Source Water Protection Plan for the City of Portsmouth

Purpose

The intent of this document is to describe what the City of Portsmouth has done, is currently doing, and plans to do to protect its source of drinking water—the Ohio River. Although the City of Portsmouth treats the water to meet federal and state drinking water standards, conventional treatment does not fully eradicate all potential contaminants, and beyond-conventional treatment is often very expensive. By completing this plan, the City of Portsmouth acknowledges that implementing measures to prevent spills and releases into the Ohio River can be a relatively economical way to help ensure the safety of the City's drinking water, while also improving river quality for other uses.

Background

Source Water Protection

Since 1974 the federal Safe Drinking Water Act (SDWA) has set minimum standards on the construction, operation, and quality of water provided by public water systems. In 1986, Congress amended the SDWA. A portion of those amendments were designed to protect the source water contribution areas around ground water supply wells. This program eventually became known as the Wellhead Protection Program (WHPP). The purpose of the WHPP was to prevent pollution of the source water supplying the wells.

The Safe Drinking Water Act Amendments of 1996 expanded the concept of wellhead protection to include surface water sources under the umbrella term of Source Water Protection. The amendments encourage states to establish source water assessment and protection (SWAP) programs to protect all public drinking water supplies. As part of this initiative states must explain how protection areas for each public water system will be delineated and inventoried for potential contaminant sources, and given a susceptibility rating.

In May 1999, the Ohio Environmental Protection Agency (OEPA) published the State of Ohio's Source Water Assessment and Protection Program, which was endorsed by the United States Environmental Protection Agency. Over the next few years, Ohio EPA staff completed an assessment (i.e., delineation, inventory and susceptibility analysis) for all of Ohio's public water systems. Each public water system was sent a copy of its assessment report. The City of Portsmouth received its Source Water Protection Assessment report in September 2004.

Unique Challenges for Ohio River Systems

Withdrawing water from, or near, the Ohio River presents many challenges for a water utility. Not only does the Ohio River pose all of the typical treatment concerns of a surface water source, the location, size, and uses of the Ohio River pose additional source water protection concerns.

The Ohio River borders or flows through six different states. For utilities in Ohio, bordering and upstream states include Kentucky, West Virginia, and Pennsylvania. This is important when considering potential pollution flowing from upstream, as protection efforts may need to be coordinated with these other states. In addition to multiple state jurisdictions, additional jurisdictions on the county, township or local levels also need to be considered.

The Ohio River is also a very valuable resource for many, sometimes competing, uses. In addition to being the direct drinking water source for several million people, many other nearby ground water utilities depend on the river as a source of natural recharge to their aquifer. Over 230 million tons of cargo are transported on the Ohio River each year, and 49 power generating stations are located along the river, making up in excess of 6 percent of the nation's power supply. Additionally, the entire Ohio River is the receiving stream (either directly or indirectly through tributaries) for industrial and sanitary waste produced by over 25 million people. The entire watershed exceeds 200,000 square miles and the river itself is 981 miles long.

Role of ORSANCO

Due to these wide-ranging interstate concerns the Ohio River Valley Water Sanitation Commission (ORSANCO) was formed in 1948. ORSANCO is an interstate water pollution control agency that manages and operates programs for water quality monitoring and assessment, assists in emergency response management, has established pollution control standards for the Ohio River, and facilitates interstate cooperation and coordination. The City of Portsmouth recognizes ORSANCO's unique position in promoting source water protection along the Ohio River and this plan reflects the City's close partnership with ORSANCO, using the Commission's knowledge, authority and resources to protect the water source.

Ohio River Delineations

Due to the size and complex nature of the Ohio River, in 1997 ORSANCO agreed to develop the source water assessment strategy for the Ohio River. This would provide a uniform approach to delineating the source water protection areas utilities would protect. A workgroup was formed, composed of regulatory agencies for the six border states and the United States Environmental Protection Agency (USEPA) Regions 3, 4, and 5. This workgroup developed the Source Water Assessment Strategy for the Ohio River, dated October 1998.

Within the strategy, ORSANCO recommends using a tiered-delineation system consisting of three protection zones (Figure 1). The purpose of this tiered-approach is to define the level of source inventory within the Ohio River Basin, and serve as a guide

for management and other activities to allow water suppliers to most effectively apply their source water protection resources. Ohio's Source Water Assessment and Protection Program (May 1999) incorporates this strategy for surface water systems drawing from the Ohio River.

Figure 1. Source Water Protection Zones for Ohio River Public Water Systems

Zone I - Zone of Critical Concern. The Zone of Critical Concern (ZOCC) extends ¼ mile below a water intake to 25 miles upstream the Ohio River and major tributaries identified in U.S. EPA Reach File 1. The lateral extent includes ¼ mile on both sides of the riverbank and major tributaries. The 25 miles upstream is based upon a 5 hour time-of-travel estimate using maximum Ohio River velocities. This is considered the area "within which a contamination event would quickly affect the water supply."

Zone 2 – Zone of High Concern. The Zone of High Concern (ZOHC) extends ¼ mile below a surface water intake, upstream, to ¼ mile below the next Ohio River intake. Major tributaries are incorporated within a 25-mile distance upstream from the intake. The lateral extent includes all 14-digit hydrologic units adjacent to the banks of the Ohio River and major tributaries. The only difference between the ZOHC and the ZOCC is a wider buffer, incorporating the small watersheds adjacent to the river instead of just a ¼ mile buffer.

Zone 3 – Upstream Watershed. Zone 3 is the entire portion of the Ohio River Basin upstream from a surface water intake. It is within this zone that cooperation with ORSANCO will be most valuable.

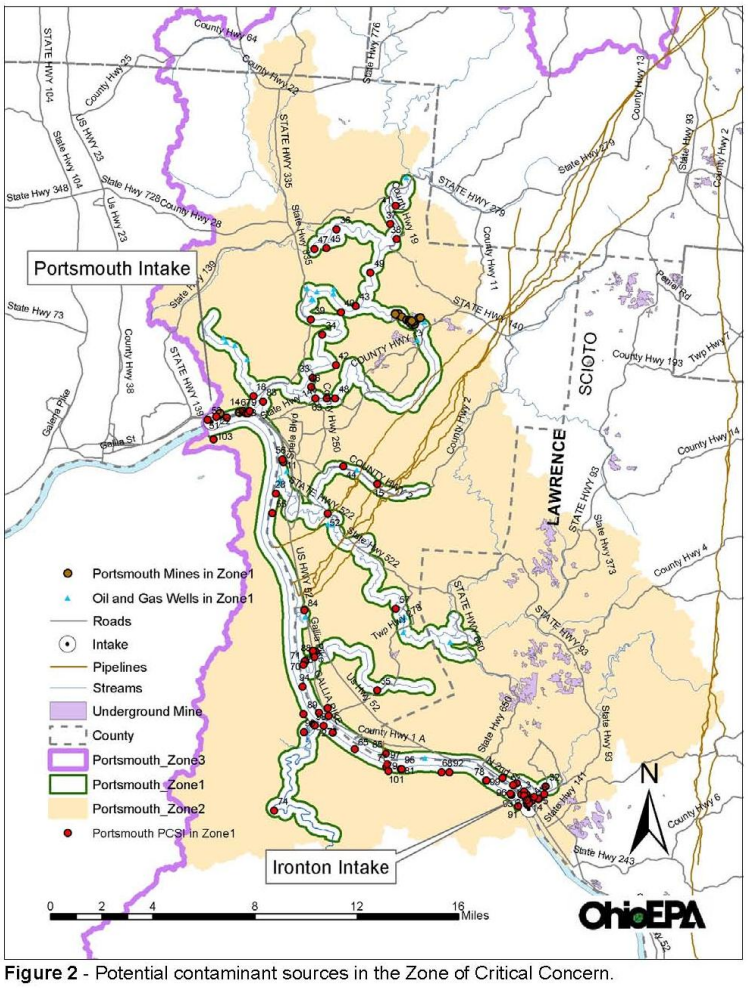


Figure 2 - Potential contaminant sources in the Zone of Critical Concern.

Zone 1 is the area enclosed by a green line, and follows the river and its tributaries up to 25 miles from the intake.

Zone 2 is all the area shaded light orange, and represents all the areas that drain to the river and tributaries within Zone 1.

Zone 3 is delineated with a pink line and extends into Kentucky, West Virginia, and Pennsylvania. Only the lowermost portion of Zone 3 is shown in Figure 2.

Introduction

The City of Portsmouth operates a community public water system that serves a population of approximately 40,675 people with 14,750 municipal, residential and industrial service connections. A community public water system is a system that regularly supplies drinking water from its own sources to at least 15 service connections used by year-round residents of the area or regularly serves 25 or more people throughout the entire year. The treatment capacity is approximately 12 million gallons per day, but current average production is about seven million gallons per day.

The water treatment facility is located along State Route 52 in front of the recently abandoned New Boston Coke Plant. The plant is staffed and operated 24 hours a day. The water intake is located on the Ohio River at river mile 350.8, 23.1 miles down-stream from the public water system intake at Ironton and 57.7 miles upstream from the intake at Maysville, Kentucky. It was constructed in 1914 and the plant was constructed in 1950. The plant was modified in 1972 when eight filters were added along with an increase in pumping capacity.

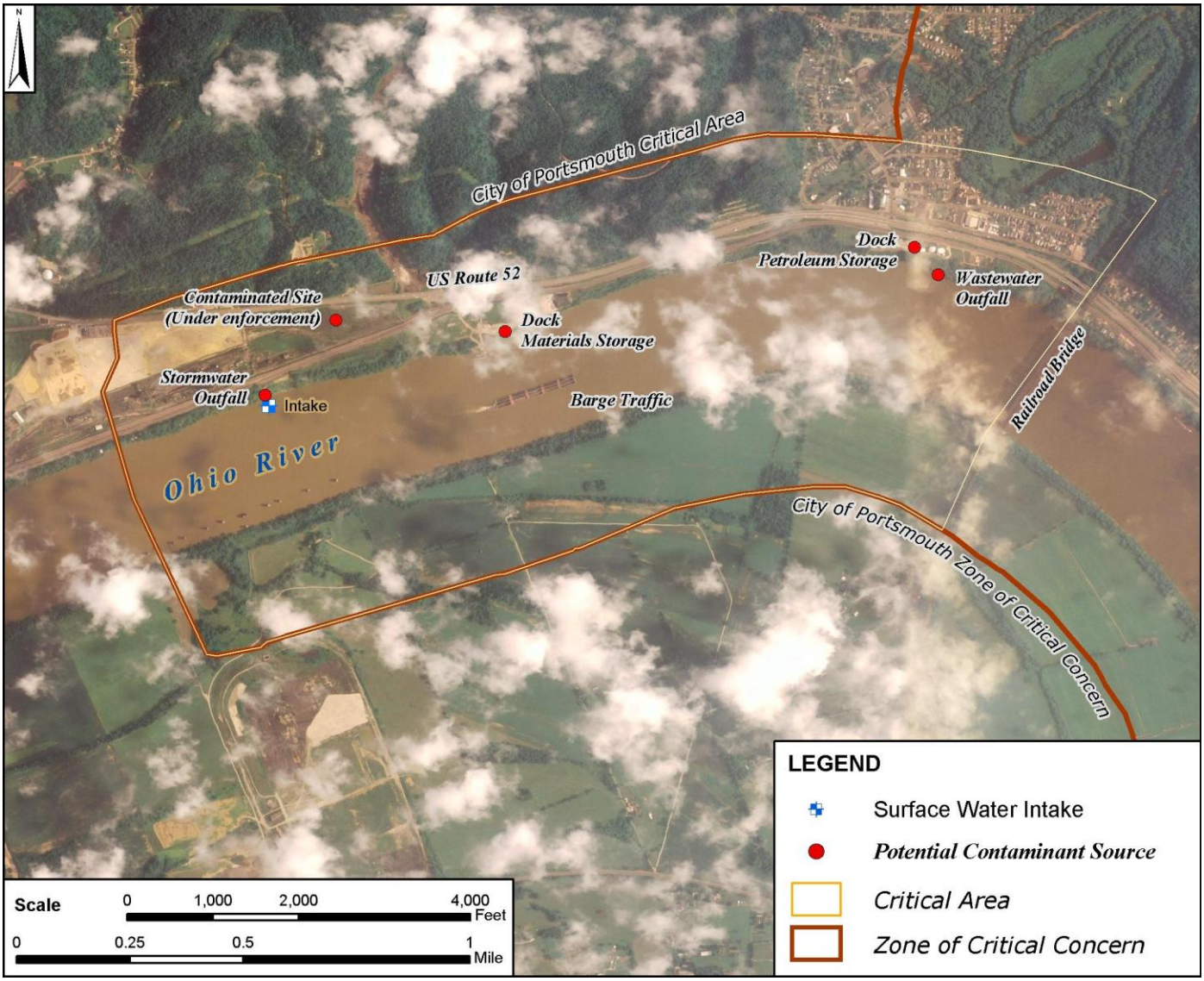
Water treatment processes include oxidation, pH control, coagulation, and organics removal enhanced with potassium permanganate (to address algae and mussels), alum/polymer, lime and powdered activated carbon. A $4 million MIEX treatment unit, for removing organic compounds, is currently being installed (2008). All sludge removed during treatment is discharged to the river. There are ten storage tanks and eleven booster stations maintained on Portsmouth's distribution system, which allows for more than 26 million gallons, or 3.9 days' worth of storage for Portsmouth.

Scioto Water, Inc. purchases bulk water from Portsmouth for eleven additional public water systems including the communities of Sugar Camp, Wheelersburg and Franklin Furnace. With a total population of 8,888, these systems require the Portsmouth Water Treatment Plant to process an average of 622,000 extra gallons per day.

Identification of Local Source Water Concerns

Critical Areas

During an April 11, 2008 meeting with staff from Ohio EPA, plant operator Sam Sutherland identified the river shoreline from the intake to the railway bridge at Sciotoville, approximately two miles upriver, as a critical area. Within this area lie a city storm sewer outlet, several storage areas with a transfer dock on the river, a wastewater treatment outlet, Route 52, and a major oil terminal with a transfer dock on the river. The treatment plant itself is located next to the former New Boston coke facility, an area of contaminated soils that is undergoing clean-up under the supervision of Ohio EPA, Division of Emergency and Remedial Response.



Potential Contaminant Source Inventory

As part of the source water protection assessment conducted by Ohio EPA in 2003-2004, potential contaminant sources were identified for the zone of critical concern from electronic databases and from a conference call with City of Portsmouth officials. The locations of these potential contaminant sources are mapped on Figures 2 and 3.

In May 2008, in preparation for developing this protection plan, Ohio EPA staff met with City staff, including the public water system operator and the local Emergency Management Agency director, who provided detailed maps of the Corridor Management Zone. These maps, created in 2003, show the locations of the same facilities indicated on the original SWAP inventory map and several additional facilities, as well as docks, the river channel, outfalls, and pipelines, both aerial and underground.

Also, Ohio EPA staff reinventoried the Ohio and Kentucky shorelines from the intake up to Greenup Dam, to verify the existence of sources previously identified and to identify any new sources. They located a major fuel loading terminal (Norfolk Southern

Terminal) with large stockpiles of coal at the location marked 55 and identified as "wastewater impoundment" on the original SWAP inventory map. They also added to the inventory an aerial natural gas pipeline located almost a mile downstream from Greenup Dam. (This pipeline theoretically could be used to carry other petroleum products, and therefore warrants inclusion in the inventory.) It was noted that from Sciotoville to Greenup Dam, the Ohio riverbank is wooded. Within this stretch, with the exception of the Norfolk coal terminal, the floodplain between Route 52 and the river is undeveloped,and sparsely populated.

On the Kentucky side, there are no significant contaminant sources within ten miles upriver, other than Route 23 and the railway, which follow the riverbank in the vicinity of Greenup Dam, but veer away from the river farther downstream. Land use along the highbank is primarily wooded and in the floodplain, agricultural and residential. Downstream from the critical zone there are a number of large industrial facilities but they are not likely to affect Portsmouth's intake due to their location downriver.

Prioritization of Potential Contaminant Sources

The City of Portsmouth has identified barge traffic, dredging, and the potential contaminant sources listed above under "Critical Areas" as the highest priority contaminant sources at this time. This prioritization is based on their proximity to the intake (within two miles upriver), the nature of the contaminants (primarily petroleum products) and the large amounts of contaminants treated, transferred and/or stored. In addition, the railroad bridge itself poses a degree of risk related to potential derailments and spills into the Ohio River. The City of Portsmouth's protective strategies will focus on these potential contaminant sources.

Potential contaminant sources farther upriver are more spread out and lie beyond the City of Portsmouth's jurisdiction. Greenup Dam (about ten miles upriver from the intake) could be considered a concern because of the potential for shipping accidents at the locks. However, as the locks and dam are staffed around the clock, workers can provide immediate notification to the drinking water utilities, the state, the National Response Center or ORSANCO should they observe, by either sight or smell, unusual water quality conditions. In addition, during spill events, lock and dam locations provide secure access to the Ohio River for sampling purposes. Greenup Dam was built in 1962 and to date there have been no shipping accidents in the vicinity of the dam that have resulted in impacts to drinking water utilities.

Greenup Dam, from the Kentucky side, looking east toward the Ohio riverbank.

Protective Strategies

Source Management Strategies

Barge Traffic (highest priority). According to the Scioto County EMA, over 100 barges carrying hazardous materials pass through the zone of critical concern within a 24-hour period. Each barge can carry up to 30,000 barrels of petroleum—equal to the amount carried in 40 rail cars. Every year, several barge accidents are documented on the Ohio River, most often during high-flow and involving collisions with dams or bridges. Barges are regulated by the U.S. Coast Guard, which has the authority to halt all traffic on the river during flood conditions. When an accident occurs, the National Response Center is immediately contacted and it contacts ORSANCO, which then contacts the relevant downstream public water systems (as described below under "Contingency Planning"). Each barge company is required to have a contract with a commercial Hazmat company which must arrive on-site within a specified time period, usually an hour or two. The U.S. Coast Guard itself has similar arrangements with private Hazmat contractors. Also, the Scioto County EMA has a Tier 3 Hazmat Team that can be mobilized as necessary.

Probably the only *preventive* measures that could be taken would be to persuade the barge companies to avoid operating during high-flow and/or to provide for higher towboat horsepower in the vicinity of dams during high-flow. This could be proposed by ORSANCO as a voluntary measure for barge operators, or a regulation to be imposed by the U.S. Coast Guard. (Until fairly recently, the U.S. river barge industry was only lightly regulated and notorious for its high accident rate.) As a member of ORSANCO, the City of Portsmouth would add its support to basinwide efforts to make barge traffic safer.

Dredging. By regulation, the Army Corps of Engineers is required to notify public water systems within ten miles downstream whenever it initiates dredging operations in a navigable channel. However, the public water system staff note that dredging operations have occurred approximately annually in the vicinity of the BP terminal at Sciotoville without notification of the public water system (or if notification is occurring, it is directed to the wrong person). The dredging results in noticeably higher turbidity levels in the City's source water, and the particles may contain legacy contaminants deposited in the river bed from historic unregulated discharges and from more recent accidental spills. In the course of preparing this plan, Ohio EPA staff contacted the Army Corps of Engineers, who indicated they do not dredge in this vicinity. The City of Portsmouth will work to determine who is doing the dredging, and arrange for consistent notification of the correct individuals whenever such dredging takes place.

City of Portsmouth Storm Sewer Outlet. A major storm sewer outlet is located on the riverbank due north of the drinking water intake. However, this outlet poses less of a risk than its location suggests, because the drinking water intake is located over 75 feet out into the river at pool elevation. Only a very substantial stormwater flow has the

velocity to approach the intake. Generally, the discharge tends to travel downstream along the shoreline. Also, the Scioto County EMA director indicates that major spills into the storm sewer would either be handled by the responsible facility's Hazmat company or else by the Scioto County Hazmat Team, which is trained and equipped for such contingencies. At this time no additional source water protection measures are proposed for this potential contaminant source.

Storage Areas and Transfer Docks. Within a half-mile upriver from the water treatment plant are two materials storage areas with loading docks on the river. The facility nearest the plant is Cunningham Materials, which handles concrete materials and salt. The more distant facility is operated by the Conley Trucking Company. Salt is shipped to this location by barge, and then sold as road salt to ODOT, the city, and other entities responsible for road maintenance. At this time (2008), the main concern with these areas is the potential for storing and transferring other, less benign, materials, especially if the companies change ownership. The City will explore the possibility of zoning this area to prohibit the siting of facilities that ship or store large quantities of toxic materials.

Oil Terminals. An oil transfer terminal owned by British Petroleum (BP) is located along the Ohio riverbank at Sciotoville, about two miles upriver from the intake. A series of tanks is capable of holding over 3 million gallons of petroleum products (primarily diesel fuel, gasoline and additives). Under the Oil Pollution Act of 1990, BP is required to have a Spill Prevention Control and Counter-measures (SPCC) Plan. BP's plan indicates that the expected SPCC measures are in place, including spill alarms, >100% secondary containment around tanks and transfer areas, frequent inspections of all components, drainage of rainwater through oil/water separators and sampling before release to the river, sorbent materials on site, contract with a HazMat company, etc. Historically, the BP terminal has been well managed, according to the Scioto County EMA director, and the City proposes no additional source water protection measures to address this potential contaminant source.

Route 52. The Scioto County EMA lists truck spills as the kind of hazardous materials spill most likely to occur. State Route 52, which is a hazardous cargo route, follows the Ohio River closely within the 2-mile "critical area". Because of the rugged terrain, highways and railways in southern Ohio follow the river valleys, and the Ohio River valley from the water treatment plant to Sciotoville is very narrow. The topography also makes alternate routes impractical. The only measure the City could take to reduce the threat from Route 52 would be to construct drainage ditches along the highway that lead to a lined containment pond. However, such a costly effort does not seem warranted by the actual threat to water quality. At this time the City proposes no additional source water protection measures to address this potential contaminant source.

Sciotoville Wastewater Outlet. The Sciotoville Wastewater Treatment system, which is under the jurisdiction of the City of Portsmouth, formerly had periodic combined sewer overflows. In 2005, a wastewater containment pond was installed to hold up to 144,000 gallons of overflow, and this has been effective in controlling the problem.

In addition to the above, several ORSANCO programs support source management for source water protection plans. First, and foremost, the ORSANCO Pollution Control Standards for Wastewater Discharges to the Ohio River assure the development and adoption of appropriate stream criteria for the Ohio River. These criteria form the basis for Ohio River wastewater discharge permit limits and thereby reduce the threat of wastewater discharges to the quality of the Ohio River.

ORSANCO's Urban Wet Weather, Combined Sewer Overflow tracking program, Watershed Pollutant Reduction, TMDL and Source Identification program all characterize and promote an understanding of non-point sources of pollutants.

Education and Outreach

Consumer Confidence Report. The City of Portsmouth publishes a Consumer Confidence Report (CCR) annually, as required by the Safe Drinking Water Act, which is sent to all water customers. Information is included in the CCR about the source of drinking water. Starting in 2009, information concerning the city's Source Water Protection Plan will be included in the CCR.

Due to recent heightened concerns about the effects of pharmaceuticals in surface water bodies, the City will also include in the 2009 CCR information about pharmaceuticals and how to properly dispose of them.

Plant Tours. The public water system staff regularly provide tours of the water plant upon request, usually to school groups but occasionally to other groups, such as the Boy Scouts. The tours are especially in demand during the late Spring, shortly before the school term ends.

Science Fairs. The District Science Fair is held at Shawnee State University (in Portsmouth) every March. During the months leading up to this, the public water system staff are often contacted to provide information for a student's water quality project.

School Curricula. The PWS operator will investigate having information about source water protection—especially as it applies to the City of Portsmouth—included in the local middle and high school science curricula, as has been done in numerous other Ohio counties.

River Sweep. The City of Portsmouth also regularly participates in "River Sweep", which is an annual basinwide riverbank cleanup sponsored by ORSANCO. Begun in 1989, it attracts thousands of volunteers from public organizations, civic groups, recreational clubs and the general public. Starting in 2009, the City will have source water protection information available at this event.

Scioto County Fair. The Scioto County Fair, held during the first week of August, is one of the largest county fairs in the state, attracting folks throughout the region. The

City of Portsmouth's Health Department regularly hosts a booth there. The public water supplier will provide the Health Department with information on source water protection, starting in 2009.

Signage. The City of Portsmouth will develop signage about drinking water protection areas to erect beside bridges over tributaries leading into the Ohio River. These signs will be installed upstream from the intake within the appropriate areas under the city's jurisdiction. The city will also initiate discussions with Ohio township officials further upstream as far as Greenup Dam, to request that they consider installing these signs.

Coordination. The city's health, utilities and fire departments meet with the county EMA on a monthly basis, and all the agencies are in constant communication with one another. Moreover, the city has good relations and open communication with the City of Ironton, the next municipal public water system upriver on the Ohio side. The City of Portsmouth is committed to continuing this high level of communication.

ORSANCO's Basinwide Education. In addition, ORSANCO provides basinwide opportunities for outreach and public education through a variety of public meetings, which include:

- the triannual meetings of Commissioners;
- public workshops and hearings during the triennial review of the Commission's Pollution Control Standards;
- project-specific workshops (such as the CSO workshop); and
- programs provided by the Commission public information section, such as the mobile aquarium, school-based volunteer monitoring and the ORSANCO Ohio River Education Foundation's floating classroom.

The ORSANCO Educational Foundation (OEF) is a 501c(3) non-profit organization that was founded by ORSANCO in 2003 to design, manage, and raise funds for educational programs in the Ohio River Basin. OEF's flagship program is the PA Denny River Education Center, a floating classroom that travels the Ohio River. OEF has developed a curriculum for high schools that includes activities focused on watersheds, point and non-point pollution, and water monitoring. OEF has developed additional programming for elementary schools, community groups, and the general public. OEF also partners with agencies and organizations throughout the Ohio River Watershed to offer training opportunities for teachers, scientists, and environmental educators. The City of Portsmouth will request a visit from the PA Denny River Education Center during River Sweep 2009.

The PA Denny River Education Center is the highlight of the ORSANCO Educational Foundation's community programs. In 2004, this historic sternwheeler was renovated into a "river lab", complete with scientific classrooms. High school students from the Greater Cincinnati area have the unique opportunity to come on board this floating classroom for an educational, interactive cruise to explore and study *their* Ohio River. During these voyages, students are able to do hands-on activities, such as test water quality, identify aquatic organisms, and make habitat observations.

Contingency Planning

ORSANCO's early-warning program is the foundation of the City of Portsmouth's source water contingency planning. When a spill or release is reported on the Ohio River, ORSANCO notifies public water systems downstream and conducts time-of-travel calculations to give the systems an approximate timeline for the arrival of the plume. ORSANCO also samples the plume and reports its findings to the potentially affected systems until the emergency is over. This process is also put into action when a contaminant is detected during daily sampling, where the source of contamination may or may not be known. Typically ORSANCO sends out an e-mail to all the Ohio River public water systems downstream from a spill. In addition, ORSANCO staff make a direct telephone call to those systems most immediately downstream of the spill.

When notified of an impending plume, the City of Portsmouth water officials decide whether to treat water or close off intakes and possibly start conservation practices. All decisions are based on type of contaminant, concentration, length of plume, and river speeds. Contamination reported to the city via email generally does not initiate any immediate action, as ample time is available to react as described above. However, if contamination is reported to the city by phone call, water treatment operators use a spill check list to obtain pertinent information and then notify water quality personnel so that appropriate actions can be taken. The spill check list documents the following:

- Name of caller
- Name of company they work for, if applicable
- Nature of spill (contaminant name)
- Time of spill

- Location of spill (mile marker) - the city's mile marker is 350.8
- Amount spilled
- Speed of river
- Estimated time of arrival at intake
- Operator who received call
- Date call received
- Time water quality personnel were instructed to prepare for spill

The public water system's primary response to a major spill is to shut off the intakes and work with ORSANCO to determine when the intakes can safely be reopened. The City has three days' worth of storage serving western Portsmouth and one day of storage serving eastern Portsmouth (Sciotoville and beyond). If an emergency exceeded that time frame*, the City would ship raw water to the treatment plant by barge (as Ironton did during the 1994 ethylene dibromide spill). For some years the City has been building up a Contingency Fund—currently over one million dollars—that is available for funding such a contingency

As noted previously, the entity responsible for a spill is also responsible for cleaning it up; all the barge companies and the regulated facilities along the river are supposed to have contracts with clean-up companies, with stipulations that the company be able to arrive on-site within a certain time period, usually one to two hours. In the event that a major spill is detected but the responsible party is not immediately apparent, the U.S. Coast Guard can initiate clean-up using its own contracted clean-up companies.

Since 2001, the Scioto County EMA has conducted annual emergency response exercises, which have included scenarios such as a chemical spill into the river. As noted previously, the County has some limited ability to respond to such an emergency.

Source Water Monitoring

The City of Portsmouth collects raw water samples at its intake on a daily basis. These samples are analyzed for 21 compounds as well as alkalinity, hardness and pH. Turbidity is sampled constantly using an auto-sampler. The organic compounds are monitored through ORSANCO's Organic Detection System that is described below in the Basinwide Sampling Section. Daily treatment decisions are based on the results of these analyses. For example, if turbidity increases, alum and lime dosages are increased accordingly.

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*Currently the City has no contingency plan for permanently losing the Ohio River as a source. In such an unlikely event, the City would be obliged to construct a wellfield or tie in with another public water system. Either option would involve installing many miles of water mains.

Basinwide Sampling

ORSANCO operates several water quality monitoring programs that support Source Water Program initiatives. ORSANCO's Organics Detection System (ODS) collects water samples on a daily basis from 13 locations on the Ohio River and major tributaries and screens for volatile organic compounds. Detections from this program are reported to ORSANCO offices where they are evaluated. As necessary, notification is then provided to downstream utilities (described above) and reported to the National Response Center. Portsmouth is one of the 13 ODS sampling sites, and the Portsmouth water treatment plant's laboratory is used for analysis. Sample collection for other water quality monitoring programs ranges from weekly (bacteria) to quarterly (metals).

ORSANCO currently is in the process of leveraging a federal grant to provide autosamplers for all of its ODS stations. These would provide real-time quantitative data on a suite of organic contaminants.

Implementation

The following chart summarizes the City of Portsmouth's source water protection plan. (Bolded items are new commitments; others are already complete or ongoing.)

Activity	***Responsible Party***	***When Implemented***	***Comments***
SOURCE MANAGEMENT ACTIVITIES			
Response to spills from commercial barges, railway bridge, pipelines	US Coast Guard	Ongoing	City cannot realistically conduct spill prevention activities. It will continue to monitor and provide rapid response to spills. See Contingency Plan.
Contact appropriate party about notification of upstream dredging	PWS operator	By September 1, 2009	Portsmouth operator will identify dredging company and request that they notify him or a specified designee about any planned dredging within Critical Area
Materials storage areas – propose overlay zoning ordinance to prohibit facilities handling large quantities of toxic materials	City planning department	By Sept. 2010	
Construct overflow containment pond for Sciotoville wastewater outlet	Portsmouth Utilities Department	2005	Completed
EDUCATION AND OUTREACH			
Include info on source water protection plan in CCR	PWS operator and staff	Annually, starting in 2009	
Include info on pharmaceuticals and how to properly dispose of them in CCR	PWS operator and staff, City Health Dept. staff	Spring, 2009	Text may be included annually or on a periodic basis … to be decided.
Provide information on Portsmouth source water protection for River Sweep and at Scioto County Fair.	PWS operator and staff, and City Health Dept. staff	Annually, starting in 2009	Development of brochure or other outreach material may be delegated to City staff or a volunteer with appropriate skills
Conduct PWS plant tours	PWS staff	Ongoing – as requested	
Assist science fair participants	PWS staff	Ongoing – as requested	
Add source water protection information to high school curricula.	??	By September 2009	Operator will initiate effort, locate the appropriate individuals in school and/or on local school board.

Activity	*Responsible Party*	*When Implemented*	*Comments*
Provide source water protection signs where roadways cross the Critical Area and its tributaries	PWS operator and staff	By September 2009	Operator will initiate effort; appropriate City staff and/or contractors may design and erect signs.
Coordinate with other City offices, other Ohio River communities, and ORSANCO	PWS operator and all directors of City offices	Ongoing	
Request visit from PA Denny River Education Center during River Sweep 2009	PWS operator or other City official	Submit request by July 2008	Discuss the potential for regular visits to Portsmouth, and how to coordinate with local school children
CONTINGENCY PLANNING			
Continue participation in ORSANCO network	PWS operator	Ongoing	
SOURCE WATER MONITORING			
Continue monitoring raw water	PWS operator	Ongoing	Anticipating the ability to obtain real-time data on numerous chemical constituents by 2009, via autosamplers funded through a federal grant requested by ORSANCO.

Evaluating Effectiveness

As a systematic measure of effectiveness, the City of Portsmouth will review and report, upon request, the success of ORSANCO's plume-tracking and early-warning notification upriver from its intake (see next paragraph). Also, the City will document:

- The number of 401 notifications, as a measure of improvement over the number received before 2008. If the notifications enable the treatment plant to avoid additional treatment, the City may be able to calculate an annual dollar benefit of the source water protection plan.

- Any anecdotal reports of potential source water contamination events detected early or prevented due to the city's own source control or educational efforts.

Effectiveness of Basinwide Source Water Protection Efforts. ORSANCO is in a unique position to measure the effectiveness of its efforts, because every year there are hundreds of spills on the Ohio River. Whenever its notification efforts enable a utility to avoid drawing contamination into a drinking water intake, both ORSANCO and the affected communities have scored a source water protection success. ORSANCO annual reports documenting the year's spill events are available at http://www.orsanco.org/rivinfo/pubs/orsa.asp.

Updating the Plan

The City of Portsmouth commits to updating this Protection Plan every 5 years or whenever

- leadership of the water plant changes;
- new contaminant sources appear upstream or existing sources discontinue operations; or
- major changes in water quality are detected.