Source Water Protection on the Ohio River: Working Together to Protect Drinking Water

Jerry G. Schulte / Lila Xepoleas Ziolkowski
Ohio River Valley Water Sanitation Commission (ORSANCO)

One Water
Ohio WEA-AWWA 2014 Technical Conference
August 26, 2013
Who is ORSANCO?

Ohio River Valley Water Sanitation Commission

- Created in 1948 to abate water pollution in interstate streams in “Compact District”
- 8 States pledge cooperation
- Governed by “Board of Directors”, Commissioners - 27
  - 3 each state, appointed by Governor
  - 3 federal government, appointed by president
Who is ORSANCO?

- Funded by annual state contributions and federal grants
  - Total annual budget - $3.7M
- One office, in Cincinnati, OH
- Staff of about 27
- Focus water pollution control
- Possibly expanding service into water resources management
Who is ORSANCO?

- Created substantially on need for source water protection
- **Not dictatorial; not autonomous**
- Extensive committee structure comprised of state, federal and industry personnel
- Help identify needs and solutions
- Guide actions of the Commission
Advisory Committees

- Water Users Advisory Committee
- Power Industry Advisory Committee
- Publicly Owned Treatment Works Advisory Committee
- Chemical Industry Advisory Committee (?)
- Public Interest Advisory Committee
- ORSANCO/Ohio River Users Advisory Committee
Technical Sub-Committees

- Comprised of state/federal agency personnel
  - Source Water Protection
  - NPDES Coordinating
  - Monitoring Strategy
  - Stream Criteria
  - Emergency Response
  - Biological Criteria
Water Users (Drinking Water) Advisory Committee

- Oldest industry committee – 1950 – present!
- Provide input/advice to Commission on issues of concern to drinking water utilities
- Meet 3x/year
- Current issues include ammonia criteria; SWP, ODS, notification; atrazine; algae.
Ohio River Source Water Protection Program

- Water quality based - Monitoring
- Spill detection - Response
- Communication – Source Water Protection
- Not prevention based
  - Source Water Protection Plans
  - Source Water Protection Meetings
ORSANCO Source Water Protection Program Integration

- **MONITORING**
  - Organics Detection System

- **COMMUNICATION**
  - Source Water Program

- **RESPONSE**
  - Spill Response
  - E.R. Preparation
Established 1978 after Carbon Tetrachloride released into the Kanawha River contaminated water supply systems in Huntington, Portsmouth, Cincinnati.

Initial assistance from utilities, ORSANCO and U.S.EPA to establish seven monitoring stations.

By 1985 13 ODS stations were operational

Presently 17 stations spanning over 1000 miles of navigable waters from Pittsburgh to Paducah

ODS host sites are a combination of drinking water facilities and private sector industrial facilities
Drinking Water Intakes

ODS DW/IW intakes
GC/MS capability
DW ODS Intakes
Online Process GC
ODS sites w/ existing instrumentation

OHINIL
KY
WV
Pittsburgh
Huntington
Portsmouth
Louisville
Evansville
Paducah
Allegheny R.
Monongahela R.

ORSANCO
Organics Detection System Installations

NY
PA
Allegheny R.
Monongahela R.

IN
OH
WV
KY
VA

Drinking Water Intakes
ODS DW/IW intakes
GC/MS capability
DW ODS Intakes
Online Process GC
ODS sites w/ existing instrumentation

Allegheny R.
Monongahela R.

Wabash R.

Great Miami R.
Muskingum R.

Scioto R.

Licking R.

Kentucky R.

Green R.

Cumberland R.

Tennessee R.

Wabash R.

Wheeling

Parkersburg

Pittsburgh

Evansville

Louisville

Portsmouth

Huntington

Paducah

Cincinnati

Cumberland R.

Kentucky R.

Scioto R.

Great Miami R.

Muskingum R.

Green R.

Cumberland R.

Tennessee R.

Wabash R.

Wheeling

Parkersburg

Pittsburgh

Evansville

Louisville

Portsmouth

Huntington

Paducah

Cincinnati

Cumberland R.

Kentucky R.

Scioto R.

Great Miami R.

Muskingum R.

Green R.

Cumberland R.

Tennessee R.
ODS - System Operation

- Collect and analyze at least one sample of untreated river water every 24 hours (blank, ccv, raw)
- Detections exceeding 2ug/L prompt ORSANCO notification by operator
- The detection is verified by operator and ORSANCO ODS staff
- Notifications to drinking water utilities, NRC and state emergency response agencies
## Compounds Identified by the ODS (original list)

<table>
<thead>
<tr>
<th>Compound</th>
<th>Compound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Styrene</td>
<td>Bromodichloromethane</td>
</tr>
<tr>
<td>Bromoform</td>
<td>Carbon Tetrachloride</td>
</tr>
<tr>
<td>Chloroform</td>
<td>Dibromochloromethane</td>
</tr>
<tr>
<td>1,1 Dichloroethane</td>
<td>1,2 Dichloroethane</td>
</tr>
<tr>
<td>1,1 Dichloroethylene</td>
<td>1,2 Dichloropropane</td>
</tr>
<tr>
<td>Methylene Chloride</td>
<td>Tetrachloroethylene</td>
</tr>
<tr>
<td>1,1,1 Trichloroethane</td>
<td>Trichloroethylene</td>
</tr>
<tr>
<td>Trichlorofluoromethane</td>
<td>Benzene</td>
</tr>
<tr>
<td>Chlorobenzene</td>
<td>Ethylbenzene</td>
</tr>
<tr>
<td>1,2 Dichlorobenzene</td>
<td>1,3 Dichlorobenzene</td>
</tr>
<tr>
<td>1,4 Dichlorobenzene</td>
<td>Toluene</td>
</tr>
</tbody>
</table>
Current Calibrated Compounds List

- Methylene Chloride
- 1,1 Dichloroethylene
- 1,1 Dichloroethane
- Chloroform
- 1,1,1 Trichloroethane
- Carbon Tetrachloride
- Benzene
- Trichloroethylene
- 1,2 Dichloropropane
- Dichlorobromomethane
- Toluene
- Tetrachloroethylene
- Dibromochloromethane
- Ethylbenzene
- Chlorobenzene

- Styrene (co-elutes with o,p xylenes)
- Bromoform
- 1,3 Dichlorobenzene
- 1,4 Dichlorobenzene
- 1,2 Dichlorobenzene
- Acrylonitrile
- 1,2 Dichloroethane
- trans-1,2 Dichloroethylene
- cis-1,3 Dichloropropene
- trans-1,3 Dichloropropene
- Hexachloro-1,3-butadiene
- 1,1,2,2 Tetrachloroethane
- 1,1,2 Trichloroethane
- Trichlorofluoromethane
- Napthalene
Organics Detection System – Why?

Perchloroethylene Detections
January 30 - February 3, 2004

Cumulative Hours

Conc. PERC, ug/l

THO – 1 ppm

MCL 5 ppb
Pollution Control Standards

- States’ empower ORSANCO to develop and hold the Pollution Control Standards for Ohio River
- Reviewed every three years
- Receive comments from Stakeholders and general public
- Comments are also submitted by other internal committees (WUAC, POTW)
- Basis for NPDES permits
Review of NPDES Permits

- Receive draft permits from state permitting agency
- Review for compliance with Pollution Control Standards
- Identify problems or inconsistencies and bring to states’ attention
- > 600 NPDES permits on Ohio River
Review of Dredge and Construction Permits

- Evaluate activity’s ability to impact drinking water utilities
  - Proximity to utilities
  - Duration of activity
  - Monitoring measures needed
- May also impact ORSANCO’s Program monitoring activities
Emerging Contaminants Research

- Nonylphenol Monitoring Project
- TDS and Inorganic Constituents Project
- Pharmaceutical Brochure
  - Developed with input from Water Users Advisory Committee members
  - Printed by pharmaceutical industry representative
  - Distributed to utilities for dissemination to consumers
Emergency Response

- Spill communication system
  - Supported by ORSANCO staff
    - Receive NRC Spill Reports for all counties along Ohio River and major tributaries 24/7
  - Communicate necessary ones to utilities
  - Support utilities needs during spill events
    - Time of travel calculations
    - Estimates of in-stream concentrations
    - Sample collection and analysis
Emergency Response

- Publish “Emergency Response Directory” annually
- Maintain emergency response equipment and supplies
- Participate in USEPA/USCG Regional and local Response Team meetings
- Participate in agency and industry sponsored spill exercises
Ideal Ohio River Source Water Protection Program

- Knowledge of chemicals/contaminants
  - What’s out there
  - Where is it relative to intakes
  - Analytical
  - Treatability – how to treat if enters utility
  - Trackability – how to track, contain, control, recover, etc.

- Access to key reference materials
  - SDS sheets
  - ToxNet, ATSDR
  - Standard Methods
Ideal Ohio River Source Water Protection Program

- Communication
  - Updated facility/utility contact information
    - 24 hour information
  - Annual meetings to update contact information and review previous years activities
    - Promotes interaction between neighboring utilities
  - Development of mutual assistance programs
    - Emergency analytical support
Ohio River Source Water Protection

Questions?
Recent Spill Investigation

Elk River Spill Event: Debriefing and Evaluation of Downstream Spill Response Activities
Elk River/Freedom Industry Release
Freedom Industries Storage Tanks
ORSANCO’S ROLE IN SPILL EVENTS

- Communication
  - Communicate spill/incident information to all affected stakeholders

- Contaminant Plume Modeling
  - Estimate time of travel to drinking water intakes and other asset points
    - Dams, power plants, sampling locations, etc.
  - Calculate in stream contaminant concentration

- Provide on-river response
  - Sampling and logistical support

- Analytical Support
  - Provide hands on experience through Organics Detection System and other in-house and contract analytical methods as needed.
Elk River Spill Event Timeline

- **8:15 am, Jan. 9th**, West Virginia Department of Environmental Protection officials received air complaints concerning odor around Freedom Industries Storage Tanks
- **10:30 am, Jan. 9th**, employees with Freedom Industries discovered coal processing chemical 4-methylcyclohexane methanol (MCHM) has leaked from a steel storage tank into the Elk River, just 1.5 miles upstream of the intake for West Virginia American Water (Charleston)
- **12:00 pm, Jan. 9th**, WV DEP personnel arrive on site to investigate
- **12:05 pm, Jan. 9th**, Freedom Industries called state hotline to report leak
- At **5:45 pm, Jan. 9th**, West Virginia American Water issued a “Do Not Use except for toilet flushing and fire fighting” order
- **Jan. 9th**, estimated 10,000 gallons of crude MCHM were released into the Elk River
- ORSANCO maintained spill communications through **Jan 23rd**
Elk River Spill Tracking Timeline

- **Thursday, Jan 9th, 1200**: Elk River Spill Tracking
- **Sunday, Jan 12th, 1300**: Organics Detection System (ODS) DW/IW intakes
- **Saturday Jan 11th, 0230**: GC/MS capability
- **Monday, Jan 13th, 0300**: ODS DW Intakes
- **Monday, Jan 13th, 1400**: ODS sites w/ existing instrumentation
- **Thursday, Jan 15th, 0600**: Huntington – Portsmouth = 14 hrs @ 2.7 mph
- **Tuesday, Jan 15th, 0600**: Huntington – Portsmouth = 14 hrs @ 2.7 mph
- **Wednesday, Jan 16th, 0700**: Huntington – Portsmouth = 14 hrs @ 2.7 mph
- **Friday, Jan 17th, 0530**: Monday, Jan 13th, 0300
- **Sunday, Jan 19th, 2330**: Tuesday, Jan 15th, 0600
- **Saturday Jan 11th, 0230**: Wednesday, Jan 16th, 0700
- **Thursday, Jan 15th, 0600**: Huntington – Portsmouth = 14 hrs @ 2.7 mph
- **Monday, Jan 13th, 0300**: Huntington – Portsmouth = 14 hrs @ 2.7 mph
Only problem is…

- 4-MCHM is not regulated under the Clean Water Act (CWA or SDWA) so there is no USEPA method…
- Literature review had very few studies done on this compound, and analyses that were performed, used instrumentation unavailable in the ODS system.
- However, based on information from chemical manufacturer’s SDS information, it appeared that our volatiles instrumentation may be able to detect this (with fingers crossed)
- We hypothesized that it would be a later eluting compound because of boiling point and structure but had no idea of what peak response would be like
- Where do we find pure reference standard?
INCIDENT DESCRIPTION

*Report taken by: CIV NYDIA RAWLS at 15:45 on 09-JAN-14
Incident Type: FIXED
Incident Cause: UNKNOWN
Affected Area:
Incident occurred on 09-JAN-14 at 15:00 local incident time
Affected Medium: AIR ATMOSPHERE

INCIDENT LOCATION

OHIO STREET    County: KANAWHA
City: CHARLESTON    State: WV
IN THE VICINITY OF LOCATION BELOW

RELEASED MATERIAL(S)

CHRIS Code: UNK    Official Material Name: UNKNOWN MATERIAL
Also Known As:
Qty Released: 0 UNKNOWN AMOUNT

---DESCRIPTION OF INCIDENT---
CALLER IS REPORTING A STRONG CHEMICAL SMELL IN THE AIR FROM AN UNKNOWN SOURCE.

INCIDENT DETAILS

Package: N/A
Building ID:
Type of Fixed Object: PRIVATE RESIDENCE
Power Generating Facility: UNKNOWN
Generating Capacity:
Type of Fuel:
NPDES:
NPDES Compliance: UNKNOWN

REMEDIAL ACTIONS

MAKING NOTIFICATION
Release Secured: UNKNOWN
Release Rate:
Estimated Release Duration:

---DESCRIPTION OF INCIDENT---
RESIDENTS IN CHARLESTON AND SURROUNDING COUNTIES WERE TOLD THURSDAY EVENING NOT TO DRINK, COOK WITH OR WASH WITH WATER SUPPLIED BY WEST VIRGINIA AMERICAN WATER, FOLLOWING A LEAK EARLIER IN THE DAY AT A CHEMICAL FACILITY ALONG THE ELK RIVER. ANY WATER Supplied BY WEST VIRGINIA AMERICAN WATER IN KANAWHA, PUTNAM, BOONE, JACKSON AND LINCOLN COUNTIES WAS TO BE USED ONLY FOR FLUSHING TOILETS AND PUTTING OUT FIRES. THE STATE OF EMERGENCY INCLUDES WEST VIRGINIA AMERICAN WATER CUSTOMERS IN BOONE, LINCOLN, KANAWHA, JACKSON AND PUTNAM COUNTIES, ACCORDING TO NBC STATION WSAZ. RESIDENTS WERE TOLD NOT TO DRINK THE WATER, BATHE IN IT OR COOK WITH THE WATER AND ONLY USE IT FOR FLUSHING AND FIRE EMERGENCIES. BOILING IT WILL NOT REMOVE THE HEMICALS. THE DECLARATION IS BELIEVED TO IMPACT 100,000 CUSTOMERS, WSAZ REPORTED. THE STATION SAID THE CHEMICAL LEAKED FROM A TANK AT FREEDOM INDUSTRIES IN CHARLESTON. THE LEAKED PRODUCT IS 4-METHYLCYCLOHEXANE METHANOL, WHICH IS USED IN THE FROTH FLATION PROCESS OF COALWASHING AND PREPARATION. ACCORDING TO WEST VIRGINIA AMERICAN WATER, DUE TO A CHEMICAL LEAK THAT WENT INTO THE ELK RIVER THURSDAY, A DO NOT USE WATER ORDER HAS BEEN ISSUED FOR THE COUNTIES OF BOONE, JACKSON, KANAWHA, LINCOLN, AND PUTNAM IN WV. RESIDENTS LIVING IN THESE COUNTIES WHO USE WEST VIRGINIA AMERICAN WATER ARE BEING ASKED NOT USE TAP WATER FOR DRINKING, COOKING, WASHING, OR BATHING UNTIL FURTHER NOTICE. THE PUBLIC SERVICE DISTRICT SAYS THIS ONLY AFFECTS CUSTOMERS WHO USE WEST VIRGINIA AMERICAN WATER. CUSTOMERS IN ST. ALBANS AND CEDAR GROVE ARE NOT AFFECTED BY THIS. IT IS BELIEVED THAT THE MATERIAL MAY BE HAZARDOUS AND MAY HAVE ENTERED THE WATER SYSTEM. THE GOVERNOR OF WV HAS DECLARED A STATE OF EMERGENCY. A SPOKESPERSON FOR WEST VIRGINIA AMERICAN WATER SAYS IF YOU CAME INTO CONTACT WITH THE WATER AND FEEL ILL, CALL THE POISON CONTROL HOTLINE AT 1-800-222-1222.

Environmental Impact: UNKNOWN
Media Interest: HIGH  Community Impact due to Material:

REMEDIAL ACTIONS

Release Secured: UNKNOWN
Release Rate:
Estimated Release Duration:
Methylcyclohexane is a simple organic hydrocarbon with a molecular formula is \( \text{C}_7\text{H}_{14} \); it is a colourless liquid with a faint benzene-like odor.\[citation needed\] Methylcyclohexane is used as a solvent and occasionally as a reagent in organic synthesis and polymer chemistry. It is a component of jet fuel and is used in some consumer products such as correction fluids. It can be handled safely, but is considered a flammable and toxic liquid with consequences in case of human or other environmental exposure.
4-Methylcyclohexane Methanol (4-MCHM)

9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance Physical State:</td>
<td>Liquid</td>
</tr>
<tr>
<td>Form:</td>
<td>Liquid</td>
</tr>
<tr>
<td>Color:</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor:</td>
<td>Alcohol</td>
</tr>
<tr>
<td>Odor Threshold:</td>
<td>No data available.</td>
</tr>
<tr>
<td>pH:</td>
<td>No data available.</td>
</tr>
<tr>
<td>Freezing Point:</td>
<td>0 °C</td>
</tr>
<tr>
<td>Boiling Point:</td>
<td>180 °C</td>
</tr>
<tr>
<td>Flash Point:</td>
<td>112.8 °C (Setaflash Closed Cup)</td>
</tr>
<tr>
<td>Evaporation Rate:</td>
<td>No data available.</td>
</tr>
<tr>
<td>Flammability (solid, gas):</td>
<td>No data available.</td>
</tr>
<tr>
<td>Flammability Limit - Upper (%):</td>
<td>No data available.</td>
</tr>
<tr>
<td>Flammability Limit - Lower (%)</td>
<td>No data available.</td>
</tr>
<tr>
<td>Vapor pressure:</td>
<td>No data available.</td>
</tr>
<tr>
<td>Vapor density (air=1):</td>
<td>No data available.</td>
</tr>
<tr>
<td>Relative density:</td>
<td>&lt; 1 (estimated)</td>
</tr>
<tr>
<td>Solubility(ies):</td>
<td></td>
</tr>
<tr>
<td>Solubility in Water:</td>
<td>Appreciable</td>
</tr>
<tr>
<td>Solubility (other):</td>
<td>No data available.</td>
</tr>
<tr>
<td>Partition coefficient (n-octanol/water):</td>
<td>No data available.</td>
</tr>
<tr>
<td>Autoignition Temperature:</td>
<td>No data available.</td>
</tr>
<tr>
<td>Decomposition Temperature:</td>
<td>Thermal stability not tested. Low stability hazard expected at normal operating temperatures.</td>
</tr>
<tr>
<td>Viscosity:</td>
<td>No data available.</td>
</tr>
<tr>
<td>Explosive properties:</td>
<td>No data available.</td>
</tr>
<tr>
<td>Oxidizing properties:</td>
<td>No data available.</td>
</tr>
</tbody>
</table>

SYNONYMS OF 4-MCHM

- 4-Methylcyclohexanemethanol
- (4-Methylcyclohexyl)methanol
- 4-methyl-1-(Hydroxymethyl)-4-methylcyclohexane
- 34885-03-5
- Cyclohexanemethanol, 4-methyl-, trans-
- AMC2-20amee
- AC1L3MEZ
- SureCN155951
- AC1Q7C7Z
- SureCN3485266
- SureCN8216437
- DSSTox_CID_21813
- DSSTox_RID_79850
- DSSTox_GSID_41813
cis-4-Methylcyclohexanemethanol
- CTK1B4020
- trans-4-Methylcyclohexanemethanol
- Tox21_301528
- AR-1G3608
- AKOS009158915
- Cyclohexanemethanol, 4-methyl-, cis-
- NCGC00255649-01
- AI3-28423
- CAS-34885-03-5
- FT-0692545
- M1412
- M112072
- 3937-49-3
<table>
<thead>
<tr>
<th>Jan 09</th>
<th>Jan 10</th>
<th>Jan 11</th>
<th>Jan 12</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Forecast Point...</strong></td>
<td><strong>Flow (kCFS)</strong></td>
<td><strong>Vel (MPH)</strong></td>
<td><strong>Flow (kCFS)</strong></td>
</tr>
<tr>
<td>Allegheny River...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C.W. Bill Young L and D</td>
<td>20.1</td>
<td>0.9</td>
<td>24.4</td>
</tr>
<tr>
<td>Monongahela River...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Braddock</td>
<td>19.3</td>
<td>1.2</td>
<td>16.5</td>
</tr>
<tr>
<td>Beaver River...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beaver Falls</td>
<td>6.0</td>
<td>0.8</td>
<td>5.1</td>
</tr>
<tr>
<td>Ohio River...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dashields Lock and Dam</td>
<td>40.3</td>
<td>1.1</td>
<td>41.5</td>
</tr>
<tr>
<td>Montgomery Lock and Dam</td>
<td>46.4</td>
<td>1.2</td>
<td>44.7</td>
</tr>
<tr>
<td>Wheeling</td>
<td>48.8</td>
<td>2.0</td>
<td>46.2</td>
</tr>
<tr>
<td>Moundsville</td>
<td>49.5</td>
<td>1.2</td>
<td>46.8</td>
</tr>
<tr>
<td>Willow Island L and D</td>
<td>51.6</td>
<td>1.7</td>
<td>48.4</td>
</tr>
<tr>
<td>Parkersburg</td>
<td>64.3</td>
<td>1.4</td>
<td>61.3</td>
</tr>
<tr>
<td>Racine Lock and Dam</td>
<td>67.8</td>
<td>1.4</td>
<td>64.8</td>
</tr>
<tr>
<td>R C Byrd Dam</td>
<td>90.9</td>
<td>1.6</td>
<td>87.5</td>
</tr>
<tr>
<td>Huntington</td>
<td>96.9</td>
<td>1.7</td>
<td>91.5</td>
</tr>
<tr>
<td>Lloyd Greenup Dam</td>
<td>109.9</td>
<td>1.6</td>
<td>99.5</td>
</tr>
<tr>
<td>Meldahl Dam</td>
<td>124.7</td>
<td>2.5</td>
<td>107.9</td>
</tr>
<tr>
<td>Cincinnati</td>
<td>139.3</td>
<td>2.4</td>
<td>119.3</td>
</tr>
<tr>
<td>Markland Dam</td>
<td>145.2</td>
<td>2.5</td>
<td>134.4</td>
</tr>
<tr>
<td>McAlpine Upper</td>
<td>154.5</td>
<td>1.6</td>
<td>154.0</td>
</tr>
<tr>
<td>McAlpine Lower</td>
<td>154.0</td>
<td>2.5</td>
<td>153.6</td>
</tr>
<tr>
<td>Cannelton Dam</td>
<td>156.7</td>
<td>2.5</td>
<td>158.4</td>
</tr>
<tr>
<td>Evansville</td>
<td>180.3</td>
<td>2.1</td>
<td>177.1</td>
</tr>
<tr>
<td>J T Myers Dam</td>
<td>238.3</td>
<td>2.1</td>
<td>219.4</td>
</tr>
<tr>
<td>Shawnee Dam</td>
<td>248.1</td>
<td>2.3</td>
<td>223.9</td>
</tr>
<tr>
<td>Golconda</td>
<td>275.4</td>
<td>1.8</td>
<td>240.7</td>
</tr>
<tr>
<td>Smithland Lock and Dam</td>
<td>285.6</td>
<td>1.9</td>
<td>249.3</td>
</tr>
<tr>
<td>Muskingum River...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>McConnelsville</td>
<td>6.9</td>
<td>0.7</td>
<td>7.6</td>
</tr>
<tr>
<td>Kanawha River...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kanawha Falls</td>
<td>12.5</td>
<td>2.3</td>
<td>8.0</td>
</tr>
</tbody>
</table>
Analytics
Elk River Emergency Response Cooperation

- All affected drinking water utilities
- WVDEP
- WV DHHR
- PA AM Water
- KY DOW
- KY Office of DW/ER
- OH EPA
- OH Office of DW/ER
- IDEM DW/ER
- ILEPA/ER
- USCG Huntington
- USEPA 3, 4, 5
- USACE
- NOAA/AHPS
80 ppb standard 4-MCHM
Analyzed on CMS 5000 at GCWW

Chromatogram of Crude MCHM spiked in deionized water. Column DB-624, 30 m, 0.53 mm id, 3.0 µm
Conc. Fill: 12 min.
Temperature Profile: 50 °C (hold 0.5 min.) to 85 °C at 4 °C/min, to 180 °C at 8 °C/min (hold 0.5 min), to 150 °C at 20°C/min.
Peaks: 1 = cis 4methylcyclohexanemethanol (80 µg/L), 2 = trans 4methylcyclohexanemethanol (80 µg/L)
100 ppb standard 4-MCHM
Analyzed with OI 4560 P&T/Agilent 6890 GC at St. Albans
50 & 100 ppb standard comparison with PWTP river water
Comparison of River water (01/04/14 0:200) PWTP to 4-MCHM crude product
Sometimes other analyses are useful...
Legislation for Chemical Safety before Elk River incident

Executive Order 13650: Improving Chemical Facility Safety and Security

Executive Order Progress Update*: February 2014
Executive Order Progress Update*: December 2013

Background
On August 1, 2013, President Obama signed Executive Order 13650, entitled Improving Chemical Facility Safety and Security. The Executive Order directs the Federal Government to improve operational coordination with state and local partners; improve Federal agency coordination and information sharing; modernize policies, regulations, and standards; and work with stakeholders to identify best practices.

The Executive Order working group includes representatives from:

- U.S. Department of Homeland Security (DHS)
- U.S. Department of Agriculture (USDA)
- U.S. Department of Justice (DOJ)
- U.S. Department of Labor (DOL)
- U.S. Department of Transportation (DOT)
- U.S. Environmental Protection Agency (EPA)
H. R. 4024

To protect navigable waters from contamination by chemical storage facilities, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

February 10, 2014

Mrs. Capito introduced the following bill; which was referred to the Committee on Transportation and Infrastructure

A BILL

To protect navigable waters from contamination by chemical storage facilities, and for other purposes.

S. 1961

To protect surface water from contamination by chemical storage facilities, and for other purposes.

IN THE SENATE OF THE UNITED STATES

January 27, 2014

Mr. Manchin (for himself, Mrs. Boxer, and Mr. Rockefeller) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

A BILL

To protect surface water from contamination by chemical storage facilities, and for other purposes.
National Significance

ENROLLED
COMMITTEE SUBSTITUTE
FOR
COMMITTEE SUBSTITUTE
FOR

Senate Bill No. 373

(Senators Unger, Kessler (Mr. President), Palumbo, Plymale, Laird, Yost, Miller, Prezioso, Fitzsimmons, Wells, Cann, Chafin, Tucker, Stollings, Cookman and Snyder, original sponsors)

[Passed March 8, 2014; in effect ninety days from passage.]

AN ACT to amend and reenact §16-1-2 and §16-1-9a of the Code of West Virginia, 1931, as amended; to amend said code by
“...The sad truth is this chemical is one of tens of thousands of chemicals on the market today with little or no safety data. MCHM is one of the 62,000 chemicals that were already in use when TSCA, our nation’s main chemical safety law, was passed in 1976. All of these chemicals were grandfathered by TSCA: That means they were simply presumed to be safe, and EPA was given no mandate to determine whether they are actually safe. Even to require testing of these chemicals under TSCA, EPA must first provide evidence that the chemical may pose a risk – a toxic Catch-22. “ Richard Dennison, PHD, EDF Health
THANK YOU!