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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: Chip Zimmer
300 Sower Boulevard, 3rd Floor
Frankfort, Kentucky 40601 or edward.zimmer@ky.gov

For assistance, contact Chip Zimmer at (502) 782-7141 or edward.zimmer@ky.gov

System Information:

PWS Name: **Bardwell City Utilities**

PWS ID Number: **KY0200018**

AI Number: **0678**

Contact Person/Title: **David Hutchinson, Manager & Operator**

Mailing Address: **225 Front St., P.O. Box 639, Bardwell, KY 42023**

Telephone: **(270) 445-0061** Email: **bcuelectric323@gmail.com**

System Type: **Community**

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

Source*: **5 Wells; 2 Active & 3 Inactive** *Well(s) or Spring(s) and total number of each

AKGWA #(s): **Well 1/00033904; Well 3/00070884**

County: **Carlisle**

ADD: **PADD**

WWD Permit #: **0055** Permitted Amount (mgd): **0.180**

Population Served: **1227 Residential**

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

WHPP Changes Summary: **Bardwell currently has two (2) active wellfields using one well each including Well #3 that was constructed in 2016 in the eastern wellfield and Well #1 located in town at the western wellfield. Bardwell has three other inactive wells which include two (2) in town that need to be plugged and Well #4 needs to be regularly operated and maintained to remain functional. Water withdrawals are permitted for up to 0.180 million gallons per day (MGD), with current average monthly water withdrawals of 0.113 MGD under Permit #0055 (2018-2022). The WHPA delineation has been modified to account for the active wellfield which includes just over 590 acres of mostly developed land use and 6 potential contaminants with the highest risk composed of a major roadway (51) and railway crossing (Canadian National Railway). The overall susceptibility rating is medium. Bardwell City Utilities is exploring options for funding to plug their inactive wells, inactivating the western wellfield in town, and developing interconnections with neighboring water systems in case of emergencies.**

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 Bardwell Water Treatment Plant is located off Ken Winters Drive in Bardwell, Carlisle County, Kentucky

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.

Bardwell City Utilities withdrawals from the Jackson Purchase Region, or Mississippi Embayment, which is located the westernmost part of Kentucky. It is bounded by the Tennessee River on the east, Ohio River on the north and Mississippi River on the west. The area is underlain by unconsolidated deposits of sand, gravel, silt, and clay. These deposits are on top of limestone that dips relatively

steeply to the west. Groundwater occurs within the unconsolidated granular aquifers and is generally abundant. Bardwell City Utilities withdrawals from a wellfield under Permit #0055 which was last revised in 1970 and an application for amendment to the permit will be submitted to account for the active wellfield. Over the last 5 years (2018-2022), average monthly water withdrawals have varied from 0.102 to 0.144 MGD with maximum monthly withdrawals varying from 0.114 to 0.137 MGD.

Well #1 (00033904) is sampled quarterly as part of the statewide Ambient Groundwater Monitoring Program which provides baseline groundwater data on aquifer characterization, ambient groundwater quality and nonpoint source pollution. Groundwater, including public water supplies and private-sector wells and springs, are sampled quarterly, and analyzed for hundreds of parameters, including metals, nutrients, pesticides, and volatile organic compounds. Sampling began April 1, 2013. Based on a 2018 Report on the Condition of Ambient Groundwater in Kentucky, groundwater quality monitoring in the Jackson Purchase showed trends including a decrease in fluorides and a significant decrease in sulfates.

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.

No changes have occurred since the 2018 update. The City of Bardwell has proposed closing the western wellfield in town and developing the newer eastern wellfield just on the outskirts of town along Ken Winters Drive. This would secure the western wellfield from sources of potential contamination like the railroad track and floodplain and prevent the expense and logistics of pumping water to the eastern wellfield. This would require plugging the existing wells and requesting to update the water withdrawal permit that authorizes active sources. The City of Bardwell is looking for funding through grants and loans to complete this work.

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.

David Hutchinson, Manager, Operator & Fire Chief
Mark Drysdale, Office Manager, City of Bardwell
Adrian Cunningham, City Clerk/Treasurer, City of Bardwell

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.

There are currently two (2) active wellfields are both accounted for in this update.

Table 2: WHPA Delineations

Western Wellfield		
Zone	Time of Travel (TOT)	Acres
1	180-day	13.37
2	10-year	51.63
3	Hydrologic boundary	361.49
Total		426.49
Eastern Wellfield		
Zone	Time of Travel (TOT)	Acres
1	180-day	11.53
2	10-year	151.18
3	Hydrologic boundary (Shared)	361.49
Total		162.71
Total Wellfield		589.20

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. The wellhead protection area for the two (2) active public water system wells is further delineated into three (3) zones based on time of travel (TOT) and the hydrological boundary for potential contaminants, including:

Zone 1: 180-day time of travel

Zone 2: 10-year time of travel

Zone 3: Hydrologic boundary

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. Bardwell City Utilities currently withdraws from two (2) wells drilled into unconsolidated granular aquifers of the Jackson Purchase Region, or Mississippi Embayment. The delineated wellhead protection area is predominately developed (low, medium, high and intensity and open space), forested, and pasture/hay land use. It also lies in the middle of a major roadway and railroad transportation route. The contaminant source inventory indicates six (6) potential contaminant sources including a highway, railroad line, row crops, cemetery, abandoned landfill, and Kentucky Utilities transmission line.

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:

Highway 51 and the Canadian National Railway in town were identified as high-risk potential contaminants in the last update. The active WHPA now encompasses a newer wellfield composed of mainly agricultural areas, an abandoned landfill, and Roselawn cemetery. The last WHPP update outlined strategies including water supply protection area road signs, using the Consumer Confidence Report (CCR) for promotion of the WHPP, and development of interconnections with neighboring water systems.

Newly Proposed Management Strategies:

Bardwell City Utilities is exploring options to properly abandon the western wellfield along the road and railroad tracks due to the risk of potential contamination and overall susceptibility rating. Just managing the newer eastern wellfield as the only active WHPA and associated CSI is still being pursued. Additionally, the City of Bardwell has proposed projects to provide extensions to both Arlington and Cunningham to have interconnections with neighboring water districts. There are currently no interconnections so in emergencies hauling and providing bottling water would be necessary.

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.

Local Emergency Response	Phone Number
Plant Operator	270-445-0061
Fire Department/City Hall	270-628-5415
Police Chief (Brandon Marbry)	270-628-5415
Carlisle County Judge Executive (Greg Terry)	270-628-5451
Carlisle County Emergency Dispatch Emergency Operations Center	270-628-5420 or 911

State and Federal Assistance	Phone Number
Kentucky DOW (Frankfort)	502-564-3410
Kentucky DOW Regional Field Office (FO)- Paducah	270-898-8468
Kentucky Environmental Response Team 24 hour response line	(502) 564-2380 (800) 928-2380
Kentucky State Fire Marshall	(502) 573-0382

Any Other Pertinent Contacts	Any Other Pertinent Numbers
Julio Vela, Dominique, Clifton (City Employees)	

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.

Click here to enter text.

Newspaper, Television, and Radio Stations	Phone Numbers
93.3 WKYQ (Radio)	270-444-6397
Click here to enter text.	PHONE NUMBER

Potential Future Problems:

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

However, the Canadian National Railway is an Amtrak Route to the City of New Orleans so the risk should not be the same as freight. So, the highest risk would more than likely come from a spill on US-51. Over the long-term nitrates should be monitored and managed due to the influence of agriculture in the WHPA but has shown a decline over the sampling period to date from 2.5 to 0 mg/l.

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.

Water supply emergencies can require both short and long-term responses depending on the nature and extent of the contaminant or event. Bardwell City Utilities currently has no interconnections with other neighboring systems so in an emergency either a boiled water advisory would be issued and/or hauled/bottled water would have to be provided. However, the City of Bardwell has proposed infrastructure projects that include constructing extensions to neighboring systems including 5 miles of 10-inch PVC to Arlington Water Department and 8 miles of 8 and 10-inch PVC Cunningham Water District.

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.

Click here to enter text.

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

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

[Click here to enter text.](#)

***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: David Hutchinson

Date: 10/31/2023
Click here to enter text.

Printed Name/Title: Click here to enter text. David Hutchinson, Manager

Assistance:

For any assistance, please contact Wellhead Protection Staff:

Chip Zimmer
(502) 782-7141
Edward.Zimmer@ky.gov

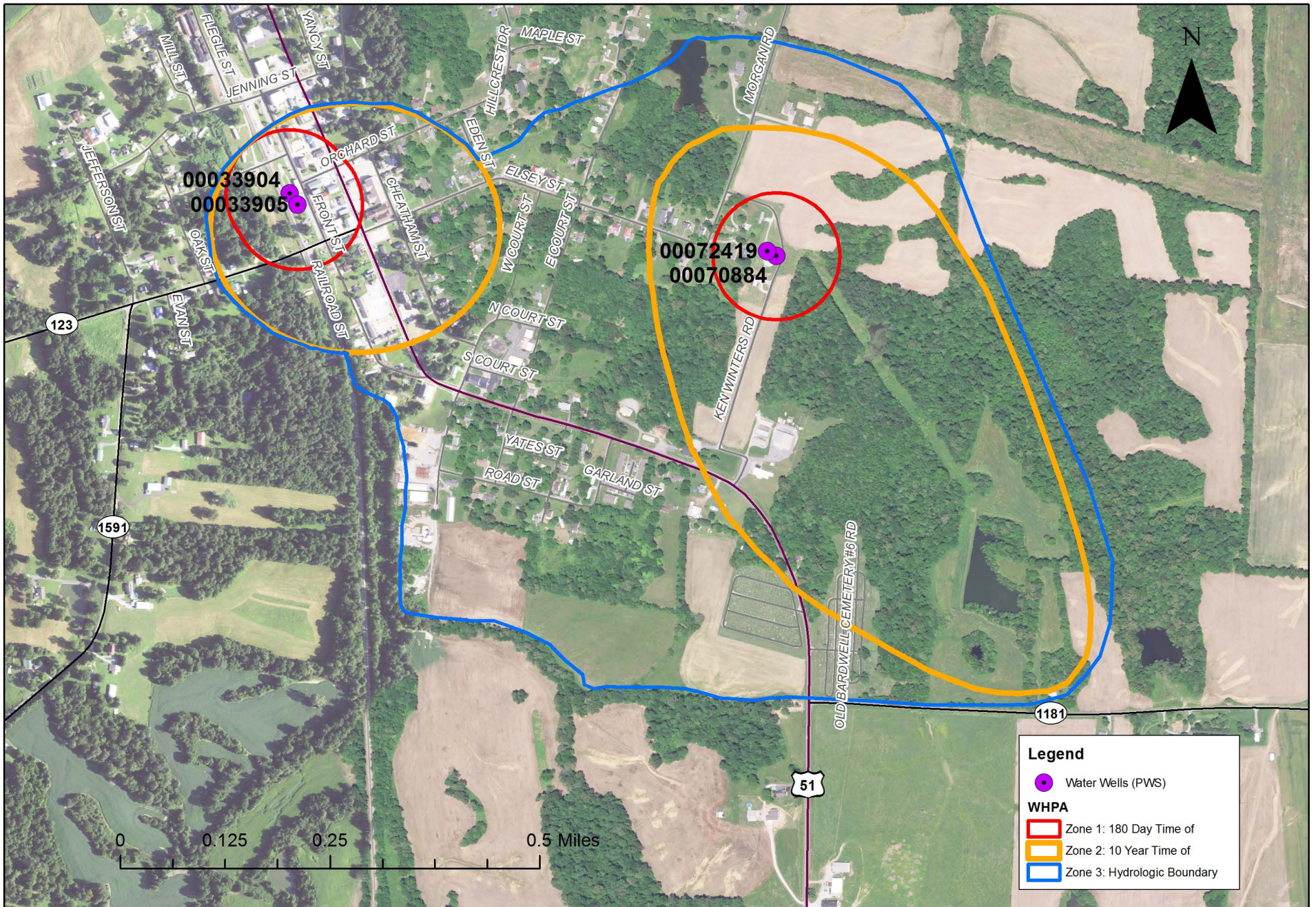
Dale Booth
(502) 782-6895
Dale.Booth@ky.gov

Please sign and return completed form to:

Kentucky Division of Water
Watershed Management Branch
Attention: Chip Zimmer
300 Sower Boulevard, 3rd Floor
Frankfort, Kentucky 40601
or Edward.Zimmer@ky.gov

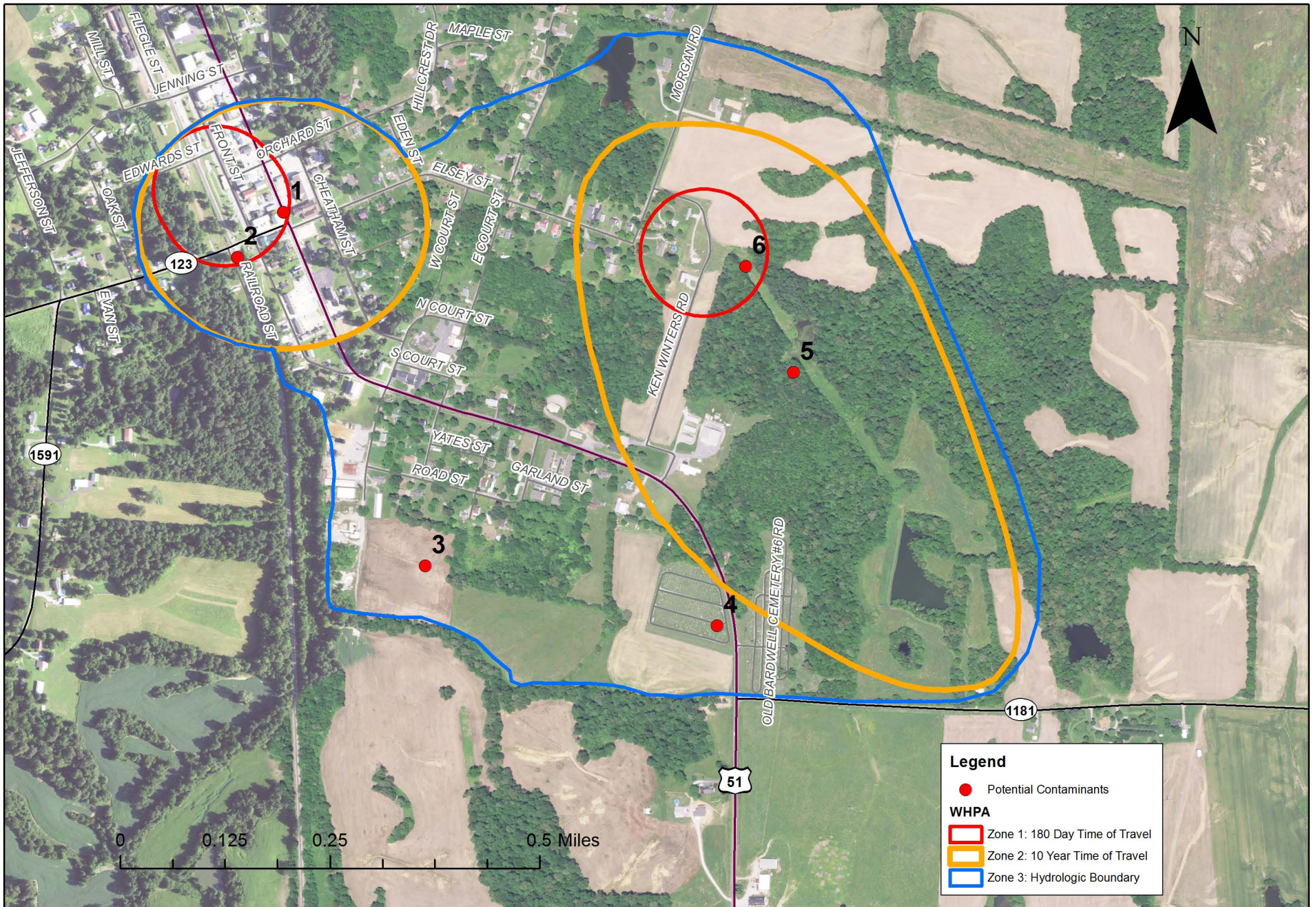
Section 6: WHPA Map

Bardwell City Utilities Well Locations



Section 7: Contaminant Source Inventory

Bardwell City Utilities Contaminant Source Inventory



Date: 10/17/2023

Author: Kentucky Division of Water

Contaminant Source Inventory and Susceptibility Analysis for *Bardwell City Utilities (KY0200018)*

CSI Map ID #	Site ID	Contaminant Source Type	CS CODE	Name	Address	Lat	Lon	Quantity	Zone	Proximity Value	Contaminant Value	Hydrologic Sensitivity	Numeric Rating	Susceptibility Ranking	Contaminant Notes
1		Major Roadways	M-7	Highway 51	Bardwell, KY 42023	36.871063	-89.009744	1	1	3	3	2	17	HIGH	
2		Railroad Lines	C-32	Transportation Route Railroad	Bardwell, KY 42023	36.870254	-89.010695	1	1	3	3	2	17	HIGH	
3		Row Crops : Corn, Soybean, Wheat	A-5	Row Crops	Bardwell, KY 42023	36.86504	-89.00643	3	3	1	3	1	12	MED	
4		Cemeteries*	C-8	Rose Lawn Cemetery	U.S. 62, Bardwell, KY	36.86418	-89.000098	1	3	1	2	1	9	LOW	
5		Municipal Landfills	W-7	Abandoned City Landfill	WHPA 2	36.868605	-88.998647	1	2	2	3	1	14	MED	Abandoned
6		Chemically Managed Utilities Corridors and Green Spaces	M-9	KU transmission line		36.870405	-88.999752	1	1	3	2	1	13	MED	

CSI Totals	Low	1
	Med	3
	High	2

Overall Susceptibility Ranking	Med
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Section 10 & 11: Public Notice Documentation

This space is being save for HCWD#2 Documentation HCWD#2 to provide webpage link and copy of redacted customer bill for public notification.