

Potential Significant Contaminant Sources above West Virginia American Water's Charleston Intake

A Preliminary Assessment

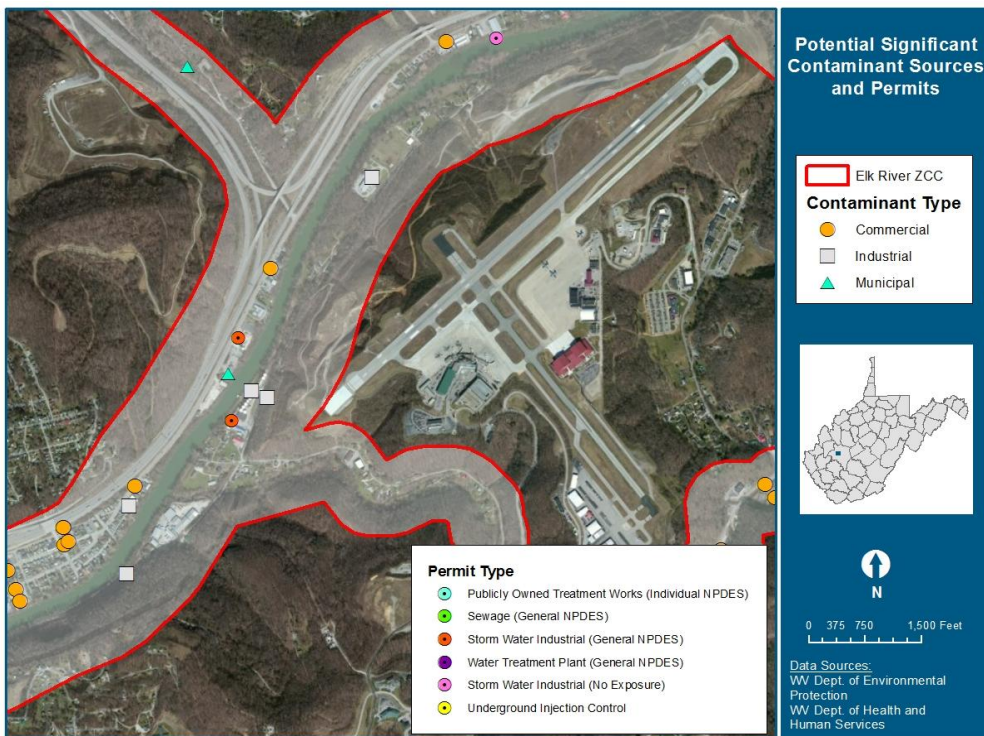
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1. INTRODUCTION

On January 9, 2014, a chemical leak was officially reported from 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 (WVAW’s) treatment plant (WVDEP, 2014a, b, and c). WVAW supplies drinking water to a nine-county area, including Charleston.

Since that date, citizens, businesses, organizations, and government officials have raised questions about how such an event could happen. Prominent questions include:

- Why are facilities such as the Freedom site allowed to be located immediately upstream from drinking water intakes?
- What other similar sites present risks of contamination?
- What can be done to minimize or eliminate these risks?

This report provides a preliminary assessment of sites that, if improperly managed, could contaminate WVAW’s drinking water intake. Our goal is to provide data and information so that state leaders can make the most informed decisions possible as they complete work on a bill¹ to prevent future spills and to upgrade the protection of public water intakes across the state. This report will also be useful as public utilities, local governments, and citizens across West Virginia engage in new source water protection efforts.

Across West Virginia, Source Water Assessment Reports (SWARs) were written for public water systems in the early 2000s. SWARs were created to help reduce the risk posed to public drinking water supplies by identifying potential significant contaminant sources (PSCs). The West Virginia Bureau for Public Health (WVBPH) wrote a SWAR for WVAW’s Charleston system in 2002 (WVBPH, 2002), and the agency’s searchable online database lists 342 SWARs across West Virginia (WVBPH, 2014a). Protecting source water is clearly a statewide challenge.

The Charleston SWAR delineates a zone of critical concern (ZCC)—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 PSCs were identified in this zone, including the Freedom Industries site.²

This report includes four chapters after this introduction. In Chapter 2, we present information provided by WVBPH about PSCs in the 2002 SWAR and in its recent response to our Freedom of Information Act request. In Chapter 3, we identify other sites of interest within the ZCC using Google Earth, a windshield survey, and a query of water resources permits. Many of these sites do not appear in the official list of PSCs. In Chapter 4, we identify three sites that are outside of the ZCC, but which deserve additional research to determine whether they should be included in source water protection efforts. Finally, in Chapter 5, we present conclusions.

¹ As of the date of publication of this report, the Senate has passed Senate Bill 373. The House Health and Human Resources Committee then amended the bill, which is pending in the House Judiciary Committee. It is also referenced to the House Finance Committee.

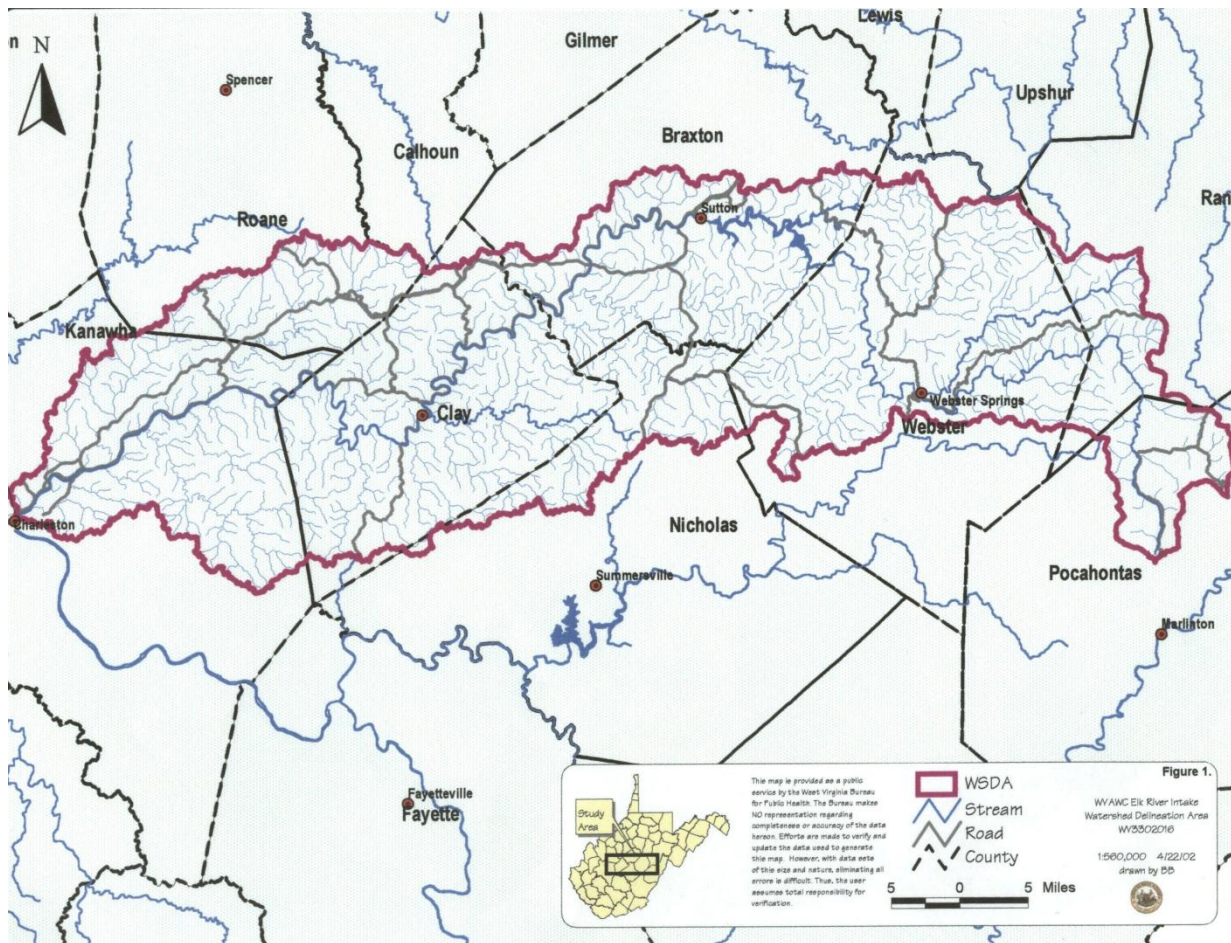
² For comparison, the SWAR for Morgantown also lists approximately 50 PSCs in the ZCC, and the SWAR for Huntington lists more than 400.

2. POTENTIAL SIGNIFICANT CONTAMINANT SOURCES IN THE SOURCE WATER ASSESSMENT REPORT

2.1 Information from the Source Water Assessment Report

The SWAR for WVAW's Charleston system was released in 2002. Raw water is drawn from the Elk River, which drains a 1,527 square mile watershed that stretches from Charleston upstream through parts of Roane, Clay, Braxton, Nicholas, Webster, Randolph, and Pocahontas Counties. In the SWAR, this entire watershed is called the "watershed delineation area" (WSDA) (See Figure 1, which is copied from the SWAR).

Figure 1: Watershed delineation area copied from the Source Water Assessment Report

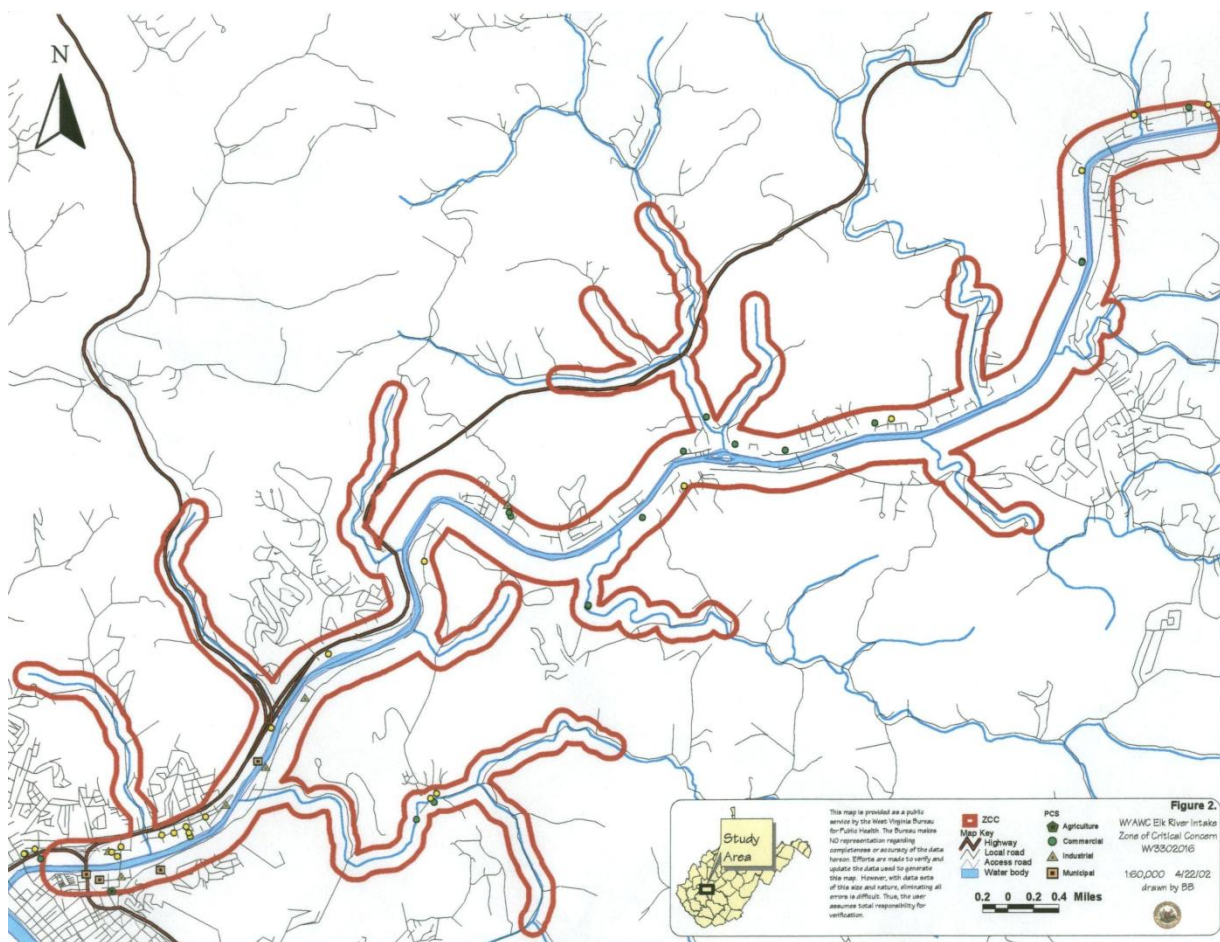


Source: Copied from Figure 1 in WVBPH (2002).

While spills anywhere within this WSDA might eventually reach the water intake, the zone directly upstream from the intake is of more pressing concern because there is less time for dilution to occur or for emergency measures to be taken. If a pollutant reaches a stream within the ZCC, it will be transported to the intake with little advanced warning. Figure 2, which is copied from the SWAR, delineates this ZCC with a red line. The SWAR describes the ZCC as follows:

“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. 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.” (WVBPH, 2002, p. 2)

Figure 2: Zone of critical concern and potential significant contaminant sources copied from the Source Water Assessment Report



Source: Copied from Figure 2 in WVBPH (2002).

Figure 2 also maps the PSCSs within the ZCC.³ The SWAR documents PSCSs according to 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.” (WVBPH, 2002, p. 5)

Results from this first broad inventory appear to be presented in Table 6 of the SWAR, which documents 53 PSCSs within the WSDA, of which 26 are within the ZCC. None of these PSCSs are named. It is not known at this time whether these 26 PSCSs are included in the inventory of PSCSs within the ZCC described immediately below, nor whether they are symbolized differently in Figure 2.

The second step documented in the SWAR focuses more narrowly on the ZCC:

“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 [of the SWAR, reproduced above as Figure 2 in this report].” (WVBPH, 2002, p. 5)

Table 1 summarizes the information available for the 51 PSCSs identified in the ZCC (again, this count of 51 PSCSs in the ZCC is different from the count of 53 PSCSs within the WSDA). Most PSCSs are commercial sites. The Freedom Industries site, formerly the Pennzoil Manufacturing Plant, is provided as an example of one of the seven industrial PSCSs. The report also documents four municipal and one agriculture PSCS.

Table 1: Potential significant contaminant sources within the zone of critical concern identified in the Source Water Assessment Report

Category	Count	Examples provided in the Source Water Assessment Report
Agriculture	1	
Residential	0	
Municipal	4	City of Charleston Sewage Lift Station, Road Salt Storage
Commercial	39	Shell Gas Station, Sun Belt Rentals
Industrial	7	Allegheny Power Company, Pennzoil Manufacturing Plant
Total	51	

Source: WVBPH (2002). The Pennzoil Manufacturing Plant has transferred ownership since 2002 and is now the Freedom Industries site.

³ The legend labels these PSCSs as “PCS” and divides them into four categories: agriculture, commercial, industrial, and municipal. A fifth category—residential—is included in the text in the SWAR; however, no residential PSCSs are identified in the ZCC for the Charleston system. The legend in Figure 2 of the SWAR does not explain the yellow circles on the map.

2.2 Additional information from the West Virginia Bureau for Public Health

In response to a Freedom of Information Act request, WVBPBPH provided further information about the PSCSs that were identified in the 2002 SWAR (WVBPBPH, 2014b). Figure 3, produced for this report using this new information from WVBPBPH, is similar to the original map from the SWAR that is copied in Figure 2. However, a visual comparison of these figures makes it clear that, while some points are consistent, others are not.

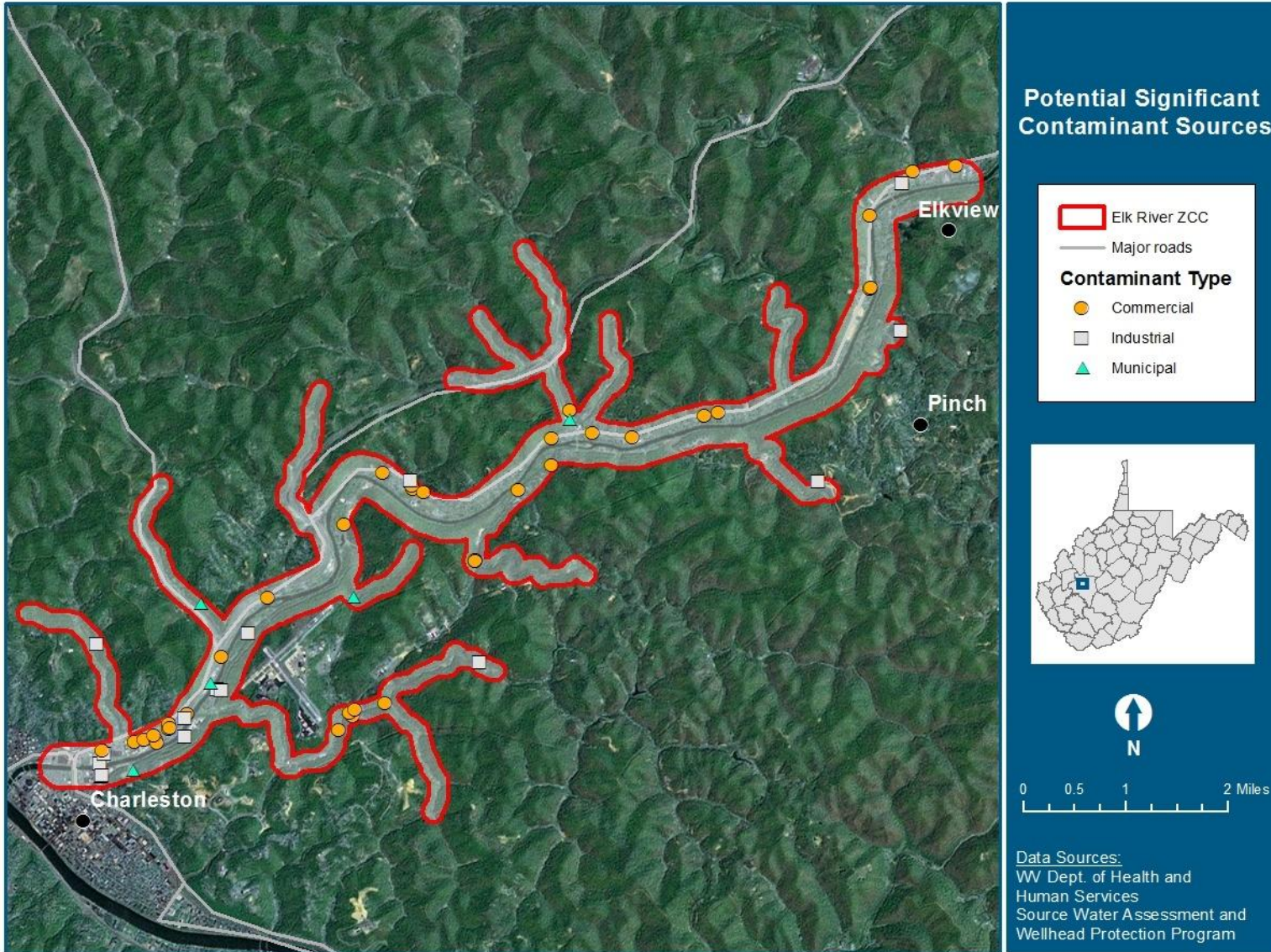
In fact, according to this new dataset, which is summarized in Table 2, WVBPBPH has identified 62 PSCSs in the ZCC. No explanation has yet been provided for how this count is consistent or inconsistent with the SWAR, which counts 53 PSCSs within the WSDA (26 of which are within the ZCC), and which provides a separate inventory of 51 PSCSs within the ZCC. According to WVBPBPH, the new list of 62 PSCSs is the most accurate and up-to-date list (WVBPBPH, 2014c); therefore, we utilize this dataset for the rest of this report.

Table 2: Categories and types of potential significant contaminant sources

Type	Commercial	Industrial	Municipal	Total
Aboveground storage tanks	1			1
Auto repair shops	4			4
Body shops	2			2
Car dealerships	10			10
Car washes	3			3
Chemical drums/storage		1		1
Construction areas	1			1
Equipment rental/repair shops	3			3
Fleet/truck/bus terminals	1			1
Fuel oil distributors		1		1
Gas stations	7			7
Golf courses	1			1
Gravel pits		1		1
Machine and metalworking shops		1		1
Other	2	6	1	9
Permitted discharge pipes (outfalls)		5		5
Public utilities (phone, gas, electric power)		1		1
Repair shops (engine, appliances, etc.)	4			4
Road maintenance depots/deicing operations			1	1
Sewage sludge/biological solids applications			3	3
Welding shops	1			1
Wells: oil and gas		1		1
Total	40	17	5	62

Source: WVBPBPH (2014b). Note: The categories and types in this table are exactly as provided by WVBPBPH. This count of PSCSs appears to be inconsistent with the counts in the 2002 SWAR, but no explanation for this apparent inconsistency has been provided by WVBPBPH. The Freedom Industries site is the fuel oil distributor site, and not the aboveground storage tank site.

Figure 3: Potential significant contaminant sources in the zone of critical concern identified in additional information from WVBP



While the new PSCS dataset provided by WVBPH provides some information about each site, it does not provide a business name, and in many instances does not provide an address. However, some PSCSs are able to be identified.

After the January 9 spill, the Freedom Industries site is the most well-known PSCS (See Figure 4). It was listed in the 2002 SWAR, but because that plan is dated, it was identified as the Pennzoil Manufacturing Plant. In the new PSCS dataset, it is listed as a fuel oil distributor. Today, the site is under different ownership and the tanks that were used to hold petroleum products now hold chemicals. This site is permitted under the National Pollutant Discharge Elimination System (NPDES) with general industrial stormwater permit number WVG610920 (See Section 3.2).

Figure 4: The Freedom Industries site



Source: Google Earth. Note: This site is within the zone of critical concern.

As shown in Table 2, the largest numbers of PSCSs are identified as car dealerships (10 sites), gas stations (7 sites), permitted discharge pipes (5 sites), repair shops (4 sites), and auto repair shops (4 sites). Gas stations store large quantities of fuel onsite—usually in underground storage tanks (See Figure 5). No gas stations appear to be permitted under NPDES (See Section 3.2). Repair shops and auto repair shops may handle and store fluids that, if spilled, could impact drinking water, such as antifreeze, fuel, oils, and lubricants (See Figure 6). These sites also do not appear to be permitted under NPDES (See Section 3.2).

Figure 5: Gas station classified as a potential significant contaminant source in the zone of critical concern



Source: Google Earth. Note: This site is within the zone of critical concern.

Figure 6: Auto repair shop classified as a potential significant contaminant source in the zone of critical concern



Source: Google Earth. Note: This site is within the zone of critical concern.

Another PSCS of note is the school bus parking and refueling facility shown in Figure 7. At this site, what appears to be diesel fuel is stored in an aboveground storage tank in the center of the lot. Two PSCSs in the WVBPH dataset point to this facility: the commercial aboveground storage tank PSCS and the fleet/truck/bus terminals PSCS (See Table 2). It is located immediately adjacent to the Elk River, approximately 10 miles upstream from the public water intake. This site does not appear to be permitted under NPDES (See Section 3.2).

Figure 7: School bus parking and refueling facility classified as a potential significant contaminant source in the zone of critical concern



Source: Google Earth. Note: This site is within the zone of critical concern.



Source: Downstream Strategies. Note: This site is within the zone of critical concern.



Source: Downstream Strategies. Note: This site is within the zone of critical concern.

Another PSCS of note is the concrete facility located alongside the Elk River in the vicinity of the public water supply intake (See Figure 8). The WVBPH dataset identifies an industrial PSCS as a gravel pit site, and the location of this site appears to be on the same or an adjacent parcel. As shown by the photos of this site, three aboveground storage tanks are immediately apparent on this site—two that appear to store chemicals and one that appears to store fuel. This site is permitted under NPDES with general industrial stormwater permit number WVG610327 (See Section 3.2).

Figure 8: Concrete facility classified as a potential significant contaminant source in the zone of critical concern



Source: Google Earth. Note: This site is within the zone of critical concern.



Source: Downstream Strategies. Note: This site is within the zone of critical concern.



Source: Downstream Strategies. Note: This site is within the zone of critical concern.

3. OTHER POTENTIAL SIGNIFICANT CONTAMINANT SOURCES WITHIN THE ZONE OF CRITICAL CONCERN

The 2002 SWAR does not provide detailed explanations for how they determined whether a facility is or is not a PSCS. Also, 12 years have passed since that report was produced. In this chapter, we consider whether additional possible PSCSs exist.

Section 3.1 presents photos and information about several sites identified via Google Earth and an informal windshield survey. Section 3.2 presents an analysis of water resources permits within the ZCC and compares those against PSCSs that have already been identified.

3.1 Sites identified via Google Earth and a windshield survey

Google Earth is a tool that provides high-resolution aerial images as well as street-level images. We used Google Earth to identify several sites not identified as PSCSs, but which, upon further research, might belong in that category. In addition to using Google Earth, we performed an informal windshield survey by driving through and photographing sites of potential interest.

Using these methods, we identified a large industrial park almost immediately downstream from Freedom Industries, directly on the bank of the Elk River. As shown in Figure 9, this site includes a large paved area, and materials appear to be stockpiled behind the buildings. Also, trucks that appear to transport materials from oil and gas operations, in addition to other trucks, are parked at this site. Additional investigation would be required to confirm whether this site should be listed as a PSCS. This site does not appear to be permitted under NPDES (See Section 3.2).

Figure 9: Possible potential significant contaminant source just downstream from the Freedom Industries site



Source: Google Earth. Note: This site is within the zone of critical concern.



Source: Downstream Strategies. Note: This site is within the zone of critical concern.



Source: Downstream Strategies. Note: This site is within the zone of critical concern.



Source: Downstream Strategies. Note: This site is within the zone of critical concern.

A second area to investigate further is a cluster of commercial and/or industrial buildings on the west side of the Elk River. As shown in Figure 10, the 2002 SWAR identified several PSCs in the vicinity of these buildings, as shown by the orange circles and gray squares. However, very few buildings in this photograph have been identified as PSCs. This is an example of how important it is for WVBPH to provide full information about the process used to identify PSCs and for the importance of frequently updating the list of PSCs.

Figure 10: First cluster of commercial and/or industrial buildings on the west side of the Elk River



Source: Google Earth. Note: The zone of critical concern includes the shaded area within the red boundary.

Finally, a third example is provided by another cluster of buildings just downstream from—and across the Elk River from—the first cluster. As shown in Figure 11, very few of the buildings in this cluster were identified as PSCs in the 2002 SWAR (as signified by orange circles and gray squares). While we do not have definitive information regarding the activities at these buildings, they deserve additional research given that they are adjacent to the Elk River and immediately upstream from the WVAW drinking water facility.

Figure 11: Second cluster of commercial and/or industrial buildings on the east side of the Elk River



Source: Google Earth. Note: The zone of critical concern includes the shaded area within the red boundary.

3.2 Water resources permits

We created a preliminary inventory of water resources permits within the ZCC because these sites deserve consideration as PSCSs. This inventory was created by querying WVDEP’s online water resources permit database for the quads that intersect with the ZCC (WVDEP, 2014d).⁴ We then filtered the query results to include only those permits within the ZCC. In order to focus on the permits that are likely to present the most significant threats, we then excluded home aeration unit permits, construction stormwater permits, inactive permits, and cancelled permits.

As shown in Table 3 and Figure 12, 18 permits remained. These include 15 NPDES permits—three individual and 12 general permits—plus one “no exposure” permit and two underground injection control permits.

Site-specific individual NPDES permits undergo public notice and comment and are written separately for each facility. General NPDES permits, in contrast, do not undergo public notice and comment when WVDEP grants registration under the permit. These registrations are based on pre-written permits created for classes of facilities.⁵

Table 3: Water resources permits within the zone of critical concern

Permit type	Number of permits
Individual NPDES permits	
Publicly Owned Treatment Works	3
General NPDES permits	
Sewage	2
Storm Water Industrial	8
Water Treatment Plant	2
No exposure permits	
Storm Water Industrial	1
Underground Injection Control permits	
Underground Injection Control	2
Total	18

Source: WVDEP (2014d). Note: These permits do not include home aeration unit permits, construction stormwater permits, inactive permits, or cancelled permits.

Figure 13 and Figure 14 illustrate the poor overlap between facilities with water resources permits and PSCSs. As shown, very few PSCSs appear to hold NPDES or underground injection control permits. Investigating each site in detail is beyond the scope of this report; however, this poor overlap might be explained by a number of potential factors:

- the list of PSCSs may be out of date,
- the databases may use slightly different coordinates for the same site, or
- some PSCSs may not be required to secure water resources permits.

No matter what the reason or reasons, this comparison points to the importance of frequently updating the list of PSCSs, as well as the importance of using WVDEP’s permit database as a resource when updating this list.

⁴ These include the Big Chimney, Blue Creek, Charleston East, Charleston West, and Pocatalico quads.

⁵ The general industrial storm water permit, however, does include site-specific storm water pollution prevention plans and groundwater protection plans.

Figure 12: Water resources permits in the zone of critical concern

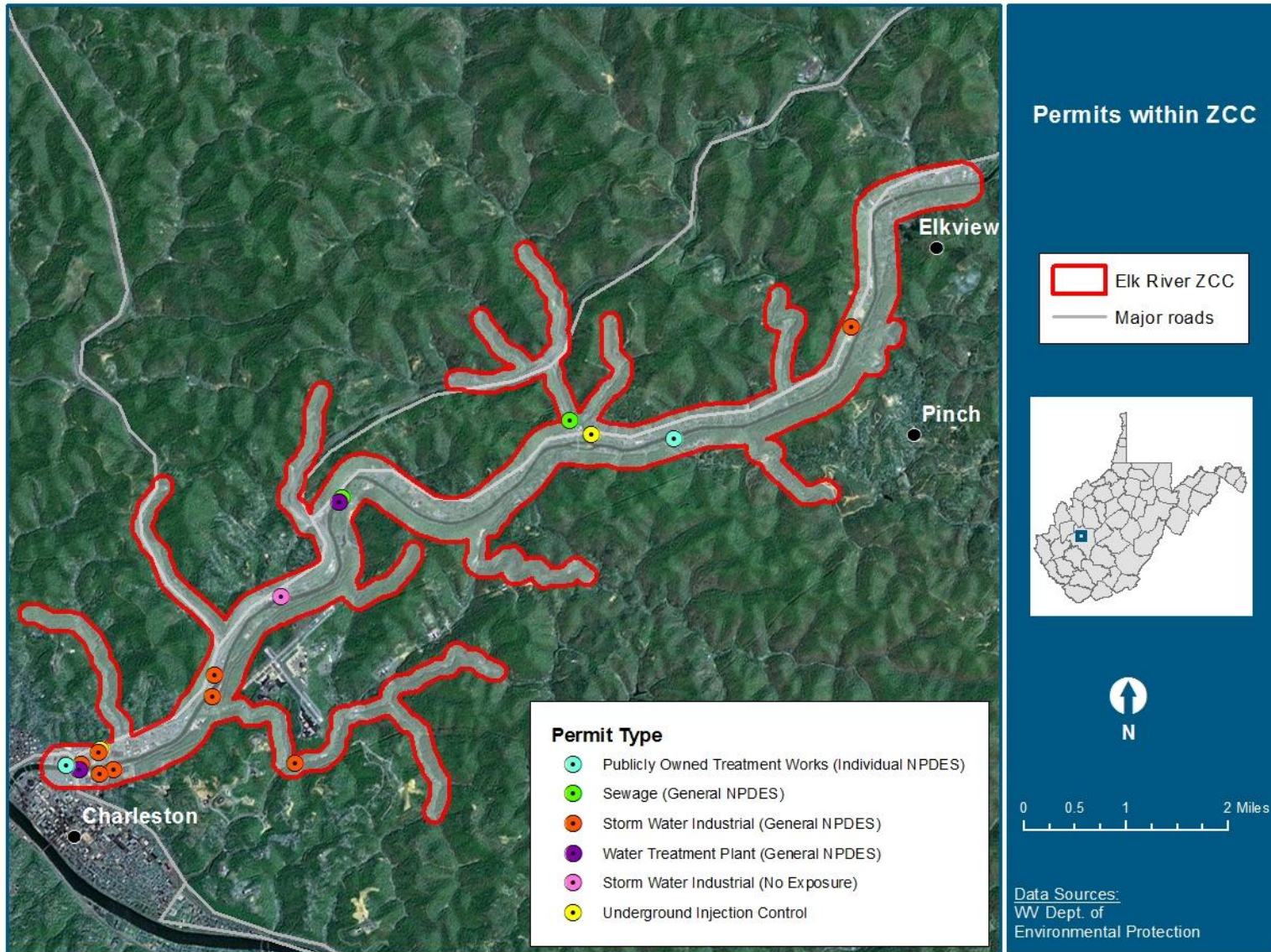


Figure 13: Water resources permits and potential significant contaminant sources in the zone of critical concern near the intake

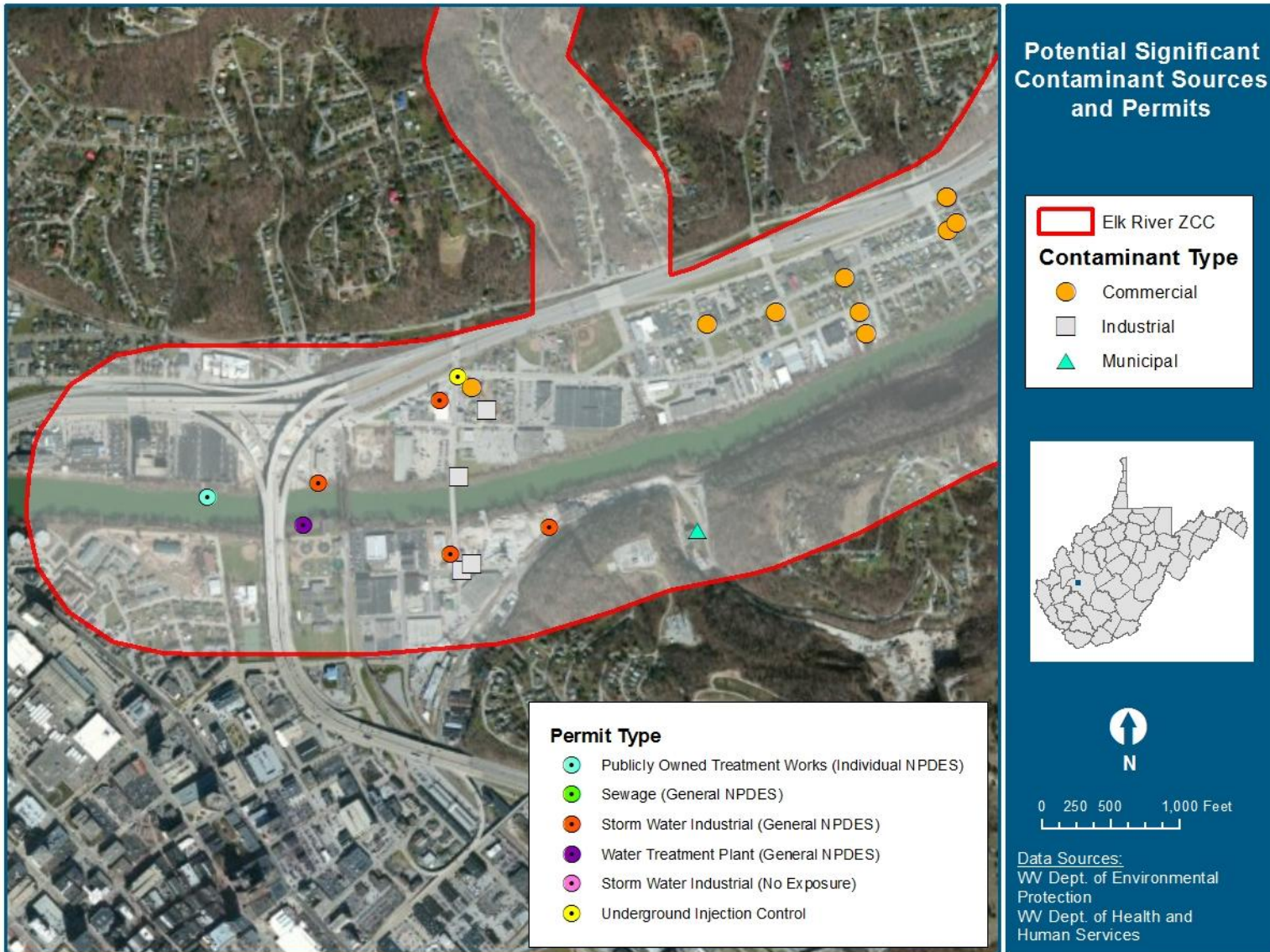
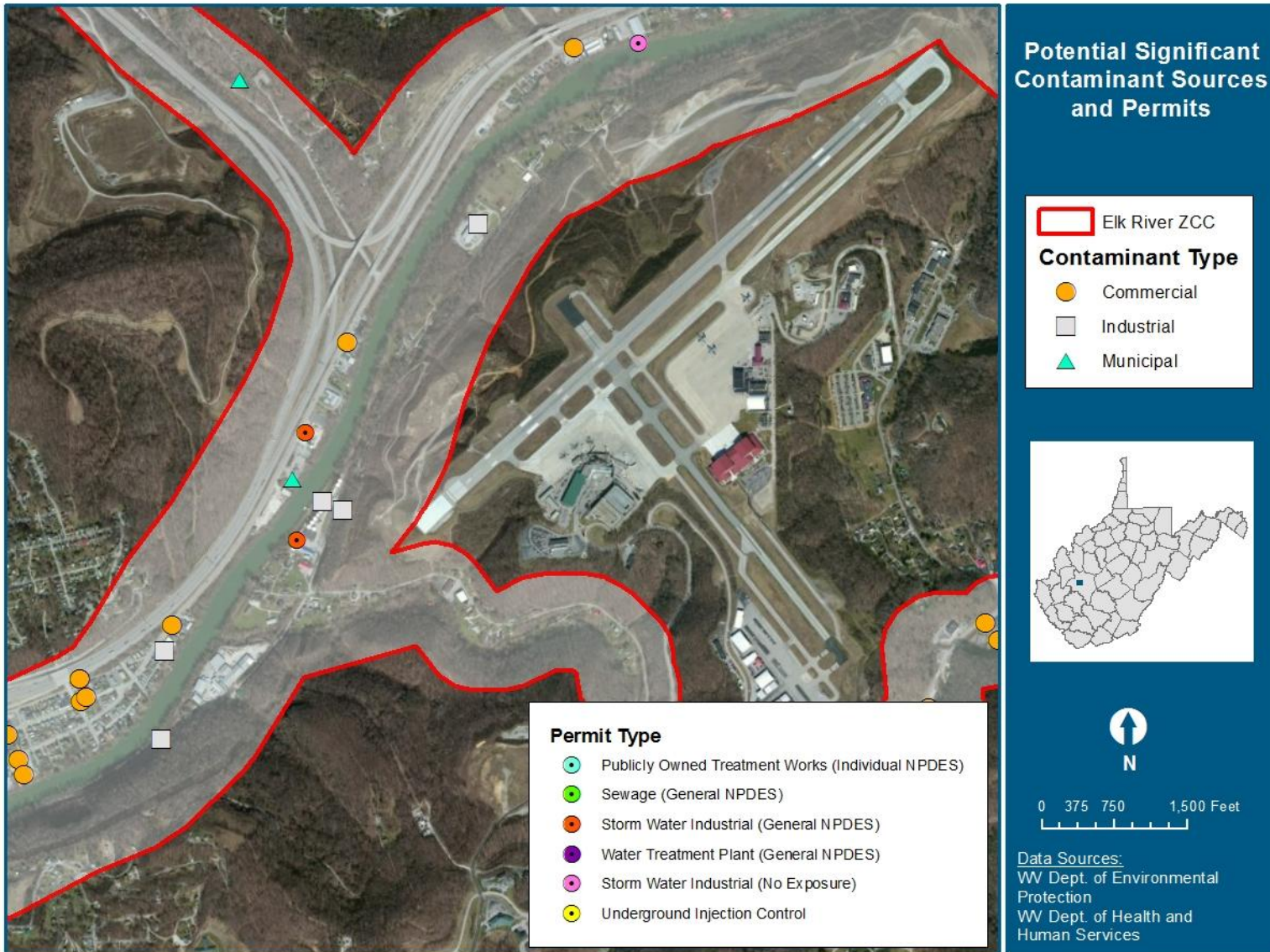


Figure 14: Water resources permits and potential significant contaminant sources in the zone of critical concern near the airport



4. OTHER POTENTIAL SIGNIFICANT CONTAMINANT SOURCES OUTSIDE THE ZONE OF CRITICAL CONCERN

It is important to be particularly attentive to possible pollution sources in the ZCC because if a pollutant reaches a stream within the ZCC, it will be transported to the intake with little advanced warning. But consideration of potential risks cannot simply stop at that boundary. The ZCC only includes approximately 5,969 acres, or less than 10 square miles. For comparison, the entire Elk watershed spans approximately 1,527 square miles (WVBPH, 2002).

Sites outside the ZCC boundary may also deserve attention if they store potentially harmful materials. As witnessed by the recent spill of coal combustion waste into the Dan River in North Carolina, pollutants traveled as many as 70 miles, passing public water supply intakes along the way (News & Record, 2014). The 2002 SWAR recognizes this possibility because it provides two inventories, as described above. The first inventory looks within the entire Elk watershed (the WSDA) and documents 53 PSCs, many of which are outside of the ZCC. The SWAR, however, does not identify any of these sites.

Above the Elk intake, perhaps the most important potential risk that is close to, but not within the ZCC, is Yeager Airport. As shown in Figure 15, the airport is located just outside of the ZCC. It sits atop a steep slope. If a significant spill at the airport were not properly contained and flowed to the north, west, or south, it would reach the Elk River or a tributary within the ZCC and threaten the intake. As shown in the zoomed-in aerial photograph in Figure 16, an apparent aboveground storage tank is evident in the top-right portion of the photograph (See red arrow). Additional photos taken during a February 2014 windshield survey also show aboveground storage tanks at this site. Additional research is needed to determine which tanks, if any, hold potentially harmful materials.

Figure 15: Yeager Airport



Source: Google Earth. Note: The zone of critical concern includes the shaded area within the red boundary.

Figure 16: Aboveground storage tank at Yeager Airport



Source: Google Earth. Note: This site is outside the zone of critical concern. The red arrow points to an apparent aboveground storage tank.



Source: Downstream Strategies. Note: This site is outside the zone of critical concern.



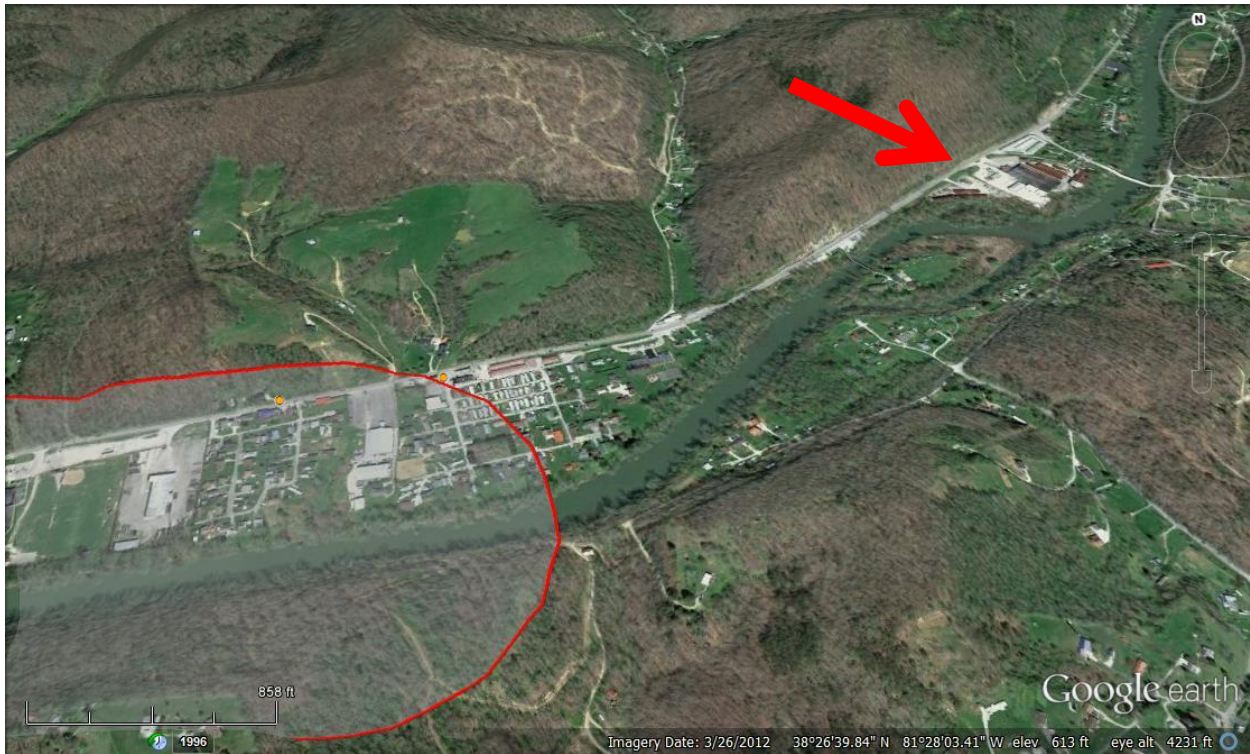
Source: Downstream Strategies. Note: This site is outside the zone of critical concern.

While we did not perform an exhaustive search for additional potential risks, two facilities on the Elk River upstream from the ZCC are instructive. As shown in the three photos in Figure 17, the first site is located less than a mile from the upstream edge of the ZCC. The facility of interest is apparent in the upper-right corner of the first image in this figure (See red arrow).

The zoomed-in aerial photograph shows the extent of this facility and its proximity to the Elk River. The third photo, a street-level image from Google Earth, shows two aboveground storage tanks plus fuel trucks.

However, these Google Earth images are out of date. A windshield survey conducted in February 2014 suggests that this facility used to be a Halliburton site (based on old signage), but it is now an Airgas propane facility. This underscores the importance of updating the inventory of PSCs, as well as the importance of field-verifying information gathered via Google Earth.

Figure 17: A potential risk just upstream from the zone of critical concern



Source: Google Earth. Note: The zone of critical concern includes the shaded area within the red boundary.



Source: Google Earth. Note: This site is outside the zone of critical concern.



Source: Google Earth. Note: This site is outside the zone of critical concern.



Source: Downstream Strategies. Note: This site is outside the zone of critical concern.

The second site of interest is located just upstream from Clendenin and approximately nine miles upstream from the ZCC (Figure 18). Based on signage observed during a windshield survey conducted in February 2014, this site appears to be a natural gas compressor station and extraction plant. As shown in the recent photos, two large aboveground storage tanks are located above a secondary containment area, and five other tanks are located in an adjacent area. Because this was a preliminary assessment, no attempt was made to identify the contents of these tanks or other tanks at this site. Additional research is necessary to determine whether this site presents a potential risk to the drinking water intake.

Figure 18: A potential risk just upstream from Clendenin



Source: Google Earth. Note: This site is outside the zone of critical concern.



Source: Downstream Strategies. Note: This site is outside the zone of critical concern.



Source: Downstream Strategies. Note: This site is outside the zone of critical concern.

5. CONCLUSIONS

In this report, we characterize the PSCSs within the ZCC that have been compiled by WVBPH, before presenting additional sites of interest—both within and outside of the ZCC.

- The 2002 SWAR written for WVAW’s Charleston system identified 51 PSCSs within the ZCC, but did not provide a complete listing.
- Additional information recently provided by WVBPH identifies 62 PSCSs within the ZCC. According to WVBPH, this is the most accurate and up-to-date list available; we therefore utilize it in this report.
- The largest numbers of PSCSs are identified as car dealerships (10 sites), gas stations (7 sites), permitted discharge pipes (5 sites), repair shops (4 sites), and auto repair shops (4 sites).
- Notable PSCSs identified by WVBPH include the Freedom Industries site, a school bus parking and refueling facility with an aboveground storage tank, and a concrete facility with three readily visible aboveground storage tanks.
- Additional research has identified other potential sites of interest within the ZCC that deserve additional scrutiny: an industrial park just downstream from the Freedom site and clusters of commercial and industrial buildings on both sides of the Elk River near the intake.
- A water resources permit query identified 15 NPDES permits, two underground injection control permits, and one “no exposure” permit within the ZCC. These permits did not correlate well with the PSCSs identified by WVBPH.
- The NPDES permits included three individual and 12 general permits, in addition to the general permits issued for home aeration units and construction sites that were omitted from the analysis. If the Legislature were to require individual NPDES permits within ZCCs, this new requirement would apply to these 12 identified general permits as well as to the home aeration units and construction sites omitted from this analysis.
- Three facilities outside of the ZCC were identified for additional investigation. These sites include Yeager Airport, which is located immediately adjacent to the ZCC; what appears to be a propane facility located less than one mile upstream from the ZCC; and a compressor station and extraction plant located just upstream from Clendenin.

These results are preliminary. When the list of PSCSs above WVAW’s Charleston intake is officially updated, additional research will be required to verify whether the sites described in this report are appropriate to include as PSCSs and whether additional sites not mentioned in this report deserve to be listed.

Once inventories of PSCSs are updated, there is no single solution available to minimize the risk that they present to public water intakes. Water utilities, local governments, local emergency planning committees, and other organizations or individuals can all take actions to protect source water from contamination.

According to WVBPH, which offers guidance on source water protection planning, possible actions include:

- prohibitions and permits,
- municipal ordinances,
- design and operating standards,
- public education,
- inspectors at construction/drilling sites,
- best management practices,
- local water quality districts,
- groundwater monitoring,
- subdivision regulations,
- site plan reviews,
- sole source aquifer designations, and
- purchase of property and development rights by organizations such as farmland protection boards and land trusts. (WVBPH, 2007).

Although not mentioned by WVBPH, comprehensive plans, which are now being completed across West Virginia, can also be a vehicle for minimizing the risks presented by PSCSs.

The appropriate mix of actions to protect source water from contamination will differ system by system. Only through an inclusive process, which involves the public at all stages, will solutions be identified that minimize risks and maximize the likelihood of implementation.

While this report focuses on the PSCSs and water resources permits above WVAW's Elk River intake, the circumstances that led to contamination of the Elk River are examples of what could happen to many communities if they do not engage in proper planning and if regulatory agencies do not provide proper oversight. In some cases, tighter regulations are also warranted. Populations in Morgantown, Huntington, and cities and towns across the state are at risk if PSCSs are not accurately identified, and if risks from these sites are not managed.

REFERENCES

- News & Record. 2014. Coal ash lines Dan River 70 miles from Eden spill site. February 18. http://www.news-record.com/news/local_news/article_7840f43c-98e3-11e3-80d0-001a4bcf6878.html
- West Virginia Bureau for Public Health (WVBPH). 2014a. Source Water Assessment Reports & Summaries. Query performed for all counties and all districts. January 19. <http://www.wvdhhr.org/oehs/eed/swap/search.cfm>
- _____. 2014b. ZCC and PSCSs provided by James Mitchell Jr., GIS Technical Administrator I, West Virginia Department of Health and Human Resources, WVBPH/Office of Environmental Health Services/Environmental Engineering Division/Source Water Assessment Program. February 19.
- _____. 2014c. Personal communication between author Gilmer and Bill Toomey, Unit Manager, Source Water Assessment and Wellhead Protection Program, WVBPH. February 20.
- _____. 2007. Step-By-Step Guide for Developing a Local Source Water Assessment and Protection Program. Draft. June. http://www.wvdhhr.org/oehs/eed/swap/swap_ed/unit6/Program_Guide.pdf
- _____. 2002. State of West Virginia Source Water Assessment and Protection Program, Source Water Assessment Report, WVAWC – Kanawha Valley, Kanawha County, PWSID: WV330216. April. <http://www.wvdhhr.org/oehs/eed/swap/get.cfm?id=3302016>
- West Virginia Department of Environmental Protection (WVDEP). 2014a. Complaint Investigation Form, Department of Environmental Protection, Air Quality. Etowah Terminal. Filed January 9, 8:16 AM.
- _____. 2014b. Order 8027. Issued under the Water Pollution Control Act, West Virginia Code, Chapter 22, Article 11, and the Groundwater Protection Act, West Virginia Code, Chapter 22, Article 12. Issued to Etowah River Terminal, LLC. January 10.
- _____. 2014c. Order 8028. Issued under the Water Pollution Control Act, West Virginia Code, Chapter 22, Article 11, and the Groundwater Protection Act, West Virginia Code, Chapter 22, Article 12. Issued to Freedom Industries, Inc. January 10.
- _____. 2014d. Water resources permit query performed for the Big Chimney, Blue Creek, Charleston East, Charleston West, and Pocatalico quads. February 18. <http://www.dep.wv.gov/insidedep/Pages/WaterResourcesPermitSearch.aspx>