



**Andy Beshear**  
GOVERNOR

**ENERGY AND ENVIRONMENT CABINET**  
**DEPARTMENT FOR ENVIRONMENTAL PROTECTION**

300 Sower Boulevard  
Frankfort, Kentucky 40601  
Phone: (502) 564-2150  
Fax: 502-564-4245

**Rebecca Goodman**  
SECRETARY

**Anthony R. Hatton**  
COMMISSIONER

**KENTUCKY DIVISION OF WATER**  
**WELLHEAD PROTECTION PLAN**  
**5-YEAR UPDATE FORM**

**Update Requirements:**

This form should be used for the 5-year update submittal requirements of the Kentucky Wellhead Protection Program (WHPP) in compliance with 401 KAR 4:220 and SDWA Section 1428. Once the form is complete, please sign and send to:

Kentucky Division of Water  
Watershed Management Branch  
Attention: Dale Booth  
300 Sower Boulevard, 3<sup>rd</sup> Floor  
Frankfort, Kentucky 40601 or [dale.booth@ky.gov](mailto:dale.booth@ky.gov)

For assistance, contact Dale Booth at (502) 782-6895 or [dale.booth@ky.gov](mailto:dale.booth@ky.gov)

**System Information:**

PWS Name: **Worthington Municipal Water Works**

PWS ID Number: **KY0450478**

AI Number: **1613**

Contact Person/Title: **Rick King/Superintendent**

Mailing Address: **PO Box 366, Worthington, KY 41183**

Telephone: **606-836-6821** Email: **rickrking15@outlook.com**

System Type\*: **Community**

\*Community; Non-Transient/Non-Community; Transient/Non-Community

Source\*: **Field of 3 Wells** \*Well(s) or Spring(s) and total number of each

AKGWA #(s): **Well #1/00029505; Well #2/00029508; Well #3/00029511**

County: **Greenup** ADD: **FIVCO**

WWD Permit #: **0688** Permitted Amount (mgd): **0.250**

Population Served: **1673**

Overall Susceptibility Rating\*: **Medium**      \*High, Medium or Low

WHPP Changes Summary: **Worthington Municipal Water Works withdraws its source water from Quaternary alluvium deposits of the Ohio River Valley via three (3) wells drilled to 75 feet deep. Water Withdrawal Permit #0688 authorizes 0.250 million gallons per day (MGD), however daily withdrawals averaged 0.117 MGD over the last five years. The WHPA delineation includes approximately 696 acres of mostly developed land use dominated by residential septic systems, the CSX railyard, and highway. The overall susceptibility rating is medium. Worthington Municipal Water Works’s management strategies include proposed wastewater service within the WHPA, education and outreach via Consumer Confidence Reports (CCR), Water Supply Protection Area road signs, and the development of Groundwater Protection Plans (GPPs) for all activities that have the potential to pollute groundwater.**

#### **Update Form Instructions:**

Please complete each section that applies to any system or WHPP updates and submit the supporting documentation. Please indicate if a section is not applicable to this update. **Sections 4 and 6 through 11 are required for every 5-year update.**

Please sign certification on the last page upon completion.

#### **Section Updates:**

##### **Section 1: Treatment Plant**

If the treatment plant location has changed then provide a new location map below. This can be a county roadmap or a GIS-produced map. Please use the area below to provide relevant details, or to indicate that no change has occurred.

**The Worthington Water Plant is still located at 1004 McCloud Dr, Worthington, KY 41183**

##### **Section 2: Water Withdrawal and Water Quality**

If there have been changes in water withdrawal rates or water quality since the last submittal, provide a discussion of the relevant details in the space below (include new Water Withdrawal Permit Number if applicable). Include supporting documentation as an attachment.

**Worthington Municipal Water Works is authorized to withdrawal from 0.250 MGD of water a field of three (3) wells along the Ohio River authorized under Permit # 0688 which was last revised in 2005. Since the last update (2020-2024), average monthly water withdrawals have varied from 0.099 to 0.134 MGD with maximum monthly withdrawals varying from 0.143 to 0.176 MGD. The 1992 & 1995 Phase I and Phase II WHPPs reported average water withdrawals as 0.139 and 0.140 MGD respectively. Additionally, they reported 660 service connections compared to the 680 service connections currently. So, over the last thirty (30)**

years customers and average water withdrawals have remained relatively consistent. Population in Greenup County is projected to decline from 2025-2050 so production will likely not increase.

Worthington Municipal Water Works withdraws its source water from the Quaternary alluvium deposits of the Ohio River Valley via three (3) wells constructed to depth of 75 feet. Well #1 (00029505) and Well #2 (00029508) were constructed in 1968 and the water treatment plant was placed into operation in 1972. Well #3 (00029511) was constructed in 1978 and added to the permit in 1983. Well #1 (00029505) is sampled twice a year as part of the statewide Ambient Groundwater Monitoring Program Sampling at Well #1 (00029505) began August 22, 1995. The program provides baseline groundwater data on aquifer characterization, ambient groundwater quality and nonpoint source pollution for public and private wells and springs, which are sampled quarterly, and analyzed for hundreds of parameters, including metals, nutrients, pesticides, and volatile organic compounds. Ohio River Alluvium physiographic region is showing significantly increasing trends for conductivity, barium, and potassium, and significantly decreasing trend for orthophosphate and detections of Atrazine (Report on the Condition of Ambient Groundwater in Kentucky 2018). The system is developing PFAs sampling, monitoring, and potential treatment options.

### **Section 3: Change or Modification to Groundwater Source**

If the system has changed or modified the wells or springs being used, provide the following: 1) a description of changes/modifications; 2) copies of the relevant form(s) (Kentucky Water Well Record, Well Maintenance & Plugging Record, Well Inspection Form or Spring Inventory Record); and 3) any other information relating to well construction (i.e., installation logs, driller's logs, lithological or geophysical logs), below.

**There have been no modifications of the wells since the last update other than routine maintenance requirements, except Well #3. Since the last update, Well #3 underwent repair and rehabilitation due to a hole in the casing so construction of a new well was not required.**

### **Section 4 (REQUIRED): Planning Team**

Effective water supply protection requires community involvement and public awareness. Identify the planning team consisting of a leader and at least two team members, with their respective titles, below.

**Leader:**

**Rick King, Superintendent**

**Team Members:**

**Kentucky Rural Water Association, Technical Assistance**

### **Section 5: WHPA Delineation**

If the system is revising a Wellhead Protection Area (WHPA) delineation, or if a new groundwater source has been added since the last submittal, provide a site-specific description of the local geology and aquifer. Include references for published literature. Provide a summary of any aquifer tests (i.e. pumping tests, slug tests, tracer tests), including data gathering and evaluation methods. Show calculations and supporting data for each WHPA delineated or revised. Include the detailed hydrogeologic report as an attachment.

**No changes in delineation. The current WHPA for Worthington Municipal Water Works has not changed for this update and encompasses approximately 696 acres of mostly developed land use with minor amounts of pasture/hay and deciduous forest. Much of the development within the WHPA is represented by residential communities, roadways, and the CSX railyard. Please refer to the table below for the WHPA delineation zones and associated acreages:**

**Zone 1: 180-day time of travel= 21.32 acres**

**Zone 2: 10-year time of travel= 82.58**

**Zone 3: Hydrologic boundary= 696.42 acres**

### **Section 6 (REQUIRED): WHPA Map**

Provide a WHPA map that shows each groundwater source labeled with the appropriate AKGWA #, all protection zones identified and the Contaminant Source Inventory (CSI) point locations. If no changes have occurred since the last submittal, then a copy of the most recent WHPA/CSI map can be resubmitted. To view the most recent delineations for your system, please visit the [Source Water Protection Viewer](#). Please contact program staff for assistance.

**See attached WHPA Map for the three (3) active public water supply wells**

### **Section 7 (REQUIRED): Contaminant Source Inventory**

Provide an updated CSI in table format. This can be created using the spreadsheet template provided, and copied into the space below. If no changes occurred since the last update, the table can be pulled from previous WHPP documents. Each contaminant source listed should have a Contaminant Source ID # that corresponds to the WHPA map in Section 6. The CSI table must show the susceptibility determination ranking for each contaminant source. Include a brief narrative discussion of the overall system susceptibility. For more information on potential sources of contamination, please visit the DOW's [Web Tools for SWP Planning website](#). Please contact program staff for assistance.

**See attached CSI. Worthington Municipal Water Works currently withdraws from a wellfield that has a delineated protection area of approximately 696 acres of mostly low to high intensity developed land use. There are eleven (11) potential types of contaminant sources which are dominated by residential septic systems, the CSX railyard, and highway. The overall susceptibility rating is medium.**

### **Section 8 (REQUIRED): Management Strategies**

Provide a discussion of the previous and newly proposed management strategies to prevent source water contamination. This discussion must include the previous management strategies that were implemented as well as the goals that were met. Next, include any NEWLY proposed management strategies, associated goals, implementation plans and the party responsible for implementation. For information about wellhead protection strategies please visit the DOW's [Source Water Protection Strategies website](#).

#### **Previous Management Strategy Update:**

**Worthington Municipal Water Works is part of the Division of Water's Ambient Groundwater Monitoring Network, which provides the system with raw water quality data on a quarterly basis. This also provides the system with on-going monitoring and management opportunities due to the potential for the data to provide an early warning in the event of contamination or shifts in source water quality. In addition, old water supply protection signs remain along the roadways of the WHPA Zone 3 boundary, however these need to be updated. The City of Raceland, City of Wurtland, and City of Worthington all have proposed wastewater extensions to provide service within the WHPA. These projects should be prioritized and funded to eliminate and/or control these potential sources of contamination inventoried. Management strategies include a combination of regulatory compliance and public education strategies including the correct water supply protection area road signs, development of groundwater protection plans (GPPs), Consumer Confidence Reports (CCR), and emergency management notifications in the event of a spill or release of potential contaminants.**

#### **Newly Proposed Management Strategies:**

**Worthington Municipal Water Works will continue to participate in the Ambient Groundwater Monitoring Network and pursue public education and outreach to manage the WHPA including using the CCR and the development of GPPs. Additionally, the system would like to request updated water supply protection signs remain along the roadways of the WHPA Zone 3 boundary.**

### **Section 9 (REQUIRED): Contingency and WHP Planning**

Provide a description of Contingency and WHP Planning. Complete the Emergency Response Phone List, Procedures for Public Notification, identification of Potential Future Problems and the procedures to establish Alternative Water Supplies. This section must also address how often the WHPP will be reviewed and updated.

#### **Emergency Response Phone List**

**Fill in all Blanks and Phone Numbers with appropriate information.**

<b>Local Emergency Response</b>	<b>Phone Number</b>
<b>Plant Operator: Rick King</b>	<b>(606) 922-0085</b>
<b>Worthington Fire Department</b>	<b>(606) 836-5766</b>
<b>Worthington Police Department</b>	<b>(606) 836-6144</b>
<b>Greenup Disaster Emergency Services</b>	<b>(606) 473-5644</b>
<b>Local Emergency Dispatch</b>	<b>911</b>

<b>State and Federal Assistance</b>	<b>Phone Number</b>
<b>Kentucky DOW (Frankfort)</b>	<b>(502) 564-3410</b>
<b>Kentucky DOW Associated Field Office (FO) Morehead:</b>	<b>(606) 783-8655</b>
<b>Kentucky Environmental Response Team 24 hour response line</b>	<b>(502) 564-2380 (800) 928-2380</b>
<b>Kentucky State Fire Marshall</b>	<b>(502) 573-0382</b>

<b>Any Other Pertinent Contacts</b>	<b>Any Other Pertinent Numbers</b>
Click here to enter text.	PHONE NUMBER
Click here to enter text.	PHONE NUMBER
Click here to enter text.	PHONE NUMBER

**Procedures for Public Notification:**

In the event of a water system emergency that would threaten the health or life of the public, use the following procedure. Prepare and broadcast an advisory, including directions for the public. Describe the public notification process and provide contacts for those media outlets. If the system uses methods other than traditional media please list them.

**In the event of a water system emergency that could threaten public health, the following procedures should be followed: post/announce a brief statement concerning the nature of the emergency any necessary instructions and/or precautions to be taken. These notifications should be issued to various media outlets including, radio stations, alerts on water bills, newspaper, television, or door-to-door visits, if necessary.**

Newspaper, Television, and Radio Stations	Phone Numbers
WSAZ Channel 3 News	(304) 697-4780
The Greenup Gazette	(606) 314-1135
Facebook <a href="https://www.facebook.com/CityofWorthington/">https://www.facebook.com/CityofWorthington/</a>	(606) 836-6821

**Potential Future Problems:**

Describe the *most likely* scenarios that could threaten the water supply.

**A spill or accident on US 23 and/or at the CSX railroad facility is the largest potential threat to the water supply in addition to septic contamination.**

**Alternative Water Supply (Short and Long Term):**

Describe the short term and long-term water supply alternatives that address each of the potential future problems identified above. List all current interconnections with other water systems. Discuss the capacity of each potential alternative water supply to sustain normal operations.

**If Worthington Municipal Water Works need alternative water supplies could include purchasing water from an existing interconnection with Russell Water Company and constructing new well(s) or wellfield and/or modification of the existing treatment process.**

**Schedule for Update and Review:**

The Wellhead Protection Plan will be reviewed regularly and updated every five years as required by regulation.

**Section 10 (REQUIRED): Copies of Public Notices and Education Materials**

Provide copies of wellhead protection public notices and education materials distributed.

**A copy of this wellhead protection plan will be posted on the Kentucky Rural Water Association webpage and the link to plan will be printed on customer bills for public notice.**

**Section 11 (REQUIRED): Public Meeting Documentation\*\*\***

Provide the record of WHPP public meeting attendance, minutes and comments.

**A copy of this wellhead protection plan will be posted on the Kentucky Rural Water Association webpage and the link to plan will be printed on customer bills for public review. A copy will be provided in the attachments for documentation.**

\*\*\*Non-Community Water Systems are not required to have public meetings for 5-year updates, but must post a public notice in a conspicuous place. A public notice template is provided as a separate document. However, public input and associated documentation are encouraged. Please contact program staff if you have any questions.



**Certification Signature (TO BE COMPLETED BY PLANNING REPRESENTATIVE):**

"I certify that this document and all attachments were prepared under my direction or supervision. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete."

Signature:  Date: 1-13-23

Printed Name/Title: Rick King, Director of Public Works

**Assistance:**

For any assistance, please contact Wellhead Protection Staff:

Dale Booth  
(502) 782-6895  
[Dale.Booth@ky.gov](mailto:Dale.Booth@ky.gov)

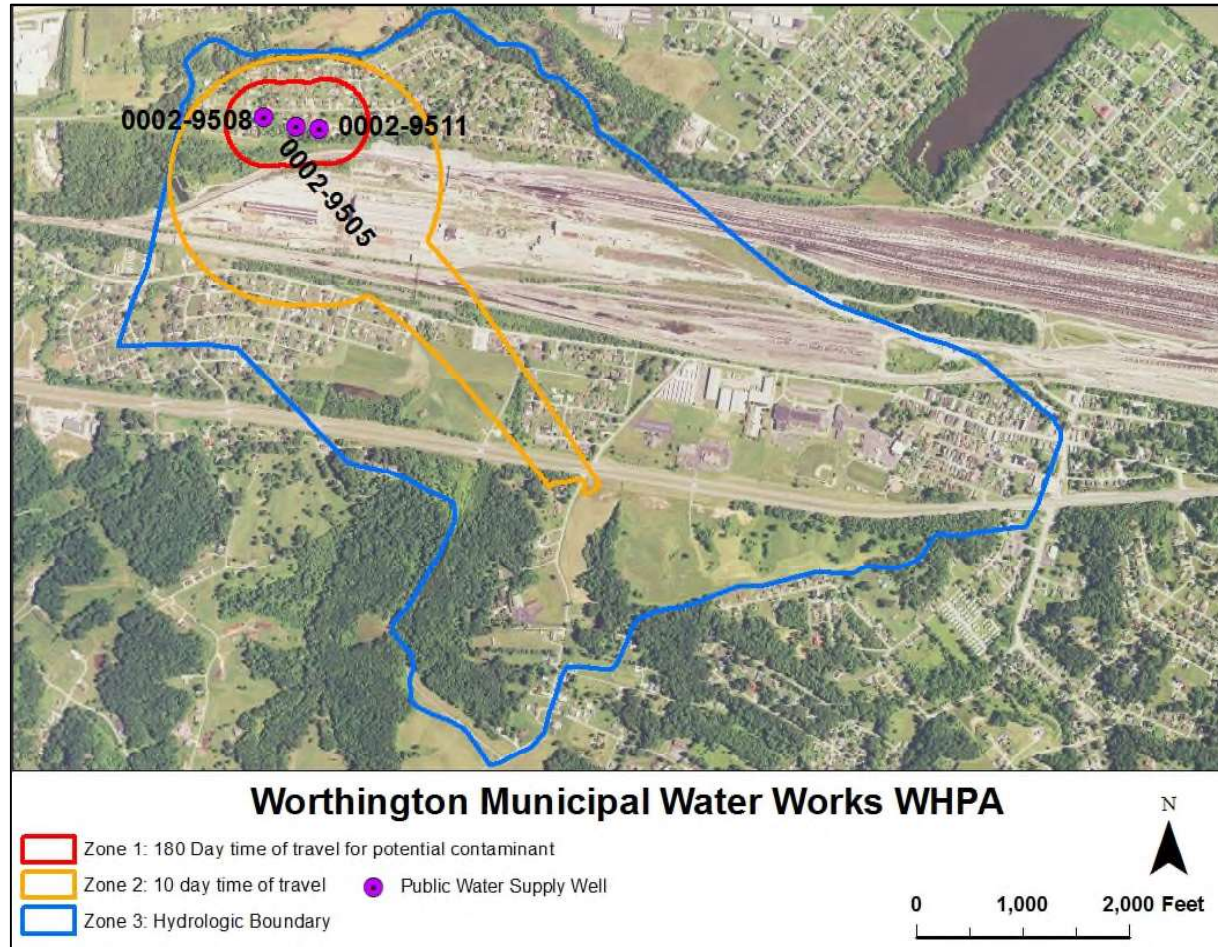
Allan Shingleton  
(502) 782-6907  
[Allan.Shingleton@ky.gov](mailto:Allan.Shingleton@ky.gov)

**Please sign and return completed form to:**

Kentucky Division of Water  
Watershed Management Branch  
Attention: Chip Zimmer  
300 Sower Boulevard, 3<sup>rd</sup> Floor  
Frankfort, Kentucky 40601  
or [Dale.Booth@ky.gov](mailto:Dale.Booth@ky.gov)

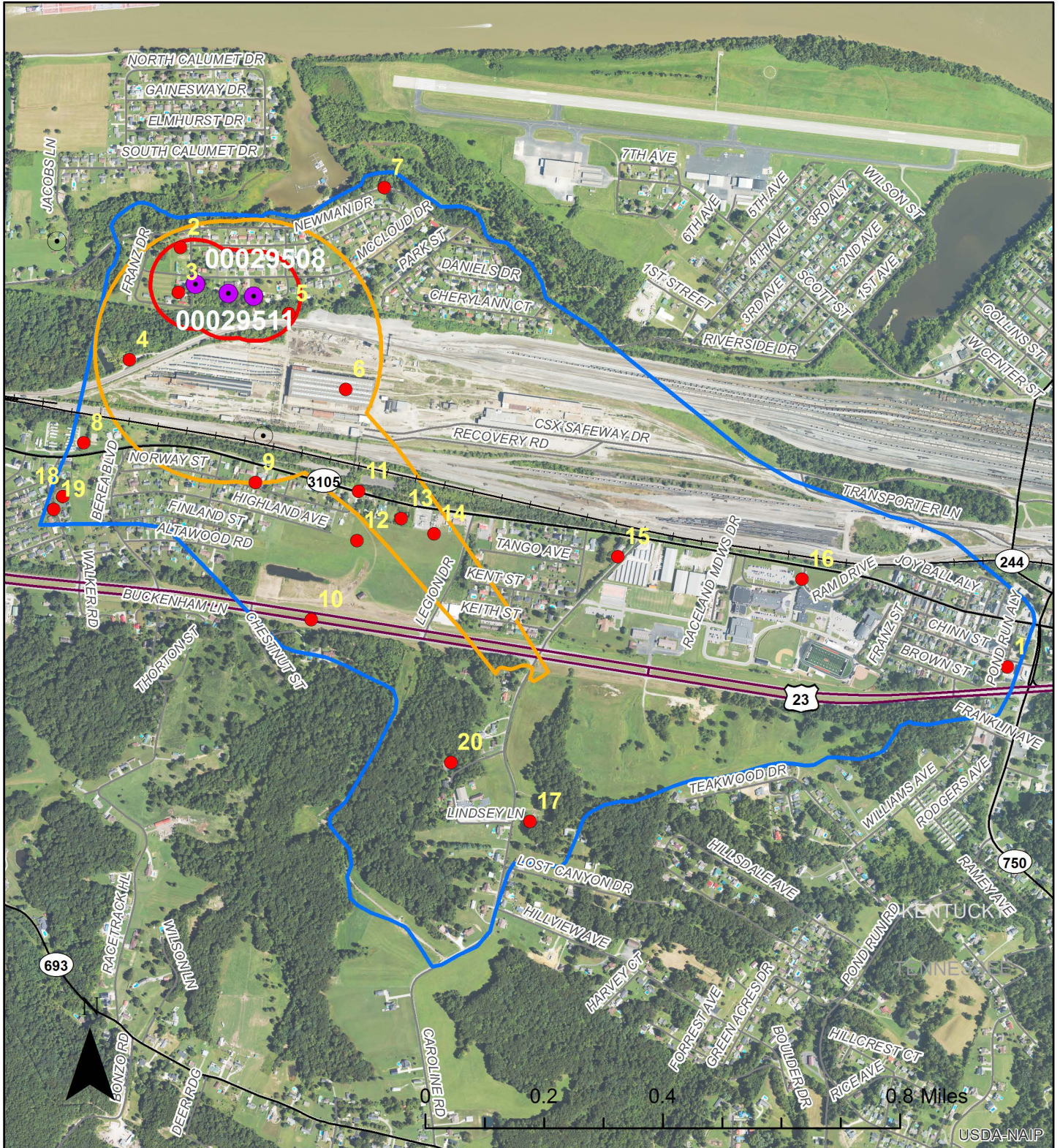
## **Section 6: WHPA Map**

Section 6 Attachment



## **Section 7: Contaminant Source Inventory**

# Contaminant Source Inventory



- XYCSI\_Worthington\_2019
- Active Railroad
- Water Wells (PWS)
- Zone 1: 180 Day time of travel for potential contaminant
- Zone 2: 10 year time of travel
- Zone 3: Hydrologic Boundary

CSI Map ID #	Contaminant Source Type	CS CODE	Name	Address	Lat	Lon	Quantity	Zone	Proximity Value	Contaminant Value	Hydrologic Sensitivity	Numeric Rating	Susceptibility Ranking
1	Gas stations (existing & abandoned/historic)	C-16	UST Super Quik No 3	500 Pond Run Road, Raceland, KY 41169	38.5408	-82.7292	1	3	1	3	3	14	MED
2	Domestic Wells	G-7	Private Wells	Franz Drive, Worthington, KY	38.5517	-82.7545	3	1	3	2	3	15	MED
3	Residential Septic	R-4	Septic Systems	Franz Drive, Worthington, KY	38.5506	-82.7546	2	1	3	2	3	15	MED
4	Wastewater Treatment Plant*	M-15	CSX Sewage Disposal Plant PTP	Worthington, KY	38.5490	-82.7562	1	2	2	3	3	16	HIGH
5	Lift Stations	M-6	Sewage Lift Station	Worthington, KY	38.5500	-82.7512	1	1	3	3	3	18	HIGH
6	Railroad Yards/Maintenance	C-33	Railroad Yard and Repair Shops	Worthington, KY	38.5481	-82.7495	1	2	2	3	3	16	HIGH
7	Other Commercial Sources	C-27	UST for Dock	Worthington, KY	38.5530	-82.7481	1	3	1	3	3	14	MED
8	Mobile Home Park/Campground	R-2	Trailer Park Septic	Worthington, KY	38.5470	-82.7577	1	3	1	2	3	11	MED
9	Domestic Wells	G-7	Trailer Park Wells	Worthington, KY	38.5470	-82.7577	1	2	1	2	3	11	MED
10	Residential Septic	R-4	Subdivision Septic	Worthington, KY	38.5459	-82.7524	1	3	2	2	3	13	MED
11	Domestic Wells	G-7	Subdivision Well	Worthington, KY	38.5459	-82.7524	1	2	2	2	3	13	MED
12	Major Roadways	M-7	HWY 23	Worthington, KY	38.5425	-82.7508	1	3	1	2	3	11	MED

13	Auto Repair Shops/ Body Shops	C-2	Garage	Worthington, KY	38.5449	-82.7479	1	2	2	2	3	13	MED
14	Other Municipal Sources	M-10	Electric Substation	Worthington, KY	38.5445	-82.7469	1	2	2	2	3	13	MED
15	Cemeteries*	C-8	McCoy Cemetery	Worthington, KY	38.5374	-82.7442	1	3	1	2	3	11	MED
16	Cemeteries*	C-8	Walker Cemetery	Worthington, KY	38.5457	-82.7584	1	3	1	2	3	11	MED
17	Residential Septic	R-4	Septic System	Walker Rd. Worthington, KY	38.5454	-82.7587	1	3	1	2	3	11	MED
18	Residential Septic	R-4	Septic System	Caroline Rd. Worthington, KY	38.5389	-82.7466	1	3	1	2	3	11	MED

**Section 10 & 11: Public Notice Documentation**