1/6 Months |
| Total Suspended Solids | 100 mg/l | 1/6 Months |

Sector B. Stormwater Discharges Associated With Industrial Activity From Paper and Allied Products Manufacturing Facilities

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to stormwater discharges from the following activities: facilities engaged in the manufacture of pulps from wood and other cellulose fibers and from rags; the manufacture of paper and paperboard into converted products, such as paper coated off the paper machine, paper bags, paper boxes and envelopes; and establishments primarily engaged in manufacturing bags of plastic film and sheet. These facilities are commonly identified by Standard Industrial Classification (SIC) Major Group 26.

2. Monitoring Requirements

Table B-1
Monitoring Requirements for Paper and Allied Products Mfg. Facilities

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------|----------------------------------|-----------------------|
| Chemical Oxygen Demand | 120 mg/l | 1/6 Months |

Sector C. Stormwater Discharges Associated With Industrial Activity From Chemical and Allied Products Manufacturing Facilities

1. Discharges Covered Under this Section. The requirements listed under this section shall apply to stormwater discharges associated with industrial activity from a facility engaged in manufacturing the following products and generally described by the SIC code shown:

- a) Basic industrial inorganic chemicals (including SIC 281).
- b) Plastic materials and synthetic resins, synthetic rubbers, and cellulosic and other human made fibers, except glass (including SIC 282).
- c) Soap and other detergents and in producing glycerin from vegetable and animal fats and oils; specialty cleaning, polishing, and sanitation preparations; surface active preparations used as emulsifiers; wetting agents, and finishing agents, including sulfonated oils; and perfumes, cosmetics, and other toilet preparations (including SIC 284).
- d) Paints (in paste and ready-mixed form); varnishes; lacquers; enamels and shellac; putties, wood fillers, and sealers; paint and varnish removers; paint brush cleaners; and allied paint products (including SIC 285).
- e) Industrial organic chemicals (including SIC 286).
- f) Nitrogenous and phosphatic basic fertilizers, mixed fertilizer, pesticides, and other agricultural chemicals (including SIC 287).
- g) Industrial and household adhesives, glues, caulking compounds, sealants, and linoleum, tile, and rubber cements from vegetable, animal, or synthetic plastics materials; explosives; printing ink, including gravure ink, screen process ink, and lithographic; miscellaneous chemical preparations, such as fatty acids, essential oils, gelatin (except vegetable), sizes, bluing, laundry soaps, writing and stamp pad ink, industrial compounds, such as boiler and heat insulating compounds, and chemical supplies for foundries (including facilities with SIC 289).
- h) Ink and paints, including china painting enamels, india ink, drawing ink, platinum paints for burnt wood or leather work, paints for china painting, artists' paints and artist's water colors (SIC 3952, limited to those listed).

2. Monitoring Requirements

**Table C-1A
Agricultural Chemicals Monitoring Requirements**

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|-------------------------------|---|------------------------------|
| Nitrate plus Nitrite Nitrogen | 0.68 mg/l | 1/6 Months |
| Total Recoverable Lead | 0.0816 mg/l | 1/6 Months |
| Total Recoverable Iron | 1.0 mg/l | 1/6 Months |
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |
| Phosphorus | 2.0 mg/l | 1/6 Months |

**Table C-1B
Agricultural Chemicals Effluent Limits Based on Effluent Limitations Guidelines**

| Industrial Activity | Parameter | Effluent Limit | Monitoring Frequency |
|--|------------------|---------------------------|-----------------------------|
| Discharges from phosphate fertilizer manufacturing facilities (SIC 2874) | Fluoride | 75.0 mg/l daily maximum | 1/year |
| | | 25.0 mg/l average monthly | |

**Table C-2
Industrial Inorganic Chemicals Monitoring Requirements**

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|-------------------------------|---|------------------------------|
| Total Rec. Aluminum | 0.75 mg/l | 1/6 Months |
| Total Recoverable Iron | 1.0 mg/l | 1/6 Months |
| Nitrate plus Nitrite Nitrogen | 0.68 mg/l | 1/6 Months |

**Table C-3
Soaps, Detergents, Cosmetics, and Perfumes Monitoring Requirements**

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|-------------------------------|---|------------------------------|
| Nitrate plus Nitrite Nitrogen | 0.68 mg/l | 1/6 Months |
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |
| Surfactants | Monitor Only | 1/6 Months |

**Table C-4
Plastics, Synthetics, and Resins Monitoring Requirements**

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------------|---|------------------------------|
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |

Sector D. Stormwater Discharges Associated With Industrial Activity From Asphalt Paving and Roofing Materials and Lubricant Manufacturers

1. Discharges Covered Under This Section

a) The requirements listed under this section shall apply to stormwater discharges from facilities engaged in manufacturing asphalt paving and roofing materials, including those facilities commonly identified by Standard Industrial Classification (SIC) codes 2951 and 2952.

b) The requirements listed under this section shall apply to stormwater discharges from portable asphalt plant facilities (also commonly identified by SIC Code 2951).

c) The requirements listed under this section shall apply to stormwater discharges from facilities engaged in manufacturing lubricating oils and greases, including those facilities classified as SIC Code 2992.

d) **Limitations on Coverage.** The following stormwater discharges associated with industrial activity are not authorized by this section of the permit.

(1) Stormwater discharges from petroleum refining facilities, including those that manufacture asphalt or asphalt products and that are classified as SIC Code 2911.

(2) Stormwater discharges from oil recycling facilities, and

- (3) Stormwater discharges associated with fats and oils rendering.

2. Monitoring Requirements

Table D-1A
Monitoring Requirements for Asphalt Paving and
Roofing Materials Mfg. Facilities

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------|----------------------------------|-----------------------|
| Total Suspended Solids | 100 mg/l | 1/6 Months |
| Chemical Oxygen Demand | 120 mg/l | 1/6 Months |
| Oil and Grease | 15 mg/l | 1/6 Months |

Table D-2B
Asphalt Paving and Roofing Materials Mfg. Facilities
Effluent Limits Based on Effluent Limitations Guidelines

| Industrial Activity | Parameter | Effluent Limit | Monitoring Frequency |
|---|----------------|-------------------------|----------------------|
| Discharges from asphalt emulsion facilities | TSS | 23 mg/l max daily | 1/year |
| | | 15 mg/l average monthly | |
| | pH | 6.0 – 9.0 s.u. | |
| | Oil and Grease | 15 mg/l max daily | |
| | | 10 mg/l average monthly | |

Sector E. Stormwater Discharges Associated With Industrial Activity From Glass, Clay, Cement, Concrete, and Gypsum Product Manufacturing Facilities

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to stormwater discharges from the following activities: manufacturing flat, pressed, or blown glass or glass containers, manufacturing hydraulic cement; manufacturing clay products including tile and brick; manufacturing of pottery and porcelain electrical supplies; manufacturing concrete products; manufacturing gypsum products; nonclay refractories; and grinding or otherwise treating minerals and earths. This section generally includes the following types of manufacturing operators: flat glass, (SIC Code 3211); glass containers, (SIC Code 3221); pressed and blown glass, not elsewhere classified, (SIC Code 3229); hydraulic cement, (SIC Code 3241); brick and structural clay tile, (SIC Code 3251); ceramic wall and floor tile, (SIC Code 3253); clay refractories, (SIC Code 3255); structural clay products not elsewhere classified (SIC Code 3259); vitreous china table and kitchen articles (SIC Code 3262); fine earthenware table and kitchen articles (SIC Code 3263); porcelain electrical supplies, (SIC Code 3264); pottery products, (SIC Code 3269); concrete block and brick, (SIC Code 3271); concrete products, except block and brick (SIC Code 3272); gypsum products, (SIC Code 3275); minerals and earths, ground or otherwise treated, (SIC Code 3295); mineral wool and mineral wool insulation products (SIC 3296). and nonclay refractories, (SIC Code 3297).

Facilities engaged in the following activities are not eligible for coverage under this section; lime manufacturing (SIC 3274); cut stone and stone products (SIC 3281); abrasive products (SIC 3291); asbestos products (SIC 3292).

2. Monitoring Requirements

Table E-1
Monitoring Requirements for Clay Product Manufacturers

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|-----------------------|----------------------------------|-----------------------|
| Total Rec. Aluminum | 0.75 mg/l | 1/6 Months |
| PH | 6.0 to 9.0 s.u. | 1/6 Months |

Table E-2
Monitoring Requirements for Concrete and Gypsum Product Manufacturers

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------|----------------------------------|-----------------------|
| Total Suspended Solids | 100 mg/l | 1/6 Months |
| Total Recoverable Iron | 1 mg/l | 1/6 Months |
| PH | 6.0 to 9.0 s.u. | 1/6 Months |

**Table E-3
Material Storage Piles at Cement Manufacturing Facilities
Effluent Limits Based on Effluent Limitations Guidelines**

| Industrial Activity | Parameter | Effluent Limit | Monitoring Frequency |
|---|------------------|-----------------------|-----------------------------|
| Discharges from material storage piles at cement manufacturing facilities | TSS | 50 mg/l max daily | 1/year |
| | pH | 6.0 – 9.0 s.u. | |

Sector F. Stormwater Discharges Associated With Industrial Activity From Automobile Salvage Yards

1. Discharges Covered Under This Section

The requirements listed under this section shall apply to stormwater associated with industrial activity from facilities engaged in dismantling or wrecking used motor vehicles for parts recycling or resale and for scrap (SIC Code 5015).

2. Monitoring Requirements

**Table F-1
Monitoring Requirements**

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------------|---|------------------------------|
| Total Suspended Solids | 100 mg/l | 1/6 Months |
| Total Rec. Aluminum | 0.75 mg/l | 1/6 Months |
| Total Recoverable Iron | 1 mg/l | 1/6 Months |
| Total Recoverable Lead | 0.0816 mg/l | 1/6 Months |
| Oil and Grease | 15 mg/l | 1/6 Months |
| Chemical Oxygen Demand | 120 mg/l | 1/6 Months |

Sector G. Stormwater Discharges Associated With Industrial Activity From Scrap Recycling and Waste Recycling Facilities

1. Discharges Covered Under this Section. The requirements listed under this section are applicable to stormwater discharges from the following activities: facilities that are engaged in the processing, reclaiming and wholesale distribution of scrap and waste materials such as ferrous and nonferrous metals, paper, plastic, cardboard, glass, animal hides (these types of activities are typically identified as SIC Code 5093). Facilities that are engaged in reclaiming and recycling liquid wastes such as used oil, antifreeze, mineral spirits, and industrial solvents (also identified as SIC Code 5093) are also covered under this section.

2. Monitoring Requirements

Table G-1
Industry Monitoring Requirements for Scrap Recycling and Waste Recycling Facilities (non-source separated only)

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|--------------------------|----------------------------------|-----------------------|
| Chemical Oxygen Demand | 120 mg/l | 1/6 Months |
| Total Suspended Solids | 100 mg/l | 1/6 Months |
| Total Rec. Aluminum | 0.75 mg/l | 1/6 Months |
| Total Recoverable Copper | 0.0636 mg/l | 1/6 Months |
| Total Recoverable Iron | 1 mg/l | 1/6 Months |
| Total Recoverable Lead | 0.0816 mg/l | 1/6 Months |
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |
| Oil and Grease | 15 mg/l | 1/6 Months |

Sector H. Stormwater Discharges Associated With Industrial Activity From Vehicle Maintenance Areas, Equipment Cleaning Areas, or Deicing Areas Located at Air Transportation Facilities

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to stormwater discharges from establishments and/or facilities including airports, air terminals, air carriers, flying fields, and establishments engaged in servicing or maintaining airports and/or aircraft (generally classified under SIC Code 45) which have vehicle maintenance shops, material handling facilities, equipment cleaning operations or airport and/or aircraft deicing/anti-icing operations. For the purpose of this permit, the term

"deicing" is defined as the process to remove frost, snow, or ice and "anti-icing" is the process which prevents the accumulation of frost, snow, or ice.

2. Monitoring Requirements

Table H-1
Monitoring Requirements

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|---------------------------|----------------------------------|-----------------------|
| Biochemical Oxygen Demand | 30 mg/l | 1/6 Months |
| Chemical Oxygen Demand | 120 mg/l | 1/6 Months |
| Ammonia | 4 mg/l | 1/6 Months |
| pH | 6.0 to 9 s.u. | 1/6 Months |
| Oil and Grease | 15 mg/l | 1/6 Months |
| Total Suspended Solids | 100 mg/l | 1/6 Months |

Sector I. Stormwater Discharges Associated With Industrial Activity From Motor Freight Transportation Facilities, Passenger Transportation Facilities, Petroleum Bulk Oil Stations and Terminals, Rail Transportation Facilities, and United States Postal Service Transportation Facilities

1. Discharges Covered Under This Section. Stormwater discharges from ground transportation facilities and rail transportation facilities (generally identified by SIC Codes 40, 41, 42, 43, and 5171), that have vehicle and equipment maintenance shops vehicle and equipment rehabilitation, mechanical repairs, painting, fueling and lubrication) and/or equipment cleaning operations are eligible for coverage under this section.

Table I-1
Monitoring Requirements for Motor Freight Transportation Facilities, Passenger Transportation Facilities, Petroleum Bulk Oil Stations and Terminals, Rail Transportation Facilities and United States Postal Service Transportation Facilities.

Table I-1
Monitoring Requirements

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------|----------------------------------|-----------------------|
| Total Suspended Solids | 100 mg/l | 1/6 Months |

| | | |
|------------------------|----------|------------|
| Chemical Oxygen Demand | 120 mg/l | 1/6 Months |
| Oil and Grease | 15 mg/l | 1/6 Months |

Sector J. Stormwater Discharges Associated With Industrial Activity From Food and Kindred Products Facilities

1. Discharges Covered Under This Section. This section covers all stormwater discharges from food and kindred products processing facilities (commonly identified by SIC Code 20), including: meat products; dairy products; canned, frozen and preserved fruits, vegetables, and food specialties; grain mill products; bakery products; sugar and confectionery products; fats and oils; beverages; and miscellaneous food preparations and kindred products and tobacco products manufacturing (SIC Code 21), where industrial plant yards; material handling sites; refuse sites; sites used for application or disposal of process wastewater; sites used for storage, or disposal; shipping and receiving areas; manufacturing buildings; and storage areas for raw material and intermediate and finished products are exposed to stormwater and areas where industrial activity has taken place in the past and significant materials remain. For the purpose of this paragraph, material handling activities include the storage, loading, and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product or waste product.

2. Monitoring Requirements

Table J-1
Grain Mill Products

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------|----------------------------------|-----------------------|
| Total Suspended Solids | 100 mg/l | 1/6 Months |

Table J-2
Fats and Oils Products Monitoring Requirements

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|-------------------------------|----------------------------------|-----------------------|
| Biochemical Oxygen Demand | 30 mg/l | 1/6 Months |
| Chemical Oxygen Demand | 120 mg/l | 1/6 Months |
| Nitrate Plus Nitrite Nitrogen | 0.68 mg/l | 1/6 Months |
| Total Suspended Solids | 100 mg/l | 1/6 Months |

Sector K. Stormwater Discharges Associated With Industrial Activity From Textile Mills, Apparel, and Other Fabric Product Manufacturing Facilities

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to stormwater discharges from the following activities: textile mill products, of and regarding facilities and establishments engaged in the preparation of fiber and subsequent manufacturing of yarn, thread, braids, twine, and cordage, the manufacturing of broad woven fabrics, narrow woven fabrics, knit fabrics, and carpets and rugs from yarn; processes involved in the dyeing and finishing of fibers, yarn fabrics, and knit apparel; the integrated manufacturing of knit apparel and other finished articles of yarn; the manufacturing of felt goods (wool), lace goods, nonwoven fabrics, miscellaneous textiles, and other apparel products (generally described by SIC Code 22 and 23).

2. Monitoring Requirements. There are no chemical analysis to be performed for this industry sector.

Sector L. Stormwater Discharges Associated With Industrial Activity From Wood and Metal Furniture and Fixture Manufacturing Facilities

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to stormwater discharges associated with industrial activities from facilities involved in the manufacturing of: wood kitchen cabinets(generally described by SIC Code 2434); household furniture (generally described by SIC Code 251); office furniture (generally described by SIC Code 252); public buildings and related furniture (generally described by SIC Code 253); partitions, shelving, lockers, and office and store fixtures (generally described by SIC Code 254); and miscellaneous furniture and fixtures (generally described by SIC Code 259) if waste wood products are exposed to stormwater.

2. Monitoring Requirements.

Table L-1
Monitoring Requirements for furniture and cabinet manufactures

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------|----------------------------------|-----------------------|
| Total Suspended Solids | 100 mg/l | 1/6 Months |
| Chemical Oxygen Demand | 120 mg/l | 1/6 Months |

Sector M. Stormwater Discharges Associated With Industrial Activity From Printing and Plate making Facilities

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to stormwater discharges associated with industrial activity from the following types of facilities: book printing (SIC Code 2732); commercial printing, lithographic (SIC Code 2752); commercial printing, gravure (SIC Code 2754); commercial printing, not elsewhere classified (SIC Code 2759); and platemaking and related services (SIC Code 2796).

2. Monitoring Requirements. There are no chemical analysis to be performed for this industry sector.

Sector N. Stormwater Discharges Associated With Industrial Activity From Rubber, Miscellaneous Plastic Products, and Miscellaneous Manufacturing Industries

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to all stormwater discharges associated with industrial activity from rubber and miscellaneous plastic products manufacturing facilities (SIC major group 30) and miscellaneous manufacturing industries, except jewelry, silverware, and plated ware (SIC major group 39, except 391).

2. Monitoring Requirements

Table N-1
Monitoring Requirements

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------|----------------------------------|-----------------------|
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |

Sector O. Stormwater Discharges Associated With Industrial Activity From Fabricated Metal Products Industry

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to stormwater discharges associated with industrial activity from the fabricated metals industry listed below, except for electrical related industries: fabricated metal products, except machinery & transportation equipment, SIC 34 (3429, 3441, 3442, 3443, 3444, 3451, 3452, 3462, 3471, 3479, 3494, 3496, 3499); and jewelry, silverware, and plated ware (SIC Code 391).

2. Monitoring Requirements

Table O-1
Monitoring Requirements for Fabricated Metal Products Except Coating

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|-------------------------------|----------------------------------|-----------------------|
| Total Rec. Aluminum | 0.75 mg/l | 1/6 Months |
| Total Recoverable Iron | 1 mg/l | 1/6 Months |
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |
| Nitrate plus Nitrite Nitrogen | 0.68 mg/l | 1/6 Months |

**Table O-2
Monitoring Requirements for Fabricated Metal Coating and Engraving**

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|-------------------------------|---|------------------------------|
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |
| Nitrate plus Nitrite Nitrogen | 0.68 mg/l | 1/6 Months |

Sector P. Stormwater Discharges Associated With Industrial Activity From Facilities That Manufacture Transportation Equipment, Industrial, or Commercial Machinery

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to stormwater discharges associated with transportation equipment, industrial or commercial machinery manufacturing facilities (commonly described by SIC Major Group 35 except SIC 357. And SIC Major Group 37, except SIC 373). Common activities include: industrial plant yards; material handling sites; refuse sites, sites used for application or disposal of process wastewater; sites used for storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas for raw material and intermediate and finished products; and area where industrial activity has taken place in the past and significant materials remain and are exposed to stormwater.

**Table P-1
Monitoring Requirements for Transportation Equipment, Industrial, or Commercial Machinery Manufacturing facilities.**

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------------|---|------------------------------|
| Total Suspended Solids | 100 mg/l | 1/6 Months |
| Oil and Grease | 15 mg/l | 1/6 Months |
| Chemical Oxygen Demand | 120 mg/l | 1/6 Months |

Sector Q. Stormwater Discharges Associated With Industrial Activity From Facilities That Manufacture Electronic and Electrical Equipment and Components, Photographic and Optical Goods

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to all stormwater discharges associated with industrial activity from facilities that manufacture: electronic and other electrical equipment and components, except computer equipment (SIC major group 36); measuring, analyzing, and controlling instruments; photographic, medical and optical goods; watches and clocks (SIC Major Group 38) and computer and office equipment (SIC Code 357).

2. Monitoring Requirements. There are no chemical analysis to be performed for this industry sector.

Sector R. Stormwater Discharges Associated With Industrial Activity From Primary Metals Facilities

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to all stormwater discharges from the primary industry, which includes the following types of facilities:

- a) Steel works, blast furnaces, and rolling and finishing mills including: steel wire drawing and steel nails and spikes, cold-rolled steel sheet, strip, and bars; and steel pipes and tubes (SIC code 331).
- b) Iron and steel foundries, including: gray and ductile iron, malleable iron, steel investment, and steel foundries not elsewhere classified (SIC code 332).
- c) Primary smelting and refining of nonferrous metals, including: primary smelting and refining of copper, and primary production of aluminum (SIC code 333).
- d) Secondary smelting and refining of nonferrous metals (SIC code 334).
- e) Rolling, drawing, and extruding of nonferrous metals, including: rolling, drawing, and extruding of copper; rolling, drawing, and extruding of nonferrous metals, except copper and aluminum; and drawing and insulating of nonferrous wire (SIC code 335).
- f) Nonferrous foundries (Castings, including: aluminum die-castings, nonferrous die-castings, except aluminum, aluminum foundries, and nonferrous foundries, except copper and aluminum (SIC code 336).
- g) Miscellaneous primary metal products, not elsewhere classified, including: metal heat treating, and primary metal products, not elsewhere classified (SIC code 339).

Activities covered include, but are not limited to, stormwater discharges associated with coking operations, sintering plants, blast furnaces, smelting operations, rolling mills, casting operations, heat treating, extruding, drawing, or forging of all types of ferrous and nonferrous metals.

2. Monitoring Requirements.

Table R-1
Steel Works, Blast Furnaces, and Rolling and Finishing Mills (SIC 331)
Monitoring Requirements

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------------|---|------------------------------|
| Total Rec. Aluminum | 0.75 mg/l | 1/6 Months |
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |

Table R-2
Iron and Steel Foundries (SIC 332) Monitoring Requirements

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------------|---|------------------------------|
| Total Rec. Aluminum | 0.75 mg/l | 1/6 Months |
| Total Suspended Solids | 100 mg/l | 1/6 Months |
| Total Recoverable Copper | 0.0636 mg/l | 1/6 Months |
| Total Recoverable Iron | 1 mg/l | 1/6 Months |
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |
| Oil and Grease | 15 mg/l | 1/6 Months |
| Lead, Total | 0.0816 mg/l | 1/6 Months |

Table R-3
Rolling, Drawing, and Extruding of Non-Ferrous Metals (SIC 335) Monitoring Requirements

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------------|---|------------------------------|
| Total Recoverable Copper | 0.0636 mg/l | 1/6 Months |
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |

**Table R-4
Non-Ferrous Foundries (SIC 336) Monitoring Requirements**

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------------|---|------------------------------|
| Total Recoverable Copper | 0.0636 mg/l | 1/6 Months |
| Total Recoverable Zinc | 0.117 mg/l | 1/6 Months |
| Oil and Grease | 15 mg/l | 1/6 Months |
| Lead, Total | 0.0816 mg/l | 1/6 Months |

Sector S. Stormwater Discharges Associated With Industrial Activity From Facilities engaged in Motorsports including Motorcycles, All Terrain Vehicles and Automobiles

1. Discharges Covered Under this Section Stormwater discharges from Motorsport complexes that involve the racing of Motorcycles, All Terrain Vehicles, Automobiles or other motorized vehicle (generally identified by SIC Code 7948).

Automobile, Motorcycle, ATV and all other Motorsports Complexes

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------------|---|------------------------------|
| Oil and Grease | 15 mg/l | 1/6 Months |
| Total Suspend Solids | 100 mg/l | 1/6 Months |

Sector T. Stormwater Discharges Associated With Industrial Activity From Facilities engaged in the Mining of Shale for NON MANUFACTURING PURPOSES.

1. Discharges Covered Under This Section. Stormwater discharges from facilities engaged in the mining of shale for NON MANUFACTURING PURPOSES ONLY (generally identified by SIC Code 1459)
2. Monitoring Requirements

Table T-1
Monitoring Requirements

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------|----------------------------------|-----------------------|
| Total Suspended Solids | 100 mg/l | 1/6 Months |
| Total Iron | 1.0 mg/l | 1/6 Months |

Sector U. Stormwater Discharges Associated With Industrial Activity From Facilities engaged in the Storage of Salt (Less than 50,000 tons only)

1. Discharges Covered Under This Section. Stormwater discharges from facilities engaged in the storage of salt (generally identified by SIC Code 5169)
2. Monitoring Requirements

Table U-1
Monitoring Requirements

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------|----------------------------------|-----------------------|
| Total Suspended Solids | 100mg/l | 1/6 Months |
| Chloride | 860mg/l | 1/6 Months |
| Cyanide | Monitor Only | 1/6 Months |
| Total Iron | 1.0mg/l | 1/6 Months |

The Following special conditions apply to Sector U.

Salt piles must be covered at all times by an impervious cover. The only time this cover may be removed is when product is being added or removed. All salt must be entirely stored on an impervious pad. All ponds and diversion ditches must have an impervious liner with a minimum imperviousness of 10 to the negative 7.

Sector V. Stormwater Discharges Associated With Industrial Activity From Facilities engaged in the transloading of Ammonia Nitrate.

1. Discharges Covered Under This Section. Stormwater discharges from facilities engaged in the transloading of ammonia nitrate between trucks, barges, and rail cars. (generally identified by SIC Code 5169)

2. Monitoring Requirements

Table V-1
Monitoring Requirements

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|-------------------------------|----------------------------------|-----------------------|
| Total Suspended Solids | 100 mg/l | 1/6 Months |
| Ammonia Nitrogen | 4 mg/l | 1/6 Months |
| Nitrite Plus Nitrate Nitrogen | 0.68 mg/l | 1/6 Months |
| Oil and Grease | 15 mg/l | 1/6 Months |
| pH | 6.0-9.0 s.u. | 1/6 Months |

Sector W. Stormwater Discharges Associated With Industrial Activity From Facilities That Are Not Covered Under Sectors A Thru V.

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to stormwater discharges associated with industrial activity from those facilities that are not covered for such discharges under Sectors A thru V. It is the intent of the Division that this sector include those stormwater discharges which Stormwater are not covered under Sectors A thru V as well as those facilities which had no previous stormwater permit that are applying for the first time and will not be covered under Sectors A thru V.

2. Monitoring Requirements

Table W-1
Monitoring Requirements

| Pollutants of Concern | Monitoring Cut-Off Concentration | Measurement Frequency |
|------------------------------|---|------------------------------|
| Biochemical Oxygen Demand | 30 mg/l | 1/6 Months |
| Chemical Oxygen Demand | 120 mg/l | 1/6 Months |
| Total Suspended Solids | 100 mg/l | 1/6 Months |
| Ammonia Nitrogen | 4 mg/l | 1/6 Months |
| Oil and Grease | 15 mg/l | 1/6 Months |
| pH | 6.0-9.0 s.u. | 1/6 Months |

SECTION B. OTHER REQUIREMENTS

1. Requiring an individual permit.

The Director may require any person authorized by this permit to apply for and obtain an individual NPDES permit. Any interested person may petition the Director to take action under this paragraph. The Director may require any owner or operator authorized to discharge under this permit to apply for an individual NPDES permit only if the owner or operator has been notified in writing that a permit application is required. This notice shall include a brief statement of the reasons for this decision, an application form, a statement setting a deadline for the owner or operator to file the application, and a statement that on the effective date of the individual NPDES permit, coverage under this general permit shall automatically terminate. The Director may grant additional time to submit the application upon request of the applicant. If an owner or operator fails to submit in a timely manner an individual NPDES permit application required by the Director under this paragraph, then the applicability of this permit to the individual NPDES permittee is automatically terminated at the end of the day specified for application submittal.

2. Prohibition on non-stormwater discharges.

All discharges covered by this permit shall be composed entirely of stormwater except for the following listed below.

The following non – stormwater discharges that are mixed with stormwater are allowed.

a. Mist discharges which originate from cooling towers and which are deposited at an industrial facility.

Mist discharges must meet the following requirements: 1. The permittee has evaluated the potential for the discharges to be contaminated by chemicals used in the cooling tower and determined that the levels of such chemicals in the discharges would not cause or contribute to a violation of an applicable water quality standard and 2. The permittee has addressed this source of pollutants with appropriate BMPs in the SWPPP.

- b. Discharges from fire fighting activities
- c. Fire hydrant flushings
- d. Potable water sources including waterline flushings
- e. Irrigation drainage
- f. Lawn watering
- g. Routine external building washdown without detergents
- h. Pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred and where detergents are not used
- i. Air conditioning condensate
- j. Compressor condensate
- k. Uncontaminated ground water or spring water and foundation and footing drains where flows are not contaminated with process materials

These other sources of non – stormwater must be identified in the facility's Stormwater pollution prevention plan.

3. Releases in excess of Reportable Quantities.

This permit does not relieve the permittee of the reporting requirements of 40 CFR 117 and 40 CFR 302. The discharge of hazardous substances in the stormwater discharge(s) from a facility shall be minimized in accordance with the applicable stormwater pollution prevention plan for the facility, and in no case, during any 24-hour period, shall the discharge(s) contain a hazardous substance equal to or in excess of reporting quantities.

4. Low Concentration Waiver.

When the average concentration for a pollutant calculated from all monitoring data, with a minimum of four(4) consecutive samples, is less than the corresponding listed cut-off concentration for that pollutant, additional monitoring for that pollutant in Section A, is not required. The facility must submit each year, to the Division of Water and Waste Management in lieu of the monitoring data, a certification (form provided) that there has not been a significant change in the industrial activity or the pollution prevention measures in the area of facility that drains to the outlet for which sampling was waived.

The waiver is valid only for the term of the facilities current registration. If a facility would like to continue its waiver after this date it must reapply at the time of reissuance. The sampling required for a waiver extension consists of one(1) sample of each pollutant. If the sample is less than the corresponding listed cut-off concentration, then the waiver may be extended for the term of the facilities next registration.

5. Natural Background Pollutant Levels

Following the first two semi-annual benchmark monitoring, if the average concentration of a pollutant exceeds a benchmark value, and the permittee determines that exceedence of the benchmark is attributable solely to the presence of that pollutant in the natural background, the permittee is not required to perform corrective action or additional benchmark monitoring provided that:

- The average concentration of your benchmark monitoring results is less than or equal to the concentration of that pollutant in the natural background;
- The permittee documents and maintains with the SWPPP the supporting rationale for concluding that benchmark exceedences are in fact attributable solely to natural background pollutant levels. You must include in your supporting rationale any data previously collected by you or others (including literature studies) that describe the levels of natural background pollutants in your stormwater discharge; and
- The permittee notifies the DWWM on its final (second) semi-annual benchmark monitoring report that the benchmark exceedences are attributable solely to natural background pollutant levels.

Natural background pollutants include those substances that are naturally occurring in soils or groundwater. Natural background pollutants do not include legacy pollutants from earlier activity at the facility, or pollutants in run-on from neighboring sources which are not naturally occurring.

6. Benchmark Monitoring

All monitoring in this permit is benchmark monitoring. The "benchmarks" are the pollutant concentrations above which the DWWM determined represents a level of concern. The level of concern is a concentration at which a stormwater discharge could potentially impair, or contribute to impairing water quality or affect human health from ingestion of water or fish. The benchmarks are also viewed by the DWWM as a level, that if below, a facility represents little potential for water quality concern. As such, the benchmarks also provide an appropriate level to determine whether a facility's stormwater pollution prevention measures are successfully implemented. The benchmark concentrations are not effluent limitations and should not be interpreted or construed as such. These values are merely levels which the DWWM is using to determine if a stormwater discharge from any given facility merits further monitoring to insure that the facility has been successful in implementing a stormwater pollution prevention plan. As such, these levels represent a target concentration for a facility to achieve through implementation of pollution prevention measures at the facility.

The United States Environmental Protection Agency's NPDES Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity subjects Sectors C, D, and E to effluent limitation guidelines. These Sectors must monitor once per year at each outfall the parameters specified in the sector specific section of Section A.

7. Stormwater Pollution Prevention Plan practice review

Permittee shall review its stormwater pollution prevention practices each year and revise the plan (required in Section B-17), if this average concentration for any indicator pollutant in the previous year's sampling was greater than the corresponding cut-off value for that pollutant. This plan must be revised within thirty (30) days of finding the previous year's sampling results being over the cut-off value.

8. Alternative Certification

A discharge is not subject to the monitoring requirements of Section "A" provided the discharger makes a certification (form provided) for a given outlet, or on a pollutant-by-pollutant basis in lieu of monitoring reports, under penalty of law, signed in accordance with Signatory Requirements as specified in the Appendix; that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial, machinery or operations, or significant materials from past industrial activity, that are located in areas of the facility within the drainage area of the outlet are not presently exposed to stormwater and are not expected to be exposed to stormwater for the certification period.

9. No Exposure Certification

A facility that has a SIC code listed in section A requiring them to be covered under this permit is exempt from permitting requirements if they meet the following requirements consistent with the Code of Federal Regulations Section 122.26(g).

A condition of no exposure exists at an industrial facility when all industrial materials and activities are protected by a storm resistant shelter to prevent exposure to rain, snowmelt, and/or runoff. Industrial materials include, but are not limited to, material handling equipment or activities, industrial machinery, raw materials, intermediate products, by-

products, final products, or waste products. Material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product or waste product. A storm resistant shelter is not required for the following industrial materials and activities:

- drums, barrels, tanks, and similar containers that are tightly sealed, provided those containers are not deteriorated and do not leak. "Sealed" means banded or otherwise secured and without operational taps or valves;
- adequately maintained vehicles used in material handling; and
- final products, other than products that would be mobilized in stormwater discharges (e.g. rock salt).

A No Exposure Certification must be provided for each facility qualifying for the no exposure exclusion. In addition, the exclusion from NPDES permitting is available on a facility-wide basis only, not for individual outfalls. If any industrial activities or materials are or will be exposed to precipitation, the facility is not eligible for the no exposure exclusion. The certification must be submitted once every five years along with the required fee determined by the Division of Water and Waste Management (DWWM).

If circumstances change and industrial materials or activities become exposed to rain, snow, snow melt, and / or runoff. The conditions for this exclusion no longer apply. In such cases, the discharge becomes subject to enforcement and / or un-permitted discharge. Any conditionally exempt discharger who anticipates changes in circumstances should apply for and obtain permit authorization prior to the change of circumstances.

Notwithstanding the provisions of this paragraph, the DWWM retains the authority to require permit authorization (and deny this exclusion) upon making a determination that the discharge causes, has a reasonable potential to cause, or contributes to an instream excursion above an applicable water quality standard including designated uses.

10. Representative Discharge.

When a facility has two or more outlets that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outlet, the permittee reasonably believes discharges substantially identical effluents, the permittee may test the effluent of one of such outlets and report that the quantitative data also applies to the substantially identical outlet(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outlets and explains in detail why the outlets are expected to discharge substantially identical effluents. In addition, for each outlet that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g. low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan. The permittee shall include the description of the location of the outlets, explanation of why outlets are expected to discharge substantially identical effluents, and estimate of the size of the drainage area and runoff coefficient with the Stormwater Monitoring Report.

11. Visual Examination of Stormwater Quality

Permittee shall perform and document a visual examination of a stormwater discharge associated with industrial activity for each outlet during each monitoring period. Examination shall be made of samples collected within the first 30 minutes (or as soon thereafter as practical, but not exceed one hour) of when the runoff or snowmelt begins discharging. The examinations shall document observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of stormwater pollution. Visual examination reports must be maintained onsite in the stormwater pollution prevention plan.

12. Water Quality Standards.

The effluent or effluents covered by this permit are to be of such quality so as to not cause violations of applicable water quality standards.

13. TMDL and 303D Impaired Waters Requirements.

Permittees discharging pollutants of concern to waters for which there is a total maximum daily load (TMDL) established or approved by EPA are not eligible for coverage under this general permit, unless the permit conditions of this general permit are consistent with the assumptions and requirements of such TMDL. The permittee should consult with the State or EPA TMDL authority to confirm if his/her facility is subject to an approved TMDL. If you discharge to an impaired water body without an approved TMDL you must meet all applicable water quality standards for that receiving waterbody. You must also monitor for all pollutants for which the waterbody is impaired. If the pollutant for which the water is impaired is not present and not expected to be present in your discharge, or is present but you have determined that its presence is caused solely by natural background sources, you should include a notification to this effect in your first monitoring report, after which you may discontinue annual monitoring. To support a determination that the pollutant's presence is caused solely by natural background sources, you must keep the following documentation with your SWPPP records.

1. An explanation of why you believe that the presence of the pollutant causing the impairment in your discharge is not related to the activities at your facility; and
2. Data and/or studies that tie the presence of the pollutant causing the impairment in your discharge to natural background sources in the watershed.

Natural background pollutants include those substances that are naturally occurring in soils or groundwater. Natural background pollutants do not include legacy pollutants from earlier activity on your site, or pollutants in run-on from neighboring sources which are not naturally occurring.

If you are a new discharger you must also meet the following requirements to discharge into a 303D impaired water.

1. Prevent all exposure to stormwater of the pollutant(s) for which the waterbody is impaired, and retain documentation of procedures taken to prevent exposure onsite with your SWPPP; or

2. Document that the pollutant(s) for which the waterbody is impaired is not present at your site, and retain documentation of this finding with your SWPPP; or
3. In advance of submitting your application, provide to DWWM data to support a showing that the discharge is not expected to cause or contribute to an exceedance of a water quality standard, and retain such data with your SWPPP. This data must demonstrate that the discharge of the pollutant for which the water is impaired will meet instream water quality criteria at the point of discharge.

14. Endangered and Threatened Species Requirements.

If a site discharges to a stream where a Federally endangered or threatened species or its habitat are present, the applicant should contact the US Fish and Wildlife Service to insure that requirements of the Federal Endangered Species Act are met.

15. Reopener Clause

If there is evidence indicating potential or realized impacts on water quality due to any stormwater discharge associated with industrial activity covered by this permit, the owner or operator of such discharge may be required to obtain an individual permit in accordance with Section B.1. of this permit or the permit may be modified to include different limitations and/or requirements.

16. Other Statutes or Regulations

No condition of this permit shall release the permittee from any responsibility or requirements under other environmental statutes or regulations.

17. Stormwater Pollution Prevention Plans (SWPPP) and Groundwater Protection Plan (GPP).

Each facility covered by this permit shall have a stormwater pollution plan and a groundwater protection plan. These two plans may be combined into one plan so long as all requirements for both plans are met. Alternatively, they may be developed and maintained as separate stand-alone documents. Stormwater pollution prevention plan shall be prepared in accordance with good engineering practices. The plan shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater discharges associated with industrial activity from the facility. In addition the plan shall describe and ensure the implementation of practices which are to be used to reduce the pollutants in stormwater discharges associated with industrial activity at the facility and to assure compliance with the terms and conditions of this permit. The SWPPP and the GPP shall be signed in accordance with Section I.6, Appendix A of this permit and shall be retained on site. Plans shall provide for compliance with the terms of the plan prior to submitting a registration form to be covered under this permit. The permittee shall make plan(s) available, upon request, to the Director or authorized representative. All facilities wishing to be covered by this permit for the first time must submit a copy of the SWPPP and GPP with the application for review.

If the plan(s) are reviewed by the Director or authorized representative, that individual

may notify the permittee at any time that either the SWPPP and/or the GPP does not meet one or more of the minimum requirements of this section. After such notification, the permittee shall make changes to the plan in accordance with the time frames established below, and shall submit to the Director, a written certification that the requested changes have been made. The permittee shall have 30 days after such notification to make the changes necessary.

All SWPPPs and GPPs required under this permit are considered reports that shall be available to the public under Section 308 (b) of the CWA. The owner or operator of a facility with stormwater discharges covered by this permit shall make plans available to members of the public upon request by the public. However, the permittee may claim any portion of a stormwater pollution plan as confidential in accordance with 46 CSR 2-12.7.

If representative organization of a significant number of facilities in a particular SIC code can develop and demonstrate an acceptable stormwater pollution prevention plan, and/or groundwater protection plan, the DWWM will review this approach for considering those facilities for coverage under this general permit and in compliance with this section.

A. Stormwater Pollution Prevention Plan Requirements

a) **Contents of Plan.** The plan shall include, at a minimum, the following items:

(1) **Description of Potential Pollutant Sources.** Each plan shall provide a description of potential sources which may be reasonably expected to add significant amounts of pollutants to stormwater discharges or which may result in the discharge of pollutants during dry weather from separate storm sewers draining the facility. Plans shall identify all activities which may potentially be significant pollutant sources, including: 1) loading or unloading of dry bulk materials or liquids, 2) outdoor storage of raw materials, intermediary products or products, 3) outdoor process activities, 4) dust or particulate generating processes, 5) illicit connections or management practices, and 6) waste disposal practices. To facilitate this process, each plan, shall at a minimum, include:

(A) A site map indicating, at a minimum: each drainage and discharge structure; an outline of the drainage area of each discharge point, each past or present area used for outdoor storage or disposal of significant materials; each existing structural control measure to reduce pollutants in stormwater runoff; materials loading and access area; each hazardous waste storage or disposal facility (including each area not required to have a RCRA permit which is used for accumulating hazardous waste under 40 CFR 262.34); each well where fluids from the facility are injected underground; sinkholes; springs; and other surface water bodies;

(B) An estimate of the area of impervious surfaces (including paved areas and building roofs) relative to the total area drained by each outlet;

(C) A topographic map (or other map if a topographic map is unavailable), extending one mile beyond the property boundaries of the facility, depicting the facility and each of its intake and discharge structures, springs, other surface water bodies, and drinking water wells listed in public records or otherwise known to the applicant in the map area. The requirements of this paragraph may be included in the site map required under Section G.5.d) (1) (A).

(D) A narrative description of significant materials that have been treated, stored or disposed in a manner to allow exposure to stormwater between the time of three years prior to the date of the coverage under this permit and the present; method of on-site storage or disposal; materials management practices employed to minimize contact of these materials with stormwater runoff between the time of three years prior to the date of issuance of this permit and the present; materials loading and access areas; the location and a description of existing structural and nonstructural control measures to reduce pollutants in stormwater runoff; and description of any treatment the stormwater receives.

(E) A list of significant spills and leaks of toxic or hazardous pollutant that occurred at the facility after the date of three (3) years prior to coverage under this permit and the present. Such list shall be updated when a significant spill or leak of toxic or hazardous pollutants occurs and shall include a description of the materials released, an estimate of the volume of the release, the location of the release, and a description of any remediation or cleanup measures taken;

(F) For each area of the plant that generates stormwater discharges associated with industrial activity with a reasonable potential for containing significant amounts of pollutants, a

prediction of the direction of flow, and an estimate of the types of pollutants which could be present in stormwater discharges associated with industrial activity; and

(G) A summary of existing sampling data describing pollutants in stormwater discharges.

(2) Stormwater Management Controls

Each facility covered by this permit shall develop a description of stormwater pollution controls appropriate for the facility, and implement such controls. Priorities developed in a plan for implementing controls shall reflect the nature of identified potential sources of pollutants at the facility. The description of stormwater pollution controls shall address the following minimum components, including a schedule for implementing such controls:

(A) **Pollution Prevention Committee** - The description of the stormwater Pollution Prevention Committee shall identify specific individuals within the organization who are responsible for developing the stormwater pollution prevention plan and assisting the manager in its implementation, maintenance, and revision. The activities and responsibilities of the committee should address all aspects of the facility's stormwater pollution prevention plan.

(B) **Risk identification and Assessment/Material Inventory** - The stormwater pollution prevention plan shall assess the potential of various sources at the facility to contribute pollutants to stormwater discharges associated with industrial activity. The plan shall inventory the types of materials handled, the location of material management activities, and types of material management activities. Factors to consider when evaluating the pollution potential of runoff from various portions of an industrial plant include: loading and unloading operations, outdoor storage activities; outdoor manufacturing or processing activities; dust or particulate generating processes; and waste disposal practices. Other factors to consider are the toxicity of chemicals; quantity of chemicals used, produced, or discharged; history of water quality violations; history of significant leaks or spills of toxic or hazardous pollutants; and nature and uses of the receiving waters.

(C) **Preventive Maintenance** - A preventive maintenance program shall involve inspection and maintenance of stormwater pollution prevention devices (e.g., cleaning oil/water separators, catch basins, etc.) as well as inspecting and testing plant equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters.

(D) **Good Housekeeping** - Good housekeeping requires the maintenance of a clean, orderly facility.

(E) **Spill Prevention and Response Procedures** - Areas where potential spills can occur, and their accompanying drainage points shall be identified clearly in the stormwater pollution prevention plan. Where appropriate, specifying material handling procedures and storage requirements in the plan should be considered. Procedures for cleaning up spills shall be identified in the plan and made available to the appropriate personnel. The necessary equipment to implement a cleanup should be available to all personnel.

(F) **Stormwater pollution prevention** - After measures have been taken to minimize pollutant sources to stormwater, traditional stormwater pollution prevention practices should be considered.

(G) **Sediment and Erosion Prevention** - The plan shall identify areas which, due to topography, activities, or other factors, have a high potential for soil erosion, and identify measures to limit erosion. Some sectors may be required to submit a sediment and erosion control plan.

(H) **Employee Training** - Employee training programs shall inform personnel at all levels of responsibility of the components and goals of the stormwater pollution prevention plan. Training should address topics such as spill response, good housekeeping, and material management practices. A pollution prevention plan shall identify periodic dates for such training.

(I) **Visual Inspections** - Qualified company personnel shall be identified to inspect designated equipment and plant or other appropriate areas. Material handling areas shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. A tracking or follow-up procedure should be used to ensure that adequate response and corrective actions have been taken in response to the inspection. Records of inspections shall be maintained.

(J) **Record keeping and Internal Reporting Procedures** - Incidents such as spills, leaks, and improper dumping, along with other information describing the quality and quantity of stormwater discharges should be included in the records. Inspections and maintenance activities such as cleaning oil and grit separators or catch basins should be documented and recorded.

(K) **Non-Stormwater Discharges** - A certification that the discharge has been tested for the presence of non-stormwater discharges. The certification shall include a description of the results of any test for the presence of non-stormwater discharges, the method used, the date of any testing, and the on-site drainage points that were directly observed during the test. Such certification may not be feasible if the facility operating the stormwater discharge associated with industrial activity does not have access to an outlet, manhole, or other point of access to the ultimate conduit which receives the discharge. In such cases, the source identification section of the stormwater pollution plan shall indicate why the certification required by this section was not feasible.

b) Site Inspection

A site inspection shall be conducted annually by appropriate personnel named in the stormwater pollution prevention plan to verify that the description of potential pollutant sources required under Section B.11.A.a)(1) is accurate; the drainage map has been updated or otherwise modified to reflect current conditions; and the controls to reduce pollutants in stormwater discharges associated with industrial activity identified in the stormwater pollution prevention plan are being implemented and are adequate. Records documenting significant observations made during the site inspection shall be retained as part of the stormwater pollution prevention plan for three years.

c) A facility which has experienced one or more releases of a hazardous substance in excess of reporting quantities established at 40 CFR 117.3 or 40 CFR 302.4 within twelve months prior to the effective date of this permit, or after the effective date of this permit, shall include as part of the stormwater pollution prevention plan for the facility a written

description of each release, corrective actions taken and measures taken to prevent recurrence. (Note: Section B.3. if this permit prohibits stormwater discharges which, during any 24-hour period, contain a hazardous substance equal to or in excess of the reporting quantities of 40 CFR 117 and 40 CFR 302.)

d) Consistency with Other Plans and Programs

Stormwater management plans and programs may reflect requirements for Spill Prevention Control and Countermeasure (SPCC) plans under section 311 of the Clean Water Act (CWA) or Best Management Practices (BMP) plans otherwise required by a W/INPDES permit, and may incorporate any part of such plans into the stormwater pollution prevention plan by reference.

B. Groundwater Protection Plan Requirements

Groundwater Protection Plans (GPPs) shall be prepared in accordance with this Section and the requirements of Title 47, Series 58, Section 4.11., et. seq. (Groundwater Protection Regulations). If the GPP is combined with the SWPPP into a single plan it may not be necessary to repeat some of the information required by the following subsections. However, stand alone GPPs must contain the following information at a minimum:

(1) The GPP shall include an inventory of all operations which may reasonably be expected to contaminate the groundwater resources with an indication of the potential for soil and groundwater contamination from those operations. The following potential sources must be considered: Outside materials storage areas; Disposal areas; Loading and unloading areas; Bulk storage and distribution areas; Drums; Sumps; Pumps; Tanks; Impoundments; Ditches; and Underground Pipelines. In addition the GPP shall provide a thorough and detailed description of procedures designed to protect groundwater from the identified potential contamination sources. Specific attention must be given to manufacturing facilities, materials handling, equipment cleaning, construction activities, maintenance activities, pipelines, sumps, and tanks containing contaminants.

(2) Facilities which have areas that require remedial action to install, implement, or develop procedures or control equipment to protect groundwater shall include in their GPP a schedule of compliance listing such areas, the remedial actions necessary, and the projected date such remedial actions will be completed. The schedule of compliance is a part of the GPP and enforceable under Title 47, Series 58, Section 4.12.e.1.

(3) A thorough and detailed list of groundwater protection procedures to be employed in the design of new equipment or operations.

(4) A thorough and detailed summary of all activities carried out under other regulatory programs which have relevance to groundwater protection (for example: RCRA, CERCLA, Stormwater Permit, Spill Prevention Control and Countermeasures plans, Toxic Substances Control Act, DOT training requirements, Management of Used Oil, etc.)

(5) All reasonably available information groundwater quality at the site. This should include any known sampling in the area, other potential sources of contamination, depth to groundwater, and any other information available.

(6) A statement that no wastes will be used for deicing, fills, or for other uses on the site unless provided for in existing rule.

(7) Provisions for training all employees and contractor personnel on their responsibility to ensure groundwater protection. Job procedures shall provide direction on prevention of groundwater contamination.

(8) Provisions for quarterly inspections of the facility to ensure that all elements and equipment of the groundwater protection programs are in place, functioning properly, and are appropriately managed.

The herein described activity is to be constructed or installed, and operated, used and maintained strictly in accordance with the terms and conditions of this permit; with all plans and specifications previously submitted with the individual site registration application form or individual permit application; with a plan of maintenance and method of operation thereof; and with any applicable rules and regulations promulgated by the State Environmental Quality Board.

Failure to comply with the terms and conditions of this permit, with the plans and specifications previously submitted with individual site registration application form or individual permit application, and with a plan of maintenance and method of operation thereof shall constitute grounds for the revocation or suspension of this permit and for the invocation of all the enforcement procedures set forth in Chapter 22, Article 11 of the Code of West Virginia.

This permit is issued in accordance with the provisions of Chapter 22, Article 11 of the Code of West Virginia

BY: 

Director

WV/NPDES Permit No. WV0111457

Appendix A

I. MANAGEMENT CONDITIONS:

1. **Duty to Comply**
 - a) The permittee must comply with all conditions of this permit. Permit noncompliance constitutes a violation of the CWA and State Act and is grounds for enforcement action; for permit modification, revocation and reissuance, suspension or revocation; or for denial of a permit renewal application.
 - b) The permittee shall comply with all effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.
2. **Duty to Reapply**

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Division of Water and Waste Management will provide the permittee with an application package at such time as they will need to reapply. Applicants will have 30 days from when they receive the application to reapply.
3. **Duty to Mitigate**

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit, which has a reasonable likelihood of adversely affecting human health or the environment.
4. **Permit Actions**

This permit may be modified, revoked and reissued, suspended, or revoked for cause. The filing of a request by the permittee for permit modification, revocation and reissuance, or revocation, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.
5. **Property Rights**

This permit does not convey any property rights of any sort or any exclusive privilege.
6. **Signatory Requirements**

All applications, reports, or information submitted to the Director shall be signed and certified as required in Title 47, Series 10, Section 4.6 of the West Virginia Legislative Rules.
7. **Transfers**

This permit coverage is not transferrable to any person except after notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary.
8. **Duty to Provide Information**

The permittee shall furnish to the Director, within a reasonable specified time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, suspending, or revoking this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.
9. **Other Information**

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information.
10. **Inspection and Entry**

The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

 - a) Enter upon the permittee's premises in which an effluent source or activity is located, or where records must be kept under the conditions of this permit;
 - b) Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit;
 - c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
 - d) Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the State Act, any substances or parameters at any location.
11. **Permit Modification**

This permit may be modified, suspended, or revoked in whole or in part during its term in accordance with the provisions of Chapter 22-11-12 (of the Code of West Virginia).
12. **Water Quality**

The effluent or effluents covered by this permit are to be of such quality so as not to cause violation of applicable water quality standards adopted by the Environmental Quality Board.
13. **Outlet Markers**

A permanent marker at the establishment shall be posted in accordance with Title 47, Series 11, Section 9 of the West Virginia Legislative Rules.

14. Liabilities

- a) Any person who violates a permit condition implementing sections 301, 302, 306, 307, 308, 318, or 405 of the Clean Water Act is subject to a civil penalty not to exceed \$10,000 per day of such violation. Any person who willfully or negligently violates permit conditions implementing sections 301, 302, 306, 307, or 308 of the Clean Water Act is subject to a fine of not less than \$2,500 nor more than \$25,000 per day of violation, or by imprisonment for not more than 1 year, or both.
- b) Any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.
- c) Any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.
- d) Nothing in C.14 a), b), and c) shall be construed to limit or prohibit any other authority the Director may have under the State Water Pollution Control Act, Chapter 22, Article 11.

15. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Clean Water Act.

II. OPERATION AND MAINTENANCE:

1. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls, and appropriate quality assurance procedures. Unless otherwise required by Federal or State law, this provision requires the operation of back-up auxiliary facilities or similar systems which are installed by the permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

2. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of the permit.

3. Bypass

a) Definitions

- (1) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility; and
- (2) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b) Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provision of II.3.c) and II.3.d) of this permit.

- (1) If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten (10) days before the date of the bypass;
- (2) If the permittee does not know in advance of the need for bypass, notice shall be submitted as required in IV.2.b) of this permit.

d) Prohibition of bypass

- (1) Bypass is permitted only under the following conditions, and the Director may take enforcement action against a permittee for a bypass, unless:
 - (A) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
 - (B) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgement to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and
 - (C) The permittee submitted notices as required under II.3.c) of this permit.
- (2) The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed in II.3.d.(1) of this permit.

4. Upset

a) Definition. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

b) Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitation if the requirements of II.4.c) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

c) Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

- (1) An upset occurred and that the permittee can identify the cause(s) of the upset;
- (2) The permitted facility was at the time being properly operated;
- (3) The permittee submitted notice of the upset as required in IV.2.b) of this permit.
- (4) The permittee complied with any remedial measures required under I.3. of this permit.

d) Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

5. Removed Substances

Where removed substances are not otherwise covered by the terms and conditions of this permit or other existing permit by the Director, any solids, sludge, filter backwash or other pollutants (removed in the course of treatment or control of wastewater) and which are intended for disposal within the State, shall be disposed of only in a manner and at a site subject to the approval by the Director. If such substances are intended for disposal outside the State or for reuse, i.e., as a material used for making another product, which in turn has another use, the permittee shall notify the Director in writing of the proposed disposal or use of such substances, the identity of the prospective disposer or users, and the intended place of disposal or use, as appropriate.

III. MONITORING AND REPORTING

1. Representative Sampling, Sample Type and Sampling Period

Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. For discharges from holding ponds or other impoundments with a retention period greater than 24 hours, (estimated by dividing the volume of the retention pond by the estimated volume of water discharged during the 24 hours previous to the time that the sample is collected) a grab sample may be taken at any time within 24 hours from the beginning of rainfall. For all other discharges, samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. Where once per six(6) month sampling is required, the samples for each six(6) month period shall be collected at least three(3) months apart. The grab sample shall be taken during the first thirty minutes of the discharge. If the collection of a grab sample during the first thirty minutes is impractical, a sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first thirty minutes was impractical.

Permittee shall monitor samples collected during the sampling period of January through June and July through December.

2. Reporting

- a) Permittee shall submit each year, according to the enclosed format, a Discharge Monitoring Report (DMR) indicating in terms of concentration, the values of the constituents listed in Part A analytically determined to be in the effluent(s).
- b) The required DMRs should be mailed no later than 20 days following the end of the reporting period and be addressed to:

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| Director Division of Water and Waste Management 601 5 th Street SE Charleston, WV 25304 Attention: Permitting Section | and Supervisor Environmental Enforcement (General Permit Registration shall contain Regional address) |
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3. Test Procedures

Samples shall be taken, preserved and analyzed in accordance with the latest edition of 40 CFR Part 136, unless other test procedures have been specified elsewhere in this permit.

4. Recording of Results

For each measurement or sample taken pursuant to the permit, the permittee shall record the following information.

- a) The date, exact place, and time of sampling or measurement;
- b) The date(s) analyses were performed;
- c) The individual(s) who performed the sampling or measurement;
- d) The individual(s) who performed the analyses; if a commercial laboratory is used, the name and address of the laboratory;
- e) The analytical techniques or methods used, and
- f) The results of such analyses. Information not required by the DMR form is not to be submitted to this agency, but is to be retained as required in III.6.

5. Additional Monitoring by Permittee

If the permittee monitors any pollutant at any monitoring point specified in this permit more frequently than required by this permit, using approved test procedures or others as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the Discharge Monitoring Report Form. Such increased frequency shall also be indicated. Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in the permit.

6. Records Retention

The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for the permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

7. Definitions

- a) "Daily discharge" means the discharge of a pollutant measured during a calendar day or within any specified period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the average measurement of the pollutant over the day.
- b) "Average monthly discharge limitation" means the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.
- c) "Maximum daily discharge limitation" means the highest allowable daily discharge.
- d) "Composite Sample" is a combination of individual samples obtained at regular intervals over a time period. Either the volume of each individual sample is proportional to discharge flow rates or the sampling interval (for constant volume samples) is proportional to the flow rates over the time period used to produce the composite. The maximum time period between individual samples shall be two hours.
- e) "Grab Sample" is an individual sample collected in less than 15 minutes.
- f) "Is" = immersion stabilization - a calibrated device is immersed in the effluent stream until the reading is stabilized.

III. MONITORING AND REPORTING CONTD.

- g) The "daily average temperature" means the arithmetic average of temperature measurements made on an hourly basis, or the mean value plot of the record of a continuous automated temperature recording instrument, either during a calendar month, or during the operating month if flows are of shorter duration.
- h) The "daily maximum temperature" means the highest arithmetic average of the temperatures observed for any two (2) consecutive hours during a 24 hour day, or during the operating day if flows are of shorter duration.
- i) The "daily average fecal coliform" bacteria is the geometric average of all samples collected during the month.
- j) "Measured Flow" means any method of liquid volume measurement, the accuracy of which has been previously demonstrated in engineering practice, or which a relationship to absolute volume has been obtained.
- k) "Estimate" means to be based on a technical evaluation of the sources contributing to the discharge including, but not limited to pump capabilities, water meters and batch discharge volumes.
- l) "Non-contact cooling water" means the water that is contained in a leak-free system, i.e., no contact with any gas, liquid, or solid other than the container for transport; the water shall have no net poundage addition of any pollutant over intake water levels, exclusive of approved anti-fouling agents.
- m) "Best Management Practices" (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.
- n) "CWA" means Clean Water Act or the Federal Water Pollution Control Act.
- o) "Director" means the Director of the Division of Water and Waste Management, Department of Environmental Protection or their designated representative.
- p) "Runoff coefficient" means the fraction of total rainfall that will appear at the conveyance as runoff.
- q) "Salt Piles" means the commercial storage of common salt (sodium chloride).
- r) "Section 313 water priority chemicals" means a chemical or chemical categories which are:
(1) Are listed at 40 CFR 372.65 pursuant to section 313 of Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986, also titled the Emergency Planning and Community Right-to-Know Act of 1986;
(2) Are present at or above threshold levels at a facility subject to SARA Title III, section 313 reporting requirements; and
(3) That meet at least one of the following criteria: (1) Area listed to appendix D of 40 CFR part 122 on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols) or Table V (certain toxic pollutants and hazardous substances); (ii) Are listed as a hazardous substance pursuant to Section 311 (b)(2)(A) of the CWA at 40 CFR 116.; or (iii) are pollutants for which EPA has published acute or chronic water quality criteria.
- s) "Significant materials" includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under Section 101(14) of CERCLA; any chemical the facility is required to report pursuant to Section 313 of III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with stormwater discharges.
- t) "Site Registration Application Form" means the form(s) designed by the Director for the purpose of making application for coverage under a general permit.
- u) "Significant spills" includes, but is not limited to: releases of oil or hazardous substances in excess of reportable quantities under section 311 of the CWA (see 40 CFR 110.10 and CFR 117.21) or section 102 of CERCLA (see 40 CFR 302.4).
- v) "Stormwater" means stormwater runoff, snow melt runoff and surface runoff and drainage.
- w) "Stormwater Associated with Industrial Activity" means the discharge from any conveyance which is used for collecting and conveying stormwater and which is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program. For the categories of industries identified below in (i) through (xi), the terms includes, but is not limited to stormwater discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites, refuse sites, sites used for the application or disposal of process wastewater (as defined at 40 CFR 401); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to stormwater. For the categories of industries identified below in (xi) the term includes only stormwater discharges from all areas listed in the previous sentence (except access roads) where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products or industrial machinery are exposed to stormwater. For the purposes of the stormwater regulations (40 CFR Part 122.26), material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with stormwater drained from the above described areas. Industrial facilities (including industrial facilities that are Federally or municipally owned or operated that meet the description of the facilities listed in the paragraph (i)-(xi)) include those facilities designated under 122.26(a)(i)(v). The following categories of facilities are considered to be engaging in "industrial activity" for purposes of these regulations

III. MONITORING AND REPORTING CONTD.

- (i) Facilities subject to stormwater effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR Subchapter N (except facilities with toxic pollutant effluent standards which are exempted under category (XI));
 - (ii) Facilities classified as Standard Industrial Classifications 24 (except 2434), 26 (except 265 and 267), 28, 29, 30, 311, 32, 33, 3441, 373;
 - (iii) Facilities classified as Standard Industrial Classifications 10 through 14 (mineral industry) including active or inactive mining operations (except for areas of coal mining operations meeting the definition of a reclamation area under 40 CFR 434.11 (1)) and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge stormwater contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations; inactive mining operations are mining sites that are not being actively mined, but which have an identifiable owner/operator;
 - (iv) Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of RCRA;
 - (v) Landfill and land application sites, and open dumps that have received any industrial wastes (waste that is received from any of the facilities described under this subsection) including those that are subject to regulation under Subtitle D of RCRA;
 - (vi) Facilities involved in the recycling of materials, including metal scrap yards, battery reclaimers, salvage yards, and automobile junkyards, including but limited to those classified as Standard Industrial Classification 5015 and 5093;
 - (vii) Steam electric power generating facilities, including coal handling sites;
 - (viii) Transportation facilities classified as Standard Industrial Classifications 40, 41, 42, 43, 44, 45, and 5171 which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling and lubrication), equipment cleaning operations, airport deicing operations, or which are otherwise identified in (i)-(vii) or (ix)-(x) are associated with industrial activity;
 - (ix) Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with the design flow of 1.0 MGD or more, or required to have an approved pretreatment program under 40 CFR 403. Not included are farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with 40 CFR Part 503;
 - (x) Construction activities, including clearing, grading and excavation activities except: operations that result in the disturbance of less than three acres of total land area which are not part of a larger common plan of development or sale;
 - (xi) Facilities under Standard Industrial Classifications 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 323, 34 (except 3441), 35, 26, 27 (except 373), 38, 39, 4221-25, (and which are not otherwise included within categories (i)-(xi)).
- (x) "Trout Streams" means any waters which meet the definition of Section 2.18 of 46 CSR1.
- (y) "Waste pile" means any noncontainerized accumulation of solid, nonflowing waste that is used for treatment or storage.
- (z) "25-year, 24-hour precipitation event" means the maximum 24-hour precipitation event with a probable reoccurrence interval of once in 25 years. This information is available from the National Climatic Center of the Environmental Data Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.
- (aa) "10-year, 24-hour precipitation event" means the maximum 24-hour precipitation event with a probable reoccurrence interval of once in 10 years. This information is available from the National Climatic Center of the Environmental Data Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

IV. OTHER REPORTING

1. Reporting Spills and Accidental Discharges

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities or penalties established pursuant to Title 47, Series 11, Section 2 of the West Virginia Legislative Rules promulgated pursuant to Chapter 22, Article 11.

Attached is a copy of the West Virginia Spill Alert System for use in complying with Title 47, Series 11, Section 2 of the Legislative rules as they pertain to the reporting of spills and accidental discharges.

2. Immediate Reporting

- a) The permittee shall report any noncompliance which may endanger health or the environment immediately after becoming aware of the circumstances by using the Agency's designated spill alert telephone number. A written submission shall be provided within five (5) days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.
- b) The following shall also be reported immediately:
 - (1) Any unanticipated bypass which exceeds any effluent limitation in the permit;
 - (2) Any upset which exceeds any effluent limitation in the permit; and
 - (3) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in the permit to be reported immediately. This list shall include any toxic pollutant or hazardous substance, or any pollutant specifically identified as the method to control a toxic pollutant or hazardous substance.
- c) The Director may waive the written report on a case-by-case basis if the oral report has been received in accordance with the above.
- d) Compliance with the requirements of IV.2 of this section, shall not relieve a person of compliance with Title 47, Series 11, Section 2.

3. Reporting Requirements

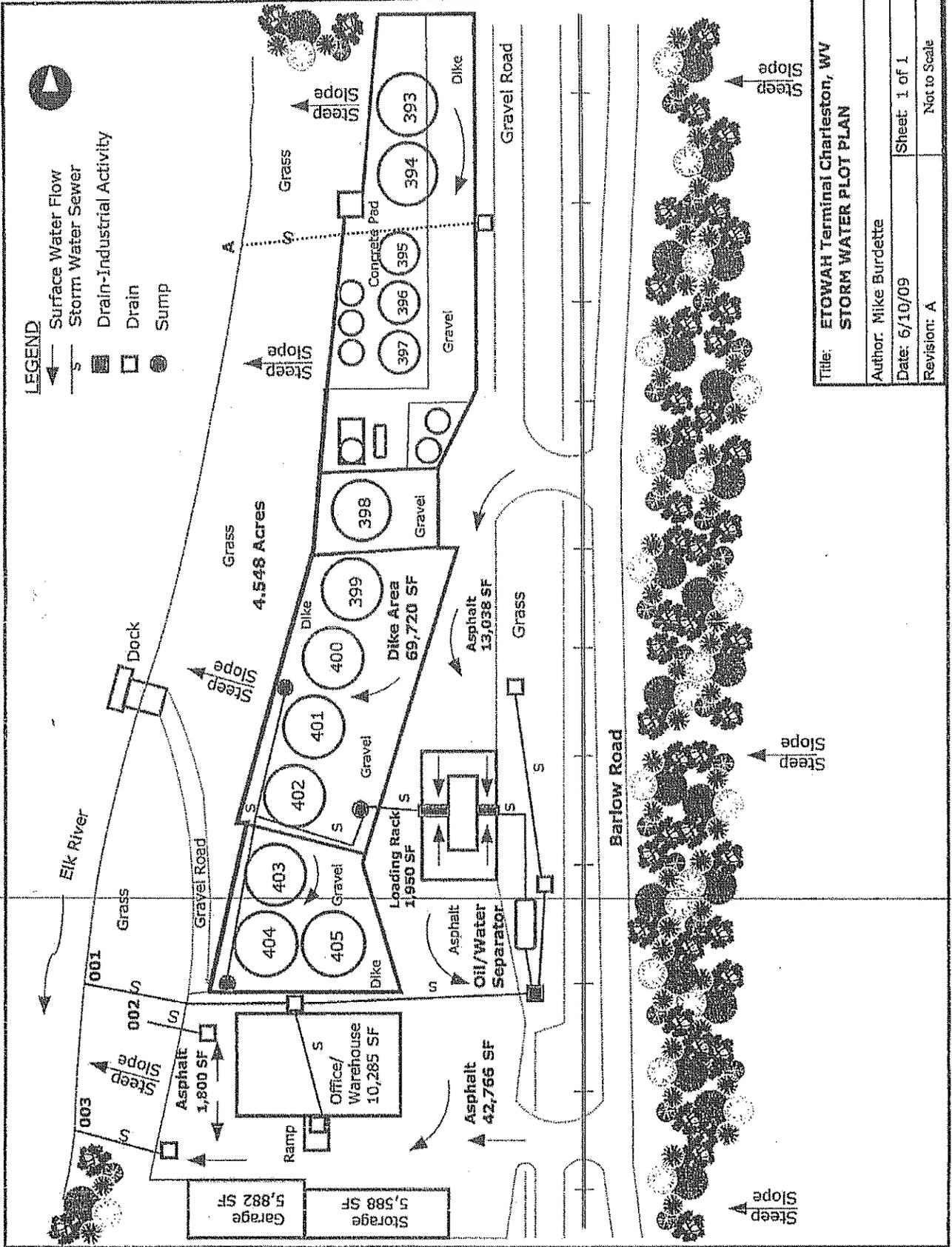
- a) **Planned changes.** The permittee shall give notice to the Director of any planned physical alterations or additions to the permitted facility which may affect the nature or quantity of the discharge.
- b) **Anticipated noncompliance.** The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

4. Other Noncompliance

The permittee shall report all instances of noncompliance not reported under the above paragraphs at the time monitoring reports are submitted. The reports shall contain the information listed in IV.2.a).

WVG610920
ETOWAH RIVER
TERMINAL LLC
11/17/09

PERMIT



LEGEND

- Surface Water Flow
- Storm Water Sewer
- Drain-Industrial Activity
- Drain
- Sump

| | |
|---------------------------------------|---------------|
| Title: ETOVAH Terminal Charleston, WV | |
| STORM WATER PLOT PLAN | |
| Author: Mike Burdette | |
| Date: 6/10/09 | Sheet: 1 of 1 |
| Revision: A | Not to Scale |

ETOWAH Terminal
Charleston WV
6/11/09

Area Calculations Data Sheet

The legal description for the Etowah Terminal describes the irregular shaped property as containing 4.548 acres. Calculations for the following areas are based on field measurements and legal documents for Section 16.

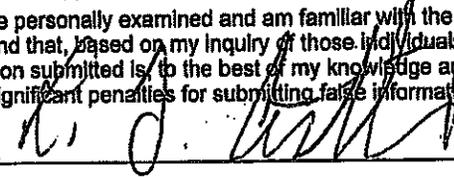
- A. Paved, roofed or other impervious areas.
- Asphalt paved area for office was calculated by taking the gross area from the main entrance to the perimeter fence at the West end and multiplying this by the distance from the back side of the Garage/Storage Area to the dike wall behind the Office building for a total of 68,121 sq ft. Subtracting from this value is the area of the Garage/Storage building (11,470 sq ft), the Office building (10,285 sq ft) and the gravel area at the West end (1,800 sq ft). The total area is 44,566.
 - Asphalt paved roadway that parallels Barlow Road includes the area left and right of the Loading Rack plus the North entrance. $5,280 \text{ sq ft} + 6,786 \text{ sq ft} + 972 \text{ sq ft} = 13,038 \text{ sq ft}$.
 - Concrete pads include the one at the North end that supports tanks 393 – 397 (9,672 sq ft) + old pump house pad (450 sq ft) + pad at Southeast corner of same dike area (375 sq ft) + Product Loading Rack Sump (3,240 sq ft) = 13,737 sq ft
 - Structures include Office 10,285 sq ft + Garage Shop 11,470 sq ft + Storage Tanks 13,454 sq ft = 35,209 sq ft
 - Total for Section 16A = 106,550 sq ft
- B. Graveled or stoned areas include the area along the Southwest corner fence line 1,900 sq ft + Dock Road 2,160 sq ft + Dike areas minus any tanks, or concrete pads 37,065 sq ft = 41,125 sq ft. The gravel road at the North end of the terminal is not within the property description and was not included in the area calculation.
- C. Exposed or barren ground - N/A
-
- D. Vegetated area was calculated by backing into the number by taking the known area of property minus the calculated values for 16 A,B,C. $4.548 \text{ acres} \times \text{conversion factor } 43,560 \text{ to obtain total area in sq ft} = 198,111 \text{ sq ft}$. Subtracting $(106,550 + 41,125 \text{ sq ft})$ the total for this section is 50,436 sq ft.

Section 21 C is for the total square footage of the collection area passing through the oil/water separator. This value includes the area within the dikes 37,065 sq ft + Product loading sump 3,240 sq ft = 40,305 sq ft. This converts to 0.925 acres.

| | | |
|---|--|--|
|  | Applicant: ETOWAH RIVER TERMINAL LLC Reference ID: WVG610920 (05/19/2009) | Type: Reissue NPDES Industrial Permit ID: WVG610920 Status: New |
| | Section 22: Certification | Printed: Jun. 11, 2009 8:41 AM |

By completing and submitting this application, I have reviewed; understood and agreed to the terms and conditions of the general permit. I understand that provisions of the permit are enforceable by law. Violations of any term and condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

21. SIGNATURE of OWNER 

Owner Name and/or
Authorized Official of
Company:

Roger Arthur

TITLE:

General Manager

DATE:

6/11/2009



Please print and mail this page to the following address:

West Virginia Department of Environmental Protection
Division of Water and Waste Management
Permitting and Engineering Branch
801 57th Street SE
Charleston, WV 25304-2345

DEP NPDESEP

From: DEP NPDESEP
Sent: Tuesday, November 17, 2009 10:03 AM
To: rj@freedom-industries.com; DEP NPDESEP
Cc: Chambers, Jason; Saunders, Kevin W; Hackney, Richard; Musser, Cynthia J; Larue, Tina C
Subject: Reissuance Approval for WVG610920, Etowah River Terminal LLC, Kanawha County
Attachments: WVG610920.pdf

John Hutchinson, Terminal Mgr.
Etowah River Terminal LLC
PO Box 713
Charleston, WV 25323

Physical Site Location: 1015 Barlow Dr., Charleston

Please be advised that this e-mail constitutes approval for your stormwater activity and your Registration No. is WVG610920. You are now authorized to operate under WV/NPDES General Water Pollution Control Permit No. WV0111457, issued on April 1, 2009. You should carefully read the contents of this General Permit and become familiar with all requirements needed to remain in compliance with your permit. You are subject to the monitoring requirements of Sector I-1 of the General Permit. Facilities permitted to discharge pollutants to the waters of the State under Chapter 22, Article 11 of the West Virginia Code are required to test their effluent in order to verify permit compliance. This testing is the responsibility of the permittee and these test results are to be submitted to this office on the attached Discharge Monitoring Report. If required by the industrial sector, you must perform this sampling and analysis once every six (6) months. However, the DMR forms are to be completed and submitted to this office only once per year. Failure to submit required DMRs is a violation of the permit and can lead to enforcement actions being taken by this agency for noncompliance. It is suggested that several copies of the attached DMR form be made for your future use. Your first DMR is due on or before January 20, 2011. Finally, note that copies of all future correspondence regarding the permit registration must be sent to the following addresses:

WV Department of Environmental Protection
Division of Water & Waste Management
Permitting and Engineering Branch
601 57th Street SE
Charleston, WV 25304-2345

WV Department of Environmental Protection
Environmental Enforcement
PO Box 662
Teays, WV 25569

This general permit registration e-mail approval supercedes your general permit registration number WVG610920 dated October 22, 2004.

Your annual permit fee has been assessed as \$250.00. You will be invoiced by this agency upon the anniversary date of this approval date. Failure to submit the annual fee within ninety (90) days of the due date will render your permit void upon the date you are mailed a certified written notice to that effect.

Scott G. Mandirola

Acting Director
WV DEP-Division of Water & Waste Mgt.
601 57th St SE
Charleston, WV 25304-2345
Phone: (304) 926-0495
Fax: (304) 926-0496

STATE OF WEST VIRGINIA ROUTING SLIP

FROM: PERMITTING SECTION (CIRCLE ONE) Patrick Michelle

TO: Alice

DATE: 11/4/09

PERMIT NO.: WVG 610920

SPECIAL CONDITION (CIRCLE ONE) YES NO

DMR'S (CIRCLE ONE) YES NO

ANNUAL CERTIFICATION (CIRCLE ONE) YES NO

APPLICATION FEES PAID- CHECK ERIS (CIRCLE ONE) YES NO

EMAIL ADDRESS: rj@freedom-industries.com

SECTOR: I-1

COUNTY: kanawha

SITE LOCATION: (GET THIS INFO FROM FACILITY TAB IN ERIS, STREET ADDRESS AND CITY)

1015 Barlow Drive
charleston w.v. 25311

FIELD OFFICE: (CIRCLE ONE) TEAYS OAK HILL ROMNEY FAIRMONT

ANNUAL PERMIT FEE: \$ 250

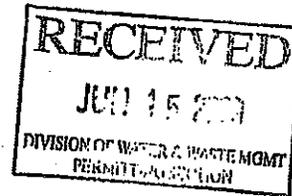
COMMENTS: Any changes that need to be made to ERIS for
address corrections. If so please list below:

Previous Issue date 10/22/04

**Etowah River Terminal
PO Box 713
Charleston WV 25323
(304) 345 0967**

June 11, 2009

West Virginia DEP
Division of Water and Waste Management
Permitting Section
601 57th ST SE
Charleston, WV 25304-2345



RE: WVG610920

Attached, in support of the Etowah River Terminal electronic application for reissue of WVG610920 are:

1. Topographical map of the area. There are no known wells, sinkholes, springs or drink water wells in the area. Streams, rivers and surface waters are shown on the map.
2. Arial photo of the facility
3. Sketch of the facility, showing the oil-water separator, storm drains and outlets drainage areas and water flow.
4. Copy of the DMR submitted in January. The results from the latest sampling have not yet been received.
5. Signature / certification signed by an authorized company official.
6. Check for \$350

In preparation for the stormwater permit renewal, Etowah River Terminal (ERT) has undertaken an extensive review of its facility and storm drains.

Outlet 001 is the discharge point for the oil/water separator. The entire dike area and loading rack area drain through the oil/water separator

Outlet 002 is a small, 4" pipe that drains only a small walkway between the back of the plant and the dike wall. The outlet was covered with vegetation and grass is growing along the bottom of the pipe. The small amount of water from this outlet flows onto a grassy bank, where it dissipates. Plant personnel have never observed sufficient flow from this outlet to obtain a proper sample.

Storm drains on the East side of Barlow Drive are collapsed, allowing run-off from the airport to wash over the road into the ERT parking lot. During heavy rains, this results in silt and mud going in to outlet 003.

**Etowah River Terminal
PO Box 713
Charleston WV 25323
(304) 345 0967**

Stormwater from North of the property collects in a storm drain outside the dike wall (the property line at this point) then goes through the storm sewer, under the tank farm, to the river bank. This is labeled as outlet A on the sketch of the facility.

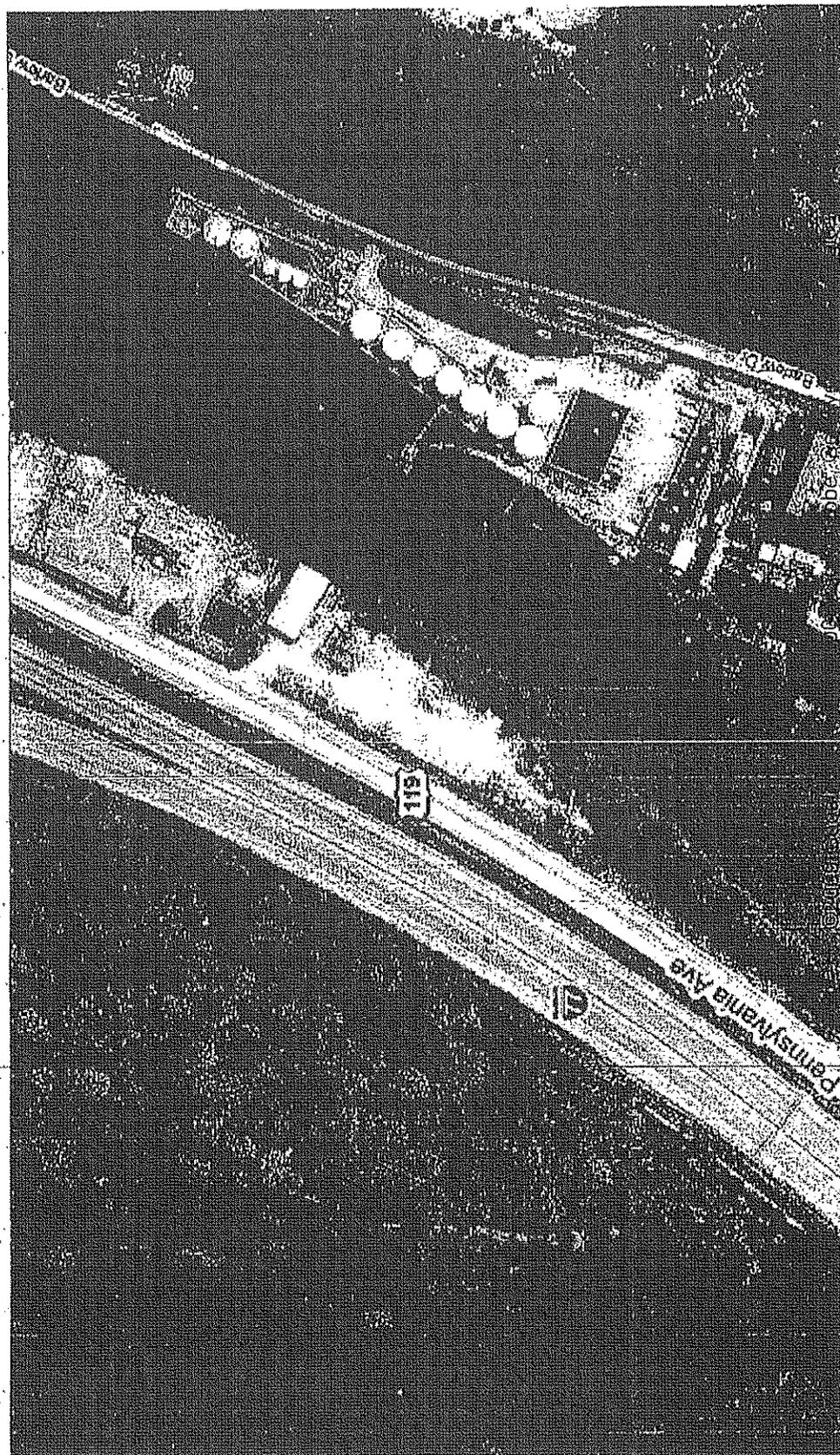
If there are any questions, or if you need any additional information, please contact me at 919-303-5018 (office) or 919-649-4753 (cell) or Roger Arthur at 304-720-8065.

Sincerely



**Bob Reynolds
Regulatory & Environmental**

Google maps



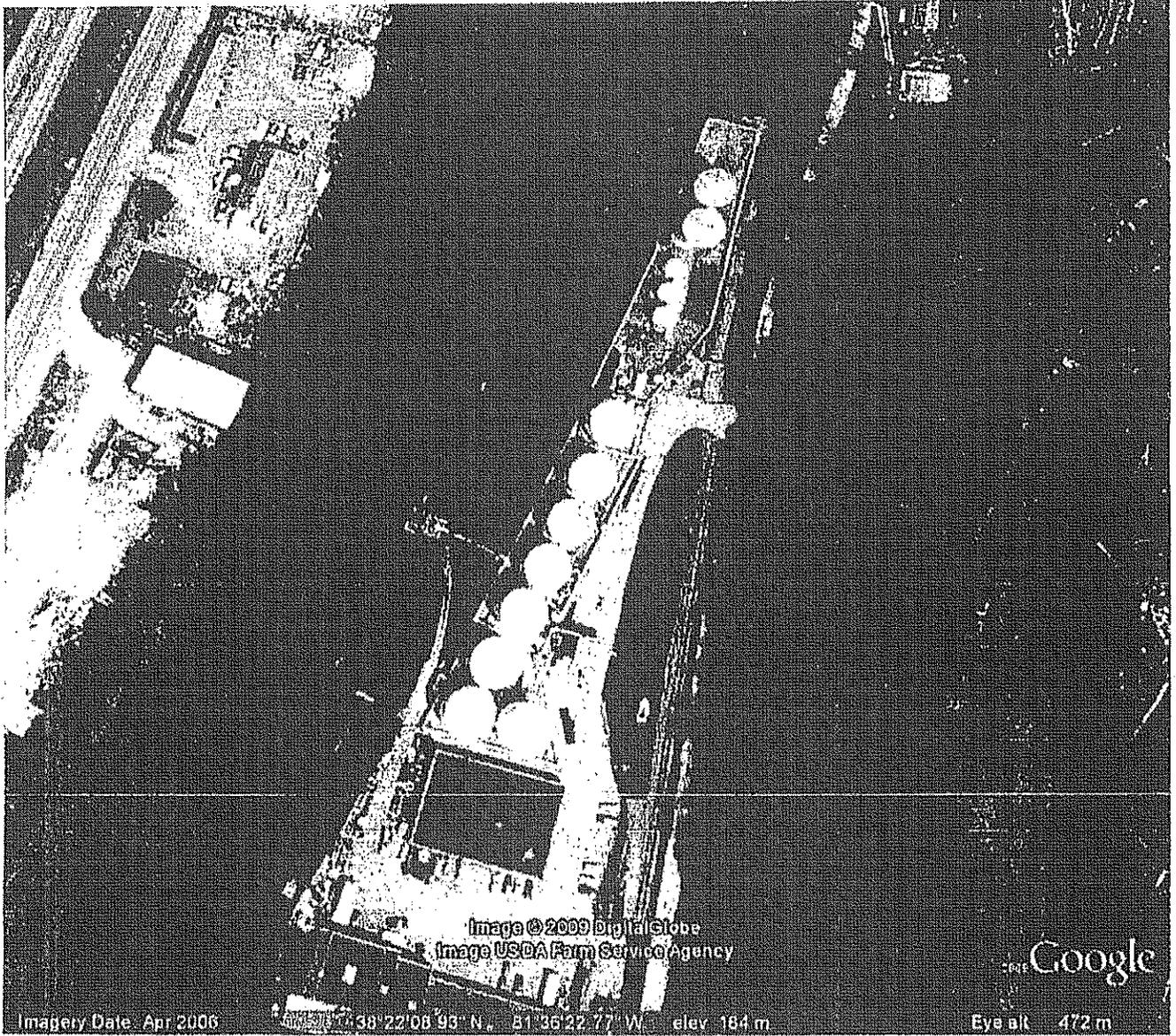


Image © 2009 DigitalGlobe
Image USDA Farm Service Agency

Google

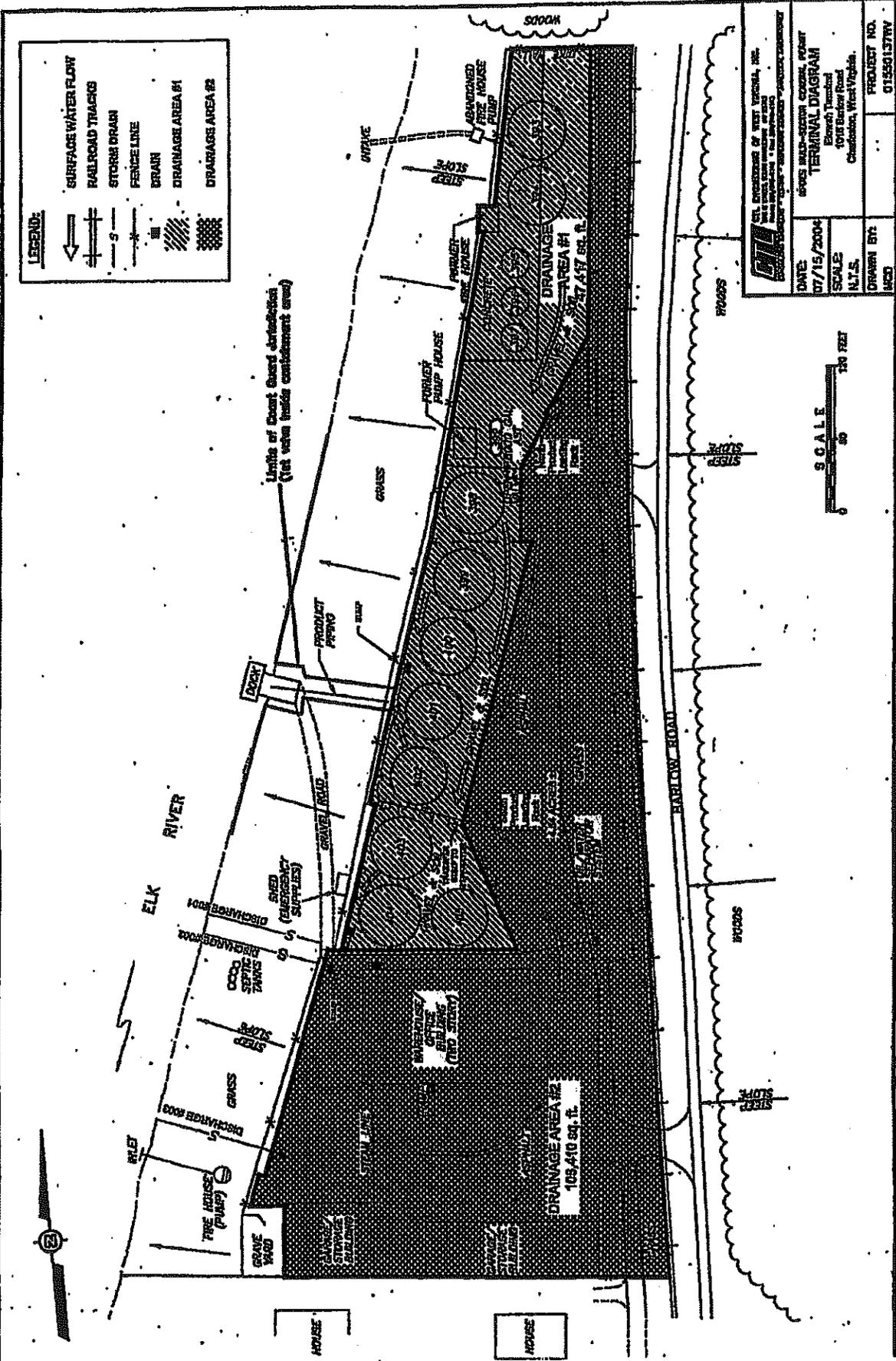
Imagery Date: Apr 2006

43° 38' 22.08" N, 81° 36' 22.77" W, elev 184 m

Eye alt 472 m

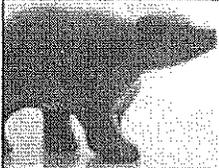
6

| LEGEND: | |
|---------|--------------------|
| | SURFACE WATER FLOW |
| | RAILROAD TRACKS |
| | STORAGE DRAIN |
| | FENCE LINE |
| | DRAIN |
| | DRAINAGE AREA #1 |
| | DRAINAGE AREA #2 |



| | |
|---|--|
| | |
| SCL ENGINEERING OF WEST VIRGINIA, INC. 1015 S. MAIN STREET, MARTINSBURG, WEST VIRGINIA 26101 | |
| DATE: | 07/19/2004 |
| PROJECT: | SPONSOR: MARY-ANN CORRAL, POTOMAC TERMINAL DIAGRAM |
| SCALE: | N.T.S. |
| DRAWN BY: | BT |
| PROJECT NO.: | 01550137RV |





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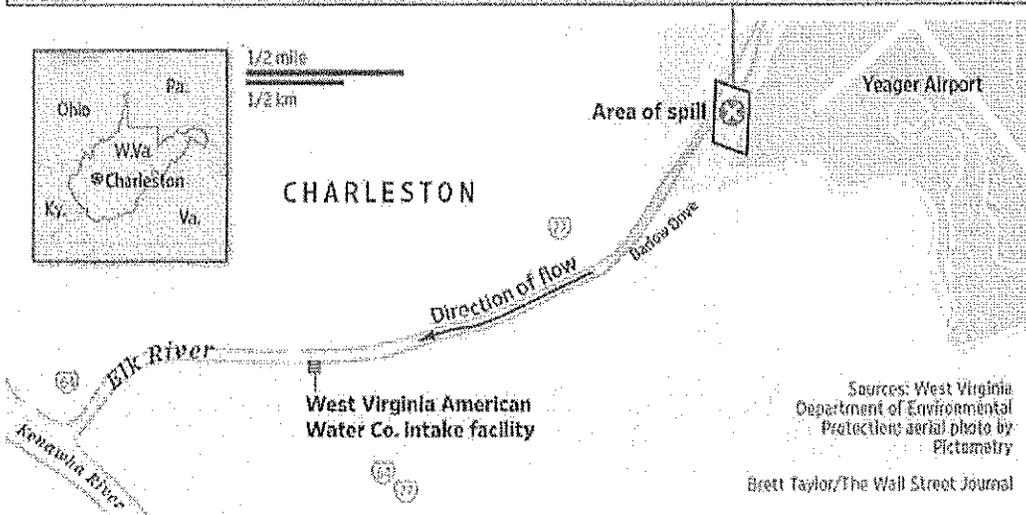
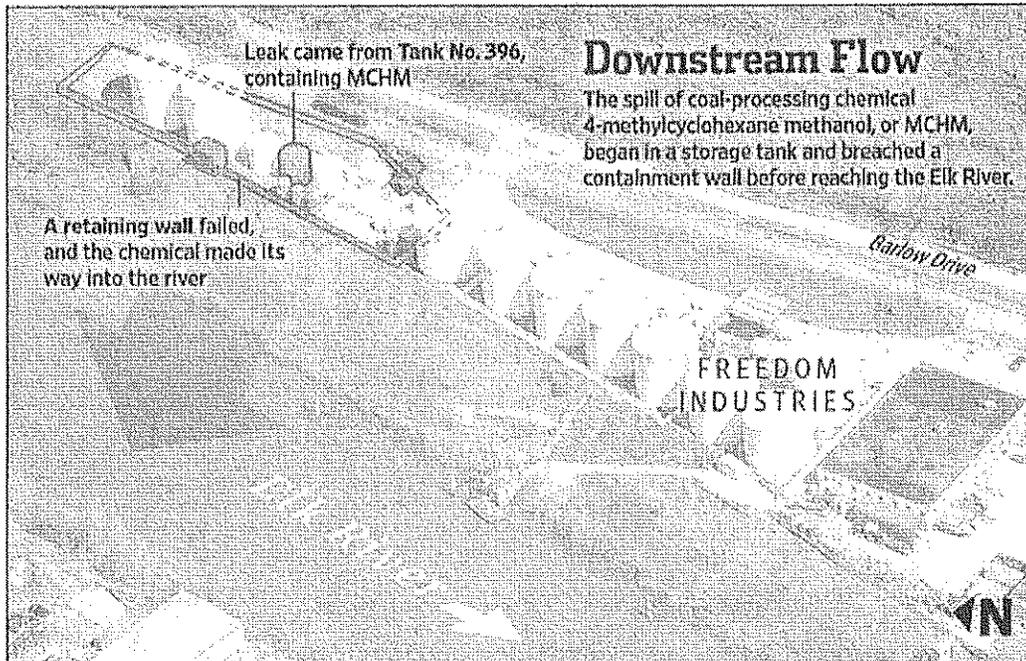
U.S. NEWS

West Virginia Inspectors Visited Chemical Spill Site Five Times Since 2001

West Virginia Residents Complained of Strong Smell From Storage Facility

By KRIS MAHER and VALERIE BAUERLEIN

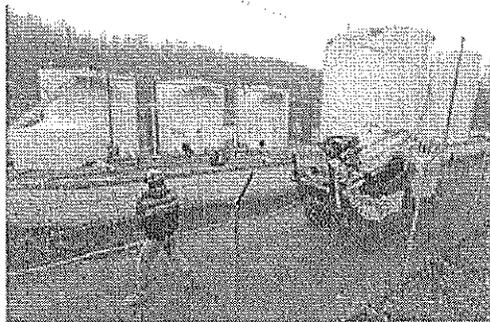
Updated Jan. 16, 2014 8:33 p.m. ET



Brett Taylor/The Wall Street Journal

APP000158

A Freedom representative declined to comment Thursday.



Inspectors who visited the West Virginia chemical storage site didn't focus on the tanks themselves. A worker at the site Monday. *Associated Press*

The April 2010 inspection lends support to reports from nearby residents who say they have smelled the chemical, at times strongly, for several years.

Jerry Burgess, 71 years old, who lives near the site and whom records show made the 2010 complaint, said he has smelled the odor periodically since. He said he never called state officials again.

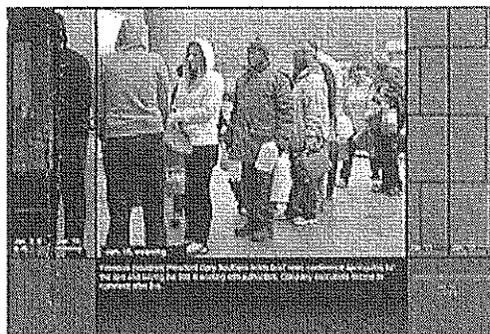
"I didn't get no results then, so what's the use of calling again?" he said.

Robert Keatley, a senior engineer in the state DEP's air-quality division, went to the site in April 2010 with another inspector in response to the complaint. The odor didn't rise to the level of a violation, Mr. Keatley said in an email to the Journal.

The agency determined a few months later that the site didn't require a permit because MCHM emissions into the air were under state limits for hazardous pollutants, according to a separate document.

Timeline: West Virginia Chemical Spill

See a timeline of events surrounding the contamination of the water supply around Charleston, W.Va.



He added that the agency's air-quality division has inspected the site for more than 20 years, including when it was a bulk gasoline terminal under Pennzoil. He said the 2010 odor complaint was the only one the agency had received before last week.

"The odor could have come from the loading of the MCHM," Mr. Keatley said.

In a brief Jan. 10 news conference, Freedom President Gary Southern also attributed prior reports of odors from residents to normal handling of MCHM. "We load tank trucks of this material on a regular basis and occasionally we've had reports of an odor previously," he said.

The Jan. 9 spill has left many residents worried about what they say is a history of strong smells they now believe were coming from the Freedom facility.

Little is known about the health effects of the chemical, one of thousands of industrial substances used with little federal oversight. It can irritate skin, eyes and breathing tracts, according to the available data. Its long-term effects haven't been studied in humans, according to publicly available information. Water is slowly being restored to the area as the chemical dissipates.

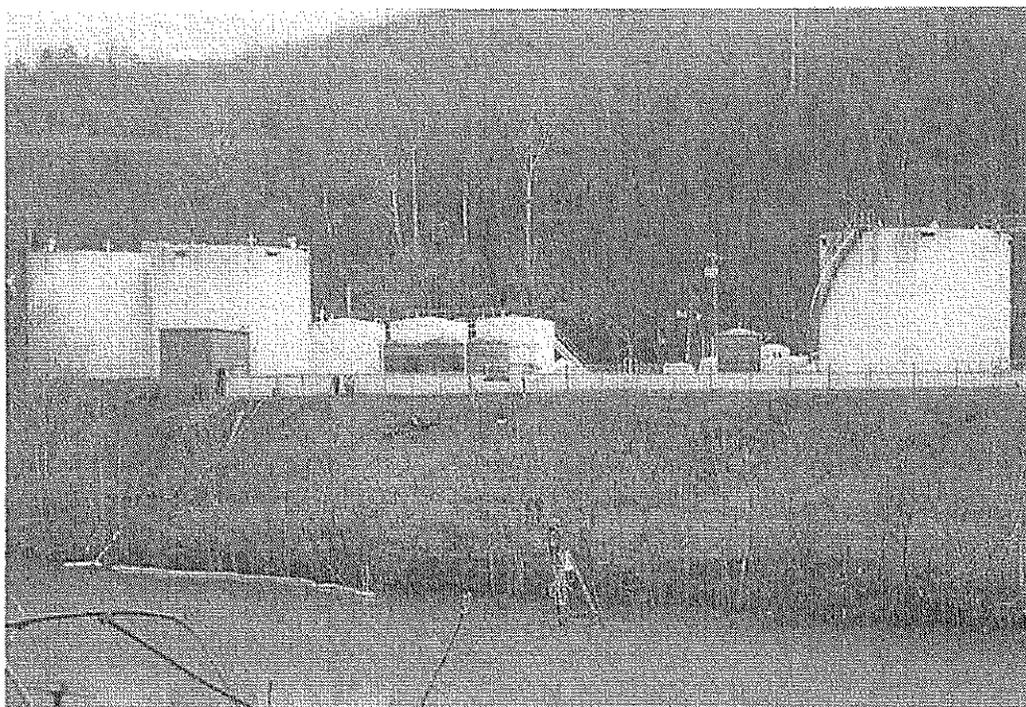
On Jan. 10, after the spill, inspectors cited the company for two alleged air-pollution violations at the site.

Al Rock, who records show first reported the smell from the chemical leak to the state DEP on Jan. 9, said in an interview that he and his family has detected the odor on and off for about two years. Mr. Rock, who sells commercial kitchen equipment near the site, said the smell would sometimes linger in his warehouse for

APP000160

hours and that it was sometimes so strong it made his brother and wife nauseated.

"We've been fighting these smells for at least two years," he said.



Workers inspect an area outside a retaining wall around storage tanks where a chemical leaked into the Elk River in Charleston, W.Va. *Associated Press*

Over that time, Mr. Rock said he tried to find the odor's source. He said he had the gas company come to his property to check for a gas leak and called a hotline to report a possible methamphetamine lab in the area. He also thought one of the many chemical manufacturers in the region might have been to blame for the odor.

On Jan. 9, Mr. Rock said he and his wife noticed the smell while they were still in their car driving to their business. "As soon as we hit that intersection, my wife got nauseous and her head was hurting and she said she had an oily film in the roof of her mouth," he said. "That's what motivated me to get on and call somebody."

Mr. Rock said he called the state DEP's air-quality hotline a little after 8 a.m. and relayed his complaint, and was told a staffer to handle the complaint would be in at 8:30 a.m. He called again at 8:16 a.m. but decided not to leave a message. Then at 9:30 a.m. he called 911, he said.

Patricia Schott, 61, who lives near the Freedom facility, said she has smelled the licorice odor for at least three years and wondered about the potential health impacts. The family cooked and bathed in their water on Jan. 9 during a seven-hour period after the spill was discovered but before a water ban went into effect, she said.

The next day, she said her 7-year-old granddaughter developed severe diarrhea, wheezing and welts over her body and was taken to a hospital, where she spent eight hours and was given anti-inflammatory medication.

"We're afraid of the water still," Ms. Schott said.

APP000161

—Alexandra Berzon contributed to this article.

Storage Facility Given All-Clear—Until Leak

2002: State reviews property before voluntary environmental clean-up by site's former owner, Pennzoil-Quaker State Co.

May 2005: Routine, unannounced air-quality inspection. Site in compliance.

June 2009: Routine, unannounced air-quality inspection. Site in compliance.

April 2010: Air-quality inspection in response to a complaint of a strong licorice smell by a resident. No violation found. State agency later determines that no air-quality permit is needed for the chemical causing the smell, known as MCHM, because its emissions don't exceed legal limits.

February 2012: Routine, unannounced air-quality inspection. Site in compliance.

Jan. 9, 2014: Air-quality inspectors respond to a complaint of strong licorice odor. MCHM is found to be leaking from a storage tank, flowing past a containment wall and spilling into the nearby Elk River, inspectors say.

Jan. 10, 2014: State cites site owner Freedom Industries for alleged violations of air-pollution laws at the facility. Freedom declines to comment.

Sources: West Virginia Department of Environmental Protection records; WSJ reporting

Write to Kris Maher at kris.maher@wsj.com and Valerie Bauerlein at valerie.bauerlein@wsj.com

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Bloomberg Businessweek

Companies & Industries

<http://www.businessweek.com/articles/2014-01-30/west-virginia-chemical-spill-mystery-who-runs-freedom-industries>

Who Runs Freedom Industries? West Virginia's Chemical Spill Mystery

By Paul M. Barrett January 30, 2014

(Corrects a photo that misidentified Dennis Farrell.)

Before the lawsuits and the retreat into federal bankruptcy court, before the change in ownership in a veiled roll-up by an out-of-state coal baron, before the Justice Department's environmental-crimes investigation, the presidentially declared emergency, and the National Guard's arrival—nine years before all of that—the co-founder of Freedom Industries, the company at the center of the Jan. 9 chemical spill that cut off tap water for 300,000 West Virginians, was convicted of siphoning payroll tax withholdings to splurge on sports cars, a private plane, and real estate in the Bahamas. And 18 years before that, in 1987, before he started Freedom Industries, Carl Kennedy II was convicted of conspiring to sell cocaine in a scandal that brought down the mayor of Charleston.

Little known, even locally, Freedom was born and operated in a felonious milieu populated by old friends who seemed better suited to bartending at the Charleston-area saloons they also owned. "These people who were running Freedom Industries weren't the sort you'd put in charge of something like chemical storage that could affect the whole community," Danny Jones, Charleston's current mayor, says. "Who are these guys, anyway?"

Good question. Kennedy kept the books for bars and restaurants, including a rib house Mayor Jones used to own, although he hadn't gotten to know him well. "He was pleasant enough," Jones says. Until the spill, the mayor had no idea his former accountant had been enmeshed with Freedom. That really seems troubling, Jones says, "especially with the cocaine stuff in his history."

Kennedy's main partner was a college buddy named Dennis Farrell, who had some technical background and took over Freedom after Kennedy went to prison in 2006. By Farrell's own account, the company, founded in 1992, nearly ran aground on his watch. Only a rescue in 2009 funded by the federal antirecession stimulus program kept the company going.

The third member of the company's leadership triad, Gary Southern, has served as Freedom's public face since the spill. He lives in Marco Island, Fla., and says he'd been advising the company for several years before becoming full-time president in 2013. Not blessed with a talent for public expression, Southern didn't mention in the first days after the leak of 10,000 gallons of coal-processing compounds that Freedom had been acquired, only 10 days earlier, by Cliff Forrest.

A different sort of character from Kennedy, Farrell, and Southern, Forrest founded and heads Rosebud Mining, the third-largest coal producer in Pennsylvania and the 21st-largest in the country. He's a prominent figure in his

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industry and an opponent of what he calls the Obama administration's "war on coal." Why he wanted Freedom's decrepit facilities for blending and distributing chemicals remains a mystery. Publicly, Forrest hasn't said a word. His connection to Freedom wasn't confirmed until Jan. 17, when his lawyers put the company into bankruptcy. The Chapter 11 filing in Charleston required disclosure of a financial paper trail that led to Forrest's coal company headquarters near Pittsburgh via another entity called Chemstream Holdings.

So while the spill revealed once again that porous legislation and murky assumptions about industry self-policing hinder oversight of dangerous chemicals, it also highlighted a peculiar and deeply troubling element of American commerce, one where holding companies and roll-ups make it difficult to determine who's accountable.

Kennedy grew up in Montgomery, W. Va., a small city on the Kanawha River. He went to college there at West Virginia University Institute of Technology. It was later, in Charleston, that he attained a measure of notoriety.

West Virginia's rugged mountains and forested hollows are home to struggling coal-mining communities. Locals call the Kanawha region Chemical Valley because of the network of foul-smelling refining plants spread across it. The state ranks among the nation's poorest. Charleston, with its office towers and expensive eateries, is a place apart: Home to a social and business elite of lawyers, lobbyists, and coal executives, the capital enjoys a wealth and élan alien to the state's rural and industrial precincts.

In the mid-1980s, Kennedy moved easily in a narcotic-fueled night scene associated with Charleston's Republican mayor at the time, James "Mad Dog" Roark. Targeted by a federal investigation, Roark pleaded guilty to cocaine possession in 1987, resigned as mayor, and went to jail. The same year, Kennedy, then 30 years old, was charged with distributing the not-trivial amount of 10 ounces to 12 ounces of coke. In a plea deal, he admitted to one distribution count and was sentenced to five years' probation. In all, federal prosecutors notched some 30 convictions.

A forgiving town, Charleston didn't ostracize Kennedy. Despite his criminal record, he and Farrell became prolific business partners. Farrell had earned a master's degree from West Virginia University and for a time was employed by a company called Sherex Chemical. Together they invested in commercial real estate and a saloon in Montgomery called the Bank Bar & Grill. In a laudatory 2002 article, the *Charleston Gazette* marveled at the pair's "far-flung array of business ventures," which included a manufacturer of a synthetic fuel additive, a trucking company, and a plant in the town of Nitro, W. Va., that mixed chemicals. Kennedy's portfolio also contained Freedom Industries, which he incorporated in 1992, according to filings with the West Virginia secretary of state. (Kennedy, Farrell, and lawyers who have represented them over the years all failed to respond to telephone and e-mail messages.)

Kennedy's work with the tax ledgers at Freedom is what got him back into serious trouble. When armed IRS agents showed up at his office in Charleston in 2004, he knew why they'd come. "He quickly admitted everything he [had] done," his criminal defense lawyer, John Kessler, later told U.S. District Judge John Copenhaver Jr., according to the *Gazette*. Kennedy pleaded guilty to pocketing more than \$1 million withheld from Freedom employees' paychecks that he was supposed to have passed along to the federal government. He admitted, as well, that he'd evaded personal taxes of \$510,040.96. "These are large sums," Copenhaver observed in court. He'd been the judge for Kennedy's earlier cocaine conviction. "It seems to me," Copenhaver said during a hearing in January 2006, "you would have learned from past experience." Since Kennedy apparently hadn't, the judge sentenced him to 40 months behind bars.

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Kennedy's lifestyle had been expensive, court records showed. Among his possessions were a Hummer H2, two MGB sports cars, five Ford trucks, a pair of excavator vehicles, a private plane, and three two-acre plots on Rum Cay, an island in the Bahamas. His wife, Kathy, had filed for divorce.

In 2005 a prison-bound Kennedy filed for personal bankruptcy. He left Freedom and began to sell his business investments. Freedom, for its part, failed to file an annual report that year and had its state business license revoked. It later reorganized and got its paperwork in order. Freedom sued Kennedy in 2005, seeking to get back money he allegedly misappropriated. Not in a conciliatory mood, perhaps because of his date with the Federal Bureau of Prisons, Kennedy filed a counterclaim against Freedom for the value of his 45 percent ownership stake. That dispute resulted, strangely, in the company paying him \$800,000 in a settlement.

Nothing if not enterprising, Kennedy eventually struck a deal to get his prison sentence reduced. In exchange for his help with a drug investigation, federal prosecutors persuaded Judge Copenhaver to release Kennedy after only 22 months. An assistant U.S attorney named Monica Schwartz told the judge that Kennedy "was anxious to cooperate." Under the supervision of federal agents, he made "controlled buys" of cocaine that led to the convictions of two longtime business associates.

Freedom survived Kennedy's cooking the books, with Farrell replacing his college classmate as president. The compounds the company wholesales control road dust, keep coal from freezing, and help prepare the fuel for burning. One Freedom facility, a tank farm along the Elk River formerly used by Pennzoil (RDS/A) to store gasoline, has 17 huge steel vats capable of holding 35,000 gallons each. Known as the Etowah River Terminal, the tank farm "processes large volumes of chemicals rapidly and cost effectively," Freedom's website says. The riverside location allows the plant to do business by barge as well as truck.

Much of Freedom's commerce comes from distributing products made by larger companies, including a chemicals unit of Georgia-Pacific owned by billionaire brothers Charles and David Koch. In May 2008, Georgia-Pacific Chemicals announced that Freedom would serve as a distributor of its Talon mining reagents—compounds that reduce ash content and prevent the loss of combustible coal—in eight states: West Virginia, Virginia, Pennsylvania, Ohio, Maryland, Minnesota, Kentucky, and Michigan. (Four years later, Georgia-Pacific ended Freedom's distribution role, the manufacturer said in a written statement. Georgia-Pacific didn't explain the change and said the West Virginia company is "still a customer of ours.")

In 2009, Farrell told the *Charleston Daily Mail*, Freedom faced having to shut down its main Elk River location because silt buildup made it difficult for barges to travel from the terminal to the confluence with the Kanawha River. "At some point, we wouldn't have been economically fit to run the facility," Farrell said. "That's our claim to fame—the barges." The U.S. Army Corps of Engineers came to the rescue. With \$400,000 in federal stimulus money, the Army Corps dredged the Elk River and kept the Freedom plant viable.



Photograph by Paul Corbit Brown All 17 of the storage tanks operated by Freedom Industries on the Elk River will be scrapped following the leak that led to more than 30 hospitalizations, treatment for hundreds, and egg on the faces of state regulators. Since the spill, first indicated through reports of its odor by nearby residents at 8 a.m. on Jan. 9, the West Virginia Department of Environmental Protection has twice increased its estimate of the scale of the contamination, first from 5,000 gallons to 7,500 gallons and then to 10,000 gallons, as of Jan. 27

Freedom and a constellation of affiliated companies were dissolved and reformulated several times in the 2000s, state records show. The purpose of this paper shuffling wasn't disclosed. Freedom's operations along the Elk River did not receive much government oversight, according to records and local officials. The U.S. Environmental Protection Agency leaves regulation of such chemical facilities primarily to the states. West Virginia doesn't view that delegation of authority as reason to regulate aggressively, however. To the contrary, the state prides itself on being industry-friendly, and Governor Earl Ray Tomblin, a Democrat, routinely castigates what he calls federal overreaching. West Virginia doesn't require inspection of storage tanks containing potentially dangerous coal-processing chemicals, according to Larry Zuspan, who runs the local emergency planning committee in Charleston. What made the Freedom tank farm on the city's outskirts unusual, even for West Virginia, is that the regional utility operates the sole intake for the area's public water system only a mile and a half downriver.

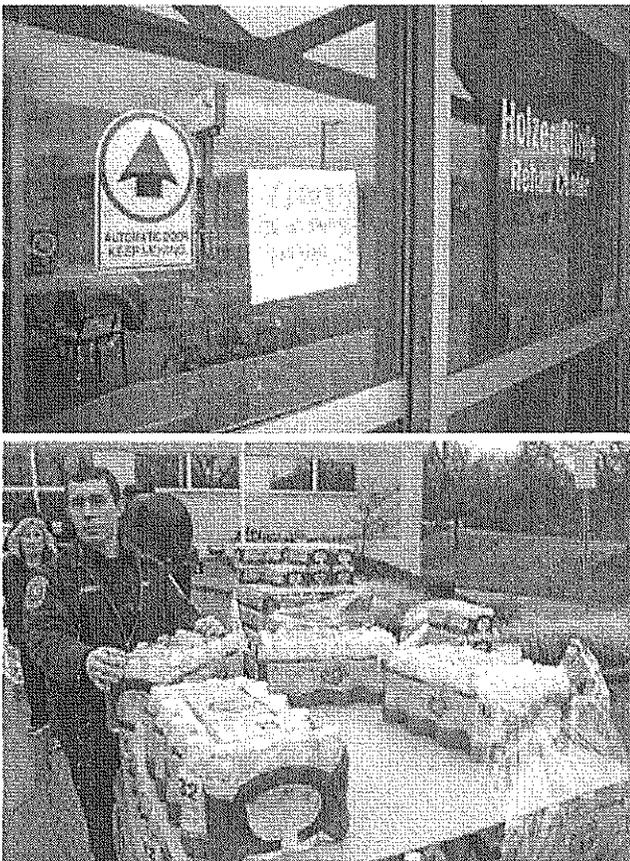
Also surprisingly close to the Freedom site is a cluster of working-class homes. From time to time over the years, Mayor Jones says, people have complained to state authorities about unpleasant odors wafting from the facility. State inspectors have looked around but never reported anything amiss, according to available records. In particular, they didn't notice that a concrete containment wall meant to prevent any tank leakage from reaching the river was visibly cracked, Jones says. Only after the Jan. 9 spill did Freedom disclose that sometime in 2013 it had set aside \$1 million to fix the wall and make other improvements; for reasons that haven't been clarified, the repairs hadn't started. On Jan. 25, Governor Tomblin's office announced that the state had approved

Freedom to shut down and dismantle the entire tank farm because all 17 tanks lack adequate containment walls to prevent leaks from spreading.

At some point recently, Forrest, the man in charge of Rosebud Mining in Kittanning, Pa., decided that Freedom Industries was worth owning. Named for the flower, not the enigmatic line from *Citizen Kane*, Rosebud calls itself “a great employer—and a great neighbor.” Forrest, a plainspoken executive, voted for Barack Obama in 2008 but then turned bitterly against the president because of what Forrest perceived as the White House’s hostility to coal. In an interview with Bloomberg TV in October 2012, he warned that if Obama was reelected, the industry might not survive.

Despite that grim assessment, Forrest last year went ahead with his acquisition of Freedom, which relies heavily on coal company clients for its \$30 million in annual revenue. On Dec. 6, Forrest, operating via Chemstream, agreed to pay \$20 million to Freedom’s three owners—Farrell and two other men. Then, on Dec. 31, Forrest merged Freedom with three smaller companies. Neither transaction received any publicity. Nine days later, the water supplies were shut down.

Residents began reporting a licorice-like smell coming from the Freedom tank farm a little after 8 a.m. on Jan. 9, a Thursday. State inspectors drove to the facility and by 11:15 a.m. located a 4-foot-wide stream of 4-methylcyclohexane methanol, or MCHM, seeping through the cracked containment wall and into the Elk River. By noon, the West Virginia unit of American Water Works (AWK), a large publicly traded utility company, had been informed of the contamination. The water company added carbon filters in an attempt to keep the MCHM out of its treatment plant but decided not to shut the intake.



Photographs by Michael Switzer/AP Photo; Lisa

Hechesky/Reuters By the time tap water was declared safe to drink again, four days after the spill, FEMA had

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trucked in more than 530,000 gallons of bottled water

Not until 12:05 p.m. did Freedom officials finally call a West Virginia hotline to report the leak—a step state officials say they were supposed to have taken immediately. By late afternoon, MCHM was found in tests of filtered water. Shortly before 6 p.m., Governor Tomblin announced a ban on water use for drinking, cooking, and bathing. President Obama declared a federal emergency the next morning, authorizing the National Guard to truck water into Charleston and eight surrounding counties.

Harmful if swallowed or inhaled, MCHM can cause skin irritation, nausea, and vomiting, according to the American Association of Poison Control Centers. Apart from that, relatively little is known about MCHM's effect on humans. It's one of the thousands of chemicals that weren't tested when they were grandfathered in for commercial use under the Toxic Substances Control Act of 1976, says Daniel Rosenberg, a senior attorney with the nonprofit Natural Resources Defense Council. More than 500 West Virginians have reported symptoms possibly related to exposure to MCHM. While more than 30 were admitted to hospitals, there haven't been any deaths or serious illnesses reported.

On Friday evening, Jan. 10, Southern, the man listed in state records as Freedom's president, called a press conference. (Confusingly, the company's website still says Farrell is the president.) No mention was made of the company's sale to Forrest. Southern, who has close-cropped white hair and a British accent, is affiliated with a number of companies in addition to Freedom, according to public records. These include Blackwater Consulting Group in Marco Island, the Florida resort where he lives; Ecodrill, also located in Marco Island; and HVC, a chemical company in Cincinnati.

At the press conference, Southern initially apologized. "This incident," he said, "is extremely unfortunate, unanticipated, and we are very, very sorry for the disruption of everyone's daily life." His explanation, however, was vague. He said Freedom employees became "aware" of a leak "around 10:30 a.m.," more than two hours after residents first complained of the licorice odor. He conceded that the company had "occasionally" had "reports of an odor previously," but he didn't elaborate on what preventive steps, if any, had been taken. "It has been an extremely long day," he continued, looking exasperated. "I would appreciate it if we could wrap this thing up." A local reporter interjected that it had "been an extremely long day for a lot of people" without water. Sipping from a plastic bottle of water, Southern answered several more queries before abruptly walking away.

Two days later, Charles Ryan Associates, a prominent Charleston public-relations firm, dropped Freedom as a client, refusing to explain why. A woman who answered my call to Freedom's corporate office said executives weren't available. She referred me to what she said was a public-relations firm; the Florida phone number connected to an answering machine where messages left over several days went unanswered.

In the hours after the spill, additional insight into the mood within Freedom came from Kathy Stover-Kennedy, Carl Kennedy's ex-wife. Now Farrell's girlfriend, Stover-Kennedy took to her Facebook page (since deleted) to defend her ex-husband's ex-partner. "I'm not asking for anyone's sympathy but a little empathy wouldn't hurt," she wrote. "And just so you know, the boys at the plant made and drank coffee this morning! I showered and brushed my teeth this morning and I am just fine!" Noting "criticism from many about how Freedom Industries is handling this," Stover-Kennedy continued: "Denny is not a spokesman and has no desire to be. His expertise was much needed elsewhere." She didn't respond to phone messages.

Meanwhile, Randy Huffman, cabinet secretary of West Virginia's Department of Environmental Protection, was also on the defensive. Since the spill, Huffman has tried to explain why his agency didn't show more skepticism

earlier about Freedom. One point he's stressed to journalists is that as far as state and federal chemical classifications go, MCHM isn't considered "hazardous." Freedom thus didn't need a special state permit to store the compound, he said. Records released in the wake of the spill show that West Virginia inspectors had visited the Elk River tank farm at least five times since 2001 but focused primarily on air quality.

One Year: 3,885 Spills

The West Virginia chemical spill might seem like a rare catastrophe, but this type of thing happens every day in the U.S., as these data and media reports make clear. —*Eric Chemi*

The 3,885 tally for 2013 is based solely on self-reports of accidents from 76 publicly traded American companies. Ten U.S. companies reported more than 100 spills each.

From 2001 to 2010, there were 992 oil and gas fluid spills in three Colorado counties alone.

In 2011, 1,374 facilities in the U.S. discharged approximately 194 million pounds of chemicals into streams, rivers, lakes, and oceans.

An analysis by CBS found more than 6,500 industrial accidents, fires, spills, and leaks in 2010— for an average of 18 a day.

DATA: BLOOMBERG ESG DATA TEAM

The company that made the MCHM, Eastman Chemical (EMN), based in Kingsport, Tenn., discloses in publicly available information that MCHM has a U.S. Occupational Safety and Health Administration rating of "hazardous." Rosenberg of the Natural Resources Defense Council explains that the apparent contradiction over MCHM's danger level isn't unusual. "We rely on manufacturers to test the vast majority of chemicals used in commerce," he says, "so there just isn't much consistency or certainty."

Within 24 hours of the announcement of the contamination, plaintiffs' attorneys were heading to Charleston's state and federal courthouses to sue Freedom, West Virginia-American Water, and Eastman. More than two dozen suits have been filed so far, some seeking class-action status. All three companies have denied wrongdoing. Although she forcefully rejected the accusation that Eastman failed to provide adequate warnings about MCHM, a company spokeswoman pointedly told me the manufacturer couldn't vouch for the conduct of Freedom or the water utility.

On Jan. 17, Freedom filed for Chapter 11 protection. That had the effect of freezing the liability suits against the company while U.S. Bankruptcy Judge Ronald Pearson sorts out creditors' claims. During a preliminary hearing on Jan. 21, Pearson called the situation "one of the most unusual Chapter 11 cases I've seen."

Freedom's bankruptcy attorneys, led by Mark Freedlander of the Pittsburgh office of McGuireWoods, immediately floated a theory designed to ease Freedom's liability. "It is presently hypothesized," they wrote in one filing, "that a local water line break [caused] the ground beneath a storage tank at the Charleston facility to freeze in the extraordinary frigid temperatures in the days immediately preceding" what Freedlander delicately termed "the incident." He further hypothesized that "the hole in the affected storage tank" was caused by "an object piercing upwards through the base" of the tank.

The implication is that water expanded as it froze, pushing the mystery "object" up through the floor of the tank. It's difficult to say whether the court will buy this explanation. Certainly plaintiffs' attorneys are going to argue

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that steel tanks containing dangerous chemicals ought to be able to withstand winter weather.

Testifying at the preliminary hearing, Southern continued in the obtuse vein of his prior appearance. “The unfortunate incident of the 9th, which resulted in material leaving the facility,” he said, “caused an otherwise profitable and successful company to endure the tragedy of consequence relating to that which we’ve dealt with since the 9th.” A company lawyer hastened to clarify that Southern, who said he’d worked in the chemicals industry for 30 years, didn’t mean to imply that Freedom had been negligent. “Absolutely not. No sir,” Southern said.

Mayor Jones wasn’t impressed. “I don’t think any of these people at the company seems honest,” he says. And he worries that Charleston’s woe isn’t over. Many residents, he says, are still scared to drink from the tap. The U.S. Centers for Disease Control and Prevention in Atlanta has warned pregnant women that they ought to play it safe and stick to bottled water.

In response to orders from state officials, Freedom moved its MCHM supply from the Elk River facility to its location in Nitro. After the MCHM had been transferred, though, state environmental authorities cited the Nitro operation for five fresh violations. The most urgent related to the absence of a secondary containment wall—an ominous reminder of the apparent failure of the aging cement wall on the Elk River. “Given what we’ve been through, it would be very hard for me to convince anybody that there’s not something to be nervous about,” Huffman, the state environmental chief, told reporters. Freedom is now looking for another place to store the chemical.



Barrett, an assistant managing editor and senior writer at *Bloomberg Businessweek*, is working on a book about the Chevron oil pollution case in Ecuador, which is scheduled for publication by Crown in 2014. His most recent book is *GLOCK: The Rise of America’s Gun*.

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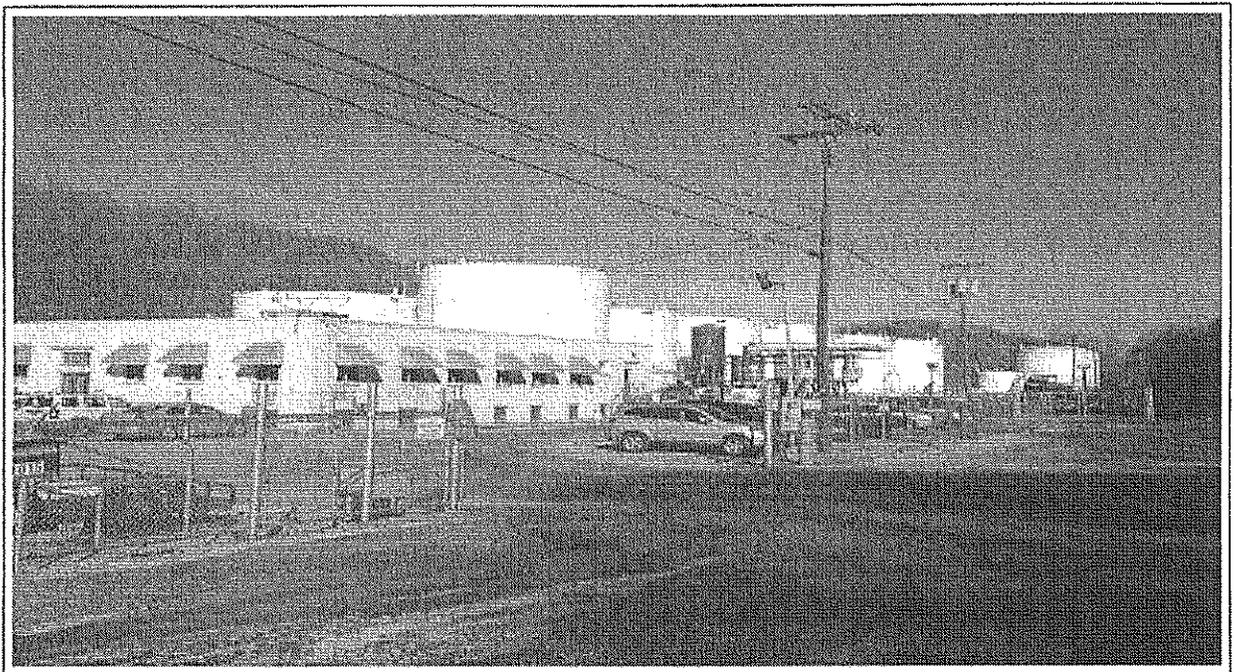


(<http://www.wsaz.com>)

W.Va. Gov. Issues State of Emergency for 9 Counties, Water Ban for 100,000+

By: Anna Baxter (<http://www.wsaz.com/station/bios/news/235456481.html>) - Email (<mailto:anna.baxter@wsaz.com>)

Posted: Fri 11:32 AM, Jan 10, 2014



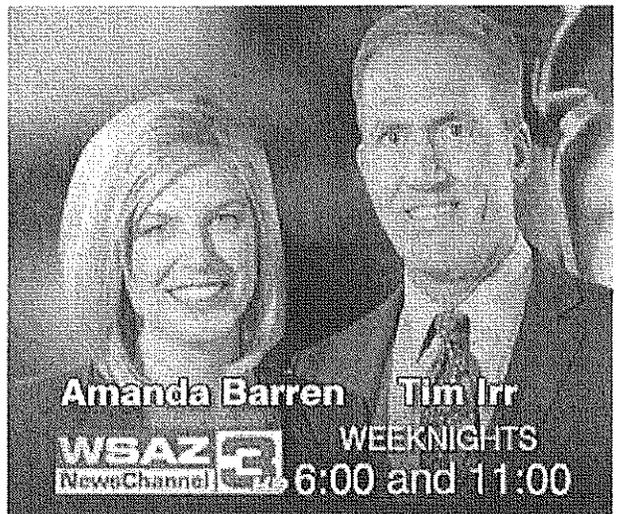
UPDATE 1/10/14 @ 7:45 a.m.

CHARLESTON, W.Va. (WSAZ) -- West Virginia American Water hopes a test Friday morning will give them a better idea about the situation following a chemical leak in Charleston.

Governor Earl Ray Tomblin declared a state of emergency Thursday after a chemical leak in Charleston. This included a water ban for West Virginia American Water customers in nine counties.

A spokesperson with West Virginia American Water tells WSAZ.com at 8 a.m. the Corp of Engineers and Dupont will conduct tests at the same time to to see if each test gets the same results. The water company hopes this test will give a better look at the water standards.

WVAW has also been working with a chemist from DuPont and Laura Jordan says he's found that the chemical is leaking at ground level.



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Jordan says there is a possibility this leak has been going on for sometime before it was discovered Thursday.

A spokesperson with Freedom Industries tells WSAZ.com the company will release a statement at 10:30 a.m.

Keep clicking on WSAZ.com for the latest information.

UPDATE 1/10/14 @ 6:30 a.m.

CHARLESTON, W.Va. (WSAZ) -- Thousands of West Virginia American Water customers are still asked not to use their water unless its for sanitation reasons.

Governor Earl Ray Tomblin declared a state of emergency Thursday after a chemical leak in Charleston. This included a water ban for West Virginia American Water customers in nine counties.

A spokesperson with West Virginia American Water tells WSAZ.com they are conducting water quality testing every hour to figure out the level of concentration in the water.

The samples have been sent to a ~~State~~ plant in Huntington for testing.

So far there has been no conclusive results. The water company also doesn't know how much of the chemical got in the water.

Laura Jordan says there is no way to treat the water. The company still doesn't have a timetable for when the water will be safe to use.

Jordan says this is isolated and the chemical shouldn't move to other areas.

Meanwhile, emergency responders are expected to meet about 6 a.m. Friday to discuss the situation and come up with a plan to distribute water to affected customers.

Governor Earl Ray Tomblin announced early Friday morning that the White House has approved a federal emergency declaration to assist with the emergency water situation in nine West Virginia counties.

The state of emergency includes West Virginia American Water customers in Kanawha, Cabell, Boone, Putnam, Lincoln, Logan, Clay, Roane and Jackson counties.

West Virginia American Water says Culloden water customers are the only ones affected by the water ban. No other Cabell County customers are affected.

West Virginia American Water says customers on Queen Shoals PSD, Lincoln PSD, City of Culloden PSD and Reamer Hill are also impacted by the advisory.

A spokesperson with Freedom Industries tells WSAZ.com the company will release a statement at 10:30 a.m.

Keep clicking on WSAZ.com for the latest information.

UPDATE 1/10/14 @ 4:15 a.m

CHARLESTON, W.Va. (WSAZ) -- Governor Earl Ray Tomblin announced early Friday morning that the White House has approved a federal emergency declaration to assist with the emergency water situation in

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Governor Tomblin declared a state of emergency Thursday evening after a chemical leak in Charleston. The state of emergency includes West Virginia American Water customers in Kanawha, Cabell, Boone, Putnam, Lincoln, Logan, Clay, Roane and Jackson counties.

West Virginia American Water says Culloden water customers are the only ones affected by the water ban. No other Cabell County customers are affected.

West Virginia American Water says customers on Queen Shoals PSD, Lincoln PSD, City of Culloden PSD and Reamer Hill are also impacted by the advisory.

Logan County 911 Director Marilyn Triplett Crosby says, "There is only a small area in Logan County affected by the water issue also....just a few communities that border Boone County and get their water from Boone County. They are Sharples, Clothier, Coal Valley, Mifflin, Dobra, and Monclo. Marilyn Crosby Logan County 911 Director"

WVAW customers are told not to use tap water for drinking, cooking, washing, or bathing. You can use the water for toilets and fire emergencies. Boiling water will not get rid of the chemical.

This is believed to impact 100,000 customers.

"Right now, our priorities are our hospitals, nursing homes, and schools. I've been working with our National Guard and Office of Emergency Services in an effort to provide water and supplies through the county emergency services offices as quickly as possible," Gov. Earl Ray Tomblin said.

The Kanawha Charleston Health Department, which covers Kanawha and Putnam counties tells WSAZ.com all permit holders in both counties, including daycares, universities, restaurants, and schools need to shut down.

Julie Miller with the Boone County Health Department says restaurants are also closing in the county.

West Virginia DHHR says symptoms include: severe burning in throat, severe eye irritation, non-stop vomiting, trouble breathing or severe skin irritation such as skin blistering.

Homeland Security says if you feel sick, seek medical attention at a local hospital or call poison control hotline at 1-800-222-1222. You can also call the Emergency Operations Center at 304-746-8828.

According to a news release, the leak happened at Freedom Industries in Charleston. The leaked product is 4-Methylcyclohexane Methanol, which is used in the froth flotation process of coal washing and preparation.

The chemical is believed to have leaked into the Elk River.

West Virginia American Water believes the material is hazardous, but is not lethal in it's current form.

FEMA has been contacted to bring clean water into the area.

There is no estimated time when this will be repaired, according to Gov. Earl Ray Tomblin. The State of Emergency will be in place until Department of Health and Human Resources, Department of Environmental Protection and West Virginia American Water determine the water is safe.

They say customers with St. Albans, Cedar Grove Water, Town of West Hamlin Water, Branchland-Midkiff PSD, Putnam PSD, and Logan County PSD are not affected by this leak.

Putnam PSD is asking customers to consider filling bottle or 2 for friends & family living in the area covered by Do Not Use warning.

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The West Hamlin Volunteer Fire Department has water available for WVAW customers in Lincoln County.

Dr. Michael Castellani with Marshall University tells WSAZ.com the chemical is colorless and there is a faint odor.

Dr. Castellani says if you bath with contaminated water, it will irritate your skin.

He tells WSAZ.com it is also a respiratory irritant if you inhale it.

If you drink the water, Dr. Castenalli says it may have a gas taste.

Lawrence Messina, Communications Director for the Department of Military Affairs and Public Safety says WV Legislature will convene Friday, but with skeleton staff. Messina says the legislative manager has advised all other staff to stay home.

We have several crews on the scene.

Keep clicking on WSAZ.com for the latest on this story.

UPDATE 1/9/14 @ 9:35 p.m.

CHARLESTON, W.Va. (WSAZ) -- West Virginia Governor Earl Ray Tomblin has issued a state of emergency for nine counties after a chemical leak in Kanawha County Thursday morning.

The state of emergency includes West Virginia American Water customers in Kanawha, Cabell, Boone, Putnam, Lincoln, Logan, Clay, Roane and Jackson counties.

West Virginia American Water says Culloden water customers are the only ones affected by the water ban. No other Cabell County customers are affected.

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The chemical is believed to have leaked into the Elk River.

West Virginia American Water believes the material is hazardous, but is not lethal in it's current form.

FEMA has been contacted to bring clean water into the area.

Officials describe the smell as something similar to liquorice.

There is no estimated time when this will be repaired, according to Gov. Earl Ray Tomblin. The State of Emergency will be in place until Department of Health and Human Resources, Department of Environmental Protection and West Virginia American Water determine the water is safe.

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Keep clicking on WSAZ.com for the latest on this story.

UPDATE 1/9/14 @ 5:45 p.m.

CHARLESTON, W.Va. (WSAZ) -- West Virginia Governor Earl Ray Tomblin is warning residents of possible water contamination after a leak at Freedom Industries in Charleston Thursday morning.

Gov. Tomblin says residents in Boone, Lincoln, Kanawha, Jackson and Putnam counties should not use tap water for drinking, cooking, washing, or bathing. You can use the water for toilets and fire emergencies. Boiling water will not get rid of the chemical.

The Kanawha County Department of Homeland Security and Emergency Management says this impacts residents who have West Virginia American Water.

According to a news release, the leaked product is 4-Methylcyclohexane Methanol, which is used in the froth flotation process of coal washing and preparation.

West Virginia American Water believes the material is hazardous, but is not lethal in it's current form.

They say water from St. Albans or Cedar Grove Water is not affected by this leak.

An emergency press conference is scheduled for 5:45 p.m.

We have a crew on the scene.

Keep clicking on WSAZ.com for the latest on this story.

UPDATE 1/9/14 @ 2:15 p.m.

CHARLESTON, W.Va. (WSAZ) -- The Department of Environment Protection is monitoring a leak at a business in Charleston that produced a strong smell in the Kanawha Valley.

C.W. Sigman, Kanawha County Emergency Manager, tells WSAZ.com Freedom Industries on Barlow Drive had a tank leak.

According to a news release, the leaked product is 4-Methylcyclohexane Methanol, which is used in the froth flotation process of coal washing and preparation. The product initially leaked into a containment area, the product then leaked from the containment area into the Elk river. Sigman says the leak has produced a smell described as something similar to liquorice.

Sigman says there is no way to get it out of the water. There is some concern the product could get into the water intake, according to Sigman. Crews are monitoring the situation.

Right now, the DEP continues to work to clean the affected areas.

At this point, it's unclear how much of the product leaked. However, the product safety data sheet does not indicate a toxic level for inhalation. Sigman says the product is dangerous to ingest.

A shelter in place has not been advised, but if people who live in the area would happen to show signs of nausea they are advised to go indoors.

West Virginia American Water says the water quality and water treatment teams are closely monitoring the chemical spill on the Elk River near the Kanawha Valley Water Treatment Plant.

They say water quality experts advise that the incident does not present a health risk to customers. Contaminants that reach the plant's intake site are removed from the water through the plant's multifaceted treatment process, which includes filtration through advanced Granular Activated Carbon filters.

They say water quality experts will continue to monitor the situation closely and remain in direct contact with the WV Department of Environmental Protection and the chemical supplier.

Keep clicking on WSAZ.com for the latest information.

UPDATE 1/9/14 @ 11:20 a.m.

CHARLESTON, W.Va. (WSAZ) -- A strong smell in the Kanawha Valley appears to be coming from a business in Charleston.

C.W. Sigman, Kanawha County Emergency Manager, tells WSAZ.com an odor is coming from a company called Freedom Industries on Barlow Drive.

The smell is from a product called crude, which is used in the coal prep process. Sigman describes the smell as something similar to liquorice.

The West Virginia Department of Environmental Protection is on the scene trying to resolve the odor.

Air quality crews are out in the county monitoring how much of the substance is in the air. No other details are being released at this time.

The smell was reported about 10 a.m. and seemed to be concentrated in the areas of Garrison Avenue and the Elk River area near the I-77/I-64 split.

The county has had similar incidents in St. Albans and Chesapeake in the past year. None of the incidents are related.

Firefighters from Charleston and Sissonville helped in Thursday's investigation.

WSAZ.com has contacted the company, but our calls were not returned before publication.

We have a crew at the scene. Keep clicking on WSAZ.com for the latest information.

ORIGINAL STORY 1 9/14 @ 10:45 a.m.

CHARLESTON, W.Va. (WSAZ) -- Emergency crews are investigating a strong smell in the Kanawha Valley.

C.W. Sigman, Kanawha County Emergency Manager, tells WSAZ.com the smell seems to be concentrated in the areas of Garrison Avenue and the Elk River area near the I-77/I-64 split.

Sigman describes the smell as something similar to liquorice. The smell was reported about 10 a.m. Thursday.

Right now, firefighters in Charleston and Sissonville are out trying to locate where the smell is coming from.

We have a crew on the scene.

Keep clicking on WSAZ.com for the latest information.

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Developing

6:02 PM THU JANUARY 9, 2014

State of Emergency, Water Advisory Issued for 9 West Virginia Counties

By [DAVE MISTICH](#) ([PEOPLE/DAVE-MISTICH](#)), [ASHTON MARRA](#) ([PEOPLE/ASHTON-MARRA](#)) AND [ASSOCIATED PRESS](#) ([PEOPLE/ASSOCIATED-PRESS](#))

Governor Earl Ray Tomblin has issued a state of emergency and West Virginia American Water is telling more than 100,000 customers (about 300,000 people) in Boone, Cabell, Clay, Jackson, Kanawha, Lincoln, Logan, Putnam, and Roane counties **NOT to ingest, cook, bathe, wash or boil water.** Water in



WEST VIRGINIA
AMERICAN WATER

this coverage area is okayed **ONLY** for [flushing and fire protection](http://mediad.publicbroadcasting.net/wv/pn/files/201401/wvamwater.jpg). The [advisory comes as a result of a chemical spill of 4-Methylcyclohexane Methanol](http://mediad.publicbroadcasting.net/wv/pn/files/201401/wvamwater.jpg) [from Freedom Industries, Inc.](http://mediad.publicbroadcasting.net/wv/pn/files/201401/MSDS-MCHM_1140109214955.pdf)

Various water distribution centers and filling stations are beginning to open in the areas affected by the water advisory/state of emergency. For a the most up-to-date list available, [please refer to this list](https://chartheat.com/dashboard?url=wvpublic.org#page:;path=wvpublic.org/post/where-find-water-list-distribution-centers) (<https://chartheat.com/dashboard?url=wvpublic.org#page:;path=wvpublic.org/post/where-find-water-list-distribution-centers>)

Updated: Monday, January 13 at 7:55 a.m.:

At a Sunday afternoon press conference Governor Tomblin said there is "[light at the end of the tunnel](http://wvpublic.org/post/audio-tomblins-sunday-briefing-water-company-establish-website-clearing-zones)" as he was joined by other state officials and West Virginia American Water President Jeff McIntyre. McIntyre indicated that water will be returned soon to those affected and testing of water samples were headed in the right direction. The company is setting up a website and automated phone calls to let residents know when their designated zone is approved for the flushing process.

Some restaurants, bars, and other businesses have also [been allowed to begin reopening](http://wvpublic.org/post/end-outage-may-be-sight-water-customers-businesses) after applying for conditional approval through the Kanawha-Charleston Health Department.

Updated: Sunday, January 12 at 5:00 a.m.:

At a press conference Saturday night, Col. Greg Grant of the National Guard said the amount of chemical present is trending downward with each test, but must be consistently below 1 part per million for a 24 hour period before West Virginia American Water can begin to flush their piping system.

"What we're looking at is a broad spectrum of data that gives us a composite look at

this water over a period of time to make sure it's safe," he said at a press conference Saturday night, "and those data points are showing that we are moving in the right direction."

Grant said his teams would collect more than 100 samples overnight from the treatment plant and throughout the system to increase the data set and give them more accurate information.

"These individual samples are like a puzzle piece. We have a bunch of puzzle pieces, but we don't have the picture yet," added West Virginia American Water President Jeff McIntyre.

An outside contractor has been hired to help expedite the testing process of these samples, a process they've narrowed down from 46 to 18 minutes.

McIntyre said it will still likely take days to flush the system even if they have the proper data set Sunday, but customers should not start flushing their own plumbing now.

Updated: Friday, January 10, 2014 at 5:45 a.m.:

Reporters around the Kanawha Valley say West Virginia American Water continues to test the water for safety reasons. Still no conclusive results.



Courtney Khondabi

@CourtneyKhondabi

Follow

From @wvamwater spokesperson: still NO timeline on when water will be safe.



Anna Baxter

@AnnaBaxter1

Follow

West Virginia American Water is still conducting water quality tests every hour. So far no conclusive results.
bit.ly/KJo5YQ #wsaz

Updated: Friday, January 10, 2014 at 5:29 a.m.:

After consulting experts in the field of toxicology, West Virginia Department of Agriculture state veterinarian Dr. Jewell Plumley said late Thursday evening that at this time there are no known associated risks to livestock that may have been exposed to potentially contaminated water from a chemical leak that impacted the West Virginia American Water plant in Charleston.

Updated: Friday, January 10, 2014 at 5:02 a.m.:

The Associated Press reports (<http://bigstory.ap.org/article/wva-gov-declares-emergency-after-chem-spill>) that the effects of the chemical spill are far-reaching around the Kanawha Valley and surrounding areas. Restaurants are closed, children are staying home from school and state lawmakers have suspended their just-begun session.

Officials say they're still trying to determine the extent of any possible contamination from the spill.

Updated: Friday, January 10, 2014 at 12:50 a.m.:



Governor Tomblin

Follow

UPDATE: White House has approved my request for federal emergency declaration to assist w/situation in affected areas.

Through a news release, the Kanawha County Department of Homeland Security and Emergency Management announced they are working with State Emergency Officials to obtain water for public distribution:

"Officials will continue to work to obtain the water throughout tonight. Emergency Officials will meet at 6:00 a.m. to assess the amount of water that has been received or is being received and will then release information as to the location of the distribution centers for the public."

Updated: Thursday, January 9, 2014 at 10:55 p.m.:

The West Virginia National Guard just confirmed that two drinking water distribution centers are now open.

They are:

- Lincoln Co. 911 Call Center (bring your own container)
- Boone Co. at 1267 Smoot Ave. in Danville.

Updated: Thursday, January 9, 2014 at 9:34 p.m.:

Gov. Tomblin has expanded the state of emergency to 9 counties. They are the following:



Governor Tomblin

Follow

SOE declared in Boone, Cabell, Clay, Jackson, Kanawha, Lincoln, Logan, Putnam, and Roane counties.
bit.ly/1iXaFX7

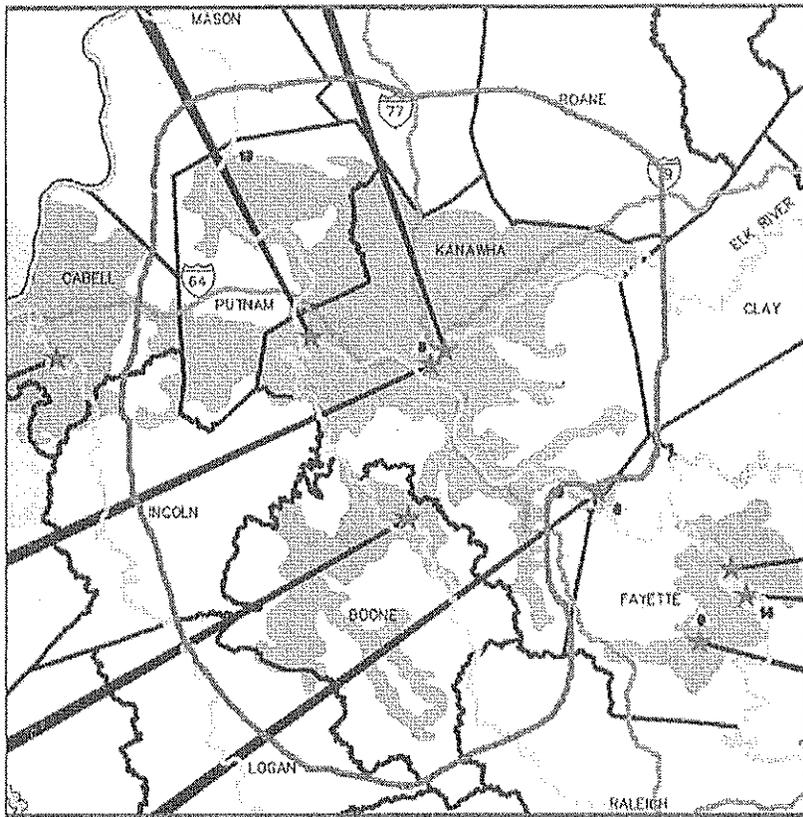
Tomblin also noted in a news release that residents served by Lincoln PSD, Queen Shoals PSD, Reamer PSD, City of Culloden PSD, and City of Hurricane PSD are also affected by the advisory.

"West Virginians in the affected service areas are urged NOT to use tap water for drinking, cooking, washing or bathing," Gov. Tomblin said.

"Right now, our priorities are our hospitals, nursing homes, and schools. I've been working with our National Guard and Office of Emergency Services in an effort to provide water and supplies through the county emergency services offices as quickly as possible."

Updated: Thursday, January 9, 2014 at 9:02 p.m.:

West Virginia American Water has released the following map to illustrate the areas affected by the water advisory. The areas shaded blue inside the red circle are currently under the advisory.



Updated: Thursday, January 9, 2014 at 8:23 p.m.:

West Virginia American Water now says Culloden in Cabell County has been added to the list of areas affected by the DO NOT USE water advisory.



Cabell County 911

Follow

Just received notification from West Virginia American Water that Culloden is affected by the Water Emergency. Please share with others.

Updated: Thursday, January 9, 2014 at 8:03 p.m.:

West Virginia Department of Health and Human Resources Cabinet Secretary Karon L. Bowling has clarified that if residents have consumed the water late this afternoon and are experiencing severe symptoms to contact the poison center at [1-800-222-1222](tel:1-800-222-1222) (<tel:1-800-222-1222>).

Severe symptoms include: severe burning in throat, severe eye irritation, non-stop vomiting, trouble breathing or severe skin irritation such as skin blistering.

Updated: Thursday, January 9, 2014 at 7:55 p.m.:

West Virginia American Water has expanded the areas affected by the water advisory to Logan, Roane, and Clay counties. (<https://www.facebook.com/wv.am.water>)

Updated: Thursday, January 9, 2014 at 7:40 p.m.:

Larry Messina of the Department of Military Affairs and Public Safety says fresh drinking water will be distributed to county emergency services offices and then

distributed to the public from there.

Updated: Thursday, January 9, 2014 at 6:15 p.m.:

The Associated Press reports that Governor Tomblin has issued a state of emergency for all 5 counties effected by chemical spill into the Elk River.

West Virginia American Water released the following statement at 6:20 p.m. Thursday, January 9.

PUBLIC HEALTH NOTICE:

CUSTOMERS IN THE KANAWHA VALLEY WATER SYSTEM are instructed to DO NOT USE THEIR TAP WATER UNTIL FURTHER NOTICE.

Today, a chemical spill occurred along the Elk River, causing contamination in the Kanawha Valley water system. The entire Kanawha Valley water system is affected, including parts of Kanawha, Boone, Putnam, Jackson, Lincoln and Clay counties. There is a probability that your water is contaminated. Testing has not occurred to confirm or deny the presence of contamination in your water.

DO NOT USE THE WATER.

Due to the nature of the contamination, it is not safe to use the water for any purpose. Alternative sources of water should be used for all purposes. Bottled water or water from another, safe source should be used for drinking, making ice, brushing teeth, washing dishes, bathing, food and baby formula preparation and all other purposes until further notice.

Original story posted Thursday, January 9, 2014 at 6:02 p.m.:

Gov. Tomblin is making announcements via his official twitter account:



Governor Tomblin

Follow

EMERGENCY: Do NOT use tap water for drinking, cooking, washing or bathing in Boone, Lincoln, Kanawha, Jackson, Putnam counties.

Through a news release, the Kanawha County Commission Emergency Management says a product leak

(<https://www.dropbox.com/s/i8rsw5n2cgvxhwt/Freedom%20Industries.docx>) of 4-

Methylcyclohexane Methanol at Freedom Industries on Barlow Dr. is responsible for the contamination of the local water supply.

Local health department officials are urging restaurants and bars to close immediately:



Charleston Gazette

Follow

BREAKING: Head of Kanawha health dept. says ALL restaurants/bars in Kanawha and Putnam should shut down NOW because of water contamination.

Bottled water at local grocery stores was flying off the shelves almost as soon as the advisory was announced. Here's a photo from the Foodland on Spring St. in

Charleston:



VasilisaSD

Follow

@wvamwater has been tainted by a chemical leak. Joy. I thought I was getting a head start on stocking up. Nope.

Feb 5, 2014

By 6:45 other retailers were out of water, too:



Lori Kersey

Follow

No more water at the East end Rite Aid.

Feb 5, 2014

A repost of...

TAGS: [Government \(/term/government/\)](#) [West Virginia American Water \(/term/west-virginia-american-water/\)](#) [Advisory \(/term/advisory/\)](#) [Emergency \(/term/emergency/\)](#) [Chemical leak \(/term/chemical-leak/\)](#)

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Water Advisory
[Where to Find Water: A List of Distribution Centers](#)
[#post-where-find-water-list-distribution-centers](#)



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State of Emergency

02-04-14 @ 1:45PM

WATER DISTRIBUTION POINTS

| Name | County | Address | Phone | Hours | Notes |
|------------------------------------|---------|---------------------------------|----------------|-----------|--------------------------------------|
| Boone Co. Maintenance Garage | Boone | 35 Ave B, Madison | (304) 369-0285 | 0700-1430 | Bottled |
| Madison VFD | Boone | 1 Firehouse Square | (304) 369-1021 | 0700-1800 | Bottled |
| Culloden VFD | Cabell | 2102 3rd St. | (304) 743-5391 | Noon-2000 | Bottled/Bring Containers |
| Milton Water Plant | Cabell | 339 E Main St, Milton | (304) 743-3821 | 0800-1600 | Bring Containers |
| Old DDH Garage | Clay | Intersection of Rt 4 and 16 | (304) 587-4539 | | Bottled |
| Big Sandy Parking Lot-Cross Lanes | Kanawha | 110 Lakeview Drive | (304) 357-0966 | 24hrs | Bring Containers |
| Crossings Mall-Elkview | Kanawha | 223 Crossings Mall Road | (304) 965-7390 | 24hrs | Bring Containers |
| Nitro Public Works | Kanawha | 194 Republic Way, Nitro | (304) 755-0704 | 0700-1900 | Bring Containers |
| Nitro PD | Kanawha | Nitro | (304) 755-1437 | 10:00 | Bottled Only |
| Walmart - Quincy | Kanawha | 1001 Warrior Way | (304) 220-3001 | 24hrs | Bring Containers |
| St Albans Municipal Water | Kanawha | 1006 5 B Street | (304) 727-6757 | 0600-1600 | Bring Containers |
| St Albans FD | Kanawha | Walnut St | (304) 727-2252 | 24hrs | Bring Containers |
| Shawnee Park | Kanawha | Institute | (304) 357-0966 | 24hrs | Bring Containers |
| Sharples VFD | Logan | 18843 Spruce River Rd | (304) 369-2630 | 24hrs | Bottled |
| Captain D's in Teays Valley | Putnam | 4150 State Rt 34 | (304) 757-8144 | 1030-2200 | Bring Containers |
| Bancroft Fire Dept | Putnam | Bancroft | (304) 586-9665 | 4p-8p | Bottled |
| Poca VFD | Putnam | Main Street, Poca | (304) 755-5061 | 4p-8p | Bottled |
| Route 34 Vol Fire Dept (Grandview) | Putnam | Route 34, Red House | (304) 586-9938 | 6p-8p | Bottled/Bring Containers |
| Church of Nazarene | Putnam | 2325 U.S. 60 | (304) 757-8400 | 24hrs | Bring Containers |
| Good Shepherd Baptist Church | Putnam | Tiger Lane Scott Depot | (304) 757-7621 | 24hrs | Bring Containers |
| Hurricane FD | Putnam | 2716 Main St. | (304) 562-5663 | 10a-8p | Bottled |
| John Henson Center | Putnam | Hurricane | (304) 562-9451 | 0800-1400 | Bring Containers |
| Old Buffalo High School | Putnam | 3317 Buffalo Road Buffalo | (304) 937-2661 | 24hrs | Bottled/Bring Containers |
| Putnam County PSD | Putnam | 107 Poplar Fork Rd, Scott Depot | (304) 757-6551 | 24hrs | Bring Containers |
| Tri-County YMCA | Putnam | 200 Carls Lane | (304) 757-0016 | 0530-2100 | (Showers available) Bring Containers |
| VFW 9097 | Putnam | Hurricane | (304) 757-9766 | 24hrs | Bottled |
| Winfield Courthouse | Putnam | #6 Courthouse Drive | (304) 586-0246 | 10a-8p | Bottled |

02-02-14

WEST VIRGINIA SCHOOLS RECEIVING GOOD NEWS AFTER A SECOND SET OF FLUSHING WATER SYSTEMS

CHARLESTON, W.Va. - The West Virginia Department of Education (WVDE) learned that after re-flushing five schools have achieved a non-detect level of MCHM in their water systems. These five schools join the nearly 100 schools where testing has resulted in non-detect readings at the more rigorous screening limit.

The West Virginia National Guard, last week, began a round of testing on public and private schools. Six schools were highlighted by the round of testing. The six schools in Kanawha, Lincoln, Clay and Putnam counties were well below the U.S. Centers for Disease Control's (CDC) recommended level, but were not yet at the more rigorous screening level that the state's interagency team was directed to achieve by Gov. Earl Ray Tomblin beyond the CDC guidelines.

The five schools that were re-flushed and re-tested over the weekend and now fall below both the CDC recommendation and Gov. Earl Ray Tomblin's directive are:

Kanawha County

George Washington High School
John Adams Middle School
Andrew Heights Elementary School

Putnam County

Buffalo High School

Clay County

H.E. White Elementary

The WVDE is awaiting another set of results for Lincoln County High School.

"I hope these latest results provided by the National Guard will help assure parents, students and teachers that our schools are safe," said West Virginia Superintendent of Schools Jim Phares. "The results that are in for the impacted schools meet all standards. As always, student learning and student safety are priorities and I must commend our local superintendents for their quick and diligent work with health officials and the National Guard."

This second round of flushing took place to achieve a non-detect level below 10 parts per billion, which is 100 times more rigorous than the 1 part per million screening level provided by the CDC for protecting public health. Governor Earl Ray Tomblin directed the National Guard to test public and private schools to confirm the water meets this more rigorous standard to provide an additional level of assurance. The more rigorous standards are also approved by the CDC for pregnant women.

During the current water crisis, county school systems have partnered with their respective health departments, the West Virginia Bureau of Public Health and the National Guard to make sure each of their schools met the safe criteria for water consumption.

01-31-14 @ 5:15PM

THREE WEST VIRGINIA COUNTY SCHOOL SYSTEMS CONTINUE RESPONSE TO WATER CRISIS

CHARLESTON, W.Va. The West Virginia Department of Education (WVDE) is working closely with county school systems to ensure student safety. The WVDE was made aware that five state public schools located in three West Virginia counties will undergo another round of flushing following water tests conducted by the West Virginia National Guard.

"It is important for students, parents and educators to understand that the five schools highlighted by the most recent round of testing were well below the U.S. Centers for Disease Control's (CDC) recommended level, but were not yet at the more stringent screening level that the interagency team was directed to achieve beyond the CDC guidelines," said West Virginia Superintendent of Schools Jim Phares.

Kanawha County

George Washington High School
John Adams Middle School
Andrew Heights Elementary School

Putnam County

Buffalo High School

Lincoln County

Lincoln County High School

This second round of flushing is to achieve a non-detect level, below 10 parts per billion, which is 100 times more rigorous than the 1 part per million screening level provided by the CDC for protecting public health. Governor Earl Ray Tomblin directed the National Guard to test public and private schools to confirm the water meets this more rigorous standard to provide an additional level of assurance.

During the current water crisis, county school systems have partnered with their respective health departments, the West Virginia Bureau of Public Health and the National Guard to make sure each of their schools met the safe criteria for water consumption. Hand sanitizer, bottled water and food preparation with bottled water will continue to be used in impacted county schools until the schools have been cleared below 10 parts per billion.

Kanawha, Putnam and Lincoln County School Systems will re-flush the five county schools once again following the proper protocol and guidelines for flushing to achieve a level below the 10 parts per billion. Additional water samples will be taken to ensure water quality at the identified schools. As additional results come in from the remaining facilities, county school systems will communicate with parents and the public.

For more information contact Liza Cordeiro in the WVDE Communication Office at (304) 558-2699.

01-30-14 @ 6:39PM

GOVERNOR TOMBLIN ANNOUNCES U.S. SBA ECONOMIC INJURY DISASTER LOANS AVAILABLE

Loans to help small businesses and eligible private, nonprofit organizations in the areas affected by the Elk River chemical spill

CHARLESTON, W.Va. - Gov. Earl Ray Tomblin today announced the U.S. Small Business Administration (SBA) granted his request for an Economic Injury Disaster Loan declaration. The declaration makes low-interest loans available for small businesses and nonprofit organizations affected by the chemical spill that forced a curtailment of water service beginning January 9, 2014 and continuing until January 17, 2014.

"I'm grateful for the SBA's quick response to my request for assistance to help the businesses and nonprofit organizations whose operations were disrupted as a result of West Virginia American Water Company's DO NOT USE order," Gov. Tomblin said.

Businesses and nonprofit organizations located in Boone, Kanawha, and Putnam counties as well as Cabell, Clay, Fayette, Jackson, Lincoln, Logan, Mason, Nicholas, Raleigh, Roane, and Wyoming counties may apply for the U.S. SBA economic injury disaster loans. Loan amounts and terms are set by the SBA.

APP 000185

based on each applicant's financial condition.

Applicants may apply online using the Electronic Loan Application provided on the SBA's website: <https://disasterloan.sba.gov/ela>. Disaster loan information and application forms can also be obtained by calling the SBA's Customer Service Center at 800-659-2955 (800-877-8339 for the deaf and hard-of-hearing).

01-30-14 @ 6:26PM GOVERNOR TOMBLIN ASKS WVAW TO MAKE POTABLE AND BOTTLED WATER AVAILABLE IN AFFECTED AREAS

AUDIO

CHARLESTON, W.Va. – Gov. Earl Ray Tomblin today asked West Virginia American Water President Jeff McIntyre to provide potable and bottled water to West Virginians in the areas affected by the January 9 Elk River chemical spill.

"Immediately following West Virginia American Water's DO NOT USE order on January 9, I began working with the West Virginia National Guard and Office of Emergency Services to provide water and supplies to impacted citizens," Gov. Tomblin said. "While the DO NOT USE order has been lifted, we continue to receive calls from constituents and organizations requesting water be made available to their communities. To address this need, I have asked West Virginia American Water Company to make available potable and bottled water to West Virginians in the affected areas."

To read the letter in its entirety, [click here](#).

01-29-14 @ 5:15PM

The following was issued by the West Virginia Department of Health and Human Resources:

CHARLESTON, W.Va. – Scott Simonton's presentation to the West Virginia Joint Legislative Committee today is totally unfounded and does not speak to the health and safety of West Virginians.

Subject matter experts who have been assisting West Virginia through this entire emergency response state that the only way possible for formaldehyde to come from MCHM is if it were combusted at 500 F.

The World Health Organization (WHO) states formaldehyde is the most frequent aldehyde found in nature and is naturally measurable in air and water. Formaldehyde is created through the normal breakdown cycle of plants and animals. Formaldehyde dissolves easily in water and does not last a long time in water.

Additionally, formaldehyde is naturally produced in very small amounts in our bodies as a part of our normal, everyday metabolism and causes no harm. It can also be found in the air that we breathe at home and at work, in the food we eat, and in some products that we put on our skin.

Formaldehyde is found in many products used every day around the house such as antiseptics, medicines, cosmetics, dish-washing liquids, fabric softeners, shoe-care agents, carpet cleaners, glues and adhesives, lacquers, paper, plastics, and some types of wood products.

We are unaware of the specifics of how this study was conducted, including sampling procedures, protocol and methodology, and would also be interested in the possibility of some other issue affecting the testing of water at the establishment indicated.

Everyone has been affected by this water crisis and public health is of the utmost importance. Mr. Simonton has not been part of the integral team of water testing officials from numerous state, local and private agencies working non-stop since January 9. His opinion is personal but speaks in no official capacity.

01-27-2014 @ 8:33PM GOVERNOR TOMBLIN REQUESTS FEMA MODIFY EMERGENCY DECLARATION

Modification would allow state, local governments and non-profit agencies to receive reimbursement for relief efforts

CHARLESTON, W.Va. – Gov. Earl Ray Tomblin today urged the Federal Emergency Management Agency (FEMA) to modify the current federal Emergency Declaration to provide for Direct Funding Assistance to state and local government programs and eligible non-profit agencies in the nine counties affected by the Elk River chemical spill on January 9.

"At the time of the Emergency Declaration, no one knew how long this assistance would be needed," Gov. Tomblin said. "The response to the Elk River chemical spill is ongoing and many of our agencies continue to work hard to recover from this spill. I urge FEMA to modify the current emergency declaration so eligible expenditures by our first responders, state and local governments and non-profit agencies can be reimbursed."

As the current Emergency Declaration stands, public and non-profit agencies that have made expenditures to distribute supplies and meet the needs of those in the affected areas are presently denied access to Category B Emergency Protective Measures funding. A modification to the current declaration would allow eligible applicants in the affected counties to receive FEMA support, including reimbursement.

To read Gov. Tomblin's letter in its entirety, [click here](#).

01-27-2014 @ 8:32PM GOV. TOMBLIN REQUESTS ASSISTANCE FROM SMALL BUSINESS ADMINISTRATION

To help small businesses and eligible private, nonprofit organizations

CHARLESTON, W.Va. – Gov. Earl Ray Tomblin today requested assistance from the Small Business Administration to expedite help for small businesses and eligible private, non-profit organizations. The letter highlights how some small businesses are struggling to meet financial obligations and pay ordinary and necessary operating expenses because of curtailed water service in parts of nine counties following a chemical leak.

"Businesses suffered revenue losses as a result of the West Virginia American Water's DO NOT USE order in addition to local employees who lost wages," Gov. Tomblin said. "This event caused significant disruption to businesses in the affected areas."

Gov. Tomblin also noted in his letter that even after water was restored, certain businesses and restaurants were required to cleanse their facilities in order to meet requirements set by local health departments.

APP000186

To read Gov. Tomblin's letter in its entirety, [click here](#).

01-25-14 @ 3:11PM

GOVERNOR TOMBLIN ORDERS FREEDOM INDUSTRIES TO DISMANTLE, REMOVE AND PROPERLY DISPOSE OF ALL ABOVE GROUND STORAGE TANKS

CHARLESTON, W.Va. – Gov. Earl Ray Tomblin ordered Freedom Industries to begin, by March 15, 2014, the process of dismantling, removing and properly disposing of all of its above ground storage tanks, as well as associated piping and machinery, at its Etowah River Terminal in Charleston.

Gov. Tomblin's directive is included in Consent Order 8034 issued Friday by the West Virginia Department of Environmental Protection (WVDEP) and signed by Freedom Industries. Gov. Tomblin and Cabinet Secretary Randy Huffman began discussing the need to dismantle the tanks on Jan. 10, 2014.

The Etowah River Terminal, located on the Elk River, is the site of a Jan. 9 chemical spill that leaked Crude MCHM from a storage tank into the Elk and shut down the drinking water supply for nearly 300,000 West Virginia residents.

The facility currently has 17 tanks, including three tanks that contained Crude MCHM. The tank that leaked and caused the resulting spill also contained the chemical PPH. All three of those tanks are now empty. Materials in the remaining 14 tanks include Calcium Chloride and Glycerin. All 17 tanks are located within inadequate secondary containment areas that allowed materials to spill into the Elk River.

Gov. Tomblin is ordering Freedom Industries, on or before March 15, 2014, to remove all materials from the remaining 14 tanks at the Elk River facility and store the material off-site in an area which provides adequate secondary containment. The company also must provide the WVDEP with reports detailing the disposition of the materials removed from the tanks.

During the dismantling of the tanks, Freedom Industries is ordered to install measures that ensure that secondary containment is adequate to contain any potential spills resulting from the work. Secondary containment structures cannot be removed until all above ground tanks have been dismantled and removed from the site.

Freedom Industries must take all actions required by the terms and conditions of the Order and agrees it will not contest the state's jurisdiction regarding the Order.

The state also has the right to take further action against Freedom Industries if compliance with the terms and conditions of the Order does not adequately address violations noted. Also, if any event occurs which causes delay in Freedom Industries meeting the requirements of the Order, the company must prove that the delay was caused by circumstances beyond its reasonable control and could not have been overcome by due diligence.

Compliance with the terms and conditions of the Order does not relieve Freedom Industries of the obligation to comply with any applicable law, permit, other order, or any other requirement otherwise applicable. Violations of the terms and conditions of the Order may subject Freedom Industries to additional penalties and injunctive relief in accordance with the applicable law.

The Order is subject to a 30-day public comment period. To read the Order in its entirety, [click here](#).

01-18-14 @ 4:16PM

GOV. TOMBLIN DIRECTS DR. TIERNEY AND GENERAL HOYER TO HOST CONFERENCE CALL ADDRESSING COMMUNITY CONCERNS

Topics included overview of CDC guidelines, testing protocol

CHARLESTON, W.Va. – Gov. Earl Ray Tomblin today hosted a community conference call. Dr. Letitia Tierney, Commissioner for the Bureau of Public Health and the State's Health Officer, and Adjutant General James A. Hoyer provided an overview of the U.S. Centers for Disease Control and Prevention's guidelines and testing protocol. The following questions were submitted by members of the community and addressed by Dr. Tierney and General Hoyer.

Are you (Dr. Tierney) using the water?

Initially when I flushed my house, I did not detect any smell. Throughout the next couple of days, I did detect a smell. I have used it for drinking, bathing, and cooking—and as of today, I'm no longer detecting the odor in my home.

Why do I still smell licorice even though I've flushed my water lines?

MCHM has a low odor threshold—meaning you can smell MCHM at 100,000 times the no observable adverse effect level.

Will we continue testing? At what levels?

We will continue testing until the system has been sampled and tested at 1/100 parts per million—a level well below the CDC recommended threshold for public health. The CDC provided information that it believes there is no evidence to suggest that water levels below the laboratory limit of detection of 10 parts per billion (1/100 parts per million) would have adverse health effects, including for pregnant women.

Testing will continue and the Bureau of Public Health Office of Environmental Services will continue to monitor until the sampling throughout the system has reached the 1/100 ppm level.

Why is the water unsafe for pregnant women to drink but considered safe for everyone else to consume?

Doctors routinely advise pregnant women to avoid consuming a number of things—including caffeine, alcohol, raw or undercooked meat, unpasteurized dairy products, luncheon meats and hot dogs. Fetal cells are continuing to develop, which is why pregnant women have been encouraged to continue drinking boiled water until there are no longer detectable levels of MCHM in the water distribution system. The CDC provided us the guideline "out of an abundance of caution," just the same as we do for caffeine, alcohol and unpasteurized dairy products.

What is causing the burns/irashes and emergency room visits, if people are using "safe" water?

We've been monitoring everyone who has presented to the hospital, and what they've been complaining of is not a burn like you and I would think of as a burn. Some doctors have described it as a "solar burn" which is similar to a sunburn. Basically, it's red skin. Everyone has different sensitivities and as we move through the flushing process, sediment has been stirred up from your hot water tank and the pipes. Some sediment may be coming through the shower that you don't even see. Because everyone has different sensitivities, some may be experiencing this and some may not.

These are topical only. They're short-lived. They are easily treated with over-the-counter products. I would advise anybody who is seeing this type of reaction to speak with your physician. They won't last. Once things settle down, these symptoms will go away.

Can children under three years of age consume the water?

DHHR confirmed the only guidance from the CDC is that "due to limited availability of data, and out of an abundance of caution, you may wish to consider an alternative drinking water source for pregnant women until the chemical is at non-detectable levels in the water distribution system." The CDC provided information that they believe there is no evidence to suggest that water levels below the laboratory limit of detection of 10 parts per billion (1/100 parts per million) would have adverse health effects, including for pregnant women. Children were considered in these guidelines. Short-term exposure at these levels is not likely to cause any adverse health effects for children or others.

APP000187

Are there known risks associated with this chemical mixing with household cleaners?

No. Household cleaning can continue normally.

Is this water harmful to my pets?

If you are concerned about a pet (dogs and cats) that may have been exposed to contaminated water, contact your local county health officials. In regards to livestock, State Veterinarian Dr. Jewell Plumley said last Friday afternoon, after continuing to seek consultation and advice from toxicologists and animal experts from across the country, there are no known risks to livestock that may have been exposed to the water.

How has the chemical spill impacted fish and other aquatic life?

DNR is coordinating with all appropriate agencies to monitor any potential impacts to aquatic organisms resulting from this chemical spill. The Wildlife Resources Section has had staff on site and has not observed or received any reports of dead fish at this time.

Will grey water from the affected West Virginia American Water systems have a negative impact on surrounding districts?

(Grey water sewage and flush water) Sewage goes to a treatment plant to be treated. Because Total Organic Carbon is measured and regulated, the treatment plant must notify DEP if unsafe levels of MCHM are present. At this time, there are no reports of unsafe levels. Following treatment, the water is sent into rivers and streams where any MCHM is further diluted into non-detectable levels. In the case of flush water, it is again diluted into non-detectable levels. There is no cause for concern for surrounding water intakes bringing in water at unsafe levels.

Does MCHM adhere or leech into plastics?

MCHM may temporarily adhere to plastic pipelines which could result in a lingering licorice smell for some time. The chemical is such that you can continue to smell it, even at 100,000 times below the no observable adverse effect level.

Are water distribution sites still available? If so, where and for how long?

Water distribution sites are still available and will continue to be available well into next week. In order to determine where and how long these sites will remain in effect, it's important for you to reach out to your county emergency management office. Please note, the counties adjust and change distribution points based on need and availability. To find a water distribution location in your area, contact your local emergency management office or visit www.governor.wv.gov.

Will there be any future legislation presented to protect the integrity of our water?

Gov. Tomblin directed his legal team to work with the DEP to draft legislation to help prevent this type of crisis from happening again and anticipates introducing a bill next week. This legislation will: empower the DEP to implement an above ground storage tank regulatory program; require above ground storage tanks to be constructed and maintained in a safe manner; ensure public water systems have proper contingency plans in place to prepare for emergencies such as this; and requires public notice to affected municipalities, counties and the general public concerning regulated above ground storage tanks. The governor anticipates submitting this legislation to the Senate and House of Delegates early next week. The efforts will be coordinated with legislative leadership as well as West Virginia's Congressional Delegation.

I'm breastfeeding, can I drink the water?

(Dr. Tiemey) understand your concern. This was taken into account concerning the safety factors provided by the CDC. Short-term exposure at these levels is not likely to cause any adverse health effects for children or others. If you are concerned check with your physician, and feel free to use bottled water as this is a personal decision.

I experienced nausea when I flushed my pipes, why is this?

It is important to remember we have old pipes, new pipes, copper pipes and iron pipes—flushing is causing the sediment to be stirred up. Even small amounts of copper can cause people to feel sick to their stomach and can make people vomit. This will not continue—it is a result of the flushing process.

Why are so many people going to the hospital?

There are a couple of reasons—we're in the middle of flu season and virus season. Many of us haven't been able to consistently wash our hands with soap and water. While the sanitizer is good for cleaning, it isn't great for eliminating a virus. Some people are getting these viruses, as many people do every winter. In addition, a lot of people are getting very anxious. Anxiety is a real diagnosis and it can be really hard on people and it's okay to be seen by a health professional to ensure you're okay. The flushing process may have caused the side effects as noted above. Also, the number of people who have been seen in hospitals is a very small number of people as it relates to the affected population. No one has been seriously ill. No one remains hospitalized.

01-17-14 @ 5:12PM

GOVERNOR TOMBLIN PROVIDES UPDATE REGARDING THE CURRENT STATE OF EMERGENCY

CHARLESTON, W.Va. – Gov. Earl Ray Tomblin today issued a statement regarding the current status and continued course of action regarding the State of Emergency in Boone, Cabell, Clay, Jackson, Kanawha, Lincoln, Logan, Putnam, and Roane counties.

"West Virginia American Water has recently lifted the DO NOT USE order for the last area -- allowing families and businesses to begin the flushing process. However, agencies are responding to concerns in the Buffalo area of Putnam County and will continue to monitor that specific situation. Across the affected regions our testing teams will remain on the job to make sure the water company's system complies with CDC guidelines.

"Following recent guidance from the CDC, plant output will continue to be tested at parts per billion. As the system is fully restored, we will test at the parts per billion level to confirm non-detectable levels in the water distribution system.

"My team's number one priority is the health and safety of those impacted by this crisis. My family is in the affected area. Many of the team's families and neighbors are in the affected areas. This crisis hits home. The efforts we are taking are for all of our families.

"So far we have distributed more than 15 million bottles of water. We have more than 100 trailers on hand at the National Guard distribution center. Bottled water distribution at various locations in the affected areas will continue. I've asked the Director of Homeland Security to place additional orders so that water will be available well into next week.

"I would also ask if you are stocked up on water, please refrain from taking free water from the emergency assistance centers. We've got to make sure water is available to those most in need. Also, please pay attention to any updates from my team and from West Virginia American Water Company. We are working hard to give you the most accurate and up to date information we have available.

Proposed Legislation

"I've directed my legal team to work with the DEP to draft legislation to help prevent this type of crisis from happening again. We'll have a bill introduced next week. This legislation empowers the DEP to implement an above ground storage tank regulatory program. It requires above ground storage tanks to be constructed and maintained in a safe manner. It ensures that public water systems have proper contingency plans in place to prepare for emergencies, such as this, and requires public notice to affected municipalities, counties, and the general public concerning regulated above ground storage tanks.

"I anticipate submitting this legislation to the Senate and House of Delegates early next week. We will coordinate these efforts with our legislative leadership as well as our Congressional Delegation in Washington."

APP000188

01-16-14 @ 11PM
REMINDER FROM WEST VIRGINIA AMERICAN WATER

Please do not begin flushing until your area is lifted, nor flush beyond the necessary 25 minutes highlighted in our "How to Flush Your Plumbing System" guide. As a result of peak demand in the locations where the Do Not Use order has been lifted, the available water storage in our system is approaching levels that may cause low pressure situations, service disruptions, and reduce the amount of water available for fire protection. It also has delayed the time when additional areas can be released from the Do Not Use order. Thank you for your cooperation and patience as West Virginia American Water, the Army National Guard and our interagency partners continue to work around the clock to restore service to all of our Kanawha Valley customers.

01-16-14 @ 8:10PM
STATE OF EMERGENCY UPDATE

CHARLESTON, W.Va. –Adjutant General James A. Hoyer this evening issued the following statement.

"We have been sampling at the plant at both the parts per million (ppm) and parts per billion (ppb) levels throughout this process to ensure the highest level of confidence in the system. When the U.S. Centers for Disease Control (CDC) provided us with the 1 ppm public health standard we focused on testing at the parts per million level.

"In light of the CDC's additional guidance last night related to the abundance of caution for pregnant women and to ensure the highest level of public health we will continue to test the plant output at parts per million. Once the system is fully restored, we will test the system at the parts per billion level to ensure non-detectable levels in the water distribution system."

01-15-14 @ 9:45PM

To view a frequently asked questions document regarding the consumption of water by pregnant women developed by the West Virginia Bureau of Public Health in conjunction with the U.S. Centers for Disease Control (CDC), [CLICK HERE](#).

01-15-14 @ 7:40PM
WATER ADVISORY FOR PREGNANT WOMEN

The West Virginia Bureau of Public Health advises, after consultation with the U.S. Centers for Disease Control (CDC) this evening, that the CDC recommends - out of an abundance of caution - that pregnant women drink bottled water until there are no longer detectable levels of MCHM in the water distribution system. However, the CDC re-affirmed previous advice that it does not anticipate any adverse health effects from levels less than 1 ppm.

To view guidance from the CDC, [CLICK HERE](#).

01-14-14 @ 7:50PM
GOVERNOR TOMBLIN PROVIDES UPDATE REGARDING THE CURRENT STATE OF EMERGENCY

CHARLESTON, W.Va. – Gov. Earl Ray Tomblin today issued the following statement regarding the ongoing State of Emergency in Boone, Cabell, Clay, Jackson, Kanawha, Lincoln, Logan, Putnam, and Roane counties.

"More West Virginians have seen the DO NOT USE order lifted for their area and have been asked to begin the flushing process. More than one-third of the affected customers have had safe water restored. West Virginia American Water Company reports that samples taken at its treatment plant intake now show no presence of the chemical.

"The DO NOT USE order remains in place for other areas. I ask residents in these areas to be patient and refrain from beginning the flushing process. Please continue to check West Virginia American Water Company's map (<http://www.amwater.com/wvaw/about-us/news.html>) to find out if your area has been cleared for flushing. This information is also available by phone at 1-800-685-8660.

"The West Virginia National Guard will continue to provide bottled water to West Virginians in the affected counties. Please visit www.governor.wv.gov to find a water distribution center near you or contact your local emergency management office.

"Getting our students back into safe and healthy classrooms is one of my top priorities. Reopening will be determined on a county-to-county basis and will require that specific protocols be met. The Department of Education is working with the local county emergency and health agencies, along with the National Guard, to ensure our schools are properly flushed and cleaned before students return to the classroom. Parents concerned about sending their child to school may contact their school principal.

"I'd also like to express my appreciation to the residents of the affected areas for their patience and understanding. I know this has been a difficult time for both residential and business communities. I ask you to continue to be patient—our team must have adequate time to ensure the safe and stable return of water service to affected areas."

01-13-14 @ 4:45PM

Please call West Virginia American Water at 1-800-685-8660 or visit www.btljy/1anLkRP to see if the DO NOT USE order has been lifted in your area.

01-13-14 @ 1:30PM

To view West Virginia American Water Company's "How to Flush Your Plumbing System" guidelines, [CLICK HERE](#).

01-11-14 @ 12PM

To read the proclamation extending the State of Emergency to Cabell, Clay, Logan and Roane counties, [CLICK HERE](#).

APP000189

To read the proclamation declaring a State of Emergency in Boone, Jackson, Kanawha, Lincoln and Putnam counties, [CLICK HERE](#).

01-10-14 @ 7:45PM

For assistance locating a water distribution point in your county, please contact your local emergency management office.

Boone County – 304 369-9913
 Cabell County – 304 743-5391
 Clay County – 304 587-2019
 Jackson County – 304 373-2208 or 304 372-2000
 Kanawha County – 304 744-6843
 Lincoln County – 304 824-3443
 Logan County – 304 752-7662 or 304 752-8817 or Sharples VFD 304-369-2630
 Putnam County – 304 586-0246
 Roane County – 304 927-0911

01-10-14 @ 7:30PM

West Virginia American Water issued a DO NOT USE WATER NOTICE for all West Virginia American Water customers in Kanawha, Boone, Putnam, Lincoln, Logan, Clay, Roane and Jackson counties, as well as customers in Culloden in Cabell County. All other WVAW customers in Cabell County are NOT affected, as they receive their water from the Huntington Water Treatment Plant. Customers who are served by the City of Hurricane, St. Albans, Putnam PSD, Montgomery and Cedar Grove/East Bank are NOT affected.

Please Note: West Virginia American Water is NOT shutting off water to any customers as a result of the "do not use" order currently in place in the Kanawha Valley system.

01-10-14 @ 4PM

GOVERNOR TOMBLIN PROVIDES UPDATE REGARDING THE STATE OF EMERGENCY

During afternoon press conference

CHARLESTON, W.Va. – Gov. Earl Ray Tomblin this afternoon provided an update regarding the State of Emergency still in effect for parts of Boone, Cabell, Clay, Jackson, Kanawha, Lincoln, Logan, Putnam, and Roane Counties.

"We encourage all individuals to determine whether their home or business is in the affected service areas. One indicator of the contaminated water is the odor of the water. We urge all residents in the affected areas to follow West Virginia American Water Company's "do not use" order until it is lifted. This includes water companies supplied by West Virginia American Water in this area. If you live in one of those areas, do not use tap water for drinking, cooking, cleaning, washing, or bathing. At this time, I do not know how long this will last.

"We ask that all West Virginians check on their friends, families, and neighbors—especially those with small children and seniors living in their households—to make sure they have enough water, food, and supplies. If you—or anyone you know—experiences symptoms including: nausea, vomiting, dizziness, irritation of the eyes and skin, seek care immediately.

"Yesterday my DEP ordered the company storing the chemical ... to take immediate action and stop additional flows of the chemical into the Elk River. This discharge of pollutants is unacceptable. I spoke with the president of West Virginia American Water and the COO of American Water, the parent company. I've also spoken with the Secretary of Homeland Security, Secretary Johnson. They have pledged their full support and assistance.

"I've mobilized and deployed all appropriate government assets and resources, including our Office of Emergency Management, our experts at DEP, DHHR Bureau of Public Health along with our National Guard—who are out doing health and wellness checks across the area along with collecting, testing and monitoring the water. The federal government is also providing assistance. The President has approved my request to issue a federal emergency declaration to provide FEMA resources. County emergency offices are also working 24-7.

"Until we receive an "all-clear," we are focusing efforts on helping the most vulnerable in hospitals and nursing homes. We have asked the DHHR Bureau for Public Health, Senior Services, and WVNG to develop a long-term plan to help ensure adequate supplies of water and food is available.

"If you are low on bottled water, do not panic. Help is on the way. We are taking every measure to provide water to you. There is no shortage of bottled water. Supplies are moving into the area as we speak. We encourage all West Virginians in affected areas to contact their local emergency management office for water distribution sites.

"If you or your organization would like to donate supplies, please contact your local emergency center. If you are in the Kanawha Valley Area, we are organizing a call to action drive for needed items—including water, sanitizer, wipes, liquid baby formula, paper plates, plastic utensils, and microwavable meals. The drive will take place on the Boulevard in front of the State Capitol from 2:30 – 6:30 today. It is important to emphasize, water and supplies are available—there is not a persistent shortage of bottled water.

"We are grateful for the offers of support from private firms and charities—and our fellow West Virginians—to aid in providing relief.

"I will direct my general counsel, and my Director of the Division of Homeland Security and Emergency Management, General Hoyer to begin reviewing our emergency response to this incident. They reviewed both the response to the Derecho and Hurricane Sandy. We learned a lot from those disasters. Our past reviews have prepared us well for this situation. We can learn a lot from this particular incident."

01-10-14 @ 10:25AM

CHARLESTON, W.Va. – Gov. Earl Ray Tomblin today issued the following statement regarding the current State of Emergency in Boone, Cabell, Clay, Jackson, Kanawha, Lincoln, Logan, Putnam, and Roane counties.

The State of Emergency remains in the affected counties. The Governor dispatched the state's Department of Environmental Protection to Freedom Industries yesterday, ordering it to halt further leaching of the particular chemical into the river.

Our emergency response team has worked to develop a testing protocol and a sampling plan on the chemical at issue. Initial samples have been taken, and additional sampling and testing will continue throughout the situation.

The sampling plan is a coordinated effort with West Virginia American Water Company and the state Bureau of Public Health, and our emergency responders. This process will take time, but we continue to work quickly to provide information related to the ability to lift the "do not use" ordered by West Virginia American Water.

Company.

Also overnight, water supplies have been relocated and have begun to be distributed to affected areas. Please call your local emergency service office to locate the closest distribution point for your area. Continue to refrain from using the water for drinking, cooking, cleaning, bathing and washing. Do not boil this water or use it to supply oxygen machines.

Our efforts will continue until we have a resolution. Our main focus continues to center around our hospitals, nursing homes and those most vulnerable. I will continue to keep our citizens updated as we gather additional information.

01-10-14 @ 12:48AM

The White House has approved Gov. Tomblin's request for a federal emergency declaration to assist with the situation in affected areas.

01-09-14 @ 9:32PM

GOVERNOR TOMBLIN DECLARES STATE OF EMERGENCY IN 9 COUNTIES

Water to be available through the county offices of emergency services

CHARLESTON, W.Va. -- Gov. Earl Ray Tomblin this evening issued a State of Emergency for Boone, Cabell, Clay, Jackson, Kanawha, Lincoln, Logan, Putnam, and Roane counties. This declaration follows a notice from West Virginia American Water Company that its water supply had become contaminated. Residents served by Lincoln PSD, Queen Shoals PSD, Reamer PSD, City of Culloden PSD, and City of Hurricane PSD are also affected.

"West Virginians in the affected service areas are urged NOT to use tap water for drinking, cooking, washing or bathing," Gov. Tomblin said. "Right now, our priorities are our hospitals, nursing homes, and schools. I've been working with our National Guard and Office of Emergency Services in an effort to provide water and supplies through the county emergency services offices as quickly as possible."

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President Obama Signs West Virginia Emergency Declaration

Release date: JANUARY 10, 2014

Release Number: HQ-14-002

WASHINGTON, D.C. -- The U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) announced that federal emergency aid has been made available to the State of West Virginia to supplement state and local response efforts due to the emergency conditions resulting from a chemical spill on January 9, 2014, and continuing.

The President's action authorizes FEMA to coordinate all disaster relief efforts which have the purpose of alleviating the hardship and suffering caused by the emergency on the local population, and to provide appropriate assistance for required emergency measures, authorized under Title V of the Stafford Act, to save lives and to protect property and public health and safety, and to lessen or avert the threat of a catastrophe in the counties of Boone, Clay, Jackson, Kanawha, Lincoln, Logan, Putnam, and Roane.

Specifically, FEMA is authorized to identify, mobilize, and provide at its discretion, equipment and resources necessary to alleviate the impacts of the emergency. Emergency protective measures, limited to direct federal assistance, will be provided at 75 percent federal funding.

Michael J. Lapinski has been named as the Federal Coordinating Officer for federal response operations in the affected area.

FEMA's mission is to support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards.

Follow FEMA online at www.fema.gov/blog, www.twitter.com/fema, www.facebook.com/fema, and www.youtube.com/fema. Also, follow Administrator Craig Fugate's activities at www.twitter.com/craigatfema.

The social media links provided are for reference only. FEMA does not endorse any non-government websites, companies or applications.

Last Updated: January 10, 2014 - 07:45

State/Tribal Government or Region: [West Virginia](#)

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APP000192

News

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January 29, 2014

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Experts warn 'flushing' might not have worked

Chemicals may still remain in plumbing systems after spill

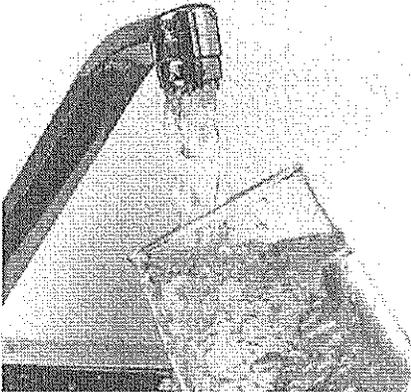
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CHARLESTON, W.Va. -- The "flushing" recommended by the Tomblin administration and West Virginia American Water might not have effectively eliminated Crude MCHM and other toxic chemicals from plumbing systems in homes and businesses, experts are warning.

MCHM from the Jan. 9 Freedom Industries leak into the Elk River might be stuck inside pipes and hot-water tanks, and experts are concerned that the chemical also could be breaking down into other toxic materials that have yet to be fully identified.

Scott Simonton, a Marshall University environmental engineer, told a legislative committee Wednesday that he found cancer-causing formaldehyde -- which he said is one possible breakdown product from the chemical -- in one local water sample and that the continued lack of data on the chemicals that leaked into the Elk is very concerning.

"It's frightening, it really is frightening," said Simonton, who is a member of the state Environmental Quality Board and also consults for at least one local law firm that's filed suit over the leak. "What we know scares us -- and

we know there's a lot more we don't know."

Early Wednesday evening, the state Department of Health and Human Resources issued a statement that called Simonton's comments regarding formaldehyde "totally unfounded" and said his testimony "does not speak to the health and safety of West Virginians."

Dr. Letitia Tierney, commissioner of the Bureau for Public Health, said Wednesday evening that the chemists the state had consulted with all said the formaldehyde could not have come from the MCHM.

"Our experts are all in agreement that it's unlikely that his findings are in any way related to the chemical spill," she said. "It's already in our environment."

Tierney and Elizabeth Scharman, director of the West Virginia Poison Center, questioned Simonton's methodology, saying that he hasn't released multiple samples, the lab he used, how his sample was collected or other details. They also said Simonton had not made attempts to contact them.

"People shouldn't just take the statement of, 'Oh we found formaldehyde in the water,' and have that be a scary statement in itself," Scharman said. "What we're trying to let people know is that formaldehyde can be found in the water and it can be found in the air, and just put that in perspective."

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APP000193

Tierney said formaldehyde is not something they test for because it is created and breaks down naturally and dissolves quickly.

"Formaldehyde is naturally produced in very small amounts in our bodies as part of our normal, everyday metabolism and causes no harm," Tierney's statement said. "It can also be found in the air that we breathe at home and at work, in the food we eat, and in some products that we put on our skin."

Wednesday morning, Simonton told a joint legislative committee on water resources that his family is still not drinking or cooking with tap water, two weeks after the water company and government officials said it is safe for all uses.

"Your level of what risk you will accept is up to you," Simonton said. "I can only tell you what mine is, and I'm not drinking the water. The formaldehyde had me personally a little freaked out."

Sen. John Unger, chairman of the legislative water committee, summed up Simonton's findings. "I think we're in a little bit of shock because of this," said Unger, D-Berkeley.

Andrew Whelton, an environmental engineer from the University of South Alabama, drove to West Virginia after the leak. He and his team of researchers have been taking water samples and helping residents complete the flushing process, but with a different set of guidelines than the state and West Virginia American recommended.

For example, Whelton emphasizes that residents should open their windows during the flushing process and use ceiling or floor fans to push chemical fumes outside.

Whelton also suggests shutting off hot-water tanks before flushing because chemicals in the water will evaporate faster into your home or workplace from hot water than from cold.

In an interview, Whelton said it's crucial that officials begin testing and sampling inside people's homes to determine the level of contamination of plumbing systems and what to do about it.

"I can't believe they aren't doing this," Whelton said. "These issues aren't being addressed. The long-term consequences of this spill are not being addressed."

The latest estimates made public by the state Department of Environmental Protection are that 10,000 gallons of Crude MCHM leaked from a storage tank at Freedom's Etowah Terminal, just 1.5 miles upstream from West Virginia American's regional intake, which provides drinking water to 300,000 people.

The main ingredient in Crude MCHM is another chemical, called 4-methylcyclohexanemethanol. Simonton noted, though, that methanol also is one of its main components. Methanol can break down into formaldehyde, he said.

Tierney, however, said the state's experts have concluded that MCHM cannot be broken down into formaldehyde unless it is heated to 500 degrees Fahrenheit.

Scharman added that, although information on the health and long-term effects of the chemical is still limited, the state has much better information on its chemical makeup and how it breaks down.

Simonton said he found traces of formaldehyde in water samples taken from the Vandalia Grille, in downtown Charleston.

Kevin Thompson, an attorney who retained Simonton as an expert witness for a leak lawsuit, said the sample taken at the Vandalia Grille five days after the leak found 32 parts per billion of formaldehyde. He said that one sample is the only one of dozens his team took that they has been received, so far.

Formaldehyde is found in food and in common consumer products, such as cigarettes, cosmetics and wrinkle-free clothing. It can enter your body by inhalation, ingestion or if your skin comes into contact with liquids containing formaldehyde, according to the U.S. Agency for Toxic Substances and Disease Registry.

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CHARLESTON, W.Va. -- The "flushing" recommended by the Tomblin administration and West Virginia American Water might not have effectively eliminated Crude MCHM and other toxic chemicals from plumbing systems in homes and businesses, experts are warning.

MCHM from the Jan. 9 Freedom Industries leak into the Elk River might be stuck inside pipes and hot-water tanks, and experts are concerned that the chemical also could be breaking down into other toxic materials that have yet to be fully identified.

Scott Simonton, a Marshall University environmental engineer, told a legislative committee Wednesday that he found cancer-causing formaldehyde -- which he said is one possible breakdown product from the chemical -- in one local water sample and that the continued lack of data on the chemicals that leaked into the Elk is very concerning.

"It's frightening, it really is frightening," said Simonton, who is a member of the state Environmental Quality Board and also consults for at least one local law firm that's filed suit over the leak. "What we know scares us -- and we know there's a lot more we don't know."

Early Wednesday evening, the state Department of Health and Human Resources issued a statement that called Simonton's comments regarding formaldehyde "totally unfounded" and said his testimony "does not speak to the health and safety of West Virginians."

Dr. Letitia Tierney, commissioner of the Bureau for Public Health, said Wednesday evening that the chemists the state had consulted with all said the formaldehyde could not have come from the MCHM.

"Our experts are all in agreement that it's unlikely that his findings are in any way related to the chemical spill," she said. "It's already in our environment."

Tierney and Elizabeth Scharman, director of the West Virginia Poison Center, questioned Simonton's methodology, saying that he hasn't released multiple samples, the lab he used, how his sample was collected or other details. They also said Simonton had not made attempts to contact them.

"People shouldn't just take the statement of, 'Oh we found formaldehyde in the water,' and have that be a scary statement in itself," Scharman said. "What we're trying to let people know is that formaldehyde can be found in the water and it can be found in the air, and just put that in perspective."

Tierney said formaldehyde is not something they test for because it is created and breaks down naturally and dissolves quickly.

"Formaldehyde is naturally produced in very small amounts in our bodies as part of our normal, everyday metabolism and causes no harm," Tierney's statement said. "It can also be found in the air that we breathe at home and at work, in the food we eat, and in some products that we put on our skin."

Wednesday morning, Simonton told a joint legislative committee on water resources that his family is still not drinking or cooking with tap water, two weeks after the water company and government officials said it is safe for all uses.

"Your level of what risk you will accept is up to you," Simonton said. "I can only tell you what mine is, and I'm not drinking the water. The formaldehyde had me personally a little freaked out."

Sen. John Unger, chairman of the legislative water committee, summed up Simonton's findings. "I think we're in a little bit of shock because of this," said Unger, D-Berkeley.

Andrew Whelton, an environmental engineer from the University of South Alabama, drove to West Virginia after the leak. He and his team of researchers have been taking water samples and helping residents complete the flushing process, but with a different set of guidelines than the state and West Virginia American recommended.

For example, Whelton emphasizes that residents should open their windows during the flushing process and use ceiling or floor fans to push chemical fumes outside.

Whelton also suggests shutting off hot-water tanks before flushing because chemicals in the water will evaporate faster into your home or workplace from hot water than from cold.

In an interview, Whelton said it's crucial that officials begin testing and sampling inside people's homes to determine the level of contamination of plumbing systems and what to do about it.

"I can't believe they aren't doing this," Whelton said. "These issues aren't being addressed. The long-term consequences of this spill are not being addressed."

The latest estimates made public by the state Department of Environmental Protection are that 10,000 gallons of Crude MCHM leaked from a storage tank at Freedom's Etowah Terminal, just 1.5 miles upstream from West Virginia American's regional intake, which provides drinking water to 300,000 people.

The main ingredient in Crude MCHM is another chemical, called 4-methylcyclohexanemethanol. Simonton noted, though, that methanol also is one of its main components. Methanol can break down into formaldehyde, he said.

Tierney, however, said the state's experts have concluded that MCHM cannot be broken down into formaldehyde unless it is heated to 500 degrees Fahrenheit.

Scharman added that, although information on the health and long-term effects of the chemical is still limited, the state has much better information on its chemical makeup and how it breaks down.

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Formaldehyde is found in food and in common consumer products, such as cigarettes, cosmetics and wrinkle-free clothing. It can enter your body by inhalation, ingestion or if your skin comes into contact with liquids containing formaldehyde, according to the U.S. Agency for Toxic Substances and Disease Registry.

The ATSDR said the risks of formaldehyde are "low" at 10 parts per billion. The agency said the risks of irritation from formaldehyde are "medium" at 100 parts per billion.

After Simonton's testimony about formaldehyde, West Virginia American Water issued a statement that said, "It is misleading and irresponsible to voice opinions on potential health impacts to residents of this community without all of the facts.

"Procedures for water analysis are carefully prescribed, outlined and certified," the water company statement said. "West Virginia American Water will continue working with governmental health and environmental professionals and, in conjunction with these professionals, we and public health agencies will make public any reliable, scientifically sound information relating to risks to public health, if any."

In his testimony, Simonton also said he is still concerned with the 1 part per million standard for Crude MCHM that the federal Centers for Disease Control and Prevention has said is safe in water for everyone except pregnant women.

The vast majority of the most recent test results posted by the state Division of Homeland Security show a "not detected" level of Crude MCHM in water samples. The state has said it can detect the chemical down to 10 parts per billion, although officials in Louisville, Ky., have said their tests can detect the chemical at concentrations down to 1 part per billion.

Scharman said that is just the nature of testing.

"For any test that we do," she said, "different labs have different lower thresholds, so you can always find a level that can test just slightly under."

In a letter sent Tuesday to Sen. Jay Rockefeller, D-W.Va., West Virginia American Water President Jeff McIntyre emphasized that the most recent testing using the state's method has shown "non-detectable levels of MCHM in multiple pressure zones, accounting for approximately 85 percent of our local service area.

"In remaining areas where testing results are above the non-detectable limit, they are still extremely low and only a fraction of the CDC-established 1 ppm health-protective limit," McIntyre wrote.

Last week, Adjutant Gen. James Hoyer of the West Virginia National Guard said the Guard had done some testing in hospitals but had no plans to test in individual homes or businesses.

"I'd have Guardsmen on duty for the rest of my career," Hoyer said.

The water company also has said it has no plans to provide customers with home testing of their tap water.

In his legislative testimony Wednesday, Simonton stressed what other outside public-health officials have already made clear: Little is known about the chemicals involved in the leak.

"We don't know what happens to this stuff once it gets into the environment," he said. "What happens when it reacts with makeup or soap or shampoo or anything else that we come into contact with everyday?"

He also said the flushing period recommended by West Virginia American and state officials wasn't enough and that the chemical is sticking to pipes in the system.

Starting Jan. 13, water company officials and the state began a weeklong process of lifting broad "do not use" orders for sections of the nine-county area impacted by the MCHM leak. After the order was lifted, residents were advised to run their hot water for 15 minutes, their cold water for 5 minutes, and their outside faucets for 5 minutes to flush the chemical from their homes.

But since then, residents have continued to complain that the black-licorice smell of the chemical is lingering, especially in their hot water.

State officials, in announcing their guidance for flushing, rejected an earlier recommendation from the ATSDR that residents be advised to flush their plumbing systems until the chemical odor is gone.

Simonton said people have flushed for hours and hours, and the odor still remains.

"We know the stuff is sticking," he said. "Exactly where it is or how it's happening is unclear right now."

The U.S. Environmental Protection Agency had said in internal documents that flushing the chemicals out of the system "may require a fairly prolonged time to complete," perhaps two to three weeks.

In a letter sent Monday to the Federal Emergency Management Agency, Tomblin acknowledged that the public lacks faith in the safety of the region's water supply.

"Despite the best efforts of the company and government many people no longer view their tap water as safe and are continuing to demand bottled water to meet their potable water needs," the governor wrote to FEMA Regional Director MaryAnn Tierney. "It is impossible to predict when this will change, if ever."

Reach David Gutman at david.gutman@wvgazette.com or 304-348-5119.

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January 16, 2014

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Pediatrician: Young children shouldn't drink the water

By Lori Kersey

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CHARLESTON, W.Va. -- If pregnant women shouldn't drink the tap water until the chemical that spilled into it last week is gone, neither should small children, a pediatrician told the Kanawha Charleston Board of Health on Thursday.

Dr. Raheel Khan, of the West Virginia chapter of the American Academy of Pediatrics, asked the health board at its regular meeting why a recommendation that pregnant women not drink the water while there are traces of Crude MCHM in it be extended to include children under 3 years old.

Small children drink proportionately more water than adults, said Khan, who is also an associate professor of pediatrics at the Charleston division of West Virginia University School of Medicine.

"The risk is that they might get more of the chemical as opposed to adults by proportion," Khan said. "Since the CDC came out with this recommendation for pregnant women ... shouldn't we be extending this precaution to younger kids who are equally vulnerable?"

Officials with the federal Centers for Disease Control and Protection came out with the recommendation that pregnant women not drink the water on Wednesday night, but said Thursday that recommendation was made out of an "abundance of caution," and that it did not apply to breastfeeding mothers, infants or children.

West Virginia American Water, using guidelines from the CDC, has lifted the "do-not-use" orders in zones after the levels of Crude MCHM -- the chemical spilled by Freedom Industries into the Elk River last week -- fell below 1 part per million.

Dr. Rahul Gupta, health officer for the Kanawha-Charleston Health Department, said Thursday he would call state health officials who are in contact with CDC officials and ask them about Khan's recommendation.

"We have concerns about all our vulnerable populations and ... [Dr. Khan's recommendation] definitely makes sense," Gupta said. "The question is, has that been looked into? Has that been factored in?"

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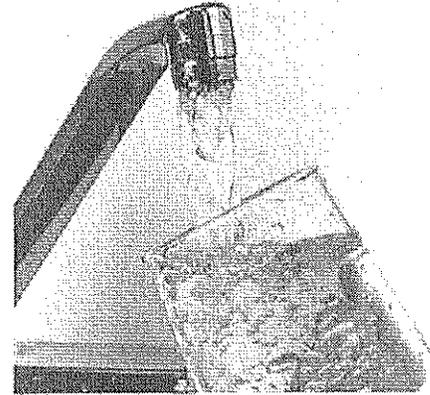
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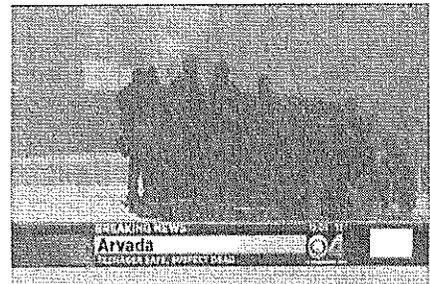


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"We have concerns about all our vulnerable populations and ... [Dr. Khan's recommendation] definitely makes sense," Gupta said. "The question is, has that been looked into? Has that been factored in?"

Khan said breast milk is mostly filtered and is less of a concern than infant formula mixed with the water.

"Without having any scientific evidence, we are using sort of a educated guess based on that," Khan said. "A lot of things are filtered out [of breast milk] and breast milk should be a little bit safer for the newborn babies. But a lot of these babies are not breastfeeding, they're getting formula mixed with water, so that is my main concern."

South Charleston resident Jeremy Parsons asked health board members if they could deviate from the CDC's advice and recommend that people discontinue use of the water until levels of the chemical are lower. He cited the numerous reported emergency room visits that have followed the water use bans being lifted.

"Obviously from what we're seeing, 1 part per million does not seem to be a safe threshold," Parsons told the health board.

Gupta is advising people to make their own decisions when it comes to whether or not to drink the water. He said some people's adverse reactions may not be due to the chemical's toxicity, but rather to an allergic reaction, or a reaction to the odor of the chemical.

In other business, the health board also passed a resolution supporting state legislation that would make pseudoephedrine products available only by prescription. A Kanawha County substance abuse task force, as well as a similar state group, recommended the measure to cut down on methamphetamine labs. Gov. Earl Ray Tomblin did not mention the measure in his State of the State address last week.

Reach Lori Kersey at lori.ker...@wvgazette.com or 304-348-1240.

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Kanawha Schools Superintendent Duerring: Snow day decision is complicated

By Mackenzie Mays

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CHARLESTON, W.Va. -- After Kanawha County Schools had an unusually high number of snow days this year, in addition to closures because of contaminated water, Board of Education members heard concerns from parents about how administrators decide when to call school off during inclement weather.

That decision is a complicated process that involves the National Weather Service, the Department of Transportation and other factors, Kanawha County Schools Superintendent Ron Duerring said at a special session on Monday.

"It's never a science. You do the best you can with the information you get. We're in contact with a lot of people when making those decisions," Duerring said.

For example, last week, the weather forecast predicted 11 degrees -- not cold enough to constitute a two-hour delay -- but by the time school employees arrived, the temperature had dropped to 6 degrees. By then it was too late to cancel.

The latest the school system can call off school or announce a two-hour delay is 4 or 5 a.m. that day, Duerring said, citing school personnel, like cooks, who would be en route to school soon after that.

More importantly, it's difficult to make changes to the schedule after school buses are en route, which could leave students stranded at the bus stop while their parents are already off to work.

"It's safer to bring them in than to let them stand [outside.] We have no choice," Duerring said.

School board member Becky Jordan asked Duerring to go through the criteria on Monday after receiving numerous phone calls from parents about the recent school closures. Kanawha County students only attended about a week total of school during the month of January because of snow days and a chemical leak into the Elk River that banned water use.

"I think people think you sit in your home and decide what you're going to do by watching [the news] and then ask our opinion. They don't understand it's a process throughout the night," Jordan said.

Another consideration is the different locations of the 69 schools in Kanawha County -- the state's largest district. There are several hollows and mountainous areas in the district, and administrators have to consider those bus routes in inclement weather for safety reasons, Duerring said.

But the chances of only canceling school for students living in certain areas who are hit by the snow the worst -- instead of the system as a whole -- are unlikely, Duerring said.

"We would consider that but what that sends out to the public is confusion. Everyone will hear 'closed' and assume it's everywhere. That makes it very difficult," Duerring said. "Everybody

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Also at Monday's meeting, the board held its second -- and final -- required public hearing on next year's school calendar. The board plans to officially vote on the calendar, which could start school as early as Aug. 11, at its regular meeting Feb. 19.

Reach Mackenzie Mays at mackenzie.m...@wvgazette.com or 304-348-4814.

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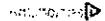
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January 23, 2014

Back to school, back to food

School closures put some students at risk

by Mackenzie Mays

CHARLESTON, W.Va. -- No clean water has meant no school for students across several West Virginia districts in recent weeks, and for some, no school also meant no food.

"That's why every provision has been made to adjust menus to use filtered, packaged water to prepare a quality hot meal -- instead of just serving cold lunches -- for the hardest hit, who really need a nutritious meal now," said Diane Miller, executive director of food and nutrition for Kanawha County Schools, the state's largest district.

About 60 percent of public school students in West Virginia qualify for free or reduced-priced meals at school. Throughout the state, schools sometimes will open in the evening, despite snow days, so they can serve students a free meal.

But in this case, in which a chemical spill into the Elk River -- and the water supply -- forced schools to close for six days, that option was too big of a risk, Miller said.

"There was so much uncertainty -- about the water usage and the protocol to go through for health inspections . . .," she said. "That wasn't done only because there was so much uncertainty about the cleanliness of our kitchens after contamination."

Thursday was the first day students in Kanawha County have attended class (although it was a two-hour delay) since Jan. 9. Schools were on a two-hour delay again Friday. In addition to the water crisis, which forced a water-use ban in nine counties, the area was slammed with multiple snow days, meaning Thursday was the fourth day students have attended class since they returned from Christmas Break on Jan. 2 -- and two of those for were on two-hour delays.

At Mary C. Snow West Side Elementary School in Charleston, all students receive free meals. Ninety-three percent of the school's more than 500 students come from low-income families.

While most schools' doors were closed in the midst of the water crisis and during recent freezing temperatures, Mary C. Snow Principal Mellow Lee was at school, along with several teachers, collecting and distributing food.

That's because many of Lee's students depend on the meals provided to them at school, she said.

"The majority of that time off -- including on Saturday -- my staff helped collect and hand out nonperishable items and water to a lot of our families," Lee said. "A lot of our families were there every day to pick things up, until we ran out."

In a way, Lee said, because of the school's impoverished attendance zone, which police have labeled the most crime-ridden part of the city, her teachers likely were more prepared than those in other districts to handle the crisis.

"For us, that's always in the back of our minds -- basic needs like food and water for the students: Are they being met?" she said. "Today, we're just trying to get the focus back on where we were with academics, and we're coming up with alternative ways to provide things at home for students to do."

Mary C. Snow students also are helped by the fact that they operate on a year-round schedule, meaning students are more accustomed to breaks, Lee said.

"We've been out longer than normal," she said. "I just hope that our adjustment won't be as difficult because we

APP000202

have those three-week breaks. The students just come back and are ready to start where they left off. They're used to it."

Piedmont Elementary School's staff also worked to offer food to families during the time off.

Additionally, Miller said several employees at Kanawha County's Central Office donated canned or frozen fruits and other foods that don't require much water for preparation.

"I have heard of several schools that are distributing foods to their communities for usage at home," she said. "I'm hoping that more will turn up if this crisis continues."

Miller estimated that schools will be able to use bottled water for food preparation through the first week of February.

Reach Mackenzie Mays at mackenzie.m...@wvgazette.com or 304-348-4814.

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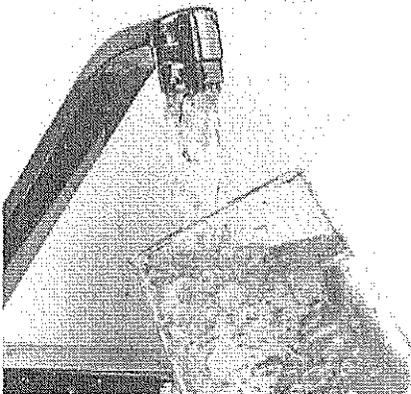
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Charleston, W.Va. -- The economic impact of the Jan. 9 chemical spill that contaminated the water supply for 300,000 people is \$61 million, according to a preliminary study.

The Marshall University Center for Business and Economic Research conducted a preliminary investigation, which looked at establishments such as schools, medical offices, restaurants, hotels and some retail stores that needed clean water to provide service.

The CBER estimates the initial impact to be slightly more than \$19 million for each business day during the "Do Not Use" water order issued for nine counties.

"This amounts to 24 percent of the economic activity of the affected area," a press release states.

In the four days following the ban, CBER estimates the total impact around \$61 million, including two business days and two weekend days.

The study estimates the number of affected workers to be nearly 75,000 for each business

day the ban was in place, representing about 41 percent of area workers.

Some were hit harder than others, the study shows.

"This high share is an indicator of the nature of the impacts, where the lower-wage, service-producing sector was more acutely impacted than higher-wage industries," the release states. "Establishments in the restaurant and lodging industries are less likely to recover lost revenues and are among those most affected by the inability to use water."

The study suggests state and local government and industries such as mining and construction to be unaffected.

The estimated impact does not include clean-up costs of the spill or emergency expenditures made as a result and thus does not represent the full economic impact, the release states.

A portion of the impact is permanently lost revenue and employee income that will not be recovered. Further analysis is needed to uncover the full effect, the release states.

Last week, the Charleston Convention and Visitors Bureau told The Charleston Gazette financial losses from only 12 businesses are totaling \$1 million.

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investigation, which looked at establishments such as schools, medical offices, restaurants, hotels and some retail stores that needed clean water to provide service.

The CBER estimates the initial impact to be slightly more than \$19 million for each business day during the "Do Not Use" water order issued for nine counties.

"This amounts to 24 percent of the economic activity of the affected area," a press release states.

In the four days following the ban, CBER estimates the total impact around \$61 million, including two business days and two weekend days.

The study estimates the number of affected workers to be nearly 75,000 for each business day the ban was in place, representing about 41 percent of area workers.

Some were hit harder than others, the study shows.

"This high share is an indicator of the nature of the impacts, where the lower-wage, service-producing sector was more acutely impacted than higher-wage industries," the release states. "Establishments in the restaurant and lodging industries are less likely to recover lost revenues and are among those most affected by the inability to use water."

The study suggests state and local government and industries such as mining and construction to be unaffected.

The estimated impact does not include clean-up costs of the spill or emergency expenditures made as a result and thus does not represent the full economic impact, the release states.

A portion of the impact is permanently lost revenue and employee income that will not be recovered. Further analysis is needed to uncover the full effect, the release states.

Last week, the Charleston Convention and Visitors Bureau told The Charleston Gazette financial losses from only 12 businesses are totaling \$1 million.

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PRESS RELEASE for TUESDAY, JANUARY 28TH

Contact: Lida Shepherd (304-356-8428), Cathy Kunkel (304-237-3802)

Legislators Aren't Drinking the Water: Report Card Reveals Bi-Partisan Support for Progressive Response to Water Crisis

Initial Results of Legislator Poll Show Republican and Democrat Support for Increasing DEP Inspectors, Following Federal Chemical Safety Board Recommendations, and Increased Emergency Response Funding

Charleston, WV – Today, Regenerate West Virginia, a local Political Action Committee is releasing initial results from a survey of legislators from areas affected by the chemical spill. The results show broad support for a safety-first agenda, one that bolsters regulations and puts families before corporate interests. Legislators agree on one other thing: none of them is drinking the water, and none believes it is safe for others to drink.

Of the 6 respondents thus far, all of them (including Doug Skaff-D, Chris Walters-R, Meshea Poore-D, Nancy Guthrie-D, Jeff Eldridge-D, and Ted Tomblin-D) showed unanimous support for the following, hard-lined responses to the spill.

Key Findings:

- All agreed to support increased funding to the West Virginia DEP to allow for chemical storage facilities upstream of drinking water intakes to be inspected annually.
- All agreed to support legislation to increase resources to local emergency planning committees to better assess and prepare for future disasters.
- All agreed to support legislation implementing the Hazardous Chemical Release Prevention Program, which would require third-party safety audits of hazardous chemical facilities, as recommended by the federal Chemical Safety Board.
- All stated that they had contacted the Governor's office to urge him to make Disaster Unemployment Assistance available for working families who lost work hours because of the water crisis.

The poll also asked legislators if they were drinking water coming from the tap, which some in government have said is safe to drink for people other than pregnant women. Every respondent who was directly affected by the spill agreed on this point, as well: none of them feel safe drinking the water yet. This is an important finding in light of some recent reports that free water stations may begin closing soon.

Regenerate-WV thanks and congratulates these legislators for their commitment to strong reforms that put clean water for all above special interests. Regenerate is urging residents of the affected areas to contact their legislators in support of implementing the Chemical Safety Board's recommendations and to contact the governor's office to make Disaster Unemployment Assistance available to people who lost work hours due to the crisis.

"We want delegates from Kanawha and surrounding counties at the forefront, putting our families' safety ahead of corporate interests," said Lida Shepherd, a Charleston mother and board member of Regenerate-WV. "This poll is only a start, and it only counts if we see real commitment in the legislature to enforce existing laws and implement the recommendations that will keep our water safe and ensure some measure of accountability, so that this disaster never happens again."

Legislators in the affected counties received the survey in paper form at their legislative offices and by e-mail to their legislative e-mail addresses. Follow-up calls were also made last week.

The Political Action Committee will keep the survey open for legislators who have not yet been able to respond, and hopes to keep adding supporters in the coming weeks.

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News

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January 23, 2014

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Chemical-related hospital visits still rising

By David Gutman

Advertiser

CHARLESTON, W.Va. -- Days after all water service has been restored, and with the immediate water crisis beginning to fade, the number of West Virginians seeking treatment in relation to the Elk River chemical leak continues to rise.

As of Thursday, 533 West Virginians had been evaluated at hospitals with symptoms they report as being associated with the chemical spill, according to the Department of Health and Human Resources. That's up nearly 30 percent since Saturday, the last time DHHR reported treatment numbers. On Saturday, DHHR reported that 411

patients had been seen and treated at 10 area hospitals.

The number of patients admitted to hospitals has also risen by 30 percent since Saturday. DHHR reports that 26 patients have been admitted and released at six area hospitals, up from 20 admittances on Saturday.

One additional patient has been admitted to a hospital out of the water crisis area, but with related symptoms.

The number of calls to the West Virginia Poison Center is up more than 34 percent since Saturday. As of Thursday, there had been 2,555 calls to the poison center, up from 1,903 calls as of Saturday.

Of the total calls, 2,008 were human related, 100 were for animals and the rest were informational only.

On Saturday, the governor's office de-emphasized the number of people receiving treatment, saying it was a very small number compared to the overall population and that no one has been seriously ill.

Dr. Letitia Tierney, the commissioner for the state's Bureau of Public Health, pointed to flu season, anxiety, and insufficient hand washing as reasons for the hospital visits.

Tierney also downplayed the burns and rashes that have been reported as resulting from the chemical leak, saying they were easily treated.

"We've been monitoring everyone who has presented to the hospital and what they've been complaining of is not a burn like you and I would think of as a burn," Tierney said Saturday. "Some doctors have described it as a 'solar burn' which is similar to a sunburn. Basically, it's red skin."

DHHR spokeswoman Allison Adler said that the agency will continue to monitor and analyze the medical charts of all visits related to the chemical leak.

"We will not be able to determine whether the numbers are truly related to the chemical until the surveillance is done," Adler wrote Thursday. "The surveillance will start soon, but will take some time to determine a link."

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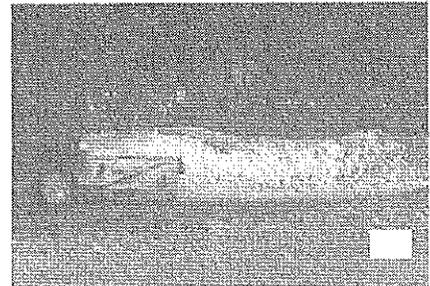
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January 15, 2014

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Freedom cited after moving chemical from Elk River site

By Ken Ward Jr.

By David Gutman

NITRO, W.Va. -- It smells like licorice in the Par Industrial Park in Nitro.

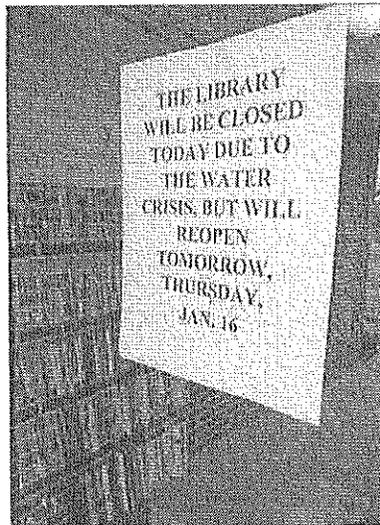
Par Industrial Park is the home of Poca Blending, a subsidiary of Freedom Industries. Under orders from the state Department of Environmental Protection, Freedom used tanker trucks to transport all the remaining chemicals from their facility on the Elk River to Poca Blending, a drive of about 17 miles.

Every one of those trucks went within about 100 feet of the Nitro Public Library. The library, which has been closed since the leak was discovered last week, sits about a quarter mile down the road from Poca Blending.

Lynn Godby, the library manager, was at work on Wednesday morning, beginning the process of flushing the building's pipes so they could reopen today.

She had no idea that the tanker trucks that had driven by contained 4-methylcyclohexanemethanol from Freedom Industries, or that the chemical was being stored so close by.

"It makes me a little uneasy," Godby said Wednesday. "You don't like to think they're just right down the road."



David Gutman

Earlier this week, Freedom Industries moved chemicals from their facility on the Elk River to Poca Blending in Nitro. The company was cited by the state Department of Environmental Protection at its site, about a quarter-mile from the Nitro Public Library, which is set to reopen Thursday. "It makes me a little uneasy," the library manager said Wednesday. "You don't like to think they're just right down the road."

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On Tuesday state regulators cited Freedom Industries for a broad variety of violations after an inspection of the Poca Blending site. The state Department of Environmental Protection issued five notices of violation, or NOV's, alleging improper storage of materials that could contaminate groundwater, failure to follow a DEP-issued stormwater permit, failure to provide required pollution discharge monitoring reports.

Interestingly, the DEP also cited Freedom's Nitro operation for not having the appropriate "secondary containment" for chemical spills -- a

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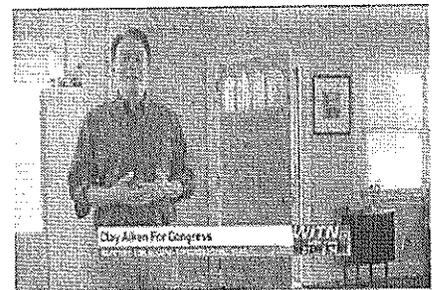
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problem that regulators have said was a major cause of last Thursday's spill of "Crude MCHM" into the Elk River.

"Secondary containment within the facility was deteriorated or non-existent," the DEP said in an inspection report. "The plan indicates that the building itself acts a secondary containment, but holes exist at floor level in the building's walls.

"The building is surrounded by a trench which catches any runoff from within the building," the report says. "Closed gates prevent this trench from discharging unless personnel open them, but since there is no method for separating stormwater from spillage prior to entering the trench, it does not function as secondary containment."

The report says that six tanks containing MCHM from the Elk River site are staged on site. It adds, "Construction of a clay berm is planned to provide secondary containment for these tanks, but two are currently placed in a location which would prevent such construction and only one tank is on an impervious surface."

DEP inspected the Nitro site on Monday and issued the NOV's on Tuesday. The documents were made public on Wednesday.

Agency Secretary Randy Huffman said that DEP's enforcement and cleanup order had clearly mandated that Freedom Industries take the material from the Elk River spill to a site with proper precautions, including required spill containment.

"It's a problem," Huffman said. "They did not follow our order."

DEP's order to Freedom Industries did not specify exactly where the material from the Elk River site had to be taken, and Huffman said he did not know for sure when agency officials learned it was being taken to Nitro.

Huffman said the company's Nitro operation holds a DEP storm-water pollution permit.

NITRO, W.Va. -- It smells like licorice in the Par Industrial Park in Nitro.

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Interestingly, the DEP also cited Freedom's Nitro operation for not having the appropriate "secondary containment" for chemical spills -- a problem that regulators have said was a major cause of last Thursday's spill of "Crude MCHM" into the Elk River.

"Secondary containment within the facility was deteriorated or non-existent," the DEP said in an

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Scott Mandirola, director of DEP's Division of Water and Waste Management, said agency officials inspected the Nitro site in 2004 following an acid spill that the company remediated in 2005.

Late Wednesday, the U.S. Department of Labor's Occupational Safety and Health Administration announced it had opened an investigation at the Nitro site following reports of "potential chemical storage hazards."

Also released by DEP were records concerning the agency's response to an odor complaint at the Elk River terminal in April 2010. A resident said the air near the terminal smelled like licorice and left a bad taste in their mouth.

DEP records about that complaint indicate that an agency inspector went to the facility and requested a material safety data sheet, or MSDS, "for the product causing the odor."

Huffman said that DEP had previously determined that the company, which at the time handled only the material glycol, did not meet the state test for needing an air pollution permit.

During their odor investigation in April 2010, though, DEP inspectors found the company also handling another, licorice-smelling material, presumably MCHM, officials said.

"Once back at the office, we found out that a permit determination was not completed for this product," the DEP inspection report shows.

The records say that DEP in May 2010 took the appropriate forms to the site and asked facility manager Roger Arthur to complete them "for any product on site that was not in the first determination.

"On May the 10th, the company came in to review files and to complete the said forms," the DEP records show. "No further action at this time, but we will need to see what comes out of the determination."

Huffman said DEP determined the site still did not meet the test for needing an air pollution permit.

Other records released by DEP documented the Jan. 9 odor complaint that led to DEP inspectors

discovering the Elk River spill in the first place.

One email record relates one DEP employee forwarding that complaint to another agency worker.

"Hey there," the e-mail said. "Just received a call from a gentleman that said there is something in the air at the 77-79 split each morning when he comes to work. He said it is coating his wife's throat. Told him I would give you his contact information. Thanks!!"

Back at the Nitro library on Wednesday morning, Godby said she didn't know that the chemicals were being stored without any secondary containment wall, in violation of DEP orders.

"Oh, that's good to know," she said, sarcastically, when told.

A private security guard escorted a Gazette reporter out of the Nitro Blending parking lot Wednesday morning. He would not say who hired him.

Reach Ken Ward Jr. at kw...@wv Gazette.com or 304-348-1702. Reach David Gutman at david.gut...@wv Gazette.com or 304-348-5102.

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Home > News > Freedom verifies two chemicals (Crude MCHM, PPH) in tank

Freedom verifies two chemicals (Crude MCHM, PPH) in tank

1/22/2014

Freedom Industries told the West Virginia Department of Environmental Protection today that the tank that leaked materials into the Elk River from the company's Ettowah Terminal on Jan. 9 contained two chemicals – Crude MCHM and PPH.

Freedom was responding to an Order issued by the WVDEP this morning demanding that the company, by this afternoon, disclose all materials spilled during a release from Storage Tank 396 at its Elk River facility. The spill shut down the water supply for close to 300,000 West Virginia residents.

The WVDEP Order arose from Freedom's disclosure to the WVDEP on Jan. 21 that another chemical (PPH), in addition to Crude MCHM, was contained in the above-ground storage tank that leaked materials into the Elk River.

"PPH is added to the Crude MCHM to act as an 'extender' in that the Crude MCHM is available in limited, sporadic quantities," Freedom said in its response letter to the WVDEP. "At the time of the release on Jan. 9, the blend in Tank No. 396, after extensive calculation, was approximately 88.5 percent Crude MCHM, and 7.3 percent PPH by weight and 4.2 percent water by weight. Our records and internal investigations indicate that there were no other materials in Tank 396 at the time of the release."

Freedom's letter was signed by Freedom President Gary Southern.

Freedom told the WVDEP on Jan. 21 that the storage tank contained roughly 300 gallons of PPH that it adds to its Crude MCHM mixture. This material was not included in the initial information regarding the composition of the spilled materials. Failure to accurately report "the type or types and quantity or quantities of the material or materials therein" is a violation of state code.

Today's Order gave Freedom until 4 p.m. to provide any and all information fully describing the composition of the materials spilled into the Elk River on Jan. 9.

"Having this revelation so late in the game is completely unacceptable," WVDEP Cabinet Secretary Randy Huffman said earlier today. "We have ordered Freedom to reveal any other information they have regarding the contents of the tank that leaked."

"Having to order them to provide such obvious information is indicative of the continued decline of their credibility," Huffman said.

Compliance with the terms and conditions of this Order did not in any way relieve Freedom Industries, Inc. of the obligation to comply with any applicable law, permit, other order, or any other requirement otherwise applicable. Violations of the terms and conditions of this Order would subject Freedom Industries, Inc. to additional enforcement action in accordance with the applicable law.

[Read Freedom's response here](#)

Contact:

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FOR IMMEDIATE RELEASE
January 23, 2014



Contacts:

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Lawrence Messina
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Lawrence.C.Messina@wv.gov

CHARLESTON, W.Va. – Initial retesting concluded today has revealed no detectable levels of PPH, the material that Freedom Industries failed to disclose as being present in the storage tank that leaked into the Elk River on Jan. 9, 2014. These results indicate no health concerns, based on the latest guidance provided by the U.S. Centers for Disease Control and Prevention.

To ensure the protection of public health, the interagency team plans to pursue more aggressive testing of water samples for PPH.

The team retested 30 samples drawn since Jan. 10 from the intake and outflow at West Virginia American Water Co.'s treatment plant. The methodology for testing for PPH, developed on Wednesday, Jan. 22, included a detection limit at 2 parts per million. That retesting, concluded earlier today, returned "No Detect" readings for all 30 samples at that detection limit.

Those results are attached and will be posted online. The team plans to pursue additional testing at a detection limit of 1 ppm.

Officials also report that a review of water quality tests routinely conducted at the treatment plant show no sign of phenol, a chemical byproduct that should appear if PPH reacted with water treatment processes. Spectrometer readings conducted since the Jan. 9 leak have also shown no decomposition product of PPH or the phenol byproduct.

Gov. Earl Ray Tomblin has approved the team's pursuit of testing as the CDC continues to research an appropriate testing threshold for PPH.

CDC officials have so far cited available toxicological information on PPH to report that the toxicity of this material appears to be lower than the toxicity of MCHM. The CDC also considers it likely that any amount of PPH currently in the water system would be extremely low. State officials remain in contact with CDC.

Dr. Vikas Kapil, Chief Medical Officer & Acting Deputy Director at the CDC's National Center for Environmental Health and Agency for Toxic Substances and Disease Registry, has said "An initial review of the currently available toxicological information does not suggest any new health concerns associated with the release of PPH."

###

APP000214



STATE OF WEST VIRGINIA
DEPARTMENT OF HEALTH AND HUMAN RESOURCES

Earl Ray Tomblin
Governor

Office of the Secretary
One Davis Square, Suite 100, East
Charleston, West Virginia 25301
Telephone: (304) 558-0684 Fax: (304) 558-1130

Karen L. Bowling
Cabinet Secretary

January 13, 2014

**Statement from Karen Bowling, Cabinet Secretary,
West Virginia Department of Health and Human Resources**

State and local health care officials have reviewed and concur with the guidelines developed by West Virginia American Water Company for flushing water systems to ensure water quality.

IMPORTANT: Please be advised you should only follow these guidelines when the “do not use” order has been lifted for your zone. It’s critical that you adhere to the guidelines by zone to help avoid service interruption.

Thank you for your patience and cooperation during this crisis. We are confident if we follow these guidelines by zone, will ensure the safe restoration of water to affected areas.

###



**STATE OF WEST VIRGINIA
DEPARTMENT OF HEALTH AND HUMAN RESOURCES**

Office of the Secretary

One Davis Square, Suite 100, East
Charleston, West Virginia 25301

Telephone: (304) 558-0684 Fax: (304) 558-1130

**Earl Ray Tomblin
Governor**

**Karen L. Bowling
Cabinet Secretary**

January 16, 2014

**Statement from Dr. Letitia Tierney
Commissioner for the Bureau for Public Health and State Health Officer**

The Bureau for Public Health has received numerous questions related to the advisory for pregnant women based on additional advice from the Centers for Disease Control and Prevention (CDC). The Bureau for Public Health has received no further information to suggest there is any harm to any other populations.

Please continue to follow the flushing guidelines established as your zone is lifted. As always, if you have medical concerns, contact your physician.

###



FOR IMMEDIATE RELEASE

January 29, 2014

Statement from Dr. Letitia Tierney, Commissioner for the State Bureau for Public Health and State Health Officer

CHARLESTON, W.Va. – Scott Simonton's presentation to the West Virginia Joint Legislative Committee today is totally unfounded and does not speak to the health and safety of West Virginians.

Subject matter experts who have been assisting West Virginia through this entire emergency response state that the only way possible for formaldehyde to come from MCHM is if it were combusted at 500°F.

The World Health Organization (WHO) states formaldehyde is the most frequent aldehyde found in nature and is naturally measurable in air and water. Formaldehyde is created through the normal breakdown cycle of plants and animals. Formaldehyde dissolves easily in water and does not last a long time in water.

Additionally, formaldehyde is naturally produced in very small amounts in our bodies as a part of our normal, everyday metabolism and causes no harm. It can also be found in the air that we breathe at home and at work, in the food we eat, and in some products that we put on our skin.

Formaldehyde is found in many products used every day around the house such as antiseptics, medicines, cosmetics, dish-washing liquids, fabric softeners, shoe-care agents, carpet cleaners, glues and adhesives, lacquers, paper, plastics, and some types of wood products.

We are unaware of the specifics of how this study was conducted, including sampling procedures, protocol and methodology, and would also be interested in the possibility of some other issue affecting the testing of water at the establishment indicated.

Everyone has been affected by this water crisis and public health is of the utmost importance. Mr. Simonton has not been part of the integral team of water testing officials from numerous state, local and private agencies working non-stop since January 9. His opinion is personal but speaks in no official capacity.

###



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Town Hall Panelists Weigh In On Water Crisis Issues

Reported: Jan. 29, 2014 2:39 PM EST
Updated: Jan. 30, 2014 2:10 PM EST

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CHARLESTON, W.Va. (Jeff Morris) – A heavy-hitter panel of experts quickly weighed in on discussion about the water crisis at a Town Hall forum at the Clay Center, with one official acknowledging there are still many unknowns about the effects of the chemical spill on public health.

"We are the first human beings this chemical has ever been experimented on," Dr. Rahul Gupta, executive director of the Kanawha-Charleston Health Department, said. "We are the laboratory population in a way."

Gupta told audience members on Wednesday at the "Town Hall: West Virginia Water Crisis: What's Next?" that the main guidance people have had to follow since the chemical spill of MCHM was the 1 part per million level that was being followed by West Virginia American Water based on the advice of the Centers for Disease Control.

The health department official said there still are many people who have reported health issues such as rashes and diarrhea, but Gupta said there is no way yet to prove a direct link. He said he would like to see a health surveillance program started to document people's symptoms and try to determine if they are related to the contact and exposure to the chemical.

Several people in the audience wanted to know why there was not any type of enforcement or regulations that would have prevented the chemical spill at Freedom Industries.

Environmental activist Erin Brockovich said regulation without enforcement is "pointless."

During the forum, the issue of trust was raised several times. Some people said they were angry at West Virginia American Water and Freedom Industries for not sending representatives to the forum.

Brockovich, who said she is a mother and a grandmother, said she knows where she stands on the issue of trust.

"I don't need anyone to tell me to trust them, when I can see and smell something is wrong," Brockovich said.

Randy Huffman, cabinet secretary for the West Virginia Department of Environmental Protection, said he understands it is going to take some time and effort when it comes to trust.

"We respect it is going to take some time," Huffman said. "We can't talk our way into it. We have to demonstrate it with our actions."

The full video of the two-hour forum can be viewed [here](#).

CHARLESTON, W.Va. (Jeff Morris, Bethany Simmons) – It's just a few hours until a major event that tackles a topic that has been on the minds of nearly everyone in our region – the water crisis.



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Eyewitness News' "Town Hall: West Virginia Water Crisis: What's Next?" will begin at 5:30 p.m. Wednesday at the Clay Center. If you have registered to attend, make sure to bring your email confirmation ticket with you.

Registration is now closed due to limited seating, but you can watch from the comfort of your own home.

Watch the event live from 5:30 p.m. to 6:30 p.m. on WCHS TV, and the entire forum will be streamed live on our website at wchstv.com from 5:30 p.m. to 7 p.m. Click on the Town Hall tab on the website.

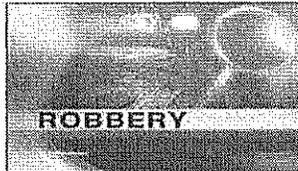
Plus, join us on Facebook for a live chat -- just click the Town Hall tab to join in on the conversation.

The Town Hall will have a live audience with an expert panel of guests. Our panelists include:

- * Environmental activist, Erin Brockovich
- * Cabinet Secretary for the West Virginia Department of Environmental Protection, Randy Huffman
- * Executive Director at Kanawha-Charleston Health Department, Rahul Gupta
- * Lead Investigator U.S. Chemical Safety Board, Johnny Banks
- * Environmental Investigator Bob Bowcock
- * Chief of Environmental Security Emergency Response, Mike Dorsey

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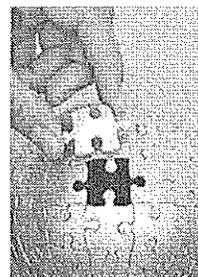
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EYEWITNESS LOCAL NEWS
from Eyewitness News Online

Freedom Industries Has Another Spill

Reported: Jan. 31, 2014 3:35 PM EST
Updated: Jan. 31, 2014 6:28 PM EST

EYEWITNESS NEWS ONLINE WEBCAST VIDEO

CHARLESTON, W.Va. (Bob Aaron, Heath Harrison) -- Another spill has been reported at Freedom Industries facility near Charleston.

An excavator ripped into a pipe containing water and crude MCHM Thursday night.

The West Virginia Department of Environmental Protection said the material spilled into a culoff trench and did not reach the Elk River. The pipe was not listed on the maps of Freedom Industries' grounds.

Crews used a camera to explore the pipe. A strong licorice odor was produced. The DEP called it a small amount, but declined to say how much was spilled. The spill was said to have slowed to a trickle.

The company had a major chemical spill of MCHM Jan. 9 at its Barlow Drive facility near Charleston. The leak into the Elk River resulted in a massive water crisis in nine counties.

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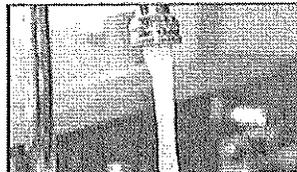


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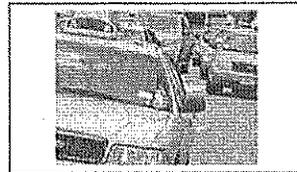
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Water Company Says All Boil Water Advisories For South Charleston Now Lifted



Feb. 4, 2014 3:53 PM EST
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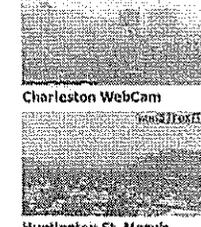


Feb. 4, 2014 3:05 PM EST
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Firefighters Save Dog From Sinkhole In Buffalo, NY



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EYEWITNESS LOCAL NEWS

from Eyewitness News Online

Water Tests At Three Kanawha Schools Are Above Acceptable Levels

Reported: Jan. 31, 2014 1:04 PM EST
Updated: Jan. 31, 2014 6:29 PM EST

EYEWITNESS NEWS ONLINE WEBCAST VIDEO

CHARLESTON, W.Va. (Jeff Morris) – Water tests at three Kanawha County schools are above acceptable levels.

Kanawha County school board member Pete Thaw said the schools are George Washington High School and John Adams Middle School in Charleston and Andrews Heights Elementary School in Tornado.

The West Virginia National Guard conducted the tests at 130 schools in the wake of the water crisis.

Schools have been using bottled water for drinking and cooking. But the tests of the tap water were done as a precautionary measure. Thaw said the systems will be flushed at the schools this weekend, and he expects them to be ready on Monday.

Kanawha County Schools Superintendent Ron Duerring said in a news release the three schools will undergo another round of flushing following water tests conducted by the West Virginia National Guard. He said this is to achieve a non-detect level below 10 parts per billion as directed by Gov. Earl Ray Tomblin.

During the current water crisis, Kanawha County Schools has partnered with the Kanawha County Health Department, the West Virginia Bureau of Public Health and the National Guard to make sure each of its 69 schools met the safe criteria for water consumption, Duerring said.

The superintendent said the state's interagency team has been testing the water system to ensure non-detect levels below 10 parts per billion. This testing included additional testing inside schools and hospitals in the affected areas to give an additional level of assurance.

Hand sanitizer, bottled water and food preparation with bottled water is being used in each school until the schools have been cleared below 10 parts per billion. Kanawha County Schools will re-flush.

Duerring said Kanawha County Schools followed the proper protocol and guidelines for flushing each individual school to achieve the CDC recommended level of 1 part per million. This additional testing and work is to ensure a level 100 times below the CDC recommended level and a level CDC has deemed safe for all populations.

As an additional safety precaution, each school's water was tested and samples were taken to ensure the water quality was at this additional standard. Out of the 69 schools that were tested, 59 water samples have returned and three schools were not yet at the lower threshold that the interagency team was directed to achieve beyond the CDC guidelines. The rest of those schools results showed non-detect levels at the 10 parts per billion level.

"Kanawha County Schools continues to work with the local health department, the West Virginia Bureau of Public Health and the National Guard to meet safe water standards," Duerring said. "Additional flushing will begin this weekend and additional water samples will be taken to ensure water quality at the identified schools. As additional results come in from the remaining facilities, Kanawha County Schools will communicate with parents and the public. Our goal is the safety of all children."

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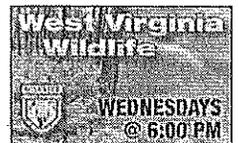
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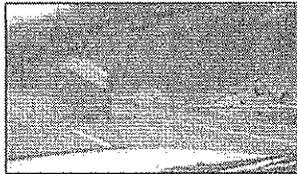
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The results of the water tests conducted at the schools can be viewed [here](#).

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Feb. 5, 2014 11:38 AM EST CHARLESTON, W.Va. (Bethany Simmons) -- A large boulder ...

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Feb. 5, 2014 11:31 AM EST MORGANTOWN, W.Va. -- Sign, sign everywhere is a sign ...

Tomblin To Hold 1:45 P.M. News Conference Wednesday On Water Crisis



Feb. 5, 2014 10:56 AM EST CHARLESTON, W.Va. (Jeff Morris) - West Virginia Gov. ...



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Feb. 5, 2014 10:49 AM EST



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Feb. 5, 2014 11:21 AM EST



Deputies Say Two Taken Into Custody After Meth Lab Found On West Side

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Feb. 5, 2014 10:52 AM EST



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CDC, EPA Officials Visiting Charleston Wednesday For Water Crisis Update

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AEP Adds Charge On Bills; Company Says No Net Range Change

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Residents In Boyd County Still Struggling With Water Crisis

Feb. 5, 2014 10:00 AM EST



DEP To Monitor Contaminated Soil At Freedom Industries As Water Levels Rise

Feb. 4, 2014 5:52 PM EST



WV Senate Committee Moves Sudafed Bill Forward

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January 24, 2014

MCHM leak inquiry will take about a year

Chemical Safety Board here for the 3rd time in 6 years

by David Gutman

CHARLESTON, W.Va. --The federal Chemical Safety Board has not discovered any holes in Freedom Industries' secondary containment wall, but the agency's investigation probably will last a year, and it's too early to know if the wall failed, CSB officials said Friday.

A CSB investigative team has been at Freedom Industries, the site of the chemical leak that contaminated the region's drinking water, since Jan. 13, but investigations of this type generally take about a year, CSB lead investigator Johnnie Banks told a special joint legislative committee on water resources.

Banks said that the secondary containment wall, which surrounds the leaky tank, had no defects "that we can observe with the naked eye."

He said that if investigators discover anything that requires an immediate recommendation, they will issue one.

"There's a sense of urgency in our mission, as well," he said. "We realize that the citizens of this area want to know what happened."

Several of the seven lawmakers at the committee hearing were looking for recommendations they could act on within the ongoing 60-day legislative session.

After the hearing, Rafael Moure-Eraso, the chairman of the CSB, said that seems unlikely.

"We are interviewing people, we are collecting evidence, our tank expert has come to see the place and basically say, 'This is what I'm going to need.' We are getting started," Moure-Eraso said. "We will be able to talk more in six months, perhaps."

This is the third time in recent years that the CSB has been in the Kanawha Valley to investigate an incident.

Investigators were here in 2008 after an explosion at the Bayer CropScience plant in Institute killed two workers and they were here in 2010 to investigate a series of leaks at the DuPont plant in Belle that killed one worker.

The final Bayer report was not issued until Jan. 2011, two and a half years after the explosion. The final DuPont report was issued in July 2007, a year and a half after the leaks.

In both those reports, the CSB recommended that West Virginia establish a program to prevent hazardous chemical releases. State officials did not heed either recommendation.

Moure-Eraso said that that is the nature of his agency.

"We contact them and say, 'This is what we recommend' and we write letters to them and say, 'What are your actions about this,'" Moure-Eraso said. "The power that we have is to say 'It's acceptable' or 'It's unacceptable.'"

"We go to people like your newspaper and say, 'Look, we make these recommendations, which are public recommendations, and they have to be acted on.'"

Delegate Mike Manypenny asked if the CSB's three visits to the region in five years meant that there was a "systemic problem" with chemical maintenance in the Kanawha Valley, and in West Virginia as a whole.

"That is a fair statement," Banks said, although he added that West Virginia is not alone in having problems with chemical safety.

APP000223

"We look at how things drift to a state of being, over time, and then there's a catastrophic failure, and the question is, how could that happen?" Banks said. "It evolves over time."

Moure-Eraso also said it was the chemical manufacturer's obligation to provide information on the chemicals that leaked into the Elk River and that the information that has been provided has been scant and inadequate.

The two leaked chemical compounds -- Crude MCHM and PPH, stripped -- are made by Eastman and Dow chemicals, respectively.

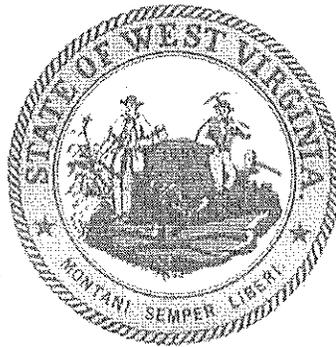
The federal Centers for Disease Control and Prevention have said the area's water is safe for everyone except pregnant women, with less than 1 part per million of Crude MCHM.

Moure-Eraso did not counter that standard, but he did say of Crude MCHM and PPH, stripped, "They shouldn't be in drinking water. Period. At any level."

Reach David Gutman at david.gut...@wv Gazette.com or 304-348-5119.

**State of West Virginia
Source Water Assessment and
Protection Program
Source Water Assessment Report**

**WVAWC - Kanawha Valley
Kanawha County
PWSID: WV3302016**



Prepared by:

**West Virginia Department of Health and Human Resources
Bureau for Public Health
Office of Environmental Health Services
Source Water Protection Unit**

Date: April 2002

**Surface Water Public Water Supply Systems
Source Water Assessment and Protection Program (SWAPP)
Susceptibility Report**

Prepared by the West Virginia
Bureau for Public Health, Source
Water Assessment and Protection
Unit

Date Prepared: Thursday, April 25,
2002

What is the Purpose of a Susceptibility Report?

A susceptibility report identifies the most significant potential contaminant sources that could threaten the quality of your public water supply. Your susceptibility ranking does not imply poor water quality. Regular water tests best reflect actual water quality. This report will be used by public water supply systems with a surface water source. In addition, this report will enhance West Virginia's existing watershed approach to water quality improvement and protection. Table 1 provides you information on your public water supply.

What is SWAPP?

The SWAPP, established under the Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supplies;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

Table 1: Public Water Supply (PWS) Information

| | |
|---------------|-----------------------------------|
| PWS Name | WVAWC-Kanawha Valley |
| PWS Address | P.O. Box 1906 Charleston WV 25301 |
| PWS ID Number | WV3302016 |
| County | Kanawha |
| System Type | Community |

The West Virginia Bureau for Public Health (BPH) is undertaking this task. The rankings of susceptibility of your intake (s) to potential contamination are listed in Table 2.

Table 2: Intake Information

| Facility Name | Source Name | Design Meets Regulations | Susceptibility Ranking |
|----------------------|-------------|--------------------------|------------------------|
| WVAWC-Kanawha Valley | Elk River | Yes | High |

The BPH Central Office assessed the source, West Virginia American Water Company (WVAWC)-Kanawha Valley. A file review and field survey were used to conduct the assessment.

What is my Source Water Protection Area (SWPA)?

Unlike ground water aquifers, which have a natural protective layer above them, all surface waters are susceptible to contamination because they are exposed at the surface and lack a protective barrier from contamination. Accidental spills, releases, sudden precipitation events that result in overland runoff, or storm sewer discharges can allow pollutants to readily enter the source water and potentially contaminate the drinking water at the intake. Because of this, the SWPA consists of two types of delineations.

- **Watershed Delineation Area**

The first type of delineation is the Watershed Delineation Area (WSDA). Figure 1 shows the extent of the WSDA, which covers approximately 1,527 square miles in the Elk River Watershed. The WSDA includes the entire watershed area upstream of the intake up to the boundary of the West Virginia state border, or a topographic boundary. The perimeter of the catchment area provides the water to the water supply intake.

- **Zone of Critical Concern**

The second type of delineation is the Zone of Critical Concern (ZCC). Figure 2 shows the ZCC area, which covers approximately 5,969 acres. The ZCC is a corridor along streams within the WSDA area that warrants a more detailed inventory and management due to its proximity to the surface intake and to the susceptibility to potential contaminants. The ZCC is calculated using a mathematical model that accounts for stream flows, gradient, and area topography. The length of the ZCC is based on a five hour time of travel. The ZCC width is 1000 feet from each bank of the principal stream and 500 feet from each bank of the tributaries draining into the principal stream.

What is Susceptibility?

Susceptibility is a measure of your intake's potential for contamination from land uses and activities within the SWPA at concentrations that pose a concern. The purpose of the susceptibility analysis is to provide a pointer to what action a public water system should take to further define and reduce susceptibility. This may include recommendations for a more detailed inventory and assessment, monitoring work, or an indication of the type and intensity of source water and other protection activities needed.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMP's) are used. However, the susceptibility determination for your intake did not take into account whether BMP's are being used.

Susceptibility of a drinking water intake does not mean a customer will drink contaminated water. Water Suppliers protect drinking water by monitoring and treating water supplies, and using BMP's and source water protection measures to ensure that safe water is delivered to the tap.

How Was The Water Supply Susceptibility Determined?

Your intake (s) susceptibility is based on the following:

Resource Characterization

The purpose for conducting the Resource Characterization analysis of the delineated SWPA is to obtain an understanding of its physical, biological, chemical, and hydrological characteristics. Four resource characteristics were evaluated:

- The potential for surface runoff to occur;
- The ease that surface runoff transport material can be delivered into the stream;
- The movement through the SWAP area; and
- The biological and chemical health of the surface water resource in the SWAP area.

- **Potential for Surface Runoff to Occur**

The soil types present in the watershed area and the associated soil properties have a direct influence on the potential for surface runoff to occur. As infiltration rate of soil increases, (more precipitation soaking in rather than running off) the contaminant load associated with the reduced runoff should decrease. Table 3 provides a summary of the associated soil groups.

Table 3: Summary of Soil Associations in the WSDA

| Soil Associations | Soil Drainage | Topographic Setting |
|---------------------------|--------------------------|--------------------------------|
| Kanawha-Hackers | Well drained | Gently sloping |
| Gilpin-Upshur-Vandalia | Well drained | Gently sloping to very steep |
| Clymer-Gilpin-Dekalb | Well drained | Very steep |
| Buchanan-Chavies-Pope | Moderate to Well drained | Steep to nearly level |
| Gilpin-Upshur-Buchanan | Moderate to Well drained | Very steep |
| Gilpin-Dekalb-Buchanan | Moderate to Well drained | Very steep |
| Calvin-Belmont-Mecksville | Well drained | Gently sloping to very steep |
| Potomac-Tioga-Holly | Well and Poorly drained | Nearly level |
| Mandy-Snowdog-Gauley | Moderate to Well drained | Strongly sloping to very steep |
| Cateache-Shours-Belmont | Well drained | Gently sloping to very steep |

- **Ease of movement of material into the Stream System (Rate of Overland Material Transport):**

The size, shape, and slope of the SWAP area have a direct influence on material transported by surface runoff. In general, the longer the overland travel distance and travel time that surface runoff has taken in order to reach a stream channel, the greater the chance it has to deposit and filtrate the contaminants that may occur. Table 4 provides an analysis of the size, shape, and slope.

Table 4: Hydrologic Setting

| | |
|--------------------------------------|---------------|
| Size of WSDA Area (mi ²) | 1,527 |
| Shape of WSDA Area | Long & Narrow |
| Stream Length (Main Stem) (mi) | 186 |
| Average Watershed Slope | 10 to 30 % |

- **Movement of Water through the Watershed Area**

A number of physical and natural factors can influence the movement of water through the SWAP area. The pattern and development of the drainage network of the SWAP area directly influence the rate of water movement. Evaluation of the hydrologic cycle will provide an indication of the amount of annual rainfall that is absorbed into the ground or becomes runoff. Table 5 summarizes the total mileage of streams contained in the WSDA, average stream gradients of the main stem, average rainfall, the nearest relevant USGS stream gauge, distance to gauge, topographic position of gauge, annual mean discharge, high flow, and low flow.

Table 5: Movement of Water

| | |
|---|-------------|
| Number of Stream Miles | 2,051 |
| Average Stream Gradient (Main Stem) | 11.13 ft/mi |
| Average Rainfall | 44 |
| Nearest Relevant USGS Stream Gauge | 031197000 |
| Distance to Relevant USGS Stream Gauge (mi) | 22 |
| USGS Stream Gauge Topographic Position | Upstream |
| Annual Mean Discharge (cfs) | 3,259 |
| High Flow (cfs) | 158,000 |
| Low Flow (cfs) | 595 |

- **Review of Water Quality Data**

In order to characterize the condition of the surface water within the watershed, the available chemical and biological water quality data was reviewed. This data was collected as part of the BPH and the West Virginia Department of Environmental Protection (DEP) implementation of the federal Safe Drinking Water Act and Clean Water Act. Water quality data was evaluated to help provide direct pointers to a source of contamination and to direct the focus for additional source evaluations. Additionally, immediate source water protection efforts will be identified by this review.

Available water quality data includes test results from treated drinking water, finished water, and untreated source water (raw water) conducted by the water supplier; ambient water chemistry; biological criteria and monitoring (bacteria, macroinvertebrates and fish); and habitat evaluation. The sampling requirements for public water systems vary depending on the type of system and the federal regulated testing requirements. Therefore, a lack of water quality impacts may indicate the lack of a certain type of sampling rather than a lack of contamination.

Summary of Raw and Finished Water Quality Results from Public Water System

Water sampling conducted by West Virginia American Water Company indicates that raw water turbidity maximums appear to have increased significantly over the past two years, based on the five years of data reviewed. The WVAVC-Kanawha Valley Plant takes a raw water bacteriological sample almost on a daily basis; which is not required by regulation. These tests indicate elevated levels during periods of high water.

There have been no occasions when the observed concentrations have been above the established MCLs for these parameters in the finished water. For additional information on the finished water quality, please review the consumer confidence report for a yearly summary of the water quality.

Summary of Chemical and Biological Water Quality Results from the West Virginia DEP

In 2000, the DEP conducted biological and chemical water quality monitoring on 153 streams totaling 832 miles in the Elk River watershed for the 305b report, as a requirement of the federal Clean Water Act. Two hundred and twenty miles (26%) were fully supporting their overall designated uses. Considering major and moderate/minor impacts, the principal causes of impairment in the watershed are metals, siltation, and habitat alteration (non-flow). Additional significant causes of impairment are pH and Fecal Coliform. Considering major and moderate/minor impacts, the principal sources of pollution in the watershed are unknown source, petroleum activities, and abandoned mining. During this reporting cycle, 460.41 miles of stream in the Elk River watershed were monitored for toxics. Of these, 65.09 miles (14.1%) had elevated levels of toxics.

The DEP performed an ecological assessment of the Elk River and its tributaries in 1997. Assessments at each site included measurements of physical attributes of the stream and riparian zone, observations of activities and disturbances in the surrounding area, water quality analysis, and benthic macroinvertebrate collection. Of the 145 sites sampled, 26 were impaired, 14 were potentially impaired, 95 were unimpaired, and 10 were collected by incomparable methods and could not be scored.

Summary of Other Available Chemical and Biological Water Quality Data

Not Available

POTENTIAL SIGNIFICANT CONTAMINANT SOURCES (PSCS'S):

Inventory of Potential Significant Contaminant Sources

The purpose of providing an inventory of certain types of land uses, potential significant contaminant sources, and activities within the SWAP area is to aid in reducing the risk posed to the public drinking water supply. The following subsections provide information regarding the methodology used to generate the inventories.

The inventory portion of the SWAP consists of two steps:

- The first step is the broad inventory based primarily on regulated and existing databases. The inventory consists of a general land use analysis, the identification of regulated activities in the delineated WSDA areas, and an analysis of road and rail crossings adjacent to the streams in the WSDA area.
- The second step is the detailed inventory of PSCS's in the ZCC. The detailed source inventory is conducted to identify PSCS's that were not captured in the broad regulated source inventory and to field verify the PSCS's in the ZCC. PCS's located during the inventory are found on Figure 2.

A detailed risk-assessment of the PSCS's was beyond the scope of this survey because of minimal data and resources. Local decision makers should do the detailed risk analysis because they are better suited to make the bridge from assessment work to protective strategies. The West Virginia SWAP program can provide guidance to the decision makers and help in prioritizing the PSCS sources.

- **Existing (primarily regulated) Database Review**

Table 6: Summary of existing (primarily regulated) PSCS's

Table 6 is a summary of existing PSCS's based on public information obtained from various federal, state, and local agencies that maintain environmental regulatory databases. These databases provide information about the regulatory status of a property and incidents involving use, storage, spilling or transportation of oil, and hazardous materials.

| | NUMBER | PERCENT |
|------|--------|---------|
| WSDA | 53 | 100 |
| ZCC | 26 | 49 |

- **Summary of the Detailed Inventory**

Table 7: Summary of PSCS within the ZCC

Table 7 is a summary of the detailed inventory of potential contaminant sources in the ZCC. The detailed source inventory was conducted to identify PSCS's that were not identified in the existing database review and to verify the location of the PSCS within the ZCC. Additional potential significant contaminant sources that were identified in detailed inventories of the ZCC consist of commercial activities (Shell Gas Station, Sun Belt Rentals), municipal operations (City of Charleston Sewage Lift Station, Road Salt Storage), and industrial operations (Allegheny Power Company, Pennzoil Manufacturing Plant). Of these PSCS's, some of the industrial sources may have large volumes of potential contaminant stored.

| Potential Contaminant Source | TOTAL PSCS'S | PERCENT |
|------------------------------|--------------|---------|
| AGRICULTURE | 1 | 2 |
| RESIDENTIAL | 0 | 0 |
| MUNICIPAL | 4 | 8 |
| COMMERCIAL | 39 | 76 |
| INDUSTRIAL | 7 | 14 |

- **Transportation Network**

A summary of the transportation network is shown in Table 8. This information can be used to aid in planning for transportation related accidents that could result in contamination of the source water in the delineated WSDA. Table 9 is a summary of the transportation network stream crossings in the WSDA. Please note that miles of train tracks could be less due to decommissioning of tracks.

Table 8: Transportation Network Summary for WSDA

| | Within 100 feet of stream | Total |
|---------------------|---------------------------|-------|
| Miles of Interstate | 0.08 | 83 |
| Miles of Primary | 0.05 | 71 |

| | | |
|-----------------------|-----|-----|
| Miles of Secondary | 1.4 | 379 |
| Miles of Train Tracks | 21 | 212 |

Table 9: Transportation Network Stream Crossings in the WSDA

| | Train Tracks | Interstate | Primary Roads | Secondary Roads |
|----------------------------|--------------|------------|---------------|-----------------|
| Number of Stream Crossings | 180 | 47 | 44 | 224 |

- **General Land Use**

The general land use analysis will provide an indication of which land uses predominate throughout the SWAP area, near the intake, or adjacent to the rivers, streams, lakes, and reservoirs. The land use in the SWAP area is shown in Table 10.

Table 10: General Land Use

| LAND USE | WSDA Area (Acres) | WSDA % of Total | ZCC Area (Acres) | ZCC % of Total |
|-------------|-------------------|-----------------|------------------|----------------|
| Shrub Land | 11,343 | 1.00 | 102 | 2.00 |
| Woodland | 888,568 | 91.00 | 2,754 | 46.00 |
| Water | 10,314 | 1.00 | 797 | 13.00 |
| Roads | 1,201 | 0.10 | 133 | 2.00 |
| Power lines | 2,312 | 0.20 | 16 | 0.30 |
| Urban | 11,633 | 1.00 | 1,745 | 29.00 |
| Agriculture | 46,476 | 5.00 | 406 | 7.00 |
| Barren | 5,250 | 0.50 | 15 | 0.30 |
| Wetland | 401 | 0.04 | 1 | 0.02 |

SWAPP Area Assessment and Protection Activities

Analysis of the Resource Characterization and potential significant contaminant sources of the SWAP area for the WVAWC-Kanawha Valley indicates that the water supply is susceptible to possible future contamination based on the following:

- ✓ The long narrow shape, steep topographic setting, and the large size of the WSDA present an increased potential for contamination. An important flood control/recreational impoundment is located on the Elk River at Sutton in Braxton County approximately 100 miles upstream of the intake. In addition, the large number of stream crossings (495 total) provides the opportunity for an accidental release/spill of material to easily get directly into the stream drainage network. Source water protection efforts should be directed toward the establishment of an effective and efficient emergency response plan if one does not currently exist.
- ✓ Current land use practices appear to be having an adverse impact on the ecological health of the Elk River Watershed. Coal, oil, gas, timbering, and sandstone quarries are among the industries present. Agriculture is dominated by livestock and related products. This is evidenced by of the 832.41 miles assessed in the DEP 303b report; only 26.5% were fully supporting the overall designated use. Higher bacteria levels are generally concentrated around populations centers, caused by regulated or unregulated discharges. In addition, the health of the Elk River may be impacted by a number of regulated and unregulated point and non-point sources in the ZCC and WSDA.

Recommendations:

- ✓ Protection efforts should focus on the collection of additional information on the point and non-point sources present to evaluate the risk;
- ✓ Work with the Department of Health and Human Resources, other state agencies and local officials to make sure your intake is included in local regulations and inspections efforts;
- ✓ Restrict access to the intake area and post the area with Drinking Water Protection Area signs;
- ✓ Address any biological contaminant issues; and
- ✓ Protection options need to be actively considered to further evaluate and manage all potential contaminant sources and the WVAWC-Kanawha Valley public water supply should place a high priority on protecting its supply source.

NEXT STEP – SWAP Protection Plan

The next step in source water protection planning is to prepare a SWAP protection plan. The SWAP protection plan incorporates this source water delineation assessment report and three additional sections: Contingency Planning, Alternative Sources, and Management Planning.

Contingency Planning

A contingency plan documents the system's planned response to interruption of the source water supply.

Alternative Sources

Information pertaining to alternative water sources focusing on long-term source replacement should the system be required to develop a new source of water due to contamination (or other reasons). This section outlines the most likely sources that can be used as an alternate water source.

Management Planning

Management planning is the most important element of SWAP. The management plan identifies specific activities that will be pursued by the system to protect their water resources. The system will benefit by taking a proactive approach to source water protection in their watersheds. It is anticipated that most of the management effort will focus on coordination with government agencies and periodic surveys of the watersheds. It may be necessary to conduct a limited number of special studies to determine actual risk and consequences for selected contaminant sources. This information may be needed before decisions can be made on management activities.

Need additional information?

Additional information or sources of information can be obtained by calling or visiting the BPH web site at www.wvdhhr.org/bph/swap or phoning 304-558-2981.

Glossary:

Best Management Practices (BMP's) are operational procedures used to prevent or reduce pollution.

Public Water System (PWS) is a system for the provision to the public of pipe water for human consumption, if such system has at least 15 service or regularly serves an average of at least 25 individuals daily at least 60 days of the year.

Water Quality Data is used to help assess both the potential pathogen contamination and other compliance monitoring (Nitrates) parameters associated with public water supply wells.

Potential Significant Contaminant Source (PSCS) is a facility or activity that stores, uses, or produces chemicals or elements, and has the potential to release contaminants identified in the state program within a source water protection area in an amount, which could contribute significantly to the contaminants of the source waters of the public water supply.

Disclaimer - The coverage's presented in this program are under constant revision as new sites or facilities are added. They may not contain all the potential or existing sites or facilities. The West Virginia Bureau for Public Health is not responsible for the use or interpretation of this information. Please report any inaccuracies on either the map or inventory by phoning 304-558-2981.

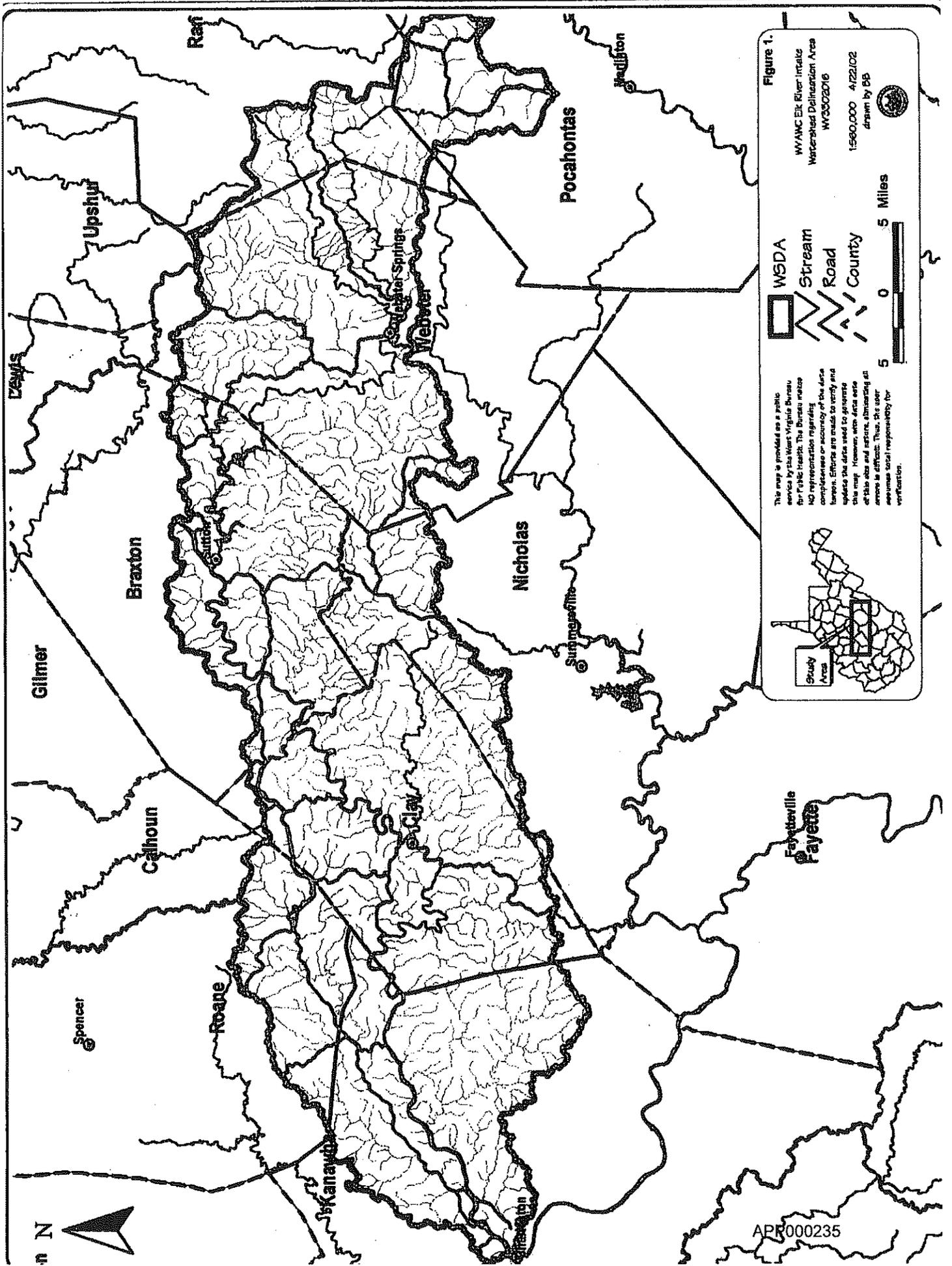
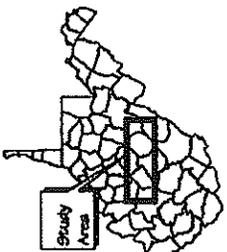


Figure 1.
 WAWAC Elk River Intake
 Watershed Delineation Area
 W0302016
 1:500,000 4/22/02
 drawn by BS

 WSDA
 Stream
 Road
 County

This map is provided as a public service by the West Virginia Bureau for Public Health. The Bureau makes no representation regarding completeness or accuracy of the data herein. Efforts are made to verify and update the data used to generate this map. However, when data were of this age and nature, obtaining all accurate data is difficult. Thus, the user assumes total responsibility for verification.





Infrastructure and Capacity Development

PERMITS ISSUED

| County | Project | Date | Number | Type | Location | Applicant |
|---------|--|------------|--------|------|------------------|--|
| Kanawha | Highland Way Apartments | 5/16/2005 | 16,529 | W&S | Cross Lanes | AB Contracting |
| Kanawha | Marmet Locks and Dam | 4/22/2002 | 15,226 | S | Marmet | AL Branch, Jr, US Army Corps |
| Kanawha | Drexel Place Subdiv. | 4/24/2000 | 14,466 | W&S | Cross Lanes | AI Teranova |
| Kanawha | Kanawha Court Apartments | 5/4/2004 | 16,057 | W&S | St. Albans | Bill Tuner - Kanawha Court Apartments |
| Kanawha | Knollview Village Apartments | 3/31/2005 | 16,455 | S | near St. Albans | Bill Turner |
| Kanawha | Knollview Village Apartments | 10/12/2004 | 16,258 | S | near St. Albans | Bill Turner Pison Inc. |
| KANAWHA | CROSSROADS VILLAGE APARTMENTS II | 1/23/2006 | 16,903 | W&S | NITRO | BILL TURNER, PISON DEVELOPMENT, INC. |
| Kanawha | Bilmar Corp Apts | 9/30/2003 | 15,797 | W&S | St Albans | Bilmar Corp |
| KANAWHA | RABEL MEADOWS SUBDIVISION | 5/18/2007 | 17,507 | W&S | ALUM CREEK | BLUERIDGE DEVELOPMENT, LLC |
| KANAWHA | BOBCAT OF ADVANTAGE VALLEY | 1/22/2007 | 17,373 | W&S | CROSS LANES | BOBCAT OF ADVANTAGE VALLEY |
| Kanawha | Camp Virgil Tate Sew | 3/21/2000 | 14,416 | S | Camp Virgil Tate | Camp Virgil Tate |
| Kanawha | Camp Virgil Tate | 1/24/2003 | 15,513 | S | Camp Virgil Tate | Camp Virgil Tate |
| Kanawha | Cardinal Storage&Apt | 1/2/2004 | 15,894 | S | Elkview | Cardinal Land Co LLC |
| Kanawha | SteinerWaySubd, PhIII | 6/21/2000 | 14,528 | W&S | Charleston | Carl Wiersteiner |
| Kanawha | WalhondaHillsSub, PhI | 12/4/2000 | 14,706 | W&S | St. Albans | Carmar Corporation |
| KANAWHA | CARRIAGE HILL TOWN HOUSES | 6/21/2005 | 16,601 | W&S | NEAR AMANDAVILLE | CARRIAGE HILL, LP |
| KANAWHA | CARRIAGE HILL TOWN HOUSES | 11/9/2005 | 16,807 | W&S | NEAR AMANDAVILLE | CARRIAGE HILL, LP |
| Kanawha | Hernshaw No. 1 Deep Mine Bathhouse | 5/10/2005 | 16,519 | S | Eskdale | Catenary Coal Company |
| KANAWHA | HERNSHAW NO. 1 DEEP MINE BATHHOUSE | 5/10/2006 | 17,051 | S | ESKDALE | CATENARY COAL COMPANY |
| KANAWHA | HERNSHAW NO. 1 DEEP MINE BATHHOUSE | 11/9/2007 | 17,768 | S | ESKDALE | CATENARY COAL COMPANY |
| Kanawha | Winchester Mine Bathhouse | 4/4/2008 | 17,932 | W | near Red Warrior | Catenary Coal Company |
| KANAWHA | CAMPBELLS CREEK NO.7 DEEP MINE BATHHOUSE | 5/11/2007 | 17,501 | S | TAB | CATENARY COAL COMPANY, LLC |
| KANAWHA | TEST WELLS | 12/21/2007 | 17,813 | WW | NEAR RED WARRIOR | CATENARY COAL COMPANY, LLC |
| KANAWHA | YEAGER AIRPORT- GENERAL AVIATION AREA | 5/4/2007 | 17,496 | W | CHARLESTON | CENTRAL WV REGIONAL AIRPORT AUTHORITY |
| KANAWHA | AIRPORT MOBILE HOME PARK PARCEL 6 ADDITION | 1/30/2006 | 16,915 | W&S | MILIKEN | CHARLES N. SLACK, AIRPORT MOBILE HOME PARK |
| Kanawha | 33rd street Sewer & Water Relocation | 2/10/2005 | 16,397 | W&S | Charleston | Charleston Area Medical Center |
| KANAWHA | ORCHARD MANOR | 4/6/2007 | 17,453 | S | CHARLESTON | CHARLESTON HOUSING AUTHORITY |

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| | APARTMENTS | | | | | %HARBINGER DEVELOPMENT |
|---------|---|------------|----------|-----|---|---|
| KANAWHA | ENGLEWOOD SUBDIVISION | 1/4/2008 | 17,827 | W&S | CROSS LANES | TRI-STATE ASSOCIATES |
| KANAWHA | TYLER HEIGHTS APARTMENTS | 10/28/2005 | 16,789 | W&S | CROSS LANES | TYLER HEIGHTS, LP % HARBINGER DEVELOPMENT |
| Kanawha | De-chlorination Fac. | 5/26/2000 | 14,499 | S | Cross Lanes | Union P.S.D. |
| Kanawha | Big Tyler Rd Sewer | 10/29/2002 | 15,437 | S | Cross Lanes | Union PSD |
| Kanawha | 40th Street Wastewater Treatment Plant Upgrade Big Tyler Road Sewer Extension Little Tyler Road Sewer Extension | 7/29/2009 | DNR(DEP) | S | 40th Street, Big Tyler & Little Tyler Roads | Union PSD |
| Kanawha | 40th Street WWTP Upgrade Big & Little Tyler Mountain Roads Sewer Extensions | 10/27/2008 | 18,142 | S | Cross Lanes | Union Public Service District |
| Kanawha | NewSwimmingPoolFilte | 7/25/2000 | 14,566 | P | Charleston | University of Charleston |
| Kanawha | Wal-Mart Store # 4278-00 | 12/1/2008 | 18,179 | W&S | Quincy | Wal-Mart Real Estate Business Trust 2001 SE 10th Street Bentonville, AR 72716 |
| KANAWHA | GUTHRIE/UPPER FISHER BRANCH WATER LINE EXTENSIONS | 10/17/2006 | 17,279 | W | GUTHRIE | WEST VIRGINIA AMERICAN WATER COMPANY |
| KANAWHA | GUTHRIE/UPPER FISHER BRANC H WATER LINE EXT. | 4/24/2007 | 17,478 | W | GUTHRIE | WEST VIRGINIA AMERICAN WATER COMPANY |
| KANAWHA | 12" CLENDENIN REINFORCEMENT WATER LINE EXTENSION | 7/9/2007 | 17,569 | W | CLENDENIN | WEST VIRGINIA AMERICAN WATER COMPANY |
| Kanawha | Derricks Creek Ridge Water Line Extension | 10/10/2008 | 18,136 | W | Derricks Creek Ridge | West Virginia American water Company David Carovillano PE |
| Kanawha | C. E. White Property | 1/4/2000 | 14,319 | W&S | Charleston | White Properties |
| Kanawha | Northwoods Develop. | 4/11/2000 | 14,448 | W&S | Charleston | William O. Jordan |
| Kanawha | Kanawha Valley WTP | 10/28/2002 | 15,435 | W | Charleston | WV Am Water Co-K Mitzner |
| Kanawha | Sanderson/Dutch Ridge Water Line Extnesions | 9/22/2008 | 18,105 | W | Sanderson/Dutch Ridge | WV American Water Co/March Shamblyn P O Box 1906 Charleston WV 25327 |
| KANAWHA | UPPER FRAME, PHASE I & II WATER LINE EXTENSION | 6/21/2007 | 17,547 | W | FRAME | WV AMERICAN WATER COMPANY |
| KANAWHA | UPPER WINIFREDE (FIELDS CREEK) WATER LINE EXTENSION | 10/15/2007 | 17,730 | W | WINIFREDE | WV AMERICAN WATER COMPANY |
| KANAWHA | GUTHRIE CENTER & HRDE HOUSING PROJECT WWTP REPLACEMENT | 7/20/2006 | 17,151 | S | GUTHRIE | WV DEPARTMENT OF AGRICULTURE |
| KANAWHA | MUNDY HOLLOW ROAD & FLEMING LANDFILL SEWERS | 1/23/2006 | 16,904 | S | NEAR SISSONVILLE | WV DEPARTMENT OF ENVIRONMENTAL PROTECTION |
| Kanawha | Tiger Morton Detenti | 4/24/2002 | 15,229 | W&S | Dunbar | WV Reg.Jail & Correct.Fac |
| Kanawha | WV Truck & Trailer | 10/7/2003 | 15,804 | W&S | Cross Lanes | WV Truck & Trailer |
| Kanawha | Upper Frame, Phase I & II Water Line Ext | 4/20/2004 | 16,034 | W | Frame | WV-American Water Co |
| Kanawha | Contr. 1-7,10,11,13 | 1/12/2000 | 14,330 | W | Kanawha County | WV-American Water Company |

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| | | | | | | |
|---------|----------------------|------------|--------|-----|-----------------|---------------------------|
| Kanawha | Big Tyler Rd Wtrline | 8/27/2002 | 15,348 | W | near Charleston | WV-American Water Company |
| Kanawha | Kanawha Co2003Wtr | 5/29/2003 | 15,646 | W | near Charleston | WVAWC |
| Kanawha | Witcher Cr WL Extens | 12/23/2003 | 15,886 | W | near Diamond | WVAWC |
| Kanawha | YWCA | 4/30/2008 | 17,971 | P&S | Charleston | YWCA |
| Kanawha | YWCA Swimming Pool | 8/23/2001 | 14,989 | P | Charleston | YWCA of Charleston |

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January 25, 2014

Freedom tanks not 'unregulated,' as Tomblin said DEP chief calls site 'under-regulated'

by Ken Ward Jr.
Staff writer

CHARLESTON, W.Va. -- Last Monday, Gov. Earl Ray Tomblin stood behind a podium in the West Virginia Capitol and announced his plan for a new program to prevent chemical spills from what he called "unregulated" above-ground storage tanks.

Tomblin said his proposal would give the state Department of Environmental Protection "the tools necessary" to prevent another chemical leak like the one from the Freedom Industries tank farm, which contaminated the Elk River and the drinking water supply for 300,000 West Virginians.

"It was not regulated, and this bill will address that," the governor said later to a small group of reporters.

When asked how he could call the Freedom Industries tank farm -- which held a water-pollution permit approved by the DEP -- "unregulated," the governor had agency Secretary Randy Huffman explain. Huffman carefully clarified what the governor had said.

"Unregulated is probably not the right word," Huffman said. "It was under-regulated."

Policymakers are beginning to respond to the leak of the chemical Crude MCHM into the Elk River, just upstream from the West Virginia American Water regional intake.

Some confusion continues, though, about exactly what authority the DEP had over the facility. A front-page New York Times story, for example, paraphrased Huffman as saying that, "because the facility stored chemicals, but did not produce them, his department had no responsibility for regulating it."

However, in several interviews with the Sunday Gazette-Mail, Huffman and other DEP officials have made it clear -- as Huffman did in his appearance with the governor -- that Freedom Industries was absolutely not unregulated.

"I don't think of them as being unregulated, but as being under-regulated," Huffman said in one discussion.

As debates over future actions move through the Statehouse, the distinction is important. Environmental groups and regulatory experts say that no matter what rules govern Freedom Industries or any other company, those rules mean little unless the DEP becomes more aggressive with inspections and enforcement actions.

"[The] DEP has long been influenced by anti-regulation and pro-industry political pressure," said Pat McGinley, an environmental law professor at West Virginia University's College of Law. "West Virginians can't expect any new law, alone, to change this deep-rooted culture."

Even some political leaders are starting to agree that West Virginia needs to take a closer look at how its political culture influences the DEP's enforcement actions.

"All the rules on the books won't work if there isn't adequate enforcement," said state Senate President Jeff Kessler, D-Marshall.

'They just store things'

In the days immediately after the Elk River leak, DEP officials said an initial review showed that they had not inspected the Elk River tank farm since at least 1991, when it was owned by a different company and was used for a different purpose.

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After a more comprehensive review of their records, DEP officials have revealed a series of site visits by inspectors from the agency's Division of Air Quality. Air inspectors were responding to odor complaints from residents -- some of whom reported the now-familiar black-licorice smell of Crude MCHM -- and examined if the site needed a state air-pollution permit. So far, DEP records indicate the agency concluded that the odor complaints were unfounded, and that no new permits were necessary.

"They don't manufacture anything and they don't process anything," the DEP's Huffman said on Jan. 10. "They just store things."

Last week, though, Freedom revealed that it was mixing two chemicals to make a material it called "PPH, stripped," and, in turn, mixing that material with Crude MCHM. Twelve days after the initial leak, Freedom revealed those facts when it disclosed that PPH also leaked into the Elk.

The DEP has not responded to a question about whether mixing those chemicals together should have required an agency permit or not.

What agency officials have disclosed is that Freedom Industries asked for and received DEP approval for registration under a "general permit" program covering storm-water-runoff pollution from industrial facilities.

During a legislative committee meeting Thursday, several lawmakers quizzed Huffman about this permit and what it did -- and didn't -- require of the DEP.

Huffman explained that the permit clearly gave the DEP authority to inspect the site. Then again, Huffman told lawmakers, "I have authority to enter onto any piece of ground in the state of West Virginia, whether it has a permit or not."

The site's storm-water permit also contained three key provisions that are important to remember in the context of the Elk River leak: It mandates that the company submit a storm-water-pollution prevention plan and a groundwater-pollution prevention plan, and it requires that the company immediately report any spills.

'[The] DEP issues these permits'

Early last week, the West Virginia Rivers Coalition and the consulting firm Downstream Strategies issued a report on the leak that pointed a finger at the DEP for not doing enough to use those tools to prevent such an incident.

"[The] DEP issues these permits, and it is [the] DEP's responsibility to enforce these permits," said Evan Hansen, president of Downstream Strategies and co-author of the report.

Hansen said that proper pollution-prevention plans would have required the company to explain the measures it had in place to contain the materials it handled, prevent spills and respond to any spills that did occur. However, Hansen's report indicated that those plans don't appear to have ever been filed with the DEP, and agency officials have not disputed that assessment.

Huffman doesn't dispute that some provisions of the storm-water permit could have helped. He pointed to the requirement to immediately report the leak, which Freedom Industries didn't follow, and the mandate to immediately take steps to adequately contain any spills, something else DEP inspectors say the company ignored.

If those things had been done, Huffman told the Senate Judiciary Committee, they "very possibly could have prevented this from entering the river."

DEP officials, though, also have tried to downplay any connection between the storm-water permit and the leak. Huffman said, for example, that the permit alone doesn't give his agency authority to set specific standards for the integrity of above-ground storage tanks -- something that legislation moving through the Senate would do.

Environmental groups don't necessarily disagree that more specific standards for such tanks are needed. They just think that a much broader approach, including a rethinking of the state's common jobs-versus-the-environment rhetoric is what's needed.

The Rivers Coalition-Downstream Strategies report, for example, urges the Legislature to require the DEP to inspect all facilities across the state that have any kind of water-pollution permit -- something the public might be surprised to learn isn't already mandated. And, the report recommends that the DEP no longer be allowed to grant storm-water permits to industrial facilities near drinking-water intakes through the much-less rigorous "general" permitting program.

General permits "are intended to be reserved for categories of activities with minimal environmental impact and are used to make permitting more efficient," the Rivers Coalition-Downstream Strategies report said.

Under this program, the DEP issues what it calls a "general permit" that contains basic requirements for controlling storm-water pollution. Companies then register with the DEP under the program, promising on paper that they'll comply with its basic requirements. Frequently, there is little follow-up by the DEP.

"Our presence at this or any of these sites is reactive in nature," Huffman said in a Jan. 20 interview.

"This incident could have been prevented or minimized just with the regulations we have in place," Huffman said, "but it just didn't click in anybody's mind that this was a concern."

'This is a different kind of animal'

Pat Parenteau, an environmental law professor at the Vermont Law School, said that's part of the problem with the DEP allowing such a site to be covered by a general permit program.

"It's no surprise that there was weak follow-up and enforcement on a general permit," Parenteau said. "That program isn't really designed for facilities like this. This is a different kind of animal."

Parenteau said the Elk River leak also is symptomatic of what happens when agencies have media-specific inspection procedures, rather than combined efforts that include things like air and water together.

"You have this sort of tunnel-vision approach," Parenteau said. "Media-specific inspections often miss violations of other sorts of media. It doesn't surprise me that the air-quality guys would go out there and pay no attention to spill prevention of any kind. That really isn't their job."

Johnnie Banks, a supervising investigator with the U.S. Chemical Safety Board, told lawmakers Friday that it's easy for companies and for regulators to, over time, ignore things like the odors residents complained were coming from Freedom Industries.

Often in industrial settings, Banks said, odors can become "normalized," so that workers don't really notice them. The same thing can happen with warning alarms about leaks. If little leaks set off alarms too often, workers can grow to ignore them as "nuisance alarms."

"If it becomes part of the lay of the land," Banks said in a later interview, "people get used to it."

In its report on the Upper Big Branch Mine disaster, a team led by longtime mine-safety advocate Davitt McAteer made the same point.

"Normalization of deviance' refers to a gradual process through which unacceptable practices or standards become acceptable," the McAteer team wrote. "As the deviant behavior is repeated without catastrophic results, it becomes the social norm for the organization. Individuals who challenge the norm -- from within the organization or outside it -- are considered nuisances or even threats."

'High' susceptibility to contamination

The DEP isn't the only state agency whose inactions could have played a role in the Jan. 6 leak at Freedom Industries. In their report on the incident, the Rivers Coalition and Downstream Strategies discussed the Department of Health and Human Resources' role.

In April 2002, the DHHR's Bureau for Public Health assessed potential threats to the Elk River water supply that West Virginia American Water uses to provide drinking water to 300,000 people in nine counties.

Agency officials ranked the Elk's water as having a "high" susceptibility to potential contamination from a variety of industrial, commercial, municipal and agricultural sources. The report lists only two sources by name: The Allegheny Power Co. and Pennzoil Manufacturing, which previously operated the tank farm now owned by Freedom Industries.

The Rivers Coalition/Downstream Strategies report notes that the DHHR assessment is 12 years old "and out of date."

"Since 2002, the Pennzoil site has changed ownership . . . the types of materials stored at the site have changed as well," the report said. "Effective management of the risk of source water contamination required accurate, up-to-

APP000241

date information about potential hazards."

The DHHR assessment notes that the "next step" in protecting the Elk's drinking-water supply is to prepare a plan for doing so. However, the Rivers Coalition/Downstream Strategies report says, no such protection plan appears to have ever been written -- by the water company, by state officials or by local government planners.

Laura Jordan, a spokeswoman West Virginia American, said the water company has the 2002 assessment on file and, "I am not aware of any more-recent report."

Likewise, DHHR spokeswoman Allison Adler said the 2002 assessment is "the most current information" her agency has.

Jennifer Sayre, Kanawha County manager, said her staff searched county computer files and could not locate a copy of the 2002 Elk River assessment, or any memos regarding it.

Reach Ken Ward Jr. at kw...@wv Gazette.com or 304-348-1702.

From: [Evan Hansen](#)
To: [Mike Becher](#)
Subject: Fwd: Freedom of Information Act Request #2014-01-085 - January 13, 2014
Date: Thursday, January 30, 2014 8:55:58 AM
Attachments: [Storm Water Pollution Prevention Plan for Etowah River Terminal LLC.pdf](#)

Here's the SWPPP. Note that it's "DRAFT". I still haven't had a chance to review in any detail.

Also note their acknowledgement that they don't have the GPP.

Holler if you want the materials that Annette provided on CD and I'll upload.
Evan

----- Forwarded message -----

From: [Hoskins, Annette L <Annette.L.Hoskins@wv.gov>](#)
Date: Thu, Jan 30, 2014 at 8:42 AM
Subject: RE: Freedom of Information Act Request #2014-01-085 - January 13, 2014
To: [Evan Hansen <ehansen@downstreamstrategies.com>](#)
Cc: [DEP FOIA <DEPFOIA@wv.gov>](#)

Evan,

Attached you will find a copy of the SWPPP which I received this morning. What I provided to you on disc were the documents prior to the spill. This was not in our possession. We requested it at the spill site and received it sometime after January 9th.

As for the GPP, we do not have a copy of it. We have asked for them to provide a copy and they have been unable to locate it and supply a copy to us.

If you need anything further, please let me know.

Thank you,

Annette.

From: Evan Hansen [mailto:ehansen@downstreamstrategies.com]
Sent: Thursday, January 30, 2014 8:00 AM
To: Hoskins, Annette L
Cc: Mike Becher; DEP FOIA; Mandirola, Scott G
Subject: Re: Freedom of Information Act Request #2014-01-085 - January 13, 2014

Annette:

Thank you for providing the CD yesterday in response to my FOIA request. My FOIA specifically requested the SWPPP and GPP. Neither of these documents were included in your response. Can you please tell me definitively whether the SWPPP and GPP exist? I am double-checking because I have heard that Scott Mandirola (copied on this email) believes that a SWPPP does indeed exist.

I do not consider my FOIA request to have been fulfilled until I receive these two documents or until WVDEP tells me definitively whether they exist.

Thank you very much,

Evan

On Wed, Jan 29, 2014 at 10:44 AM, Hoskins, Annette L <Annette.L.Hoskins@wv.gov> wrote:

No problem, I will put Evan's name on the package. Thanks!

From: Mike Becher [mailto:mbecher@appalmad.org]
Sent: Wednesday, January 29, 2014 10:42 AM
To: Hoskins, Annette L; Evan Hansen
Cc: DEP FOIA
Subject: RE: Freedom of Information Act Request #2014-01-085 - January 13, 2014

Thanks again, Annette,

APP000244

It turns out Evan has to be in Charleston this afternoon for a meeting, so he will pick up the disk from the front desk himself. Sorry for any confusion.

Mike

J. Michael Becher

Appalachian Mountain Advocates

304-382-4798

From: Hoskins, Annette L [<mailto:Annette.L.Hoskins@wv.gov>]

Sent: Wednesday, January 29, 2014 10:07 AM

To: Evan Hansen

Cc: Mike Becher; DEP FOIA

Subject: RE: Freedom of Information Act Request #2014-01-085 - January 13, 2014

Evan,

I have the water permitting and environmental enforcement files and will copy them to a disc shortly and place it at the front desk for Mike to pick up. The cost associated with this request is \$50. I have attached an invoice. If you have any questions, please let me know.

Thanks,

Annette.

From: Evan Hansen [<mailto:ehansen@downstreamstrategies.com>]

Sent: Tuesday, January 28, 2014 1:46 PM

To: Hoskins, Annette L

Cc: Mike Becher

APP000245

Subject: Re: Freedom of Information Act Request #2014-01-085 - January 13, 2014

Hi Annette:

To help expedite the process, Mike Becher has agreed to visit the DEP office at 4:00 tomorrow, Wednesday the 29th, to pick up the package in person. Instead of placing it in the mail tomorrow, please provide it to Mike Becher. I've copied Mike on this email so that we're all on the same page.

Thank you again for your help in fulfilling this FOIA request,

Evan

On Mon, Jan 27, 2014 at 4:39 PM, Evan Hansen <ehansen@downstreamstrategies.com> wrote:

Hi Annette:

I'm disappointed that the materials are not available yet. I understand that this must be a difficult time at DEP; however, I submitted the FOIA on January 13. A total of 10 business days have elapsed between the date I submitted the FOIA and today. My reading of the code is that DEP has 5 business days to either (1) provide the information, (2) deny the request, or (3) provide the information or advise me of a time and place to inspect the materials. More than 5 business days have elapsed and the timing for providing the information appears to keep slipping. I really do hope that you're able to get the materials in the mail by Wednesday. Thank you very much!

Evan

On Mon, Jan 27, 2014 at 1:51 PM, Hoskins, Annette L <Annette.L.Hoskins@wv.gov> wrote:

Evan,

APP000246

I still do not have the files from Water Permitting. I expect to have them by Wednesday afternoon and hope to get them placed in the mail to you before I leave on Wednesday evening. If you have any questions or need anything in the meantime, please let me know.

Thank you,

Annette.

From: Evan Hansen [mailto:ehansen@downstreamstrategies.com]
Sent: Monday, January 27, 2014 7:45 AM
To: Hoskins, Annette L
Subject: Re: Freedom of Information Act Request #2014-01-085 - January 13, 2014

Thank you. I look forward to hearing from you by 2:00 today.

Evan

On Fri, Jan 24, 2014 at 6:28 PM, Hoskins, Annette L <Annette.L.Hoskins@wv.gov> wrote:

Evan,

I am still here and called the number you gave me and left a message at 5:34 pm, sorry I missed you; I just saw this email. The documents that we have gathered are from our Air Quality, Environmental Remediation and Hazardous Waste offices. I will have files from the Water Permitting and Environmental Enforcement offices early next week as the bulk of these employees are still in the field handling the investigation. Your request is specifically asking for documents related to the storm water permit which are located in the Water Permitting files. I will let you know on Monday by 2pm when these files will be available. However, just to let you know, we expect the files to be large so emailing the documents are probably out of the question. I will have to put them on a disc and get them mailed to you.

APP000247

If you have any questions, or if there is anything I can assist with in the meantime, please let me know.

Thank you,

Annette Hoskins

WV DEP – Public Information Office

601 57th Street, SE

Charleston, WV 25304

304-926-0499 ext. 1659

Annette.L.Hoskins@wv.gov

From: Evan Hansen [mailto:ehansen@downstreamstrategies.com]
Sent: Friday, January 24, 2014 5:25 PM
To: Hoskins, Annette L
Cc: DEP FOIA
Subject: Re: Freedom of Information Act Request #2014-01-085 - January 13, 2014

Hi Annette:

We spoke at 4:45 and you told me that all of the materials weren't ready yet and that you would call me in a few minutes to let me know the status. I requested the materials that you already had in hand and you said that you couldn't do that. It's now 5:25 and I haven't heard from you, and I'm not sure if you're still at the office. Your last name doesn't appear to be in the phone directory and the receptionist is no longer answering the phone.

I gave you my home number to call, but I'm about to leave that number. Please call me cell at 304-319-0042 with an update.

APP000248

Thank you very much for helping me get this important information as soon as possible.

Evan

On Fri, Jan 24, 2014 at 9:35 AM, Evan Hansen <ehansen@downstreamstrategies.com> wrote:

Hi Anette:

I look forward to receiving these materials today. Thank you very much.

Evan

On Monday, January 20, 2014, Hoskins, Annette L <Annette.L.Hoskins@wv.gov> wrote:

January 20, 2014

Evan Hansen

Downstream Strategies, LLC

ehansen@downstreamstrategies.com

Re: Freedom of Information Act Request #2014-01-085

Dear Mr. Hansen:

This letter is regarding your Freedom of Information Act Request (FOIA) that the West Virginia Department of Environmental Protection's (DEP) Public Information Office received on January 13, 2014.

APP000249

We are gathering these documents within the agency and will have them to you by the end of business on Friday, January 24, 2014.

If you need further assistance, please contact me or Sarah Alford at 304-926-0499 ext. 1641.

Sincerely,

A. Hoskins

Annette Hoskins

FOIA Officer

From: dep.online@wv.gov [mailto:dep.online@wv.gov]
Sent: Monday, January 13, 2014 10:13 AM
To: DEP FOIA
Subject: FOIA Request

FOIA REQUEST FORM

Name: Evan Hansen
Address1: Downstream Strategies, LLC
Address2: 295 High Street, Suite 3
City/State/ZIP: Morgantown, WV 26505
Telephone Number: 304-292-2450
Email Address: ehansen@downstreamstrategies.com
Date: 13-Jan-14, 10:13 AM

Request: For NPDES Permit WVG610920 for ETOWAH RIVER TERMINAL LLC in Kanawha County, I request the Storm Water Pollution Prevention Plan (SWPPP) and Groundwater Protection Plan (GPP). In addition, I request records of any inspections or enforcement actions taken since January 1, 2012. I request electronic copies of these documents. Please inform me ahead of time if there is to be a charge.

Timeframe: ASAP

For DEP use only:

APP000250

| | |
|----------------|--|
| Referred to: | |
| Date referred: | |

--

Evan Hansen, President

Downstream Strategies

295 High Street, Suite 3

Morgantown, WV 26505

304.292.2450

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Follow us on Twitter

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ETOWAH RIVER TERMINAL, LLC.

**“STORM WATER POLLUTION PREVENTION
PLAN”
(SWPPP)**

DRAFT

KANAWHA COUNTY, WEST VIRGINIA

February 14, 2002

Prepared by:
CTL Engineering of WV, Inc.
510 C Street
South Charleston, WV 25303
(304) 746-1140
(304) 746-1143 (fax)

Prepared for:
ETOWAH River Terminal, LLC
1015 Barlow Drive
Charleston, WV 25331

STORM WATER POLLUTION PREVENTION PLAN

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SECTION 1 – INTRODUCTION

This storm water pollution prevention plan (SWPPP) was prepared for the Etowah River Terminal, LLC located along the Elk River in Kanawha County, West Virginia. The facility is registered under the West Virginia National Pollution Discharge Elimination System (NPDES) Multi-Sector General Permit for Storm Water Associated with Industrial Activity in West Virginia (Permit Number WV0111457). Etowah River Terminal, LLC has applied to the West Virginia Department of Environmental Protection (WVDEP) to transfer the existing NPDES General Permit for the site, from Pennzoil Quaker State to themselves. A copy of the permit transfer will be included with the SWPPP once approval from the WVDEP is received. This plan satisfies the requirements for a SWPPP under the NPDES permit registration.

The SWPPP assesses the potential pollutant sources and identifies best management practices at the facility, procedures for implementing the plan and for evaluating/monitoring the effectiveness of the plan. The SWPPP should be kept at the facility. The plan should be reviewed and updated regularly.

SECTION 2 – POLLUTION PREVENTION TEAM

The pollution prevention team includes individuals at the Etowah River Terminal Facility who will be responsible for various aspects of the development, implementation, and maintenance of the SWPPP. Worksheet #1 identifies the members of the pollution prevention team and their responsibilities associated with the SWPPP.

SECTION 3 – ASSESSMENT

This section includes an assessment of the facility and operations to determine what materials or practices are or may be a source of contaminants to the storm water discharges from the site.

3.1 Site Map

- A site map is included at the end of this section.

3.2 Materials Inventory

The SWPPP must include a current inventory of the types of materials that are handled, stored, or processed at the facility. "Significant Materials" are defined as: Raw materials; fuels; materials such as solvents, detergents and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under section 101(14) of CERCLA; any chemical the facility is required to report pursuant to EPCRA, section 313; fertilizers; pesticides; and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharges (federal regulation 40 CFR 122.26(b)(12)). The materials inventory is included in Worksheet #3 at the end of this section.

3.3 Past Leaks and Spills

Worksheet #4 contains a list of the leaks and spills that have occurred in the last three years. This list contains both significant spills of toxic or hazardous substances and spills and leaks of non-hazardous substances. "Significant spills", or reportable quantity (RQ) releases includes releases in excess of reportable quantities. A reportable quantity release is defined as a release that occurs when a quantity of hazardous substance or oil is spilled or released within a 24-hour period of time and exceeds the RQ level assigned to that substance under CERCLA or the Clean Water Act. Regulations listing these quantities are contained in 40 CFR 302.4, 40 CFR 117.3.

3.4 Non-Storm Water Discharges

The facility should be tested or evaluated for non-storm water discharges. Examples of non-storm water discharges include any water used directly in a manufacturing process, air conditioning condensate, vehicle wash water, or sanitary wastes. Unless specifically covered by a NPDES permit, non-storm water discharges may be illegal. However, the general permit allows for the following types of non-storm water discharges: Discharges from fire fighting activities; fire hydrant flushing; potable water sources including waterline flushings; irrigation drainage; lawn watering; uncontaminated groundwater; foundation or footing drains where flows are not contaminated with process materials;

discharge from springs; routine exterior building washdown which does not use detergents or other compounds; pavement wash waters where spills or leaks of toxic or hazardous substances have not occurred and where detergents are not used; air conditioning condensate.

Non-storm water discharges can be checked by using one of the following three common dry weather tests: visual inspection; plant schematic review; and/or dye testing. Based on visual inspection, there are currently no non-storm water discharges at the site. Worksheet #5, included at the end of this section, contains a summary of the non-storm water discharge assessment and certification.

3.5 Existing Monitoring Data

There is currently no storm water sampling data available from the previous owner, Pennzoil, for this facility. The current WV/NPDES permit for the site, WV0111457, Multi-Sector General Permit For Storm Water Associated With Industrial Activity In West Virginia, does not require storm water sampling.

There is the potential for storm water to be impacted by the following: benzene, toluene, ethylbenzene, total xylenes and lead. These are potential pollutants due to historical operation of the facility as a bulk petroleum storage facility by Pennzoil. Pennzoil is entering into the Voluntary Remediation Program with the WVDEP. However, there is no evidence at this time that the aforementioned parameters are impacting the site.

3.6 Site Evaluation Summary

Based on the assessment of the facility, a potential for storm water contamination is associated with spills or leaks, which may occur during the transfer or storage of materials at the facility. The activities with the potential to impact storm water include the following:

- a. Spills during tank truck loading.

Spills while loading are prevented by carefully defined procedures, including measurements of products in all tanks prior to the delivery and any unusual delivery procedures are spelled out on the driver route card for each location.

- b. Unloading of bulk products from barges.

These spills are primarily operating errors and are prevented by constant operating surveillance by terminal plantmen and the crew of the barges. Careful advance planning of all pumping operating during barge unloading is very important in this operation as well as the prevention of overfilling of storage tanks.

c. Overfill of Storage Tanks.

TANKS FITTED WITH OVERFILL ALARMS

Storage tank product levels are indicated by a float gauge on the outside of all tanks. These tank gauges are inspected regularly for accuracy. Careful advance planning of all pumping operations is a must to prevent overfilling. Constant diligence during "topping off" of tanks is a must and this includes good communications.

e. Storage tank rupture.

This contingency has been considered in the design and construction of all tanks. All tanks are constructed with API standard reinforcing. All storage tanks are routinely inspected (visual) for soundness. The concrete block dike walls are capable of containing the total of the total of the largest tank inside the dike.

f. Petroleum product tanks

Two 275-gallon above ground storage tanks (ASTs) and two 55-gallon drums are located inside the garage/storage building. One AST contains kerosene for a heater and the other AST contains diesel fuel for the emergency generator for the fire suppression system. The 55-gallon drums also contain kerosene for the heater. The ASTs will be diked to contain a spill at least equal to the maximum content of each AST.

SECTION 4 – BEST MANAGEMENT PRACTICES

4.1 Good Housekeeping

The facility will be maintained in order to allow maximum efficiency of operation. This will include the following: 1) removal of all debris and non-essential equipment from around the dock area, pipelines for transferring product leading from the dock to the AST field and from the product loading racks 2) implement careful material storage practices 3) maintain up-to-date inventory 4) schedule routine cleanup operations 5) maintain well organized work areas and 6) train employees about good housekeeping practices.

4.2 Preventive Maintenance

Material is transferred from the barges by two (2) 6-inch diameter pipes. A hydrostatic test on the lines was performed prior to transferring material from the barges to the ASTs onsite. The transfer piping will be hydrostatically tested on an annual basis.

Pumps, valves or hoses handle all the bulk products at the terminal and, therefore, are subject to frequent inspection and constant operating surveillance by all plantmen. Pump and valve maintenance is routine and leaks and spills are effectively prevented by training and supervision, as well as the design of the equipment.

Day-to-day maintenance activities are performed on valves, lines and tanks in order to ensure that each tank and its components are in proper working order. During valve maintenance or piping repair, the individual valve or section of pipe is isolated. Residual material is drained into container and then transferred into a mixed product tank or a bulk storage tank.

4.3 Visual Inspections

Facility employees perform regular inspections of facility equipment to insure that it is in working order and may perform minor repairs on piping/valves/pumps as needed to correct potential leaks/drips.

All aboveground piping and ancillary equipment will be inspected at least annually in accordance with this SWPPP plan. These inspections are performed to detect areas that have the potential for a release. For information regarding inspections see Section 6.1 of this plan.

4.4 Spill Prevention and Response

A detailed review of known possible potential occurrences of a discharge of pollution into sewers and the river has been made by experienced and responsible personnel of the Etowah River Terminal. The principle hazards in the terminal operations are: (1) the

possibility of spills during loading of tank trucks; (2) overfilling storage tanks; (3) the failure of storage tanks; (4) unloading of bulk products from barges on the river; and (5) hose, valve or pump failures.

A stationary discharge collection system, holding approximately 275 gallons is provided for the hose connection on the float at the dock, for barge unloading. The collection tank will be available to collect residual product in the hose connection upon completion of product transfer and to contain spills, which may occur at the dock area. Material collected in this containment equipment is to be pumped back into the barge with the pump provided. The barge is equipped with discharge containment equipment for use when disconnecting the hose from the barge manifold. Any drips or drainage from the hose is to be contained in this equipment. Any barge content in the barge collection equipment is to be drained into a barge compartment at the conclusion of the operation.

Any temporary connection made to accomplish the transfer should have a portable catchment in place under the connection prior to transfer.

In transfer of barge content from the barge to the terminal, emergency shutdown would be automatic by the use of a check valve that is installed in the line at the dock area.

Available in the event barge content should get into the river during the transfer are absorbent socks and absorbent pads. The absorbent socks and pads are stored in a metal building, which is located at the Terminal. If barge content should get into the river, absorbent pads will be used to absorb any of the spilled material, which remains on the water surface. Because the glycols and calcium chloride solution are water soluble, those spills will have a very small amount on the water surface. Small spills will be contained as safely as possible with existing equipment. Large spills will necessitate calling Weavertown Environmental Group to aid in containment and cleanup. Deployment of terminal personnel will be less than one half hour.

Spills, which occur to the ground, shall have the free liquid portion of the spill contained and free liquid removed as soon as the spill is discovered and proper containment equipment and personnel, can be assembled. Free liquid removed from the site will be recycled or properly disposed. Spills, which are absorbed into the soil, will be evaluated as to the extent and impact of the spill on soil, groundwater and surface water. Those spills will be remediated as necessary and in a timely manner in accordance with normal industry standards.

4.5 Sediment Erosion and Control

Two storm drains are located at the Terminal. Storm water is collected in a sump inside the terminal fence, near the northwest corner of the warehouse/office building. A second storm drain is located in the southwest portion of the Terminal. The second drain collects storm water from inside the fenced, asphalt-covered portion, of the Terminal. Both storm drains are piped outside the fenced Terminal and discharge to a grassy bank and then into the Elk River.

As currently designed the facility has two 500-gallon sumps, which act as the storm water collection/drainage system in the storage tank farm designated as dike 1. The second diked tank farm contains no sumps for storm water collection; accumulated storm water is drained from dike 2 by valves into dike 1, as needed, to remove this liquid. The two 500-gallon sumps currently drain by gravity to a junction box, which then discharges to an oil/water separator system, which then discharges to surface waters. This system will be evaluated and altered to prevent the automatic discharge of storm water from the diked tank farm, through the oil/water separator, to the Elk River. The oil/water separator was installed many years ago, when the facility was used as a petroleum products storage facility and petroleum products were the pollutants of concern at the facility. The oil/water separator will not remove the glycols and other de-icing agents currently stored at the site.

4.6 Management of Runoff

Storm water runoff originates from two areas within the Terminal as noted on the Terminal Diagram included in Section 3. Drainage area #1 is approximately 47,417 square feet and encompasses the area within the diked storage tank farm. The surface area within drainage area #1 consists of ASTs, gravel and soil, and concrete. Storm water from this area discharges as identified in Section 4.5 of this Plan.

Drainage area #2 is approximately 106,410 square feet and encompasses the fenced area of the Terminal, which includes the product loading racks, garage/storage building, warehouse office building, asphalt paved driving and parking areas and grassy areas along the fence line. Storm water from this area drains to two sumps located on the west side of the terminal. Storm water is piped from the sumps to a grassy area before entering the Elk River.

A grassy strip is located between the fenced area of the terminal and the Elk River. The grassy strip is approximately 100 feet wide, except for a gravel road leading from the fenced portion of the terminal to the barge unloading dock on the Elk River. The grassy strip acts as a sediment control measure for storm water coming from the Terminal.

SECTION 5 – IMPLEMENTATION

Implementation of the SWPPP includes the implementation of appropriate controls identified in Section 4, Best Management Practices, and employee training.

5.1 Implementing Controls

All controls for managing storm water are currently in place. Therefore, the storm water prevention team is responsible for maintaining these controls.

5.2 Employee Training

The goal of the employee-training program is to teach personnel the components and goals of the storm water pollution prevention plan. New operations personnel (non-clerical) employees will be trained initially and other operations employees will be trained annually. The training will cover topics such as spill prevention and response, good housekeeping, and material management practices.

6.0 – SWPPP EVALUATION

The SWPPP must be kept up to date by regularly evaluating the information you collected in the Assessment Phase (Section 3 of this Plan) and the controls selected in the Plan Design Phase (Section 4 of this Plan). Specifically, you must (A) conduct site evaluations, (B) keep records of all inspections and reports, and (C) revise the SWPPP as needed.

6.1 Annual Site Compliance Evaluation

Qualified personnel must conduct site compliance evaluations annually. The following is required as part of the evaluation:

- Inspect storm water drainage areas for evidence of pollutants entering the drainage system.
- Evaluate the effectiveness of BMPs (for example, is your site cleaner? Are your employees more familiar with good housekeeping measures and spill prevention and response practices?).
- Observe structural measures, sediment controls, and other storm water BMPs to ensure proper operation.
- Revise the plan as needed within 2 weeks of inspection, and implement any necessary changes within 12 weeks of inspection.
-  **Prepare a report** summarizing inspection results and follow-up actions, identifying the date of inspection and personnel who conducted the inspection.
- **Sign the report** and keep it with the plan.

6.2 Record Keeping

Records must be maintained for all spills, leaks, inspections and maintenance activities for at least one year after the permit expires. For spills and leaks, records should include information such as the date and time of the incident, weather conditions, cause, and resulting environmental problems.

6.3 Plan Revisions

The plan must be revised for any major changes in the facility's design, construction, operation or maintenance or if the revisions are required based on the annual inspection. The SWPPP must be revised within two weeks of the inspection.

SECTION 7 – REQUIRED SIGNATURE

THIS PLAN IS ACCEPTED BY MANAGEMENT

ETOWAH RIVER TERMINAL LLC

Signature

Date

CTL Engineering of WV, Inc.

Consulting Engineers • Testing •
Inspection Services • Analytical Laboratories
Environmental Consulting

510 C Street
S. Charleston, WV 25303

(304) 746-1140
(304) 746-1143 Fax

DATE: 2/15/02 TIME: _____ FAX #: 345-0968

ATTN: John Hutchinson

COMPANY: Ebocach

FROM: Bill Chambers

We are transmitting 9 pages including this cover page. If transmission is incomplete, please contact _____ at 304/746-1140.

COMMENTS:

John

These are the Work Sheets that go with the SWPPP that I left with you earlier today.

Take a close look at the Terminal Diagram (map). Based on our conversations, I believe Discharge #2 should be moved from beside the firehouse on the southwest end of the property to beside the abandoned firehouse pump on the northwest end of the property. I'll so, hand draw location on map & fax back to me along with any other comments you have.

Keep a copy of everything I give/send you to show in case

VISIT OUR HOME PAGE! www.ctleng.com
you would get a visit/inspection from a regulatory agency.
Offices: Ohio, West Virginia, North Carolina, Indiana

Thank for the other info you provided me!
Bill

| | |
|---|--|
| POLLUTION PREVENTION TEAM Etowah River Terminal MEMBER ROSTER | Worksheet #1 Completed by: <u>Bill Chambers</u> Title: <u>Consultant</u> Date: <u>February 14, 2002</u> |
|---|--|

Leader: John Hutchinson Title: Terminal Manager
 Office Phone: 304-345-0967

Responsibilities:

Implementing all general permit and pollution prevention plan requirements.
Defining and agreeing upon an appropriate set of goals for the facility's storm water management program. Being aware of any changes that are made in plant operations to determine whether any changes must be made to the Storm Water Pollution Prevention Plan. Maintaining a clear line of communication with plant management to ensure a cooperative partnership.

Members:

(1) Larry Ryder Title: Laborer
 Office Phone: 304-345-0967

Responsibilities:

Unloading barges and maintaining aboveground storage tanks, general terminal maintenance and responding to small spills.

(2) Kenny Quinn Title: Laborer
 Office Phone: 304-345-0967

Responsibilities:

Unloading barges and maintaining aboveground storage tanks, general terminal maintenance and responding to small spills.

(3) _____ Title: _____
 Office Phone: _____

Responsibilities:

**NON-STORM WATER DISCHARGE ASSESSMENT AND
FAILURE TO CERTIFY NOTIFICATION**

Worksheet
Completed by
Title
Date

Directions: If you cannot feasibly test or evaluate an outfall, fill in the table below with the appropriate information and sign this form to certify the accuracy of the included information.
List all outfalls not tested or evaluated, describe any potential sources of non-storm water pollution from listed outfalls, and state the reason(s) why certification is not possible. Use the key from your site map to identify each outfall.

Important Notice: A copy of this notification must be signed and submitted to the Director within 180 days of the effective date of this permit.

| Identify Outfall Not Tested/Evaluated | Description of Why Certification Is Infeasible | Description of Potential Sources of Non-Storm Water Pollution |
|---------------------------------------|--|---|
| | | |
| | | |
| | | |
| | | |

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations, and that such notification has been made to the Director within 180 days of _____ (date permit was issued), the effective date of this permit.

| | |
|--|--------------------------------|
| A. Name & Official Title (type or print) | E. Area Code and Telephone No. |
| C. Signature | O. Date Signed |

NON-STORM WATER DISCHARGE ASSESSMENT AND CERTIFICATION

Worksheet to be completed by the owner.

| Date of Test or Evaluation | Outfall Directly Observed During the Test (identify as indicated on the site map) | Method Used to Test or Evaluate Discharge | Describe Results from Test for the Presence of Non-Storm Water Discharge | Identify Potential Significant Sources | Name of Person Who Conducted the Test or Evaluation |
|----------------------------|---|---|--|--|---|
| | | | | | |
| | | | | | |
| | | | | | |
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| | | | | | |
| | | | | | |

CERTIFICATION

I, _____ (responsible corporate official), certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. Name & Official Title (type or print) _____

B. Area Code and Telephone No. _____

C. Signature _____

D. Date Signed _____

LIST OF SIGNIFICANT SPILLS AND LEAKS

Worksheet #
 Completed by: BILCHINSKI
 Title: Significant
 Date: 11/27/01

Directions: Record below all significant spills and significant leaks of toxic or hazardous pollutants that have occurred at the facility in the three years prior to the effective date of the permit.

Definitions: Significant spills include, but are not limited to, releases of oil or hazardous substances in excess of reportable quantities.

| 1st Year Prior | | | | | | | | | |
|--------------------------|---------------|---|------------------|-----------|---|--|------------------------------------|---|---------------------------------|
| Date (month/day/year) | Spill Leak | Location (as indicated on site map) | Type of Material | Quantity | Description Source, if known | Reason | Response Procedure | | Preventive Measures Taken |
| | | | | | | | Amount of Material Recovered | Material No Longer Exposed to Storm Water (True/False) | |
| 11/28/01 | no | near dock - sea ramp | Kerosene | 3 gallons | In pipeline from previously eluded material | pipeline was flushed & kerosene was thought to be gone | 98% | True | |
| 2nd Year Prior | | | | | | | | | |
| None | | | | | | | | | |
| 3rd Year Prior | | | | | | | | | |
| None | | | | | | | | | |
| 3rd Year Prior | | | | | | | | | |
| Date (month/day/year) | Spill Leak | Location (as indicated on site map) | Type of Material | Quantity | Description Source, if known | Reason | Amount of Material Recovered | Material No Longer Exposed to Storm Water (True/False) | Preventive Measures Taken |
| | | | | | | | | | |
| None | | | | | | | | | |

MATERIAL INVENTORY

Monsieur's
Community Child Care
11111 Consultant
12345 Main St, Suite 100

Instructions: List all materials used, stored, or produced onsite. Assess and evaluate these materials for their potential to contribute pollutants to storm water runoff. Also complete Worksheet 3A if the material has been exposed during the last 3 years.

| Material | Purpose/Location | Quantity (gallons) | | | Quantity Exposed in Last 3 Years | Likelihood of contact with storm water. If yes, describe reason. | Past Significant Spill or Leak | |
|-------------------|--------------------|--------------------|----------|---------|----------------------------------|--|--------------------------------|----|
| | | Used | Produced | Stored | | | Yes | No |
| Diethylene glycol | Product/tank farm | none | none | 152,000 | none | very low | | XX |
| PDO - Gelsmar | Product/tank farm | none | none | 222,000 | none | very low | | XX |
| Calcium chloride | Product/tank farm | none | none | 300,000 | none | very low | | XX |
| Propylene glycol | Product/tank farm | none | none | -0- | none | very low | | XX |
| FCA - 1000 | Product/tank farm | none | none | 290,000 | none | very low | | XX |
| FCA - 2000 | Product/tank farm | none | none | 200,000 | none | very low | | XX |
| Kerosene | Heating/garage | 1,000 | none | 385 | 3 gallons | very low | | XX |
| Diesel Fuel | Emerg. gen./garage | 25 | none | 275 | none | very low | | XX |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

DEVELOPING A SITE MAP

Worksheet #2
Completed by: Bill Chambers
Title: Consultant
Date: February 14, 2002

Instructions: Draw a map of your site including a footprint of all buildings, structures, paved areas, and parking lots. The information below describes additional elements required by EPA's General Permit.

EPA's General Permit requires that you indicate the following features on your site map:

- All outfalls and storm water discharges
- Drainage areas of each storm water outfall
- Structural storm water pollution control measures, such as:
 - Flow diversion structures
 - Retention/detention ponds
 - Vegetative swales
 - Sediment traps
- Name of receiving waters (or if through a Municipal Separate Storm Sewer System)
- Locations of exposed significant materials
- Locations of past spills and leaks
- Locations of high-risk, waste-generating areas and activities common on industrial sites such as:
 - Fueling stations
 - Vehicle/equipment washing and maintenance areas
 - Area for unloading/loading materials
 - Above-ground tanks for liquid storage
 - Industrial waste management areas (landfills, waste piles, treatment plants, disposal areas)
 - Outside storage areas for raw materials, by-products, and finished products
 - Outside manufacturing areas
 - Other areas of concern (specify: _____)



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Jan 20, 2011

CSB Issues Report on 2008 Bayer CropScience Explosion: Finds Multiple Deficiencies Led to Runaway Chemical Reaction; Recommends State Create Chemical Plant Oversight Regulation

Institute, West Virginia, January 20, 2011 – The U.S. Chemical Safety Board (CSB) today released its final report on the August 28, 2008, Bayer CropScience pesticide manufacturing unit explosion that killed two workers and injured eight others. In a report scheduled for Board consideration at a public meeting this evening in Institute, the CSB found multiple deficiencies during a lengthy startup process that resulted in a runaway chemical reaction inside a residue treater pressure vessel. The vessel ultimately over pressurized and exploded. The vessel careened into the methomyl pesticide manufacturing unit leaving a huge fireball in its wake.

The report found that had the trajectory of the exploding vessel taken it in a different direction, pieces of it could have impinged upon and possibly caused a release from piping at the top of a tank of highly toxic methyl isocyanate (MIC).

The accident occurred during the startup of the methomyl unit, following a lengthy period of maintenance. The CSB found the startup was begun prematurely, a result of pressures to resume production of the pesticides methomyl and Larvin, and took place before valve lineups, equipment checkouts, a pre-startup safety review, and computer calibration were complete. CSB investigators also found the company failed to perform a thorough Process Hazard Analysis, or PHA, as required by regulation.

This resulted in numerous critical omissions, including an overly complex Standard Operating Procedure (SOP) that was not reviewed and approved, incomplete operator training on a new computer control system, and inadequate control of process safeguards. A principal cause of the accident, the report states, was the intentional overriding of an interlock system that was designed to prevent adding methomyl process residue into the residue treater vessel before filling the vessel with clean solvent and heating it to the minimum safe operating temperature.

Furthermore, the investigation found that critical operating equipment and instruments were not installed before the restart, and were discovered to be missing after the startup began. Bayer's Methomyl-Larvin unit MIC gas monitoring system was not in service as the startup ensued, yet Bayer emergency personnel presumed it was functioning and claimed no MIC was released during the incident.

CSB Chairperson Dr. Rafael Moure-Eraso said, "The deaths of the workers as a result of this accident were all the more tragic because it could have been prevented had Bayer CropScience provided adequate training, and required a comprehensive pre-startup equipment checkout and strict conformance with appropriate startup procedures. This would have revealed multiple dangerous conditions and procedures that were occurring at a time when the company wanted to restart production of a key pesticide product. Startups are always a potentially hazardous operation, but to begin with computer control systems that have not been checked, while bypassing safety interlocks, is unacceptable."

The investigation report makes recommendations to the company and its Institute plant, to the Occupational Safety and Health Administration (OSHA), the Environmental Protection Agency (EPA), and several West Virginia agencies. Citing a highly successful county program to ensure refinery and chemical plant safety in Contra Costa County, California, the CSB report recommends the West Virginia Department of Health and Human Resources establish a "Hazardous Chemical Release Prevention Program" that would have the authority to inspect and regulate such plants, and make public its ongoing findings.

Dr. Moure-Eraso said, "I believe a state and county-run program like this would go a long way to making chemical operations safer in places like the Kanawha Valley. OSHA and EPA have limited resources and cannot be everywhere at once. However, local jurisdictions can put together highly effective and targeted inspection and enforcement programs, funded by levies on the plants themselves. The accident rate in Contra Costa County has dropped dramatically, and last year in fact they had no significant accidents, thanks, in my view, to this program."

CSB Investigations Manager John Vorderbrueggen noted that a major contributing factor to the accident was a series of equipment malfunctions that continually distracted operators. "Human factors played a big part in this accident, and the absence of enforced, workable standard operating procedures and adequate safety systems meant that mistakes could prove fatal. For example, operators were troubleshooting several equipment problems and during the startup, inadvertently failed to prefill the residue treater vessel with solvent. A safety interlock was designed to stop workers from introducing highly-reactive methomyl, but it was bypassed as had been done in previous operations with managers' knowledge. Once the chemical reaction of the highly concentrated methomyl started, it could not be stopped, and the temperature and pressure inside rose rapidly, finally causing an explosion."

Board Member John Bresland, who was CSB chairman at the time of the Bayer accident, noted the confusion that resulted in the community's emergency response following the explosion at 10:33 p.m. "The Bayer fire brigade was at the scene in minutes,

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but Bayer management withheld information from the county emergency response agencies that were desperate for information about what happened, what chemicals were possibly involved," Mr. Bresland said. "The Bayer incident commander, inside the plant, recommended a shelter in place; but this was never communicated to 911 operators. After an hour of being refused critical information, local authorities ordered a shelter-in-place, as a precaution."

"Proper communication between companies and emergency responders during an accident is critical," said Mr. Bresland, adding, "The community deserved better, especially considering the amounts of hazardous chemicals, in use and being stored at various chemical facilities in the Kanawha River valley."

The CSB report notes that two workers and four volunteer firefighters required examination for possible exposure to toxic chemicals.

The investigation examined the potential consequences of a hypothetical trajectory of the careening residue treater vessel that would result in its hitting the heavy steel mesh ballistic shield surrounding the above-ground MIC tank. The analysis – using blast pressure and impact energy calculations – concluded that the shield would have protected the MIC tank from a residue treater vessel hit. However, the CSB found, had the residue treater struck the shield structure near the top of the frame, the displaced frame could have contacted an MIC pipe, which might have resulted in an MIC release into the atmosphere.

Chairperson Moure-Eraso said, "Any significant MIC release into the atmosphere along the Kanawha valley could have proven deadly, and that concern has been legitimately expressed for decades in the community. This potential was reduced when Bayer announced last year it would no longer store MIC above ground; it will be reduced to zero in approximately 18 months when the company has announced it will end MIC production and use at the Institute facility – the only place in the country still storing large quantities of MIC."

Dr. Moure-Eraso continued, "Bayer's decision to end pesticide production using MIC was, I understand, done for its own business reasons. But for whatever reasons, the eventual elimination of this chemical will enhance safety in the Kanawha Valley, for workers and residents alike, and is a positive development in my view."

The CSB public meeting is scheduled for 6:30 p.m. this evening at the West Virginia State University, Sullivan Hall, Wilson University Union, Multipurpose Room 103, in Institute. The Board will hear a full report on the investigation, and then will invite seven panelists including industry experts, community activists, and county government representatives to testify. Following a public comment period, the Board will vote on the report conclusions and recommendations.

The CSB is an independent federal agency charged with investigating industrial chemical accidents. The agency's board members are appointed by the president and confirmed by the Senate. CSB investigations look into all aspects of chemical accidents, including physical causes such as equipment failure as well as inadequacies in regulations, industry standards, and safety management systems.

The Board does not issue citations or fines but does make safety recommendations to plants, industry organizations, labor groups, and regulatory agencies such as OSHA and EPA. Visit our website, www.csb.gov.

For more information, contact Acting Director of Public Affairs Hillary Cohen at 202.261.3601 cell 202.446.8094; or Sandy Gilmour, 202.261.7614, cell 202.251.5496.

The safety video animation and photos can be downloaded at <http://12.200.22.14/CSBBayerRelease>. Username: CSBBayerRelease; Password: Sendus9\$
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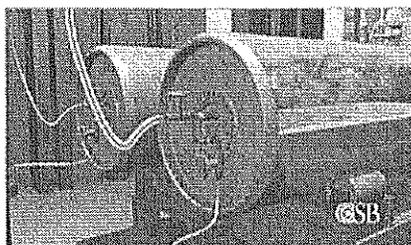
Sep 22, 2011

CSB Votes to Approve Final Report on Three Accidents at DuPont Belle, West Virginia Plant following Public Comment Period

Safety Video Released Online at www.CSB.gov

Investigation Found Lack of Safe Equipment Design, Ineffective Mechanical Integrity Programs, and Failure to Investigate Near Misses

Recommendations Call for OSHA, Industry Groups to Tighten Safeguards for Highly Toxic Gas Handling



Washington, DC, September 22, 2011— The U.S. Chemical Safety Board (CSB) today released its final report on a series of three accidents that occurred over a 33-hour period on January 22 and 23, 2010, at the DuPont Corporation's Belle, West Virginia, chemical manufacturing plant -- including a fatal release of deadly phosgene gas, which was used as a chemical weapon in World War One.

The Board voted 4-1 to approve the report following an extensive public comment period initiated with the release of a draft report on July 7, 2011, in Charleston, West Virginia. In the final report, the Board took into consideration all of the comments filed by industry stakeholders, members of the public and other interested parties, some of which resulted in factual corrections or language changes to the draft report.

CSB Chairperson Rafael Moure-Eraso said, "We thank those individuals, companies and agencies who helpfully commented on our report. Our final report shows in detail how a series of preventable safety shortcomings -- including failure to maintain the mechanical integrity of a critical phosgene hose -- led to the accidents. That this happened at a company with DuPont's reputation for safety should indicate the need for every chemical plant to redouble their efforts to analyze potential hazards and take steps to prevent tragedy."

The CSB also released a safety video today entitled "Fatal Exposure: Tragedy at DuPont," based on the investigation, which features an animation depicting the sequence of events leading to the death of a worker when a phosgene hose suddenly burst. The video also explains the causes of two other toxic chemical releases detailed in the report and features comments by Board Member John Bresland, CSB Investigation Team Lead Johnnie Banks and Investigator Lucy Tyler.

The report makes numerous safety recommendations. Among them, DuPont was urged to enclose all of its phosgene production and storage areas so that any releases of phosgene will be contained. (The Belle facility subsequently announced it was ceasing phosgene usage in 2011, and had no plans to resume use.)

The CSB recommended that the Occupational Safety and Health Administration (OSHA) revise the General Industry Standard for Compressed Gases to be at least as effective as the relevant National Fire Protection Association (NFPA) Code 55 (the Compressed Gases and Cryogenics Fluids Code). This would require secondary enclosures for highly toxic gases such as phosgene and provide for ventilation and treatment systems, interlocked failsafe shutdown valves, gas detection and alarm systems, piping system components, and similar layers of protection.

DuPont's Belle facility occupies more than 700 acres along the Kanawha River, eight miles east of Charleston, the state capital. The plant produces a variety of specialty chemicals.

The series of accidents began on January 22, 2010, when an alarm sounded leading operators to discover that 2,000 pounds of methyl chloride, a toxic and extremely flammable gas, had been leaking unnoticed into the atmosphere

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DuPont Corporation Toxic Chemical Releases

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for five days. The next morning, workers discovered a leak in a pipe carrying oleum, producing a fuming cloud of sulfur trioxide. The phosgene release occurred later that day, and the exposed worker died the next evening in a Charleston hospital.

Noting the company started as a gunpowder manufacturer in 1802, and became a major chemical producer within 100 years, Dr. Moure-Eraso said, "DuPont has had a stated focus on accident prevention since its early days. Over the years, DuPont management worked to drive the injury rate down to zero through improved safety practices."

Dr. Moure-Eraso continued, "DuPont became recognized across industry as a safety innovator and leader. We at the CSB were therefore quite surprised and alarmed to learn that the DuPont Belle plant had not just one but three accidents that occurred over a 33-hour period in January 2010."

CSB board member and former chairman John Bresland noted the CSB finding that the phosgene hose that burst in front of a worker was supposed to be changed out at least once a month. But the hose that failed had been in service for seven months. Furthermore, the CSB found the type of hose involved in the accident was susceptible to corrosion from phosgene.

Team Lead Johnnie Banks said, "Documents obtained during the CSB investigation showed that as far back as 1987, DuPont officials realized the hazards of using braided stainless steel hoses lined with Teflon, or polytetrafluoroethylene (PTFE). An expert employed at DuPont recommended the use of hoses lined with Monel, a metal alloy used in corrosive applications. The DuPont official stated: 'Admittedly, the Monel hose will cost more than its stainless counterpart. However, with proper construction and design so that stresses are minimized...useful life should be much greater than 3 months. Costs will be less in the long run and safety will also be improved.'"

In fact, the Monel hose was never used.

Internal DuPont documents released with the CSB report indicate that in the 1980's, company officials considered increasing the safety of the area of the plant where phosgene is handled by enclosing the area and venting the enclosure through a scrubber system to destroy any toxic phosgene gas before it entered the atmosphere. The analysis concluded that an enclosure was the safest option for both workers and the public. However, the documents indicate the company was concerned with containing costs and decided not to make the safety improvements. A DuPont employee wrote in 1988, "It may be that in the present circumstances the business can afford \$2 million for an enclosure; however, in the long run can we afford to take such action which has such a small impact on safety and yet sets a precedent for all highly toxic material activities.[sic]"

The need for an enclosure was reiterated in a 2004 process hazard analysis conducted by DuPont, but four extensions were granted by DuPont management between 2004 and 2009, and at the time of the January 2010 release, no safety enclosure or scrubber system had been constructed. CSB investigators concluded that an enclosure, scrubber system, and routine requirement for protective breathing equipment before personnel entered the enclosure would have prevented any personnel exposures or injuries.

The CSB investigation found common deficiencies in DuPont Belle plant safety management systems springing from all three accidents: maintenance and inspections, alarm recognition and management, accident investigation, emergency response and communications, and hazard recognition.

CSB Team Lead Banks said, "The CSB found that each incident was preceded by an event or multiple events that triggered internal incident investigations by DuPont, which then issued recommendations and corrective actions. But this activity was not sufficient to prevent the accidents from recurring."

The CSB recommended that the DuPont Belle facility revise its near-miss reporting and investigation policy to emphasize anonymous participation by all employees so that minor problems can be addressed before they become serious. The CSB report also recommends the Belle plant ensure that its computer systems will provide effective scheduling of preventive maintenance to require, for example, that phosgene hoses get replaced on time.

For the DuPont Corporation, the Board recommended the company require all phosgene production and storage areas company-wide have secondary enclosures, mechanical ventilation systems, emergency phosgene scrubbers, and automated audible alarms, which are at a minimum consistent with the standards of the National Fire Protection Code 55 for highly toxic gases.

Industry groups have established various good practices for the safe handling of phosgene and other highly toxic materials in compressed gas cylinders. The report concluded that the most comprehensive guidelines are those set forth by the National Fire Protection Association, or NFPA.

The Board recommended that an industry group, the Compressed Gas Association (CGA) adopt the more stringent guidelines of NFPA Code 55 for the safe handling of phosgene and other highly toxic gases.

The American Chemistry Council (ACC), a prominent chemical industry trade association, was urged to revise

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its Phosgene Safe Practices Guidelines Manual. The Board recommended the manual advise against the use of hoses for phosgene transfer that are constructed of permeable cores and materials that are subject to corrosion by chlorides. And the ACC was urged to include guidance for the immediate reporting and investigation of all potential near-miss phosgene releases.

Chairman Moure-Eraso said, "Adoption of the CSB recommendations by OSHA, the Compressed Gas Association and the American Chemistry Council will greatly improve the safe handling of toxic gases nationally and will protect workers from deadly exposures."

Public comments made on the draft report may be found at www.CSB.gov. Among the revisions made to the report as a result of comments were to better define thermal expansion in a phosgene hose; to note that phosgene operations were shut down permanently at the Belle plant after the accident; the timing of the oleum leak and the relative size of holes in the oleum piping; and that a Compressed Gas Association standard had been updated after, not before, the Belle plant phosgene accident; and the addition of a reference to EPA's Chemical Accident Prevention Program and the fact that EPA, in addition to OSHA, has a requirement that companies initiate incident investigations within 48 hours.

The CSB is an independent federal agency charged with investigating serious chemical accidents. The agency's board members are appointed by the president and confirmed by the Senate. CSB investigations look into all aspects of chemical accidents, including physical causes such as equipment failure, as well as inadequacies in regulations, industry standards, and safety management systems.

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U.S. CHEMICAL SAFETY AND HAZARD INVESTIGATION BOARD

INVESTIGATION REPORT

Pesticide Chemical Runaway Reaction Pressure Vessel Explosion

(Two Killed, Eight Injured)



BAYER CROPSCIENCE, LP

INSTITUTE WEST VIRGINIA

AUGUST 28, 2008

KEY ISSUES:

- PROCESS HAZARDS ANALYSIS
- PRE-STARTUP SAFETY REVIEW
- PROCESS SAFETY INFORMATION AND TRAINING
- EMERGENCY PLANNING AND RESPONSE

Report No. 2008-08-I-WV
January 2011

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Acronyms and Abbreviations

| | |
|----------------|---|
| ATF | U.S. Bureau of Alcohol, Tobacco, and Firearms, and Explosives |
| CAD | (Emergency Operations Center) Computer aided dispatch |
| CCPS | Center for Chemical Process Safety |
| CFR | Code of Federal Regulations |
| CPQRA | Chemical process quantitative risk assessment |
| CSB | U.S. Chemical Safety and Hazard Investigation Board |
| DCS | Distributed control system |
| DEP | Department of Environmental Protection |
| DMDS | Dimethyl disulfide |
| ECC | East Carbamoylation Center |
| EHA | Extraordinarily hazardous substance |
| EMS | Emergency Medical Services |
| EOC | Emergency Operations Center |
| EPA | U.S. Environmental Protection Agency |
| FDA | U.S. Food and Drug Administration |
| FIFRA | Federal Insecticide, Fungicide and Rodenticide Act |
| fps | feet per second |
| GUI | Graphical user interface |
| HAZOP | Hazard and operability study |
| HSE | U.K. Health and Safety Executive |
| IC | Incident Commander |
| ICS | Incident Command System |
| IDLH | Immediately dangerous to life or health |
| IR | Infrared radiation |
| KCEAA | Kanawha County Emergency Ambulance Authority |
| KCSD | Kanawha County Sheriff's Department |
| KPEPC | Kanawha-Putnam County Emergency Planning Committee |
| LOPA | Layer of Protection Analysis |
| m ³ | cubic meter |
| MAWP | Maximum allowable working pressure |
| mg | milligram |
| MIBK | Methyl isobutyl ketone |

| | |
|-------|---|
| MIC | Methyl isocyanate |
| MOCR | Management of change review |
| MSAO | Methylthioacetaldoxime (also called Oxime) |
| MSDS | Material Safety Data Sheet |
| MSS | MIC stripping still |
| NAS | National Academy of Sciences |
| NIMS | National Incident Management System |
| NIOSH | The National Institute for Occupational Safety and Health |
| OES | West Virginia State Office of Emergency Services |
| OIG | Office of Inspector General |
| OSHA | U.S. Department of Labor, Occupational Safety and Health Administration |
| PEL | Permissible exposure limit |
| PFD | Probability of failure on demand |
| PHA | Process hazard analysis |
| PIO | Public Information Officer |
| ppm | parts per million |
| PSSR | Pre-startup safety review |
| PSM | Process Safety Management (29 CFR 1910.119) |
| REL | Recommended exposure limit |
| RHS | Reactive Hazard Substance |
| RMP | Risk Management Program (40 CFR 68) |
| RRT | Regional Response Team |
| SOP | Standard operating procedure |
| TCPA | (New Jersey) Toxic Catastrophe Prevention Act |
| TLV | Threshold limit value |
| TQ | Threshold quantity (OSHA PSM or EPA Risk Management Program) |
| UCC | Union Carbide Corporation |
| UCS | Unified Command System |
| VOC | Volatile organic compound |
| WCC | West Carbamoylation Complex |

Executive Summary

On August 28, 2008, at about 10:35 p.m., a runaway chemical reaction occurred inside a 4,500 gallon pressure vessel known as a residue treater, causing the vessel to explode violently in the methomyl unit at the Bayer CropScience facility in Institute, West Virginia. Highly flammable solvent sprayed from the vessel and immediately ignited, causing an intense fire that burned for more than 4 hours. The fire was contained inside the Methomyl-Larvin insecticide unit by the Bayer CropScience fire brigade with mutual aid assistance from local volunteer and municipal fire departments.

The incident occurred during the restart of the methomyl unit after an extended outage to upgrade the control system and replace the original residue treater vessel. Two company employees who had been dispatched by the control room personnel to investigate why the residue treater pressure was increasing were near the residue treater when it ruptured. One died from blunt force trauma and burn injuries sustained at the scene; the second died 41 days later at the Western Pennsylvania Burn Center in Pittsburgh, Pennsylvania. Six volunteer firefighters who assisted in the unit fire suppression activities and two contractors working at the facility were treated for possible toxic chemical exposure.

The Kanawha-Putnam County Emergency Management Director advised more than 40,000 residents, including the resident students at the West Virginia State University adjacent to the facility, to shelter-in-place for more than three hours as a precaution. The fire and drifting smoke forced the state police and local law enforcement authorities to close roads near the facility and the interstate highway, which disrupted traffic for hours.

The Chemical Safety Board (CSB) investigation team determined that the runaway chemical reaction and loss of containment of the flammable and toxic chemicals resulted from deviation from the written start-up procedures, including bypassing critical safety devices intended to prevent such a condition. Other contributing factors included an inadequate pre-startup safety review; inadequate

operator training on the newly installed control system; unevaluated temporary changes, malfunctioning or missing equipment, misaligned valves, and bypassed critical safety devices; and insufficient technical expertise available in the control room during the restart.

Poor communications during the emergency between the Bayer CropScience incident command and the local emergency response agency confused emergency response organizations and delayed public announcements on actions that should be taken to minimize exposure risk. Although Bayer CropScience reported that “no toxic chemicals were released because they were consumed in the intense fires,” the CSB later confirmed that the only air monitors suitably placed near the unit to detect toxic chemicals were, in fact, not operational at the time of the incident. No reliable data or analytical methods were available to determine what chemicals were released, or predict any exposure concentrations.

The methomyl unit used the highly toxic chemical, methyl isocyanate (MIC), in a series of complex chemical reactions to produce methomyl, a dry chemical used to make the pesticide, Larvin. MIC is manufactured in a separate production unit at the facility and stored in large underground pressure vessels. Liquid MIC was pumped to a “day tank” pressure vessel near the Methomyl-Larvin unit, which provided the daily production quantity of MIC for the methomyl unit and the carbofuran unit, which is about 200 feet west of the methomyl unit. The MIC storage tank adjacent to the methomyl unit and the MIC transfer piping between the production unit and the manufacturing units were not damaged, nor did the MIC storage tank overheat or pressurize above the operating limits during the fire.

The CSB investigation identified the following incident causes:

1. Bayer did not apply standard Pre-startup Safety Review (PSSR) and turnover practices to the methomyl control system redesign project. The equipment was not tested and calibrated before the unit was restarted.
2. Operations personnel were inadequately trained to operate the methomyl unit with the new distributed control system (DCS).
3. Malfunctioning equipment and the inadequate DCS checkout prevented the operators from achieving correct operating conditions in the crystallizers and solvent recovery equipment.
4. The out-of-specification methomyl-solvent mixture was fed to the residue treater before the residue treater was pre-filled with solvent and heated to the minimum safe operating temperature.
5. The incoming process stream normally generated an exothermic decomposition reaction, but methomyl that had not crystallized due to equipment problems greatly increased the methomyl concentration in the residue treater, which led to a runaway reaction that overwhelmed the relief system and over-pressurized the residue treater.

Many industrial facilities in the Kanawha river valley that surrounds Charleston, West Virginia, the state capital, handle thousands of pounds of toxic and flammable materials. Local community involvement in safe handling of hazardous chemicals and emergency planning and the Kanawha Valley Industrial Emergency Planning Council date back to the 1950s. In 1995, the planning council was renamed the Kanawha Putnam Emergency Planning Committee, which functions as the local emergency planning committee (LEPC) as required by the Superfund Amendments and Reauthorization Act, Emergency Planning and Community Right-to-Know Act (SARA Title III).

Although federal law requires the owner or operator of the facility to promptly provide information to the LEPC necessary for developing and implementing the emergency plan [EPCRA 303(d)(3)], it does not provide LEPCs or other local agencies with the authority to conduct reviews of facility process safety programs or directly participate in hazard reviews or incident investigations. A few

state governments have passed laws that authorize local governments to become directly involved with industry process safety programs. For example, the New Jersey Toxic Catastrophe Prevention Act,¹ created in 1986, significantly expands the requirements contained in the U.S. Environmental Protection Agency Risk Management Program (40 CFR68). In 1999, the Contra Costa County, California Board of Supervisors approved an industrial safety ordinance² that established broad authority to the county health services department to oversee local refining and chemical industries. The ordinance includes mandatory safety plan submission by regulated industries, and audit and facility inspections by the county.

Like Contra Costa County, the Kanawha valley has many facilities that handle large quantities of hazardous materials, some of which are acutely toxic. Furthermore, the valley contains environmentally sensitive areas such as the Kanawha River, which is an important transportation corridor. Yet, the local government does not have the authority to directly participate in facility safety planning and oversight even though many community stakeholders have long campaigned for such authority and involvement. The local government could adopt regulations and implement a program similar to Contra Costa County that would likely improve stakeholder awareness and improve emergency planning and accident prevention.

The Bayer CropScience investigation was the agency's first case involving company assertions of Sensitive Security Information (SSI) under the Maritime Transportation Security Act of 2002. Federal law requires a company to mark all SSI containing documents and notify the recipient that the documents must be controlled in accordance with Department of Homeland Security regulations. Early in the investigation, Bayer CropScience management asserted that most of their records contained SSI information, and therefore the CSB was prohibited from releasing it to the public. The

¹ New Jersey Administrative Code Title 7 Chapter 31.

² Contra Costa County, California, Ordinance Code Title 4 – Health and Safety, Division 450 – Hazardous Materials and Wastes, Chapter 450-8 – Risk Management.

CSB consulted with the U.S. Coast Guard and determined that the Bayer claim was without basis. The president of Bayer CropScience, LP later admitted in testimony to the U.S. House of Representatives Committee on Energy and Commerce “[W]e concede that our pursuit of SSI coverage was motivated, in part, by a desire to prevent that public debate [concerning the use of MIC] from occurring in the first place.”³

The controversy created by the SSI issue and the Bayer CropScience admission prompted the U.S. Congress to enact legislation to amend Section 70103(d) of Title 46, United States Code. The new law, titled “American Communities’ Right to Public Information Act,” prohibits designating information to be SSI to “prevent or delay the release of information that does not require protection in the interest of transportation security, including basic scientific research information not clearly related to transportation security.”

Ever since the 1984 tragic accident in Bhopal, India, which released highly toxic MIC into the community and killed thousands of nearby residents, many in the Kanawha valley community have tried to convince the owners of the Institute facility to drastically reduce or eliminate MIC. In fact, the Institute facility is the only facility in the United States that stores and uses large quantities of the highly toxic chemical. The August 2008 incident, which could have caused an MIC release into the nearby community, reinvigorated community pressure to reduce the MIC risk to the public.

In 2009, the U.S. House of Representatives Committee on Energy and Commerce asked the CSB to provide recommendations to Bayer CropScience, and federal and state regulators to “reduce the dangers posed by on-site storage of MIC.” Many of the recommendations contained in this report address that request. Also in 2009, the U.S. Congress appropriated \$600,000 to the CSB to directly

³ Statement of William B. Buckner, president and chief executive officer of Bayer CropScience, LP before the U.S. House of Representatives Committee on Energy and Commerce Subcommittee on Oversight and Investigations, April 21, 2009.

fund a study “by the National Academy of Sciences to examine use and storage of MIC...and feasibility of implementing alternative chemicals or processes at the facility.”

Bayer CropScience has taken specific action to reduce the risk of an incident involving MIC. The company did not rebuild the damaged methomyl unit and discontinued production of two of the MIC-based pesticides. The company also made an investment of more than \$25 million to redesign and modify the MIC production unit to significantly reduce the on-site inventory of MIC and make other process upgrades to reduce the risk associated with handling large quantities of MIC. The improvements including eliminating the aboveground MIC storage vessels and replacing the underground storage vessels were scheduled to be completed by late 2010. In January 2011, Bayer announced it would eliminate the production of the two remaining carbamate pesticides, aldicarb and carbaryl, during 2012 and end all production, use, and storage of MIC.

Based on the findings of this report recommendations are made to Bayer CropScience located in Research Triangle Park, North Carolina, and in Institute, West Virginia. The Board also makes recommendations to the Secretary of the West Virginia Department of Health and Human Resources Commissioner of the Kanawha-Charleston Health Department, the West Virginia State Fire Commission, Kanawha Putnam Emergency Planning Committee, the Environmental Protection Agency, and the Occupational Safety and Health Administration. Implementation of the recommendations will improve hazardous chemicals management, and improve local government and community involvement with companies that use large quantities of hazardous chemicals.

1.0 Introduction

1.1 Background

On August 28, 2008, at about 10:25 p.m., two Bayer CropScience employees at the Institute, West Virginia, manufacturing facility were asked to investigate why pressure was unexpectedly increasing in the residue treater, a pressure vessel located on the south side of the Methomyl-Larvin unit about midpoint along an adjacent road. About 10 minutes later, as they approached the newly installed residue treater, it suddenly and violently ruptured. Approximately 2,200 gallons of flammable solvents and toxic insecticide residues sprayed onto the road and into the unit and immediately erupted in flames as severed electrical cables or sparks from steel debris striking the concrete ignited the solvent vapor.

Debris was thrown in all directions, some hundreds of feet. The 5,700-pound residue treater ripped out piping, electrical conduit, and a structural steel support column as it split apart and careened northeast into the Methomyl-Larvin production unit structure (Figure 1). The blast overpressure moderately damaged the unit control building and other nearby structures. Flying debris struck the protective steel shield blanket surrounding a 6,700-gallon methyl isocyanate (MIC) "day tank" located about 70 feet southwest of the residue treater (Figure 2), but did not damage the day tank. The steel blanket also protected the MIC day tank from the radiant heat generated by the nearby fires that burned for more than 4 hours.

One employee died at the scene from blunt force trauma and thermal burn injuries. Responding unit personnel helped the second employee out of the unit. He was transported to the Western Pennsylvania Burn Center in Pittsburgh, Pennsylvania, and died 41 days later. Five Tyler Mountain firefighters and one Institute firefighter who assisted the Bayer CropScience fire brigade at the unit reported possible chemical exposure symptoms. Two Norfolk Southern railroad employees working

at the facility the night of the incident also reported chemical exposure symptoms. None reported acute or long-term effects. Doctors identified heat exhaustion in at least two of the cases.

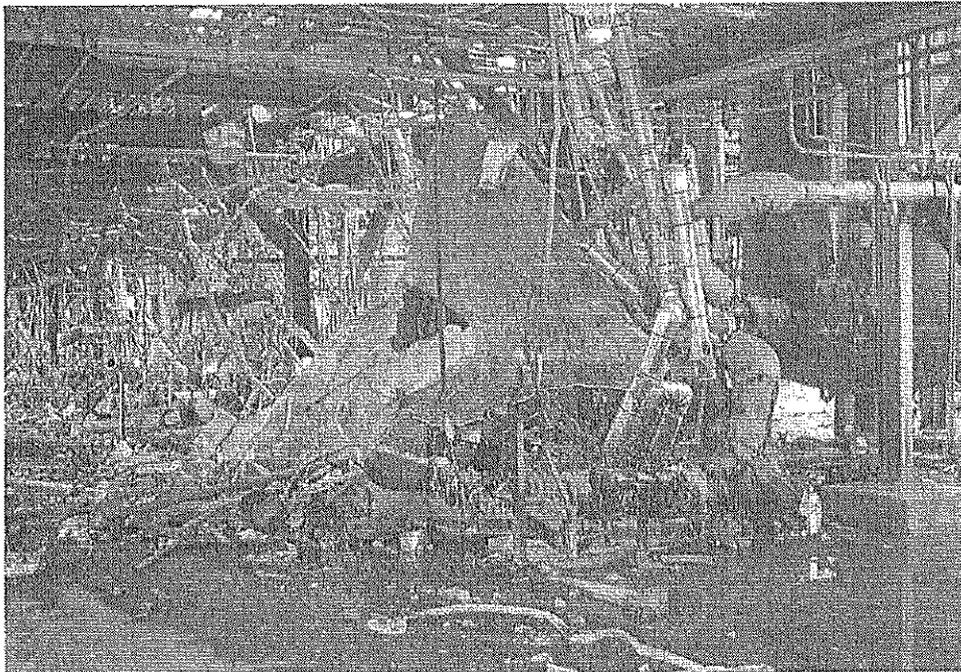


Figure 1. Residue treater came to rest inside the Methomyl-Larvin unit

The in-house fire brigade immediately responded to the incident. The Tyler Mountain and Institute Volunteer Fire Departments also arrived at the front gate of the facility to assist the fire brigade as planned in the mutual aid emergency response protocol. However, poor communications with the Metro 9-1-1 call center delayed the community shelter-in-place notification and interfered with effective off-site response activities.

The St. Albans, West Virginia, fire chief, unable to obtain specific information about the chemicals involved or the extent of the incident, prepared to issue a shelter-in-place for his community after he assumed that the smoke drifting across the river might contain toxic chemicals. After many unsuccessful attempts to communicate directly with the Bayer incident commander (IC) during the first hour of the incident, the Kanawha/Putnam County Emergency Management director declared a

shelter-in-place, which affected approximately 40,000 residents. Approximately 3 hours later county authorities lifted the shelter-in-place about 3 hours later.

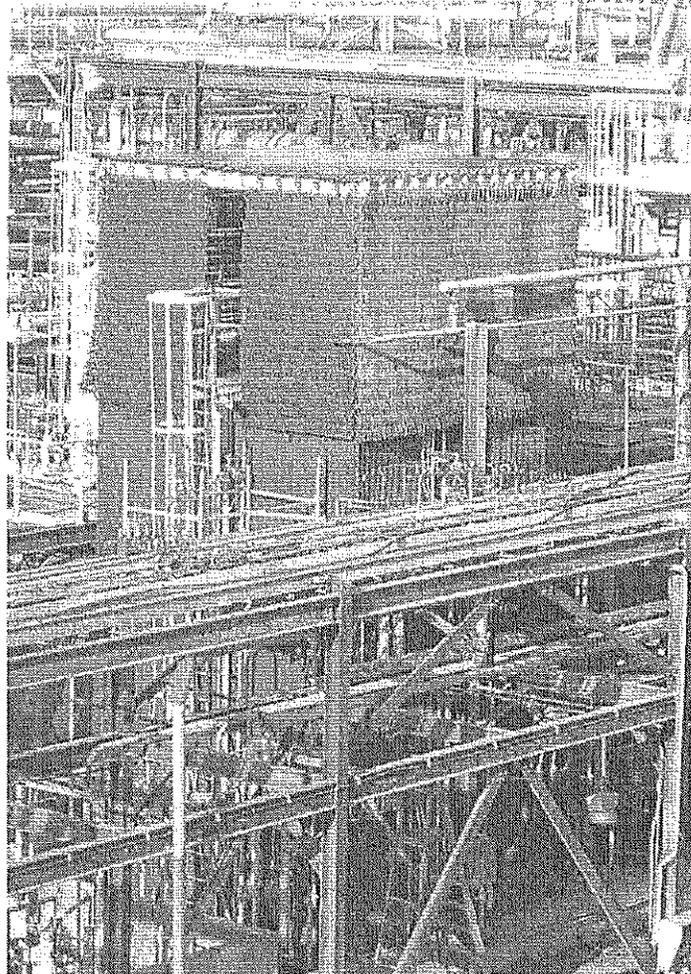


Figure 2. MIC day tank shield blanket structure

As far as 7 miles from the explosion epicenter, residences, businesses, and vehicles sustained overpressure damage that included minor structural and minor exterior damage and broken windows. Acrid, dense smoke billowed from the fire into the calm night air for many hours. Smoke drifted over Interstate 64 and nearby roads to the north of the facility, forcing many road closures and disrupting highway traffic.

Methomyl and solvents were released from the residue treater, and solvents and other toxic chemicals were released from ruptured unit piping including flammable and toxic MIC. The released chemicals rapidly ignited, producing undetermined combustion products. MIC air monitoring devices in and near the Methomyl-Larvin unit were not operational the night of the incident. Only two fenceline air monitors were operational, but they were more than 800 feet away and not located downwind of the smoke; in addition these fenceline monitors were only designed to detect carbon monoxide, hydrogen sulfide, flammable gas and oxygen. The four-gas air monitors⁴ worn by emergency responders did not detect hazardous chemicals in the air near the unit. There were no reports of river water contamination from fire suppression water runoff.

The incident occurred during the first methomyl restart after an extended outage to install a new process control system and replace the old carbon steel residue treater with a stainless steel pressure vessel with equivalent pressure and temperature operating limits. The residue treater was designed to decompose methomyl in a heated methyl isobutyl ketone (MIBK) solvent. During normal operations, dissolved methomyl and other waste chemicals were fed into the preheated residue treater partially filled with solvent. The methomyl safely decomposed inside the residue treater to a concentration of less than 0.5 percent by weight.⁵ The liquid was then transferred to an auxiliary fuel tank where it was mixed with other flammable liquid waste materials and used as a fuel in one of the facility boilers.

On the night of the incident, methomyl-containing solvent was pumped into the residue treater before the vessel was pre-filled with clean solvent and heated to the required minimum operating temperature specified in the operating procedure. The emergency vent system was overwhelmed by the evolving gas from the runaway decomposition reaction of methomyl, and the residue treater

⁴ Fire department and other emergency responder personnel typically wear a "four-gas air monitor" to measure concentrations of carbon monoxide and hydrogen sulfide, flammable gas, and oxygen concentration. An alarm sounds if any of the measured gases exceed the setpoint programmed in the detector.

⁵ All percent values used in the report are weight percent unless noted.

violently exploded. The estimated energy of the explosion was equivalent to about 17 pounds of TNT (See Appendix C).

1.2 Investigative Process

The CSB investigation team arrived at the Bayer CropScience facility the morning of August 30, 2008, and met with the Bureau of Alcohol, Tobacco, and Firearms and Explosives (ATF), Occupational Safety and Health Administration (OSHA) investigators, and Bayer management personnel to explain the CSB purpose and authority for conducting an investigation independently of other agencies and organizations. On September 2, 2008, the ATF concluded that the incident was not a criminal act and ceased its on-scene investigative activities.

Over the following 6 weeks, the CSB investigators examined and photographed the residue treater and associated process equipment; MIC day tank, blast blankets, and support structure; surveyed the control building damage; mapped the debris field; interviewed employees working at the facility on the night of the incident; and interviewed outside emergency personnel who participated in the response. The team examined methomyl unit operating procedures, control system data, process chemistry documents, worker training records, and maintenance records. Finally, the CSB commissioned computer modeling to evaluate the blast shield used to protect the MIC day tank.

1.2.1 Agency Access to Security Related Documents

The Bayer CropScience investigation is the first incident investigated by the CSB that involves the Maritime Transportation Safety Act⁶ and Sensitive Security Information (SSI). SSI is information that, if publicly released, would be detrimental to transportation security.⁷ Federal law requires a company to mark all documents containing SSI and to notify the recipient that the documents must be controlled in accordance with Department of Homeland Security regulations. Bayer's attempts to use

⁶ 46 U.S.C. § 70102

⁷ 49 CFR 1520.

the SSI designation to suppress public disclosure of information related to the investigation forced the CSB to delay the planned interim public meeting and ultimately led to congressional action to prevent future misuse of the regulation.

In January 2009, the Head of the Health, Safety, and Environment Expertise Center at the Bayer CropScience Institute facility contacted the U.S. Coast Guard Commanding Officer, Marine Safety Unit in Huntington, West Virginia and suggested "to discuss this [SSI] further with your headquarters so that we can better communicate to the CSB and possibly discourage them from even seeking this information."⁸ Then, in March 2009, Bayer CropScience sent a letter to the CSB asserting that many of the documents already delivered to the CSB contained SSI and requested the documents be returned to them so each page could be marked as required by the regulation. The company also claimed photos, interview records, and other CSB produced investigatory documents might contain SSI. The CSB declined the request to return the documents and a later request to examine the documents at the CSB office and directed Bayer CropScience to properly label and resubmit all SSI containing documents. Bayer CropScience officials later admitted they had attempted to use the Maritime Transportation Safety Act to block public disclosure of information related to methyl isocyanate and possible negative publicity.

The controversy created by raising the SSI issue to restrict CSB investigative activities resulted in the U.S. Congress enacting legislation on October 8, 2009, to amend Section 70103(d) of title 46, United States Code. The new law, titled the "American Communities' Right to Public Information Act"⁹ added the following restriction on SSI claims:

⁸ E-mail from the Head, Health, Safety, and Environment Expertise Center, Bayer CropScience, to the Commanding Officer, Marine Safety Unit Huntington, U.S. Coast Guard (Jan. 29, 2009).

⁹ Public Law 111-83.

“(d) Nondisclosure of information, 2) Limitations.—Nothing in paragraph (1) shall be construed to authorize the designation of information as sensitive security information (as defined in section 1520.5 of title 49, Code of Federal Regulations ; (A) to conceal a violation of law, inefficiency, or administrative error; (B) to prevent embarrassment to a person, organization, or agency; (C) to restrain competition; or (D) to prevent or delay the release of information that does not require protection in the interest of transportation security, including basic scientific research information not clearly related to transportation security.

1.2.2 CSB Interim Public Meeting

On April 28, 2009, the CSB held a public meeting in Institute, West Virginia, which was attended by more than 250 people. The investigation staff presented the incident timeline, described the processes and equipment involved, described the county emergency response activities, and summarized the preliminary findings of the investigation. The meeting included presentations from Bayer CropScience, the West Virginia State Fire Marshal, the Kanawha Putnam County Emergency Management Director, a representative from the International Association of Machinists, a chemical industry expert, and a representative from the community advocacy group People Concerned about Methyl Isocyanate.

The Board also heard testimony from 16 people in attendance including residents who live near the facility, the president of West Virginia State University, workers from Bayer CropScience, and other interested individuals.

1.3 Facility Description

1.3.1 Institute Manufacturing Industrial Park

The Institute facility is located 9 miles west of Charleston, West Virginia, and is bordered on the north by Route 25 and Interstate 64, on the east by the West Virginia State University, and along the

south by the Kanawha River. St. Albans, West Virginia, is across the river 3 miles west (Figure 3). Raw materials and products used or manufactured at the facility are transported by truck, rail, and barge.

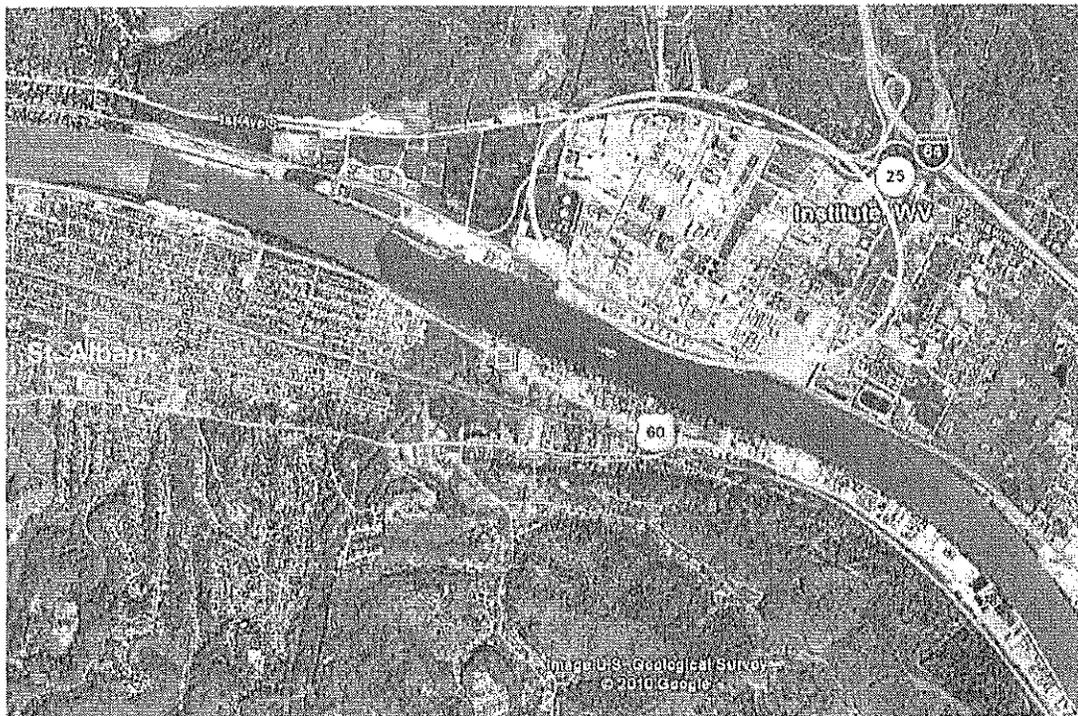


Figure 3. Institute Manufacturing Industrial Park

1.3.2 Facility Ownership History

The site was originally Wertz Field Airport and closed in 1942 to become a large, government-sponsored synthetic rubber production plant for the World War II effort managed by the Carbide and Carbon Chemicals Corporation and the United States Rubber Company. In 1947, the Union Carbide Corporation (UCC) purchased the plant to produce carbamate insecticides. In 1986, Rhone-Poulenc, a French-owned chemical company, purchased the agricultural division of UCC and operated the Institute facility until 2000. Aventis, formed by a merger of Rhone-Poulenc and AgrEvo, took over the facility until Bayer CropScience acquired it in 2002.

In August 2008, the 460-acre, multi-tenant Institute Manufacturing Industrial Park employed approximately 645 workers. The seven tenants on the facility included Bayer CropScience, Adisseo, FMC Corporation, Dow Chemical, Catalyst Refiners, Reagent Chemical, and Praxair (Figure 4). The site contains 16 production units and five utility and support units. Some of the tenants produce chemicals that are used as feedstocks in units owned or operated by other tenants.



Figure 4. Seven tenants own or operate processes at the Institute Industrial park

Bayer owns and operates nine production and utility units. Two additional process units are operated by Bayer employees under contractual agreements with the unit owners, Adisseo, and FMC. Bayer employs approximately 545 at the Institute facility.

1.4 Bayer CropScience, LP

Bayer CropScience is an independently operated company within Bayer, AG, (Bayer Group) which is the chemical and pharmaceutical parent company headquartered in Leverkusen, Germany. Bayer CropScience, Bayer HealthCare, and Bayer Material Science make up the three business areas of the Bayer Group.

The Bayer CropScience business, headquartered in Monheim, Germany, employs more than 18,000 personnel in more than 120 countries. A 12-member global executive committee, including the Bayer Board of Management chairperson, manages Bayer CropScience. Executive committee members oversee research, operations, planning, and administrative functions, as well as regional business areas. A 12-member supervisory board composed of Bayer Group executives, independent experts, and trade union representatives comprise a supervisory board to oversee company operations. The Bayer CropScience U.S. headquarters is in Research Triangle Park, North Carolina.

Bayer CropScience (Bayer) is a global provider of crop protection agents, such as insecticides, herbicides, and fungicides for commercial and private consumer use. The Crop Protection division serves the agriculture sector and the BioScience division uses gene technology to produce genetically modified crops as an alternative to conventional pesticide applications. The Environmental Science division provides services for professional weed and pest control customers.

1.4.1 Institute Operations

Bayer has three insecticide manufacturing complexes on the Institute site supported by two powerhouses and a wastewater treatment unit. The East Carbamoylation Complex (ECC) includes the MIC and Phosgene production unit and the Aldicarb and Carbaryl units. The MIC and phosgene production unit supplies feedstock to the Aldicarb and Carbaryl unit for the production of insecticides. The Methomyl-Larvin[®] unit occupied the West Carbamoylation Complex (WCC), along with the FMC-owned carbosulfan and carbofuran unit, which was operated by Bayer. The Adisseo-owned Rhodimet[®] unit makes up the third complex that Bayer also operates.

1.5 Bayer Operating Organization

For many years the methomyl unit operated in a traditional organizational structure for chemical plant operating units; that is, with a first-line supervisor who directed the work of a team of operators. Four operating crews typically covered rotating shifts, and each team included a supervisor and a crew of

operators. The supervisor's responsibilities included monitoring the operators' work to ensure that they were successfully running the process and included completing administrative tasks for those operators, such as scheduling, payroll, sick-time call-out, safety and health, and other supervisor duties. The supervisor and the operators worked the same rotating shift, and except when filling in as substitutes on other shifts or units for worker vacations and sick days, the operators reported directly to the same supervisor when they worked their normal schedule. The operators worked with the supervisor an average of 40 hours per week. If the operators had questions about their job or administrative procedures, they generally asked the supervisor who was in the unit with them at that time.

From 2004 to 2007, Bayer management analyzed and restructured the unit supervisory and technical oversight staffing. First-line supervisor positions in each operating unit were eliminated and self-directed, or self-empowered work teams were implemented. Four teams of operators worked rotating shifts, supported by a Technical Advisor and Run Plant Engineer, both day-shift workers. Instead of a first-line supervisor, all operators including the Technical Advisor report to the Production Leader (Figure 5).

A single Industrial Park Site Shift Leader, which management describes as a "first among equals," is responsible for all facility operations, rotates on shift with the shift operators, and oversees site operations. Some personnel in the Shift Leader role have prior experience as first-line supervisors on various operating units. However, the Shift Leader is not a first-line supervisor, as none of the operators report to him/ her. Instead, the Shift Leader oversees the entire facility and can advise in any area of the plant as necessary. The Shift Leader also serves as the Incident Commander if an incident requires emergency response. Bayer management describes Shift Leaders as "very good operators who have worked their way through the technical advisor role."

Bayer intended the Technical Advisor, who is not a first-line supervisor, to be an experienced operator who works the day shift, helps schedule production to meet demand, and advises the on-shift

operators. The operators can call the Technical Advisor and ask questions any time of the day or night. The other operators do not report to him/her, and the Technical Advisor does not have the strong work-checking or “looking over the shoulder” function of a historical first-line supervisor or foreman.

BayerCropscience Organization

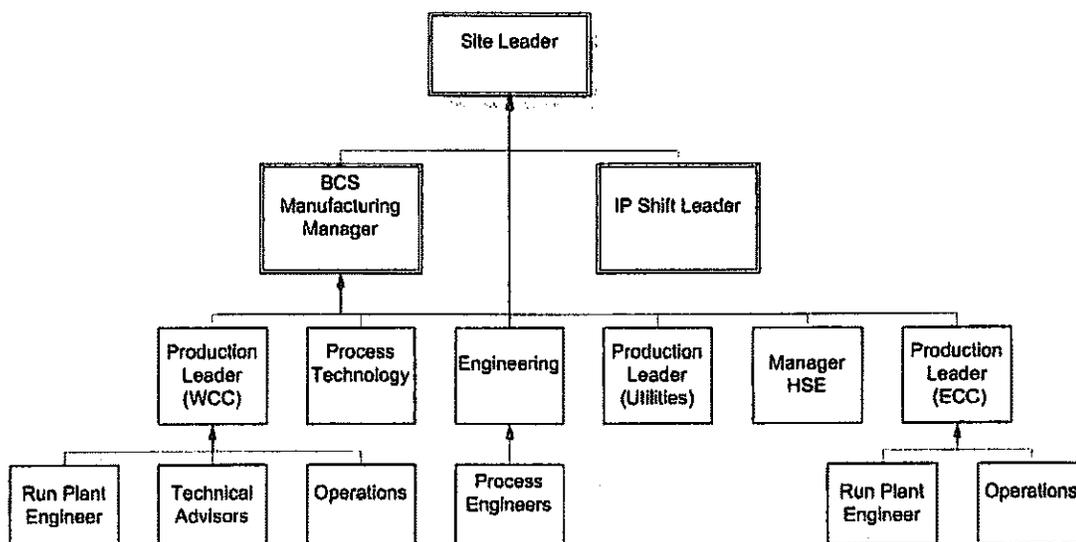


Figure 5. Institute site organization structure.

1.6 Process Chemicals

1.6.1 Methomyl

Bayer produced methomyl for international customers and as an intermediate feedstock used to make Larvin® (Thiodicarb), an insecticide and ovicide.¹⁰ Methomyl is a white, crystalline solid with a slight sulfurous odor. Methomyl dust is combustible and can form explosive mixtures when dispersed in air. It was introduced in 1966 as a carbamate insecticide and registered by the U.S. Environmental

¹⁰ An ovicide is a chemical used to control insect larvae. Larvin is used worldwide on crops such as corn, cotton, fruits, grapes, sorghum, soybeans, and vegetables.

Protection Agency (EPA) in 1968 as a restricted use pesticide¹¹ due to its high human toxicity. It is a broad-spectrum insecticide used on vegetable, fruit, and cotton crops worldwide and targets insects though direct contact and systemic absorption.

Methomyl is a cholinesterase inhibitor that disrupts central and peripheral nervous system functions. Routes of exposure include inhalation, ingestion, and skin and eye absorption. Reversible and irreversible effects can result depending on the concentration and duration of the exposure. The National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit (REL) for methomyl is 2.5 mg/m³. When burned, methomyl decomposes to form toxic gases and vapors such as nitrogen oxides, sulfur oxides, acetonitrile, hydrogen cyanide, and methyl isocyanate (Sittig, 2008).

Table 1 lists the exposure limits, characteristics, and OSHA Process Safety Management (PSM) and EPA Risk Management Program (RMP) threshold quantities for the principal chemicals used to make methomyl. Phosgene is used to make MIC and MIC is used to make methomyl; both phosgene and MIC are highly toxic.

1.6.2 Phosgene

Phosgene is a colorless, dense gas that smells like freshly cut hay or grass. Although highly toxic, phosgene is an important industrial chemical used to make thermoplastics such as eyeglass lenses, and isocyanates, intermediate chemicals used to make polyurethanes and pesticides.

¹¹ Restricted use pesticides are limited to commercial applicators certified by the EPA and the Food and Drug Administration (FDA) state programs for pesticide safety education under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).

Table 1. Characteristics of the toxic chemicals used to manufacture methomyl

| Chemical | NIOSH IDLH ¹² (ppm) | NIOSH REL (ppm) | OSHA PEL (ppm) | ACGIH TLV (ppm) | Odor Threshold ¹³ (ppm) | Odor | RMP Threshold (lbs) | PSM Threshold (lbs) |
|-------------------|--------------------------------|-----------------|----------------|-----------------|------------------------------------|--------------------------|---------------------|---------------------|
| Chlorine | 10 | 0.5 | 1 | 0.5 | 0.002 | characteristic odor | 2500 | 1500 |
| Methyl Isocyanate | 3 | 0.02 | 0.02 | 0.02 | 2 | sharp, strong odor | 10,000 | 250 |
| Methyl Mercaptan | 150 | 0.5 | 10 | 0.5 | 0.002 | garlic or rotten cabbage | 10,000 | 5000 |
| Phosgene | 2 | 0.1 | 0.1 | 0.1 | 0.4 | hay or grass | 500 | 100 |

The NIOSH-recommended time-weighted average concentration limit is 0.1 ppm.¹⁴ Phosgene reacts with proteins in the pulmonary alveoli, disrupting the blood-air barrier in the lungs. The onset of symptoms may be delayed and, based on available information, there appears to be no specific proven antidote against phosgene-induced lung injury. However, clinical experience indicates that early treatment of suspected phosgene exposure may be more effective than treating clinically overt pulmonary edema. Early treatment options include steroids and positive airway pressure ventilation. Patients are expected to fully recover from low-dose exposure.

Bayer produces phosgene at the Institute facility by reacting carbon monoxide and chlorine gas in the presence of a carbon catalyst. The phosgene is stored in the ECC until it is used in three nearby

¹² The NIOSH definition for an IDLH exposure is a condition that poses a threat of exposure to airborne contaminants when that exposure is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from such an environment.

¹³ An odor threshold is the lowest airborne concentration that can be detected by a population of individuals.

¹⁴ Time-weighted average concentration is based on up to a 10-hour workday during a 40-hour work week.

process units and to make methyl isocyanate, an intermediate chemical used to make four additional products.

1.6.3 Methyl Isocyanate

Methyl isocyanate, or MIC, is one of the key chemicals used to make methomyl and two other products at the Institute site. MIC is a clear, colorless liquid with a strong, pungent odor, is highly reactive with water, and must be stored in stainless steel or glass containers at temperatures below 40 °C (104 °F) to prevent a highly exothermic¹⁵ self-polymerization reaction.

The NIOSH-recommended time-weighted average concentration limit is 0.02 ppm. MIC can damage human organs by inhalation, ingestion, and skin contact in quantities as low as 0.4 ppm. Exposure symptoms include coughing, chest pain, dyspnea, asthma, irritation of the eyes, nose, and throat, and skin damage. Exposure levels above about 21 ppm can result in pulmonary or lung edema, emphysema and hemorrhages, bronchial pneumonia, and death.

Bayer is the only facility in the U.S. that manufactures, stores, and consumes large quantities of MIC. It stores the liquid in underground pressure vessels in the MIC production unit located in the ECC, about 2,500 feet east of the Methomyl-Larvin unit. Each pressure vessel is insulated and double-wall construction, with leak detection in the annulus between the inner and outer wall. The MIC is refrigerated to between -10 °C and 0 °C (14 and 32 °F).

Prior to the incident, liquid MIC was transferred through an insulated piping system to an aboveground pressure vessel called a "day tank" located on the southwest corner of the Methomyl-

¹⁵ An exothermic reaction is a chemical reaction that generates heat.

Larvin production unit near the control room.¹⁶ After refilling the day tank, operators drained the transfer line and purged it with nitrogen.

The maximum MIC inventory in the 6,700-gallon capacity, stainless steel day tank was approximately 37,000 pounds (about 75 percent full). The pressure vessel was rated at 100 psig, but it was normally operated at 10 psig using a dedicated nitrogen supply system. The MIC was circulated through a chiller, and cooling coils were attached to the outside of the insulated day tank to maintain the MIC between -10 °C and 0 °C (14 and 32 °F). The chiller used a non-MIC reactive solvent, MIBK, rather than a water-ethylene glycol mixture to prevent a possible MIC-water reaction should the chiller leak. The MIBK system pressure was maintained greater than the MIC system pressure and the refrigerated ethylene glycol-water mixture system pressure in the MIBK chiller to ensure that water would not enter the MIC system in the event of a leak in both heat exchangers.

The control system contained redundant pressure, temperature, and flow instruments including high-pressure and high-temperature alarms and refrigeration system failure alarms. The area around the tank was equipped with air monitors to detect MIC. Firewater monitors (stationary spray nozzles) were located nearby to mitigate an MIC leak and suppress a fire that might threaten the tank. A wire rope blast blanket surrounded the entire tank and top piping connections (Figure 2) to stop debris from striking the day tank and to provide a thermal shield from radiant heat from a nearby fire. Finally, an emergency dump tank adjacent to the day tank was available to receive the contents of the MIC day tank and cross plant transfer line.

The MIC recirculation system, carbofuran unit transfer line, and the cross plant transfer line were equipped with emergency block valves that were operated from the control room. Emergency

¹⁶ The day tank at the Methomyl-Larvin unit also supplied MIC to the FMC-owned carbosulfan - carbofuran unit through a double wall piping system. Bayer stopped using the day tank, cross-unit transfer piping and FMC unit in August 2010 as part of the MIC storage reduction effort.

generators provided power to the refrigeration system in the event of a loss of normal plant electricity. MIC system vents were connected to the process and emergency vent systems.

1.7 Methomyl-Larvin Unit

The Methomyl-Larvin unit is located in the West Carbamoylation Complex (Figure 6). Methomyl was produced, packaged, and stored in a unit warehouse for later use in manufacturing Larvin or sold directly to commercial customers. Control room and outside operators were trained to work on both the methomyl and Larvin units. Although independent, both units were operated from the same control room (Figure 7).



Figure 6. Aerial view of Bayer Institute Manufacturing Park. Methomyl-Larvin unit (circled) is in the West Carbamoylation Complex

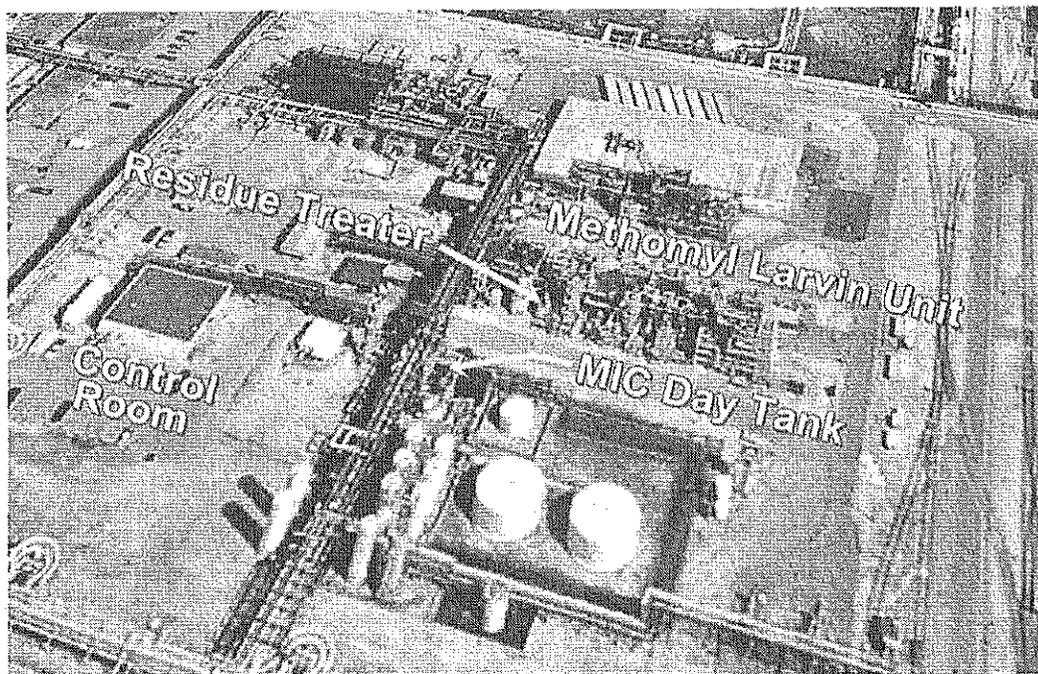


Figure 7. Overhead view of the Methomyl-Larvin production unit

1.7.1 Methomyl Synthesis

Methomyl production involved a series of complex chemical reactions. The process began by reacting aldoxime and chlorine to make chloroacetaldoxime, which was reacted with sodium methyl mercaptide in MIBK solvent to produce methylthioacetaldoxime (MSAO). Finally, MSAO was reacted with methyl isocyanate in MIBK to produce methomyl (Figure 8). Excess MIC was removed from the methomyl-solvent solution and then the solution was pumped to the crystallizers where an anti-solvent was added to cause the methomyl to crystallize. Finally, the crystallized methomyl was separated from the solvents in the centrifuges and the methomyl cake was removed from the centrifuges, dried, cooled, packaged in drums, and moved to the warehouse. The liquid exiting the centrifuges, known as mother liquor, contained MIBK and hexane, very small quantities of methomyl, and other impurities.

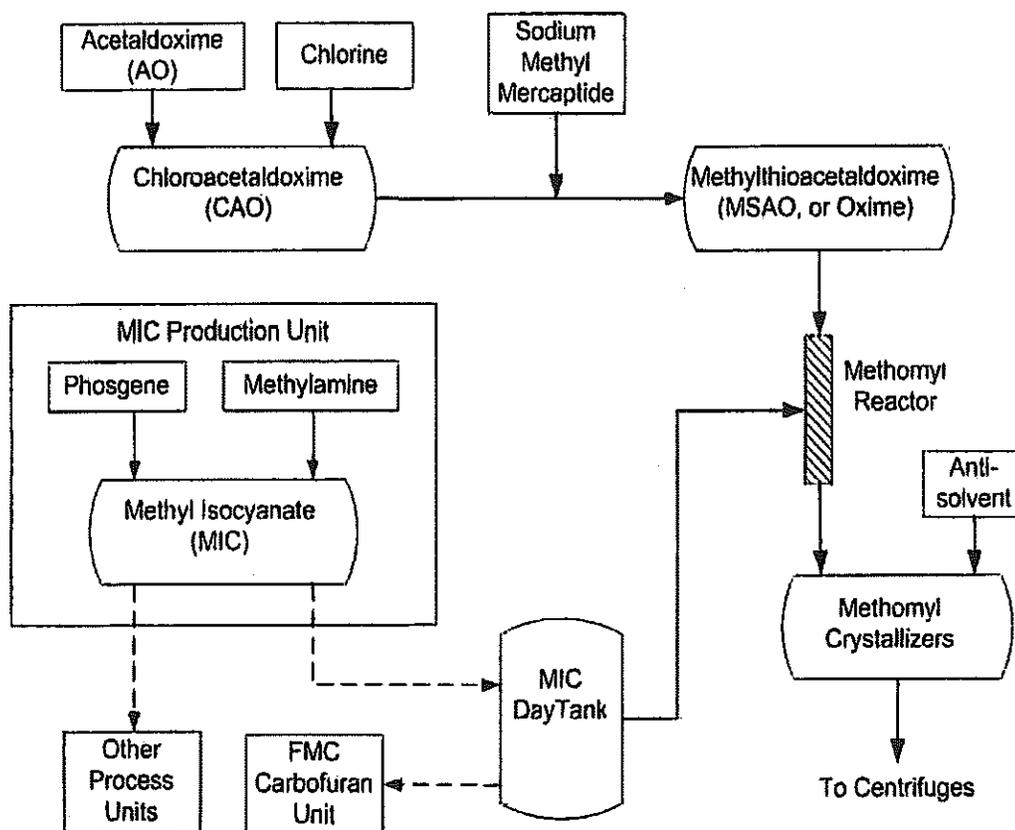


Figure 8. Methomyl synthesis process flow (dashed lines are unit-to-unit transfer pipes)

Distillation separated the solvents in solvent recovery flashers and recycled the solvents back to the beginning of the process (Figure 9). The unvaporized solvents and impurities including up to about 22 percent methomyl, accumulated in the bottom of the flasher. The flammable liquids could be used as fuel in the facility steam boilers. However, before this flammable waste liquid, called “flasher bottoms,” could be pumped to an auxiliary fuel tank, the methomyl concentration had to be reduced to not more than about 0.5 percent for environmental and processing considerations.¹⁷

¹⁷ The maximum methomyl concentration limit in the auxiliary fuel was based on environmental effluent criteria and the prevention of an uncontrolled methomyl decomposition reaction in the auxiliary fuel storage tank.

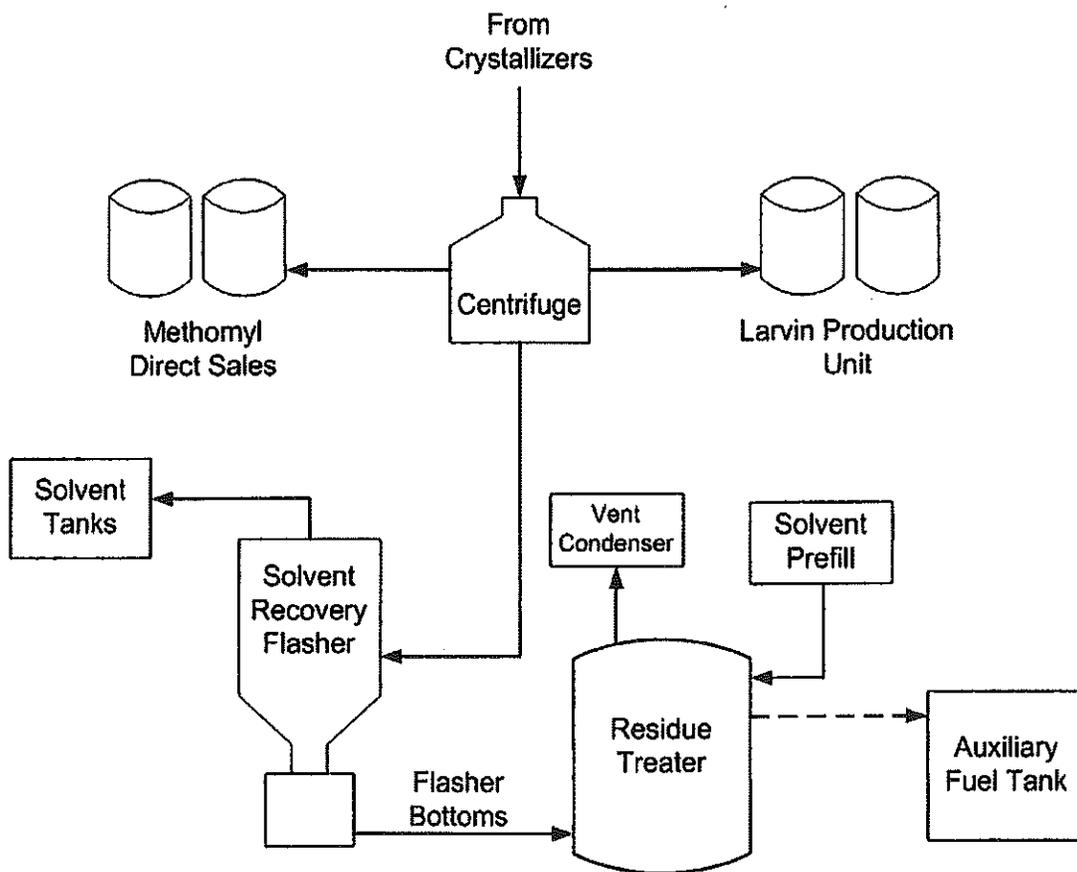


Figure 9. Methomyl centrifuge and solvent recovery process flow

The residue treater was used to dilute the incoming flasher bottoms in MIBK solvent and was designed to operate at a high enough temperature, and with sufficient residence time, to decompose the methomyl in the flasher bottoms stream to below 0.5 percent. The solvent and residual waste material were transferred to the auxiliary fuel tank for use as a fuel in the facility steam boiler. Vapor generated in the methomyl decomposition reaction exited through the vent condenser to the process vent system where toxic and flammable vapor were removed.

1.7.2 Control System Upgrade

Operators were qualified to operate the methomyl and the Larvin units, each from a separate workstation in the control room. In 2007 Bayer upgraded the Larvin unit control system to a Siemens

distributed control system (DCS)¹⁸ and upgraded the methomyl control system during the 2008 methomyl outage.¹⁹ Bayer, with assistance from Siemens, conducted formal operator training on the Larvin control system upgrade in 2007 and by spring 2008, the operators were proficient in using the Larvin DCS.

The DCS contains three control system interlock matrices: Safety, Operating, and Control. The safety matrix consists of pre-defined process deviations and computer-controlled process actions that determine how and when fail-safe automatic control functions are activated. The status of all safety matrix interlocks is displayed on a color-coded spreadsheet on the display console. Process mimic screens²⁰ also displayed safety matrix component cause/effect²¹ status next to the component icon. A password, which board operators did not have access to, was required to bypass (override) or change a safety matrix cause/effect fail-safe control.

Like the Larvin system upgrade, board operators and unit engineers directly participated in configuring the design of the methomyl DCS. New display screens designed to mimic the process flow incorporated automated icons for critical equipment to show operating status and other parameters, included a mouse user interface, and featured improved human-machine interfaces.

¹⁸ DCS are dedicated systems used to control manufacturing processes that are continuous or batch-oriented. The DCS is connected to sensors and actuators and uses setpoint controls to control process variables.

¹⁹ The methomyl process was not run year-round, as demand for methomyl was such that the methomyl unit was operated for a few months at a time with extended outages between runs. The optimal time to perform major repairs and system upgrades was during these outages.

²⁰ A mimic screen is a simplified graphical representation of a process that uses icons to display piping and equipment with color-coded operating status, instrumentation with output values and setpoint data, and other key equipment and information maintain situation awareness and to control the process.

²¹ A safety matrix cause element is a pre-defined process deviation value that triggers the specified process component action or effect. For example, if the tank level exceeds the high-high setpoint (the cause), the fill line process valve is commanded to close (the effect).

1.7.3 Residue Treater

The residue treater was a 4,500-gallon pressure vessel with a maximum allowable operating pressure of 50 psig. The relief system on the residue treater was designed to handle a maximum methomyl concentration not to exceed 1.0 percent.

The vessel mechanical integrity program inspection results found that the 25-year-old vessel had sustained significant wall thinning due to generalized corrosion. Using the management of change (MOC) program, Bayer replaced the vessel during the summer 2008 outage with a new stainless steel pressure vessel to improve corrosion resistance. The existing recirculation piping, controls, and instruments were not modified.

The vent condenser piping at the top of the residue treater was prone to blockages during unit operation. Gases that evolved from the methomyl decomposition reaction passed through the vent condenser to the flare system. The gas flow carried trace amounts of solid material into the vent system where they were deposited on the surface of the pipe. Over time, the accumulating deposits would choke the flow and cause the residue treater pressure to climb. The board operator directed outside operators to attach a temporary steam line to the vent pipe and flush the deposits from the vent pipe whenever the deposits blocked the vent and caused the residue treater pressure to approach the upper operating limit.

Because the original design did not consider the need to periodically clear blockages, the valves and connection ports were hard to reach, so Bayer repositioned them during the unit outage to improve access.

1.7.3.1 Residue Treater Operation

The residue treater (Figure 10) had an automatic level control system to control the liquid level at about 50 percent. The residue treater recirculation system was used to heat the solvent at the beginning of a new production run, mix the incoming flasher bottoms into the partially filled vessel,

and remove excess heat generated from the exothermic decomposition of the methomyl inside the vessel.

An automatic temperature control system on the residue treater monitored both the bulk liquid temperature in the residue treater and the liquid in the recirculation loop. During startup, the control system modulated the recirculation and steam flows through the heater. When the liquid temperature increased to the setpoint limit, the control system closed the steam flow valve, and changed the position of the circulation valves to redirect the recirculation flow from the heater to the cooler. The cooler was provided with constantly circulated 80 °C (176 °F) water, which was sufficient to remove excess heat from the decomposing methomyl and to maintain the liquid temperature within the operating limits, provided that the bulk methomyl average concentration inside the residue treater remained below about 0.5 percent.

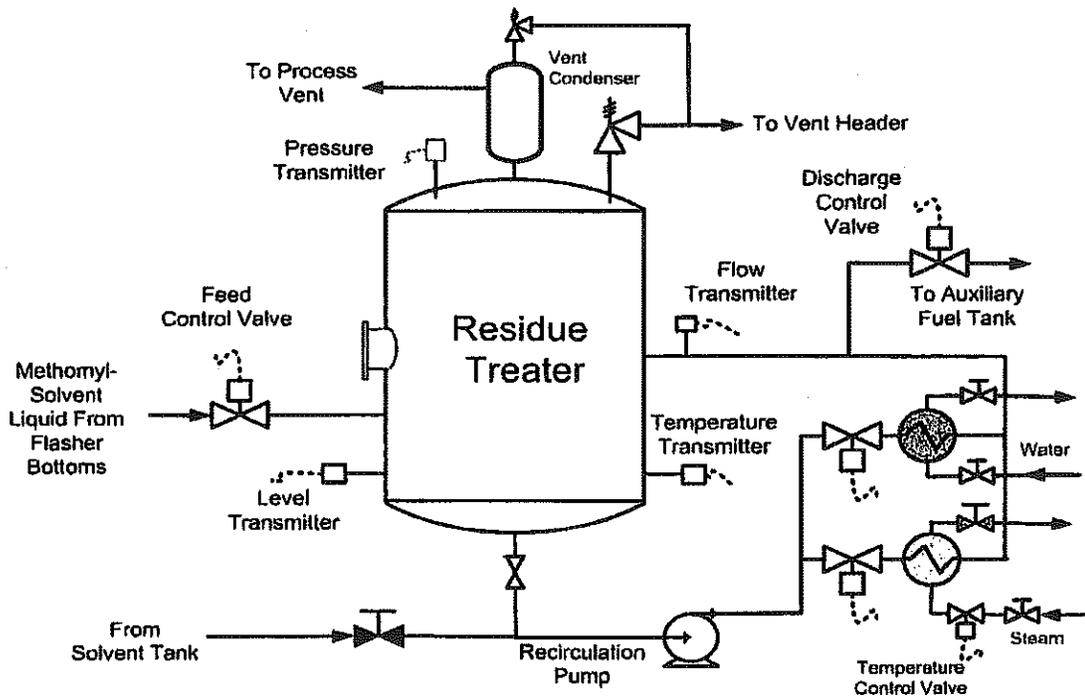


Figure 10. Residue treater piping system layout

At normal operating conditions, the temperature of the flasher bottoms liquid was kept at about 80 °C (176 °F) to prevent an uncontrolled auto-decomposition of the higher concentration methomyl. The contents of the residue treater were maintained at approximately 135 °C (275 °F), the temperature that assured the incoming methomyl quickly decomposed so as not to accumulate to an unsafe concentration inside the residue treater. As the flasher bottoms liquid entered the hot solution in the residue treater, the methomyl began to decompose. The exothermic heat of decomposition was controlled by vaporization, and condensing of the solvent in the vent cooler, supplemented as needed by the recirculation loop cooler.

1.7.3.2 Operating Limit Control Interlocks

The residue treater control system was equipped with operating limit controllers integrated into the automatic feed control valve operation. A minimum temperature interlock and a maximum pressure interlock prevented the feed control valve from opening until the minimum temperature of the residue treater contents were at or above the setpoint and the residue treater pressure was below the setpoint, respectively. Both were designated as safety interlocks; thus, bypass control was password-protected. A third interlock, designated “operating,” also prevented the feed control valve from opening until residue treater recirculation flow was established. The standard operating procedure (SOP) specifically discussed the importance of these interlocks:

Mother liquor flasher tails [flasher bottoms] can not be introduced into the residue treater until the pressure is not high-high, the tank temperature is not high-high or low-low and the circulation flow is not low-low.

The SOP contained an administrative control²² that the operator had to perform before putting the residue treater methomyl feed in automatic operation: “If the tank is allowed to cool below 130 °C [266 °F], for any reason, it must be sampled before being heated up again.” Furthermore, the SOP

²² An administrative control is an action or activity that is described and managed through a specific operating or maintenance procedure.

cautioned, “[I]f the methomyl concentration is above 1.3 %, a run away [sic] reaction could result upon heating the tank.” Furthermore, the process hazards analysis stated:

[R]egular samples of residues [flasher bottoms] from the flasher would assure proper operation and safety...Take regular samples of residues from the flasher and residue treatment tank. This will assure proper operation and safety since safety relief sizing is based on a certain maximum methomyl concentration in each item.

However, the SOP did not require analyzing the flasher bottoms, nor was the system configured such that operators could collect a liquid sample for analysis. As discussed in the incident analysis, one key factor contributing to the incident was that the operators were unaware the flasher bottoms contained an excessively high concentration of dissolved methomyl.

1.7.3.3 Startup and Operation

The SOP contained specific steps for starting the residue treater. During these startup steps, the flasher bottoms flow control valve was to be set in the manual, closed position. The safety interlocks on the flasher bottoms flow control valve were designed to prevent feeding methomyl into the residue treater until the limit conditions were satisfied. The startup sequence also required the operator to sample the liquid remaining in the residue treater from the previous run and send it to the lab to confirm that it contained less than 0.5 percent methomyl.

The startup sequence required the board operator, with the assistance from an outside operator, to manually pre-fill the residue treater with solvent to the minimum level of about 30 percent and to start the pump and achieve steady state recirculation. After reviewing the residue treater sample lab results to confirm the methomyl concentration was below 0.5 percent, the board operator started the solvent heating cycle, which was typically controlled automatically by the computer system. Finally, the SOP required the outside operator to collect another sample of the residue treater contents and send it to

the lab for analysis to re-verify that the liquid contained not more than 0.5 percent methomyl.²³ Once confirmed, the board operator set the flasher bottoms flow control valve in the automatic position, and flasher bottoms would begin entering the residue treater. These steps ensured that when the flasher bottoms began flowing into the residue treater, the flasher bottoms were diluted and heated so that the methomyl would decompose rather than accumulate above safe limits.

As long as the flasher and residue treater level controllers and temperature controllers were set to automatic, no further operator action was required to control the system. The SOP required the outside operator to collect a liquid sample from the residue treater only once every 24 hours and send it to the lab to confirm that the methomyl concentration in the liquid being transferred to the alternate fuel tank remained below 0.5 percent.

The residue treater liquid level control was designed to operate in the automatic, continuous flow mode. However, in this operating mode, the flow rate was very low; thus, the alternate fuels outgoing transfer pipe frequently became plugged with viscous material. Therefore, the board operators kept the level controller in the manual operating mode and allowed the residue treater level to increase to the upper fill limit, and periodically transferred the liquid at a much higher flow rate to prevent the line from becoming plugged. The SOP was not revised to incorporate this change.

²³ Since the residue treater was new and not previously operated, this step was not needed for the August restart. However, the SOP did not allow this deviation.

2.0 Incident Description

The incident is described in chronological order, beginning with pre-startup activities that contributed to the conditions leading up to the explosion. It continues with equipment preparation, then through the startup of the principal methomyl unit subsystems. This section next discusses the specific conditions that led to the runaway reaction in the residue treater and ends with the emergency response discussion.

2.1 Pre-Startup Activities

Unlike the normal methomyl restart after a routine shutdown, the August restart involved operations personnel, engineering staff, and contractors working around the clock to complete the control system upgrade and residue treater replacement. Work included finalizing the software upgrades, modifying the work station, calibrating instruments, and checking critical components. Board operators were provided time at the methomyl work station so that they could familiarize themselves with the new control functions, equipment and instrument displays, alarms, and other system features. Other personnel were completing the residue treater replacement, reinstalling piping and components, and reconnecting the control and instrument wiring. These activities progressed in parallel with the ongoing Larvin unit operation.

The methomyl control system upgrade required a revision to the SOP to incorporate the changes needed to operate the methomyl unit with the new Siemens system, and to reformat the SOP to a computerized document. However, at the time of the incident the SOP revision remained incomplete; the operators were using an unapproved SOP²⁴ that did not contain the new control system operating details.

²⁴ The review and approval record of the working copy in use at the time of the incident was unsigned. A watermark on each page read "draft in review 11/13/07."

2.1.1 Solvent Flush and Equipment Conditioning

Many of the subsystems in the methomyl unit required a solvent flush and nitrogen gas purge to clean and dry the systems before startup. These activities were critical to safely start the residue treater system as the feed, recirculation, and vent piping had been disconnected and a new pressure vessel had been installed. The solvent-only run was also needed to verify instrument calibrations, proper equipment operating sequences, and other operating parameters in the new DCS.

The staff flushed the process equipment with solvent to remove contaminants and water that might have gotten into the system during the outage. However, contrary to the SOP²⁵ the staff did not perform the residue treater solvent run.²⁶ Operators reported that solvent flow restrictions upstream impeded completion of instrument calibrations because the proper adjustments could not be made at low flow rates. Even had the staff not needed to verify the control system function and operability, the solvent run was required to pre-fill the residue treater to the minimum operating level and to heat the liquid to the minimum operating temperature before adding the methomyl containing flasher bottoms feed.²⁷ This was essential for safe, controlled methomyl decomposition. As discussed in Section 1.7.3.2, the control system design prevented adding methomyl until the solvent was at minimum volume and temperature, but the operators bypassed the safety devices during the startup.

2.2 Unit Restart

Although the operations staff acknowledged that management had not prescribed a specific deadline for resuming methomyl production, onsite stockpiles of methomyl necessary to make Larvin were dwindling. Unit personnel recognized the important role of methomyl in the business performance of

²⁵ Although the SOP had not been reviewed and approved, as with the prior approved SOP, it required the solvent run.

²⁶ The staff acknowledged that the solvent-only run was not performed on the residue treater, but were unable to explain who decided to proceed with feeding methomyl to the empty, unheated residue treater.

²⁷ The SOP warned that a runaway reaction would result if methomyl were allowed to accumulate in the residue treater before the treater is properly heated.

the facility, and a recent increase in worldwide demand for Larvin created a significant, sustained production schedule. Methomyl-Larvin operating staff told CSB investigators that they looked forward to resuming methomyl production and a return to the normal daily work routine after the long unit shutdown.

Operator logs documented the plan to start the MSAO (a.k.a. Oxime) unit Monday morning, August 25. Methomyl synthesis needed to begin shortly thereafter. However, critical startup activities were not completed, and the staff struggled with many problems as they attempted to bring each subsystem on line. To complicate the startup problems, process computer system engineers had not verified the functionality of all process controls and instruments in the new control system.

2.2.1 Equipment Malfunctions

Although the methomyl unit outage and new DCS implementation were incomplete, the staff proceeded with the unit restart. Some of the equipment was not yet operational and some equipment malfunctioned. For example, a few days before the incident, operators discovered that a valve had not been installed on a solvent feed line, which resulted in excessive solvent consumption. During one shift, operators discovered that heat tracing on a process line was not operating, which allowed the contents in the pipe to cool and solidify.

Another problem was traced to a broken stem on a water cooling system valve on a vapor condenser. The closed valve prevented adequate condenser cooling, which led to an imbalance in the crystallizer solvent ratios and excess MSAO in the flasher bottoms. Operators also encountered many problems tuning control loops and calibrating instruments for the newly installed computer control system. These issues were compounded because the operators had not become familiar with all of the methomyl work station functions and changes made to some process variables.

2.2.2 Methomyl Synthesis and Crystallization

The board operator startup log reported many continuing adjustments and corrections to the computer system. By mid-week, methomyl was being synthesized in the methomyl reactor and the crystallizers were put in service. The next step was to start the centrifuges to separate the crystallized methomyl from the solvents. The SOP was written such that two centrifuges operated in parallel. While one was progressing through the crystal-liquid separation cycles, the other was emptied of the crystallized methomyl "cake" and then refilled with a new batch of slurry. From there the methomyl cake went to the drying and packaging stages. This operating sequence assured that the upstream methomyl synthesis processes could run continuously.

At the beginning of this startup, only one centrifuge was operational; the other had continuing problems with electrical connections. Regardless, the operators proceeded with the restart, using only one centrifuge to separate the crystallized methomyl from the liquid solvents. An operator told CSB investigators that maintaining the proper solvent ratios was much more difficult during the startup, and that he needed to closely focus on the operating conditions and frequently adjust control variables in the DCS.

After feeding what they presumed to be normal methomyl-solvent slurry into the centrifuge, the outside operators opened the centrifuge to remove the methomyl crystal cake but discovered there were no methomyl crystals in the centrifuge basket. The absence of methomyl crystals could have been due to two causes: either a malfunction prevented methomyl from being synthesized in the methomyl reactor, or the crystallizer solvent/anti-solvent ratio was incorrect and the methomyl remained in solution rather than being crystallized. If the former was the cause, methomyl would not be present in the flasher bottoms feed to the residue treater—there would be no methomyl to decompose in the residue treater. If the latter was the cause, the methomyl concentration in the residue treater feed would likely be significantly greater than expected—uncrystallized methomyl would remain in solution and eventually accumulate in the flasher bottoms.

2.2.3 Solvent Recovery

As the operators worked through the ongoing myriad problems during the methomyl startup, they were depleting the fresh solvent inventory faster than expected. Therefore, they needed to get the solvent recovery system on line as quickly as possible to replenish the solvents. The residue treater was the last processing step in the solvent recovery system.

The liquid exiting the centrifuge normally contained only about 0.5 percent methomyl, some MSAO, trace impurities, and solvents. Routine collection and testing during startup indicated that the methomyl concentration was more than double the maximum operating limit value and as high as 4.0 percent, eight times greater than the specified operating limit for the four collected samples. These samples confirmed that methomyl was being synthesized in the reactor and that the solvent ratio was off specification in the crystallizer so the methomyl did not crystallize. Again, ongoing equipment issues and improperly calibrated and tuned instruments distracted the staff. They did not review the lab results so were unaware of the over-concentration problem and continued solvent recovery startup activities.

The solvent flasher separated and extracted the solvents for reuse. Trace impurities and MSAO accumulated in the bottom of the flasher along with the non-recoverable solvents and methomyl. These so-called flasher bottoms typically contained about 22 percent methomyl when all upstream process equipment was operating within the specified parameters. However, unknown to the startup team, the gross solvent imbalance in the crystallizer caused the methomyl concentration to climb to as high as 40 percent, nearly twice the design basis amount.²⁸

²⁸ The process hazards analysis (PHA) discussed the importance of sampling the residue treater feed (flasher bottoms) to verify that the methomyl concentration did not exceed the residue treater design limits. However, the SOP did not require such a sample, and no sample collection point was available in the system. The designers presumed that the flasher feed sample and in-specification flasher column operation would assure methomyl concentration in the flasher bottoms would not exceed the design limit.

2.2.4 Residue Treater Startup

The residue treater was the last equipment to be started. The critical startup safety prerequisites, pre-startup solvent fill and heat-up were omitted from the restart activities. Furthermore, the board operators bypassed the minimum operating temperature interlock that prevented adding methomyl into the residue treater, as some operators were accustomed to doing. The minimum recirculation loop flow interlock on the feed valve was also left bypassed by the computer programmers. Without recirculation flow, the concentrated methomyl feed was not adequately mixed with what should have been preheated solvent already in the residue treater.

Operators told CSB investigators that, based on operating experience, there would be little methomyl in the system "this early in the startup." That is most likely the reason the operators skipped the sample collection and analysis steps.

On August 28, at approximately 4 a.m., the board operator manually opened the residue treater feed control valve and began feeding flasher bottoms into the nearly empty vessel. With a low flow rate of about 1.5 gallons per minute, more than 24 hours would be required to fill the residue treater to 50 percent, the normal operating level. The operations staff did not discuss the residue treater operating status at the 6 a.m. shift change, as they were preoccupied with other startup issues.

Samples from the second sample point, the residue treater outlet, were not collected and tested as required by the startup procedure or at the normally scheduled time, the beginning of the day shift. Operators offered two explanations for not sampling the residue treater contents during the restart activities. First, since the centrifuges contained no methomyl cake, the staff incorrectly concluded that methomyl had not been synthesized. Second, the outside operator on the day shift was unaware that the residue treater had been put into operation—the night shift crew did not tell the day shift crew that the feed to the residue treater had been started.

The outside operator started the recirculation pump at 6:14 p.m. as directed by the board operator. The residue treater liquid level was approximately 30 percent (1,300 gallons) and the temperature

ranged between 60 and 65 °C (140-149 °F), still significantly below 135 °C (275 °F), the critical decomposition temperature. The pressure remained constant at 22 psig. At 6:38 p.m., the temperature began steadily rising about 0.6 degrees per minute (Figure 11). At 10:21 p.m., the level was 51 percent when the recirculation flow suddenly dropped to zero.²⁹ In less than 3 minutes, the temperature was at 141 °C (286 °F), rapidly approaching 155 °C (311 °F), the safe operating limit, and climbing at the rate of more than two degrees per minute.

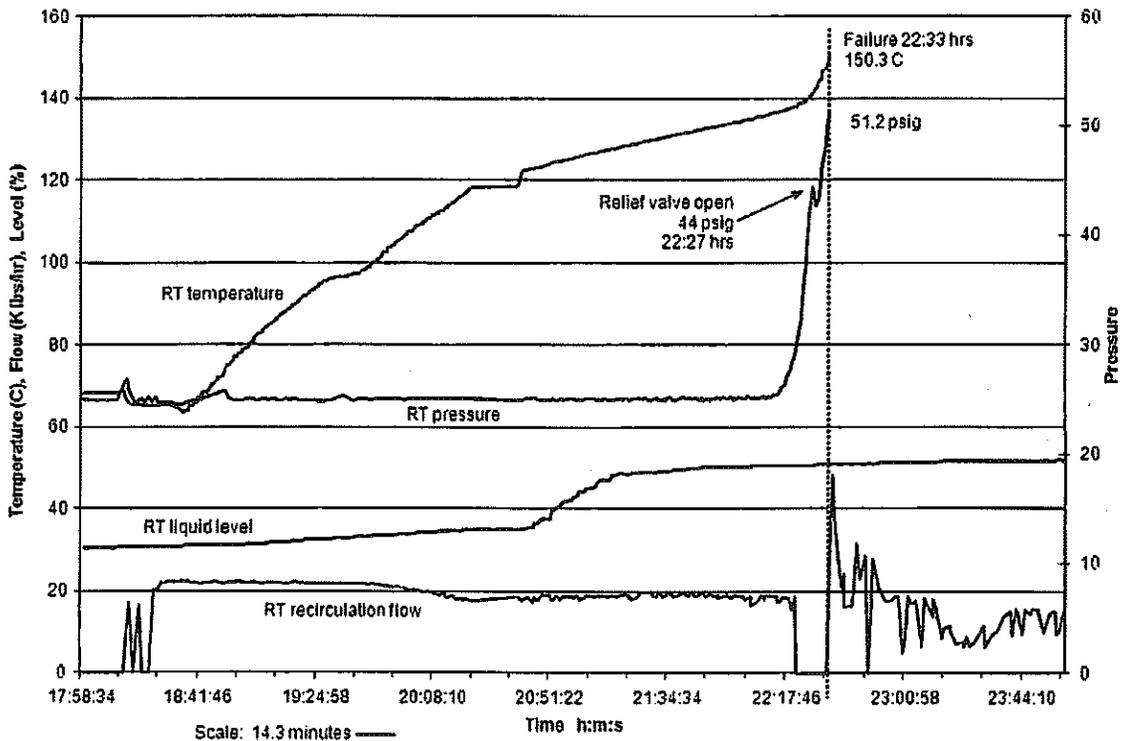


Figure 11. Residue treater process variables before the explosion. Failure occurred at 22:33, as shown at vertical dotted line

²⁹ A Bayer review after the incident determined that the split-range temperature control was incorrectly programmed in the DCS. In the process of changing from heating to cooling, the residue treater recirculation flow valves to both the heater and cooler closed, blocking all recirculation flow. However, the CSB concluded that this was not causal to the runaway reaction and vessel rupture.

At approximately 10:25 p.m., the residue treater high pressure alarm sounded at the work station. The board operator immediately observed that the residue treater pressure was above the maximum operating pressure and climbing rapidly. Not understanding what was wrong, but suspecting a blockage in the vent line, he contacted the outside operator and directed him to go to the residue treater to check the vent system.³⁰ He also asked a second outside operator to assist. He then manually switched the residue treater recirculation system to full cooling, hoping that that might slow or stop the climbing pressure.

2.3 Explosion and Fire

At 10:33 p.m., a few minutes after the board operator talked to the outside operators, a violent explosion rocked the control room. A huge fireball erupted on the south side of the unit as alarms sounded on the methomyl and Larvin work stations. Operators scrambled to shut the systems down. The onsite fire station located nearby shook from the explosion as the emergency alarm sounded. Outside operators rushed to close valves, de-energize equipment, and activate stationary water cannons to begin fire suppression efforts. Water cannons were also directed at the MIC day tank blast blanket structure to help keep the day tank cool and prevent the fire from spreading to the tank. Shortly after the explosion one of the two outside operators who had gone to investigate the residue treater problem was seen walking toward the control room. Coworkers quickly came to his aid and took him to a safe area until help arrived. He was badly burned. The body of the other outside operator was located about 4 hours later.

The bolts holding the residue treater support legs to the concrete foundation sheared off as the shell and top head of the 5,700-pound residue treater careened into the methomyl unit. The bottom head separated from the shell (Figure 12 and Figure 13) and came to rest about 20 feet from the residue

³⁰ The CSB was later told that, in hindsight, plugging in the newly installed vent system could not have been the cause of the pressure excursion. The residue treater had not operated long enough to cause deposits to accumulate inside the vent pipe.

treater foundation. The explosion destroyed nearby pumps, heat exchangers, and electrical switchgear. The fire was fueled primarily by the solvent inside the residue treater and other flammable liquids that spilled from the ruptured piping systems.

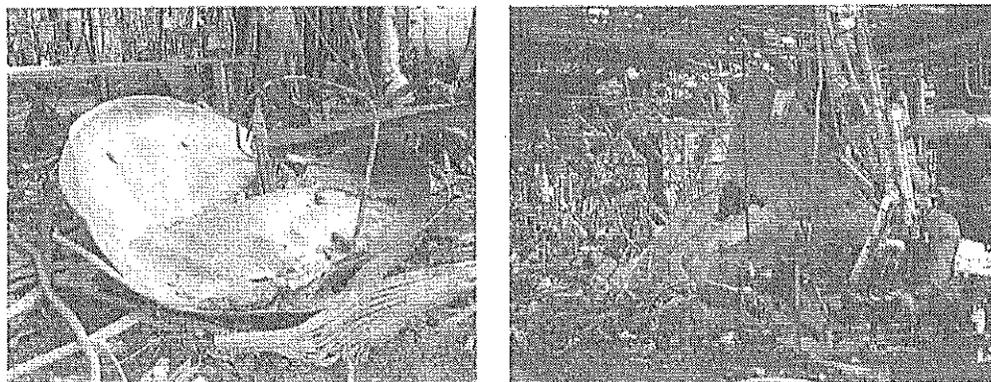


Figure 12. Residue treater bottom head (left); vessel shell and top head (right)



Figure 13. Residue treater shell and top head recovered from inside the Methomyl-Larvin unit

The residue treater struck a large support column on the four-story process unit structure and sheared it off the baseplate on the concrete foundation (Figure 14). Small debris, including conduit, valves, small diameter pipe segments, and insulation, was thrown in all directions, some of which struck, but did not penetrate the MIC day tank blast blanket. The blast blanket also functioned as a heat shield to protect the tank and attached piping from the intense solvent-fueled fire.

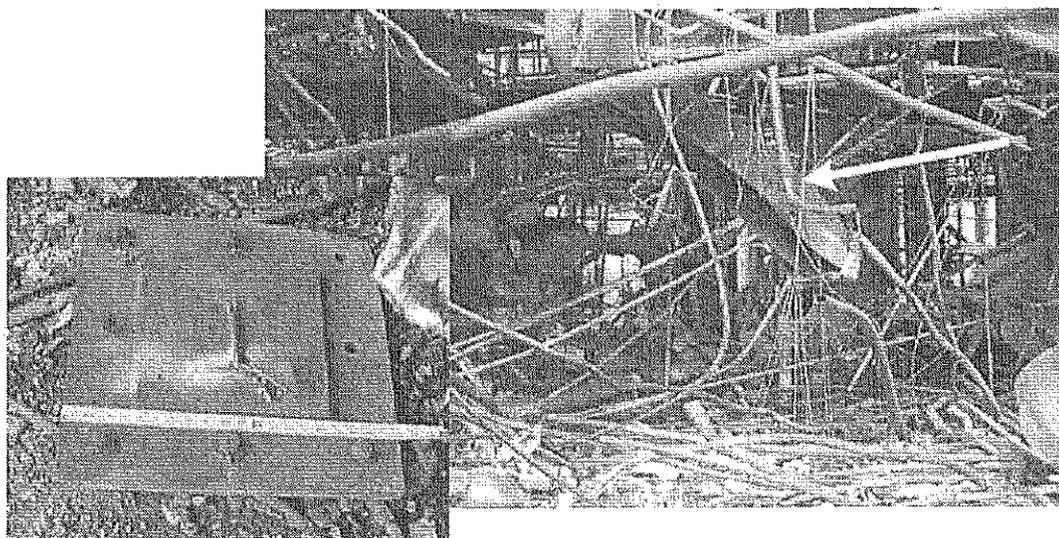


Figure 14. Structural column (arrow) ripped from the steel baseplate (left)

The overpressure produced by the rupturing residue treater damaged properties in the surrounding community. Mobile homes, houses, businesses, and vehicles sustained primarily window breakage and minor structural damage. The majority of the property damage reports were within 1.5 miles of the explosion epicenter; however, some damage was reported as far away as 7 miles (Figure 15). Bayer received 57 property damage claims from residences and businesses totaling about \$37,000.

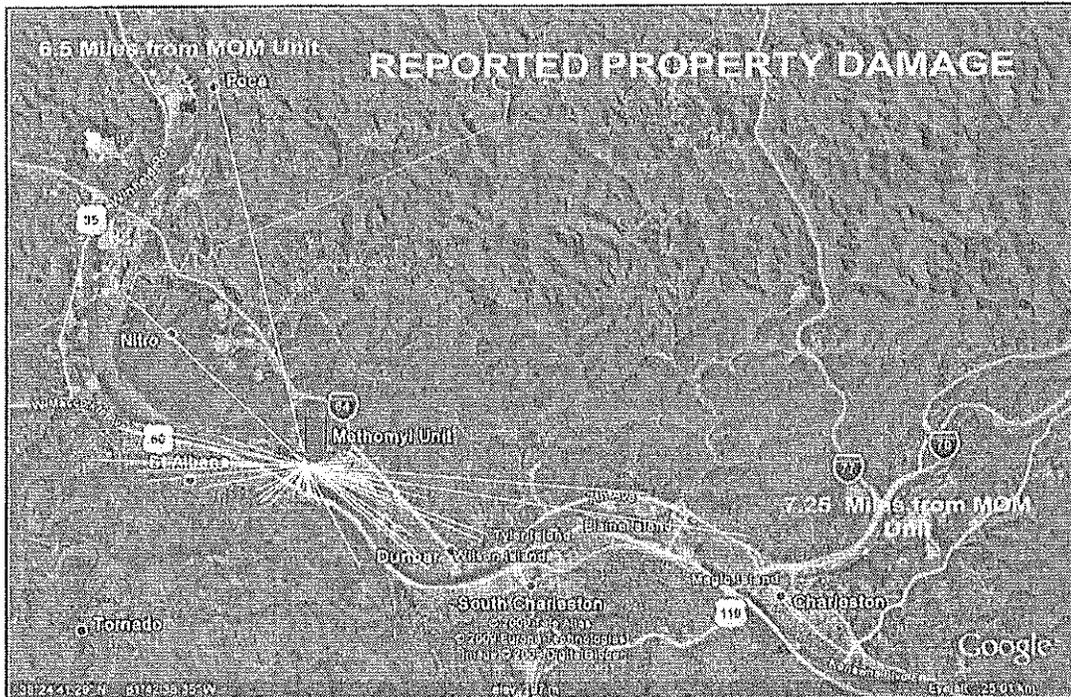


Figure 15. Aerial view of locations of reported offsite property damage

2.4 Emergency Notification and Response

2.4.1 Bayer CropScience Response

The Bayer fire brigade was at the scene within minutes of the explosion and set up a command post northeast of the methomyl unit, where the incident commander began coordinating the response as fire equipment and personnel arrived. Plant responders established and directed a water stream to the fire zone from the north.

About 5 minutes after the explosion, Metro 9-1-1 contacted the Kanawha County Emergency Ambulance Authority (KCEAA) and advised the agency of a large explosion at the Bayer plant. Emergency Medical Services (EMS) personnel began staging at the main gate about 2 minutes later. Within 6 minutes of the explosion, fire alarms sounded at the Institute and Tyler Mountain volunteer fire departments in accordance with the established mutual aid protocol. Institute fire department responders staged at the main gate with backup equipment and supplies. Tyler Mountain firefighters

joined the Bayer fire brigade at the methomyl unit to battle the blaze. A Metro 9-1-1 operator contacted the security guard at the Bayer main gate 9 minutes after the explosion.³¹ Bayer activated its Emergency Operations Center (EOC) at 10:45 p.m. Twelve minutes into the incident, the Bayer security guard asked the Metro 9-1-1 operator to dispatch an ambulance for a worker burned in the fire. The emergency response timeline is shown in Appendix B.

2.4.2 Local and State Emergency Response Agencies

As provided in the Kanawha Putnam Emergency Management Plan, the Kanawha Emergency Management Director ordered the Kanawha Putnam Emergency Operations Center (EOC) to be activated. County personnel staffed the EOC, which served as the centralized communications hub for all emergency response dispatch of police, fire, and EMS for Kanawha and Putnam counties.

The Kanawha County Sheriff heard a loud explosion at about 10:30 p.m. After hearing state and county radio traffic indicating that an explosion had occurred near the Bayer plant, he radioed Metro 9-1-1 while en route to the facility. He then requested that Metro Communications contact the Nitro and Dunbar Police Departments to arrange for roadblocks of Route 25 at the city limits to restrict traffic flow into the Institute area. The county EOC also routed information to and from the various responding municipal, state, and county agencies. Responding agencies included South Charleston, Nitro, and Dunbar Police Departments; the Jefferson and St. Albans Fire Departments; the Kanawha County Sheriff's Department; the State Fire Marshal's Office; the U.S. Bureau of Alcohol, Tobacco, and Firearms and Explosives, (ATF); and the KCEAA. All of these agencies routed their communications through the EOC during the emergency (Figure 16). As the night progressed, the Metro 9-1-1 call center received more than 2,700 phone calls, which overwhelmed the system.

³¹ The Bayer security guard told investigators that he tried many times to get through to Metro 9-1-1 but the line rang busy. The Metro 9-1-1 operator also had trouble getting through to the Bayer guard shack.

Upon arrival at the main gate about 10 minutes after the incident occurred, the Institute Volunteer Fire Department chief set up a command post and assumed the role of resource commander. In this role, he coordinated with the Bayer IC to provide outside mutual aid resources of personnel and equipment as needed. After the Institute fire department chief made the initial contact, the Bayer IC advised him that based on air monitoring information, "everything [was] being consumed in the fire" and that a shelter-in-place was not necessary. However, when the Kanawha County Sheriff arrived, he noticed an acrid smell in the air and not knowing the source, felt that he and his deputies might be at risk; thus, he ordered his deputies and state police to relocate to the Shawnee Park EOC, the location so designated in pre-planning exercises.

Immediately after the incident began, the Director of Regional Response Teams (RRT) for West Virginia, who works in the State Office of Emergency Services (OES) and was unsatisfied with the information being provided by Bayer, called the State Fire Marshal to assess the incident.³² Bayer EOC personnel directed the Fire Marshal to the onsite EOC, where he tried, unsuccessfully, to get information that would allow an accurate assessment of the conditions and status of the incident response. Based on his observations of fire suppression operations, the Fire Marshal ordered the RRT unit, a trailer with supplies and other resources stationed in Nitro, be brought to the site for use if needed. He then went to the EOC at Shawnee Park.

³² The State Fire Marshal is responsible for hazardous material incidents, incidents involving weapons of mass destruction, and mass casualty operations. The State Fire Marshal also provides guidance to 447 departments; more than 11,000 firefighters; and is responsible for code enforcement, fire safety, and investigations.

**Bayer Cropsience Emergency Operations
Communication Diagram
(8/28/08)**

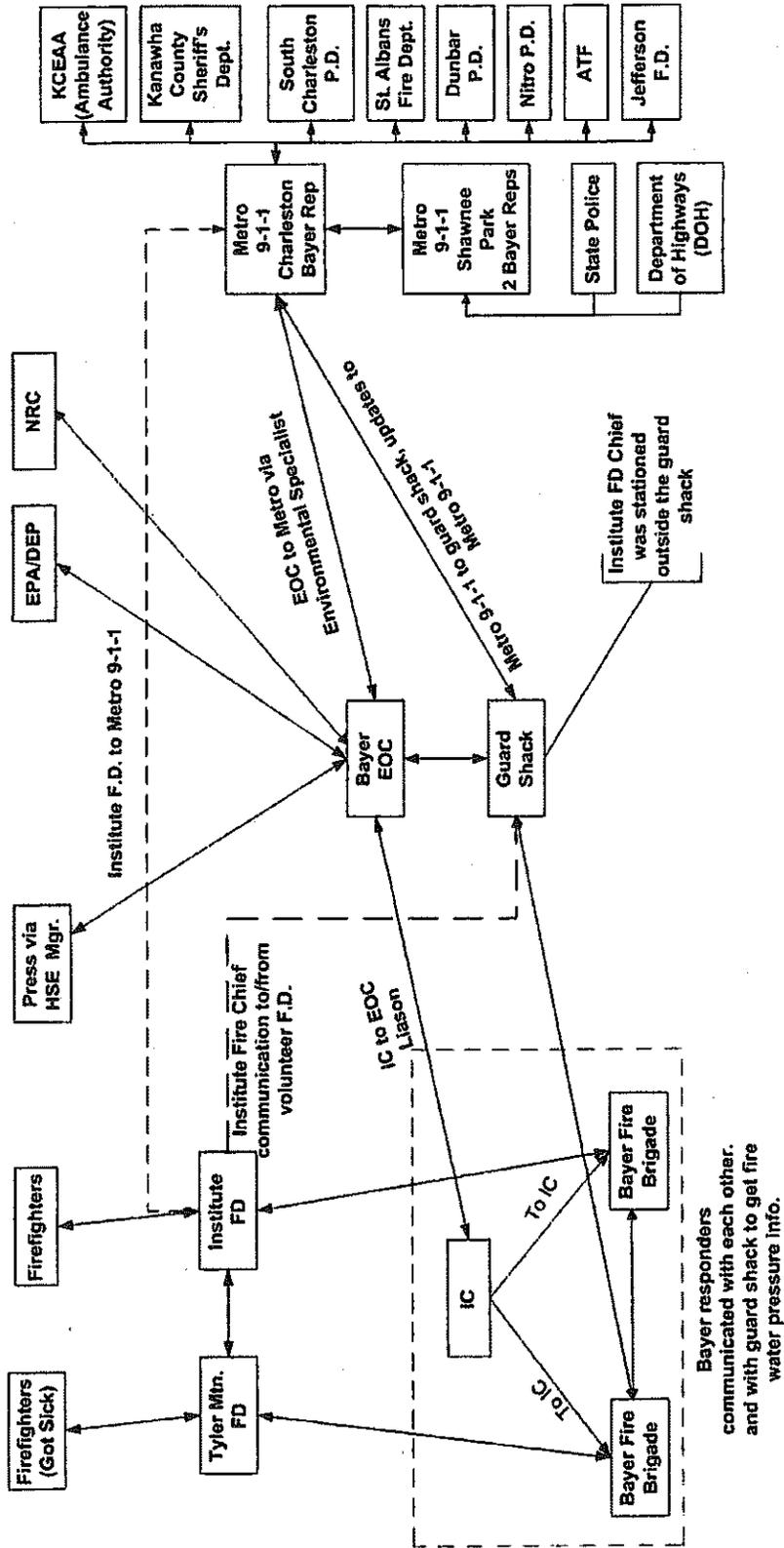


Figure 16. Methomyl unit explosion emergency communications diagram

At about 11:00 p.m., the St. Albans fire chief, after seeing a smoke cloud advancing towards St. Albans, requested information from Metro 9-1-1 about the composition of the cloud. As it approached, the chief advised Metro 9-1-1 dispatchers that if he did not get clear information regarding the make-up of the cloud, he would initiate a shelter-in-place advisory for the St. Albans community.

At 11:19 p.m., Metro 9-1-1 announced a shelter-in-place for the immediate area surrounding the Bayer facility, and initiated a reverse ring-down notification³³ to the residents in the affected community. Five minutes later, Bayer recommended that Metro dispatchers issue a shelter-in-place for the St. Albans area. At about 11:34 p.m., the KPEPC activated the County Emergency Alert System, which in turn initiated a shelter-in-place for the areas west of Charleston to Putnam County line. The shelter-in-place affected about 40,000 residents (Figure 17).

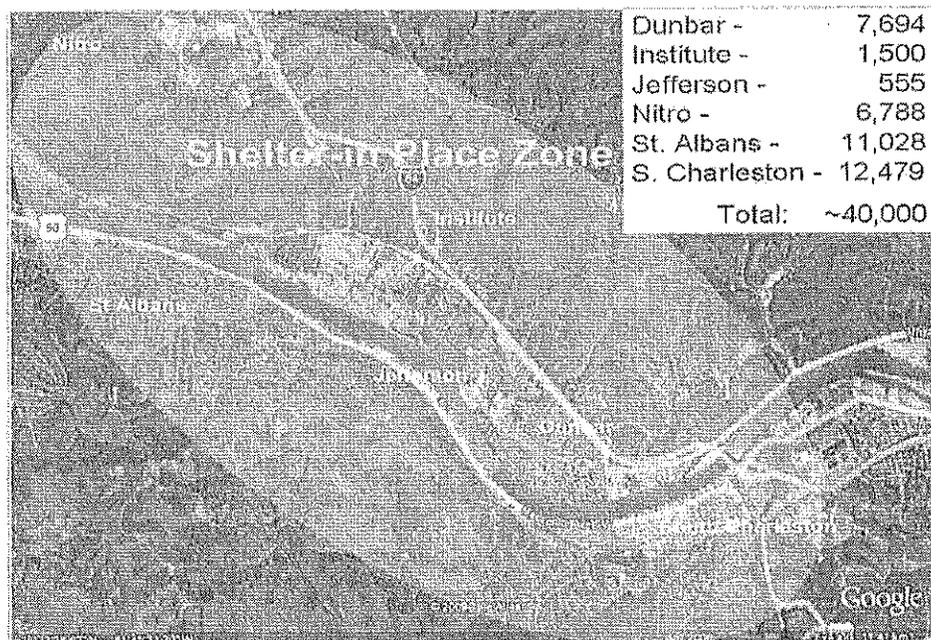


Figure 17. Areas and population affected by the shelter-in-place

³³ A reverse ring-down notification system is an automatic calling system that automatically calls residents and businesses in pre-defined areas. It delivers a pre-recorded message advising action to be taken in response to a community emergency.

At 12:34 a.m., a little more than two hours after the incident occurred, Bayer notified the National Response Center. At 2:05 a.m., about 3 hours and 30 minutes after the incident began, Kanawha Putnam EOC declared the area west of Charleston, which included St. Albans, Nitro, Jefferson, Dunbar and Institute safe to re-enter and canceled the shelter-in-place action.

2.4.3 Emergency Operations Center Activations

As the response to the emergency progressed, three EOCs were activated, which contributed to confusion and communication difficulties. The first, the Bayer EOC, was located along the northern boundary of the plant adjacent to Route 25, and was staffed by Bayer personnel including the WCC unit manager; Health, Safety, and Environmental Manager; and operations manager. This site was less than one-half mile from the incident and was part of the Bayer emergency planning process. One function of the Bayer EOC was to coordinate communication with Bayer corporate staff in Raleigh, North Carolina, and provide updates to the media. It was also responsible for communicating incident status and mutual aid assistance with the outside emergency response agencies.

The Kanawha Putnam EOC was activated at the Metro 9-1-1 call center in South Charleston. The center was staffed by county personnel and served as the centralized communications hub for all emergency response dispatch of police, fire, and EMS for Kanawha County.

As part of the Bayer emergency notification ring-down system, the plant's environmental specialist was notified of the incident and advised to report to the Kanawha Putnam EOC in response to its request for a Bayer representative to relay information directly to the county authorities. The environmental specialist arrived at the Kanawha Putnam EOC between 11:40 p.m. and 12:00 a.m. Shortly after arriving, he phoned the Bayer EOC to obtain information regarding the location of the fire and the substances thought to be involved. He spoke to the Health, Safety, and Environmental Manager and his supervisor and was able to provide the dispatchers with information regarding three substances thought to be involved in the incident: dimethyl disulfide (DMDS), methyl isobutyl ketone (MIBK), and acetonitrile. However, Bayer was slow to provide additional details.

The Kanawha Emergency Management Director also activated a mobile EOC at Shawnee Park, which was located on Route 25 less than a mile to the southeast of Bayer. Two Bayer environmental specialists reported there to act as liaisons with non-Bayer responders. Representatives from the Department of Highways, State Police, and the Sheriff's office also reported to the Shawnee Park EOC.

2.5 Air Monitoring

At the time of the incident, the two AreaRae⁶⁰ fence line air monitors³⁴ were positioned on the east end of the plant and on the west riverbank to detect concentrations of airborne chemical contaminants and alert facility occupants if air concentrations exceeded safe levels and had traveled beyond plant boundaries. The CSB investigators examined the monitor data and determined that the fence line monitors did not detect hazardous concentrations of the chemicals sampled. Another AreaRae system monitor recorded atmospheric winds, temperature, and barometric pressure.

Continuous air monitors were located in and around the production units to detect fugitive leaks in process equipment³⁵ or leaks resulting from process upsets. The Methomyl-Larvin unit had 16 localized MIC sample points connected to an analyzer, which Bayer installed in March 2006 to continuously sample and record MIC concentrations at 2-minute intervals. If concentrations exceeded 1.0 ppm, the system was designed to activate a visual alarm display in a room on the second floor of the Methomyl-Larvin control building.

However, in May 2008, the analyzer malfunctioned, causing spurious alarms. Although technicians investigated, they had not resolved the problem before the August methomyl unit startup. The CSB learned that the system had not been repaired and restarted even though the MIC storage tank had

³⁴ An AreaRae instrument is a direct-reading device that continuously samples for a wide range of chemicals including oxygen, carbon monoxide, chlorine, volatile organic compounds (VOC), and methane.

³⁵ A fugitive leak is a small leak in process equipment. Such leaks are commonly called "fugitive emissions," which must be identified and corrected.

remained in service. On the night of the incident, the personnel in the Bayer EOC were unaware that the monitoring system was not active, therefore they assumed it would alarm if it detected airborne MIC or other detectable chemicals during the incident response. They had no way of knowing if toxic vapors from chemicals used in the methomyl unit were escaping into the air.

The MIC production unit, located about 1,800 feet from the Methomyl-Larvin unit, had a similar MIC air monitoring system with 16 stationary sample points. The analyzer recorded the results at 2-minute intervals. This analyzer was operational on the night of the incident but did not detect any chemicals including MIC during or after the incident.

3.0 Incident Analysis

3.1 Residue Treater Replacement

The Mechanical Integrity program on the original, 25 year old carbon steel residue treater identified significant service degradation. Bayer, through the MOC program, replaced it with a corrosion-resistant stainless steel vessel in anticipation of the planned increase in methomyl production. With the exception of substituting stainless steel for the carbon steel and associated material thickness changes required by the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section VIII design rules, the new ASME Code-stamped vessel was identical to the original. The CSB concluded that this process modification did not contribute to the incident cause or consequences.

3.2 Internal Compliance Auditing

3.2.1 Corporate Process Safety Management Audits

The Bayer North America corporate assessment team conducted an audit of the Methomyl-Larvin unit in July 2005. The team, composed of four auditors from other Bayer facilities and business units, specialized in process safety, mechanical integrity, and pressure vessel engineering. The team audited against 7 of the 14 elements in the OSHA Process Safety Management standard³⁶ and the emergency response requirements in the EPA Risk Management Program.

The final report, issued in 2006, identified 17 PSM compliance issues in the audit focus areas. Several findings included deficiencies with tracking the status of recommendations and corrective actions from PHAs, equipment inspections, and compliance audits. As required by Bayer corporate standards, the Institute site developed a list of recommendations and corrective actions to resolve the findings

³⁶ The 2005 corporate PSM audit focused on process safety information, process hazards analysis, operating procedures, mechanical integrity, management of change, incident investigation, and compliance audits.

and entered them into a new action tracking system with an assigned responsible person for completion.

3.2.2 Audit Action Tracking System Upgrade

In 2006, Bayer implemented a new action tracking system in response to OSHA citations issued in a 2005 Institute facility inspection, which faulted Bayer for not having a tracking system to assure PHA recommendations were resolved, documented, and communicated. In 2006, Bayer program developers in Research Triangle Park, North Carolina developed the system for the Bayer facilities. A new tracking system feature contained a workflow integration function that automatically sent notifications to responsible parties and required electronic approval by managers to close completed actions. However, even with this new system, problems with action item tracking and closure continued.

3.2.3 Process Safety Management Self Assessments

Institute site personnel audited the Methomyl-Larvin unit against the PSM standard in 2004 and in 2007. The PSM "facilitated self assessment" was conducted every three years as required by the PSM standard. The 2007 facilitated self assessment found that action tracking deficiencies identified in previous corporate PSM audits and facilitated self assessments remained unaddressed. The audit also found that even after the OSHA citation 2 years earlier, action items generated in PHAs on the Methomyl-Larvin unit still were not being tracked and closed.

CSB investigators reviewed the corrective action plans identified in the corporate PSM audits and the PSM facilitated self assessments and identified similar shortcomings. For the 2005 corporate PSM audit, some listed corrective action items were still open. Some of the items listed on the 2007 facilitated self-assessment action plan were overdue by more than 9 months at the time of the August 2008 incident including one requiring the revision of Methomyl-Larvin unit SOPs.

3.3 Process Hazards Analysis

A Bayer team that included an experienced facilitator, process engineer, and experienced unit operations personnel conducted the methomyl system process hazards analysis (PHA) in 2005 using a hazard and operability study (HAZOP) technique. The team also used Bayer's semi-quantitative risk matrix to analyze whether additional protections were required for the various scenarios identified in the HAZOP. Properly applied, these tools can identify improvements that could have prevented the residue treater incident. However, the relatively short duration of the PHA, and the team's poor application of the tools during the process, produced results that failed to identify significant unmitigated scenarios that needed recommendations.

3.3.1 PHA Duration and Staffing Deficiencies

Poor execution of the PHA was due in part to the way Bayer had structured it and the total hours the PHA team worked. Bayer assigned methomyl unit operators to the PHA team, but most were only present for a few hours each. Most revealing is that in just 12 meeting days, for an average of 6 hours per day, the team analyzed 37 HAZOP nodes, including analyzing risks to determine if additional protections were needed. Considering the complexity of the unit the time spent on the HAZOP was insufficient to address all the critical process safety information, draw logical conclusions, and determine appropriate recommendations.

3.3.2 PHA Assumptions Deficiencies

The 2005 PHA team failed to validate critical assumptions used in their analyses. For example, the team accepted defined procedure steps without confirming that the operators rigorously followed the procedures. They also incorrectly assumed that the automatic safeguard controls listed in the safety matrix remained operational during all operating modes. Through staff interviews, CSB investigators learned that some board operators bypassed the two safety interlocks on the residue treater feed control valve during startups based on their experience with the residue treater heater not heating the

solvent to the minimum temperature interlock setpoint. With the interlocks in bypass, they manually opened the flasher bottoms feed valve when the residue treater temperature was about five degrees below the required operating temperature. The heat generated by the decomposing MSAO and methomyl would finally increase the residue treater temperature to the minimum operating value.

Because the PHA team was apparently unaware of any problem with the residue treater heater, and assumed the safeguards were active, it did not recommend that management resolve the residue treater startup issues. However, with the interlocks in bypass, the residue treater had insufficient protections to prevent accumulating a large quantity of cold, highly concentrated methomyl and MSAO in the residue treater.

The CSB investigators noted another significant PHA performance deficiency, namely that the PHA team identified an issue with the old control system that persisted in the new system:

The control system for methomyl is antiquated and there is no Safety Instrumented System (SIS) for a process with an above average level of hazards and risks. The operators have access to the control system that allows them to make unauthorized program changes and to alter alarm settings...

ANSI/ISA standard 84.00.01–2004 (*Functional Safety: Safety Instrumented Systems for the Process Industry Sector*) – which is a recognized good engineering practice required for compliance with the OSHA Process Safety Management standard -- recommends a Safety Instrumented System that is separate and independent from the basic process control functions. Among other requirements, the standard provides that “Bypass switches shall be protected by key locks or passwords to prevent unauthorized use.”

Despite knowing that interlock settings could be accessed and changed by the operating staff without proper safety reviews as required by the management of change program, the PHA team did not make any recommendations to improve computer access control. In the August 2008 incident, lack of

password access control to the new DCS allowed the staff to bypass the safety interlocks, which directly resulted in the runaway reaction and catastrophic residue treater failure.

3.3.3 Inadequate Process Safety Information Reviews

The PHA did not adequately incorporate the process safety information used as a basis for the assumptions and conclusions. The process safety information package from the original construction project discussed the importance of controlling the methomyl concentration in the flasher bottoms feed to the residue treater to preclude a runaway reaction. The Methomyl Process Description in the SOP discussed the importance of controlling methomyl concentration in the residue treater at least five times. For example, it cautioned, "Even with normal flow rates, care must be taken to prevent over concentrating residues in the mother liquor flasher tails." Again, it warned, "The interlocks should prevent feeding the tank when it is cold, but if the methomyl concentration is above 1.3%, a run away [sic] reaction could result upon heating the tank." In contrast, the PHA team concluded that a high residue concentration in the flasher feed was an operations issue having "no consequence." Another PHA item concluded, without substantiation, that the residue treater feed valve low-temperature safety interlock would "function as intended" and prevent a high methomyl concentration runaway reaction.

A September 1994 PHA considered high methomyl concentration caused by off-specification solvent in the crystallizer. However, that PHA team concluded that the solvent recovery system and the residue treater system could handle the excess methomyl because they considered the existing safety interlocks to be adequate protections. The team did not consider any operational errors or startup and shutdown scenarios that could lead to a large quantity of under-temperature methomyl and MSAO in the residue treater.

The 2005 PHA team used the "Bayer CropScience PHA Quick Reference Guide" to qualitatively evaluate the unmitigated and mitigated risk for various scenarios and determine whether the system needed more protections. It concluded that high methomyl concentration downstream of the

crystallizer was only a product quality problem, which the operations staff would resolve. In analyzing a possible residue treater rupture caused by a runaway reaction scenario, the team assumed that the low temperature interlock and the operating sequence described in the SOP provided adequate controls to prevent feeding methomyl until the system was at the minimum safe operating conditions. Based on these protections, the team determined that the outcome was in a range that the guide listed as not requiring additional protections. However, the original design basis concluded that a relief system could not be designed to prevent a catastrophic failure of the residue treater if the methomyl concentration exceeded the design limit.

3.3.4 Analysis Deficiencies

In addition to analyzing the hazards of a process based on the equipment information, the PHA should examine the human interactions with the equipment. In particular, for operational tasks that depend heavily on task performance and operator decisions, the team should analyze the procedures step-by-step to identify potential incident scenarios and their consequences, and to determine if the protections in place are sufficient.

According to "Guidelines for Hazard Evaluation Procedures" (CCPS, 2008),

Personnel may have less operating experience with procedure-based operations that are heavily dependent on task performance and operator decision-making. In addition, safeguards may be bypassed or not fully functional during some modes of operation such as at start-up of a continuous process. Performing a hazard evaluation of procedures can identify steps where the operator is most vulnerable and point to means of reducing the risk of an incident, such as by adding engineered safeguards and improving administrative controls.

The publication further recommends that procedures expected to involve major hazards should be subjected to a detailed procedure-based HAZOP study using guidewords similar to those used for

batch chemical processes. CCPS also gives guidance for hazard analyses for processes that include programmable control systems, chemical reactivity hazards, facility siting, and the combination of tools such as Hazard and Operability Studies with Layer of Protection Analysis. The PHA team could have addressed all these topics in analyzing the methomyl process.

3.4 Pre-Startup Safety Review

The CSB concluded that Bayer did not conduct an adequate Pre-Startup Safety Review (PSSR) for the control system upgrade and the residue treater replacement. Furthermore, staff interviews indicated that the limited PSSR work did not directly involve operators or other subject matter specialists. An eight-page checklist recorded the PSSR for the residue treater and required a “yes,” “no,” or “not applicable” checkbox mark for a series of questions and key subjects; a field at the bottom of the page was available for comments. The PSSR team incorrectly identified some items as being completed when they clearly had not been. For example, the team did not identify the SOP inadequacies that should have been addressed in the PSSR checklist item, “Do operating procedures exist that adequately cover the MOCR (management of change review)?” The existing operating procedures were not revised to address information specific to the new control system. However, the PSSR question was incorrectly answered “yes.”

The PSSR for the control system change had errors involving equipment checkouts that were marked as complete. A thorough PSSR should include verification that all equipment has been installed and configured for startup before any chemical is introduced into the system. As discussed in Section 2.2.1, while starting the unit, staff discovered that a valve had not been installed on a solvent drip line and that another valve was broken. The PSSR missed these two equipment installation problems that directly contributed to the overconcentration of methomyl in the flasher bottoms and ultimately led to the residue treater explosion.

The control system PSSR also had errors involving incomplete items. Although the PSSR marked the items as incomplete, the team did not record due dates for follow-up items. For example, the PSSR

asked whether adequate technical coverage had been specified for the startup, and the PSSR team marked the item "no." They listed two people as responsible for this follow-up, but did not specify a due date for completion. Section 0 discusses the lack of sufficient technical coverage during the startup.

3.5 Human Factors Deficiencies

3.5.1 Control System Upgrade

The introduction of the Siemens PCS7 control system significantly changed the interactions between the board operators and the DCS interface. The Siemens control system contained features intended to minimize human error such as graphical display screens that simulated process flow and automated icons to display process variables. But the increased complexities of the new operating system challenged operators as they worked to familiarize themselves with the system and units of measurement for process variables differed from those in the previously used Honeywell system.³⁷

Human interactions with computers are physical, visual, and cognitive. New visual displays and modified command entry methods, such as changing from a keyboard to a mouse, can influence the usability of the human-computer interface and impair human performance when training is inadequate. Operators told CSB investigators they were concerned with the slower command response times in the Siemens system and they talked about the methomyl process control issues they would face during the restart, which was much more difficult to control than the Larvin process. Board operators also told CSB investigators that the detailed process equipment displays in the DCS were difficult to navigate. Routine activities like starting a reaction or troubleshooting alarms would require operators to move between multiple screens to complete a task, which degraded operator awareness and response times.

³⁷ For example, one variable in the old computer system was displayed as "percent full" whereas the new system recorded total "pounds" in the vessel.

The old system display and command entry was basically a spreadsheet, or line-item display. The new system used a graphical user interface (GUI) that displayed an illustrative likeness of the process and its various components (Figure 18). The board operator selected the device that needed to be changed. This made data entry clearer, but much slower. In the old system, board operators could change multiple process variables simultaneously, but they could select and change only one variable at a time in the Siemens system.

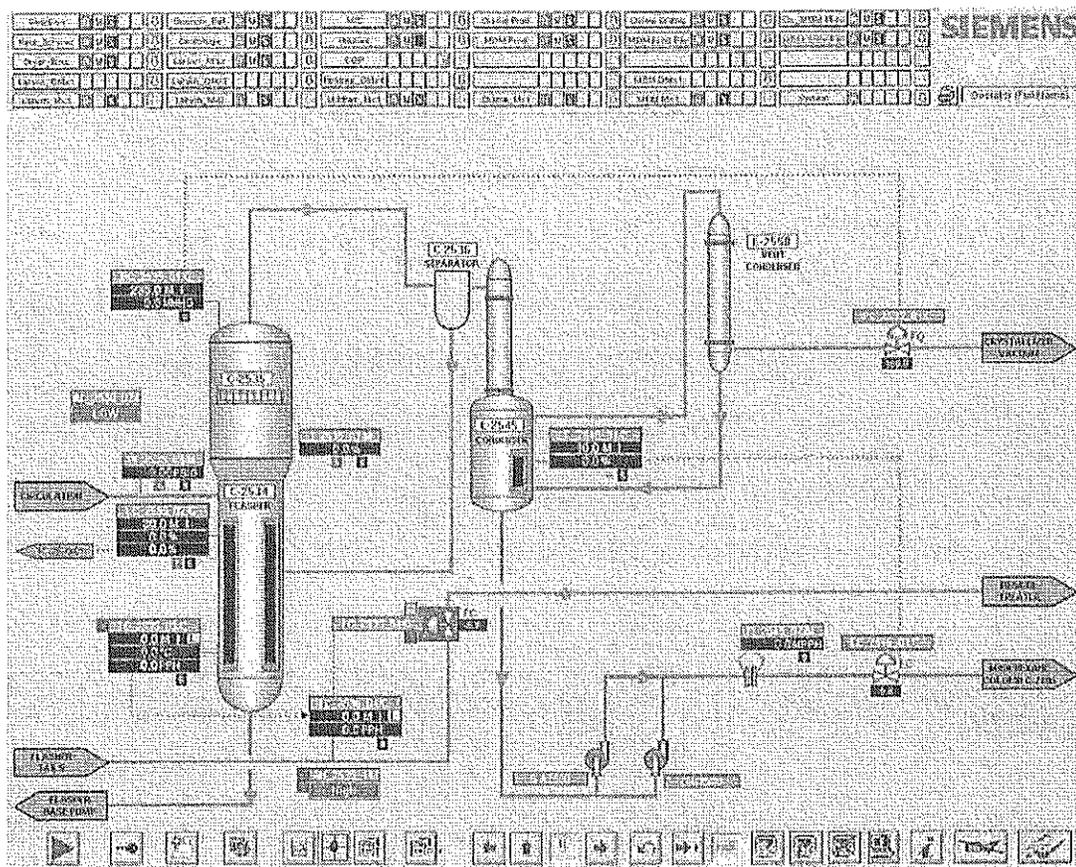


Figure 18. Typical Siemens work station screen display

The new control system also changed how board operators monitored multiple pieces of equipment. The methomyl board operators' station had five display screens available to monitor the methomyl processes and one display screen dedicated to process alarms. However, operating some methomyl equipment required the operators to use at least three of the five display screens. To simplify the operation, they asked the Siemens project engineers to add equipment overview screens to display multiple pieces of equipment. The board operators believed that the overview screens would provide more effective control of the unit; however, the screens were not available for the August 2008 startup.

3.5.2 Operator Training

The Siemens system switchover configuration for the Larvin unit began in early 2006, and the Larvin unit startup with that new DCS occurred in early 2007. The Larvin board operators attended four sessions of formal training during their shifts prior to the actual Larvin start-up. A Bayer process engineer and a contractor from the engineering company that configured the DCS conducted comprehensive training on the Larvin system before the Larvin unit was restarted. Board operators also used a Siemens operating station simulator to learn the Larvin system DCS functions and familiarize themselves with controlling different devices such as block valves, control valves, and pumps. Informal, on-shift training also took place and resources were available during the Larvin startup to assist operators, and support continued to be provided as needed.

For the Larvin system, board operators received a document labeled the "Siemens training manual" that included a system architecture description; glossary of tag names for controllers, alarms, and indicators; and an overview of the screen layouts. The manual also included a description of the application of operational and safety interlock matrices. Well-designed training manuals typically contain precise descriptions of computer control steps, icon definitions, menu hierarchy, and equipment-specific control examples. However, the Siemens training manual was not a well-designed

computer system training tool. The information in the manual did not correspond with the procedural steps the operators would take to run the control system. According to the Center for Chemical Process Safety (CCPS, 1994) control system providers should develop training tools and procedures based on how the user perceives the task. Using those tools in conjunction with classroom sessions and simulator training on normal and abnormal conditions fully prepares operators for transitioning to a new control system.

Management concluded that comprehensive formal training and practice using the new DCS on the methomyl process was unnecessary. They incorrectly assumed the methomyl and oxime board operators had become proficient from the many operating hours using the DCS on the Larvin unit. Methomyl and oxime board operators had minimal training on a few specific processes, but general training took place during the operators' shift as time allowed, and was self-directed and self-paced. Informal, on-the-job training intended to develop the necessary skills to run the system can lead to inappropriate or incorrect practices that became the norm in the absence of proper training tools and instruction (CCPS, 1994). The CSB concluded the training was inadequate.

Prior to the methomyl startup, management provided operators time on the console during the DCS upgrade to practice using the new system. However, management did not require any methomyl operator to use this time to learn and practice operating the methomyl unit, and operators could decide for themselves how much time they needed to become familiar with the new DCS. Management also assumed that operators directly involved in designing the mimic displays, such as the one in Figure 18, and other customizable features would have had adequate exposure to the new system.

Although operators had become proficient using the system on the Larvin unit, they acknowledged that the new methomyl control system created new challenges with operating the methomyl process unit, some of which were driven by the highly complex process chemistries involved in synthesizing methomyl. Substituting previous control system experience for training on a new process can be

problematic. Even minor differences in operation challenge an unfamiliar operator unless the operator has had process-specific training on the new equipment (CCPS, 1994).

Operators also told CSB investigators that the mouse interface command entry sequence responded slower than the Honeywell keyboard command entry process. They also reported that they were not familiar with some of the revised units of measure used to display equipment status and operating conditions that had been changed with the new DCS system installation. For example, one operator reported that the old control system used "percent full" to indicate the level in a vessel, but the new control system listed the level in total gallons inside the vessel. The methomyl operators had to improvise solutions to resolve the confusion by attaching paper conversion sheets on the work console for quick reference. However, at the time of the incident, some conversion charts had not yet been made. One operator told investigators:

There was an issue with the solvent ratio, because when we went to the Siemens system the ratio was a different number... We were not sure if we were feeding the wrong amounts... When we first started this process we were pretty much guessing... No one came in and told us what amounts to put in for the new system.

As with any new control system, the Siemens system required process tuning before it was placed in service. Specifically, an issue arose in the MIBK-hexane separation column: high MIBK concentration prevented the automatic control system from effectively operating the separation column. The board operators observed that the column temperature was fluctuating undesirably and that the automated valves were operating sluggishly. The unstable MIBK-hexane separation column caused excess methomyl to pass downstream as there was too little hexane in the system to achieve proper methomyl crystallization. Had the board operators received comprehensive DCS training, they might have recognized the problem much sooner.

3.5.3 Operator Fatigue

Unit startups and shutdowns typically involve significant increases in staff workload, which may result in longer work hours and extended back-to-back workdays. Many operators and other key staff were working 60 to 70 hours per week prior to the August 2008 methomyl startup, and some reported working 18-hour shifts with only 6 hours of downtime. Overtime and shift work demands disrupt sleep cycles and cause fatigue, which can adversely affect performance and safety (Stanton, 2010).

The rigors of shift work, rotating between day and night shifts, and working large amounts of overtime can impair decision-making, reaction times, and degrade communications. Performing infrequently used startup and shutdown procedures while fatigued increases the chance of errors. Fatigue also degrades competencies and alertness necessary to successfully operate an unfamiliar control system. Personnel are more likely to make mistakes as fatigue increases. Labor-intensive, non-routine activities including integrating utilities such as steam and other ancillary systems into the startup sequence complicate operator startup duties.

The staff was confronted with many startup problems and equipment malfunctions. The startup was further complicated because of the new, unfamiliar process control system. However, the CSB was unable to determine if fatigue specifically contributed to any of the staff actions during the startup, or the decisions to continue the startup in spite of the ongoing problems.

3.6 Shift Change Communications

Operators maintained an electronic notepad (eLog) on the computer system to summarize daily progress and identify ongoing activities for the incoming shift. They also held a verbal turnover meeting in the control room when shifts were changing. However, a number of key items were inadequately addressed in the shift change during the morning and evening shift changes the day of the incident. Had the written and verbal shift turnover activities been properly performed, the incident most likely would not have occurred.

As discussed, the solvent run and residue treater prefill and heatup were not performed on the residue treater, yet these deficiencies were never entered in the eLog nor were they discussed in the shift change meetings by either the board or the outside operators. Second, the night shift staff did not inform the day shift crew that they had started filling the residue treater with flasher bottoms. Third, the methomyl unit day shift operator, distracted while assisting another board operator with an operational problem at the end of his shift, neglected to inform the incoming night shift operator that the lab results from the scheduled flasher bottoms sample identified excessively high methomyl concentration. Believing that the operators had not yet started the residue treater system and it remained empty, the day shift outside operator did not collect the residue treater liquid sample as the residue treater SOP required.

3.7 Procedure Deficiencies

The CSB identified significant problems with the methomyl unit SOP. As noted, the operators were using an unreviewed, unapproved draft SOP. Regardless, the draft SOP was essentially the same as the previously approved SOP; the deficiencies discussed below existed in the earlier version.

The SOP was so complex that the table of contents spanned more than 12 pages. The SOP contained more than 1000 pages organized in 16 major sections that included much more than procedures typically used by unit operations staff to operate the process equipment. Subjects unrelated to process operations such as Change Procedure, Vendor Information, and History of Major Incidents were in the SOP. The methomyl unit SOP was last updated and approved in May 2006.

Only about 400 pages of the SOP contained detailed startup, normal operation, and emergency shutdown procedures for operating the unit with the Honeywell computer operating system. It was

available only from the computerized document control system. Operators could print specific pages for information only purposes.³⁸

Many operators reported that they did not rely on the SOP: they felt that they understood how to run the unit correctly without instructions. The SOP complexity may have also discouraged its use. This may be acceptable for frequently performed tasks but, to prevent errors, directly using the written procedure is critical especially when performing infrequent or uncommon tasks such as start-up after a major turnaround.

3.8 Process Chemistry Problems

Safe and correct operation of the methomyl unit involved closely controlling many complex chemical reactions. However, during the August startup the staff was confronted with equipment malfunctions and process chemistry problems in key equipment including:

- The methomyl reactor,
- The MIC stripping still (MSS) side-draw condenser,
- The crystallizers,
- The MIBK-hexane column, and
- The residue treater.

During steady-state conditions in the methomyl reactor, MIC and MSAO react to form methomyl. Bayer ran the reactor with enough excess MIC to consume as much MSAO as possible, which minimized the MSAO content in the methomyl product. On the day of the incident, the MIC to MSAO ratio was lower than normal, which left more MSAO unconverted and formed less methomyl.

Adding hexane to the dissolved methomyl and solvent caused the methomyl to crystallize. The crystallized methomyl could then be separated from the liquid solvents in the centrifuges. However,

³⁸ Printed pages contained a note at the bottom of each page that said "Uncontrolled when printed."

excess MIBK caused the MIBK-hexane ratio to be out of specification so that the methomyl remained in solution and passed directly through the centrifuge. Not understanding the chemistry imbalance, the staff concluded that methomyl was not being synthesized in the reactor. Had they reviewed the lab results from routine flasher feed liquid samples downstream of the crystallizer they would have quickly recognized that the reactor was producing methomyl and the problem was related to the solvent ratios. Four flasher feed samples that had been collected over 2 days contained methomyl significantly above the acceptance criteria. During the solvent recovery step, uncrystallized methomyl accumulated in the flasher bottoms significantly above the concentration normally fed to the residue treater.

The residue treater cooler had enough capacity to remove the heat of reaction from the decomposing methomyl if the average concentration in the residue treater did not exceed about 0.5 percent. As the methomyl concentration in the residue treater climbed, the decomposition reaction rate increased exponentially³⁹ until the heat and evolving gases generated enough pressure to overcome the relief system capacity and rupture the residue treater.

The methomyl decomposition reaction had important characteristics:

- It was an exothermic, or heat-releasing, reaction;
- It was a self reaction, as methomyl needed no other chemicals to begin decomposing;
- The reaction rate was faster at a higher temperature and higher methomyl concentration; and
- It rapidly produced non-condensable gases and solvent vapors.

³⁹ As the temperature increases, the rate of a chemical reaction generally increases exponentially.

The original design of the residue treater included features to control the reaction rate. First, the residue treater was intended to operate between 30 and 70 percent full of MIBK to ensure the feed to the residue treater flowed into a large volume of hot solvent. The hot solvent provided four functions:

- It diluted the incoming feed, which reduced the concentration of methomyl;
- It heated the incoming methomyl so that the methomyl would decompose quickly and not accumulate to a high concentration in the residue treater; and
- It absorbed the heat from the methomyl decomposition.

The second important safe operating condition involved the startup sequence, which was intended to ensure a safe decomposition rate at the beginning of the run. The control system contained interlocks to prevent opening the residue treater feed valve if the temperature, level, and pressure were not within the specified operating ranges. First, the operators had to fill the residue treater with solvent and start the recirculation pumps. Next, the circulation loop had to heat the solvent to the minimum operating temperature. Only then would the automatic feed control system open the flasher bottoms feed valve to begin feeding the methomyl-solvent into the preheated and circulating MIBK. This sequence assured that enough solvent was present to absorb the heat generated from the MSAO and methomyl decomposition reactions, and that the solvent was hot enough to ensure rapid decomposition to prevent the methomyl from accumulating in the residue treater.

The purpose of the residue treater was to eliminate the methomyl from the solvent before the solvent was used as a fuel in the boiler. The feed also contained unconverted MSAO. Like methomyl, MSAO decomposes exothermically, but will begin decomposing at a lower temperature than methomyl. As MSAO content in the auxiliary fuel was not a concern, the staff likely was not aware that MSAO decomposition played a role in residue treater performance and temperature control.

Although the temperature in the residue treater was lower than normal operation, the MSAO and methomyl began decomposing. Because they were both present in abnormally high concentrations,

the decomposition generated a significant amount of heat. The operators filled the residue treater to about 35 percent with flasher bottoms and then pumped hot MIBK into the residue treater to bring the level up to 50 percent. After starting the recirculation pump, the board operator set the recirculation temperature control to the automatic mode to begin the normal heating cycle. As discussed earlier, the closed steam valve prevented the heater from heating the liquid. The board operator was unaware that the temperature was climbing because large quantities of MSAO and methomyl were decomposing in an uncontrolled fashion.

The rapidly forming gases overwhelmed the vent system and the residue treater pressure started climbing. The rate of reaction continued increasing until the evolving gases caused the relief system to activate and then overwhelm the relief system. The pressure rapidly rose until the residue treater suddenly ruptured.

The relief device was sized to handle an external fire around the residue treater, but only if the residue treater contained less than 2 weight percent methomyl equivalent (280 pounds). Post-incident analysis estimated that the residue treater contained at least 40 weight percent methomyl and 7 weight percent MSAO just before the runaway reaction initiated, which could not be safely vented by the existing relief system.

The most important layer of protection against over-concentrating methomyl in the residue treater was the minimum temperature and minimum flow interlocks on the flasher bottoms feed valve, which were bypassed the night of the incident. The administrative controls requiring laboratory sampling were not robust. The most important variable, the chemical composition of the flasher bottoms going to the residue treater, was not required to be analyzed before or during residue treater operation.

Although analysis results for samples would likely have alerted the operators to the high risk situation of concentrated methomyl accumulating in the residue treater, these lab results took more than an hour to process, too long to be an effective input to the operators to prevent overcharging the residue

treater with concentrated methomyl. The existing layers of protection were inadequate to prevent a runaway reaction.

3.9 Unit Restart Equipment Problems

Unit staff encountered many problems with equipment during the restart activities. One involved a longstanding issue with the residue treater heater operation. Others were directly related to the new control system installation, and some involved equipment malfunctions or misaligned valves.

3.9.1 Residue Treater Heater Performance

The original design basis specified the minimum residue treater operating temperature to be 85 °C (185 °F), but early system runs did not adequately decompose the methomyl at that temperature. Subsequent kinetic studies determined that the ideal safe operating temperature to achieve the required methomyl decomposition was 135 °C (275 °F). Engineers added a heater in the residue treater recirculation system to preheat the MIBK solvent to the higher minimum temperature. However, more than one board operator told CSB investigators the heater could increase the temperature to only about 130 °C (266 °F). To resolve the issue during start-ups, some board operators bypassed the minimum temperature safety interlock and manually opened the flasher bottoms feed valve when the residue treater solvent temperature was within about 5-10 degrees of the operating temperature. After feeding methomyl and MSAO into the solvent, the exothermic decomposition reactions generated enough energy to heat the contents the remaining few degrees needed to satisfy the minimum temperature interlock setpoint, but not enough energy to cause an explosion. Thus, operators became accustomed to bypassing the interlocks and manually opening the feed valve before the residue treater contents were at the minimum operating temperature.

On the night of the incident, the residue treater was not pre-filled with solvent, and based on experience with the heater, the minimum temperature safety interlock was bypassed. The flasher bottoms were hot enough for the concentrated MSAO and methomyl to begin decomposing. The

temperature continued climbing until the reaction reached a runaway condition that led to the explosion.

3.9.2 Broken, Missing, and Misaligned Valves

Other equipment problems continued to disrupt the operators and cause chemical imbalances in the system.

3.9.2.1 Instrument Drip System Valve

The instrument drip system provided MIBK solvent to various components and instruments to prevent solids from depositing and accumulating inside pipe and equipment. As “drip system” implies, MIBK was intended to be added using a minute, drip-wise flow rate into the process stream. During the methomyl unit outage, a valve on the instrument drip system was inadvertently left out of a line, so that MIBK flowed continuously into the system. This oversight was not discovered and fixed until the day before the incident, which allowed off-specification material to proceed through the process. This “hydraulic load” made maintaining balanced operating conditions in the methomyl crystallizers more difficult, which contributed to the high methomyl content in the flasher bottoms feed to the residue treater.

3.9.2.2 Cooling Water Valve

A broken cooling water valve on an upstream distillation column side-draw condenser further over-concentrated the MIBK. Without the cooling water, MIBK was not condensing out of the vapor stream, worsening the solvent ratio imbalance.

3.9.2.3 Residue Treater Recirculation System Block Valves

While examining the damaged unit, CSB investigators discovered, and Bayer later confirmed, that a valve on the residue treater recirculation heater steam supply was closed, instead of fully opened as intended. This incorrect valve position should have been identified either during a formal valve alignment checkout before the unit restart began, or during a residue treater system solvent run.

However, the staff did not perform either activity before they began the unit restart so the misaligned valve was not detected during the startup.

The board operator told investigators that he believed that the heater was working correctly because the residue treater temperature was increasing in a similar way to what he had expected during a residue treater startup. The CSB concluded that the residue treater liquid temperature was climbing because highly concentrated methomyl and MSAO were already decomposing and the self-sustaining decomposition reactions were rapidly increasing and would soon go out of control.

Post-incident examination of the computer data suggested that steam was flowing into the heater (Figure 19). However, the CSB concluded that with the steam supply block valve confirmed to have been in the closed position,⁴⁰ the only possible explanation for indicated steam flow was an improperly calibrated instrument, misaligned vent valve, or malfunctioning flow instrument. This was yet another example of the inadequate system checkout.

Another equipment malfunction that should have been identified before the restart involved the residue treater heating/cooling control configuration in the DCS. About 15 minutes before the residue treater explosion, the data indicated that recirculation flow suddenly dropped to zero (Figure 11, bottom trace).

⁴⁰ The valve was removed from the pipe and visually examined. Water placed in the valve body did not leak past the seat in any measurable amount.

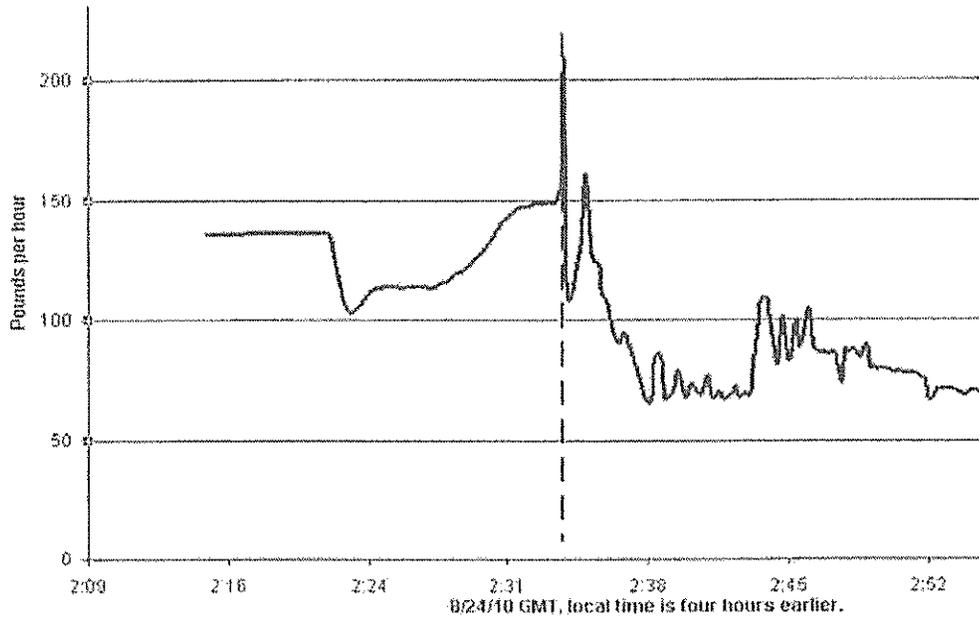


Figure 19. Indicated steam flow through the residue treater heater. Vertical dashed line shows point of vessel failure. Actual flow was zero because valve was closed

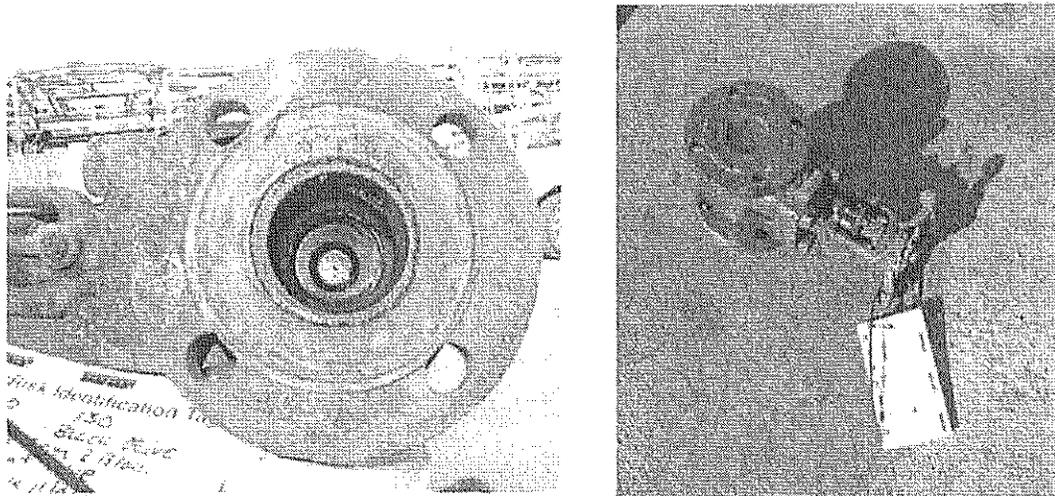


Figure 20. Closed steam block valve recovered from residue treater heater steam supply valve

It was determined that the automatic temperature control system closed both the heater and cooler flow control valves (see Figure 10) at the same time when the recirculation temperature control transitioned from heating to cooling. Bayer examined the temperature controller and its investigation team concluded that

[An] undocumented change in the heating/cooling control scheme was made during the control system upgrade that resulted in a flow restriction when changing from heating to cooling.

Regardless of this control system error, both the CSB and Bayer concluded that even if full flow had been established, the cooler could not remove enough heat to stop the runaway reaction and prevent the explosion.

3.9.3 Other Process Equipment Problems

At the Institute facility, supervisors commonly left their passwords logged in to allow operators to bypass safety systems considered troublesome during startup. Without supervisors' direct involvement, best practices were ignored to get the process underway quickly.

The excessively high concentration of MIBK caused by the equipment malfunctions upstream prevented the methomyl from crystallizing in the crystallizers: the methomyl remained dissolved in the solvent. Dissolved methomyl remaining in the solution caused the liquid level in the centrifuges to trip a high-level alarm and abort the centrifuge cycle. Operators, unaware that the problem involved a solvent ratio imbalance in the crystallizers, used the unsecured control system supervisory access⁴¹ screen to bypass the centrifuge high-level trip interlock and operated the centrifuges manually.

⁴¹ Safety matrix and operating matrix function changes were administratively controlled using a secure password to prevent inadvertent or unauthorized changes or bypassing without engineering approval. However, during startup, a supervisor logon to the operator matrix edit screen was left active so that anyone could defeat the control functions.

Improper or incomplete checkout and calibration of the Siemens control system caused more centrifuge problems. A malfunctioning relay in the new system caused the centrifuges to trip off when the operators attempted to run both at the same time, which was the normal condition. That problem combined with many recurring high-level alarms in the centrifuges led operators to believe that the two issues were linked. They did not recognize the real issue: the malfunctioning equipment upstream of the crystallizer prevented proper methomyl crystallization. Uncrystallized methomyl increased the liquid level in the centrifuges, which triggered the high level alarms.

3.10 Air Monitoring Systems Deficiencies

3.10.1 Fenceline Air Monitors

Fenceline air monitors are often relied on to determine if chemicals released from a plant enter the community. The locations of the monitors, as well as their limited chemical sensitivity, often make release determinations difficult. On the night of the incident, two property fenceline monitoring devices were operating, one on the east side and one on the west side of the facility. The closest monitor was more than 800 feet from the methomyl unit and would be effective only if it were downwind of a release. The monitors were configured to detect chlorine, carbon monoxide, methane, and oxygen. Each monitor contained a 10.6 eV (electron volt) lamp and a VOC sensor capable of picking up chemical compounds only within a certain range of ionization energies. Because the VOC sensor can detect several different chemical compounds, it is useful only in estimating a concentration if the released material is suspected and possesses an ionization energy in the detectable range. The AreaRae monitor, which was used the night of the incident, could not detect specific compounds such as methomyl or some of its intermediates. Laboratory analyses of air or swipe samples were the only sampling methods available to determine if methomyl was released, but those tests were performed days later.

The fence line monitors were also unreliable because they could not detect buoyant gas releases unless strong wind currents drove the gas back down to the detector locations. Weather conditions the

night of the explosion, including wind direction and velocity, were unfavorable for proper detection of any toxic or flammable gas by either fence line monitor.⁴²

3.10.2 Unit Air Monitors

The air sample analyzer collected and analyzed samples at 16 locations in the Methomyl-Larvin unit and near the MIC day tank at 2-minute intervals. The analytical results were recorded in a data historian and any concentrations exceeding 1.0 ppm triggered a visual alarm notification on a display panel on the second floor of the Methomyl/Larvin control building and at the board operator's console. The analyzer used a fixed filter photometer consisting of an infrared radiation (IR) source to absorb and detect the concentration of MIC within a range of 0 to 10 ppm.

In May 2008, the analyzer malfunctioned and reported erroneous concentrations in excess of 1 ppm and failed to activate control building alarms. Two weeks before the August incident, the monitor data logging system stopped recording for an unknown reason. The analyzer manufacturer worked with Bayer to resolve the problem, but the analyzer was not repaired and returned to service before the incident.

Unknown to EOC personnel the monitor was not operating the night of the incident. Assuming it was working, they concluded that the explosion did not cause an MIC release, or if MIC had been released, it was being consumed in the fires. The PSSR for the residue treater, completed prior to the methomyl restart, did not specifically list MIC analyzer operation as a requirement for startup or operation.

⁴² Weather conditions the night of the incident were 66° F (19° C) and calm wind conditions.

3.11 Organizational Deficiencies

One experienced methomyl unit operator described how the organizational structure changes degraded the technical support available during unit operations:

When we started getting rid of people--not getting rid of people--"thinning"--less technical assistance, if you will. There were some guys, they were in charge--we had a guy in charge of methomyl, a guy in charge of oxime, and a guy in charge of the warehouse. And that was their baby. And now we have like one guy doing it all. No shift supervisor.

This and other interviews led the CSB investigation team to conclude that the multiple shortcomings in the technical support available to the operators made recognizing and addressing problems with the system more difficult.

The reorganization resulted in only one Technical Advisor assigned to the entire Methomyl-Larvin unit who worked the day shift. The Shift Leader was also available to assist but did not work with the operators on a daily basis, operators relied primarily on the Technical Advisor. However, the night shift did not have a Technical Advisor on duty. If the board operators had a process question during their shift, they could call the Shift Leader or Technical Advisor who was on-call on nights and weekends. The Technical Advisor also served as a liaison to the capital project team.

For the system upgrade capital project, Bayer assigned a second Technical Advisor to assist with the increased workload. The first Technical Advisor focused on Larvin production, and the new Technical Advisor, who had no methomyl unit operating experience, focused on methomyl production. The second Technical Advisor had experience as a technical advisor and had DCS control system training. That experience, however, was in a different unit and the training was on a different brand of control system. A highly experienced methomyl unit operator helped the Technical Advisor

with limited project work such as the functional acceptance testing, but the Technical Advisor was the primary contact.

In the days leading up to the incident, the only assigned Technical Advisor had worked as many as 15 to 17 hours a day, and 10 hours on the day shift preceding the incident. Throughout the evening preceding the incident, operators struggled with stabilizing the operating conditions in the methomyl unit, and yet the Technical Advisor had already left for the day. During this critical first startup using a new control system, management should have ensured that a highly experienced Technical Advisor was assigned to the control room staff during both shifts.

A Run Plant Engineer was another person operators could consult for technical assistance. The role of the Run Plant Engineer varied depending on the needs in the particular unit and mainly involved working on improvement and repair projects, and turnarounds. The Run Plant Engineer had little involvement on day-to-day operational support. The Methomyl-Larvin unit Run Plant Engineer had less than one year of experience before the incident. In his previous assignment, he had primarily defined and installed improvement and repair projects and did not typically deal with unit startup and operating issues. This engineer told CSB investigators that he knew very little about the details of the DCS upgrade project and was not even sure who had been designated as the project manager. More importantly, he said he lacked knowledge of the methomyl unit equipment and chemistry. He had hoped to learn more about the process by having greater involvement in the unit startup, but was unable because operational difficulties on the Larvin unit demanded his attention.

The Production Leader was another resource available to the operators. However, the reorganization also changed the relationship between the operators and the Production Leader. In the traditional structure, only one team of board operators reported to a supervisor, but in the self-directed work structure, the Production Leader was responsible for four self-directed work teams. The methomyl Production Leader worked the day shift and was responsible primarily for administrative activities and had little interaction with the operators related to unit startup and operation.

The organizational changes directly contributed to the incident causes. With the self-directed team organization in place, management did not directly advise or control the unit restart schedule. The self-directed work team ultimately decided to start the methomyl unit even though the control system and some equipment were not ready and the SOP was not up-to-date. Furthermore, management was so far removed from the process operation that they were unaware that the operators seldom used the SOP and some bypassed the critical safety interlocks, which directly led to the residue treater explosion.

3.12 Previous Methomyl-Larvin Unit Incident

On August 18, 1993, at approximately 10:15 a.m., an explosion occurred in the chloroacetaldoxime (CAO) reactor loop of the methomyl unit. At the time of the incident the facility was owned and operated by Rhone-Poulenc. The explosion caused one death and injuries to two workers who were in the unit at the time of the incident. Investigators concluded that a flow indicator malfunction led to over-chlorination of acetaldoxime, which led to a violent decomposition. They further concluded that the workers' activities were not causally related to the incident. The explosion ignited a massive fire, which was fueled by flammable liquids being released by ruptured pipes.

The investigation team made the following recommendations:

- Identify, and treat as critical, all ESD interlock alarms. Examine and rigorously apply the Institute Plant Alarm Management procedure with regard to nuisance alarms; and
- Review and revise the unit procedures for "Disabling Alarms" and "By-passing Interlocks" to address a temporary bypass of a safeguard for operational purposes, such as during a unit startup.

Contrary to the 1993 recommendation to improve administrative controls involving critical process interlocks, the residue treater incident more than 15 years later directly involved similar improper control system interlock changes.

3.13 Emergency Planning and Response

3.13.1 National Incident Management System

The National Incident Management System (NIMS) is an organized system of roles, responsibilities, and procedures for the command and control of emergency operations. OSHA 1910.120(q) requires that both public safety and industrial emergency response organizations use a nationally recognized Incident Command System (ICS) for emergencies involving hazardous materials. ICS is an organized system of roles, responsibilities, and standard operating procedures used to manage and direct emergency operations (Figure 21).

Another important component of this network is the Unified Command System (UCS). UCS is a process of determining overall incident strategies and tactical objectives by having all agencies, organizations or individuals who have jurisdictional responsibility participate in the decision-making process.

As part of a comprehensive national incident management system, most state, local, and volunteer organizations are familiar with the NIMS process and use it for even routine incidents. Interviews with the St. Albans fire chief, the Kanawha County Sheriff, and Metro 9-1-1 staff revealed knowledge of the NIMS system and their use of the process in routine incidents such as traffic accidents and residential emergencies.

On the night of the incident, all of the responding outside agencies communicated via the Kanawha Putnam EOC. However, the Bayer EOC did not use a shared network to communicate with all responding agencies; thus, the responding agencies did not receive timely status updates. Important information updates about the continually changing conditions at the fire scene were not communicated to the other responding agencies (Knoll, 2005).

INCIDENT COMMAND STRUCTURE

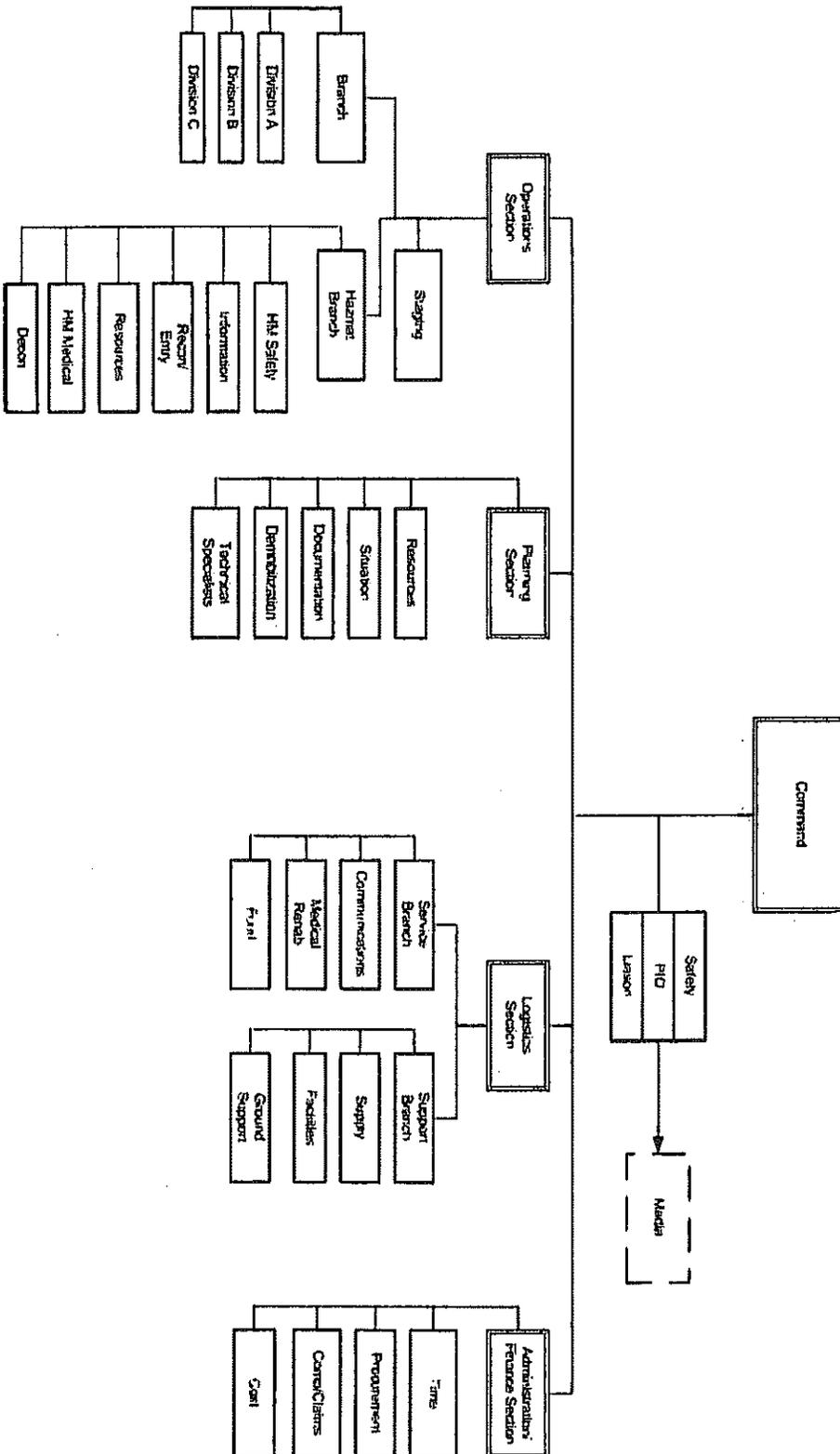


Figure 21. NIMS incident command structure

3.13.2 Kanawha Putnam Emergency Planning Committee

The Kanawha Putnam Emergency Planning Committee (KPEPC) history dates back to the 1950s when it began as the Kanawha Valley Industrial Emergency Planning Council to serve as a mutual aid group doing business in Kanawha County. In 1995, the KPEPC began functioning as the Local Emergency Planning Committees (LEPC)⁴³ in Kanawha and Putnam counties. The federally mandated committee includes volunteers from the community, industrial businesses, and representatives from the emergency response organizations in the area. KPEPC has 12 board members, 10 annex committees, and about 125 members that oversee emergency response planning. It is funded by its membership, the U.S. Department of Transportation, and West Virginia state grants.

KPEPC activities include conducting emergency drills (e.g., fire or hazardous materials spills) with member companies; holding monthly meetings; and interfacing with other LEPCs in West Virginia. The committee also serves as a resource and supports training of various emergency response agencies.

3.13.3 Kanawha Putnam Emergency Management Plan

The Kanawha Putnam Emergency Management Plan provides “general guidelines for planning, managing and coordinating the response and recovery activities of local government” in the event of a major emergency or disaster.⁴⁴ The president of the County Commission is responsible for executing the plan when the emergency involves the county. The plan is divided into a “basic plan” and two annexes. The “Functional” annex contains guidelines for participating agencies to use in developing agency-specific operating documents. The “Hazards” annex contains non-routine emergency

⁴³ An LEPC is a committee appointed by the state emergency response commission, as required by SARA Title III, to formulate a comprehensive emergency plan for its jurisdiction.

⁴⁴ West Virginia Emergency Act Chapter 15, Article 5, “Emergency Services.”

scenarios. The Emergency Management Director is responsible for the operational aspects of the plan and plan revisions.

The Basic Plan addresses only governmental organizations—it fails to address roles and responsibilities of facility personnel in the event of a chemical incident at a facility. The Basic Plan requires that only one EOC be in place for an emergency and all staffing functions be provided by emergency response agencies. Furthermore, the plan states, correctly, that an Incident Commander (IC) is responsible for tactical operations in the field and assigns “absolute control over all on-scene operations” and requires all emergency activities to conform to the ICS and NIMS.

However, the Basic Plan does not address the facility owner’s roles and responsibilities to establish an internal incident command structure in accordance with the NIMS process. It does not provide any information or direction when the facility owner assigns the IC and establishes an EOC, as was the case during the August 2008 Bayer incident.

The CSB also found that at least two functional annexes contradict the Basic Plan. Chemical HazMat Response, Annex A16, states that “the manufacturing facility (plant) Incident Commander will be part of the Unified Command structure.” Additionally, Mining Accidents, Annex 26, states that “Initially, the coal company is in charge of the incident.” The annex defines the criteria for official transfer of the incident command to state and federal government agencies when they arrive on-scene. The omissions and contradictions in the Basic Plan are likely to confuse critical emergency response activities in the event of a fire or chemical release at a facility.

3.13.4 Chemical Release Notification Law

In 2009, the State of West Virginia revised the Mine and Industrial Accident Rapid Response System regulation (West Virginia Code Chapter 15 Article 5B), to require prompt reporting of chemical releases. The new law applies to all facilities regulated by the EPA Risk Management Program regulation (40 CFR 68). It does not apply to facilities regulated only by the Occupational Safety and

Health Administration (OSHA) Process Safety Management standard (29 CFR 1910.119). The law requires the facility to notify the Mine and Industrial Accident Emergency Operations Center by telephone within 15 minutes of the industrial facility ascertaining the occurrence of an emergency event. The regulation also requires the reporting facility to:

- Implement a communications system designed to provide timely information to appropriate state and local officials;
- Upon request, provide appropriate state and local officials with timely authorized access to the person or persons charged with managing the event on behalf of the facility and the area(s) where the emergency event is being managed or the industrial facility's response to the emergency event is being coordinated; and
- Provide appropriate state and local officials with timely authorized access to any areas affected by the emergency event.

The law also requires that within 30 minutes of obtaining information that affects the public health, safety and welfare, state and local officials shall notify the public of any hazardous materials or events which may affect the area.

3.14 Incident Response and Communication Deficiencies

3.14.1 Bayer CropScience Facility

The Bayer IC led the plant's internal emergency response team but did not have direct contact with the Kanawha Putnam EOC. Because the information to and from the Bayer EOC was not part of a UCS, responding municipal, county, and state agencies were not provided updated and reliable information regarding the status of the incident throughout the response.

Concerns expressed post-incident cited a number of troubling issues, including police and fire responders' potential exposure to toxic substances while performing their duties. Responding agencies also cited the threat to the surrounding communities due to the lack of timely information that would have made for better coordination of the shelter-in-place decision-making process. The CSB could find no evidence of an effort by Bayer to align operations with other responders in a UCS.

The Bayer IC established radio communication with the Institute VFD fire chief, who was also a Bayer employee; Bayer fire brigade members; and the Bayer EOC. Information relayed to municipal, county, and state agencies that responded to the incident was not first-hand in most cases and so was prone to errors as information was relayed from one source to another.

3.14.2 Facility and Emergency Responders' Communications

Timely and accurate information updates from the Bayer EOC to the outside emergency responders were an issue throughout the incident. The quality and lack of timely information regarding the status of the incident and information necessary to make decisions advising shelter-in-place emerged as recurring concerns post-incident from participating agencies. The agencies also felt that communities were placed at greater risk and that better information would have helped in providing useful advisories to police and fire units.

More than 10 minutes elapsed before Bayer was able to alert Metro 9-1-1 and even then, the information was inadequate. The guard at Bayer's main guard shack told investigators that he tried several times to call them but was unable to get through.⁴⁵ Finally, at 10:42 p.m. contact was made when the guard was calling for an ambulance to transport a burn victim to the hospital. When the Metro 9-1-1 operator questioned him about the explosion, the caller indicated that he could not provide any information.⁴⁶ Similar exchanges continued throughout the night until the all-clear was sounded at about 5:50 a.m. the following morning.

Another control and communication deficiency involved possible toxic exposure to on-scene emergency responders. The decontamination area located outside the fire zone was shut down shortly after the all-clear was sounded, but before all the emergency responders involved in the fire

⁴⁵ The Metro 9-1-1 operator made a similar observation as he attempted to call the Bayer site.

⁴⁶ Bayer management instructed the guard, who was the official point of contact with Metro 9-1-1 for such communications, not to provide any information other than what the IC directed.

suppression activities had decontaminated their clothing and equipment. The responders from the Tyler Mountain Fire Department returned to their fire station with contaminated gear. The CSB learned that the next day they complained of symptoms indicative of toxic exposure.

3.14.3 Kanawha Valley Emergency Communications Process Improvement Initiatives

The Kanawha Putnam Emergency Plan requires that police, fire, and EMS dispatch be coordinated and directed from the Metro 9-1-1 call center. Located in Charleston, West Virginia, the facility employs about 100 dispatchers, administrative support, and supervisors. All calls for emergency assistance requiring municipal or county resources are consolidated through the call center. Metro 9-1-1 is also a member of the KPEPC and participates in the committee meetings.

To address the communication issues that occurred during the Bayer incident response, Metro 9-1-1 and KPEPC developed new tools and processes for use by the agencies charged with emergency response in the Kanawha Valley. Post-incident, Metro 9-1-1 participated in a drill with the Institute site and local emergency response organizations and implemented the following emergency response improvements:

- Developed a list of questions to use when any fixed facility calls the center and trained all telecommunications personnel;
- To improve response times when receiving calls for assistance, Metro 9-1-1 no longer serves as the conduit for KPEPC reporting requirements.⁴⁷ Plants complete and submit chemical release information forms to the KPEPC within 14 days of an incident;
- Established one-mile zones around fixed facilities for rapid, automatic reverse ringdown phone calls in the event of a release;

⁴⁷ Releases of Extremely Hazardous Substances as listed in 40 CFR 355, Appendix A, or chemicals that require release reporting as defined in section 103(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), Must be reported to LEPCs within 14 days of a chemical release.

Table 2. New Metro 9-1-1 questionnaire for fixed chemical facilities
(Courtesy Metro 9-1-1)

| Fixed Facility Chemical Questions | |
|---|---|
| 1 | What is your name? |
| 2 | What is your title? |
| 3 | What is the address/Location of the actual alarm? |
| 4 | What phone number do we use to call back about the alarm? |
| 5 | Is any outside assistance requested? |
| On initial call only: If the nature of the alarm or chemical is not known at this point, cease questions until plant personnel call back | |
| 6 | What is the Chemical involved? - How is it spelled? and/or - What is the CAS number? |
| 7 | Is the chemical involved on the "extremely hazardous" list? |
| 8 | Has the chemical been released into the air, water, or ground? If there has been a release, is it a "reportable quantity"? |
| 9 | Are there any recommended protective actions for the public? |

- Established a 15-minute rule (starting when the call is first received) for the Metro 9-1-1 Emergency Management Director to call for an advisory shelter-in-place if the call center has knowledge of an event, but the company has not provided timely or quality information about the material involved in the release. (Section 3.13.4 discusses the new state law that requires facility owners to report certain chemical releases to the Mine and Industrial Accident Emergency Operations Center);
- Developed a process for emailing residents in the affected zone when a release occurs;
- Developed a protocol for notification when a release is reported to Metro 9-1-1 that uses email, reverse ringdown phone calls, and emergency sirens;
- Increased call center phone capacity by 50 percent to address increased telephone traffic during emergencies;

- Identified mid-level personnel contact information for Bayer, DuPont, and Dow who are authorized to talk directly with Metro 9-1-1 staff during an emergency; and
- Developed a matrix that identifies the information that should be provided to the public as soon as it becomes available.

To address the communication problem between the Bayer EOC and METRO 9-1-1, Bayer installed a dedicated telephone line that directly connects the Bayer EOC to Metro 9-1-1. This is intended to ensure that overloaded phone lines do not block calls between the two parties, which typically occur in such incidents.

3.15 Environmental Impact

More than 2,000 gallons of toxic and flammable liquid was expelled from the residue treater, ruptured piping, and other equipment, most of which burned in the ensuing fire. Although the residue treater feed contained significant quantities of methomyl and MSAO, those chemicals were rapidly decomposing in the residue treater. Post-incident, trace amounts of methomyl were found in swipe samples from equipment in the vicinity of the explosion; however, the specific quantities of undecomposed or unburned methomyl or other toxic chemicals that might have escaped into the atmosphere were indeterminate.

The MIC day tank and cross-unit transfer piping were not damaged in the incident. However, the liquid in the residue treater contained significant quantities of methomyl and MSAO products of decomposition and possibly some quantity of methyl isocyanate.⁴⁸ MIC might have also been released from ruptured process piping and vent piping. MIC is flammable and highly reactive with water; at least some of any released MIC likely burned in the fire or reacted with the water used to

⁴⁸ The flasher bottoms likely contained small amounts of MIC, and MIC could have been one of the products of the methomyl decomposition reaction.

fight the fires. There were no reports of river water contamination or other offsite ground contamination.

3.16 MIC Day Tank Blast Shield Analysis

The MIC day tank was adjacent to the methomyl-Larvin unit. A steel rope mesh ballistic shield (blast blanket), mounted on the sides of and on top of a structural frame, protected the tank in the event of an explosion in the unit or nearby equipment (see Figure 2). Flying debris from the residue treater explosion struck the blast blanket. The fires radiated intense heat on the blast blankets.

After the incident, Bayer removed the blast blanket and the MIC day tank insulation and associated piping. They visually examined the day tank for impact or heat damage. They also pressure tested the day tank. The day tank showed no evidence of heat damage—the blast mat provided highly effective protection against radiant heat from the external fires. The examination and testing confirmed the day tank and associated piping were not damaged by the explosion.

As reported by the blast mat manufacturer and confirmed by independent studies, the blast mat provided effective protection against penetration by small projectiles traveling at near sonic velocity, as well as penetration by a large fragment travelling more than 100 miles per hour.⁴⁹ An analysis commissioned by Bayer after the August 2008 incident also concluded the blast mat provided effective protection against small, high-velocity projectiles.

To fully protect the day tank, the blast blanket and frame assembly had to absorb the dynamic energy from any debris strike. The original structural frame design only considered the blast mat weight and wind loading, it did not examine dynamic loading. The CSB analyzed the structural frame to determine if it provided adequate protection against overpressure blast energy and a large projectile

⁴⁹ The manufacturer worked with the Israeli Defense Force and the Southwest Research Institute to evaluate the ballistic shield design. Testing demonstrated that it is capable of withstanding detonation pressures resulting from thousands of pounds of TNT more than 30 feet from the source of the detonation.

impact into the blast mat (Appendix C). The analysis examined both maximum theoretical deflection and structural component failure. It concluded that the structural frame was adequate to prevent damage to the MIC day tank and attached vent pipe from the overpressure energy. The analysis concluded that the structure provided only marginal impact energy absorption protection from a large fragment strike at velocities predicted to result from the residue treater explosion.

Therefore, had the residue treater traveled unimpeded in the direction of the day tank, and struck the shield structure just above the top of the MIC day tank, the shield structure might have impacted the relief valve vent pipe. A puncture or tear in the vent pipe or MIC day tank head would have released MIC vapor into the atmosphere above the day tank.

4.0 Methyl Isocyanate Risk Reduction at the Institute Facility

4.1 Congressional Action

In May 2009, the U.S. House of Representatives Committee on Energy and Commerce sent a letter to the U.S. Chemical Safety Board Chairman requesting that the Board:

1. "Conduct an investigation to determine options for Bayer to reduce or eliminate the use or storage of MIC by switching to alternative chemicals or processes."
2. "Determine whether Bayer has adequately examined the feasibility of switching to alternative chemicals or processes."
3. "Provide specific recommendations for Bayer and its state and federal regulators on how to reduce the dangers posed by on-site storage of MIC."
4. "Brief our staff on the Board's findings and recommendations at the end of its investigation."

In the fall 2009, the Congress appropriated \$600,000 to the CSB fiscal 2010 budget and directed that the funds

[S]hall be for a study by the National Academy of Sciences [NAS] to examine the use and storage of methyl isocyanate including the feasibility of implementing alternative chemicals or process and an examination of the cost of alternatives at Bayer CropScience facility in Institute, WV.

The NAS study was designed to address item 1 in the May 2009 committee request. Historical studies addressing MIC alternatives conducted by Bayer and the prior owners of the Institute facility are discussed in Section 4.2.

The CSB published a draft scope of work for the NAS study in *The Federal Register*⁵⁰ on April 23, 2010, to solicit public comment. The CSB reviewed all submitted comments and revised the NAS scope of work. The CSB awarded the contract to the NAS in September 2010. The CSB is currently considering the impact of Bayer's announcement concerning the planned total elimination of MIC on the NAS study.

4.2 Alternative MIC Technology Analysis History

4.2.1 Union Carbide Corporation Studies

UCC began alternative MIC technology research in November 1976. The initial research focused in the area of "adducts," which are chemical structures that can be easily added and removed from the desired chemical. The intention of an adduct is to change undesired characteristics of the chemical to which the adduct is attached. In the case of MIC, the adduct made it water soluble and ultimately less hazardous should it escape containment. However, the MIC adduct was not easily removed, so it contaminated the insecticide products.

In July 1984, UCC researched a palladium catalyzed reaction that had the potential to completely eliminate both MIC and phosgene use. However, the cost of the catalyst greatly outweighed any potential feasibility for this process. At the time, it would have cost more than \$14 per pound of insecticide, merely to cover the cost of the palladium catalyst, which was cost prohibitive.

During its ownership, UCC reviewed 97 patents dealing with alternative technologies to MIC production but concluded that none could perform as well as the existing process. In the last year of the facility ownership, UCC found three different pyrolysis⁵¹ techniques that showed promise to

⁵⁰ The Federal Register. Chemical Safety and Hazard Investigation Board, National Academy of Sciences Study, Vol. 75, No. 78 / Friday, April 23, 2010, pg. 21223.

⁵¹ Pyrolysis is a term for chemically decomposing organic materials through heating--a form of thermal decomposition.

eliminate phosgene and/or reduce the MIC stockpile, but sold the facility before completing the studies.

4.2.2 Rhone-Poulenc Studies

Rhone-Poulenc continued research into pyrolysis through March 1989, but determined that the pyrolysis approach to manufacturing pesticide products was not cost-effective. Rhone-Poulenc also researched different approaches to operating the processes that use MIC and phosgene, intending to reduce the stockpiles of both. In all five new techniques studied, Rhone-Poulenc concluded that either the stress placed on the process equipment was too great or the new process would be unacceptably difficult to control.

Following the deadly MIC release from the Union Carbide facility in Bhopal, India, in 1984, DuPont implemented a new technology for producing the carbamate pesticide methomyl at its plant in La Porte, Texas, which did not require a large inventory of MIC. The technology also eliminated phosgene from the production process. In DuPont's technology, the less acutely toxic chemical methylformamide is converted into MIC on an as-needed basis and immediately consumed in a subsequent reaction, avoiding the need to store MIC. In the 1980s, Bayer itself used a similar approach to producing the carbamate pesticide propoxur in Europe; according to a published account, Bayer used an alternative chemistry where MIC was produced and consumed in tandem (Worthy, 1985).

Rhone-Poulenc also researched various in-situ processes for MIC, which would allow MIC to be synthesized and almost instantly consumed in the process line. This form of production eliminates the MIC stockpile and often removes the need for phosgene. In February 1989, Rhone-Poulenc analyzed the in-situ process DuPont used but did not adopt the technology, possibly due to patent restrictions.

In December 1989, Rhone-Poulenc reviewed what was thought to be a promising in-situ process proposed by Enichem. The Enichem process was going to be used at a facility in Brazil, and the

suggestion was that it could also be used at the Institute facility. The available historical records did not explain why Rhone-Poulenc did not implement the Enichem technology.

4.2.3 Bayer CropScience Studies

Bayer CropScience continued to research the Enichem in-situ process that would eliminate phosgene and the MIC stockpile. However, the company reported that a byproduct of this reaction degrades the effectiveness of pesticide products by nearly 50 percent. As of August 2010, Bayer claimed that it has had not found an alternative to MIC suitable for its products manufactured in Institute, West Virginia. Bayer however committed to cooperate with the NAS and consider the recommendations that result from the NAS study.

4.3 Bayer CropScience MIC Storage Reduction

Concern expressed by many in the community, local regulators, and Congress ultimately prompted Bayer CropScience to reevaluate MIC use at the Institute facility. In August 2009, the company reported that the use of MIC would not be eliminated at the facility and that in-situ production of MIC at the operating units where MIC is used was not a viable alternative. However, Bayer committed to significantly reduce the on-site inventory of MIC, make process unit upgrades, and continue to study alternate chemistries that could eliminate the need for MIC for pesticide production. The full text of the Bayer CropScience announcement is contained in Appendix D.

Bayer management announced the following planned changes at the Institute facility:

1. Reduce the MIC storage at the Institute facility by 80 percent;
2. Eliminate all aboveground MIC storage;
3. Eliminate all transfer, storage, and use of MIC in the West Carbamoylation Center; and
4. Eliminate manufacturing methomyl and carbofuran.

Bayer did not repair the damaged Methomyl unit and abandoned methomyl production at the Institute facility. Bayer negotiated a carbofuran unit shutdown schedule with FMC, the owner of the unit,

which ended carbofuran production in August 2010.⁵² Bayer then stopped storing MIC in the Methomyl-Larvin unit day tank.

Bayer also committed to replacing the MIC production unit underground storage system with new, smaller storage vessels and a new underground containment vault. Bayer further committed to decommissioning the remaining aboveground storage vessels at the facility. Bayer CropScience management also stated to the CSB it would revise the MIC system Process Hazard Analysis and commission an independent review of the PHA. The facility upgrade work is scheduled to be complete by February 2011.

Subsequent to Bayer's announcement of its MIC inventory reduction plans, in August 2010 the Environmental Protection Agency and Bayer reached an agreement to phase out the production of aldicarb, one of two remaining MIC-derived pesticides made in Institute, by the end of 2014. On January 11, 2011, Bayer announced plans to end the production of both aldicarb and carbaryl by mid-2012 and thereby eliminate the production, storage, and use of all MIC and phosgene. Bayer stated it would continue to produce Larvin at the plant by the conversion of methomyl purchased from commercial sources; however, this process does not require MIC or phosgene to operate.

⁵² On May 15, 2009, the Environmental Protection Agency revoked all food tolerances for carbofuran and effectively prohibited the use of the pesticide. The EPA stated that "dietary, worker, and ecological risks are unacceptable for all uses of carbofuran." See http://www.epa.gov/opp00001/reregistration/carbofuran/carbofuran_noic.htm, January 9, 2011.

5.0 Regulatory Analysis

5.1 Occupational Safety and Health Administration

5.1.1 Process Safety Management Program

The PSM standard requires employers to prevent or minimize the consequences of catastrophic releases of highly hazardous chemicals. PSM applies to processes that involve any of 137 listed toxic chemicals at, or above, threshold quantities and processes with flammable liquids or gases onsite in one location in quantities of 10,000 pounds or more. The Methomyl-Larvin unit was covered by the PSM standard because it contained listed toxic chemicals including methyl isocyanate (threshold quantity [TQ] = 250 pounds); methyl mercaptan (TQ = 5,000 pounds); and various flammable liquids including hexane and methyl isobutyl ketone, each in quantities significantly above the 10,000 pound flammable liquid/gas TQ. Chlorine (TQ = 1,500 pounds) is also used in the methomyl unit.

The PSM standard requires the owner to perform an initial PHA [1910.119(e)], and to revalidate the PHA at least every five years thereafter. Furthermore, the standard requires the employer to

[A]ssure that recommendations are resolved in a timely manner and that the resolution is documented; document what actions are to be taken; complete actions as soon as possible; develop a written schedule of when these actions are to be completed.

5.1.2 PSM Inspections at the Bayer Facility

OSHA conducted a planned inspection of the Bayer Institute facility in 2005. The inspection identified deficiencies in PSM program elements including conduct of PHAs and compliance audits. After the August 2008 incident, OSHA conducted a compliance audit that focused on the Methomyl-Larvin unit.

In addition to the PHA deficiencies discussed in Section 3.3, both the CSB and OSHA investigations found that many PHA recommendations had not been resolved, including operating procedure

deficiencies and deficient hazard analyses. Delays in addressing these issues persisted even after the methomyl system PHA conducted in 2005 identified the problem.⁵³ The Bayer PSM-facilitated self-assessment, dated Oct 30-Nov 9, 2007, again identified that many action items, called “risk sheets,” from the 2005 PHA remained incomplete and unassigned. An internal Bayer memo dated August 7, 2008, three weeks before the incident, noted 48 open risk sheets.

The CSB investigation team also identified other significant PSM program deficiencies associated with Operating Procedures [1910.119(f)]; Training [1910.119(g)]; and Pre-startup Review [1910.119(i)], which are discussed in Section 3.0. The OSHA inspection conducted after the incident identified 12 items that violated the PSM program requirements, two of which OSHA classified as “repeat” violations.

5.1.3 PSM Program Deficiency Findings in Other CSB Investigations

The PSM program deficiencies identified in the Bayer incident investigation parallel findings in many other CSB investigations (Table 3). Notably, the BP Texas City refinery investigation identified PSM deficiencies in MOC, PHA, PSSR, and operating procedures practices.

At the BP Texas City refinery CSB investigators found that, “deviations from the procedure were made without performing MOC hazard analyses.” The same situation occurred during the methomyl unit startup at Bayer. The CSB identified organizational change control deficiencies existed at both BP and Bayer. In the case of the BP incident, the company did not apply the PSM MOC process to evaluate the organization changes in the Isom unit operation. Although Bayer applied the MOC process to the organization redesign implemented in 2007, the MOC failed to adequately address the impact the changes had on technical support during special operating situations, such as the methomyl unit startup with a completely new control system.

⁵³ The recommendations and corrective action listed in the 2005 PHA report to Bayer management contain the finding that “some areas of concern were identified...Many of the risk sheets identified in previous PHAs have not been mitigated.”

Table 3. Common PSM program deficiencies identified in CSB investigations

| | PHA | MOC | PSSR | Standard Operating Procedures |
|------------------|-----|-----|------|-------------------------------|
| Bayer (2008) | X | X | X | X |
| BP (2005) | X | X | X | X |
| Formosa (2004) | X | X | | X |
| DPC (2002) | X | | | X |
| Honeywell (2003) | X | X | | |
| INDSPEC (2008) | X | | | X |
| Motiva (2001) | X | X | X | |
| Sierra (1998) | X | X | | X |
| Tosco (1999) | | X | | |
| Valero (2007) | X | X | | |

The CSB determined that PHAs and PSSRs performed at both BP Texas City and Bayer were not sufficient. In both cases, the PHAs failed to address operating conditions involving bypassed or inoperative safety devices. At BP Texas City, the CSB determined that, “none of the PSSR procedural steps were undertaken for the ISOM startup.” This is echoed in the Bayer case, as personnel improperly identified the PSSR as complete, and thus they proceeded with the methomyl unit startup even though equipment was not properly installed or calibrated.

At Bayer, longstanding operating procedure deficiencies played a significant role in the accident. As was the case in the BP incident, the CSB found that, “management did not effectively review the available computer records of [SOP] deviations and intervene to prevent future deviations.” The staff should have corrected the operational problems before they proceeded with the unit restart.

Furthermore, management did not enforce procedural compliance or proper application of MOC to ensure SOP errors were corrected. In all six CSB investigations that identified SOP problems, each

incident involved SOP deviations that became “necessary violations” to get the job done (Hopkins, 2000).

5.1.4 OSHA PSM Chemical National Emphasis Program

Since the Process Safety Management of Highly Hazardous Chemicals standard was promulgated in 1992, OSHA has found that even employers with extensive written PSM programs may not effectively implement the programs on their covered processes. On July 27, 2009, OSHA issued a directive to implement a pilot national emphasis program (NEP) for chemical facilities covered by the PSM standard. The NEP directs certain OSHA regional offices to verify that the activities actually performed by employers are consistent with the employer’s written program and with the requirements of the standard. This NEP requires auditors to use investigative questions focused on a limited number of specific PSM program activities, rather than the traditional PSM program inspections that involved comprehensive, but broad, open-ended, and resource-intensive compliance evaluations. The NEP is intended to “allow for a greater number of inspections by better allocation of OSHA resources” [OSHA Directive 09-06 (CPL 02)]. It applies to planned inspections in the pilot regions, and unplanned inspections OSHA-wide. On July 8, 2010, OSHA superseded Directive 09-06 with Directive 10-05. The revision extended the NEP through September 2010 and encouraged State Plan adoption of the program. In October 2010, OSHA extended the directive in Regions 1, 7, and 10. OSHA continues evaluating the results of the pilot chemical industry NEP, and plans to make appropriate modifications to improve its effectiveness, and extend the NEP to all ten regional offices.

5.1.5 OSHA PSM Citations Follow-up Deficiencies

OSHA has issued many citations to companies for failure to comply with the PSM standard. Generally, the companies are required to submit written certifications to OSHA that assert the corrective actions have been implemented, as Bayer submitted in response to the citations that resulted from the 2005 planned inspection. Furthermore, OSHA can levy significant penalties when

they determine that a company has a repeat violation, or has failed to abate workplace hazards cited in a previous inspection.

The CSB found, as did OSHA, that contrary to the certifications made by Bayer, some corrective actions were not implemented adequately. The CSB further found that OSHA does not always conduct follow-up field inspections to verify that companies have, in fact fully implemented agreed-upon corrective actions. OSHA field inspections that occur through planned inspections, complaints, referrals, or accident investigations do not necessarily examine the adequacy of corrective actions from previous inspections that a company has certified to be complete. Follow-up inspections specifically intended to confirm corrective action status are utilized only occasionally.

5.2 Environmental Protection Agency Risk Management Program

The EPA Risk Management Program (RMP) regulation (40 CFR 68), mandated by Section 112(r) of the Clean Air Act Amendments of 1990, regulates the use of highly hazardous chemicals at facilities (stationary sources). The purpose of the RMP is to prevent accidental offsite releases of these substances and ensure that the company and community are able to respond effectively in case of a release. The regulation applies to facilities that use or store regulated substances that exceed threshold quantities specified in the EPA regulations.

5.2.1 Application of the Bayer CropScience Risk Management Program

The Methomyl-Larvin unit and other units in the facility are subject to the RMP rule. The unit contained two listed toxic chemicals, methyl isocyanate (TQ = 10,000 pounds) and methyl mercaptan (TQ = 5,000 pounds). Bayer also reports six additional RMP regulated chemicals are used at the facility (Table 4).

Table 4. RMP covered chemicals in Bayer process units

| Chemical | Threshold Quantity (pounds) |
|------------------|-----------------------------|
| ammonia | 10,000 |
| chlorine | 2,500 |
| trichloromethane | 20,000 |
| methylamine | 10,000 |
| methyl mercaptan | 5,000 |
| phosgene | 500 |
| trimethylamine | 10,000 |

The EPA requires the facility owner to assign to each covered process one of three “prevention program” levels based on offsite consequence analyses, incident history, and PSM program applicability. Program 1 is the lowest, simplest management program. Program 2 is an intermediate management level program with added program elements and basic documentation requirements. PSM-covered processes cannot be designated Program 2. Program 3 is the highest level management program. All PSM program activities and records are directly applicable to the Program 3 regulatory activities. Most PSM-covered processes fall into Program 3, as do the Bayer Institute facility processes that involve the seven RMP listed chemicals.

Each covered process must undergo a hazard assessment (40 CFR 68, Subpart B) in which the owner is required to prepare a “worst case release scenario” and an “alternative release scenario” for each covered process. Different analysis criteria apply based on whether the covered chemical is a toxic or

flammable material. The hazard assessment also requires inclusion of the "five year accident history." The results of the hazard assessment, along with other pertinent information for each covered process, must be submitted to the EPA. This Risk Management Plan (40 CFR 68, Subpart G) is prepared and submitted electronically and must be periodically updated by the facility owner.

The most recent Bayer CropScience Institute facility Risk Management Plan submittal preceding the August 2008 incident was dated July 2007. It states:

The phosgene and MIC units [sic] on-site inventories have been minimized as far as practicable in order to minimize the potential impact in the event of a release. In 1992 and 1993, the phosgene process was rebuilt and the MIC process was modified to achieve these improvements following a thorough study of potential release scenarios.

The Risk Management Plan also discusses air emissions controls: "All of the processes covered by RMP utilize scrubbers and flares to destroy emissions from the process to minimize releases to the atmosphere."

The five-year accident history for the RMP-regulated chemicals reports an accident that released approximately 15 pounds of phosgene (October 1999), another that released less than 1 pound of chlorine (May 2000), and a third that released approximately 3,000 pounds of liquid chloroform (August 2001). Each resulted in one or more worker exposures, and the phosgene release prompted a shelter-in place-alert. However, the company reports none of the releases involved offsite consequences.

5.2.2 EPA Inspections at the Bayer Institute Facility

The CSB searched the EPA Enforcement and Compliance History Online database for a record of EPA program audits or inspections at the Bayer facility. The database identified three evaluations of the Clean Air Act, Section 112(r), the first in 2005 and the second in 2006, which involved the MIC

production unit. A third evaluation occurred in 2007.⁵⁴ None of the evaluations resulted in any enforcement action by the EPA.

5.2.3 EPA Office of Inspector General Risk Management Program Review

In 2008, the Office of Inspector General (OIG) of the U.S. Environmental Protection Agency conducted a review of the EPA implementation and oversight of the Risk Management Program (40 CFR 68). The OIG issued the final report, *EPA Can Improve Implementation of the Risk Management Program for Airborne Chemical Releases*, Report No. 09-P-0092 on February 10, 2009. The OIG review found that EPA had not inspected or audited more than half (296 of 493) of the high-risk facilities. EPA Region 3, which includes West Virginia, had the highest RMP inspection rate of high-risk facilities (96 percent).

The report contained two significant recommendations to the EPA:

- Strengthen its inspection process to provide greater assurance that facilities comply with Risk Management Program requirements, and
- Develop inspection requirements to target higher-priority facilities for inspection and track its progress in completing inspections of these facilities.

The CSB also found during other incident investigations involving RMP covered processes that the EPA has seldom performed comprehensive audits or inspections of RMP programs at the facilities where the incident occurred.

In a May 2009 memorandum to the Office of Inspector General, EPA Office of Enforcement and Compliance Assurance agreed with the OIG recommendations. It revised the definition of a high-risk facility and reported that it would “work with the regions to develop an approach for targeting high risk facilities to make the best use of our limited inspection resources.” EPA also revised the fiscal

⁵⁴ The EPA Enforcement and Compliance History Online database lists Bayer as the owner for the 2006 evaluation and Union Carbide Corporation as the owner for the 2005 and 2007 evaluation.

year 2010 National Program Managers Guidance to require the regions to "require at least 10 percent of the total number of 112(r) inspections at defined high risk facilities." Finally, EPA agreed to improve compliance inspection tracking of high-risk facilities.

5.3 State and Local Government Programs

5.3.1 Contra Costa County California Hazardous Materials Safety Ordinance

In 1999, the Contra Costa County, California Board of Supervisors approved an industrial safety ordinance⁵⁵ that established broad authority to the county health services department to oversee stationary sources in the refining and chemical industries in unincorporated areas in the county. The ordinance contains the following key elements:

- The owner shall prepare a Facility Safety Plan and submit it to the department. The Plan shall include:
 - Human factors and safety culture assessments
 - Consideration of inherently safer technologies in the PHA.
- The county health services department shall:
 - Conduct tri-annual audits of all submitted Safety Plans,
 - Hold public meetings on the facility safety plan,
 - Collect and maintain certain documents in a public information bank, and
 - Conduct an annual program performance review and issue a written report.
- The facility owner shall:
 - Allow the department to investigate an accident site and directly related facilities and submit an annual report of all accidents,
 - Document the decision made to implement or not implement all process hazard analysis recommended action items and the results of recommendations for additional studies, and
 - Periodically conduct a safety culture assessment.

⁵⁵ Contra Costa County, California, Ordinance Code Title 4 – Health and Safety, Division 450 – Hazardous Materials and Wastes, Chapter 450-8 – Risk Management.

The State also authorized the county to collect fees from each covered facility to fund the program. The department maintains a full-time staff of technical specialists who administer the program, perform the required audits, and conduct incident investigations. The City of Richmond adopted a similar ordinance in 2002 that mirrors the Contra Costa County ordinance.

The ordinance requires the Health Services department to conduct annual program reviews to evaluate the effectiveness of the program, discuss the results of audits completed by the department, and present various program metrics. The November 2009 annual audit⁵⁶ concluded:

The number and severity of the Major Chemical Accidents or Releases have been decreasing since the implementation of Industrial Safety Ordinance. The implementation of the Industrial Safety Ordinance has improved and, in most cases, is being done as required by the ordinance. It is believed that by continuing implementation of the Industrial Safety Ordinance and strengthening the requirements of the Ordinance that the possibility of accidents that could impact the community has decreased.

The ordinance applies to three refineries and four chemical facilities in the county as reported in the audit. The audit report also includes the results of the City of Richmond ordinance, which includes one refinery and one chemical facility. The total fees assessed to the covered facilities in 2008 were less than \$440,000. For the same period, the county reported that 4400 hours were charged in support of the ordinance. The report notes a significant decrease in the number of "major chemical accidents and releases" at covered facilities, from 11 incidents in 2001 to zero incidents in 2009.

As the CSB previously noted in its BP Texas City refinery investigation, the Contra Costa program has the benefit that covered facilities are regularly inspected for process

⁵⁶ http://cchealth.org/groups/hazmat/industrial_safety_ordinance.php, October 2010.

safety compliance every three years by a team of trained engineers employed by the county and funded through fee collection. By contrast, as the CSB and others noted, comprehensive OSHA and EPA safety inspections of high-hazard chemical facilities have historically been infrequent. OSHA and EPA process safety inspections do not occur on a regular schedule and often result only from a serious accident or complaint.⁵⁷

5.3.2 New Jersey Toxic Catastrophe Prevention Act

The New Jersey state legislature enacted the Toxic Catastrophe Prevention Act (TCPA) in 1985 in response to the release of MIC in 1984 from the Union Carbide India Limited plant in Bhopal. The TCPA was one of the first regulatory programs in the nation to impose more stringent requirements on chemical facilities to reduce the risk of accidental releases. The TCPA is part of the New Jersey Department of Environmental Protection (DEP) Bureau of Release Prevention and has been accepted by the U.S. EPA for implementing the Risk Management Program regulation (40 CFR 68).

The TCPA is intended to protect the public from catastrophes caused by the release of Extraordinary Hazardous Substances (EHS)⁵⁸ and Reactive Hazard Substances (RHS).⁵⁹ Facilities covered under

⁵⁷ In 2007, the CSB recommended in its BP Texas City investigation that OSHA “strengthen the planned comprehensive enforcement of the OSHA Process Safety Management (PSM) standard” and “establish the capacity to conduct more comprehensive PSM inspections by hiring or developing a sufficient cadre of highly trained and experienced inspectors.”

⁵⁸ An EHS is any substance or chemical compound used, manufactured, stored, or capable of being produced from on-site components in this State in sufficient quantities at a single site such that its release into the environment would produce a significant likelihood that persons exposed will suffer acute health effects resulting in death or permanent disability.

⁵⁹ An RHS is an EHS that is a substance, or combination of substances, which is capable of producing toxic or flammable EHSs or undergoing unintentional chemical transformations producing energy and causing an extraordinarily hazardous accident risk.

the act must submit a Risk Management Plan for all covered processes. Additionally, the DEP may require owners or operators to do the following under the TCPA:

- Immediately submit a risk management program for the DEP to review,
- Perform a safety review, hazard analysis, or risk assessment,
- Immediately take risk reduction actions or implement a risk reduction plan, and
- Cease operating until the identified risks have been abated.

The TCPA incorporates the EPA RMP list of toxic chemicals and threshold quantities; however, the TCPA EHS list contains several chemicals with lower thresholds than the RMP. The TCPA list also contains some chemicals for which the RMP does not apply. Facilities in New Jersey that process listed EHSs or RHSs in excess of the threshold quantities must submit a TCPA-specific Risk Management Plan to the DEP. The facility must also submit an EPA-specific Risk Management Plan as required by 40 CFR 68 Subpart G if the chemical is listed in the EPA RMP and the quantity exceeds the EPA threshold quantity.

Facilities with substances or mixtures containing substances on the RHS list must conduct a hazard assessment under the TCPA. The RHS list contains 30 specific reactive chemicals and 43 functional groups that exhibit reactive hazards such as water reactivity and pyrophoric or self-reacting properties. Operators must determine applicability of substances and mixtures to the RHS requirements by conducting calorimetry tests, literature reviews, or engineering calculations to determine the heat of reaction. The RHS threshold quantity ranges from 13,100 pounds for the lowest heat of reaction value (100 calories per gram) to 2400 pounds for a heat of reaction at, or above 1000 calories per gram.

In June 2008, the state amended the act to require facilities to conduct inherently safer technology (IST) reviews, to provide improved risk reduction. A team of qualified experts are required to conduct the IST reviews, as well as operations and union representatives. Each covered facility must

determine whether IST is feasible and take into account environmental, health and safety, legal, technological, and economic factors into the analysis. The IST review must be submitted to the TCPA and updated on a 5-year basis, or with major process modifications.

As of March 2010, the TCPA has eliminated the less rigorous RMP Program 1 and Program 2 criteria [40 CFR 68.10(b) and (c)]; it now requires all covered processes to be classified and managed in accordance with Program 3. It is the most rigorous toxic chemical environmental regulatory program in the United States.

5.3.3 Hazardous Materials Regulatory Oversight in West Virginia

Like Contra Costa County, the Kanawha valley has many facilities that handle large quantities of hazardous materials, some of which are acutely toxic. The EPA RMP database contains 15 facilities that report EPA Risk Management Program covered chemicals assigned as Program level 3 in Kanawha County. Statewide, the RMP database contains 54 facilities with Program level 3 plans. The region contains environmentally sensitive areas such as the Kanawha River, which is also an important transportation corridor. In addition to the serious incident at Bayer's Institute plant in 2008, the CSB is currently investigating a series of incidents that occurred in 2010 at the DuPont chemical plant in nearby Belle, West Virginia, including a fatal release of phosgene gas on January 23. Although the CSB's final report on the DuPont incidents remains to be completed, the incidents at DuPont also reveal process safety deficiencies that were not detected or corrected through existing regulatory enforcement mechanisms. In the Kanawha valley where both Bayer and DuPont are located, neither the state nor the local government has a program or regulation in place that requires or authorizes direct participation with facility safety planning and oversight even though many community stakeholders have long campaigned for such involvement.

The West Virginia Code Chapter 16, Public Health, charges the state public health agency with providing "Essential public health services" i.e., activities necessary to promote health and prevent disease, injury and disability for the citizens of the state." The code authorizes the commissioner of

the bureau for public health "To make inspections, conduct hearings, and to enforce the legislative rules concerning occupational and industrial health hazards." The Secretary of the state department of health and human resources may also propose "Fees for services provided by the Bureau for Public Health."

If the West Virginia Department of Health and Human Services were to implement a program similar to the California safety ordinance, it would likely improve stakeholder participation and awareness, and improve emergency planning and accident prevention.

6.0 Key Findings

6.1 Process Hazard Analysis

1. The PHA team did not validate the assumptions in the PHA including accuracy of the SOP, conformance to the SOP, and control of process safeguards.
2. The residue treater layers of protection to prevent a runaway reaction were inadequate.
3. Previous PHA action items were not closed in a timely manner, including operator training and control of process safeguards.
4. The methomyl unit SOP was overly complex and not reviewed and approved prior to the methomyl unit startup.
5. The SOP did not include flasher tails methomyl concentration testing as required by the original construction process safety information package.

6.2 Pre-Startup Safety Review

1. The PSSR did not include a formal process involving multiple disciplines.
2. The PSSR did not verify the completion of modifications in the field, including:
 - a. Methomyl-Larvin unit toxic gas monitoring system was not in service.
 - b. Project engineers did not verify the functionality of critical DCS control and indication circuits.
 - c. Operating equipment and instruments were not installed before the restart, some of which were discovered to be missing after the startup began.
3. Equipment checkouts as required by the pre-startup safety review were incomplete:
 - a. Methomyl-Larvin unit toxic gas monitoring system was not in service.
 - b. Project engineers did not verify the functionality of critical DCS control and indication circuits.
 - c. Valve lineups were incomplete or incorrect.
4. Control system training was inadequate. The operators were not formally trained on the methomyl DCS and were not familiar with some of the changed units of measure used on the DCS displays.

6.3 Methomyl Unit Startup

1. Methomyl unit board operators were not provided with computer screen displays to effectively operate all assigned process and utility systems.
2. Multiple operational problems diverted the staff's attention:
 - a. Only one of the two centrifuges was operating properly.
 - b. The new Siemens operating system was not calibrated; consequently, the staff struggled with balancing the MIBK- hexane ratio in the crystallizers.
 - c. Operators were pressured to start the MIBK solvent recovery system because the MIBK stockpile levels were getting low.
3. Operations personnel incorrectly assumed that methomyl was not being produced in the reactor even though the flasher feed sample lab results were available, which reported excessively high methomyl content in the process downstream from the reactor.
4. Operators and technical staff did not troubleshoot why the centrifuges did not contain methomyl cake.
5. Several required SOP steps were not completed during the methomyl unit startup:
 - a. The residue treater was not pre-filled with solvent.
 - b. The solvent was not circulated and heated to the minimum operating temperature.
 - c. The 7 a.m. daily residue treater liquid sample was not collected and analyzed for methomyl concentration.
6. Management did not strictly enforce the safety matrix control policies. Bypassing the safety interlocks on the residue treater flasher bottoms feed valve allowed the empty residue treater to be filled with concentrated methomyl.
7. Oxime system startup problems diverted operators' attention, resulting in poor communication between methomyl board operators at shift change.

8. The residue treater relief system design basis was invalidated during the methomyl unit startup:
 - a. The design basis assumed that the safety interlocks were active, but the interlocks were bypassed.
 - b. The residue treater relief system design basis relied on administrative controls such as sample collection and analysis to prevent overcharging methomyl, but these controls were either incomplete or not implemented before startup.
9. A runaway methomyl decomposition reaction inside the residue treater overwhelmed the vent system and caused the vessel to violently explode.

6.4 MIC Day Tank Shield Structure Design

1. The blast blanket design basis did not consider an impact of a large object moving at high velocity. Had the residue treater traveled in the direction of the day tank and struck the shield structure near the top of the frame it might have resulted in an MIC release into the atmosphere (see Appendix C)

6.5 Emergency Planning, Response, and Communication

6.5.1 Bayer CropScience

1. The Bayer onsite emergency response did not conform to the unified command structure contained in the National Incident Management System (NIMS) protocols.
2. Bayer did not assign a Public Information Officer (PIO) to directly communicate with the Kanawha Putnam EOC and Metro 9-1-1.
3. Unknown to Bayer emergency personnel, the Methomyl-Larvin unit air monitor system that they relied on to determine and report airborne concentrations of possible toxic chemicals was not in service the night of the incident.
4. Bayer had only two distant fence-line air monitors to determine the extent of chemical contaminants traveling off site.
5. Although the Bayer IC recommended a shelter-in-place, the Bayer EOC did not notify Metro 9-1-1.
6. Bayer discontinued hot zone decontamination activities before all emergency responders were able to clean their safety gear.

6.5.2 Outside Responding Agencies

1. The overloaded telephone system prevented Bayer from promptly notifying the Metro 9-1-1 center of the incident.
2. County emergency responders established three separate EOCs in response to the incident, which resulted in duplication of effort, poor communication, and conflicting control.
3. First-responders working near the explosion and fire did not wear adequate respiratory protection and were not decontaminated.

6.5.3 Kanawha County Commission

1. The Kanawha Putnam Emergency Management Plan does not adequately address emergency response personnel responsibilities and communications between the facility IC and outside emergency response organizations when a facility owner is responsible for incident command during an on-site emergency involving hazardous chemicals.

6.6 Environmental Impact

1. MIC air monitoring devices in the Methomyl-Larvin unit were not functioning at the time of the incident, preventing the accurate measurement of any MIC release from piping or equipment that might have resulted from the explosion and fires.
2. Two fenceline monitors located hundreds of feet from the incident location were ineffective for detecting toxic chemicals that might be released into the atmosphere either from process equipment leaks or spills, or combustion products from a major fire.

6.7 Regulatory Oversight

1. Both the Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA) had conducted process safety related audits and inspections at the Bayer facility prior to the incident in August 2008. However, the inspections did not detect or correct all the serious, longstanding process safety problems that were revealed by investigations conducted after the incident.
2. OSHA cited Bayer for deficient process hazard analyses in 2005; however OSHA did not subsequently verify that corrective actions were fully implemented by Bayer. Deficient PHAs were a causal factor in the August 2008 incident.

7.0 Incident Causes

1. Bayer did not apply standard PSSR and turnover practices to the methomyl control system redesign project. Bayer restarted the unit before the equipment was properly tested and calibrated.
2. Operations personnel were inadequately trained to operate the methomyl unit with the new DCS control system.
3. Malfunctioning equipment and the inadequate DCS checkout prevented the operators from achieving correct operating conditions in the crystallizers and solvent recovery equipment.
4. The methomyl-solvent mixture was fed to the residue treater before the residue treater was pre-filled with solvent and heated to the minimum safe operating temperature.
5. The incoming process stream normally generated an exothermic decomposition reaction, but methomyl that had not crystallized due to equipment problems greatly increased the methomyl concentration in the residue treater, which led to a runaway reaction that overwhelmed the relief system and over-pressurized the residue treater.

8.0 Recommendations

The CSB makes recommendations based on the findings and conclusions of its investigations.

Recommendations are made to parties that can effect change to prevent future incidents, which may include the companies involved; industry organizations responsible for developing good practice guidelines; regulatory bodies; and/or organizations that have the ability to broadly communicate lessons learned from the incident, such as trade associations and labor unions.

8.1 Bayer CropScience – Research Triangle Park, NC

2008-08-I-WV-R1 Revise the corporate PHA policies and procedures to require:

- a. Validation of all PHA assumptions to ensure that risk analysis of each PHA scenario specifically examines the risk(s) of intentional bypassing or other nullifications of safeguards,
- b. Addressing all phases of operation and special topics including those cited in chapter 9 of “Guidelines for Hazard Evaluation Procedures” (CCPS, 2008), and
- c. Training all PHA facilitators on the revised policies and procedures prior to assigning the facilitator to a PHA team.

Ensure all PHAs are updated to conform to the revised procedures.

8.2 Bayer CropScience - Institute, West Virginia

2008-08-I-WV-R2 Review and revise, as necessary, all Bayer production unit standard operating procedures to ensure they address all operating modes (startup, normal operation, temporary operations, emergency shutdown, emergency operations, normal shutdown, and startup following a turnaround or emergency shutdown), are accurate, and approved.

- 2008-08-I-WV-R3 Ensure that all facility fire brigade members are trained in the National Incident Management System, consistent with municipal and state emergency response agencies.
- 2008-08-I-WV-R4 Evaluate the fence-line air monitor program against federal, state, and local regulations, and Bayer corporate policies, and upgrade and install air monitoring devices as necessary to ensure effective monitoring of potential releases of high-hazard chemicals at the perimeter of the facility.
- 2008-08-I-WV-R5 Commission an independent human factors and ergonomics study of all Institute site PSM/RMP covered process control rooms to evaluate the human-control system interface, operator fatigue, and control system familiarity and training. Develop and implement a plan to resolve all recommendations identified in the study that includes assigned responsibilities, required corrective actions, and completion dates.

8.3 Director of the Kanawha-Charleston Health Department

2008-08-I-WV-R6 Establish a Hazardous Chemical Release Prevention Program to enhance the prevention of accidental releases of highly hazardous chemicals, and optimize responses in the event of their occurrence. In establishing the program, study and evaluate the possible applicability of the experience of similar programs in the country, such as those summarized in Section 5.3 of this report. As a minimum:

- a. Ensure that the new program:
 1. Implements an effective system of independent oversight and other services to enhance the prevention of accidental releases of highly hazardous chemicals
 2. Facilitates the collaboration of multiple stakeholders in achieving common goals of chemical safety; and,
 3. Increases the confidence of the community, the workforce, and the local authorities in the ability of the facility owners to prevent and respond to accidental releases of highly hazardous chemicals
- b. Define the characteristics of chemical facilities that would be covered by the new Program, such as the hazards and potential risks of their chemicals and processes, their quantities, and similar relevant factors;

- c. Ensure that covered facilities develop, implement, and submit for review and approval:
 - 1. Applicable hazard and process information and evaluations.
 - 2. Written safety plans with appropriate descriptions of hazard controls, safety culture and human factors programs with employee participation, and consideration of the adoption of inherently safer systems to reduce risks
 - 3. Emergency response plans; and,
 - 4. Performance indicators addressing the prevention of chemical incidents.
- d. Ensure that the program has the right to evaluate the documents submitted by the covered facilities, and to require modifications, as necessary
- e. Ensure that the program has right-of-entry to covered facilities, and access to requisite information to conduct periodic audits of safety systems and investigations of chemical releases;
- f. Establish a system of fees assessed on covered facilities sufficient to cover the oversight and related services to be provided to the facilities including necessary technical and administrative personnel; and,
- g. Consistent with applicable law, ensure that the program provides reasonable public participation with the program staff in review of facility programs and access to:
 - 1. The materials submitted by covered facilities (e.g., hazard evaluations, safety plans, emergency response plans);
 - 2. The reviews conducted by program staff and the modifications triggered by those reviews;

3. Records of audits and incident investigations conducted by the program;
 4. Performance indicator reports and data submitted by the facilities, and;
 5. Other relevant information concerning the hazards and the control methods overseen by the program.
- h. Ensure that the program will require a periodic review of the designated agency activities and issue a periodic public report of its activities and recommended action items.

8.4 Secretary of West Virginia Department of Health and Human Services and the West Virginia Department of Environmental Protection

2008-08-I-WV-R7 Work with the Director of the Kanawha-Charleston Health Department to ensure the successful planning, fee collection, and implementation of the Hazardous Chemical Release Prevention Program as described in Recommendation 2008-08-WV-R6, above, including the provision of services to all eligible facilities in the State.

8.5 Kanawha-Putnam Emergency Planning Committee

2008-08-I-WV-R8 Work with the Kanawha and Putnam counties Emergency Response Directors to prepare and issue a revision to the Kanawha Putnam County Emergency Response Plan and Annexes to address facility emergency response and Incident Command when such functions are provided by the facility owner.

8.6 West Virginia State Fire Commission

2008-08-I-WV-R9 Revise the Fire Department Evaluation Administrative Section Matrix addressing the periodic inspection of local fire departments to include a requirement for inspectors to examine and identify the status of National Incident Management System fire department personnel training.

8.7 Occupational Safety and Health Administration

2008-08-I-WV-R10 In light of the findings of this report and the serious potential hazards to workers and the public from chemicals used and stored at the Bayer Institute site (such as phosgene, MIC, and methomyl), conduct a comprehensive Process Safety Management (PSM) inspection of the complex. Coordinate with the Environmental Protection Agency, as appropriate.

2008-08-I-WV-R11 Revise the Chemical National Emphasis Program and the targeting criteria to:

- a. Expand the coverage to all 10 OSHA regions,
- b. Include in the targeting criteria from which potential inspections are selected all establishments that have submitted certifications of completions of actions in response to previous PSM citations;
- c. Require NEP inspections to examine the status of compliance of all previously cited PSM program items for which the company has submitted certifications of completion to OSHA.

8.8 Environmental Protection Agency

2008-08-I-WV-R12 In light of the findings of this report and the serious potential hazards to workers and the public from chemicals used and stored at the Bayer Institute site (such as phosgene, MIC, and methomyl), conduct a comprehensive Risk Management Program (RMP) inspection of the complex. Coordinate with the Occupational Safety and Health Administration, as appropriate.

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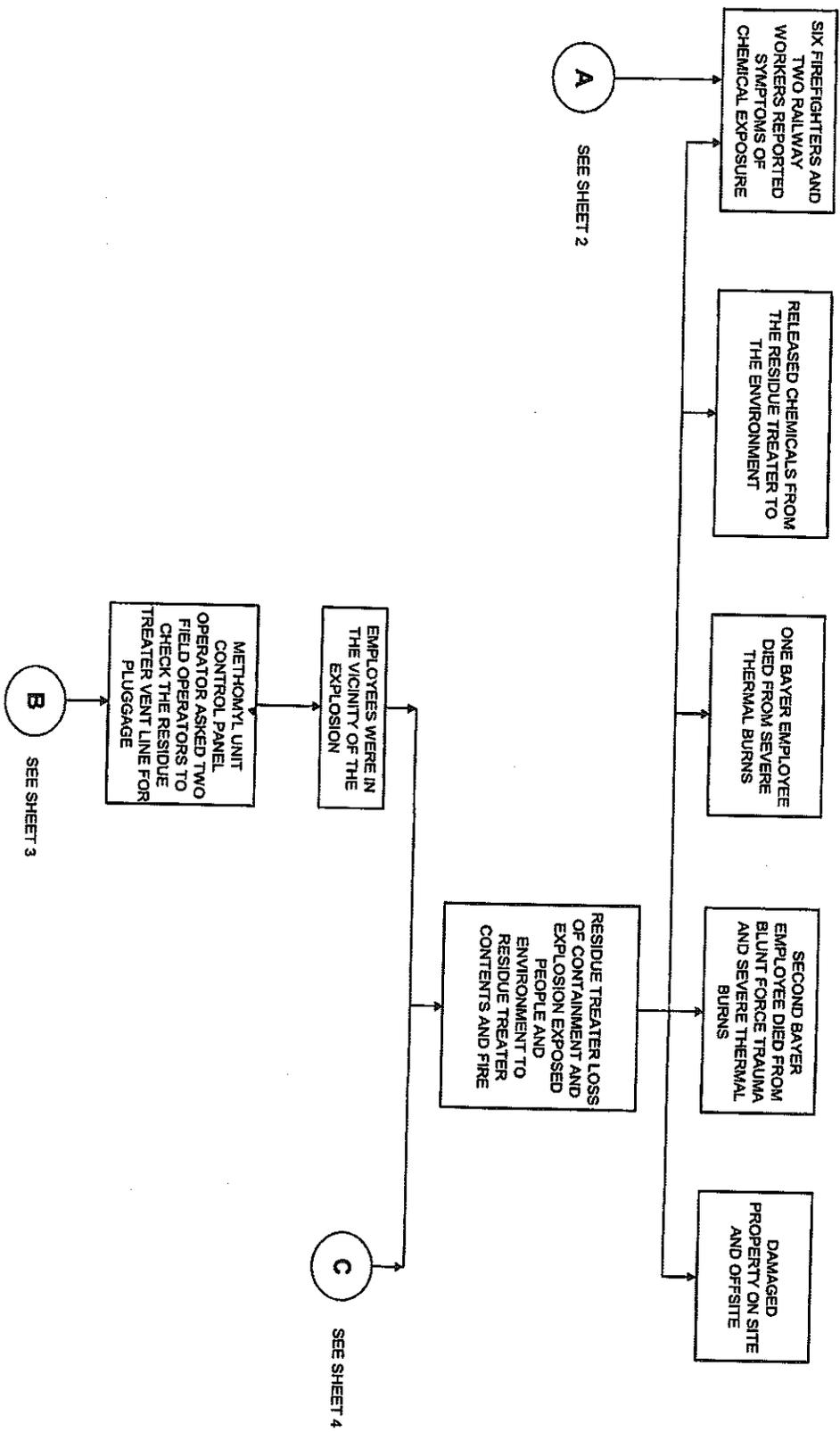
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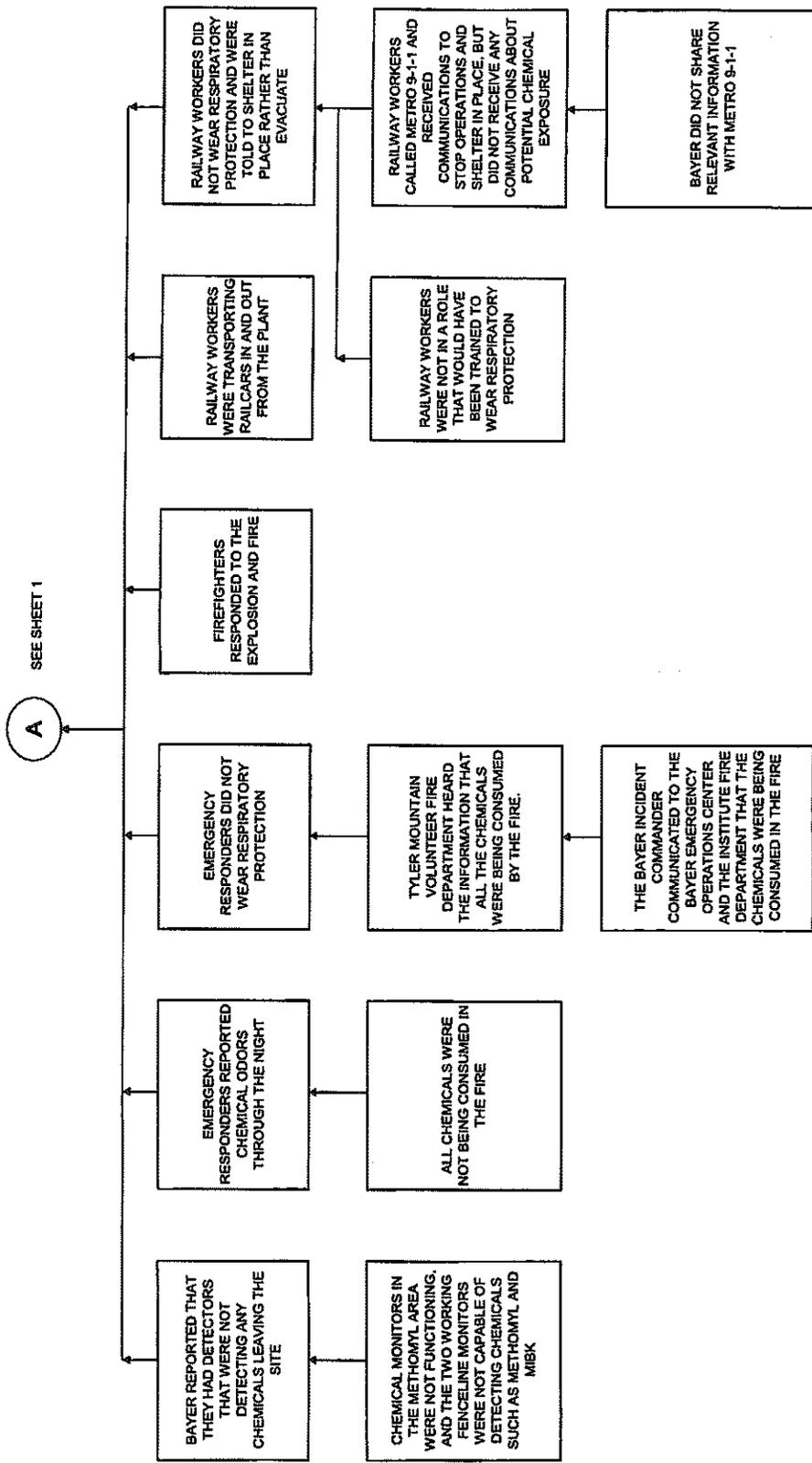
Appendix A – Causal Analysis Charts

Appendix A is a "Why Tree" diagram showing the events that led to the incident and its consequences. Each box in the Why Tree is from information discovered in the investigation, and is a statement of something that happened in the chain of events. To construct a Why Tree, the investigation team starts with a concise description of the on-site and off-site human health, environmental, and business impacts, and asks why each impact occurred. The team continues asking why each preceding event occurred until they determine that they have reached a root cause. The arrows show the direction of flow from the root causes to the final impacts. When the evidence shows that a particular hypothetical event did not happen, the box in the Why Tree has a diagonal line crossed through it and a statement next to the box describing the evidence that the event did not happen.

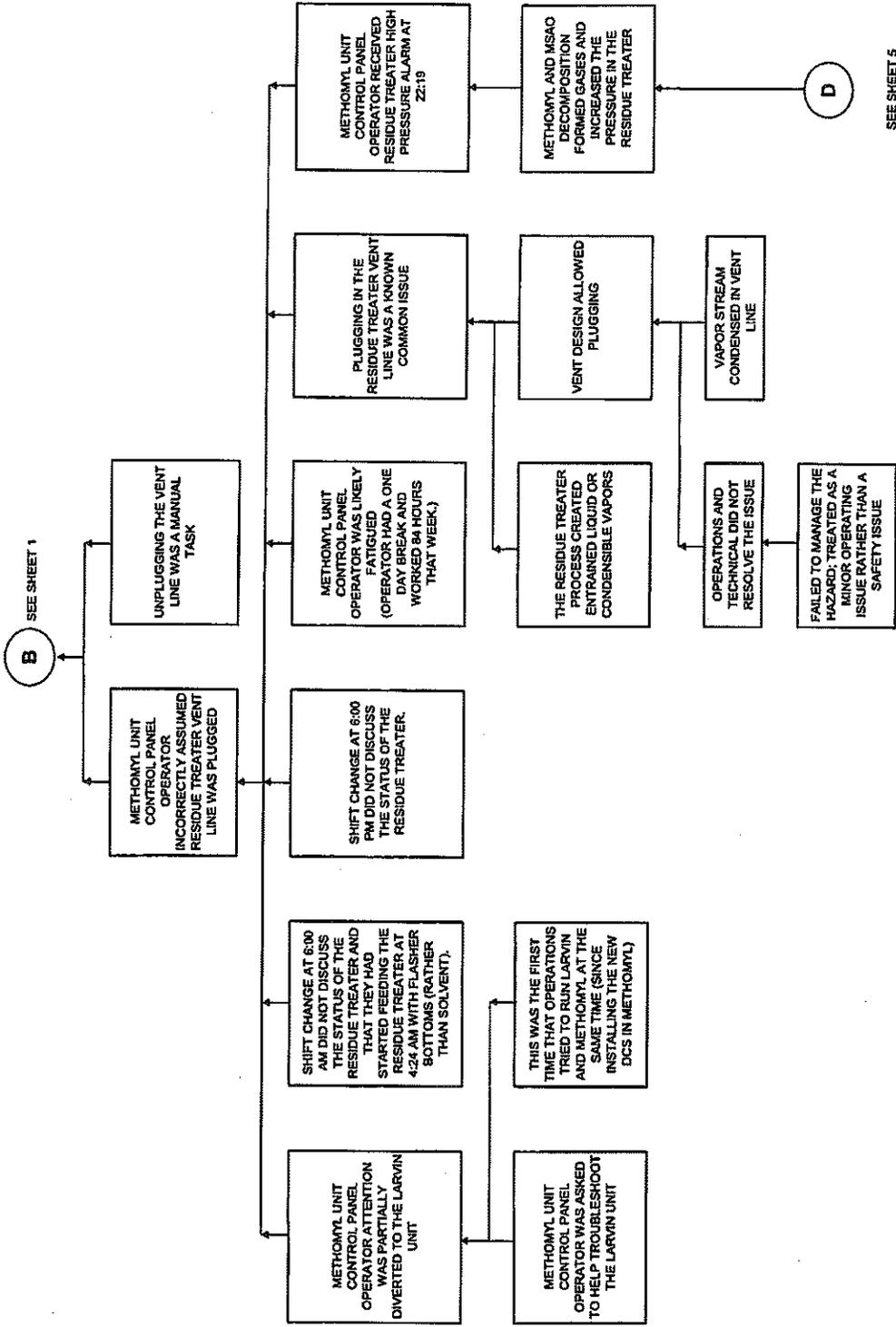
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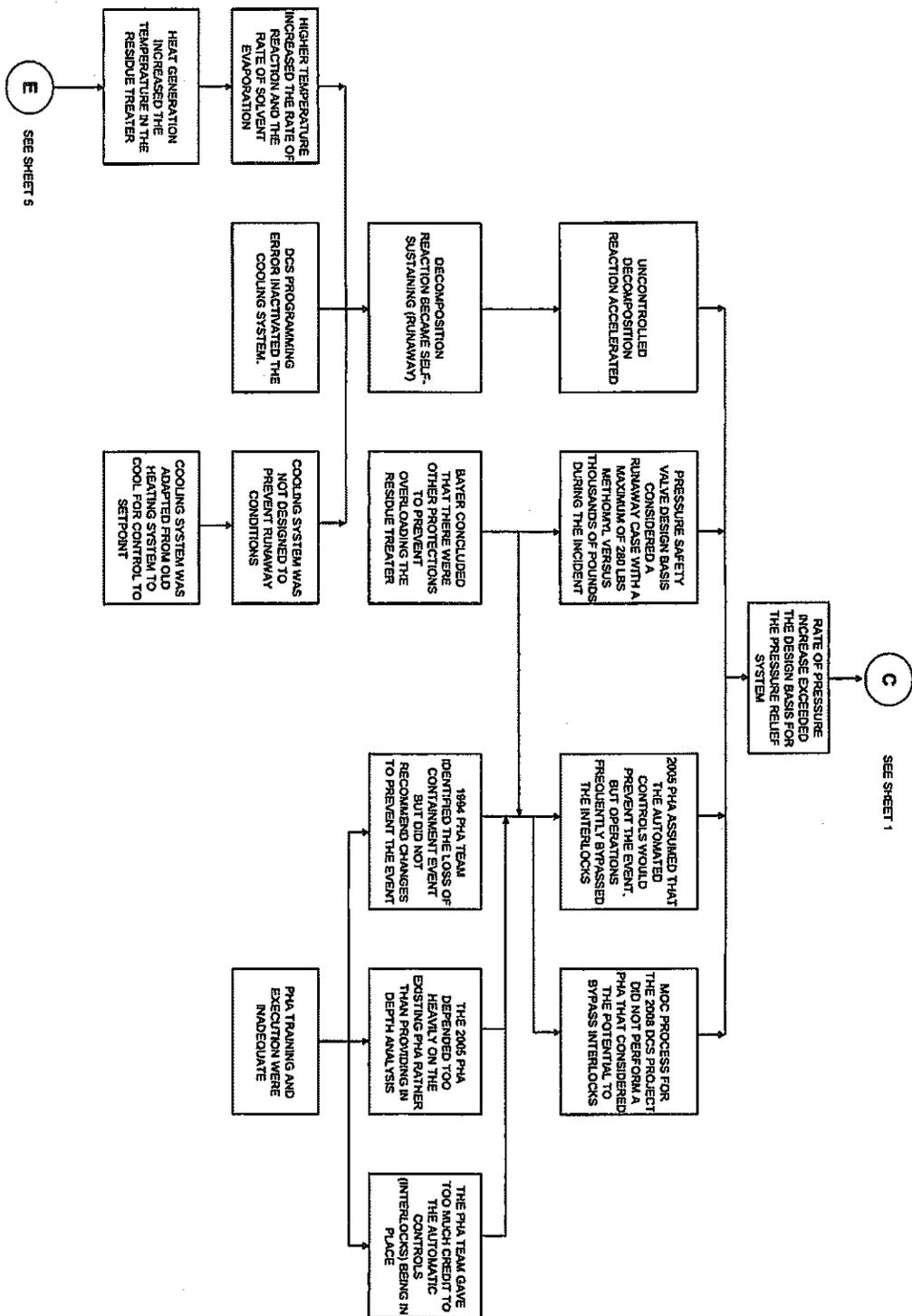
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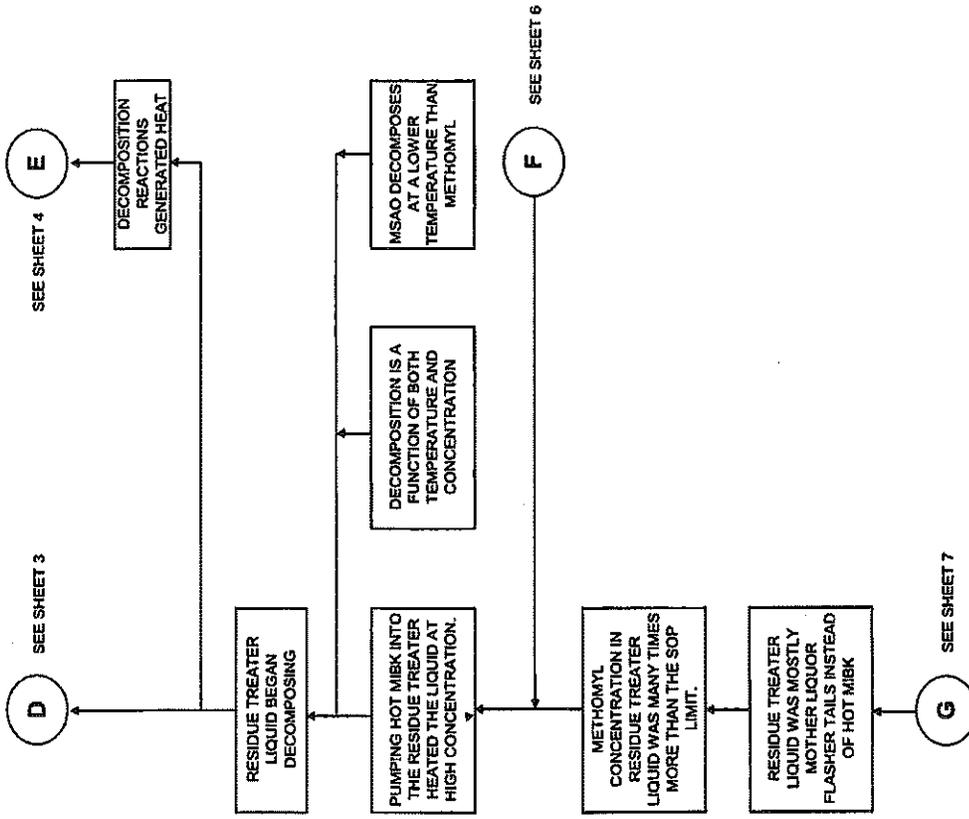
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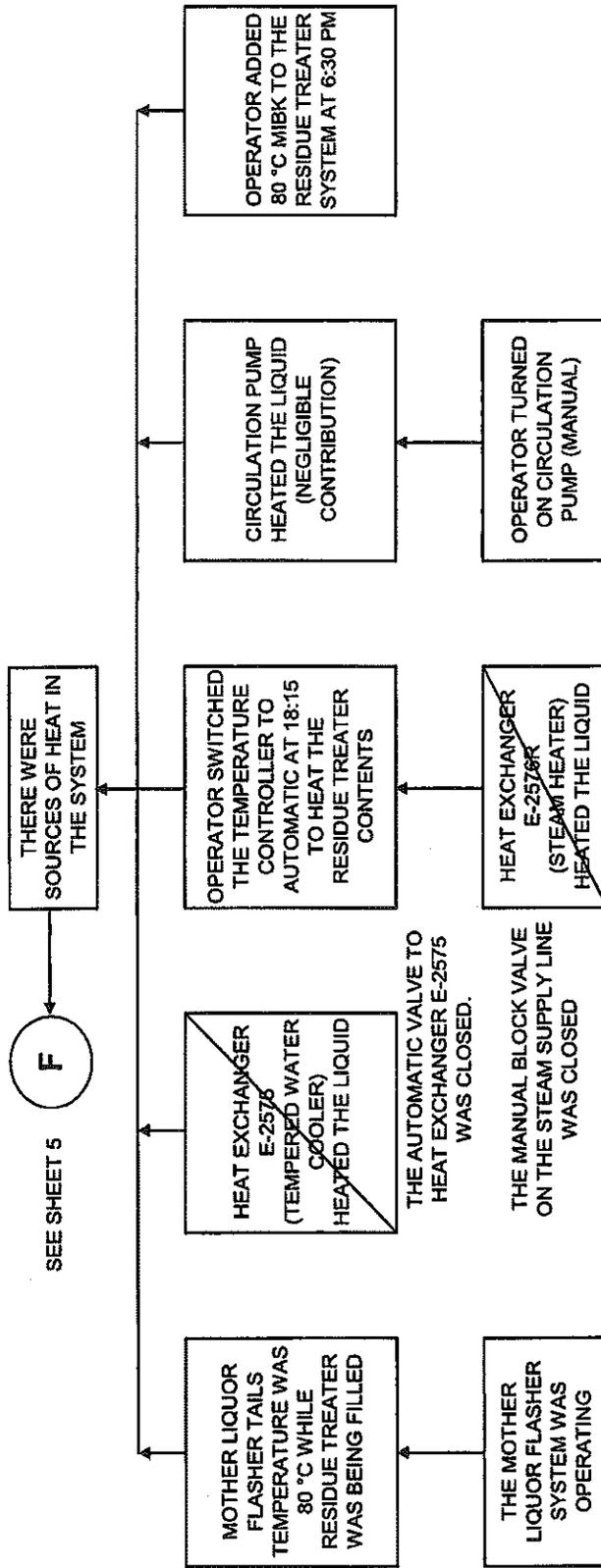
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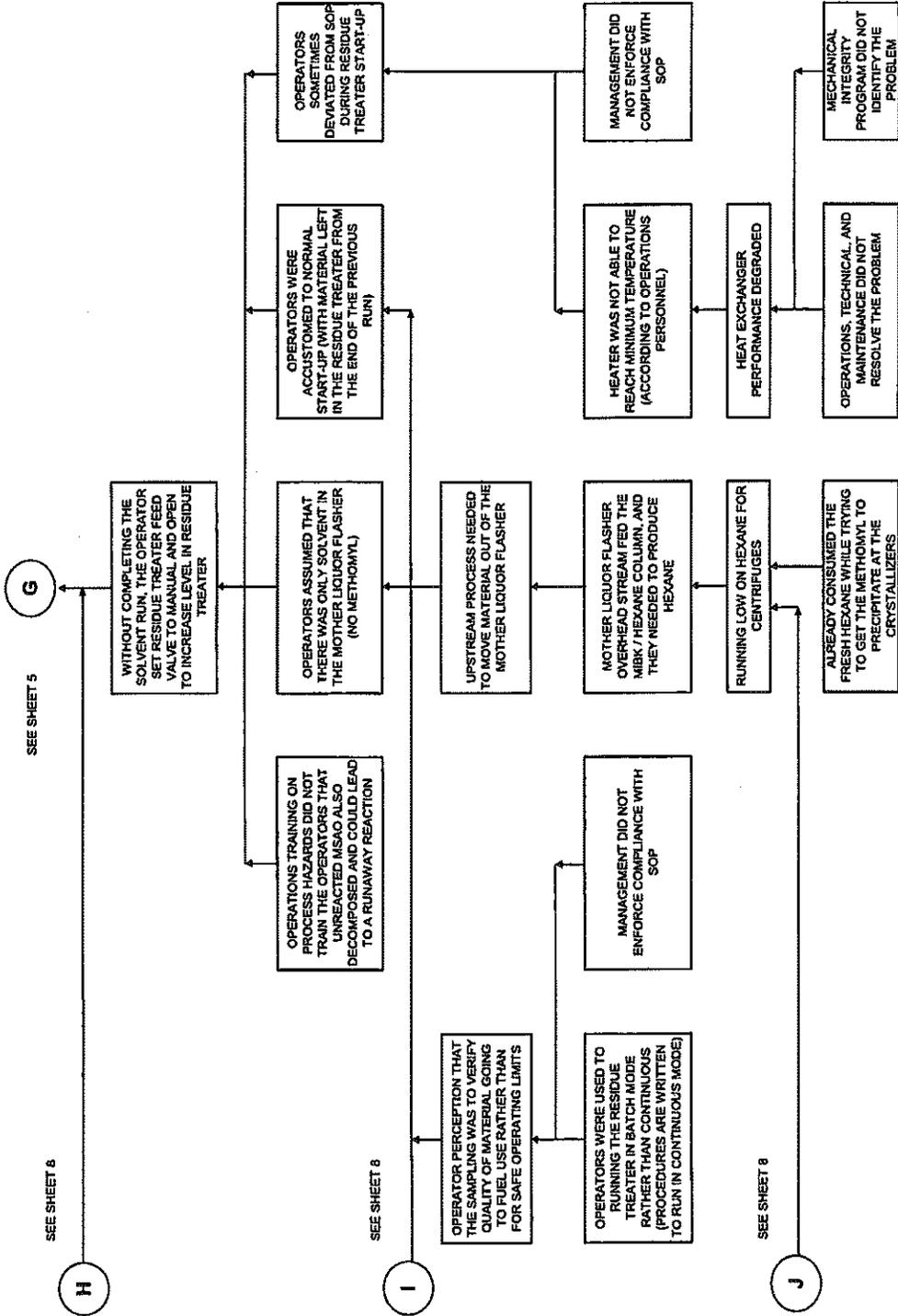
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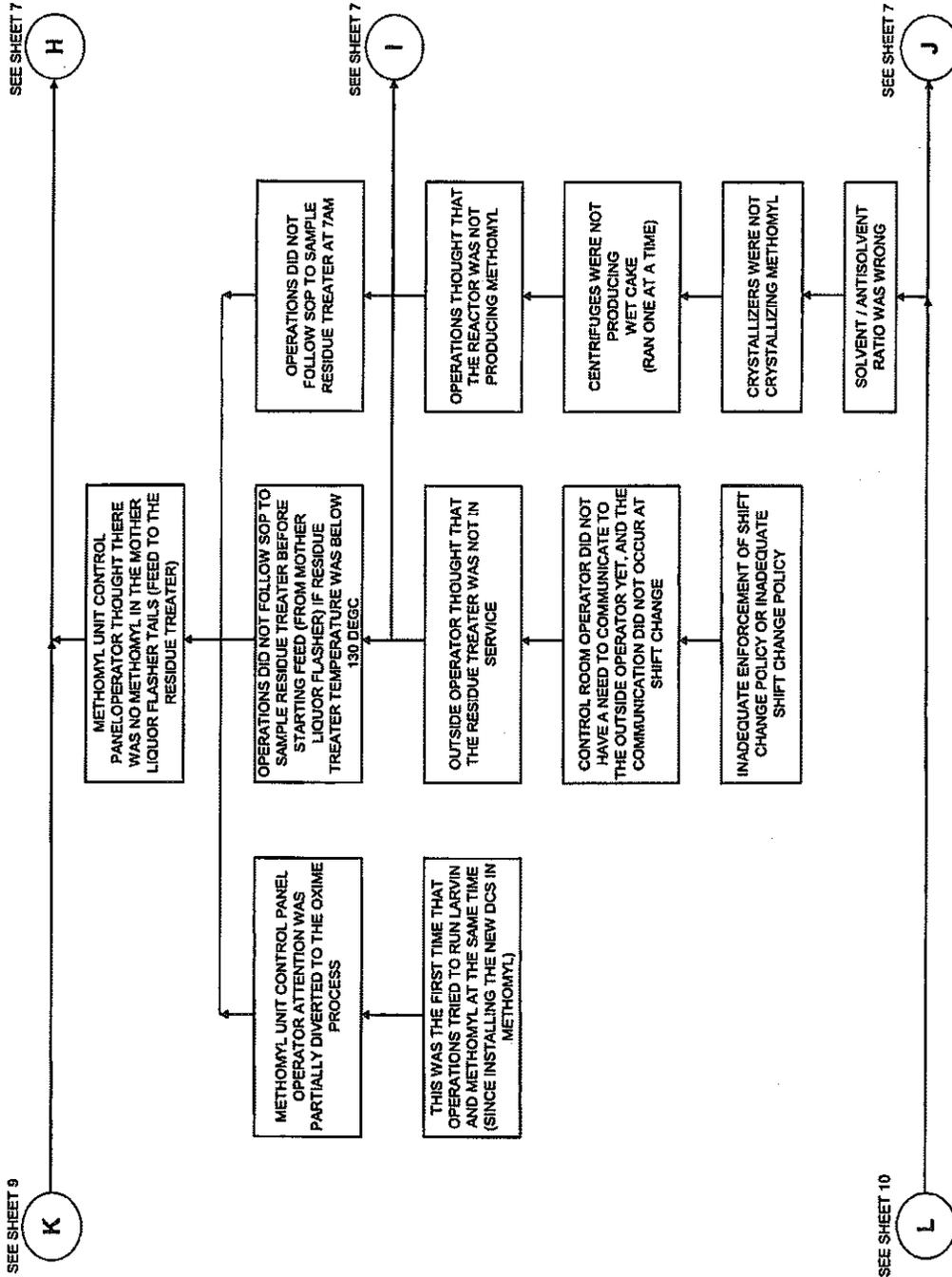
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SHEET 8



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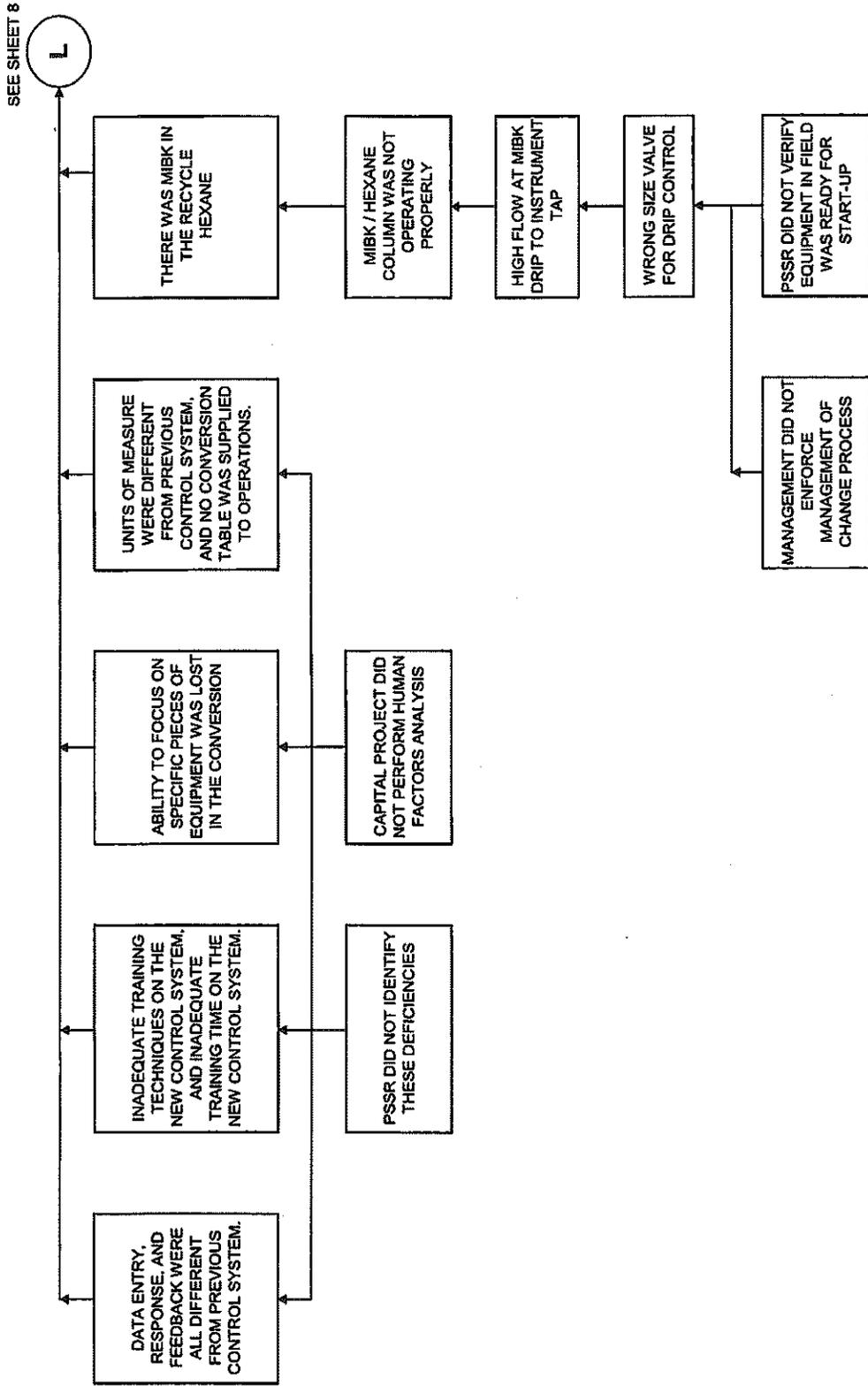
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SEE SHEET 10

SEE SHEET 7

SHEET 10



Appendix B – Emergency Response Timeline

The following is a key for the abbreviations used to denote the organizations agencies in the table below:

| | |
|-------|-------------------------------------|
| CAD | Computer Aided Dispatch |
| EOC | Emergency Operations Center |
| KCEAA | Kanawha County Ambulance Authority |
| KCSD | Kanawha County Sheriff's Department |

Appendix B

| Date | Time | Information | Source |
|------|-------|--|-----------------------|
| 8/28 | 22:34 | Explosion and Fire on Methomyl Unit | |
| 8/28 | 22:34 | Metro to Jefferson fire department (FD): unknown source of explosion, receiving numerous calls | KCSD-1 |
| 8/28 | 22:35 | EMS to Metro 911: wants address for explosion; Metro states it might be at Bayer CropScience, not sure | KCEAA |
| 8/28 | 22:36 | First report of explosion--caller to Metro | CAD Operations Report |
| 8/28 | 22:36 | Alarm--Tyler Mountain FD | Tyler Mountain FD |
| 8/28 | 22:37 | Metro to Dunbar and Institute FD--Explosion at Bayer plant, fireball 100 ft in air, numerous calls; no telephone or radio contact with plant at this time | KCSD-1 |
| 8/28 | 22:38 | Dispatch to 1600 1 st Ave South (Bayer); scene of incident confirmed to be at the center of the plant. | KCSD-1 |
| 8/28 | 22:38 | Emergency alarm at Larvin unit | EOC Log |
| 8/28 | 22:39 | Metro calls Main Gate: gate guard says he has been instructed not to give out information; emergency alarm in progress | 911 call Transcript |
| 8/28 | 22:41 | Haze coming towards Cross Lanes | KCEAA |
| 8/28 | 22:41 | EMS to Metro 911: ambulance staging outside Bayer | KCEAA |
| 8/28 | 22:42 | Metro contacts Bayer: gate guard requests ambulance immediately for a burn patient; will not provide additional information | 911 call Transcript |
| 8/28 | 22:42 | Call from Metro to Dunbar FD to stand by for Institute Station 24. Large explosion reported at the Bayer plant. No contact with plant at this time; multiple calls to plant have been made | Dunbar Fire |
| 8/28 | 22:43 | Metro to EMS: a burn patient is at main gate | KCEAA |
| 8/28 | 22:44 | Need medics at gate for burn patient | CAD Operations Report |
| 8/28 | 22:44 | Bayer has not called Metro | KCEAA |
| 8/28 | 22:44 | Metro advises that burn patient is at the main gate | KCSD-1 |
| 8/28 | 22:44 | "They're not giving us anything, I don't know if they've even called in from Bayer." | KCSD-1 |
| 8/28 | 22:45 | Unit 245 on-scene command established | KCSD-1 |
| 8/28 | 22:45 | EOC activated, Shift A and B ring-down | EOC Log |

Appendix B

| Date | Time | Information | Source |
|------|-------|---|----------------------------|
| 8/28 | 22:46 | Metro calls Bayer, no answer; gate guard not giving information. | KCEAA |
| 8/28 | 22:47 | EMS enters plant | KCEAA |
| 8/28 | 22:48 | Talks to someone at the gate, he doesn't know what is going on but they need an ambulance at the front gate | KCEAA |
| 8/28 | 22:49 | Tyler FD arrives on scene | Tyler Mountain FD |
| 8/28 | 22:51 | ATF on way to scene | CAD Operations Report |
| 8/28 | 22:51 | Route 25 closed | Dunbar Police |
| 8/28 | 22:53 | Station 31, power line down at 1014 Ellis Street. Pole and line in front of residence still smoking and leaning against a tree. Power still on to residence | St. Albans FD and Nitro FD |
| 8/28 | 22:53 | "Spoke to a gentleman in the plant and informed that the event is located in the Larvin unit. Told that the material involved is poisonous." | KCSD-1 |
| 8/28 | 22:54 | Metro to Dunbar: No contact from plant, getting info from many different sources. Keep roads closed unless you hear otherwise from Metro 9-1-1 EOC only. | Dunbar Police |
| 8/28 | 22:57 | Cloud observed moving towards metro; seeks guidance on what cloud consists of. | St. Albans FD and Nitro FD |
| 8/28 | 23:00 | Notification to shut down river traffic | CAD Operations Report |
| 8/28 | 23:00 | St. Albans FD orders SIP unless hears otherwise about the cloud over explosion | CAD Operations Report |
| 8/28 | 23:04 | Still no contact from plant to Metro 911; Dunbar FD gathers a copy of evacuation plan just in case | Dunbar FD |
| 8/28 | 22:52 | "The explosion is in the Larvin unit; someone talked to a mechanic they know in the plant [and] it's poisonous." | KCEAA |
| 8/28 | 23:04 | Metro advises command that the unit involved is the Larvin | KCSD-1 |
| 8/28 | 23:06 | No SIP per Chief 24 (Institute) | Dunbar Police |
| 8/28 | 23:06 | Burn victim in ambulance | EOC Log |
| 8/28 | 23:13 | KC-1 directed to Shawnee Park (designated as EOC) | KCSD-1 |
| 8/28 | 23:15 | Bayer contacts Metro: a Bayer representative informs Metro that they "might want to alert the community that there is an emergency at the plant right now." The rep. does not confirm Larvin unit as source | 911 call transcript |
| 8/28 | 23:18 | Secondary explosion noted | St. Albans FD and Nitro FD |
| 8/28 | 23:24 | SIP recommended for St. Albans and Nitro | EOC Log |

Appendix B

| Date | Time | Information | Source |
|------|-------|---|----------------------------|
| 8/28 | 23:33 | NWAS issues SIP; informs media | CAD Operations Report |
| 8/28 | 23:34 | Bayer contacts Metro with update; Bayer representative tells Metro that Bayer CropScience still having emergency and is responding to it. | 911 call transcript |
| 8/28 | 23:34 | Bayer informed that Metro Emergency Service director putting community SIP order for South Charleston, Dunbar, Nitro, St. Albans | 911 call transcript |
| 8/28 | 23:34 | SIP declared for western portion of the county | St. Albans FD and Nitro FD |
| 8/28 | 23:43 | By order of the Kanawha County Office of Emergency Services, SIP ordered for all cities west of the City of Charleston (South Charleston, Dunbar, Nitro & St. Albans, specifically.) | KCSD-1 |
| 8/28 | 23:48 | Individual transported to hospital | EOC Log |
| 8/28 | 23:58 | Status update: I-64 shut from Nitro to Dunbar; Rt. 25 from Dunbar to Putnam County line; Rt. 60 from South Charleston to Putnam County line; SIP for all areas west of South Charleston | KCSD-1 |
| 8/28 | | TV/radio announcement acknowledges SIP | SCPD |
| 8/29 | 0:01 | Praxair is SIP location | EOC Log |
| 8/29 | 0:06 | Bayer contacts Metro with update: still having emergency and is responding to it. Bayer rep. on way to Metro 911 center | 911 call transcript |
| 8/29 | 0:13 | West of Larvin unit under toxic cloud; SIP in west end of plant | EOC Log |
| 8/29 | 0:15 | Norfolk Southern railroad personnel onsite with rash and itching goes to medical | EOC Log |
| 8/29 | 0:21 | One employee in medical with heat-related problems | EOC Log |
| 8/29 | 0:25 | Shawnee Park requests MSDS | EOC Log |
| 8/29 | 0:35 | Chemical in the explosion is highly toxic and flammable methomyl | Dunbar Police |
| 8/29 | 0:37 | MIC tank warming | EOC Log |
| 8/29 | 0:40 | Bayer contacts Metro with update: still having emergency and is responding to it | 911 call transcript |
| 8/29 | 0:55 | EE sent to hospital is not decontaminated (HCN, Sulfide, Hexane, MIBK, methomyl residue) | EOC Log |
| 8/29 | 1:10 | Another emergency responder being transferred to medical (firefighter) | EOC Log |
| 8/29 | 1:12 | Bayer contacts Metro with update: still having an emergency and is responding to it | 911 call transcript |
| 8/29 | 1:12 | Another emergency responder sent to medical for heat stress (firefighter) | EOC Log |

Appendix B

| Date | Time | Information | Source |
|-------------|-------------|---|----------------------------|
| 8/29 | 1:20 | SIP lifted in St. Albans | EOC Log |
| 8/29 | 1:25 | Another BCS employee to medical department with heat fatigue | EOC Log |
| 8/29 | 1:27 | Third BCS emergency responder sent to medical (heat stress) | EOC Log |
| 8/29 | 1:32 | Bayer makes official statement to media | EOC Log |
| 8/29 | 1:40 | SIP all clear except Larvin unit | EOC Log |
| 8/29 | 1:42 | All community SIPs lifted; Metro notified | EOC Log |
| 8/29 | 1:43 | Bayer contacts Metro with update: still having emergency and is responding to it. | 911 call transcript |
| 8/29 | 1:47 | Two heat stress and one injured knee in medical | EOC Log |
| 8/29 | 1:55 | Metro wants written request from BCS to lift SIP | EOC Log |
| 8/29 | 2:04 | Roadways re-opened, SIP lifted | Dunbar PD |
| 8/29 | 2:08 | Metro 911 to all units: be advised SIP has been lifted. | Dunbar Fire |
| 8/29 | 2:08 | SIP lifted; roadways being re-opened | St. Albans FD and Nitro FD |
| 8/29 | 2:08 | Department of Environmental Protection notified incident over | EOC Log |
| 8/29 | 2:14 | Firefighting operations to be released, and begin to return to quarters. The fire is out | KCEAA |
| 8/29 | 3:01 | Bayer contacts Metro with update: response team has situation under control, plant still in alarm state | 911 call transcript |
| 8/29 | 3:33 | Bayer contacts Metro with update: response team has situation under control, plant still in alarm state | 911 call transcript |
| 8/29 | 4:07 | Tyler FD leaves scene | Tyler Mountain FD |
| 8/29 | 5:31 | "Governor is now on scene" | EOC Log |
| 8/29 | 5:50 | Bayer contacts Metro with update: all clear except Larvin unit | 911 call transcript |

**Appendix C – Methyl Isocyanate Day Tank
Blast Shield Analysis**

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1.0 Introduction

Methyl isocyanate (MIC) has been manufactured and used at the Institute site since at least the 1970s. Union Carbide Corporation (UCC) owned the facility when the equipment was designed and installed. Recognizing the acute toxic hazard associated with MIC, UCC specified a more rigorous design than what is often applied in chemical processes: redundant and backup instrument systems, augmented fire suppression systems, and an ammonia-steam emergency vapor suppression system. In addition, the bulk storage systems were more robust than a typical aboveground storage vessel. In particular, Union Carbide installed specialized blast-resistant structures around the aboveground MIC storage vessels to protect the vessels from projectiles in the event of an explosion in nearby equipment. The blast blankets also provided a thermal heat shield in the event of a nearby fire.

In 1994, the owner of the Institute facility, Rhone-Poulenc, increased the height of the blast shield on the MIC day tank in the Methomyl-Larvin unit. The added height protected the relief valve piping and the vent line that is attached to the top head of the vessel.

The August 2008 incident and Bayer's subsequent effort to restrict public information about the proximity of the MIC day tank to the explosion resulted in renewed concern about MIC use and storage at the plant. This appendix presents a CSB analysis that evaluates whether the exploded residue treater could have damaged the MIC day tank and piping, if it had followed a hypothetical trajectory in that direction.

2.0 Methomyl and Carbofuran MIC Supply System

2.1 MIC Manufacturing

Bayer, the only user of large quantities of MIC in the U.S., manufactures MIC and at the time of the incident stored up to 200,000 pounds in large underground pressure vessels and smaller aboveground vessels. Liquid MIC was transferred from the MIC production unit about 2500 feet through an insulated piping system to an aboveground pressure vessel called a "day tank" located adjacent to the Methomyl-Larvin production unit. After refilling the day tank, operators removed all MIC from the transfer pipe and purged the pipe with nitrogen gas.

The transfer piping and storage vessel incorporated multiple layers of protection, both active and passive:

- The MIC recirculation system, carbofuran unit transfer line, and the cross-plant transfer line were equipped with emergency block valves that were operated from the control room;
- An emergency dump tank adjacent to the day tank was available to receive the contents of the MIC day tank and cross-plant transfer line; and
- The day tank and dump tank were installed on a concrete foundation and surrounded by a concrete dike wall with the capacity to contain the maximum MIC inventory in the day tank and transfer piping.

2.2 Production Storage

The MIC day tank was a 6,700-gallon-capacity stainless steel pressure vessel. Maximum inventory was approximately 37,000 pounds (4,400 gallons). The tank was designed, fabricated, and tested in accordance with the American Society of Mechanical Engineers Boiler and Pressure Vessel Code

Section VIII and was rated for lethal⁶⁰ service. Union Carbide specified the vessel to be designed with a maximum allowable working pressure of 100 psig, even though the MIC system would operate at only 1-2 psig; the rupture disk and relief valve were set at 20 psig. UCC also installed a dedicated nitrogen supply system to maintain an inert atmosphere in the tank and piping system.

The day tank was equipped with additional layers of protection. The refrigeration system chilled the MIC to about 0 °C (32 °F). A multiple stage chiller system first used ethylene glycol to cool methyl isobutyl ketone (MIBK). The MIBK was then used to cool MIC in a separate heat exchanger. This two-step cooling process prevented a possible MIC-water reaction should the ethylene glycol chiller system leak.⁶¹ The MIBK system pressure was also maintained greater than the MIC system pressure, and the MIBK pressure in the MIBK-ethylene glycol heat exchanger was greater than the ethylene glycol pressure. This ensured that water could not enter the MIC system. Finally, emergency generators provided power to the refrigeration system in the case of normal plant electricity loss.

The day tank control system contained redundant pressure, temperature, and flow instruments including high-pressure, high-temperature, and refrigeration system failure alarms. The MIC system vents discharged into the process and emergency vent scrubber system.

The area around the tank was equipped with air monitors to detect MIC. Firewater monitors were located nearby to mitigate an MIC leak and suppress a fire that could threaten the tank. Surveillance cameras provided full-time visual display on video display panels inside the Methomyl-Larvin control room. A blast shield structure fully enclosed the day tank to protect it from flying debris and thermal radiation in the event of an explosion and fire.

⁶⁰ ASME defines lethal substance as a poisonous gas or liquid of such a nature that a very small amount of the gas or of the vapor of the liquid mixed or unmixed with air is dangerous to life when inhaled (ASME 2001). Lethal service rated vessels are designed and fabricated to a higher quality standard than non-lethal rated vessels.

⁶¹ The coolant is a mixture of ethylene glycol and water.

2.3 Impact From the Explosion and Fire

The day tank contained approximately 13,700 pounds of MIC on the night of the residue treater explosion and fire. Neither the empty cross-plant transfer line nor the carbofuran unit transfer system, which was operating at the time of the incident, was damaged. Debris from the explosion struck the blast blanket surrounding the day tank (Figure C-1), and the blast blanket was exposed to radiant heat from the fires. However, the MIC day tank was not damaged.

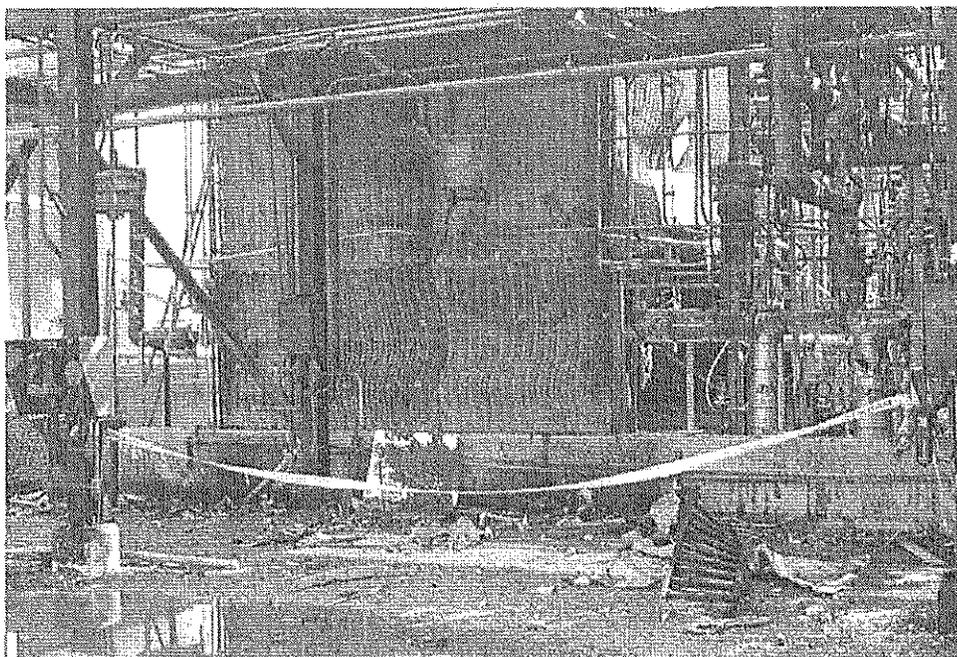


Figure C-1. MIC tank blast shield post-incident

Power to the MIC refrigeration system was interrupted, so an emergency generator was put in service. The MIC temperature rose to 8.9 °C (48 °F) and the pressure rose to 12.7 psig, which were both less than the maximum allowed values of 30 °C (86 °F) and 20 psig, respectively. The day tank temperature was below 2 °C late the next day. The day tank was then depressurized and drained.

2.4 Day Tank Inspection and Return to Service

Bayer removed the blast blankets and removed the tank insulation, then inspected the tank, piping, and refrigeration system to verify that the explosion and fire did not damage the equipment. Bayer reinsulated the tank and piping systems and purchased and installed new blast blankets to replace those that were exposed to the fire. The blankets not directly exposed to the fire were reused. Finally, the MIC tank was returned to service to provide MIC to the carbofuran unit until the unit was shut down in August, 2010.

3.0 MIC Day Tank Blast Shield Analysis

When the day tank was installed in 1983, a wire rope blast blanket system was installed to protect it from flying debris. The blast blankets also provide a radiant heat shield from nearby fires. In 1994, the structure was extended up to completely surround the entire tank and top piping connections (Figure C-2). The original frame design considered static (blast blanket weight) and wind loads only, and did not analyze the structure for dynamic side loading, one of the functional purposes of the assembly.

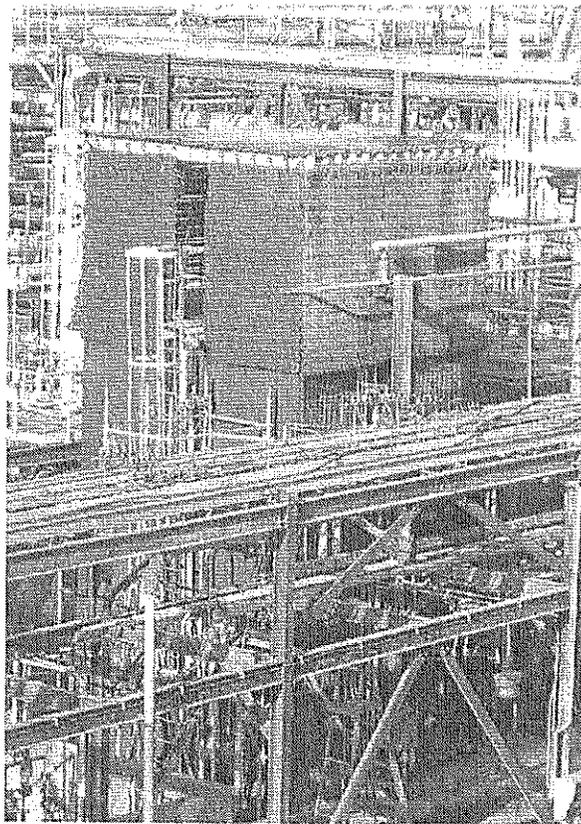


Figure C-2. MIC day tank shield structure

3.1 Postulated Worst-Case Event Analysis

The shell and one head careened into the methomyl unit when the residue treater violently exploded. The other 800-pound head (Figure C-3) sheared off and came to rest near the installed location of the residue treater. A small piece of the vessel cylindrical shell separated and lodged between a catwalk and the shell of a distillation column (Figure C-4) some 15 to 20 feet from the residue treater installed location.

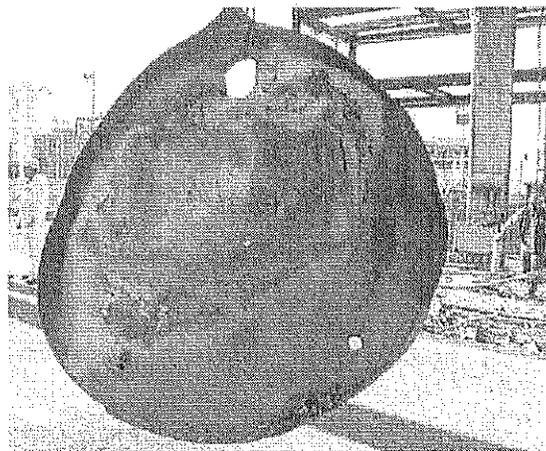


Figure C-3. 800-pound residue treater bottom head



Figure C-4. Residue treater shell fragment lodged in catwalk of adjacent distillation column

The blast shield showed no evidence of an impact by any significant projectile. However, because of the proximity of the residue treater to the structure, the CSB conducted a dynamic analysis of the shield structure and compared the results to a postulated residue treater impact with the structure. The analysis consisted of the following steps:

- Calculate the residue treater theoretical rupture pressure,⁶²
- Calculate the TNT equivalent energy at the rupture pressure and temperature,
- Calculate the initial velocity of various size residue treater fragments,
- Calculate impact forces from residue treater fragment impacts with the shield structure,
- Calculate the forces required to deflect the shield structure into the MIC day tank or attached piping, and
- Compare the results of the fragment energies to the shield structure frame analysis.

3.2 Residue Treater Rupture Pressure and TNT Energy

The newly installed 4,500-gallon residue treater was an ASME Code-stamped, SA-240 316L stainless steel pressure vessel manufactured in 2008. It had a maximum allowable working pressure (MAWP) of 50 psi at 400 °F and the vessel hydrostatic test pressure was 68 psig. The following calculations estimate the burst pressure and TNT equivalency of the energy released in the August 2008 explosion.

The Faupel method (Faupel, 1956) is a theoretical method used to predict vessel burst pressures +/- 15 percent based on vessel geometry and yield and ultimate tensile strengths of the stainless steel. The formulas were developed from nearly 100 static cylinder tests. According to Faupel, if a cylinder

⁶² The maximum pressure range of the control system residue treater pressure instruments was 0-50 psig. Therefore, the actual vessel pressure near the failure point was not recorded.

wall yields at a constant stress, it will burst at a pressure required to overstrain the wall⁶³. The residue treater burst pressure, P_b , is estimated using the following equation.

$$P_b = \frac{2\sigma_y}{\sqrt{3}} \ln R \left[2 - \frac{\sigma_y}{\sigma_u} \right]$$

where

σ_u , ultimate tensile strength = 70,000 psi

σ_y = yield strength = 25,000 psi

Cylinder wall ratio, $R = b/a$

a = inner radius (47.6875 in)

b = outer radius (48 in)

$R = 1.0066$

$$P_b = 310 \text{ psig}$$

When the residue treater ruptured, the stored energy was released nearly instantaneously, creating a blast wave that spread over a distance from the vessel. The energy of the blast wave can be compared to a high explosive detonation through a TNT equivalency calculation using the conversion factor of 1.545×10^6 ft lbs/lb of TNT.

⁶³ Though the Faupel method is intended for thick-walled vessels, it can be applied to thin-walled vessels as well. All thin- and thick- walled equations derived in the Faupel method yield the same result as the cylinder wall ratio, R , approaches the value 1.0 (Faupel, 1034).

Using the calculated burst pressure, the blast energy and TNT equivalence (Cain, 1995) are:

$$W = \frac{P_1 V_1}{\gamma - 1} \left[1 - \left(\frac{P_2}{P_1} \right)^{\frac{\gamma - 1}{\gamma}} \right]$$

where

W = total explosion energy

$P_1 = 310 \text{ psia} = 46,760 \text{ psfa}$

$P_2 = 14.7 \text{ psia} = 2117 \text{ psfa}$

$V_1 = 295 \text{ ft}^3$ (volume above liquid level: 4500-gallon vessel @ 51% full)

$\gamma =$ specific heat ratio of $\text{CO}_2 = 1.23$ (because CO_2 is a principal byproduct of methomyl decomposition)

$$W = 26.3 \text{ e}^6 \text{ ft-lbs}$$

Using the TNT equivalency factor of $1.545 \text{ e}^6 \text{ ft-lbs/lb}$, the mass of TNT required to generate the calculated explosion energy is:

$$\text{TNT} = \frac{26.3 \text{ ft-lbs}}{1.545 \text{ ft-lbs/lb}}$$

$$\text{TNT} = 17 \text{ lbs}$$

The American Institute of Chemical Engineers, Center for Chemical Process Safety (CCPS)

Guidelines for Chemical Process Quantitative Risk Analysis (AIChE, 2000) contains other methods for estimating the TNT equivalent energy from a pressure vessel explosion. The CSB compared the result from the Cain method with the methods contained in the CCPS publication. Table C-1 contains the summary of the results.

Table C-1. TNT equivalency values

| Method | TNT (lbs) | Energy (ft-lbs) |
|--------|-----------|-----------------|
| Baum | 13 | 20,690,000 |
| Brode | 36 | 57,000,000 |
| Brown | 44 | 69,900,000 |
| Crowl | 19 | 29,500,000 |
| Cain | 17 | 26,300,000 |

3.3 Fragment Kinetic Energy Estimates

The explosion caused the vessel to separate into three pieces: the bottom head, a small segment that embedded in the catwalk, and the main vessel shell with the top head attached. Initial velocities were calculated and applied to various trajectory departure angles in the direction of the MIC day tank. Aerodynamic drag coefficients were then applied to predict the velocity and kinetic energy of each fragment at impact with the day tank shield structure at the same elevation as the top of the day tank. The analyses ignored the pipe rack and other large structures between the residue treater and the day tank that would likely deflect the object, or absorb some of the kinetic energy.

3.3.1 Fragment Velocity Estimates

The energy released in an exploding pressure vessel is distributed among the energy consumed to fracture the steel vessel, shock wave, kinetic energy of the fragments, and heat energy. The energy distribution depends on the vessel failure characteristics (e.g., ductile vs. brittle fracture)⁶⁴ and can change throughout the explosion.

⁶⁴ Post-explosion visual examination of the new residue treater confirmed ductile failure of the shell and heads, as expected for stainless steel.

Assuming a complex expansion process (e.g., gas/liquid mixtures are contained in the pressure vessel), a simple kinetic energy calculation can be used to estimate the fragment upper limit velocity:

$$KE = \frac{1}{2}mv^2$$

$$\text{so } v = \sqrt{\frac{2KE}{m}}$$

where

KE = kinetic energy lbs (ft-lbs)

v = initial velocity (ft/s)

m = mass (lbs)

However, according to Baum (1988), less than 20 percent of the vessel expansion energy is transferred to projectiles. To improve the understanding of pressure vessel failure energies, the U.S. Air Force and U.S. Naval Surface Warfare Center commissioned the General Physics Corporation to develop a computer model to calculate fragment velocity and energy, called LIMIT-V, as part of the Pressure Vessel Burst Test Study (Cain, 1995). The study compared the Baum predicted values to actual fragment velocities measured from high-pressure, gas-filled pressure vessel burst tests.

Assuming a vessel axial split, which was similar to the residue treater failure, and assuming a burst pressure of 310 psig, the LIMIT-V program predicts that the fragment projectile energy and velocity for the main residue treater shell and top head are:

$$\text{Fragment energy} = 14.3 \text{ e}^6 \text{ ft-lbs}$$

$$\text{Initial velocity} = 81 \text{ ft/sec}$$

The LIMIT-V method likely over-predicts the residue treater fragment velocity because the residue treater was approximately half-full of liquid rather than vapor filled, and the method does not

consider a foamy gas-liquid mixture inside the pressure vessel. However, the results are reasonable to use for evaluating the MIC blast shield structure.

3.3.2 Fragment Range and Strike Velocities

TRAJ is a two-dimensional fragment trajectory model developed for the U.S. Naval Surface Warfare safety program to estimate fragment velocity and range at various angles. The program uses velocity and shape characteristics to plot fragment flight path height and range and accounts for aerodynamic drag and fragment ricochets off barriers or interferences in the fragment path. The program calculates the velocity and energy at the point of contact with a specified barrier or interference.

The residue treater vessel shell and top head scenario generated the greatest fragment kinetic energy that could impact the MIC day tank blast mat frame. Barriers representing the MIC day tank structure were input into TRAJ at a range of 70 feet and a height of 22 feet from the residue treater. Figure C-5 shows the path traveled by the vessel shell and top head having an initial velocity of 81 feet per second.

If a large, high velocity fragment strikes the shield structure at the elevation where the MIC tank piping passes through the grating with enough energy to deflect the structure more than about 4 inches horizontally, the piping could be damaged. The model predicts that the residue treater main fragment will strike the structure at this elevation (circled area on Figure C-5) when the departure trajectory angle from the explosion epicenter is about 30 degrees above horizontal. The fragment energy at impact is 137,000 foot-pounds.

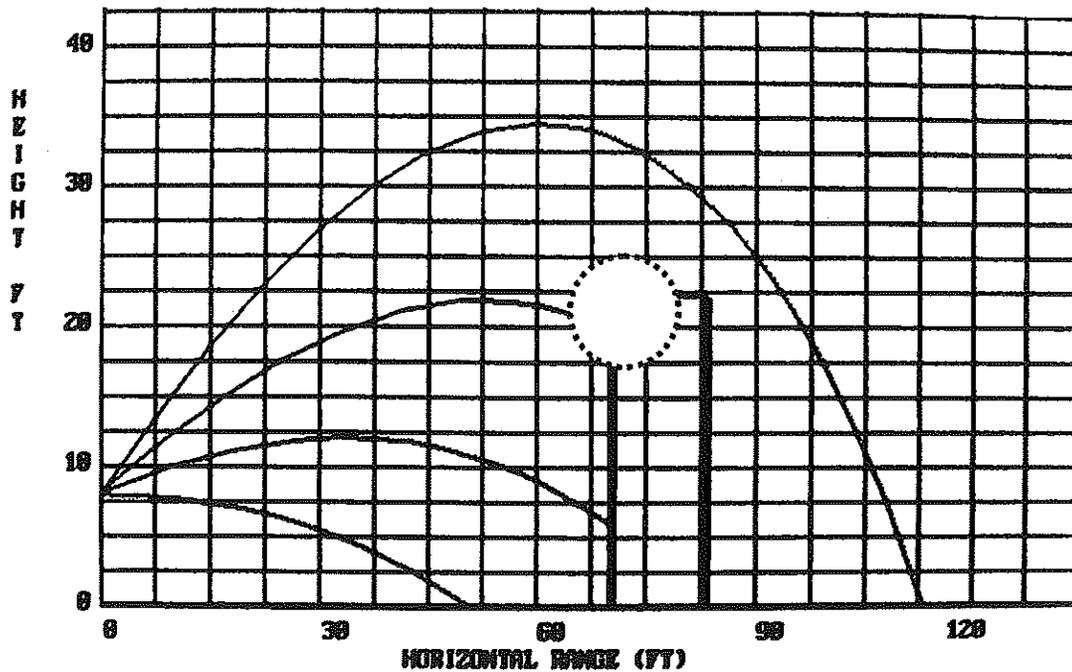


Figure C-5. TRAJ plot with fragment impact with the blast shield structure (vertical line at 75 feet range). The curves represent fragment departure angles of 0, 15, 30, and 45 degrees.

3.3.3 Shield Structure Dynamic Analysis

Union Carbide installed the blast shield structure in 1983. A 1994 modification added additional shielding above the MIC day tank. The assembly consisted of a structural frame bolted to the concrete foundation. Steel wire rope ballistic shield mats were suspended on all sides. The shield mats served multiple functions: prevent small projectile penetration or significantly reduce the projectile exit velocity, attenuate energy from an explosion generated pressure wave, and absorb heat from an explosion or fire. The structural frame supported the heavy steel mats.

A steel grating floor deck was installed a few inches above the top of the MIC day tank. The vessel relief valve piping passed through a circular opening in the floor deck. The clearance between the floor opening and the pipe was approximately 4 inches. Therefore, contact between the steel grating and the pipe will occur if the frame is deflected 4 inches horizontally. An MIC release was assumed to occur if the grating contacts the pipe—the analysis ignored the strength of the pipe and vessel

nozzle. The analysis did not evaluate the additional fragment energy (greater impact velocity) that would be necessary to puncture or break the pipe and release MIC.

3.3.4 Blast Mat Design

The blast mat is a commercially available ballistic shield product that was originally intended to protect personnel from high-energy explosive detonations. The manufacturer worked with the Israeli Defense Force and the Southwest Research Institute to determine the ability of the blast mat to absorb potential debris or pressure waves from an explosion. Testing conducted using explosive devices showed that the shield is capable of containing very high energy explosions. The testing also demonstrated that the shield is capable of withstanding detonation pressures resulting from thousands of pounds of TNT more than 30 feet from the source of the detonation.

The CSB estimated that the residue treater exploded with the force of about 17 pounds of TNT equivalent, many orders of magnitude lower than the energy absorbing capacity of the ballistic shield. Therefore, the CSB concluded the shield mat would withstand any postulated explosion pressure wave from the residue treater.

3.3.5 Structural Frame Assembly Design

Frame assembly design records address only the capacity of the frame to support the deadweight of the installed mats, plus wind loads. The records do not include a frame dynamic analysis to demonstrate that the frame assembly was strong enough to protect the day tank from a large object strike at high velocity.

The CSB commissioned a structural analysis of the frame assembly to evaluate it for resistance to two load cases:

1. Blast wave overpressure from approximately 40 pound TNT equivalent explosion at 75 feet.
2. Impact force from the residue treater vessel.

The structural and civil drawings were used to analyze the assembly using GTStrudul,[®] a comprehensive structural analysis tool. Failure was assumed if the maximum calculated stresses exceeded the material strength of any primary component in the frame assembly, or if the frame structure deflected 4 inches horizontally at the elevation of the top floor grating, the space between the hole in the grating and the pipe. The results are shown in Table C-2.

Table C-2. Frame loading analysis results

| Load condition | Frame component stress limit | Maximum Deflection |
|-------------------------------|---|--|
| Blast overpressure | Baseplate overstressed | ~ 1.8 inches (no contact with pipe) |
| Residue treater vessel impact | Baseplate, structural beams and braces overstressed | ~ 4 inches (possible contact with MIC pipe) |

The analyses are based on worst case conditions for the following reasons:

- They ignore any objects in the path between the residue treater and the MIC day tank including the pipe rack that might deflect or even stop the fragment before it strikes the shield structure (See Figure C-2);
- The blast mat is assumed to act as a rigid plate, which transmitted all forces directly into the frame (i.e., the calculation ignored attenuation of blast or impact energy by the blast mat);
- The frame is assumed to be oriented such that the east face was perpendicular to the path of the overpressure and vessel fragment trajectory; and
- The fragment analysis uses the absolute value of the velocity applied in the horizontal direction rather than the horizontal vector component of the calculated velocity at the incident angle.

The blast overpressure analysis indicates that the calculated frame deflection was less than half the available space between the grating and the relief valve pipe. Although the overpressure analysis suggested that the frame baseplates would have shown evidence of permanent structural deformation, post-incident visual examination did not identify any structural damage, confirming that the analysis results were very conservative.

The fragment impact analysis predicts that the frame might have sustained permanent and observable structural damage if the residue treater vessel had impacted the structure at maximum theoretical velocity near the top of the structure. Furthermore, the results show that the frame could contact a pipe connected to the MIC day tank. However, the same highly conservative assumptions used in the analysis likely results in the model over-predicting the maximum frame deflection.

3.3.6 Limitations of the Model

The CSB did not evaluate the likelihood that the residue treater would travel along any particular trajectory when it ruptured. The direction the vessel traveled was the result of the physical characteristics of the vessel and attached piping and other factors that are difficult to model. Factors that influenced the direction of the fragments included:

- Piping connected to the residue treater, including the relief pipe attached to the top head;
- Orientation of the support legs and concrete anchor bolts; and
- The orientation of the head and shell welds, manway, and other significant attachments that strongly influenced where the vessel shell first was breached.

Specific conditions would have been necessary for the largest residue treater fragment to strike the blast shield frame at the most vulnerable location. First, the trajectory angle would have had to approach 30 degrees above horizontal. A steep trajectory angle would also be necessary for the residue treater to pass over the elevated pipe rack that was directly in front of the day tank. The CSB

did not attempt to quantify the likelihood of these conditions occurring; in the actual incident, the residue treater followed an essentially horizontal trajectory.

3.4 Blast Shield Analysis Conclusions

The blast mat provided highly effective protection to the MIC day tank against radiant heat from an external fire and penetration from very small projectiles traveling at near sonic velocity. The blast mat would also prevent penetration of a large fragment, such as the residue treater shell or head travelling nearly 55 miles per hour.

The original design of the structural frame used to support the blast mat considered only the weight of the blast mats and wind loading. The calculations did not consider dynamic loading from a high velocity large projectile impact. The CSB frame analysis concluded that the structure provided only marginal impact energy absorption protection from such a large fragment strike at velocities predicted to result from the residue treater rupture.

Had the residue treater traveled unimpeded in the direction of the day tank, and struck the shield structure just above the top of the MIC day tank, the shield structure might have moved enough to come in contact with the relief valve vent pipe. A puncture, or tear in the vent pipe or MIC day tank head would have released MIC vapor into the atmosphere above the day tank.

The CSB notes that the scenario did not occur and remains hypothetical. The vessel might have traveled in one of many trajectories; even under conservative assumptions, only a specific narrow set of trajectories could have potentially led to an MIC release. However, the analysis does emphasize the risks of locating large vessels containing extremely toxic substances within hazardous process areas that have the potential for explosions. As noted previously, following the August 2008 incident Bayer committed to eliminating all aboveground storage tanks of MIC.

**Appendix D – Bayer CropScience Press Release
Announcing Institute Facility MIC Storage Reduction**

Bayer CropScience



News Release

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Bayer CropScience announces investment of \$25 million for Institute site

Significant production changes planned

Institute, West Virginia (USA), August 26, 2009 – Bayer CropScience today announced an investment of \$25 million for further enhancing operational safety at its Institute, W.Va. site. As part of these plans, the company will reduce methyl isocyanate (MIC) storage by 80 percent. This reduction will lead to the elimination of the transfer, use and storage of MIC at the site's West Carbamoylation Center within approximately one year. After completion of these measures, there will be no MIC storage above ground anywhere on the site.

Bayer CropScience President & CEO Bill Buckner said, "While MIC was not involved in the explosion at the Institute site in August last year, we have taken seriously the concerns of public officials and the site's neighbors, and we are making very substantial changes in how we operate our facility in the future."

A number of changes has already been implemented, including the hiring of an emergency services leader to interact with public emergency responders and new procedures, including dedicated phone lines and back-up radios, for communicating with Metro 911. Buckner added that the site also had participated recently in a successful emergency drill with the Kanawha Putnam Emergency Planning Committee.

"Within approximately one year we also will cease production of all MIC-based products currently manufactured in the West Carbamoylation Center," Buckner stated. As part of this, the company will not reconstruct the methomyl facility. To offset changes in Bayer CropScience's production, the industrial park will seek new tenants so to maintain a substantial business presence in the Kanawha Valley. Company officials said today they will work with state and federal officials to attract new businesses to the 465-acre site.

The company aims at implementing these changes to the site's production with the least amount of impact on the employees.

Beyond the changes announced today, Bayer CropScience will continue to evaluate the feasibility of further measures, which may also include the use of alternative process technologies.

In going forward, the company will also continue its dialogue and close cooperation with the community and governmental agencies involved.

About Bayer CropScience

Bayer is a global enterprise with core competencies in the fields of health care, nutrition and high-tech materials. Bayer CropScience AG, a subsidiary of Bayer AG with annual sales of about EUR 6.4 billion (2008), is one of the world's leading innovative crop science companies in the areas of crop protection, non-agricultural pest control, seeds and plant biotechnology. The company offers an outstanding range of products and extensive service backup for modern, sustainable agriculture and for non-agricultural applications. Bayer CropScience has a global workforce of more than 18,000 and is represented in more than 120 countries. This and further news is available at: www.press.bayercropscience.com.

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Find more information at www.bayercropscience.com.

hjb (2009-0498E)

Forward-Looking Statements

This release may contain forward-looking statements based on current assumptions and forecasts made by Bayer Group or subgroup management. Various known and unknown risks, uncertainties and other factors could lead to material differences between the actual future results, financial situation, development or performance of the company and the estimates given here. These factors include those discussed in Bayer's public reports which are available on the Bayer website at www.bayer.com. The company assumes no liability whatsoever to update these forward-looking statements or to conform them to future events or developments.



January 12, 2014

State ignored plan for tougher chemical oversight

by Ken Ward Jr.
Staff writer

Three years ago this month, a team of federal experts urged the state of West Virginia to help the Kanawha Valley create a new program to prevent hazardous chemical accidents.

The U.S. Chemical Safety Board recommended the step after its extensive investigation of the August 2008 explosion and fire that killed two workers at the Bayer CropScience plant in Institute.

Since then, the proposal has gone nowhere. The state Department of Health and Human Resources hasn't stepped in to provide the legal authority the Kanawha-Charleston Health Department needs to start such a program. And Kanawha County officials never funded the plan, and seldom mention that the CSB recommendation was even made.

Now, with more than 300,000 residents across the Kanawha Valley without usable water following a chemical accident at Freedom Industries on the Elk River, some local officials say it's time for action.

"We'd had their recommendation on the books for several years now," said Dr. Rahul Gupta, director of the local health department. "This gives us another opportunity to look at what they recommended."

During a press conference Saturday night, Gov. Earl Ray Tomblin said he would work with the state Department of Environmental Protection to consider tighter regulation of chemical storage facilities in the ongoing legislative session.

"There are certain reporting things that companies have to do," the governor told reporters. "And I do think we have to look at them to make sure this kind of incident does not happen again."

But so far, neither the governor's office nor the DHHR have responded to a specific question from the Gazette about whether they would move to implement the CSB's recommendation.

The CSB's proposal for a new "Hazardous Chemical Release Prevention Program," was the central recommendation in the agency's lengthy report on the Bayer explosion. Board members repeated the recommendation again in September 2011, when they released a report on a series of accidents that killed one worker at the DuPont Co. plant in Belle.

The recommendation, modeled after a highly successful chemical safety law in Contra Costa County, Calif., would require companies to submit safety plans, require regular government safety audits of plans, and give the public a greater say in monitoring safety performance at local companies. Theoretically, the program would be funded by a fee paid by companies that make, use and store dangerous chemicals.

"Like Contra Costa County, the Kanawha Valley has many facilities that handle large quantities of hazardous materials, some of which are acutely toxic," the CSB said in its 169-page report on the Bayer explosion. "Furthermore, the valley contains environmentally sensitive areas such as the Kanawha River, which is an important transportation corridor."

"Yet, the local government does not have the authority to directly participate in facility safety planning and oversight even though many community stakeholders have long campaigned for such authority and involvement," the report said. "The local government could adopt regulations and implement a program similar to Contra Costa County that would likely improve stakeholder awareness and improve emergency planning and accident prevention."

Under the board's recommendation, the DHHR would use its existing legal authority for **APP009456** forming

"occupational and industrial health hazards" to assist the Kanawha-Charleston health agency in setting up the program - not just for the Kanawha Valley, but for industry across the state.

After the board's recommendations, the Kanawha-Charleston Health Department embraced the proposal, but worried other important parties - the state and industry - would oppose it.

"I don't think it's going to be very difficult to develop a program," Gupta said in January 2011. "The real question is, are people going to play."

Also in January 2011, Kanawha County Commission President Kent Carper said he supported the program, but feared it would face significant political hurdles.

"It's going to take the support of the Legislature and it's going to take the support of the industry," Carper said. "The problem will be gaining unified support between industry, the public and government."

A few months later, in June 2011, then-DHHR Secretary Michael Lewis told the CSB that his agency and the state Department of Environmental Protection had decided not to move forward with the CSB recommendation.

"We came to a consensus that we did not, at this time, have the expertise in-house to draft the appropriate legislation that would be needed to develop the type of program suggested in your report," wrote Lewis.

Lewis said that his agency would approach the governor's office and see if lawmakers would study the issue.

It was not immediately clear over the weekend what happened to that potential study - but DHHR has not moved forward with a chemical accident prevention plan of any kind, and the CSB lists the recommendation on its website as "open."

Industry groups, including the American Chemistry Council, had opposed the CSB recommendation, saying it would "create unnecessary redundancies, as well as the imposition of additional economic burdens on local industries, communities and state governments."

"Given the existing federal agency oversight with mandated industry regulations, we contend the West Virginia environment is better served through effective execution and compliance oversight by the current agencies," wrote Karen Price, who was then president of the West Virginia Manufacturers Association, in a letter to the CSB.

CSB officials, though, noted that inspections at local chemical plants by federal officials are rare - the U.S. Occupational Safety and Health Administration hadn't inspected DuPont's Belle plant for more than five years when the fatal phosgene leak occurred in January 2010, for example.

OSHA had never inspected the Freedom Industries location, and the state DEP hadn't been there since 1991, when it was a different sort of facility owned by a different company, officials have said.

On Saturday, CSB officials announced -- under pressure from Carper and from Sen. Jay Rockefeller, D-W.Va., -- that they were deploying a team to Charleston to investigate the Freedom Industries chemical accident.

But in email interviews over the weekend, CSB officials said they were being cautious about drawing too many conclusions yet about connections between their chemical safety recommendations and the latest Kanawha Valley chemical accident.

Daniel Horowitz, the CSB's managing director, said the focus on the previous recommendation was on what he called "highly hazardous chemicals" such as those involved in the deadly Bayer and DuPont incidents.

"It would have to be determined through further investigation what are [the] hazards of the materials at terminal and storage sites like Freedom Industries, what kinds of regulatory and inspection programs are in place, and what are the opportunities for preventing this sort of serious incident in the future," Horowitz said.

But, while the CSB recommendation did specify "highly hazardous" chemicals, it also said that once the program was started, local experts and citizens could work together to "define the characteristics of chemical facilities that would be covered."

Reach Ken Ward Jr. at kw...@wvgazette.com or 304-348-1702.



(<http://www.wsaz.com>)

Chlorine Released During Leak at Plant in South Charleston

By: Anna Baxter (<http://www.wsaz.com/station/bios/news/235456481.html>) - Email (<mailto:anna.baxter@wsaz.com>)

Updated: Wed 8:13 PM, Oct 02, 2013

SCHOOLS SHELTER IN PLACE DURING CHEMICAL LEAK

SOUTH CHARLESTON, W.Va. (WSAZ) -- Nearly a dozen schools sheltered in place for around an hour during a chemical leak in Charleston. Staff say the real life situation went as smoothly as possible.

It could have been a scary situation. On Wednesday morning, young students were told this: "There was something outside that's making everybody sick, but we didn't go outside today," said Konnor, a 5-year-old preschool student.

Bridgeview Elementary office assistant Jessy Davis said, "We brought everyone downstairs so we know they're all accounted for. The teacher's have lists with their names. They do the count."

Staff follow a list of steps -- starting with gathering students in the hallway, then taping the doors shut and putting up signs saying "shelter in place." With nearly 500 students at Bridgeview, steps like these must be practiced and followed. Konnor knew exactly what to do. "Sit in the hallway and then be quiet."

Staff know one of the most important steps to keeping the students safe, is keeping them calm. Davis said, "By us staying calm, the adults, all of the kids felt like, 'oh this is OK, so we all just stayed really calm.' "

UPDATE 10/2/13 @ 1:50 p.m.

SOUTH CHARLESTON, W.Va. (WSAZ) -- The cause of a chemical spill that forced thousands to shelter in place in the Kanawha Valley remains under investigation.

At a news conference Wednesday afternoon, the plant manager at Clearon in South Charleston announced the cause of the leak is unknown.

According to the plant manager, chlorine was released from its facility at 8:25 a.m. Clearon is located along MacCorkle Avenue.

118 employees were at the plant at the time of the release. The plant manager says no one was seriously hurt, but one employee was taken to the hospital after becoming stressed. That employee is now back at work.



APP000452

Kanawha County Emergency Management has been on scene since the initial call.

OSHA is also on scene investigating the incident.

A shelter in place was issued shortly after the incident for the area west of the Mound in South Charleston, Spring Hill, North Charleston and the city of Dunbar. It was lifted just after 10 a.m.

The plant manager says the shelter in place was issued only as a precaution. The chemical leak was not believed to be a real threat to the public.

The city of South Charleston also held a news release to talk about the incident.

Mayor Frank Mullens says first responders faced some challenges at the scene, including working through crowded, tight spaces within the plant. A couple of firefighters were treated for heat exhaustion due to those conditions, according to Mullens.

Emergency responders say the company was helpful during the leak and followed proper protocol, according to Mullens.

Emergency officials say the chemical left in air is not strong enough to cause any problems or illness.

Clearon Corp. is a premier, world-class manufacturer and worldwide supplier of water treatment chemicals, according to the company's website.

Clearon employs 120 people at its South Charleston facility. The company bought the facility from Olin who purchased it from FMC, according to county records. Clearon has been operating in South Charleston since 1995.

Clearon also operates a tableting plant in Ordinance Park.

Keep clicking on WSAZ.com for the latest information.

UPDATE 10/2/13 @ 11:50 a.m.

SOUTH CHARLESTON, W.Va. (WSAZ) -- One person has been taken to the hospital after a chemical leak in South Charleston.

The leak was reported at 8:45 a.m. Wednesday at Clearon along MacCorkle Avenue in South Charleston.

South Charleston Mayor Frank Mullens tells WSAZ.com a plant employee was taken to the hospital only as a precaution. A couple of firefighters were also treated at the scene for heat exhaustion, according to Mullens. No serious injuries have been reported.

The chemical released was chlorinated dry bleach, according to a news release. Sources tell WSAZ.com the chemical is used in cleaning supplies and in swimming pool products.

Right now, investigators are still trying to figure out how much of the chemical was released.

A shelter in place was issued shortly after the incident for the area west of the Mound in South Charleston, Spring Hill, North Charleston and the city of Dunbar. It was lifted just after 10 a.m.

The county's Emergency Management crew remains on scene investigating the incident.

Jennifer Sayre, county manager reports the situation appears to be stable. Crews will continue to monitor the situation and advise the public of any changes.

APP000453

Our crew at the scene reports two ambulances have been at the plant.

Sayre tells WSAZ.com it's still unclear how much of the chemical has been released. However, it does not appear there was a large amount released.

If this would have been a major release, the U.S. Chemical Safety Board would have been called in to investigate.

However, WSAZ.com has learned the U.S. Chemical Safety Board is currently shut down due to the recent furloughs issued after Tuesday's government shutdown.

Hillary J. Cohen, Communications Manager for the U.S. Safety Board, issued a statement saying "the agency has effectively shut down and all chemical accident investigators have been furloughed. We have a skeleton crew of 3 people on duty, to reopen the agency whenever that is warranted."

A spokesperson with the West Virginia Department of Military Affairs and Public Safety tells WSAZ.com no matter the extent of the emergency, first responders remain on duty, despite the furloughs issued on Monday. Agencies affected by the furloughs, including the CSB, FEMA, EPA and MSHA have contingency plans in case a major disaster would happen during the government shut down.

Clearon Corp. is a premier, world-class manufacturer and worldwide supplier of water treatment chemicals, according to the company's website.

Clearon employees 120 people at its South Charleston facility. The company bought the facility from Olin who purchased it from FMC, according to county records. Clearon has been operating in South Charleston since 1995.

Clearon also operates a tableting plant in Ordinance Park.

Keep clicking on WSAZ.com for the latest information.

UPDATE @ 10:15 a.m.

SOUTH CHARLESTON, W.Va. (WSAZ) -- A shelter in place has been lifted after a chemical leak in South Charleston.

According to Metro 911, the shelter in place was lifted just after 10 a.m. for the area west of the Mound in South Charleston, Spring Hill, North Charleston and the city of Dunbar.

Jennifer Sayre, Kanawha County Manager, says crews from Clearon Corporation contacted Metro 911 to report a leak at its plant along MacCorkle Avenue. The call came into Metro at 8:46 a.m.

The chemical released was chlorinated dry bleach, according to a news release. Sources tell WSAZ.com the chemical is used in cleaning supplies and in swimming pool products.

The county's Emergency Management crew is on scene at the Clearon Plant evaluating the situation, Sayre said.

At this time, Sayre reports the situation appears to be stable. Crews will continue to monitor the situation and advise the public of any changes.

Our crew at the scene reports two ambulances have now arrived at the plant. However, no other information is being released at this time.

Sayre tells WSAZ.com it's still unclear how much of the chemical has been released or if there are any injuries. However, it does not appear there was a large amount released.

If this would have been a major release, the U.S. Chemical Safety Board would have been called in to investigate.

However, WSAZ.com has learned the U.S. Chemical Safety Board is currently shut down due to the recent furloughs issued after Tuesday's government shutdown.

Hillary J. Cohen, Communications Manager for the U.S. Safety Board, issued a statement saying "the agency has effectively shut down and all chemical accident investigators have been furloughed. We have a skeleton crew of 3 people on duty, to reopen the agency whenever that is warranted."

Again, Sayre reports at this point, it appears federal investigators won't be needed.

Clearon Corp. is a premier, world-class manufacturer and worldwide supplier of water treatment chemicals, according to the company's website.

Clearon employs 120 people at its South Charleston facility. The company bought the facility from Olin who purchased it from FMC, according to county records. Clearon has been operating in South Charleston since 1995.

Clearon also operates a tableting plant in Ordinance Park.

Clearon actually shut down its facility last April due to market conditions. However, Mayor Mullens says it reopened by the end of 2012.

The plant manager is expected to release more information at 1:30 p.m. today.

Keep clicking on WSAZ.com for the latest information.

UPDATE

SOUTH CHARLESTON, W.Va. (WSAZ) -- A shelter in place has now been issued in the Kanawha Valley after a chemical leak.

C.W. Sigman with Emergency Management tells WSAZ.com a shelter in place has now been issued for areas west of the Clearon facility in South Charleston. This would include the area near the Mound in South Charleston, Spring Hill, North Charleston and the city of Dunbar.

According to a spokesperson with Kanawha County Schools, schools in Dunbar, South Charleston and North Charleston are sheltering in place.

Jennifer Sayre, County Manager, says crews from Clearon Corporation contacted Metro 911 to report a leak at its plant along MacCorkle Avenue. The call came into Metro at 8:46 a.m.

The chemical release was chlorinated dry bleach, according to a news release.

The county's Emergency Management is on scene at the Clearon Plant evaluating the situation, Sayre said.

At this time, Sayre reports the situation appears to be stable. Crews will continue to monitor the situation and advise the public of any changes.

We have a crew at the scene. Keep clicking on WSAZ.com for the latest information.

APP000455

UPDATE @ 9:15 a.m.

SOUTH CHARLESTON, W.Va. (WSAZ) -- Emergency crews are on the scene of a chemical leak in South Charleston where the situation appears to be stable.

Jennifer Sayre, County Manager, says crews from Clearon Corporation contacted Metro 911 to report a leak at its plant along MacCorkle Avenue. The call came into Metro at 8:46 a.m.

The chemical release was chlorinated dry bleach, according to a news release.

The county's Emergency Management is on scene at the Clearon Plant evaluating the situation, Sayre said.

At this time, Sayre reports the situation appears to be stable. Crews will continue to monitor the situation and advise the public of any changes.

We have a crew at the scene. Keep clicking on WSAZ.com for the latest information.

ORIGINAL STORY

SOUTH CHARLESTON, W.Va. (WSAZ) -- Emergency crews are investigating a leak at a facility in South Charleston.

Kanawha County 911 Dispatchers tell WSAZ.com an unknown amount of Chlorinated Dry Bleach has leaked from the Clearon along MacCorkle Avenue in South Charleston.

C.W. Sigman with the county's Emergency Management just arrived on scene.

Drivers in the area tell WSAZ.com there is a haze over Dunbar and South Charleston. It's unclear if it is related to the incident.

No other details are being released at this time.

We have a crew headed to the scene. Keep clicking on WSAZ.com for the latest information.

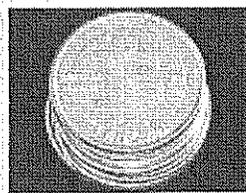
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The Register-Herald, Beckley, West Virginia

January 25, 2014

Safety board: PPH, MCHM should not be in drinking water at any level

By *Pamela Pritt*
Register-Herald Reporter

CHARLESTON — Crude MCHM and its companion chemical PPH should not be in drinking water at any level, the chair of the Chemical Safety Board said Friday morning.

Dr. Rafael Moure-Eraso said those chemicals are created to be reactive with other chemicals and have the potential to affect human beings.

“We should be worried about it,” Moure-Eraso said.

The company that manufactures the chemicals — Eastman Chemicals produced the MCHM, Dow made the PPH — is responsible for testing the chemicals and providing answers about chemical safety guidelines, Moure-Eraso said. The company has “provided very little information,” he continued, but has conducted two or three small toxicological studies. Those studies are not “adequate to determine chronic effects over a long period of time,” the director said.

The CSB’s lead investigator, Johnnie Banks, said the manufacturer has repeatedly reported no data available on MCHM’s and PPH’s toxicology.

“This came as a surprise to us, that the chemicals have no information,” Banks said. Although he said he’d seen chemical spills before, this event is “striking because it affected such a large number of people.”

A cocktail of Crude MCHM and PPH, both chemical compounds used in the coal cleaning process, leaked from the bottom of a pre-World War II era tank on the banks of the Elk River on Jan. 9. The chemicals leached through the soil, into a containment tank and then into the river a little more than half-a-mile above the sole water intake for 300,000 state residents.

The leak, detected because area residents smelled a “licorice-like” odor, caused a “do not use” order for tap water and a state of emergency for a nine-county region. The tanks belonged to Freedom Industries.

Eastman’s Safety Data Sheet for Crude MCHM warns that the chemical is harmful if swallowed, and describes first aid measures for eye and skin contact that include flushing with “plenty of water,” and then seeking medical attention. Measures for ingestion it says are “not relevant, due to the form of the product.”

As for accidental release measures, the SDS says “avoid release to the environment,” and says that spills should be absorbed with vermiculite or other inert material, then placed in a chemical waste container.

“Prevent runoff from entering drains, sewers, or streams. Dike for later disposal,” the SDS says.

The SDS says MCHM's chemical stability is not fully evaluated, but strong oxidizing agents are "incompatible materials."

Moure-Eraso said the CSB is still in the preliminary stages of its investigation, and will examine a number of issues including: siting of chemical facilities in proximity to water sources; integrity of storage tanks, among them anti-leak designs and leak sensors; and the regulatory framework of the Kanawha Valley and the state.

The director said his agency's report will include "lessons learned from this tragic accident to help prevent a similar event from occurring again."

Banks said the entire investigation will take up to a year, causing Sen. Majority Leader John Unger D-Berkeley some angst about a Senate bill aiming to regulate above ground storage tanks. Unger said the leak at Freedom Industries is an "urgent" matter, but wants to have CSB recommendations included in the bill if possible.

"There's a sense of urgency in our mission, as well," Banks said. The lead investigator said urgent recommendations could be developed.

Moure-Eraso said the CSB investigated the Bayer CropScience pesticide manufacturing explosion in 2008. The report, released two years ago, made recommendations about developing a chemical release prevention program, which Moure-Eraso said "would have prevented the accident we're dealing with today."

National Guard Adjutant General Maj. Gen. James Hoyer reported to the Joint Committee on Water Resources, Friday as well.

Hoyer said the Guard will continue to take water samples from the Elk for another week and provide data from the sampling results as quickly as possible.

Hoyer said 20 million bottles of water had been distributed since the chemical spill on Jan. 9. The general credited volunteers from community organizations and churches for helping with the effort to distribute potable water to the valley residents.

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January 14, 2014

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Discussion

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State acknowledges it had no plan for Freedom spill

By Ken Ward Jr.
Staff writer

CHARLESTON, W.Va. -- Emergency planners at the state and federal level have conceded that they never put together any strategy for dealing with spills of a toxic chemical from the Freedom Industries' tank farm, despite its location just 1.5 miles upstream from a drinking water intake serving 300,000 people.

Officials on Tuesday acknowledged the lack of such a plan, but state officials say a key federal law -- passed after major chemical accidents, including one nearly 30 years ago in Kanawha County -- did not specifically require a release of the material Crude MCHM to be modeled or planned for.

Still, experts say that it defies common sense for federal and state regulators to have done so little to consider the potential impacts, given the close proximity of Freedom's operations to the West Virginia American Water intake on the Elk River.

"Much remains to be investigated in the catastrophe -- managerial competency, local, state and federal competency, regulatory sufficiency and ultimately the public culture that protects or weakens the security of essential infrastructure," said industrial safety expert Gerald Poje, a former member of the U.S. Chemical Safety Board.

As the water company continued the slow process of lifting a "do not use" order that's been placed across parts of nine counties since Thursday evening, questions continued about whether government officials could have done more to prevent the incident.

A wide variety of investigations are underway by federal agencies, state officials and lawmakers in both Charleston and Washington.

"This whole series of events is unacceptable," said state Sen. John Unger, D-Berkeley and chairman of the Joint Legislative Oversight Commission on State Water Resources, which is planning to hold hearings and draft legislation in the wake of the leak.

"We want to find out how long this chemical was leaking and who knew about it, and if no one knew, why not," Unger said Tuesday. "There will definitely be a change to the way things have been done in the past."

Chemical Safety Board officials arrived in town Monday and have begun their site examination, and U.S. Attorney Booth Goodwin was encouraging all agencies to cooperate with his office to avoid jeopardizing its criminal probe.

Sen. Jay Rockefeller, D-W.Va., called on the U.S. Centers for Disease Control and Prevention and the U.S. Environmental Protection Agency to launch a study to gather more information about the potential long-term health impacts of the spill.

Both the CDC and the EPA have refused repeated requests for interviews with agency officials who are involved in the response to the spill and the development of the 1-part-per-million limit of Crude MCHM that state officials have insisted is safe.

"Our role right now is very limited," said EPA spokeswoman Alisha Johnson. "As we look at this, we are looking at where we have a role. Right now, that has not been determined."

At the same time, some questions about the incident remain focused on the simple fact that a significant quantity of a toxic material was being stored just upriver from the drinking water intake in the first place.

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Every year since at least 2008, Freedom Industries told state and local officials that the company's Etowah Terminal stored up to 1 million pounds of Crude MCHM at its Elk River facility.

Those disclosures came in what's called a Tier II form, filed with the state Department of Military Affairs and Public Safety under the federal Emergency Planning and Community Right to Know Act.

That law, known as EPCRA, was meant to give state and local emergency responders information to allow them to better plan for chemical leaks and spills. Congress began debating the matter after thousands of people died in a Union Carbide leak in Bhopal, India, in 1984, but didn't act until after a smaller leak at a Carbide plant in Institute injured 135 people.

In the wake of last week's spill at Freedom Industries, state and local officials -- along with West Virginia American Water -- have said they knew little about the chemical, its threats to public health, or how to properly treat it or get it out of drinking water supplies.

Technically, the chemical inventory forms go to the State Emergency Response Commission, which is chaired by Homeland Security chief Jimmy Gianato and is under the broad umbrella of the DMAPS.

Lawrence Messina, spokesman for the department, said Thursday that agency officials review the Tier II forms they receive from 9,500 different entities every year, mostly looking to see if chemical inventories from different facilities have changed.

As for planning for leaks and spills based on those reports, Messina said, "The folks who do reviews of these are really at the local level." And, he said, the law does not specifically mandate any emergency planning at all for Crude MCHM, or 4-methylcyclohexanemethanol, the material that leaked from Freedom Industries.

Under the law, companies have to file chemical inventory reports for a long list of chemicals for which the U.S. Occupational Safety and Health Administration requires employers to keep material safety data sheets on hand.

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Under the law, companies have to file chemical inventory reports for a long list of chemicals for which the U.S. Occupational Safety and Health Administration requires employers to keep material safety data sheets on hand.

But, Messina said, emergency planning is only required for facilities that store certain amounts of a smaller set of chemicals classified for purposes of EPCRA as "extremely hazardous." That list doesn't include Crude MCHM, Messina said, so no planning activities were specifically required.

"This department and its divisions strive to carry out the law as it is given to us by the policymakers," Messina said. "This department is doing everything that is required of it."

Still, state and federal law both give the governor and the SERC authority to add facilities to the emergency-planning list, regardless of whether they meet the specific legal definitions that would require it.

Kent Carper, president of the Kanawha County Commission, said there's simply no question that the Freedom Industries site should have been included in emergency plans, given that it was "hidden in plain sight" so close to an important regional water intake.

"I'm not going to stand here and lie to the people of this county and say we had a plan for this," Carper said. "I'm just going to deal with it."

Carper said local emergency planners "need to step up to the plate."

In Kanawha County, emergency officials, who are charged by law with chemical accident planning, didn't act to prepare for this type of incident, even though they had been warned for years about storage of toxic chemicals so close to the West Virginia American Water plant serving the Kanawha Valley and surrounding region.

Larry Zuspan, administrator of the Kanawha-Putnam Emergency Planning Committee, said that when Thursday's spill initially happened, he had a hard time finding the chemical inventory reports for the site. Company officials had submitted the reports, he said, under the name of Etowah River Terminal -- their name for the operation -- rather than under Freedom Industries, Zuspan said.

"That kind of threw us for a loop," he said. "Why did they do it that way?"

Zuspan said that he's not aware of any efforts by his agency to use the Freedom Industries' chemical inventory report for emergency preparedness activities.

"That's just something that's kind of fallen by the wayside," Zuspan said. "For a small company like this, it just kind of fell through the cracks."

C.W. Sigman, deputy director of emergency services for Kanawha County, said he became familiar with the material that spilled because of previous odor complaints at one site in St. Albans and another between Marmet and Chesapeake.

Several years ago, Sigman said, he drove to the eastern Kanawha County site on a Sunday, his wife in tow, to investigate an odor complaint. The smell helped him find the name of the chemical and then look it up on the county's chemical inventory filings.

"My wife Googles 'smells like licorice,' and we find it," Sigman said.

But, Sigman said, local officials never examined the potential for a spill at Freedom Industries to affect the region's water. "Specifically on that particular plant, other than knowing what the material was, I don't know of any specific planning," Sigman said.

In recent days, Gov. Earl Ray Tomblin has said that he has the Department of Environmental Protection working on potential legislation to address situations like the chemical spill.

DEP Secretary Randy Huffman said his agency is looking at options for permitting and inspections of small chemical tank farms like the one operated by Freedom Industries.

But Huffman said he wasn't aware whether there were any discussions about the state taking action now on a 3-year-old federal Chemical Safety Board recommendation to create a new chemical accident prevention program.

And so far there has been no public mention of beefing up the state's review of chemical inventory forms, or expanding emergency planning requirements to include sites like Freedom's.

Evan Hansen, an environmental consultant with the Morgantown-based firm Downstream Strategies, noted though that the DEP never exercised its existing authority to inspect the Freedom Industries' site under the company's state-issued stormwater runoff permit.

"I can grant that because of resource constraints maybe you can't inspect every single site, but if

you are going to do any prioritizing, in your [water pollution], then this would be at the top of the list," Hansen said.

Reach Ken Ward Jr. at kw...@wvgazette.com or 304-348-1702.

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Chris Dorst

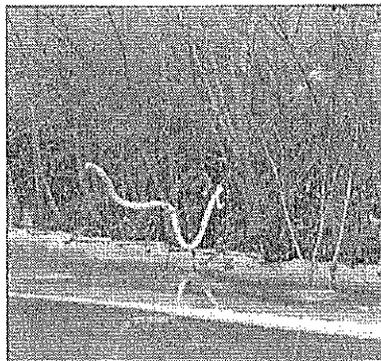
Shoppers at the Kroger on Charleston's West Side -- and at other stores throughout the region -- loaded their carts, baskets and arms with bottled water after residents in eight counties were told Thursday not to drink, wash with or cook with water provided by West Virginia American Water. A chemical leak into the Elk River, near the water company's treatment facility, prompted Gov. Earl Ray Tomblin to declare a state of emergency in Kanawha, Putnam, Boone, Jackson and Lincoln counties.

By Rachel Molenda

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Customers of several public service districts, including Lincoln, Queen Shoals, Reamer,



Chris Dorst

A Freedom Industries worker places a buoy in the Elk River at the site of a chemical leak that has fouled the drinking water in five West Virginia counties.

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Culloden and Hurricane, were also told not to use their water.

The ban could affect more than 100,000 West Virginia American Water customers, including restaurants, businesses and hospitals. Residents swarmed grocery stores, convenience stores and anywhere else with bottled water Thursday evening, and shelves were quickly depleted.

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said: "Nobody really knows how dangerous it could be. However, it is in the system.

"It's just so important, according to the health department, as well as West Virginia American: Please don't drink, don't wash with, don't do anything with the water," the governor said Thursday night at the state Capitol.

Water was being transported into the affected counties, and emergency officials said they planned to set up distribution centers.

Col. Mike Cadle at the state Air National Guard's 130th Airlift Wing said 51 tractor-trailers loaded with water were headed to West Virginia from a Federal Emergency Management Agency facility in Maryland.

A C-130 cargo aircraft took off from Yeager Airport at 7:05 p.m. for Martinsburg to pick up the water. Cadle said that if the trucks arrived too late to fly the water in Thursday, the trucks would continue driving through the night and arrive at the 130th on Friday morning for distribution.

It was not clear Thursday night what time distribution centers would be set up today, but Lt. Col. Todd Harrell of the state National Guard said a center would be set up at the Charleston Civic Center to serve customers from Kanawha and Jackson counties. Another center would be set up at the Putnam County Courthouse in Winfield, he said.

Distribution centers would also be set up at the 911 center in Lincoln County, Queen Shoals in Clay County and the Sharples Volunteer Fire Department in Logan County, Harrell said.

Distribution points for Boone, Roane and Cabell counties were yet to be determined late Thursday.

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The chemical is used in the processing of coal.

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When asked what might happen if a person consumed the chemical, McIntyre didn't get specific, only saying "it's not particularly lethal in its usage form" and the effects of the chemical would depend on its concentration.

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Mike Dorsey, director of emergency response and homeland security for the state Department of Environmental Protection, said his division learned of the incident around noon from Department of Environmental Protection air-quality officials -- who had received odor complaints about the facility as early as 7:30 a.m.

The DEP's air-quality officials discovered the spill -- which the company had not self-reported to regulatory agencies -- and called Dorsey's unit, which handles such matters for the DEP.

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State investigators discovered the material was leaking from the bottom of a storage tank, and had overwhelmed a concrete dike meant to serve as "secondary containment" around the tank, Dorsey said.

"That was going over the hill into the river," Dorsey said. "Apparently, it had been leaking for some time. We just don't know how long."

The state Department of Homeland Security has contacted the Federal Emergency Management Agency to try to have more bottled water brought into the area, Tomblin said. Later Thursday, the governor said he'd spoken with FEMA's director, Craig Fugate.

Freedom Industries produces "freeze conditioning agents, dust control palliatives, flotation reagents [and] water treatment polymers," among other chemicals, according to its website.

Freedom Industries officials, including the company's president, Dennis Farrell, did not return repeated phone calls Thursday.

Earlier in the day, some emergency officials were saying they had found little information about potential toxic effects of the substance.

One material-safety data sheet, or MSDS, said, "no specific information is available ... regarding the toxic effects of this material for humans.

"However, exposure to any chemical should be kept to a minimum," the MSDS said. "Skin and eye contact may result in irritation. May be harmful if inhaled or ingested."

Less than three hours before the state of emergency was declared, an official statement from West Virginia American Water was issued assuring the public and news media that the spill "does not present a health risk to customers."

The water company announced an emergency news conference regarding the spill at 5:09 p.m. and Tomblin officially announced the state of emergency around 6 p.m.

"This is not a chemical that we deal with every day. It's not the type of thing we would see in dealing with a water treatment plant," McIntyre said. "We took some time to understand even what we were dealing with at the time."

McIntyre said the company will have to do "extensive flushing" to make sure the contaminant is out of its system. He couldn't say how long the process will take.

State Homeland Security Director Jimmy Gianato advised those customers with concerns of exposure or consumption of the chemical can call the Poison Control Center at 1-800-222-1222. If someone is obviously sick, they should go to the hospital or call 911, Gianato said.

House of Delegates spokeswoman Stacey Ruckle said the House wouldn't conduct any business today, and would reconvene at 1 p.m. Monday.

Staff members at Thomas Memorial and Saint Francis hospitals were told not to use water except for flushing the toilets, spokeswoman Paige Johnson said Thursday.

The hospitals have some bottled water on hand and they're getting more, Johnson said.

She didn't know of any patients coming to the hospital complaining of problems associated with drinking the contaminated water.

CAMC has canceled all procedures for today, officials said.

Meadowbrook Acres Nursing Center, a 60-bed nursing home in Charleston, was prepared, said administrator Kim Toney.

"We keep a three-day emergency supply, so we should be fine," Toney said. "We're planning for more but we've got enough to last until we can get more water in here."

At the Charleston Town Center Mall, marketing director Lisa McCracken said Thursday evening, "We've closed our restaurants and we closed our treateries. We've turned off all the public restroom faucets, and we have issued an advisory mall-wide to the tenants, telling them not to use the faucets in their establishments."

Crystal Del Giudice, a supervisor at the Starbucks coffee shop in the mall, said employees ran out to buy hand sanitizer so they could clean themselves up after they closed the store.

"It's like the apocalypse," she said, half-jokingly.

Several mall restaurants had signs posted, informing customers that they were closed because of the water emergency.

At the Kroger in Kanawha City, shelves in the bottled-water aisle were nearly bare. A Charleston police officer kept an eye on the crowd.

Kerstin Halstead of Campbells Creek was doing her regular shopping when her husband called and told her to buy water.

"People have been grabbing it like crazy," she said as she loaded two cases of bottled water into her SUV, "and some people were getting -- well, they could have shared more."

The East End Rite-Aid ran out of water just after 6:30 p.m., according to a store employee. Customers were buying ice instead.

Ruby Piscopo, 28, of Charleston, and Christi Pritt, 29, of Belle, were having an after-work drink when they heard about the chemical leak. "We started getting texts and changed the TV to the news," Piscopo said. "I wasn't concerned until someone said it could go on for days."

The two bought \$30 worth of water between them. They had other friends buying water throughout the city, with the intention of splitting it up later.

Staff writers Ken Ward Jr., Caitlin Cook, Rusty Marks, Lori Kersey and David Gutman contributed to this report.

Reach Rachel Molenda at rachel.mol...@wvgazette.com or 304-348-5102.

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APP000470

Chemical levels in West Virginia water drop, but still no end in sight to ban

By Greg Botelho and Tom Watkins, CNN
updated 12:00 AM EST, Sat January 11, 2014

CNN.com

(CNN) -- The level of odorous chemical in West Virginians' water dropped Friday, but not enough for authorities to lift a warning to avoid drinking, cooking or bathing with it or to give a clear idea as to when things will change.

Gov. Earl Ray Tomblin described the situation in nine counties Friday night as "pretty bad," both for residents being told the only thing they should do with their running water is flush their toilets and schools, restaurants, hotels and other businesses forced to close.

One bit of good news is tests on the affected water supply, which are being conducted on an hourly basis, show "the chemical level is declining."

"But we're just not sure exactly how long it's going to take before it's acceptable to lift the do-not-drink ban," the governor told CNN.

Much of the anger centers around the coal-industry company from which the chemical leak occurred. And there's also frustration among some -- including Danny Jones, the mayor of West Virginia's most populated city and capital, Charleston -- that the water company trying to deal with the resulting mess still doesn't have a timeline for when things will return to normal.

"It's caused us more problems than you could ever imagine," Jones said Friday night, pointing out people can't do things like wash their hands after going to bathroom or wash their clothes.

"... It's a prison from which we would like to be released."

Utility official on water: 'I can't say it is safe'

The crisis began Thursday, when residents of Kanawha County reported a foul odor -- similar to licorice -- in the air.

The Kanawha County Fire Department and the state Department of Environmental Protection that day traced that smell to a leak from a 35,000-gallon storage tank along the Elk River.

The chemical had overflowed a containment area around the tank run by Freedom Industries, then migrated over land and through the soil into the river. The leak happened about a mile upriver from the impacted West Virginia American Water Co. plant.

After concluding the tap water was contaminated late Thursday afternoon, a stop-use warning went out to customers in Boone, Cabell, Clay, Jackson, Kanawha, Lincoln, Logan, Putnam and Roane counties.

West Virginia American Water's president Jeff McIntyre said Friday he didn't believe the substance -- 4-methylcyclohexane methanol -- was still flowing. But that doesn't mean the

APP000471

situation will be resolved soon.

What is 4-methylcyclohexane methanol?

"It is not intended to be in the water (or) distribution system," McIntyre said. "... Once it's in there, there's no more treatment for it."

While there haven't been reported widespread sicknesses, the ordeal is having a big impact.

Kanawha County Commission president Kent Carper told reporters Friday more than 300,000 people have been affected. Tomblin gave a lower estimate -- saying it was "way over 100,000 (but) we don't have an exact number yet of people ... without water."

Businesses -- including 15 McDonald's in the area, according to their ownership group -- have shut down. Hospitals have taken emergency measures to conserve water. And residents have been scrambling, as evidenced by empty shelves and worries at home.

"It's all very hectic," said Patricia Pearl of Charleston. "You don't even want to go to the grocery store. I think everyone is in a panic."

Emergency rooms busy, businesses closed

The emergency's ripple effects included the closure Friday of the state Supreme Court of Appeals in Charleston, courts in Boone and Lincoln counties, and the cancellation of classes at West Virginia State University.

In addition to shuttering her shop Flowers & More on Friday -- usually her busiest day -- Pearl noted other ripple effects, like how her 60-year-old husband's physical therapy session tied to a recent knee surgery was canceled.

"The problem is that no one seems to know when we'll have the water restored," she said.

First responders and hospitals saw a rush of activity after the alert went out. Carper said more than 1,000 calls were placed in four or five hours to the 911 center, 24 of them for emergency medical services -- five of which led to people being taken to hospitals.

Water company spokeswoman Laura Jordan urged people to get medical attention "if they are feeling something ... isn't right."

Many -- perhaps too many -- did just that.

"Our emergency rooms have been very busy with individuals unnecessarily concerned and presenting no symptoms," said Charleston Area Medical Center.

The restrictions affected the hospital in other ways, too. It put into place linen conservation and alternative cleaning methods and turned away all but emergency patients.

Daniel Stewart sued the water utility and Freedom Industries, saying his kidney transplant surgery was canceled because of the ordeal "forcing (him) to undergo dialysis, pain and

suffering and continued illness due to his renal failure and other medical damages."

West Virginia American Water "failed to maintain an appropriate emergency response plan," Stewart claimed, while Freedom "failed to properly maintain and store its chemicals."

A lawsuit was filed Friday by a man whose scheduled kidney transplant was canceled due to the water issue, said attorney Jesse Forbes said.

CNN reached out to the water company about the lawsuit.

"West Virginia American Water is not focused on litigation at this time. Our focus is on our customers and providing safe adequate water supplies," the company said in a statement.

Leaked chemical used to wash coal

Freedom Industries is feeling the heat from others as well.

President Gary Southern tried several times to walk away from a press conference Friday evening, saying "it has been an extremely long day," only to be called back by insistent reporters -- including one who noted how long a day it has been for all the West Virginians now without drinkable water or a full explanation as to why.

"This incident is extremely unfortunate and unanticipated," Southern said. "... This has been a very, very taxing process."

Freedom's crippled steel tank is about a mile upriver from the West Virginia American Water plant, according to McIntyre. According to Carper, the county official, it's part of a former Pennzoil refinery dating back to the 1930s or 1940s. Jones, Charleston's mayor, said he believes "the chemicals went through (holes in a retaining) wall."

Southern said two Freedom employees noticed material leaking from a storage tank into a dyke around 10:30 a.m. Thursday. They contacted authorities and began the cleanup process -- including hauling away the chemical still in the tank and vacuuming up some in the nearby ground.

"We have mitigated the risk, we believe, in terms of further material leaving this facility," said the head of Freedom, which supplies products for the coal-mining industry.

Southern said he couldn't say how much of 4-methylcyclohexane methanol -- which United Mine Workers spokesman Phil Smith explained is used to wash coal before it goes to market -- leaked, only that it was under 35,000 gallons. Tomblin said a maximum of 5,000 gallons of the chemical seeped out.

The Freedom Industries president downplayed the chemical's health effects, saying it has "very, very low toxicity" and opining it poses no danger to the public.

West Virginia American Water and government officials have a different take, as evidenced by the stop-use warning.

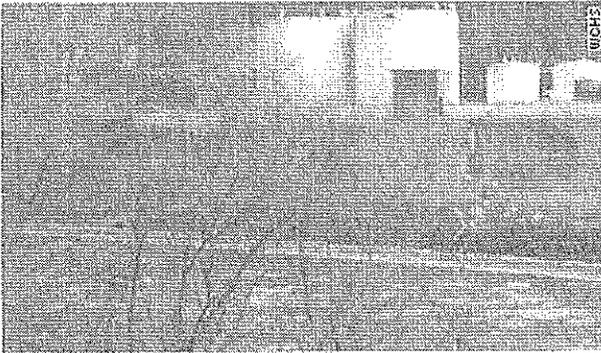
APP000473

As McIntyre said, "We don't know that the water is not safe, but I can't say it is safe."

The federal Environmental Protection Agency -- which doesn't yet have an "official role" in the response -- has taken no enforcement actions against Freedom Industries during the past five years, agency spokeswoman Alisha Johnson said.

West Virginia's Department of Environmental Protection ordered Freedom to take everything out of its 11 remaining above-ground storage tanks. This came hours after the department issued a "cease operations order" for the company, saying it could not receive any additional material until it addresses the effects of the leak and proves its structures are sound.

'I do not know how long this will last'



'Can't say' water's safe in West Va.

The rush now is on to fully assess and address the problem, and perhaps press criminal charges because of it.

Having declared a state of emergency affecting the nine involved counties, Tomblin urged West Virginians to look out for one another -- especially small children and the elderly.

To that point, he announced a "call to action drive" through Friday evening at the State Capitol to collect items such as bottled water, sanitizer, liquid baby formula, paper and plastic plates and utensils for those in need. This is in addition to water stations set up in malls, churches, high schools, recreation centers and fire departments.

The federal government has gotten involved as well, with President Barack Obama signed an emergency declaration authorizing the Federal Emergency Management Agency to coordinate disaster relief efforts.

FEMA said Friday that it was sending 75 trucks -- each carrying about 4,900 gallons of water -- to the area. Tomblin said this federal help -- for now, mostly in the form of cases of bottled water - is helpful, as are the contributions from many donating businesses.

U.S. Attorney Booth Goodwin said he and other federal authorities is looking into what happened, telling CNN Friday that "even a negligent release of this kind could be a criminal violation."

"It's really too early to tell whether criminal charges could be brought" against Freedom, he said Friday. "... We're going to want to figure out just exactly what occurred and when ... But right now, obviously, what we're trying to do is get people's water back on."

Meanwhile, West Virginia American Water is working intently as well, including teaming with DuPont and the U.S. Army Corps of Engineers to determine the contamination level. Jordan said the system would be flushed and may be returned to service in zones, but she would not speculate when that might occur.

APP000474

The water company also has provided 12 tanker trucks filled with water, and bought four tractor-trailer loads of bottled water for distribution to those in need, McIntyre said.

Tomblin noted that "there is no shortage of bottled water," but urged people to see a doctor immediately if they come down with nausea, dizziness, or eye or skin irritation. And he didn't make any promises as to when this emergency would end.

"I do not know how long this will last," the governor said.

CNN's AnneClaire Stapleton, Mike Ahlers, Paul Caron, Ashley Fantz, Ed Payne, Marlena Baldacci, Kevin Conlon, Susan Candiotti and Dave Alsup contributed to this report.

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STATE OF WEST VIRGINIA
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BUREAU FOR PUBLIC HEALTH

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Cabinet Secretary

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WATER ADVISORY FOR PREGNANT WOMEN

The West Virginia Bureau for Public Health advises, after consultation with the U.S. Centers for Disease Control and Prevention (CDC) this evening, that the CDC recommends—out of an abundance of caution—that pregnant women drink bottled water until there are no longer detectable levels of MCHM in the water distribution system. However, the CDC re-affirmed previous advice that it does not anticipate any adverse health effects from levels less than 1 ppm.

Guidance from the CDC is attached.

###

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Water Crisis

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Use of water 'your decision,' Tomblin says



Chip Ellis

Gov. Earl Ray Tomblin (center), flanked by U.S. Sen. Joe Manchin (left) and state Senate President Jeff Kessler, said Monday he thinks the choice for residents to start drinking their water again is a personal decision.

By Ken Ward Jr.
Staff writer

CHARLESTON, W.Va. -- Gov. Earl Ray

Tomblin on Monday told 300,000

Advertiser state residents that they should make their own decisions about using water from

West Virginia American Water's Elk River plant in the wake of this month's leak of the chemical Crude MCHM.

"It's your decision," the governor told reporters during a news conference at the Capitol. "If you do not feel comfortable drinking or cooking with this water, then use bottled water."

Tomblin emphasized that the U.S. Centers for Disease Control and Prevention has said the water is safe as long as it contains less than 1 part per million of the coal-cleaning chemical, which leaked into the Elk River from the Freedom Industries tank farm 1.5 miles upstream from the water intake.

Outside public health experts, though, have said the lack of much data on the chemical -- not an unusual situation for most chemicals -- makes it hard to be sure the CDC number is adequately protective, especially for young children.

Tomblin said he did not know about a U.S. Agency for Toxic Substance and Disease Register (ATSDR) recommendation that state officials advise affected residents to flush their home plumbing systems until they no longer smelled the chemical's licorice odor.

When asked why the state rejected the ATSDR's advice, Tomblin said, "I'm not aware that we did. I have not seen that."

The leak from Freedom Industries prompted a do-not-use order that covered 100,000 West Virginia American customers -- roughly 300,000 people -- across a nine-county region starting at

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about 5 p.m. Jan. 9.

Last week, officials with the water company and the state government gradually cleared all affected areas to resume using their tap water as sampling showed concentrations of Crude MCHM dropping below a 1-part-per-million screening level set by the CDC. The exception was an advisory, issued late Thursday, that pregnant women across the region drink only bottled water until absolutely no Crude MCHM is detected in water supplies.

As the water company's Internet map listed more and more areas moving into the "blue" area that officials said was safe, area residents were told to run their hot water for 15 minutes, their cold water for five minutes, and outside faucets for five minutes to flush the chemical from their homes.

But some residents have complained about odors during the flushing, and also that a licorice smell is lingering in their water days after they followed the flushing guidance.

In a prepared statement, water company spokeswoman Laura Jordan said that a Charleston Gazette story was the first time that West Virginia American had heard about the ATSDR recommendation on flushing times. But she said the recommendation would not have changed the company's advice to customers.

"Simply flushing until no odor is detected is not based upon the CDC's health recommendation and would have been an irresponsible instruction, as this excessive action would have emptied the water system and caused customers to go without water that was already determined to be under the health protective threshold for an indefinite amount of time," Jordan said in an email message.

The most recent water sampling data made available by state officials included samples taken through 6 p.m. on Jan. 18, and showed an increasing number of locations where none of the chemical could be detected.

CHARLESTON, W.Va. -- Gov. Earl Ray Tomblin on Monday told 300,000 state residents that they should make their own decisions about using water from West Virginia American Water's Elk River plant in the wake of this month's leak of the chemical Crude MCHM.

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The leak from Freedom Industries prompted a do-not-use order that covered 100,000 West Virginia American customers -- roughly 300,000 people -- across a nine-county region starting at about 5 p.m. Jan. 9.

Last week, officials with the water company and the state government gradually cleared all affected areas to resume using their tap water as sampling showed concentrations of Crude MCHM dropping below a 1-part-per-million screening level set by the CDC. The exception was an advisory, issued late Thursday, that pregnant women across the region drink only bottled water until absolutely no Crude MCHM is detected in water supplies.

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The most recent water sampling data made available by state officials included samples taken through 6 p.m. on Jan. 18, and showed an increasing number of locations where none of the chemical could be detected.

State officials have provided few details of their testing procedure, including whether they are checking only for Crude MCHM or also for any of that material's ingredients.

On Sunday, the Tomblin administration issued a statement that said the state's testing could detect to concentrations as small as 10 parts per billion. On Monday, officials from the Louisville Water Co. said that they were able to detect lower concentrations, as low as about 1 part per billion.

Asked why West Virginia was not using a method that would detect as low as the Louisville sampling, Tomblin again emphasized the CDC's guidance that anything below 1 part per million was safe for everyone except pregnant women. The state has issued an advisory warning pregnant women to drink only bottled water for now.

The governor said, "I'm not a scientist," adding that whether the detection limit is 10 parts per billion or 1 part per billion, the concentration involved "is still minuscule."

Tomblin answered questions from a small group of reporters following a news conference, held before a larger group including legislators and lobbyists, to announce his administration's plan for a new regulatory program for above-ground storage tanks.

Tomblin said his administration would be looking at all possible responses, including possibly revisiting a U.S. Chemical Safety Board recommendation, made twice following fatal chemical plant accidents in the Kanawha Valley, and create a new chemical accident prevention program.

"We're going to look at all of this," the governor said. "It's a very complex issue. I'm not a scientist. I have to follow the best information.

"All of this stuff is coming out," Tomblin said. "Right now there are recommendations from a lot of people."

Over the weekend, the Tomblin administration also tried to downplay the illnesses reported by residents who have sought medical attention, blaming the flu or anxiety over the water crisis.

Laura Vandenberg, an assistant professor of environmental health sciences at the University of Massachusetts-Amherst, said that there is little data to support the administration's comments.

"I also believe several statements are confusing the concept that just because there are no known dangers doesn't mean that something is safe," Vandenberg said.

"This is frustrating," she said. "I know that public health officials are trying to keep people from panicking, and I also know that people will start to notice small rashes or sore throats and automatically assume it is related to the spill.

"But answers to questions like, 'Are there known risks associated with this chemical mixing with household cleaners?' can be answered with a 'no' only because there are no known risks -- because this is completely unstudied," Vandenberg said.

Reach Ken Ward Jr. at kw...@wv Gazette.com or 304-348-1702.

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Marc Hutton · Top Commenter · The University of Utah

Yeeh well I am a Scientist, a chemist in fact, and a qualified HazMat Tech. It doesn't take someone with my qualifications to know that if you can still smell the chemical in your water you shouldn't drink it. Especially given the fact that the 1 PPM threshold on safety is in dispute and based on very limited data. Let us see Tomblin drinking, cooking with, doing his laundry in and taking baths in the water.

Reply · 30 · Like · Follow Post · January 20 at 5:39pm



Sam Smith · Follow · Works at Self Employed (Business)

Wow, folks its your decision, the W. VA government cannot hire or determine if the water is safe. SICK West Virginia Gov. Earl Ray Tomblin and U.S. Sen. Joe Manchin is covering up the biggest chemical spill in decades. These guys should be fired from their posts. The owner, J. Clifford Forrest, of the bankrupt Freedom Industries is now the owner of the new company. This guy also owns 2 coal mines. The whole situation is political cover up by Tomblin and Manchin. They are protecting a guy who should be charge and put in prison for poisoning the river. No one is in charge for safe water yet. In 2010 and 2012 J. Clifford Forrest spend millions against any regulations on coal and chemical. They want the EPA closed down, Speaker Boehner is working with them to defund the EPA. People of W. VA you need to elected honest law makers not the crooks in power now.

Reply · 21 · Like · Follow Post · January 20 at 8:55pm



Don Grantzki

If you leave ANY politician in office for more than four years, you deserve that which you get. This applies to all three branches of government.

Reply · 2 · Like · January 21 at 10:43am



Tom Ritchford · Top Commenter · Musician, artist, programmer at Self

Don Grantzki

That's ridiculous. First, you don't "deserve what you get" under any circumstances if you are cheated by your leaders.

But why should you fire someone after five years if they were doing a good job? In particular, it makes it almost impossible for independents to effect any change, because you're pretty well guaranteed to go back to RD after the independent is forced to leave.

You're basically saying, "I don't trust the voters to make the right decision, so I'm going to add this additional rule preventing them from voting from the person they want to vote for." You might as well say, "Democracy is stupid," and leave it at that.

Reply · 2 · Like · January 21 at 3:58pm



Don Grantzki

Tom Ritchford Uhhh, Tom. You're right! I don't trust the voters to get rid of the fruit of their voting labors after it begins to rot. When you perpetually return these guys to office, they become so filled with entitlement that their decision making never gets past what they feel is good for them.

Does Robert Byrd ring a bell for you? "He did more for the state of West Virginia than ANYBODY who ever served in Washington!" (that's because he was the ONLY one elected to that office for over seventy years)

Reply · Like · January 22 at 7:28am



Emily Porter · Follow · Top Commenter · Owner/partner and photographer at The Obarparts · 289

APP000480

Mike Becher

From: Evan Hansen <ehansen@downstreamstrategies.com>
Sent: Wednesday, February 5, 2014 8:49 AM
To: Mike Becher
Subject: Fwd: Water testing data request

----- Forwarded message -----

From: Ben Gilmer <bgilmer@downstreamstrategies.com>
Date: Tue, Feb 4, 2014 at 7:04 AM
Subject: Fwd: Water testing data request
To: Evan Hansen <ehansen@downstreamstrategies.com>, Marc Glass <mglass@downstreamstrategies.com>

Such BS!

Sent from my mobile. Please excuse typos.

Begin forwarded message:

From: "Gianato, Jimmy J" <Jimmy.J.Gianato@wv.gov>
Date: February 4, 2014, 12:52:02 AM EST
To: Ben Gilmer <bgilmer@downstreamstrategies.com>, "Howard, Paul S" <Paul.S.Howard@wv.gov>, "Hoyer, James A MG USARMY NG WVARNG (US)" <james.a.hoyer.mil@mail.mil>, "Kirk, Thomas L" <Thomas.L.Kirk@wv.gov>
Cc: "Messina, Lawrence C" <Lawrence.C.Messina@wv.gov>
Subject: RE: Water testing data request

Mr. Gilmer:

Thank you for your request. After review, we believe that the information that we have been provided as to specific locations of testing by GPS points is Protected Critical Infrastructure Data (PCII) and thus protected by various state and federal laws which do not allow us to release it. Since this data is WV American Water's, they could release the information if they chose to.

I understand the reason for your request, however, we are providing information to assist in identifying zones being tested along with approximate locations.

Thank you for your inquiry.

<image001.jpg>

Jimmy Gianato

Director/Homeland Security Advisor

West Virginia Division of Homeland Security
and Emergency Management

1900 Kanawha Blvd, E

Building 1 Room EB -80

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(304) 558-5380 office (304) 541-9990 cell

jimmy.j.gianato@wv.gov

HSDN jimmy.gianato.sle@dhs.gov

www.dhsem.wv.gov

Classification: UNCLASSIFIED
Caveats: NONE

From: Ben Gilmer [<mailto:bgilmer@downstreamstrategies.com>]

Sent: Friday, January 31, 2014 4:11 PM

To: Gianato, Jimmy J; Howard, Paul S

Subject: Water testing data request

Dear Mr. Gianato and Mr. Howard,

Lieutenant Colonel Greg Grant suggested I contact you in order to obtain additional information related to the MCHM water testing data. Specifically, we are hoping to acquire specific location coordinates (Lat/Long) for each test sample, which Lt.Col. Grant said is available. Based on our conversation, it is my understanding that the National Guard can share this information with us if it is requested from your office.

Among other project activities related to the chemical spill, we have been mapping the test results that you have released thus far alongside social, economic, and environmental data to help with community and public planning, outreach, and education. Here is the online web map: bit.ly/1gy6k8O (click on "Layers" to view more data).

This web map has been viewed over 2200 times and we have received lots of positive feedback from WV citizens, scientists, and decision makers. Among other feedback, numerous folks have told us that this web map has been a powerful tool for visualizing progress in the flushing process.

We have only been able to map a small subset of samples due to the limited location attributes that have been publicly released to date for each sample. The samples that you currently see in our online web application were mapped by relating hydrant test samples to a somewhat dated Kanawha County fire hydrant dataset. (and only a subset of these hydrants matched up)

We would sincerely appreciate it if you could request that Lt. Col. Grant provide specific location data for each test sample that has been collected to date. It is our understanding that this data is readily available, but just needs to be officially requested from your office.

Thank you very much for your time and assistance. Please do not hesitate to contact me with questions or concerns at [304.290.2644](tel:304.290.2644).

Sincerely,

Ben

Ben Gilmer | Downstream Strategies

Project Manager

w: [304.292.2450](tel:304.292.2450)

c: 304.290.2644

www.downstreamstrategies.com

--

Evan Hansen, President
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February 5, 2014

Extent of Freedom site contamination still unknown

by Ken Ward Jr.
Staff writer

CHARLESTON, W.Va. -- Federal investigators remain unsure how much chemical contamination there is in the soil and groundwater at the Freedom Industries' tank farm that spilled thousands of gallons of toxic chemicals in the region's Elk River drinking water supply.

So far, state and federal government agencies have provided the public with few details about the long-term plans for cleaning up the site, which is just 1.5 miles upstream from the West Virginia American Water intake.

Officials have also not provided even a description of the process for how that long-term plan will be developed -- or how members of the public can learn the details of it and provide any input.

"I know they are working on the plan right now," said Fran Burns, remedial project manager for the U.S. Environmental Protection Agency's regional office in Philadelphia.

EPA officials made Burns available for an interview to answer Gazette questions about the extent of contamination at the site, what has been done to control any additional runoff, and long-term prospects for remediation of the tank farm.

The state Department of Environmental Protection has not responded to requests for an interview or briefing to address those same issues.

Burns said that EPA believes that cleanup crews -- from a contractor hired by Freedom Industries -- have taken adequate steps to avoid further pollution from the site reaching the Elk River.

"As far as the extent of contamination of the spill, the work that has been going on at the site has contained anything that spilled," Burns said.

"Since the initial response, the material has been collected that could move off the site," Burns said. "There are a series of things in place, there are sumps, there is an interceptor trench, pumping the water that they collect in the trench. There have been booms set up in the river so that any material that would escape from the trench or off site is collected by the booms."

Burns said that some of the material from the Crude MCHM tank that leaked reached the river from surface runoff and some from underground leaching.

"We suspect that some of both happened," Burns said. We don't know how much of it is subsurface. It could be a little. It could be a lot.

"There are things in place now to control anything that may be remaining on the site," Burns said. "It's very hard to say what may be left at this point."

Burns said that water and any contaminants that end up in the interceptor trench are being stored on site or transported to Freedom's Poca Blending facility in Nitro.

During Tuesday's interview, Burns said he was not aware of any problems with the storage of those materials at the Poca Blending site.

"I'd have to get back to you," Burns said. "I'm not sure of any of the details of the secondary containment at the Poca facility."

The week after the Elk River spill, the DEP cited Freedom Industries for a broad variety of violations after an inspection of the Poca Blending site. The DEP issued five notices of violation, or NOVs, alleging improper storage of materials that could contaminate groundwater, failure to follow a DEP-issued stormwater permit, failure to provide required pollution discharge monitoring reports.

After the Burns interview, EPA spokeswoman Bonnie Smith said in an e-mail that her agency "is aware of the enforcement actions DEP has taken at the Nitro site. EPA has visited the Poca facility to investigate staging operations of the MCHM-contaminated water."

In a statement issued Tuesday, the DEP promised it would "closely monitor" the situation as Freedom Industries moves chemicals from the from its Nitro facility to a "coal facility" in Pennsylvania. But, DEP warned the process could create more of the licorice-like odors that have become common since the spill.

"During the moving of materials, there is a potential for area residents to detect odors," the DEP statement said. "The WVDEP will closely monitor the activity to ensure that it is done safely and with as minimal of an odor impact as possible."

Reach Ken Ward Jr. at kw...@wvgazette.com or 304-348-1702.



West Virginia Department of Environmental Protection
Office of Environmental Remediation
601 57th Street, S.E.
Charleston, WV 25304
(304) 926-0455

| | |
|-----------|------------------------|
| VRP NO. | 04506 |
| SITE NAME | PQS #5117-Etowah |
| LOCATION | Barlow Road-Charleston |

Site Visits/Inspection
Reports



VRP Project #: _____
 Brownfield Site: Yes No
 Report Date: _____
 Page _____ of _____

**OFFICE OF ENVIRONMENTAL REMEDIATION
 VOLUNTARY REMEDIATION PROJECT
 SITE VISIT/INSPECTION REPORT**

| | | | | | |
|------------------------------------|--------------|------------|----------------|--|--|
| APPLICANT | | | LRS | | |
| NAME: <i>Denzell Quarter State</i> | | | NAME: _____ | | |
| ADDRESS: _____ | | | ADDRESS: _____ | | |
| CITY: _____ | STATE: _____ | ZIP: _____ | PHONE: _____ | | |
| PHONE: () _____ | | | PHONE: _____ | | |
| CONTACT: _____ | | | CONTACT: _____ | | |

| | | |
|---------------------------------|----------------------|------------------------|
| LOCATION | | |
| FACILITY: <i>Ebawh Terminal</i> | | STREET ADDRESS: _____ |
| CITY: _____ | COUNTY: _____ | PHONE: () _____ |
| DATE OF VISIT: <i>8.15.03</i> | TIME IN: <i>7:45</i> | TIME OUT: <i>10:30</i> |

SITE STATUS: Abandoned Active UST's: Existing Former SURFACE SOIL STAINING: Yes No
 SURFACE WATER ON OR ADJACENT TO PROPERTY: Yes No EXISTING MONITORING WELLS: Yes No
 Existing Structures Including Dimensions and Use: _____
 Chemicals of Potential Concern: _____
 DRINKING WATER SOURCE: _____ SURROUNDING LAND USE: Residential Commercial Industrial
 GW Public Other _____ Recreational Agricultural Other vacant _____
 OTHER AREAS OF CONCERN: _____

COMMENTS

7:45 on site
8:05 Show Arrived Kurt & helper
 Sampled wells
 MW.1 - water clear no odor
 MW.2. " " no odor
 MW.3 " " no odor
 MW.7 - brown, turbid, no odor

Signature: _____ Date: _____
 David H. Hight, Project Manager email address: dhight@mail.dep.state.wv.us



VRP Project #: 04506
 Brownfield Site: Yes No
 Report Date: 07/31/03
 Page 1 of 1
 Site sketch completed Yes No

**OFFICE OF ENVIRONMENTAL REMEDIATION
 VOLUNTARY REMEDIATION PROJECT
 SITE VISIT/INSPECTION REPORT**

APPLICANT

LRS

| | | | | | | | | |
|-----------------------------|--------|------|------------|--------|------|------|--|--|
| NAME: Penzoil- Quaker State | | | NAME: | | | LRS# | | |
| ADDRESS: | | | ADDRESS: | | | | | |
| CITY: | STATE: | ZIP: | CITY: | STATE: | ZIP: | | | |
| PHONE: () | | | PHONE: () | | | | | |
| CONTACT: | | | EMAIL: | | | | | |
| EMAIL: | | | | | | | | |

LOCATION

| | | | | | |
|-------------------------------------|--|-----------------|-----------------------------------|--|--|
| FACILITY: POS Etowah Terminal #3117 | | | STREET ADDRESS: 1015 Harlow Drive | | |
| CITY: Charleston | | COUNTY: Kanawha | PHONE: () | | |
| Directions to site: | | | | | |
| DATE OF VISIT: | | TIME IN: | TIME OUT: | | |

| | | |
|--|--|---|
| SITE STATUS: Abandoned <input type="checkbox"/> Active <input checked="" type="checkbox"/> | UST's: Existing <input type="checkbox"/> Former <input type="checkbox"/> | SURFACE SOIL STAINING: Yes <input type="checkbox"/> No <input type="checkbox"/> |
| AST's: Existing <input type="checkbox"/> Former <input type="checkbox"/> | SURFACE WATER ON OR ADJACENT TO PROPERTY: Yes <input type="checkbox"/> No <input type="checkbox"/> | |
| EXISTING MONITORING WELLS: Yes <input type="checkbox"/> No <input type="checkbox"/> | Sampling/measurements obtained during visit: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |

Chemicals of Potential Concern:
 Existing Structures (dimensions and past & present use):
 Former Structures (dimensions and past use):

| | |
|--|---|
| DRINKING WATER SOURCE: GW <input type="checkbox"/> Public <input type="checkbox"/> Other <input type="checkbox"/> | SURROUNDING LAND USE: Residential <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Recreational <input type="checkbox"/> Agricultural <input type="checkbox"/> Other <input type="checkbox"/> |
|--|---|

OTHER AREAS OF CONCERN:

COMMENTS

-I traveled to the site on Thursday, 7/17/03 at the request of David Hight in order to conduct split soil sampling with Shaw Environmental, Inc. I arrived on site at 8:00 am. Present at the site were EnviroProbe, Inc., Bill Cosner (Shaw Environmental), and Kirk Curry (Shaw Environmental). Hole SB-1 was being prepared to be pushed when I arrived. Geoprobe operations were eventually suspended for the day due to difficulty in penetrating the layer of overlying concrete.

-I returned to the site on Monday, 7/21/03 @ 7:30 am to continue split soil sampling with Shaw Environmental. Roy Fox & Christopher Fox of Enviroprobe, Inc. were conducting the geoprobe work. Also present were Kirk Curry & Bill Cosner of Shaw Environmental who were performing the sampling. Holes SB-20 (1'-16"), SB-22 (2'-22"), SB-24 (2'-8"), & SB-25 (2'-8") were split sampled.

-I returned to the site on 7/22/03 @ 7:30 am to continue and complete split soil sampling. Roy Fox & Christopher Fox of Enviroprobe, Inc. were conducting the geoprobe work. Also present were Kirk Curry & Bill Cosner of Shaw Environmental who were performing the sampling. Holes SB-21 (2'-8"), SB-23 (2'-8"), & SB-26 (2'-8") were split sampled.

All samples were kept cold with ice in an insulated cooler and were delivered to REI Laboratories in Beaver, WV on 7/23/03 for analyses.

Signature: John Dempsey Date: 07/31/03
 John Dempsey, Project Manager email address: jdempsey@dep.state.wv.us



VRP Project #: _____
 Brownfield Site: Yes No
 Report Date: _____
 Page _____ of _____

**OFFICE OF ENVIRONMENTAL REMEDIATION
 VOLUNTARY REMEDIATION PROJECT
 SITE VISIT/INSPECTION REPORT**

| | | | | | |
|-------------------------------------|--------|------|-------------------------------|--|--|
| APPLICANT | | | LRS | | |
| NAME: <u>Fennell - Quaker State</u> | | | NAME: <u>Georgi Robertson</u> | | |
| ADDRESS: | | | ADDRESS: | | |
| CITY: | STATE: | ZIP: | PHONE: <u>768 2610</u> | | |
| CONTACT: <u>Donna M. Quinn</u> | | | LRS# | | |

LOCATION

| | | | |
|-------------------------------|-----------------------|-----------------|--|
| FACILITY: | | STREET ADDRESS: | |
| CITY: | COUNTY: | PHONE: () | |
| DATE OF VISIT: <u>7/15/03</u> | TIME IN: <u>15:30</u> | TIME OUT: | |

SITE STATUS: Abandoned Active UST's: Existing Former SURFACE SOIL STAINING: Yes No
 SURFACE WATER ON OR ADJACENT TO PROPERTY: Yes No EXISTING MONITORING WELLS: Yes No
 Existing Structures Including Dimensions and Use:
 Chemicals of Potential Concern:
 DRINKING WATER SOURCE: SURROUNDING LAND USE: Residential Commercial Industrial
 CW Public Other Recreational Agricultural Other vacant
 OTHER AREAS OF CONCERN:

COMMENTS

*To upper bus, partly cloudy
 Purpose to split soil samples*

Signature: _____ Date: _____
 David H. Hight, Project Manager email address: dhight@mail.dep.state.wy.us



VRP Project #: _____
 Brownfield Site: Yes No
 Report Date: _____
 Page _____ of _____

**OFFICE OF ENVIRONMENTAL REMEDIATION
 VOLUNTARY REMEDIATION PROJECT
 SITE VISIT/INSPECTION REPORT**

| | | | | | |
|------------------------------------|--------|------|------------|--|--|
| APPLICANT | | | LRS | | |
| NAME: <u>Pennzoil-Quaker State</u> | NAME: | | LRS# | | |
| ADDRESS: | | | ADDRESS: | | |
| CITY: | STATE: | ZIP: | PHONE: | | |
| PHONE: () | | | PHONE: | | |
| CONTACT: | | | CONTACT: | | |

| | | |
|------------------------------|-------------------------|------------|
| LOCATION | | |
| FACILITY: | STREET ADDRESS: | |
| CITY: <u>Charleston</u> | COUNTY: <u>Kanawha</u> | PHONE: () |
| DATE OF VISIT: <u>3/5/02</u> | TIME IN: <u>9:00 AM</u> | TIME OUT: |

1 diesel, 1 gasoline, 1 used oil

SITE STATUS: Abandoned Active UST's: Existing Former SURFACE SOIL STAINING: Yes No

SURFACE WATER ON OR ADJACENT TO PROPERTY: Yes No EXISTING MONITORING WELLS: Yes No 7 Total

Existing Structures Including Dimensions and Use: See S.R. Plat Map

Chemicals of Potential Concern:

DRINKING WATER SOURCE: GW Public Other SURROUNDING LAND USE: Residential Commercial Industrial
 Recreational Agricultural Other vacant Woodland, Elk River

OTHER AREAS OF CONCERN:

COMMENTS

Met George Robertson & John Hutchinson

Photo 1-8 panorama from entry off Barlow Drive

Photo 9-10 containment area North

Photo 11 ^{South} ~~North~~ Dike loading area view looking south

Photo 12 North Dike loading area w/ stained gravel

Photo 13-16 Barge loading area, area along river
 Note yellow staining wells.

Photo 17-18 New pump house w/ water intake pipes

Photo 19 Flow meter

Photo 20 Flow meter

Photo 21 Flow meter

Signature: _____ Date: _____
 David H. High, Project Manager email address: dhigh@mail.dep.state.wv.us

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February 4, 2014

Two more Kanawha schools to re-flush pipes

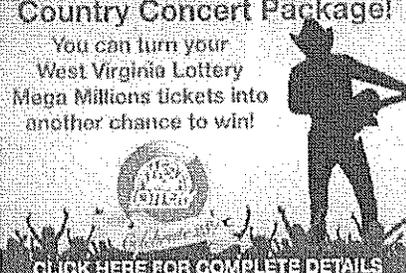
Licorice smell returns at Riverside High, Midland Trail Elementary

By Mackenzie Mays

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CHARLESTON, W.Va. -- Two Kanawha County schools will have to yet again undergo the water-flushing process after complaints from teachers and students about the return of a strong odor like black licorice.

West Virginia American Water officials planned to drain the water tank for the town of Belle Tuesday night to allow for re-flushing of area water systems, including those at Riverside High School and Midland Trail Elementary, "because of persistent odor complaints," according to Nasandra Wright, sanitarian supervisor for the Kanawha-Charleston Health Department.

"Once they accomplish that, schools can flush again [Wednesday] ... and then we'll be able to inspect and re-sample," Wright said.

According to test results posted on the website of the West Virginia Department of Homeland Security and Emergency Management, the water at the two schools tested as "non-detectable" -- below 10 parts per billion -- last week for the coal-cleaning chemical Crude MCHM, which leaked into the Elk River Jan. 9 and contaminated water for 300,000 West Virginians.

But Riverside High School Principal Valery Harper said the odor was instantly detectable Monday morning after the weekend break.

"We smelled it. When we came in Monday there was a strong licorice odor present, and an oily substance was noticed," Harper said. "I got on the intercom and told the kids what I know, and they've handled it like troupers."

An advanced placement chemistry class at the school is even trying to take the matter into their own hands. Since last week, students have been testing the water for chemicals, as well as checking pH levels, conductivity and other factors, Harper said.

The students are expecting more comprehensive results as they gather more samples within the next few days, said Rachel Daw, a student in the Riverside chemistry class.

"So far we just know it has an odor, and it has an oily top level to it," Daw said. "We are still doing tests on it throughout the week and are going to compare all the tests soon."

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Nasandra Wright, sanitarian supervisor for the Kanawha-Charleston Health Department.

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Riverside and Midland Trail -- which are next to each other in Quincy -- are not the first schools that have had to flush their water systems more than once following a chemical leak into the Elk River last month.

Just last week, Crude MCHM was detected at six area schools -- long after the water ban had been lifted and schools had been cleared by the Health Department to reopen for class.

Over the weekend, those schools were again cleared, after the schools' pipes were re-flushed and a second round of testing showed undetectable levels of the chemical.

Photos of brownish water from Midland Trail's taps circulated on social media, but Kanawha County Schools Superintendent Ron Duerring said the discoloration was not related to the chemical leak.

"The yellow water was from a water line break off our property that had nothing to do with this," Duerring said. "What we're responding to is some kind of odor. I don't know what caused that. I have no idea."

Schools impacted by the chemical leak are continuing to cook only with bottled water, and Riverside High received four more shipments Tuesday.

Harper said at Riverside they're even using bottled water to clean desks and floors, and water fountains and sinks are off limits to students.

"It just takes a bit of an extra step, but we're trying to do the best we can," Harper said. "Honestly, I expected more drama -- more questions. ... It's the most difficult for the cooks. They're the ones that have to prepare the food and use a different routine."

Reach Mackenzie Mays at mackenzie.m...@wvgazette.com or 304-348-4814.

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FEB 25 2013

**Tier Two Emergency and Hazardous Chemical Inventory
Reporting Period From January 1 to December 31, 2012**

| | | | |
|--|--|---|--|
| Facility Identification Name Etowah River Terminal Street 1015 Barlow Drive City Charleston County Kanawha State WV Zip 25311 Latitude 38.368056 Longitude -81.606667 Country USA | | Owner/Operator Name Name Denny Farrell Phone 304-552-2919 Mail Address 1384 Poca River Road, North City Poca State WV Zip 25159 Country USA | |
| Mailing Address (if different from facility address) Street P.O. Box 713 City Charleston State WV Zip 25323 Country USA NAICS Code 42269 Dun & Brad Number 78-827-6145 | | Emergency Contact Name Mike Burdette Title Director of Operations Phone 304-941-7316 Name Title Phone 24 Hr. Phone | |

| Chemical Description | Physical and Health Hazards | Inventory | Container | | Temperature | | Storage Codes and Locations (Non-Confidential) |
|--|--|--|-----------|----------|-------------|-------------|--|
| | | | Type | Pressure | Pressure | Temperature | |
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS Trade Secret Chem. Name Ammonium lignosulfonate Check All That Apply: Pure <input type="checkbox"/> Mix <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | <input type="checkbox"/> Fine <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | 05 Max. Daily Amount (code) 05 Avg. Daily Amount (code) 365 No. of Days On-site (days) | A | 1 | 4 | Tank 406 | |
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS Trade Secret Chem. Name Calcium chloride Check All That Apply: Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | <input type="checkbox"/> Fine <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | 04 Max. Daily Amount (code) 04 Avg. Daily Amount (code) 365 No. of Days On-site (days) | J | 1 | 4 | Warehouse | |

Certification (Read and sign after completing all sections)
 I certify under penalty of law that I have personally examined and am familiar with the information submitted in pages one through 3, and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate, and complete.

Mike Burdette - Director of Operations
 Name and official title of owner/operator OR owner/operator's authorized representative

Mike Burdette
 Signature

02/20/2013
 Date signed

Optional Attachments
 I have attached a site plan
 I have attached a list of site coordinate abbreviations
 I have attached a description of dikes and other safeguards measures

| Chemical Description | | Physical and Health Hazards | | Inventory | Container Type | Pressure | Temperature | Storage Codes and Locations (Non-Confidential) |
|-------------------------------------|---|---|---|-----------|----------------|----------|-------------------------|--|
| <input checked="" type="checkbox"/> | <p>Check if all of the information for this chemical is identical to the information submitted last year</p> <p>CAS 10043-52-4 Chem. Name Calcium chloride solution</p> <p>Trade Secret <input type="checkbox"/></p> <p>Check All That Apply: Pure <input type="checkbox"/> Mix <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input checked="" type="checkbox"/> Gas <input type="checkbox"/> EHS <input type="checkbox"/></p> | <p>Fire <input type="checkbox"/></p> <p>Sudden Release of Pressure <input type="checkbox"/></p> <p>Reactivity <input type="checkbox"/></p> <p>Immediate (acute) <input checked="" type="checkbox"/></p> <p>Delayed (chronic) <input type="checkbox"/></p> | <p>07 Max. Daily Amount (code)</p> <p>06 Avg. Daily Amount (code)</p> <p>365 No. of Days On-site (days)</p> | A | 1 | 4 | Tanks 402-405 | |
| <input checked="" type="checkbox"/> | <p>Check if all of the information for this chemical is identical to the information submitted last year</p> <p>CAS 56-81-5 Chem. Name Crude glycerin, recovered</p> <p>Trade Secret <input type="checkbox"/></p> <p>Check All That Apply: Pure <input type="checkbox"/> Mix <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input checked="" type="checkbox"/> Gas <input type="checkbox"/> EHS <input type="checkbox"/></p> | <p>Fire <input type="checkbox"/></p> <p>Sudden Release of Pressure <input type="checkbox"/></p> <p>Reactivity <input type="checkbox"/></p> <p>Immediate (acute) <input checked="" type="checkbox"/></p> <p>Delayed (chronic) <input type="checkbox"/></p> | <p>07 Max. Daily Amount (code)</p> <p>07 Avg. Daily Amount (code)</p> <p>365 No. of Days On-site (days)</p> | A | 1 | 4 | Tanks 393, 394, 398-401 | |
| <input checked="" type="checkbox"/> | <p>Check if all of the information for this chemical is identical to the information submitted last year</p> <p>CAS Chem. Name Magnafloc 156</p> <p>Trade Secret <input type="checkbox"/></p> <p>Check All That Apply: Pure <input type="checkbox"/> Mix <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS <input type="checkbox"/></p> | <p>Fire <input type="checkbox"/></p> <p>Sudden Release of Pressure <input type="checkbox"/></p> <p>Reactivity <input type="checkbox"/></p> <p>Immediate (acute) <input checked="" type="checkbox"/></p> <p>Delayed (chronic) <input type="checkbox"/></p> | <p>04 Max. Daily Amount (code)</p> <p>04 Avg. Daily Amount (code)</p> <p>365 No. of Days On-site (days)</p> | J | 1 | 4 | Warehouse | |
| <input checked="" type="checkbox"/> | <p>Check if all of the information for this chemical is identical to the information submitted last year</p> <p>CAS 26062-79-3 Chem. Name Magnafloc 368</p> <p>Trade Secret <input type="checkbox"/></p> <p>Check All That Apply: Pure <input type="checkbox"/> Mix <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS <input type="checkbox"/></p> | <p>Fire <input type="checkbox"/></p> <p>Sudden Release of Pressure <input type="checkbox"/></p> <p>Reactivity <input type="checkbox"/></p> <p>Immediate (acute) <input checked="" type="checkbox"/></p> <p>Delayed (chronic) <input type="checkbox"/></p> | <p>04 Max. Daily Amount (code)</p> <p>04 Avg. Daily Amount (code)</p> <p>365 No. of Days On-site (days)</p> | J | 1 | 4 | Warehouse | |

| Chemical Description | | Physical and Health Hazards | | Inventory | Container Type | Pressure | Temperature | Storage Codes and Locations (Non-Confidential) |
|---|--|--|--|---|----------------|----------|-------------|--|
| <input type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS 69418-26-4 Chem. Name Magnafloc 455 Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS <input checked="" type="checkbox"/> Trade Secret | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 04 Max. Daily Amount (code) 04 Avg. Daily Amount (code) 365 No. of Days On-site (days) | J | 1 | 4 | Warehouse |
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS 34885-03-5 Chem. Name MCHM Check All That Apply: <input checked="" type="checkbox"/> Pure <input type="checkbox"/> Mix <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS <input type="checkbox"/> Trade Secret | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 05 Max. Daily Amount (code) 05 Avg. Daily Amount (code) 365 No. of Days On-site (days) | A | 1 | 4 | Tanks 396-397 |
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS Chem. Name RDC-777 Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS <input type="checkbox"/> Trade Secret | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 05 Max. Daily Amount (code) 05 Avg. Daily Amount (code) 365 No. of Days On-site (days) | A | 1 | 4 | Tank 395, 401 |
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS 497-19-8 Chem. Name Soda ash Check All That Apply: <input checked="" type="checkbox"/> Pure <input type="checkbox"/> Mix <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS <input type="checkbox"/> Trade Secret | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 04 Max. Daily Amount (code) 04 Avg. Daily Amount (code) 365 No. of Days On-site (days) | J | 1 | 4 | Warehouse |

Tier Two Emergency and Hazardous Chemical Inventory Reporting Period From January 1 to December 31, 2011

FEB 15 2012

Facility Identification
 Name Etowah River Terminal Phone 304-552-2919
 Street 1015 Barlow Drive
 City Charleston County Kanawha State WV Zip 25311
 Latitude 38.368056 Longitude -81.606667 Country USA
Mailing Address (if different from facility address)
 Street P.O. Box 713
 City Charleston State WV Zip 25323 Country USA
 NAICS Code 42269 Dun & Brad Number 78-827-6145

Owner/Operator Name
 Name Denny Farrell Phone 304-552-2919
 Mail Address 1384 Poca River Road, North
 City Poca
 State WV Zip 25159 Country USA
Emergency Contact
 Name Mike Burdette Title Director of Operations
 Phone 304-941-7316
 Name Title
 Phone 24 Hr. Phone

| Chemical Description | Physical and Health Hazards | Inventory | Compliance | Pressure | Temperature | Storage Codes and Locations (Non-Confidential) |
|---|--|--|------------|----------|-------------|--|
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS Trade Secret <input type="checkbox"/> Chem. Name Ammonium lignosulfonate Check All That Apply: Pure <input type="checkbox"/> Mix <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | 05 Max. Daily Amount (code) 05 Avg. Daily Amount (code) 365 No. of Days On-site (days) | A | 1 | 4 | Tank 406 |
| <input type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS 10043-52-4 Trade Secret <input type="checkbox"/> Chem. Name Calcium chloride Check All That Apply: Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | 04 Max. Daily Amount (code) 04 Avg. Daily Amount (code) 365 No. of Days On-site (days) | J | 1 | 4 | Warehouse |

Certification (Read and sign after completing all sections)
 I certify under penalty of law that I have personally examined and am familiar with the information submitted in pages one through 4, and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate, and complete.

Mike Burdette - Director of Operations
 Name and official title of owner/operator
 OR owner/operator's authorized representative

Signature: *Mike Burdette*
 Date signed: 02/08/2012

Optional Attachments
 I have attached a site plan
 I have attached a list of site coordinate abbreviations
 I have attached a description of dikes and other safeguards measures

| Chemical Description | | Physical and Health Hazards | | Inventory | Container Type | Pressure | Temperature | Storage Codes and Locations (Non-Confidential) |
|-------------------------------------|--|---|---|-----------|----------------|----------|-------------------------|--|
| <input checked="" type="checkbox"/> | <p>Check if all of the information for this chemical is identical to the information submitted last year</p> <p>CAS 10043-52-4 Chem. Name Calcium chloride solution</p> <p>Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS</p> | <p><input type="checkbox"/> Fire</p> <p><input type="checkbox"/> Sudden Release of Pressure</p> <p><input type="checkbox"/> Reactivity</p> <p><input checked="" type="checkbox"/> Immediate (acute)</p> <p><input type="checkbox"/> Delayed (chronic)</p> | <p>07 Max. Daily Amount (code)</p> <p>06 Avg. Daily Amount (code)</p> <p>365 No. of Days On-site (days)</p> | A | 1 | 4 | Tanks 402-405 | |
| <input checked="" type="checkbox"/> | <p>Check if all of the information for this chemical is identical to the information submitted last year</p> <p>CAS 56-81-5 Chem. Name Crude glycerin, recovered</p> <p>Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS</p> | <p><input type="checkbox"/> Fire</p> <p><input type="checkbox"/> Sudden Release of Pressure</p> <p><input type="checkbox"/> Reactivity</p> <p><input checked="" type="checkbox"/> Immediate (acute)</p> <p><input type="checkbox"/> Delayed (chronic)</p> | <p>07 Max. Daily Amount (code)</p> <p>06 Avg. Daily Amount (code)</p> <p>365 No. of Days On-site (days)</p> | A | 1 | 4 | Tanks 393, 394, 398-401 | |
| <input checked="" type="checkbox"/> | <p>Check if all of the information for this chemical is identical to the information submitted last year</p> <p>CAS Chem. Name Fatty acids, recovered</p> <p>Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS</p> | <p><input type="checkbox"/> Fire</p> <p><input type="checkbox"/> Sudden Release of Pressure</p> <p><input type="checkbox"/> Reactivity</p> <p><input checked="" type="checkbox"/> Immediate (acute)</p> <p><input type="checkbox"/> Delayed (chronic)</p> | <p>04 Max. Daily Amount (code)</p> <p>04 Avg. Daily Amount (code)</p> <p>365 No. of Days On-site (days)</p> | A | 1 | 4 | Tank 395 | |
| <input checked="" type="checkbox"/> | <p>Check if all of the information for this chemical is identical to the information submitted last year</p> <p>CAS Chem. Name Magnafloc 156</p> <p>Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS</p> | <p><input type="checkbox"/> Fire</p> <p><input type="checkbox"/> Sudden Release of Pressure</p> <p><input type="checkbox"/> Reactivity</p> <p><input checked="" type="checkbox"/> Immediate (acute)</p> <p><input type="checkbox"/> Delayed (chronic)</p> | <p>04 Max. Daily Amount (code)</p> <p>04 Avg. Daily Amount (code)</p> <p>365 No. of Days On-site (days)</p> | J | 1 | 4 | Warehouse | |

| Chemical Description | | Physical and Health Hazards | | Inventory | Container Type | Pressure | Temperature | Storage Codes and Locations (Non-Confidential) |
|-------------------------------------|--|---|---|-----------|----------------|----------|---------------|--|
| <input checked="" type="checkbox"/> | <p>Check if all of the information for this chemical is identical to the information submitted last year</p> <p>CAS 26062-79-3 Chem. Name Magnafloc 368</p> <p>Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS</p> | <p><input type="checkbox"/> Fire</p> <p><input type="checkbox"/> Sudden Release of Pressure</p> <p><input type="checkbox"/> Reactivity</p> <p><input checked="" type="checkbox"/> Immediate (acute)</p> <p><input type="checkbox"/> Delayed (chronic)</p> | <p>04 Max. Daily Amount (code)</p> <p>04 Avg. Daily Amount (code)</p> <p>365 No. of Days On-site (days)</p> | J | 1 | 4 | Warehouse | |
| <input checked="" type="checkbox"/> | <p>Check if all of the information for this chemical is identical to the information submitted last year</p> <p>CAS 34885-03-5 Chem. Name MCHM</p> <p>Check All That Apply: <input checked="" type="checkbox"/> Pure <input type="checkbox"/> Mix <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS</p> | <p><input type="checkbox"/> Fire</p> <p><input type="checkbox"/> Sudden Release of Pressure</p> <p><input type="checkbox"/> Reactivity</p> <p><input checked="" type="checkbox"/> Immediate (acute)</p> <p><input type="checkbox"/> Delayed (chronic)</p> | <p>05 Max. Daily Amount (code)</p> <p>05 Avg. Daily Amount (code)</p> <p>365 No. of Days On-site (days)</p> | A | 1 | 4 | Tanks 396-397 | |
| <input type="checkbox"/> | <p>Check if all of the information for this chemical is identical to the information submitted last year</p> <p>CAS RDC-777</p> <p>Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS</p> | <p><input type="checkbox"/> Fire</p> <p><input type="checkbox"/> Sudden Release of Pressure</p> <p><input type="checkbox"/> Reactivity</p> <p><input checked="" type="checkbox"/> Immediate (acute)</p> <p><input type="checkbox"/> Delayed (chronic)</p> | <p>06 Max. Daily Amount (code)</p> <p>06 Avg. Daily Amount (code)</p> <p>365 No. of Days On-site (days)</p> | A | 1 | 4 | Tank 395, 401 | |
| <input checked="" type="checkbox"/> | <p>Check if all of the information for this chemical is identical to the information submitted last year</p> <p>CAS 497-19-8 Chem. Name Soda ash</p> <p>Check All That Apply: <input checked="" type="checkbox"/> Pure <input type="checkbox"/> Mix <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS</p> | <p><input type="checkbox"/> Fire</p> <p><input type="checkbox"/> Sudden Release of Pressure</p> <p><input type="checkbox"/> Reactivity</p> <p><input checked="" type="checkbox"/> Immediate (acute)</p> <p><input type="checkbox"/> Delayed (chronic)</p> | <p>04 Max. Daily Amount (code)</p> <p>03 Avg. Daily Amount (code)</p> <p>365 No. of Days On-site (days)</p> | J | 1 | 4 | Warehouse | |

| Chemical Description | | Physical and Health Hazards | Inventory | Container Type | Pressure | Temperature | Storage Codes and Locations (Non-Confidential) |
|---|--|--|--|----------------|----------|-------------|--|
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS 69418-26-4 Trade Secret <input type="checkbox"/> Chem. Name Zetag 7645 Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | 04 Max. Daily Amount (code) 04 Avg. Daily Amount (code) 365 No. of Days On-site (days) | J | 1 | 4 | Warehouse |

01/11/11 EKAS

Tier Two Emergency and Hazardous Chemical Inventory Reporting Period From January 1 to December 31, 2010

Facility Identification
 Name: Etowah River Terminal
 Street: 1015 Barlow Drive
 City: Charleston County: Kanawha State: WV Zip: 25311
 Latitude: 38.368056 Longitude: -81.606667 Country: USA

Mailing Address (if different from facility address)
 Street: P.O. Box 713
 City: Charleston State: WV Zip: 25323 Country: USA

NAICS Code: 42269 Dun & Brad Number: FEB 28 2011

Owner/Operator Name
 Name: Denny Farrell Phone: 304-552-2919
 Mail Address: 1384 Poca River Road, North
 City: Poca State: WV Zip: 25159 Country: USA

Emergency Contact
 Name: Mike Burdette Title: Director of Operations
 Phone: 304-941-7316
 Name: Title
 Phone: 24 Hr. Phone

| Chemical Description | Physical and Health Hazards | Inventory | Storage Codes and Locations (Non-Confidential) |
|---|--|--|---|
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS: Trade Secret Chem. Name: Ammonium lignosulfonate Check That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | 05 Max. Daily Amount (code) 05 Avg. Daily Amount (code) 365 No. of Days On-site (days) | Temperature: 4 Pressure: 1 Container Type: A Tanks 406 |
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS: Trade Secret Chem. Name: Calcium chloride solution Check That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | 07 Max. Daily Amount (code) 06 Avg. Daily Amount (code) 365 No. of Days On-site (days) | Temperature: 4 Pressure: 1 Container Type: A Tanks 403-405 |

Certification (Read and sign after completing all sections)
 I certify under penalty of law that I have personally examined and am familiar with the information submitted in pages one through 3, and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate, and complete.

Mike Burdette - Director of Operations
 Name and official title of owner/operator OR owner/operator's authorized representative

Mike Burdette
 Signature

02/23/2011
 Date signed

Optional Attachments
 I have attached a site plan
 I have attached a list of site coordinate abbreviations
 I have attached a description of dikes and other safeguards measures

| Chemical Description | | Physical and Health Hazards | | Inventory | Container Type | Pressure | Temperature | Storage Codes and Locations (Non-Confidential) |
|---|--|--|--|--|----------------|----------|-------------|--|
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS 56-81-5 Trade Secret <input type="checkbox"/> Chem. Name Crude glycerin, recovered Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 07 Max. Daily Amount (code) 06 Avg. Daily Amount (code) 365 No. of Days On-site (days) | A | 1 | 4 | Tanks 393, 394, 398-402 |
| <input type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS Trade Secret <input type="checkbox"/> Chem. Name Fatty acids, recovered Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 05 Max. Daily Amount (code) 05 Avg. Daily Amount (code) 365 No. of Days On-site (days) | A | 1 | 4 | Tank 395 |
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS Trade Secret <input type="checkbox"/> Chem. Name Magnafloc 156 Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 04 Max. Daily Amount (code) 04 Avg. Daily Amount (code) 365 No. of Days On-site (days) | J | 1 | 4 | Warehouse |
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS Trade Secret <input type="checkbox"/> Chem. Name Magnafloc 368 Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 04 Max. Daily Amount (code) 04 Avg. Daily Amount (code) 365 No. of Days On-site (days) | J | 1 | 4 | Warehouse |

| Chemical Description | | Physical and Health Hazards | | Inventory | Container Type | Pressure | Temperature | Storage Codes and Locations (Non-Confidential) |
|---|--|--|--|---|----------------|----------|-------------|--|
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS 34885-03-5 Chem. Name MCHM Check All That Apply: <input checked="" type="checkbox"/> Pure <input type="checkbox"/> Mix <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 05 Max. Daily Amount (code) | A | 1 | 4 | Tanks 396-397 |
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS 497-19-8 Chem. Name Soda ash Check All That Apply: <input checked="" type="checkbox"/> Pure <input type="checkbox"/> Mix <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 04 Max. Daily Amount (code) 04 Avg. Daily Amount (code) 365 No. of Days On-site (days) | J | 1 | 4 | Warehouse |
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS 69418-26-4 Chem. Name Zetag 7645 Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 04 Max. Daily Amount (code) 04 Avg. Daily Amount (code) 365 No. of Days On-site (days) | J | 1 | 4 | Warehouse |

Tier Two Emergency and Hazardous Chemical Inventory Reporting Period From January 1 to December 31, 2009

| | | | |
|--|--|---|--|
| Facility Identification Name Etowah River Terminal Street 1015 Barlow Drive City Charleston County Kanawha State WV Zip 25311 Latitude 38.368056 Longitude -81.606667 Country USA | | Owner/Operator Name Name Denny Farrell Phone 304-552-2919 Mail Address 1384 Poca River Road, North City Poca State WV Zip 25159 Country USA | |
| Mailing Address (if different from facility address) Street P.O. Box 713 City Charleston State WV Zip 25323 Country USA | | Emergency Contact Name Roger Arthur Title Phone 304-561-8678 24 Hr. Phone Name Title Phone 24 Hr. Phone | |
| NAICS Code 42269 Dun & Brad Number | | Date: MAR 04 2010 | |

| Chemical Description | Physical and Health Hazards | Inventory | Container Type | Pressure | Temperature | Storage Codes and Locations (Non-Confidential) |
|--|--|--|----------------|----------|-------------|--|
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS Trade Secret <input type="checkbox"/> Chem. Name Ammonium lignosulfonate Check All That Apply: Pure <input type="checkbox"/> Mix <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | 05 Max. Daily Amount (code) 04 Avg. Daily Amount (code) 365 No. of Days On-site (days) | A | 1 | 4 | Tank 406 |
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS 10043-52-4 Trade Secret <input type="checkbox"/> Chem. Name Calcium chloride solution Check All That Apply: Pure <input type="checkbox"/> Mix <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | 06 Max. Daily Amount (code) 06 Avg. Daily Amount (code) 365 No. of Days On-site (days) | A | 1 | 4 | Tanks 403-405 |

Certification (Read and sign after completing all sections.)
 I certify under penalty of law that I have personally examined and am familiar with the information submitted in pages one through three, and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate, and complete.

Roger Arthur - Terminal Manager
 Name and official title of owner/operator OR owner/operator's authorized representative

[Signature]
 Signature

2/24/2010
 Date signed

Optional Attachments
 I have attached a site plan
 I have attached a list of site coordinate abbreviations
 I have attached a description of dikes and other safeguards measures

| Chemical Description | | Physical and Health Hazards | | Inventory | Container Type | Pressure | Temperature | Storage Codes and Locations (Non-Confidential) |
|--|--|--|--|---|----------------|----------|-------------|--|
| <input type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS 56-81-5 Chem. Name Crude glycerin, recovered Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 07 Max. Daily Amount (code) 06 Avg. Daily Amount (code) 365 No. of Days On-site (days) | A | 1 | 4 | Tanks 393, 394, 398-402 |
| <input type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS Chem. Name Fatty acids, recovered Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 05 Max. Daily Amount (code) 05 Avg. Daily Amount (code) 320 No. of Days On-site (days) | A | 1 | 4 | Tank 395 |
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS Chem. Name Magnafloc 156 Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 04 Max. Daily Amount (code) 04 Avg. Daily Amount (code) 365 No. of Days On-site (days) | J | 1 | 4 | Warehouse |
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS 26062-79-3 Chem. Name Magnafloc 368 Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 04 Max. Daily Amount (code) 04 Avg. Daily Amount (code) 365 No. of Days On-site (days) | J | 1 | 4 | Warehouse |

| Chemical Description | | Physical and Health Hazards | | Inventory | Container Type | Pressure | Temperature | Storage Codes and Locations (Non-Confidential) |
|---|--|--|--|---|----------------|----------|-------------|--|
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year. CAS 34885-03-5 Chem. Name MCHM Check All That Apply: <input checked="" type="checkbox"/> Pure <input type="checkbox"/> Mix <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS <input type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year. | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 05 Max. Daily Amount (code) 05 Avg. Daily Amount (code) 365 No. of Days On-site (days) | A | 1 | 4 | Tanks 396-397 |
| <input type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year. CAS Chem. Name PDO Concentrate Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS <input type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year. | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 05 Max. Daily Amount (code) 04 Avg. Daily Amount (code) 120 No. of Days On-site (days) | A | 1 | 4 | Storage tank 393 |
| <input type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year. CAS 497-19-8 Chem. Name Soda ash Check All That Apply: <input checked="" type="checkbox"/> Pure <input type="checkbox"/> Mix <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS <input type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year. | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 04 Max. Daily Amount (code) 04 Avg. Daily Amount (code) 365 No. of Days On-site (days) | J | 1 | 4 | Warehouse |
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year. CAS 69418-26-4 Chem. Name Zetag 7645 Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS <input type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year. | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 04 Max. Daily Amount (code) 04 Avg. Daily Amount (code) 365 No. of Days On-site (days) | J | 1 | 4 | Warehouse |

**Tier Two Emergency and Hazardous Chemical Inventory
Reporting Period From January 1 to December 31, 2008**

| | | | |
|---|--|--|--|
| Facility Identification Name: Etowah River Terminal Street: 1015 Barlow Drive City: Charleston State: WV Zip: 25311 Country: USA Latitude: 38.3683250 Longitude: -81.6066111 | | Owner/Operator Name Name: Denny Farrell Phone: 304-552-2919 Mail Address: 1384 Poca River Road, North City: Poca State: WV Zip: 25159 Country: USA | |
| Mailing Address (if different from facility address) Street: P.O. Box 713 City: Charleston State: WV Zip: 25323 Country: USA NAICS Code: 42269 Dun & Brad Number: | | Emergency Contact Name: Roger Arthur Phone: 304-561-8678 Title: Name: Phone: Title: 24 Hr. Phone: Title: 24 Hr. Phone: | |

| Chem. Name | CAS | Check All That Apply | Chemical Description | Physical and Health Hazards | Inventory | Storage Codes and Locations (Non-Confidential) | | | |
|-------------------------------------|------------|---|---|--|---|--|----------|-------------|---------------|
| | | | | | | Container Type | Pressure | Temperature | |
| <input type="checkbox"/> | | <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | Trade Secret Ammonium ignosulfonate | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | 05 Max. Daily Amount (code) 05 Avg. Daily Amount (code) 365 No. of Days On-site (days) | A | 1 | 4 | Tank 406 |
| <input checked="" type="checkbox"/> | 10043-52-4 | <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | Trade Secret Calcium chloride solution | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | 06 Max. Daily Amount (code) 06 Avg. Daily Amount (code) 365 No. of Days On-site (days) | A | 1 | 4 | Tanks 403-405 |

Certification (Read and sign after completing all sections)
 I certify under penalty of law that I have personally examined and am familiar with the information submitted in pages one through 3, and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate, and complete.

Roger Arthur - Terminal Manager
 Name and official title of owner/operator
 OR owner/operator's authorized representative

Signature: *[Signature]*
 Date signed: 2/13/2009

Optional Attachments
 I have attached a site plan
 I have attached a list of site coordinate abbreviations
 I have attached a description of dikes and other safeguards measures

| Chemical Description | | Physical and Health Hazards | | Inventory | Container Type | Pressure | Temperature | Storage Codes and Locations (Non-Confidential) |
|-------------------------------------|--|---|---|-----------|----------------|----------|-------------------------|--|
| <input checked="" type="checkbox"/> | <p>Check if all of the information for this chemical is identical to the information submitted last year</p> <p>CAS 68476-34-6 Chem. Name FFC-10</p> <p>Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS</p> | <p><input checked="" type="checkbox"/> Fire</p> <p><input type="checkbox"/> Sudden Release of Pressure</p> <p><input type="checkbox"/> Reactivity</p> <p><input checked="" type="checkbox"/> Immediate (acute)</p> <p><input checked="" type="checkbox"/> Delayed (chronic)</p> | <p>04 Max. Daily Amount (code)</p> <p>04 Avg. Daily Amount (code)</p> <p>180 No. of Days On-site (days)</p> | D | 1 | 4 | Warehouse | |
| <input checked="" type="checkbox"/> | <p>Check if all of the information for this chemical is identical to the information submitted last year</p> <p>CAS 56-81-5 Chem. Name Glycerin</p> <p>Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS</p> | <p><input type="checkbox"/> Fire</p> <p><input type="checkbox"/> Sudden Release of Pressure</p> <p><input type="checkbox"/> Reactivity</p> <p><input checked="" type="checkbox"/> Immediate (acute)</p> <p><input type="checkbox"/> Delayed (chronic)</p> | <p>07 Max. Daily Amount (code)</p> <p>06 Avg. Daily Amount (code)</p> <p>365 No. of Days On-site (days)</p> | A | 1 | 4 | Tanks 393, 394, 398-402 | |
| <input type="checkbox"/> | <p>Check if all of the information for this chemical is identical to the information submitted last year</p> <p>CAS 25085-02-3 Chem. Name Magnafloc 156</p> <p>Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS</p> | <p><input type="checkbox"/> Fire</p> <p><input type="checkbox"/> Sudden Release of Pressure</p> <p><input type="checkbox"/> Reactivity</p> <p><input checked="" type="checkbox"/> Immediate (acute)</p> <p><input type="checkbox"/> Delayed (chronic)</p> | <p>04 Max. Daily Amount (code)</p> <p>04 Avg. Daily Amount (code)</p> <p>365 No. of Days On-site (days)</p> | J | 1 | 4 | Warehouse | |
| <input checked="" type="checkbox"/> | <p>Check if all of the information for this chemical is identical to the information submitted last year</p> <p>CAS 26062-79-3 Chem. Name Magnafloc 368</p> <p>Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS</p> | <p><input type="checkbox"/> Fire</p> <p><input type="checkbox"/> Sudden Release of Pressure</p> <p><input type="checkbox"/> Reactivity</p> <p><input checked="" type="checkbox"/> Immediate (acute)</p> <p><input type="checkbox"/> Delayed (chronic)</p> | <p>04 Max. Daily Amount (code)</p> <p>04 Avg. Daily Amount (code)</p> <p>365 No. of Days On-site (days)</p> | J | 1 | 4 | Warehouse | |

| Chemical Description | | Physical and Health Hazards | | Inventory | Container Type | Pressure | Temperature | Storage Codes and Locations (Non-Confidential) |
|---|--|--|--|-----------------------------------|----------------|----------|-------------|--|
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS 34885-03-5 Trade Secret <input type="checkbox"/> Chem. Name MCHM Check All That Apply: <input checked="" type="checkbox"/> Pure <input type="checkbox"/> Mix <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 05 Max. Daily Amount (code) | A | 1 | 4 | Tanks 396-397 |
| <input type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS 69418-26-4 Trade Secret <input type="checkbox"/> Chem. Name Zetag 7645 Check All That Apply: <input type="checkbox"/> Pure <input checked="" type="checkbox"/> Mix <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 03 Max. Daily Amount (code) | J | 1 | 4 | Warehouse |
| | | | | 03 Avg. Daily Amount (code) | | | | |
| | | | | 365 No. of Days On-site (days) | | | | |

**Tier Two Emergency and Hazardous Chemical Inventory
Reporting Period From January 1 to December 31, 2007**

| | | | |
|--|--|---|--|
| Facility Identification Name Etowah River Terminal Street 1015 Barlow Drive City Charleston County Kanawha State WV Zip 25311 Latitude 38.3683250 Longitude -81.6066111 Country USA | | Owner/Operator Name Name Denny Farrell Phone 304-552-2919 Mail Address 1384 Poca River Road, North City Poca State WV Zip 25159 Country USA | |
| Mailing Address (if different from facility address) Street P.O. Box 713 City Charleston State WV Zip 25323 FEB 2 2008 SIC Code 5169 Dun & Brad Number | | Emergency Contact Name Roger Arthur Title Phone 304-561-8678 24 Hr. Phone Name Title Phone 24 Hr. Phone | |

| Chemical Description | Physical and Health Hazards | | | | | Inventory | Storage Codes and Locations (Non-Confidential) | | | |
|---|-----------------------------|----------------------------|--------------------------|-------------------------------------|--------------------------|---|--|----------|-------------|---------------|
| | Fire | Sudden Release of Pressure | Reactivity | Immediate (acute) | Delayed (chronic) | | Container | Pressure | Temperature | |
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS Trade Secret <input type="checkbox"/> Chem. Name Ammonium lignosulfonate Check All That Apply: Pure <input type="checkbox"/> Mix <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 06 Max. Daily Amount (code) | A | 1 | 4 | Tank 393 |
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS Trade Secret <input type="checkbox"/> Chem. Name Calcium chloride solution Check All That Apply: Pure <input type="checkbox"/> Mix <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> EHS | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 06 Max. Daily Amount (code) 06 Avg. Daily Amount (code) 365 No. of Days On-site (days) | A | 1 | 4 | Tanks 403-405 |

Certification (Read and sign after completing all sections)
 I certify under penalty of law that I have personally examined and am familiar with the information submitted in pages one through 3, and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the information submitted is true, accurate, and complete.

Roger Arthur - Terminal Manager
 Name and official title of owner/operator
 OK owner/operator's authorized representative

[Signature]
 Signature

2/15/2008
 Date signed

Optional Attachments
 I have attached a site plan
 I have attached a list of site coordinate abbreviations
 I have attached a description of dikes and other safeguards measures

| Chemical Description | | Physical and Health Hazards | | | | | Inventory | Container Type | Pressure | Temperature | Storage Codes and Locations (Non-Confidential) |
|---|--|--|--------------------------------|---|---|---|--------------------|----------------|----------|-------------|--|
| <input type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS 68476-34-6 Chem. Name FFC-10 Trade Secret <input type="checkbox"/> | | <input checked="" type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input checked="" type="checkbox"/> Delayed (chronic) | 04 Max. Daily Amount (code) | D | 1 | 4 | Warehouse | | | | |
| <input type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS 56-81-5 Chem. Name Glycerin Trade Secret <input type="checkbox"/> | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | 07 Max. Daily Amount (code) | A | 1 | 4 | Tanks 394, 398-402 | | | | |
| <input type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS 26062-79-3 Chem. Name Magnafloc 368 Trade Secret <input type="checkbox"/> | | <input checked="" type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | 05 Max. Daily Amount (code) | A | 1 | 4 | Tank 395 | | | | |
| <input type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS 26062-79-3 Chem. Name Magnafloc 368 Trade Secret <input type="checkbox"/> | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | 04 Max. Daily Amount (code) | J | 1 | 4 | Warehouse | | | | |

| Chemical Description | | Physical and Health Hazards | | Inventory | Container | Pressure | Temperature | Storage Codes and Locations (Non-Confidential) |
|--|--|--|--|-----------------------------------|-----------|----------|-------------|---|
| <input type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS 69418-26-4 Chem. Name Magnasol CN2 <input type="checkbox"/> Trade Secret | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 04 Max. Daily Amount (code) | K | 1 | 4 | Warehouse |
| <input checked="" type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS 34885-03-5 Chem. Name MCHM | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 05 Max. Daily Amount (code) | A | 1 | 4 | Tanks 396-397 |
| <input type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS 34885-03-5 Chem. Name MCHM | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 05 Avg. Daily Amount (code) | | | | |
| <input type="checkbox"/> Check if all of the information for this chemical is identical to the information submitted last year CAS 34885-03-5 Chem. Name MCHM | | <input type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) | | 365 No. of Days On-site (days) | | | | |



February 1, 2014

DEP never saw Freedom's pollution control plans

by Ken Ward Jr.
Staff writer

CHARLESTON, W.Va. -- West Virginia Department of Environmental Protection officials never reviewed two key pollution-prevention plans for the Freedom Industries tank farm before the Jan. 9 chemical leak that contaminated drinking water for 300,000 residents, according to interviews and documents obtained under the state's public-records law.

Under a DEP-approved water pollution permit for the site, Freedom Industries was required to prepare a storm-water pollution prevention plan and a groundwater protection plan.

Neither plan was among the documents contained in Freedom's permit files at the DEP's Water and Waste Management office, according to copies of those files released last week in response to a Gazette-Mail Freedom of Information Act request.

The disclosure raises more questions about whether DEP officials used all their available tools to prevent an incident like the leak of what the most recent estimate says was a spill of 10,000 gallons of the coal-cleaning chemical Crude MCHM into the Elk River.

"These plans are the core part of the permit," said Evan Hansen, president of the environmental consulting firm Downstream Strategies, which has been investigating the leak. "If [the] DEP were serious about enforcing this permit, they would have reviewed these plans, especially given that the nature of the site changed ownership and the nature of the operations changed."

DEP officials say that, because the Freedom tank farm's previous owners had received a DEP water pollution permit decades ago, the site was exempt from a 2004 requirement to provide the plans to the DEP.

The requirement for older permits, the DEP says, was simply that companies write the pollution plans and keep them available on site, in case the DEP ever wanted to see them. In this case, DEP officials never did.

DEP officials obtained a copy of the company's stormwater pollution prevention plan, but only after they began investigating the leak more than three weeks ago.

"It would be fair to say the DEP had not seen the stormwater protection plan prior to the spill," said Scott Mandirola, director of the DEP's water and waste division.

After the leak, DEP inspectors also asked for the groundwater protection plan. Freedom still hasn't provided one, DEP officials say.

"That has been documented and will be included in future enforcement actions," Mandirola said.

He said the DEP will take a close look at its existing rules and procedures for stormwater permits as part of its review of the Elk River leak.

"This event, in general, is going to prompt a lot of people to take a closer look at a lot of procedures," Mandirola said. "There's a lot to be looked at."

On Wednesday, the DEP released the materials from its water pollution permit files on the Freedom site -- at least records that it had before the Jan. 9 leak -- in response to a FOIA request. The agency is withholding records generated since Jan. 9, saying they are part of an "ongoing investigation" and are exempt from release as "internal memoranda" under state law.

"[The] DEP believes it is necessary to withhold these communications at this time in order to protect the free exchange of ideas and information as we deliberate to determine what the ultimate enforcement disposition of this matter will be from an administrative, civil and criminal perspective," the agency said in a response to a Gazette-Mail

APP000513

request for the files.

As a bill to set new regulatory requirements for above-ground storage tanks moves through the Legislature, questions continue about the DEP's enforcement of existing rules — and an existing permit — that were supposed to govern the Freedom Industries' site.

House Speaker Tim Miley, D-Harrison, sent a Senate-passed storage tank bill to three House committees. Such a move, called "triple-referencing," often is seen as a maneuver to kill a bill.

Miley said his intention isn't to block the storage tank bill but to ensure a complete debate on it. He also said he wants to continue discussions about whether the DEP properly enforced existing regulations that apply to the site.

"My concern is that there may have been plenty of regulations on the books that could have prevented this from happening," Miley said in an appearance last week on the statewide Talkline radio show. "We need to be sure that we're doing what is already required to be done before we start adding additional regulations."

The DEP had approved the Freedom site's request to be registered under a storm-water pollution "general" permit, a less-rigorous program than "individual" permits and a program meant for activities expected to have minimal environmental impacts.

When the company's permit was last renewed, in 2009, Freedom Industries officials checked a box on DEP forms that indicated the storm-water and groundwater plans had been completed and that copies were available at the site.

The permit form notes that, if it's the first time the facility is obtaining a permit, those plans must be submitted to the DEP for agency officials to review. Otherwise, the plans are simply to be kept on site, in case the DEP wants to review them, officials said.

Freedom, though, had obtained a permit in 2004, when it renewed an earlier permit held by the site's previous owner, Pennzoil, as early as 1986, the DEP records show.

Mandirola and other DEP officials have emphasized that the Freedom site's permit covered any potential pollution caused by storm-water runoff from the facility. They've suggested that the storm-water permit had little connection between a leak of product from one of Freedom's tanks.

However, in a report issued Jan. 20, Downstream Strategies and the West Virginia Rivers Coalition argued that the pollution plans required by the storm-water permit were very important in the context of the Crude MCHM leak.

For example, the report explained, the storm-water pollution prevention plan was supposed to inventory the materials handled at the facility and examine loading and unloading operations, and analyze storage activities. It also was supposed to include a discussion of leak prevention and response procedures.

Also, the report explained, the company's groundwater protection plan — which the DEP still has not been given a copy of — was to explain what steps were being taken to comply with a variety of pollution, toxic-chemical and waste-handling laws.

"The storm-water permit is designed to prevent the discharge of pollutants off the site," said Hansen, who co-authored the Downstream Strategies-Rivers Coalition report. "Among other things, it requires spill prevention and response procedures to be included in the [storm-water pollution prevention plan]. It also requires immediate reporting of discharges that may endanger health or the environment."

While DEP air-quality inspectors visited the Freedom Industries site a number of times, Hansen noted the absence of water-quality inspections at the facility.

"At the very least, if [the] DEP had inspected the site, their first question should have been to ask for the [storm-water pollution prevention plan] and [the groundwater protection plan], and they should have reviewed them at that time," Hansen said. "But [the] DEP chose not to inspect the site and enforce this permit."

Reach Ken Ward Jr. at kw...@wvgazette.com or 304-348-1702.