

Impacts of HB 2574 and SB 423 on the number of tanks regulated by the Aboveground Storage Tank Act

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February 5, 2015

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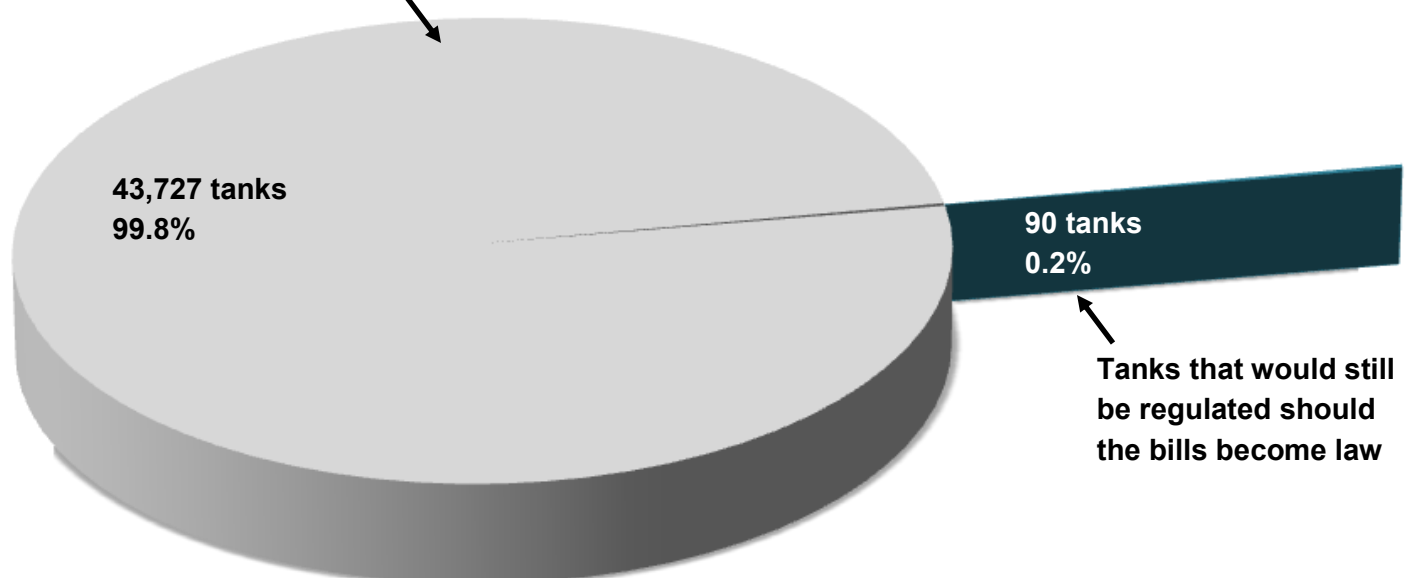
House Bill 2574 and SB 423 would make numerous changes to the Aboveground Storage Tank Act and the Public Water Supply Protection Act. These two Acts are important components of Senate Bill 373, which was unanimously passed by the House of Delegates and the Senate and signed into law by Governor Tomblin after the Freedom Industries chemical leak.

Among other major changes, the bills would drastically reduce the number of tanks subject to the Aboveground Storage Tank Act by exempting:

- ◆ tanks outside of zones of critical concern (ZCCs);
- ◆ tanks that store 10,000 gallons or less;
- ◆ tanks associated with the oil and gas industry;
- ◆ tanks certified to be operated and maintained in accordance with American Petroleum Institute (API) or Steel Tank Institute (STI) standards, a groundwater protection plan (GPP), or a spill prevention, control, and countermeasures (SPCC) program.

Only **90** tanks would still be regulated should these bills become law. This represents just **0.2%** of the tanks that are currently regulated.

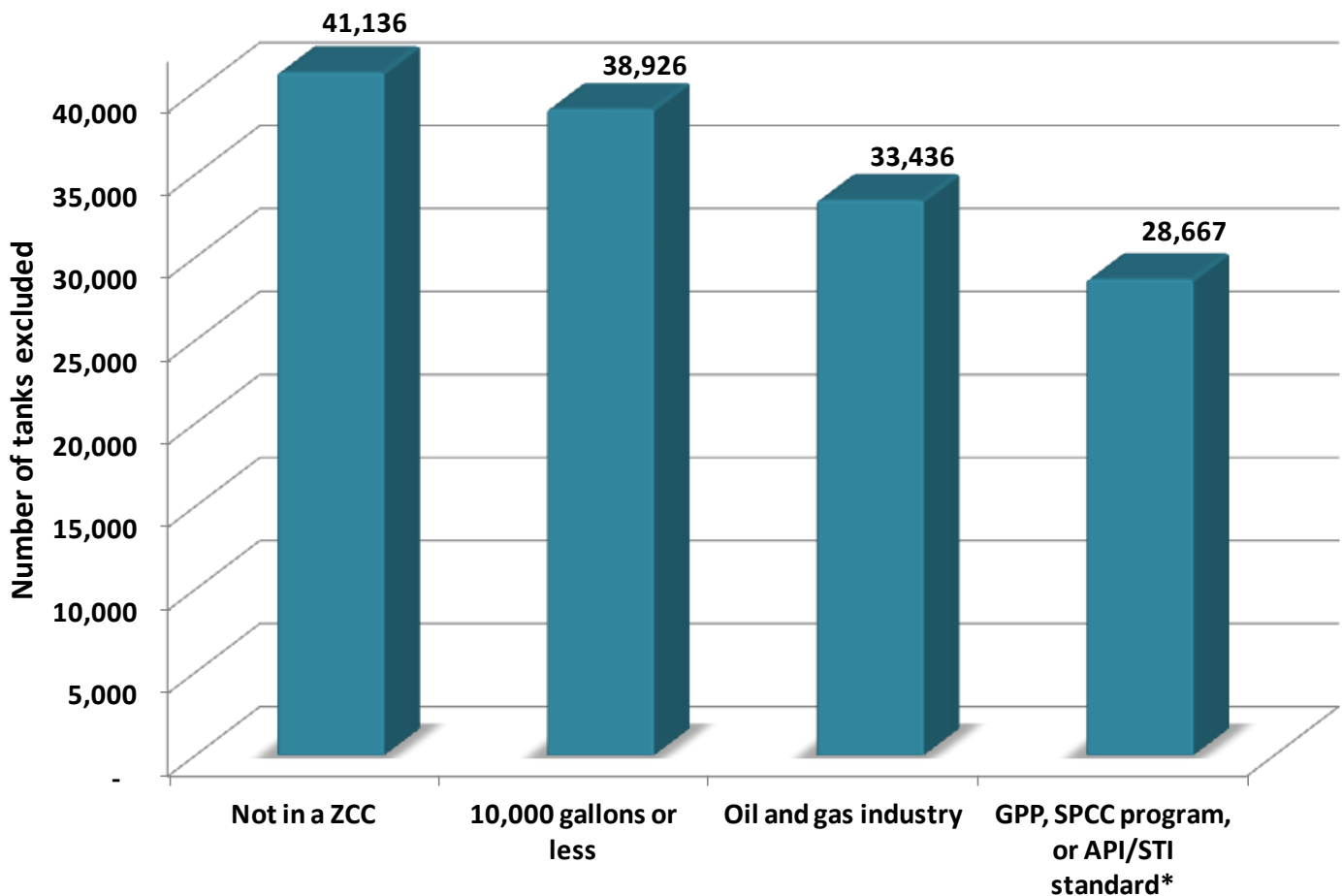
Tanks that would not be regulated should the bills become law



47,061 tanks were registered in mid-December, 2014. Of these, 43,817 contain substances other than water. These tanks that do not contain water are the focus of this analysis.

- ◆ Approximately **75%** of registered tanks are associated with the **oil and gas industry** and would be excluded should these bills become law.
- ◆ All tanks outside of a ZCC would be excluded. This leaves out **21,264 tanks located within 1,000 feet of surface water**.
- ◆ **Freedom Industries' tanks would not have been regulated under these bills** because a Groundwater Protection Plan was required.
- ◆ Of the tanks that would be excluded, almost **1,100** tanks did not pass their initial inspections, and only **58%** had been inspected.

Tanks that would not be regulated should the bills become law



Many tanks would be excluded by HB 2574 and SB 423 for more than one reason. Tanks excluded for more than one reason are counted in more than one bar in this chart.

*Total includes tanks that may contain water. All other values exclude tanks containing water.

Ethyl Methacrylate Distillates Petroleum Hydrotreated Heavy Napthenic Quaternary Ammonium Compounds Bis Hydrogenated Tallow Alkyl Dimethyl Salts With Bentonite
 Uan Fertilizer Polytetrafluoroethylene Alkyl Esters White Mineral Oil Petroleum Sulfuric Acid Water Benzene Ethylenated Residues Distn Lights
 2 Ethyl Sodium Carbonate Sodium Nitrite Kerosine Petroleum Xylene Mixed Diethylene Glycol
 Eg Water Mixture Methacrylate Monomer Methanol Clay
 Sodium Hydrogen Tin Plating Solution Acetic Acid Water
 Alkyl Naphthalene 12280 03 4 Disodium Octaborate Phosphorodithioic Acid Oo Di C1 14 Alkyl Esters Zinc Salts
 Phosphorodithioic Acid Oo Di C1 14 Alkyl Esters Zinc Salts Phosphate Ester Xylene Trimethylbenzene
 Tannins Ammonium Salts Sodium Hydroxide Waste Water Methylene Ester
 Ethyl Alcohol Xylene Phosphoric Acid Lubricating Oils Used Residues Corrosion Inhibitor Acrylic Acid Polyvinyl Acetate
 Formamide N Methyl Glycerin Ethylene Glycol Caustic Soda Etc See Mineral Oils Highly Refined
 Acetic Acid Dipropylene Glycol Methyl Ether Distillates Petroleum Hydrotreated Light
 Lubricating Oil Wastewater Kerosene Formaldehyde Methacrylate Monomer Hypochlorous Acid Sodium Salt 1 1
Natural Gas Condensates Ethane Acetone
 Other Urea A N Potassium Hydroxide Sodium Hypochlorite Caustic Soda Methanol
 Distillates Petroleum Solvent Refined Light Paraffinic Acid Reclaim Sludge Aqueous Pags Ferric Chloride
 Phosphonic Acid Poly Ethylene Oxide Calcium Chloride Cacl2 Water
 Activated Sludge And Water Sodium Hydroxide Water Triethylene Alcohols C12 15 Freeze Proof Alcohols C12 15 Emulsifier Sulfuric Acid Sodium Salt 1 2
 Cyclohexane Additive Ethyl Benzene Sodium Salt 2 Dimethylamine Methanol Brine
 Waste Diethylene Glycol Ethanol Sodium Permanganate Asches Residues N Butyl Methacrylate Stabilized
 Ethylene Oxide Sodium Bifluoride Potassium Chloride Kcl Hydrogen Sulfate See Biosludge Diphenylamine Phosphoric Acid
 N Pentane Xylene Ater Benzene Hydrogen Sulfate See
Brine/Oil/Gas Aluminum Calcium Chloride
 Amines Mixed Benzyl Acrylate Sodium Salt 1 1 Acrylonitrile Fca 2500
 Ethylene Distillates Petroleum Hydrotreated Middle Ethane Caustic Soda Dimethylformamide
 123 Propanetriol N Butane Sulfuric Acid Used Oil Zinc
 Acetone Mak Pentanenitrile 2 Amino Caprolactam Acetic Anhydride Acetic Acid Thiocyanic Acid Cc Urea Potassium Hydroxide Ammonia
Lime Sodium Chloride Nacl Ammonium Nitrate With More Than 0 2 Diesel Fuel Kerosene Hydrochloric Acid Aniline
 Monomethyl Ether Hydroquinone Ammonium Nitrate Acid Stain Inhibition Cleaner Water Aluminum Chloride Basic Ammonium Nitrate Ammonium Hydroxide
 Distillates Petroleum Hydrotreated Light Eg Water 107 21 1 7732 18 5 Methyl Methacrylate Concentrate Methylcyclohexane
 Toluene Diisocyanate Diphosphoric Acid Potassium Salt 1 4 Glycol 123 Propanetriol Hexane Alkyl Alcohol
 N Butane N Pentane Akj 852 Sulfuric Acid
Caustic Lime Calcium Chloride Cacl2 Benzene
 Ammonium Perfluorooctanoate Aldehydes Absorber Drainage Aqueous Pags Hydrolube Intermediates Ethyl Benzene
 Misc Polyalkylene Formaldehyde Acrylic Polymer Emulsion Oil Lube Oil Hydrofluoric Acid Phenol 2 11 Dimethylethyl 46 Dimethyl
 Aluminum Chloride Basic Water Polyol Based Plasticizer Aliphatic Alcohol Diesel Dimethylsulfate
 Waste Oil Distillates Petroleum Hydrotreated Heavy Paraffinic Acetamide 22 Dibromo 2 Cyano Alcohols C9 13 C10 Rich Wastes Petroleum Diesel
 Distillates Petroleum Solvent Refined 2 Propenoic Acid Cyclohexane Sulfuric Acid Tetrahydrate Monoethanolamine Sodium Hydroxide
 Extract Residues Coat Tar Oil Alk Naphthalene Distn Residues Phosphorodithioic Acid Mixed Oo Bis Sec Bu And Isooctyl Esters Zinc Salts Sodium Nitrite Ethylene Glycol Water
 Naphtha Petroleum Hydrotreated Light Varies Carbonic Acid Geo Melt 550 Ethylene Glycol Water
 Shell Morlina S3 Ba220 Magnesium Hydroxide Mg Oh 2 Aluminum Chloride Hydroxide Al2Cl Oh 5
 Xylenes Ammonium Acetate Alkyl Alcohol Glycine Nn 12 Ethanedylbis N Carboxymethyl Sodium Salt 1 4 Alkylphenols
Toluene Benzene Acetic Acid
 Calcium Chloride Cacl2 N Hexane Naphthalene Def Benzene Acetic Acid Agashed 175
 Polyethylene Glycol N Hexane Amine Acetate Alkanes C6 8 C7 Rich
 Frother F122 Poly Oxy 12 Ethanedyl Alpha Hydro Omega Hydroxy N Butane Glycerin Anhydrous 24 Dimethyl
 Water With Approx 5 Silicic Acid H2sio3 Sodium Salt 1 2

Aboveground Storage Tanks in West Virginia: A Snapshot

Evan Hansen, Meghan Betcher, Annie Stroud, Angie Rosser

January 15, 2015

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Introduction

On January 9, 2014, coal-cleaning chemicals were discovered to be leaking from the Freedom Industries aboveground storage tank facility into the Elk River, approximately 1.5 miles upstream from West Virginia American Water Company's drinking water intake. These chemicals contaminated the water supply for about 300,000 West Virginians, making people sick, forcing businesses to close, and harming the reputation of the state.

In response, the Legislature enacted Senate Bill 373. This bill, unanimously passed by the House of Delegates and the Senate and signed into law by Governor Tomblin, included numerous provisions to help prevent contamination of drinking water and to better plan for responses, should contamination occur. Among these provisions was the Aboveground Storage Tank Act.

During the debate in the Legislature, it became apparent that regulators had no firm idea of the number of aboveground storage tanks in West Virginia because they had previously been unregulated. The Act therefore required an inventory of all tanks to be completed by October 1, 2014. ***This report provides an analysis of the more than 47,000 tanks¹ registered by mid-December.***

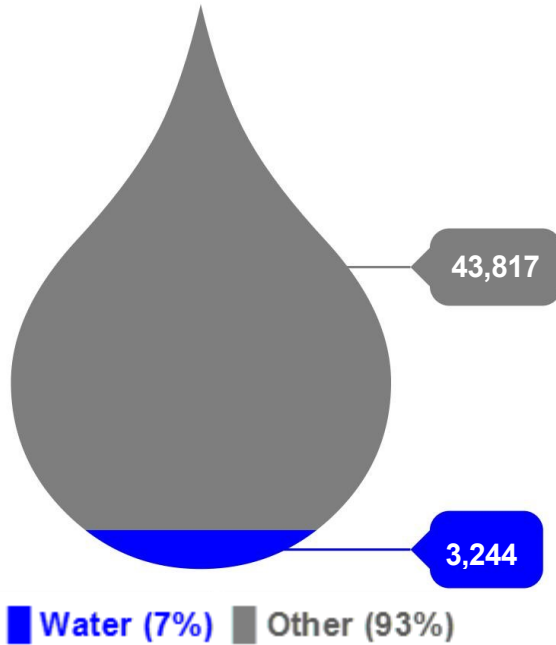
While not the subject of this report, the Act requires much more than registration. Tank owners and operators were to submit Spill Prevention Response Plans by December 3, 2014 and initial certifications of self-inspections January 1, 2015. The West Virginia Department of Environmental Protection (WVDEP) has proposed a new Aboveground Storage Tank Rule that includes among other things, certificates to operate, performance standards, leak detection systems, recordkeeping requirements, corrective action requirements, and financial assurances.

As the Legislature convenes for its 2015 regular session, this new rule, as well as the Act itself, will no doubt receive a second look. Now that a year has passed and the initial tank inventory has been completed, we know more than we did a year ago.

We hope that this analysis of initial tank registrations will help legislators, regulators, tank owners and operators, and the general public make the best decisions possible.



Overview



47,061 tanks were registered in mid-December, 2014.

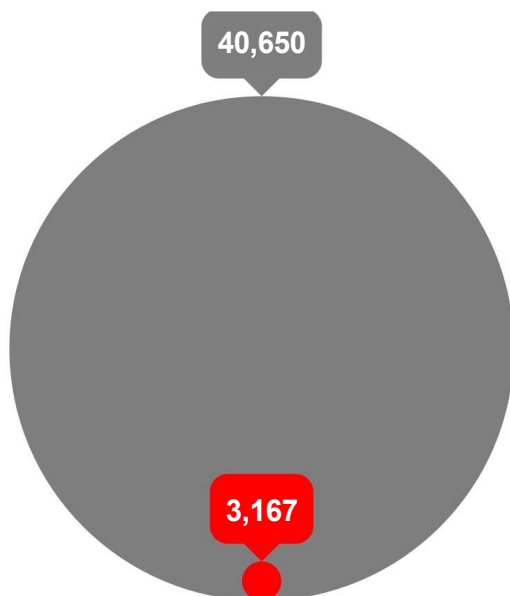
The **3,244** tanks that store water present the least threat to drinking water.²

These water tanks are omitted from the remaining analyses in this report.

If a tank leaks, its contents can drain into nearby surface waters (rivers, streams, or lakes) and can also impact groundwater below the tank.

The Act requires extra precautions for tanks in Zones of Critical Concern (ZCCs),³ which include the land next to streams that are close to, and upstream from, surface water drinking water intakes.

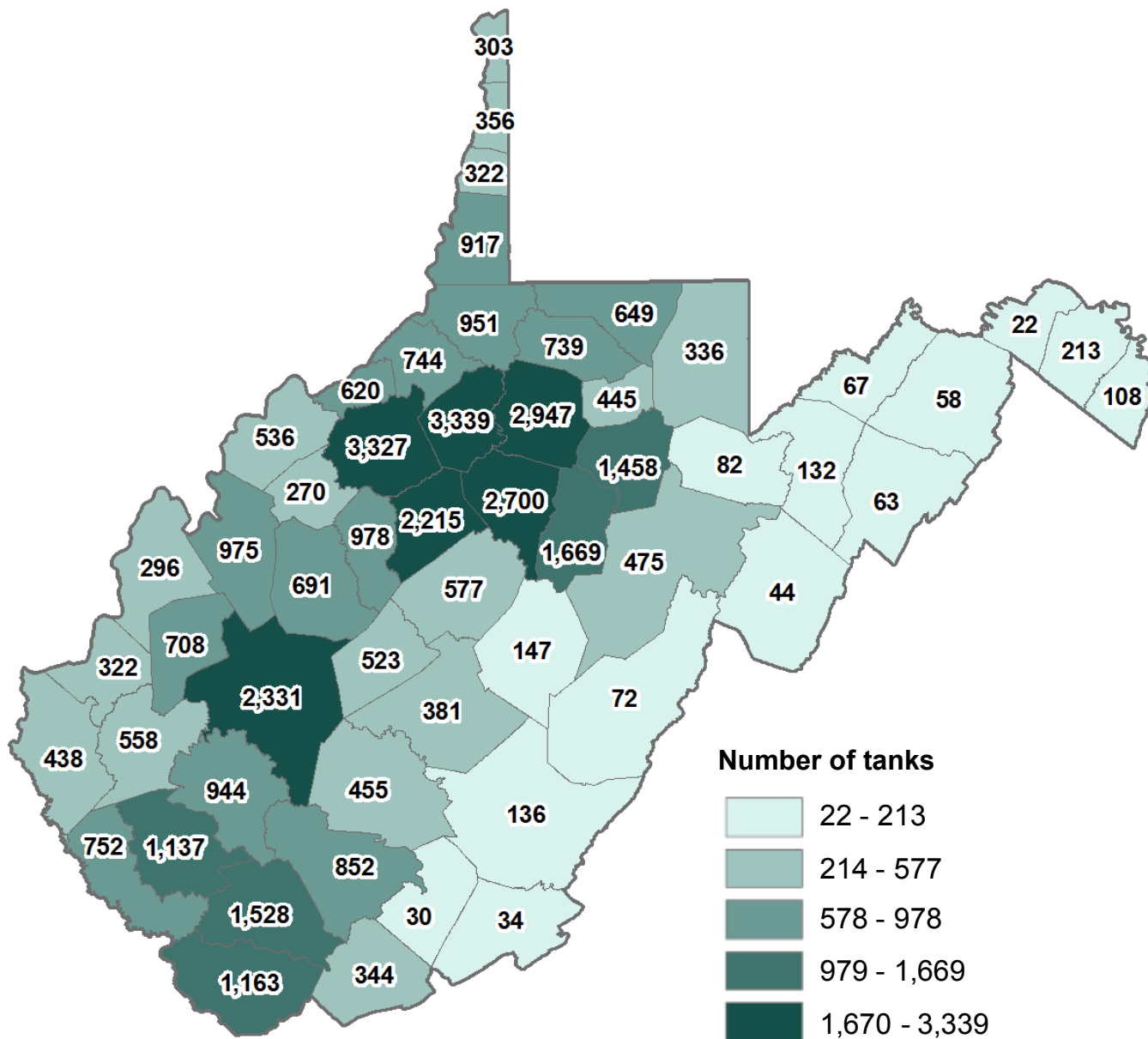
Extra precautions are also taken for tanks in Source Water Protection Areas (SWPAs),⁴ which include the land above groundwater sources of drinking water.



The **3,167** tanks in ZCCs or SWPAs present the most immediate threat to drinking water.

■ In ZCC or SWPA ■ Out of ZCC or SWPA

Where are the tanks?



Top 6 counties:

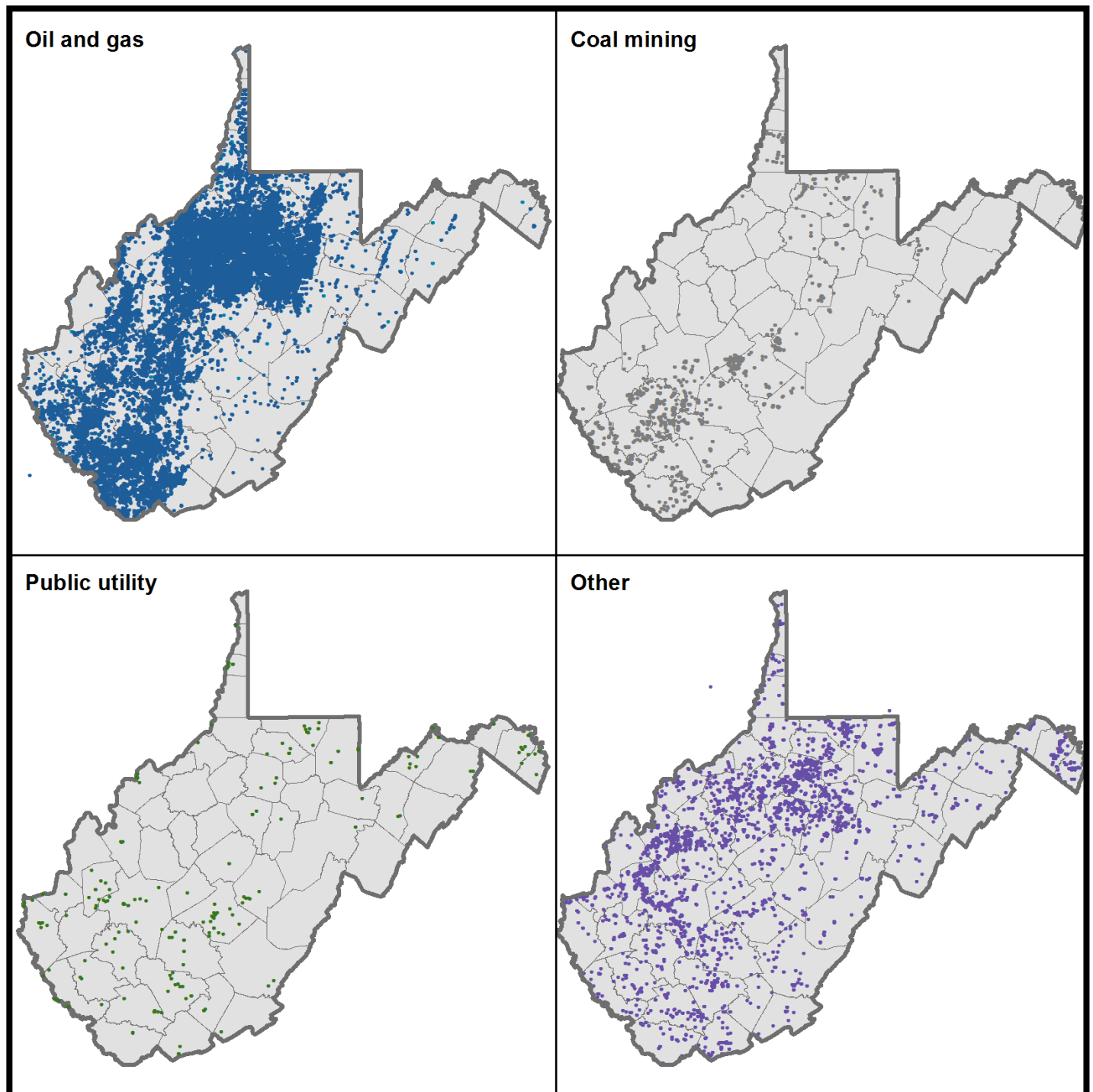
1. Doddridge
2. Ritchie
3. Harrison
4. Lewis
5. Kanawha
6. Gilmer

5 of the **6** counties with the most tanks are clustered in north-central West Virginia.

Tanks by industry type

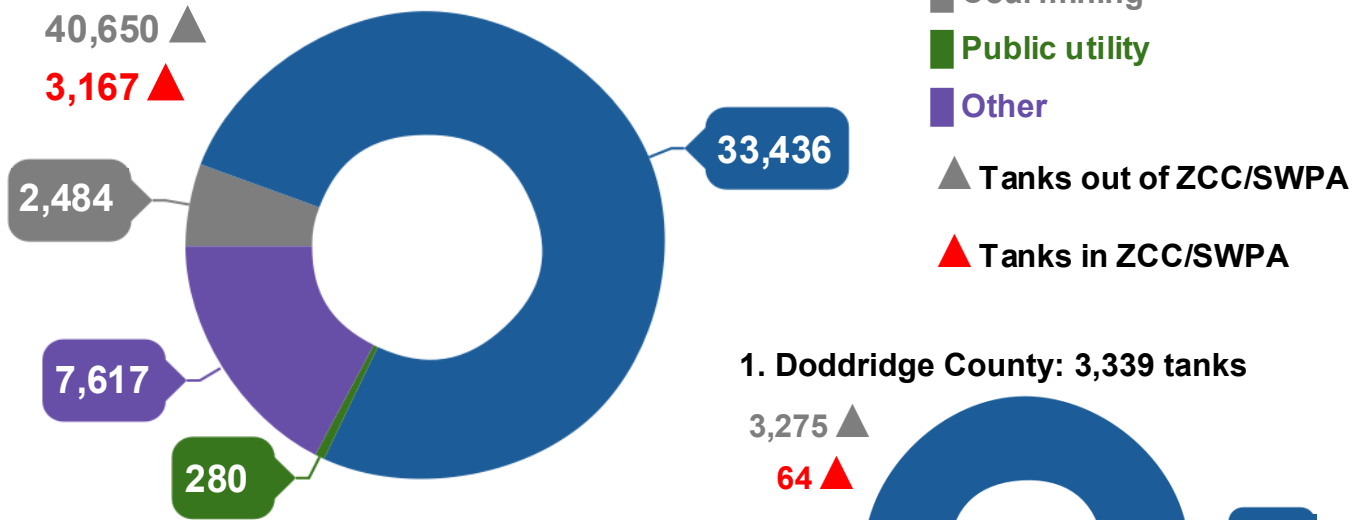
In this report, we categorize tanks by industry type.

- ◆ Oil and gas: Those on conventional and Marcellus well pads, among others.⁵
- ◆ Coal mining: Those on coal mines.⁶
- ◆ Public utility: Those registered by water and wastewater utilities.⁷
- ◆ Other: All other tanks, including those at chemical facilities and other industrial operations.⁸

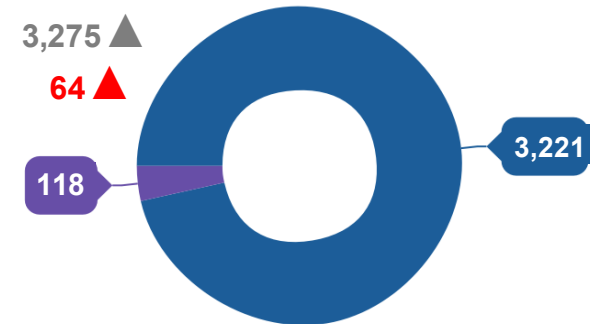


Who owns the tanks?

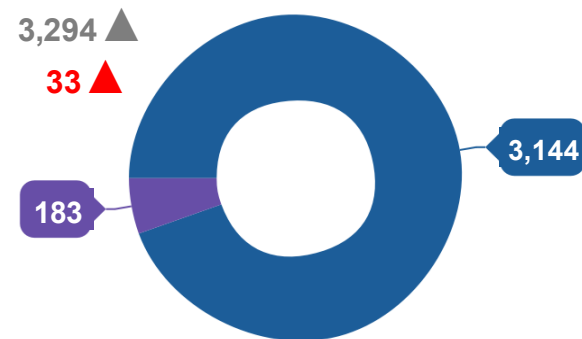
West Virginia: 43,817 tanks



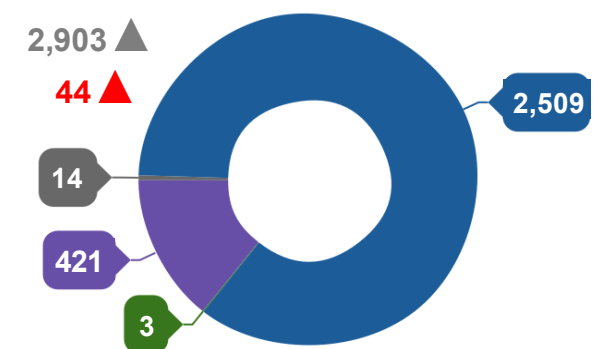
1. Doddridge County: 3,339 tanks



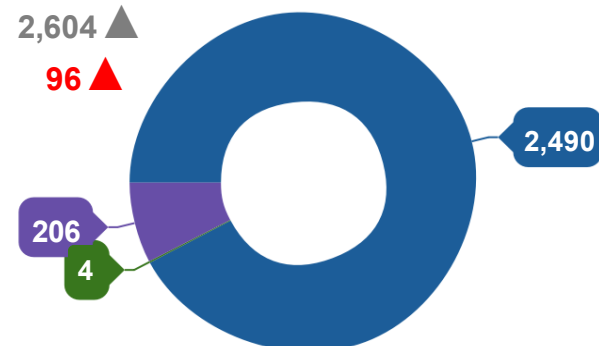
2. Ritchie County: 3,327 tanks



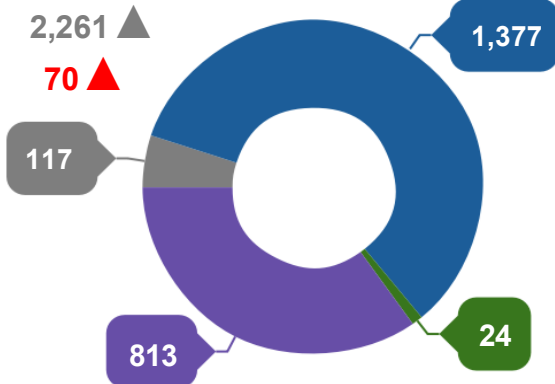
3. Harrison County: 2,947 tanks



4. Lewis County : 2,700 tanks



5. Kanawha County : 2,331 tanks



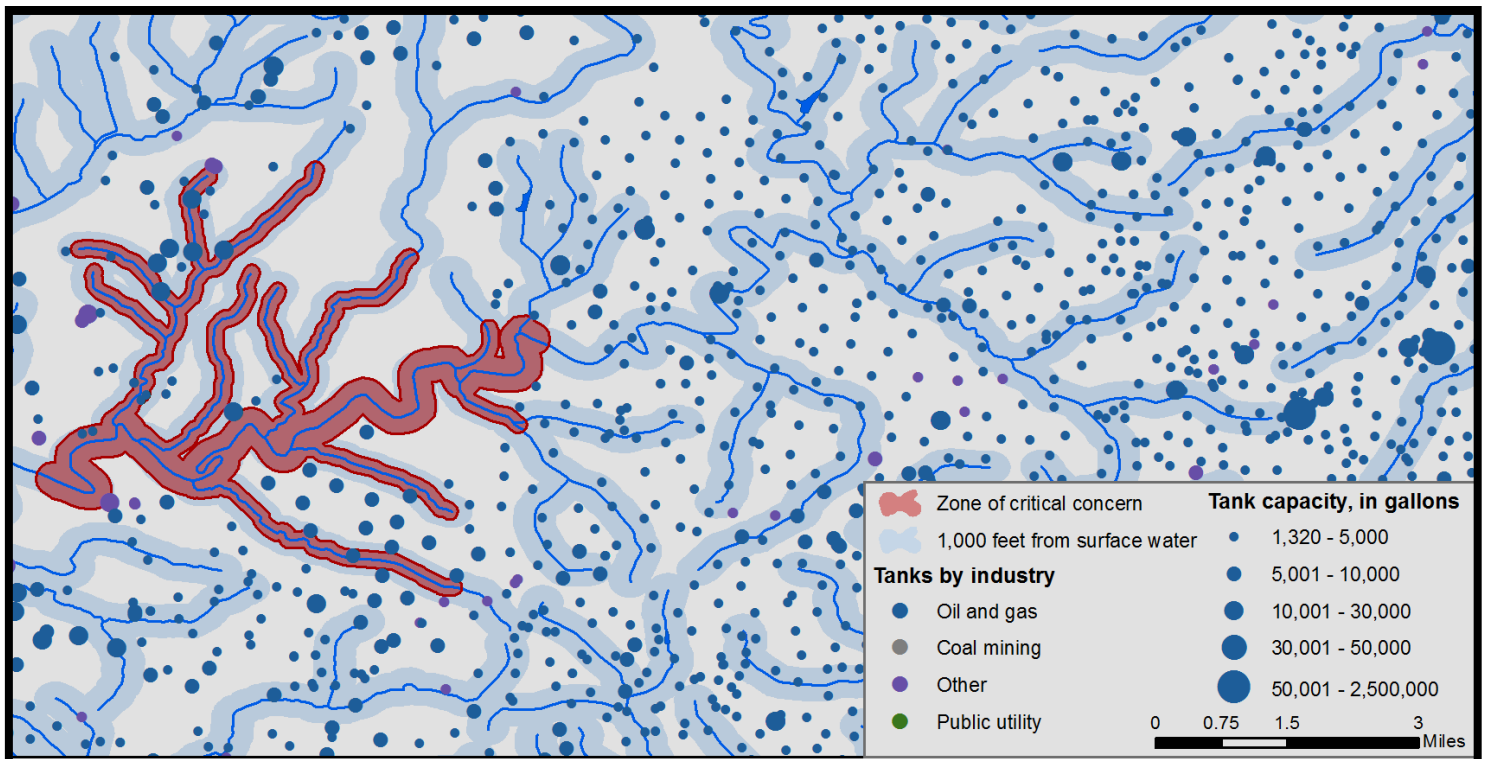
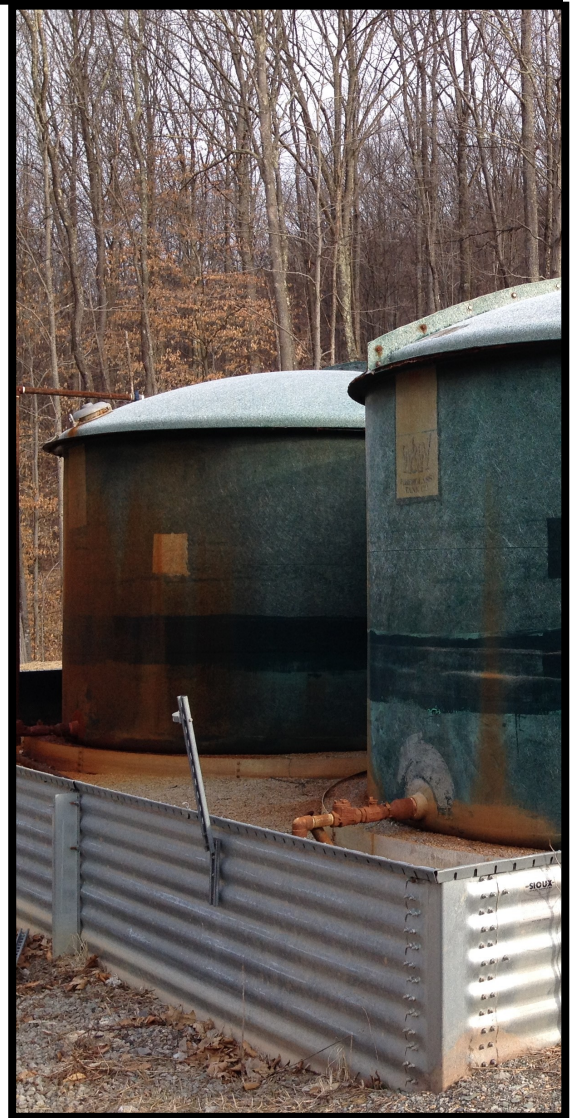
The oil & gas industry

Approximately **three-quarters** of registered tanks are associated with the oil and gas industry.

There are many more conventional than Marcellus tanks.

While **4%** of oil and gas tanks are within ZCCs or SWPAs, an additional **40%** are within **1,000** feet of surface waters.

At the border of Ritchie and Doddridge Counties, numerous oil and gas tanks are immediately adjacent to surface waters and can impact drinking water—even though they are located outside of the Hughes River Water System ZCC.

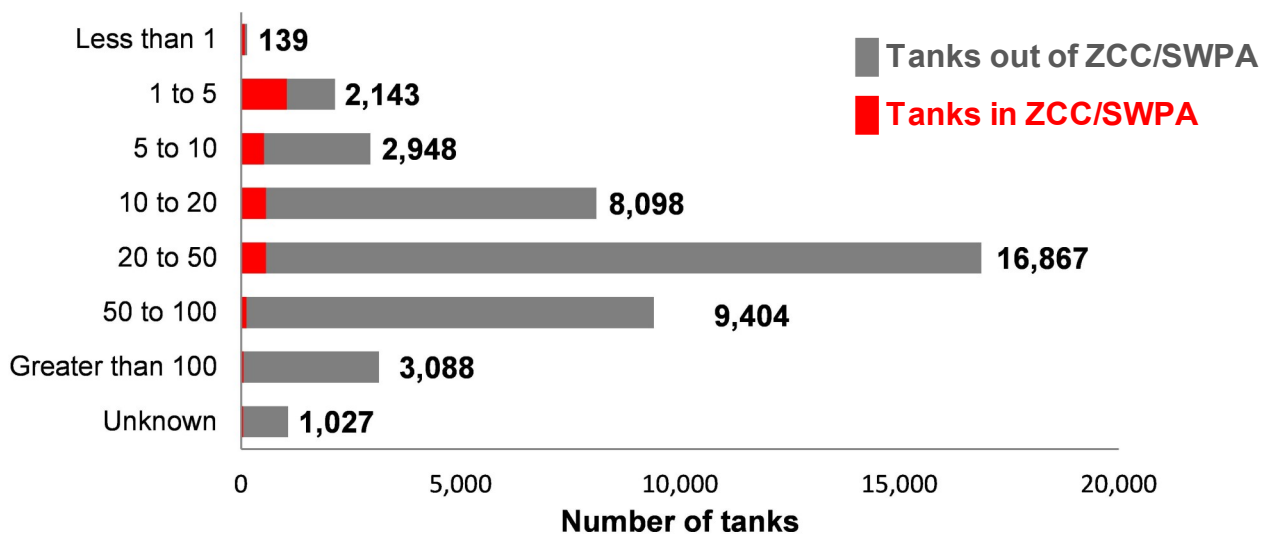


Threats to drinking water

If the Act were amended to apply only to tanks in ZCCs or SWPAs, it would miss **thousands of tanks** in close proximity to drinking water intakes.

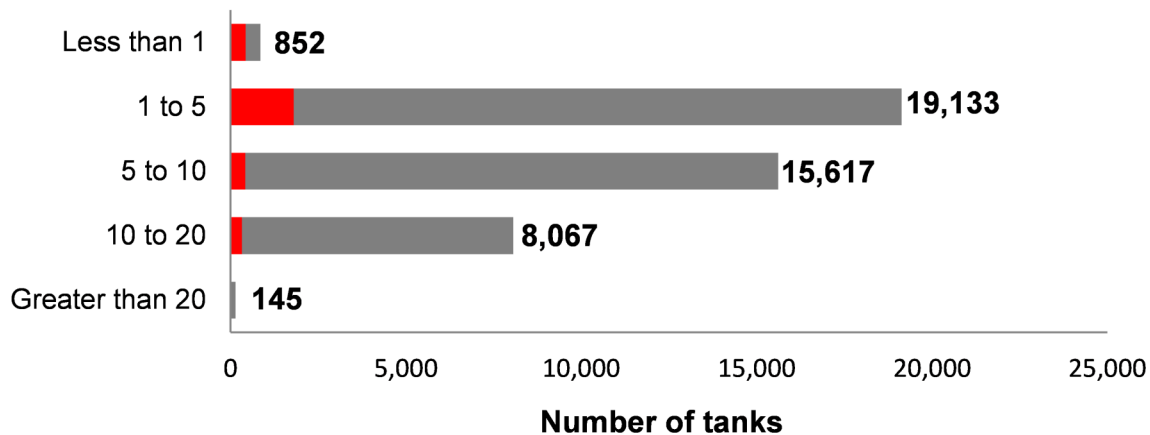
Surface water intakes

Miles to surface water intake



Groundwater intakes

Miles to groundwater intake



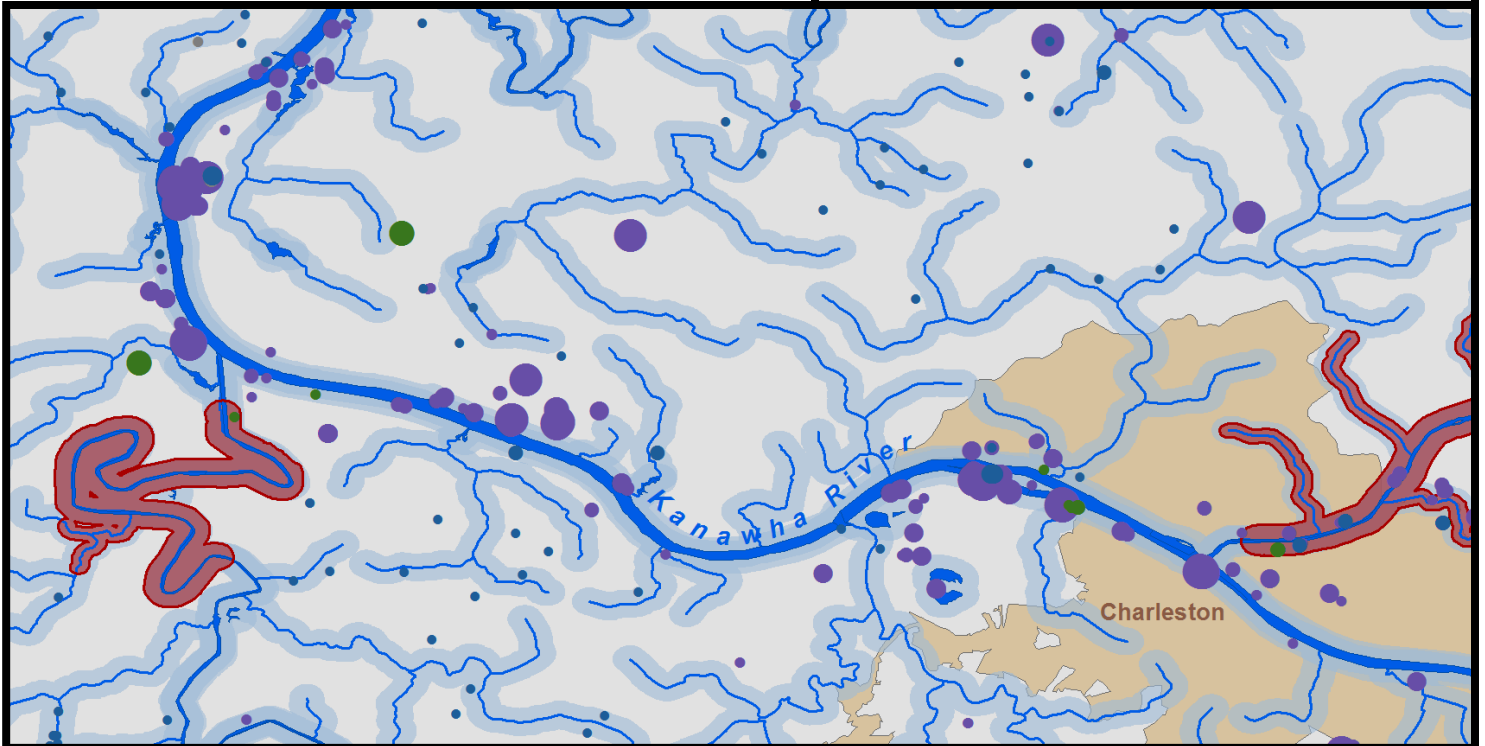
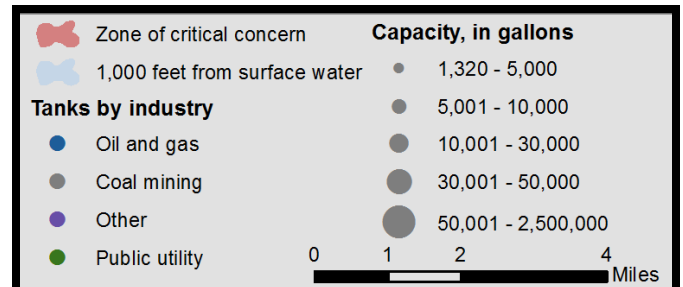
Threats to surface water

In addition to minimizing the risk of drinking water contamination, the Act also helps keep all rivers, streams, and lakes clean to protect aquatic life and to provide for healthy opportunities to fish, boat, and swim. Clean surface waters are also available to provide drinking water in the future.

Almost half of all tanks are within 1,000 feet of a surface water.

Almost every tank is within 5,000 feet of a surface water.

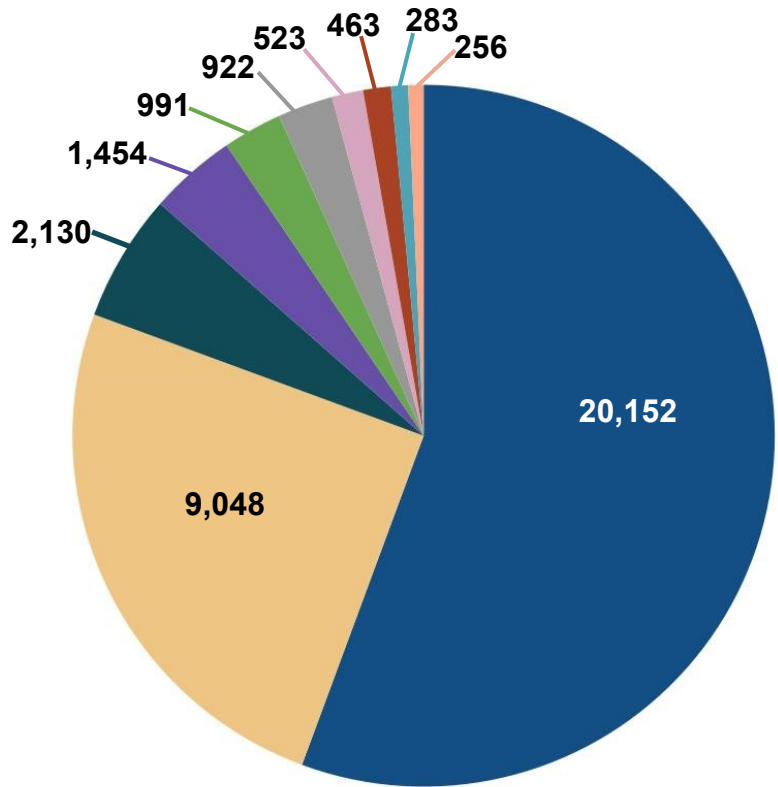
In Kanawha County, numerous large tanks are adjacent to the Kanawha River, and many smaller tanks are adjacent to tributaries. Even though there are no drinking water intakes for many miles downstream, these tanks can significantly impact stream health and recreational opportunities.



What is in the tanks?

Top 10 substances

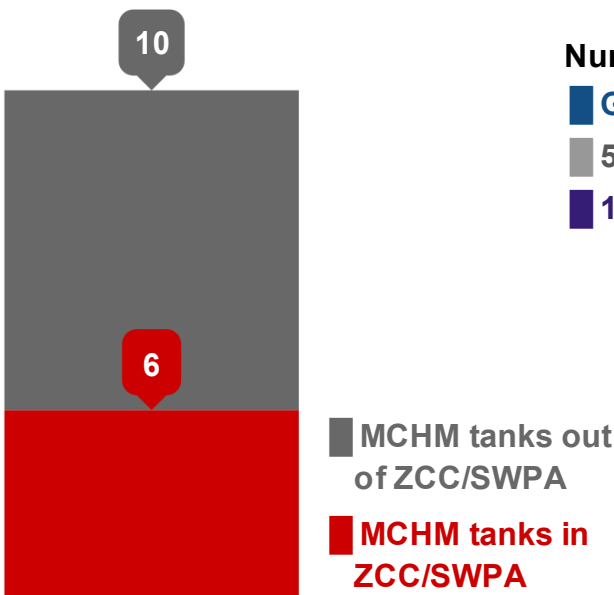
- Brine/oil/gas/water
- Crude oil
- Diesel
- Natural gas condensates
- Petroleum/petroleum distillates
- Produced fluids
- Salts/natural gas/oil/water
- Gasoline, all grades
- Motor oil
- Calcium chloride (CaCl₂)



Spotlight on MCHM

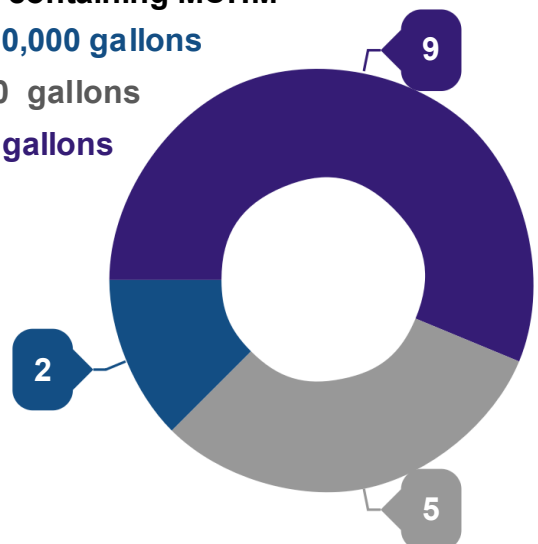
A chemical mixture including MCHM leaked from Freedom Industries. Even though these chemicals caused nausea, headaches, and vomiting, MCHM is not included on the List of Lists.⁹

16 tanks contain MCHM, **4** of which are in Raleigh County.



Number of tanks containing MCHM

- Greater than 10,000 gallons
- 5,000 to 10,000 gallons
- 1,000 to 5,000 gallons

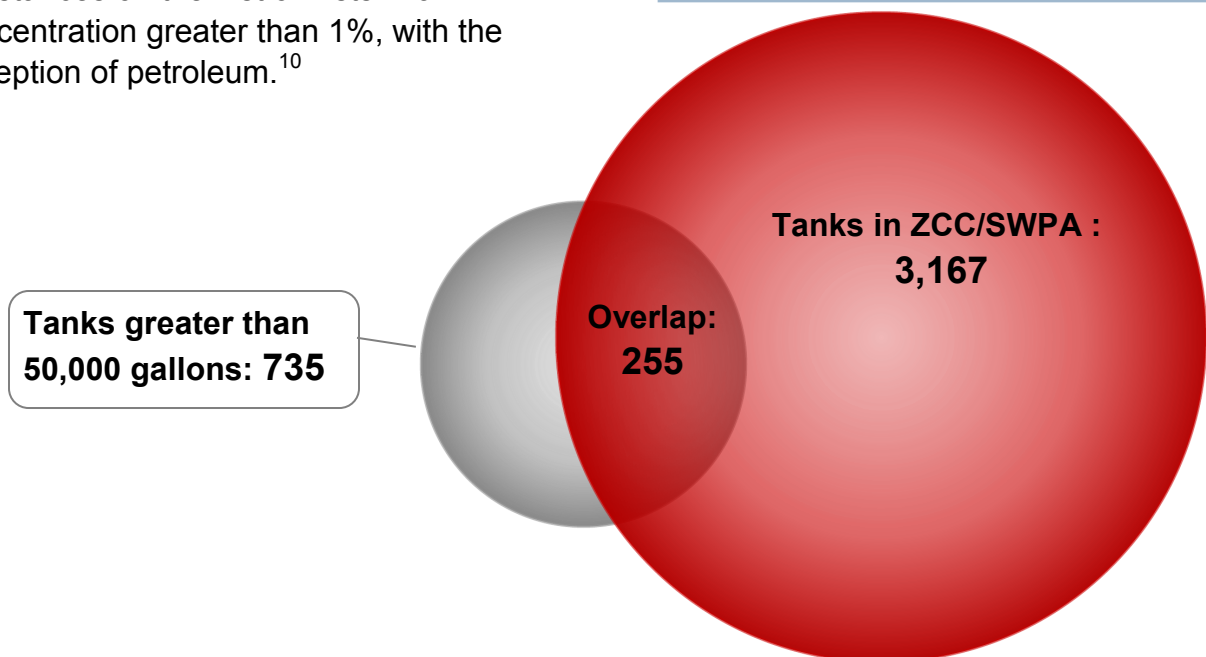


Risk-based tank regulations

In its proposed regulations, WVDEP divides tanks into three levels based on risk. Level 1 tanks “exhibit a high potential for harm to public health or the environment due to their contents, location, or size.” Level 2 and 3 tanks exhibit less risk. Level 1 tanks include those:

- ◆ within ZCCs/SWPAs,
- ◆ with capacities of 50,000 gallons or greater, and
- ◆ that contain hazardous substances or substances on the List of Lists in a concentration greater than 1%, with the exception of petroleum.¹⁰

More than **3,500** tanks should be classified as Level 1 due to size and location alone. Additional tanks should be classified as Level 1 due to contents.



Initial tank inspections

Initial data on tank self-inspections and certifications were reported by WVDEP on January 5, 2015.

More than **1,100** tanks did not pass their initial inspections, and certifications had not been received for **42%** of tanks.

Only **55%** of registered tanks have been certified as fit for service.

Key findings and recommendations

1. **The Aboveground Storage Tank Act protects all West Virginians.** Almost 50,000 aboveground storage tanks, which store a wide variety of substances, are located in every county across West Virginia.

Recommendation: While some minor adjustments may be warranted, maintain the fundamental protections provided by the Aboveground Storage Tank Act.

2. **Approximately three-quarters of registered tanks are associated with the oil and gas industry.** These tanks may hold brine, petroleum products, and other harmful substances, and many of these tanks are located very close to surface waters.

Recommendation: Because it uses so many tanks that are very close to surface waters, maintain strict regulations for oil and gas industry tanks that present risks to human health and the environment.

3. **If they leaked, thousands of tanks could contaminate drinking water sources.** More than 3,000 tanks within ZCCs and SWPAs present the most immediate contamination risks to drinking water; however, thousands of additional tanks are located within five miles of surface water or groundwater intakes.

Recommendation: While tanks located in ZCCs or SWPAs deserve extra safeguards, maintain strict regulation for other tanks that can easily contaminate surface water or groundwater intakes.





4. The Aboveground Storage Tank Act also protects aquatic life and recreational opportunities. Almost half of all tanks are located within 1,000 feet of a surface water.

Recommendation: In order to meet its goal of protecting not just human health, but also protecting the environment, maintain strict regulation for all tanks in close proximity to all surface waters.

5. Level 1 tanks will not automatically include all tanks that store harmful substances, such as MCHM. According to the proposed Aboveground Storage Tank Rule, a tank such as the leaking Freedom Industries MCHM tank located just outside of a ZCC would only be classified as a Level 2 tank.

Recommendation: Designate as Level 1 tanks those that store MCHM and other substances that, while not on the List of Lists, still present threats to human health or the environment.

6. The results from initial tank inspections and certifications, which were due on January 1, 2015, demonstrate the importance of inspections. More than 1,100 tanks did not pass their initial inspections, and certifications had not been received for 42% of tanks as of January 5. Only 55% of tanks were certified as fit for service as of this date.

Recommendation: Maintain requirements to annually inspect all tanks, and ensure that the deadlines included in the proposed Aboveground Storage Tank Rule for fixing problems identified during inspections are enforced.

Aboveground storage tanks in all West Virginia counties

County	Total	ZCC/SWPA		Industry			
		In	Out	Coal mining	Oil and gas	Public utility	Other
1. Doddridge	3,339	64	3,275		3,221		118
2. Ritchie	3,327	33	3,294		3,144		183
3. Harrison	2,947	40	2,907	14	2,509	3	421
4. Lewis	2,700	96	2,604		2,490	4	206
5. Kanawha	2,331	69	2,262	117	1,377	24	813
6. Gilmer	2,215	84	2,131		2,112		103
7. Upshur	1,669	85	1,584	43	1,506	1	119
8. Wyoming	1,528	79	1,449	112	1,332	7	77
9. Barbour	1,458	70	1,388	32	1,303		123
10. McDowell	1,163	6	1,157	73	1,019	2	69
11. Logan	1,137	195	942	223	840	3	71
12. Calhoun	978	68	910		910		68
13. Jackson	975	6	969		705	3	267
14. Wetzel	951	67	884		879	10	62
15. Boone	944	4	940	392	494	6	52
16. Marshall	917	324	593	110	480		327
17. Raleigh	852	97	755	156	532	18	146
18. Mingo	752	74	678	150	527	14	61
19. Tyler	744	4	740	1	716	1	26
20. Marion	739	9	730	59	576	12	92
21. Putnam	708	4	704	2	273	12	421
22. Roane	691	13	678		560		131
23. Monongalia	649	54	595	84	268	14	283
24. Pleasants	620		620		513		107
25. Braxton	577	30	547	17	489	2	69
26. Lincoln	558	29	529	29	472	1	56
27. Wood	536	3	533		166	14	356
28. Clay	523	33	490	24	480	1	18
29. Randolph	475	17	458	14	374	2	85

County	Total	ZCC/SWPA		Industry			
		In	Out	Coal mining	Oil and gas	Public utility	Other
30. Fayette	455	32	423	40	251	14	150
31. Taylor	445	10	435	22	352		71
32. Wayne	438	50	388	42	255	14	127
33. Nicholas	381	5	376	105	156	17	103
34. Brooke	356	219	137	2	181	1	172
35. Mercer	344		344	30	229	4	81
36. Preston	336	5	331	22	217	6	91
37. Cabell	322	80	242		29	10	283
38. Ohio	322	31	291		253	7	62
39. Hancock	303	249	54		84		219
40. Mason	296	4	292		39		257
41. Wirt	270	3	267		240		30
42. Berkeley	213	119	94		4	15	194
43. Webster	147	3	144	87	22	6	32
44. Greenbrier	136		136	32	57	2	45
45. Grant	132	17	115	10	52	5	65
46. Jefferson	108	8	100		10	6	92
47. Tucker	82	23	59	10	40	1	31
48. Pocahontas	72		72		32		40
49. Mineral	67	11	56	4	3	8	52
50. Hardy	63	12	51		25		38
51. Hampshire	58	16	42		20	2	36
52. Pendleton	44	3	41		27		17
53. Monroe	34		34		3	1	30
54. Summers	30	1	29		16	5	9
55. Morgan	22	5	17			1	21
Mobile tanks	1,338	118	1,220	426	572	1	339
Total	43,817	2,681	41,136	2,484	33,436	280	7,617

Endnotes

¹ The number of aboveground storage tanks registered with WVDEP is constantly changing. This report is based on the inventory provided by WVDEP on December 16, 2014. While the exact numbers reported in this report will change as additional tanks are registered, it is likely that the general conclusions will stay the same.

² In this report, tanks were considered to store water if their registration included a single substance that was either: demineralized water, DI water, drinking water, fresh well water, hot water, municipal water, potable water, potable drinking water, surface water, water fire suppression system, water taken from Ohio River, hydro test water, non potable water, raw water, or reverse osmosis (RO) water.

³ Senate Bill 373 defines “Zone of Critical Concern” as “a corridor along streams within a watershed that warrants more detailed scrutiny due to its proximity to the surface water intake and the intake’s susceptibility to potential contaminants within that corridor. The ZCC is determined using a mathematical model that accounts for stream flows, gradient, area, and topography. The length of the ZCC is based on a five-hour time-of-travel of water in the streams to the water intake, plus an additional one-fourth mile below the water intake. The width of the ZCC is one thousand feet measured horizontally from each bank of the principal stream and five hundred feet measured horizontally from each bank of the tributaries draining into the principal stream.”

⁴ Senate Bill 373 defines “Source Water Protection Area” for a public groundwater supply source as “the area within an aquifer that supplies water to a public water supply well within a five-year time-of-travel, and is determined by the mathematical calculation of the locations from which a drop of water placed at the edge of the protection area would theoretically take five years to reach the well.”

⁵ Tank categories were not self-reported by owners or operators. Tanks were classified as “oil and gas” if (1) the facility name included “well” or “pad;” (2) the regulation field included “oil and gas,” “WV Code 22-6,” or “WV Code 22-6A;” (3) the substance included brine, natural gas condensate, produced water, produced fluids, drilling mud, or treated flowback water; or (4) the tank owner’s name included either: oil, gas, midstream, Northeast Natural Energy, energy, gathering, Marcellus, well, Schlumberger, Antero, Chesapeake Appalachia, EQT, Dominion, drilling, drillers, or shale. Resulting matches were then scanned, and tanks that should not be included in this category were removed.

⁶ Tanks were classified as “coal mining” if (1) the tank owner’s name or facility name included coal, mining, mine, ICG, Marion Docks, Alex Energy, or Alpha Natural Resources or (2) the regulation listed for the tank included SMCRA, Article III, or permit numbers recognized as mining permits. Resulting matches were then scanned, and tanks that should not be included in this category were removed.

⁷ Tanks were classified as “public utility” if the owner’s name included: sanitary bd, water co, water association, water bd, water works, PSD, water comm., water works, utilities, or WV American Water Co. Resulting matches were then scanned, and tanks that should not be included in this category were removed.

⁸ Tanks were classified as “other” if they were not classified as oil and gas, coal mining, or public utility tanks.

⁹ The List of Lists is a consolidated list of chemicals subject to certain federal laws and regulations regarding toxic and hazardous substances.

¹⁰ WVDEP’s proposed Aboveground Storage Tank Rule explains which tanks must be considered Level 1 based on contents: “Additionally, a Level 1 AST is any tank that contains substances defined in section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as a “hazardous substance” (42 U.S.C. § 9601(14)); or is on EPA’s “Consolidated List of Chemicals Subject to the Emergency Planning and Community Right to Know Act (EPCRA), CERCLA, and §112(r) of the Clean Air Act (CAA)” (known as “the List of Lists”) as provided by 40 C.F.R. §§ 355, 372, 302, and 68) in a concentration of one percent (1%) or greater, regardless of the AST’s location, except petroleum is not a Level 1 solely based upon having constituents on the CERCLA lists.” (47 CSR 63, Section 2.36)

The word cloud on the cover displays substances stored in tanks as reported to WVDEP. The substance names are sized relative to the number of tanks in which they are stored.