

BLUEGRASS WATER

Utility Operating Company

A CSWR Managed Utility

Wellhead Protection Plan

for

Center Ridge Water District #3

KY0180502, Calloway County

Well House Road
Murray, KY 42071

WPP Phase I & WPP Phase II approved on May 2, 2008 by the Kentucky
Division of Water

Revisions and recertification to be conducted by water system personnel every five (5) years.
Revised by Central States Water Resources EH&S personnel on August 20, 2020

Table of Contents

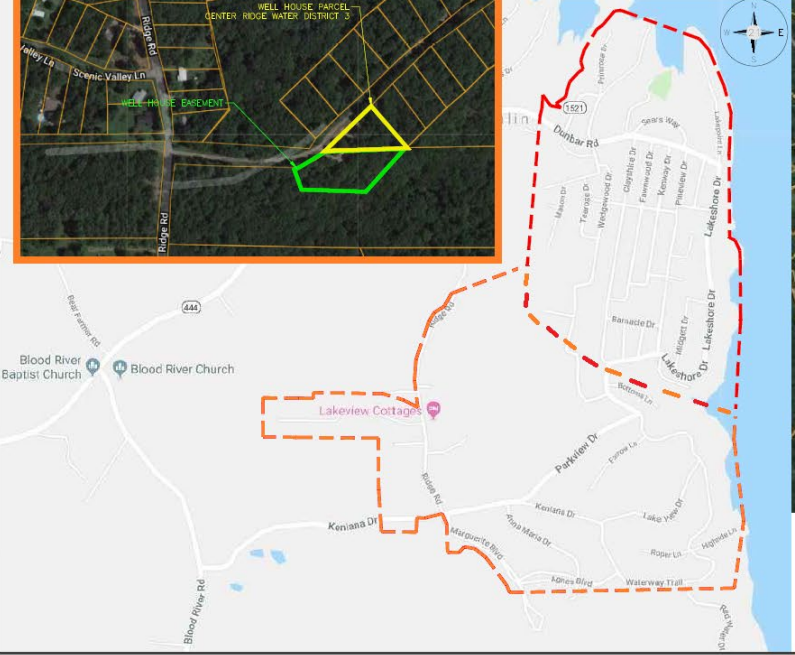
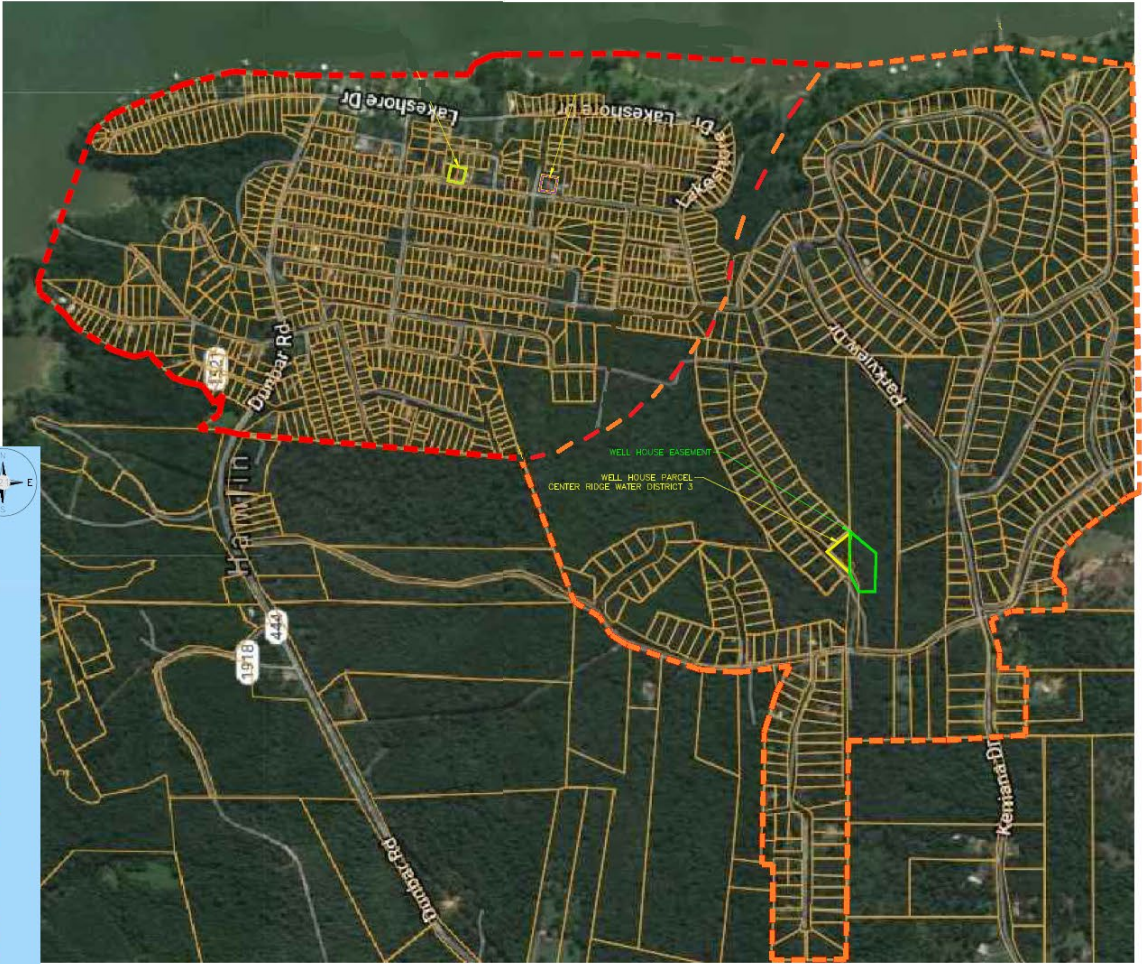
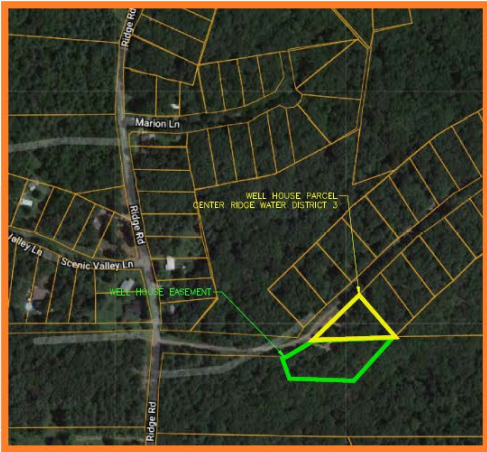
1. Facility Service Area Map
2. June 2020 Monthly Operating Report
3. Historical Well Inspection
4. Bluegrass Water UOC Planning Team
5. Wellhead Protection Area Delineation Information
6. Wellhead Protection Area Delineation Map
7. Contaminant Source Inventory Summary and Map
8. Previous and Proposed Management Strategies
9. Contingency and Wellhead Protection Planning Information
10. Public Education Materials

Attachment 1 Service Area of Center Ridge Water District #3



Legend

- CRWD #2 Service area
- Well #1
- Well #2
- CRWD #3 Service area
- Well #1 & #2
- Easement



Utility Note Disclaimer:
The utilities shown hereon are depicted based on the original design plans provided by the system manager. 21 Design Group, Inc performed no field verification of the layout and are unable to determine the exact location at this time. The location represents approximate location only and should not be construed as being 100% accurate. It is shown to provide general layout of the system only and should not be used to interpret encroachments.

DATE	DESCRIPTION
08/11/2021	ISSUE FOR PERMIT
08/11/2021	ISSUE FOR PERMIT
08/11/2021	ISSUE FOR PERMIT
08/11/2021	ISSUE FOR PERMIT
08/11/2021	ISSUE FOR PERMIT

21 DESIGN GROUP INC

ENGINEERING SURVEYING

1351 Jeffersonville, VA 22091
Washington, MD 20783

info@21designgroup.net
P: 410-433-5229

Attachment 2 June MOR

KENTUCKY DIVISION OF WATER DRINKING WATER BRANCH

Revised 05/26/20



MONTHLY OPERATION REPORT (MOR)--ALL WATER SYSTEMS

MONTH & YEAR (mm/yyyy) 06/2020

Indicate one with "X"

<input type="checkbox"/>	SURFACE WATER
<input checked="" type="checkbox"/>	GROUNDWATER
<input type="checkbox"/>	PURCHASE/DISTRIBUTE ONLY

PWS ID :	KY0180502	PLANT ID: A	A	PLANT NAME:	Center Ridge Water System #3
PWS NAME:	Center Ridge Water System #3	PLANT CLASS:	I	DIST. CLASS:	I
AGENCY INTEREST (AI):	33824	DATE MAILED:			
SOURCE NAME:	Well	COUNTY:	Calloway		
OPERATOR(S) RESPONSIBLE / IN-CHARGE		CLASS	CERTIFICATION NUMBER		
WTP SHIFT 1:	Freddie O 'Bryan	IV	595		
WTP SHIFT 2:					
WTP SHIFT 3:					
DISTRIBUTION:	Freddie O'Bryan	III	27595		

THIS REPORT MUST BE RECEIVED BY THE DIVISION OF WATER AND APPLICABLE FIELD OFFICE
NO LATER THAN 10 DAYS AFTER THE END OF THE MONTH.

TREATMENT PLANTS COMPLETE:

1. DESIGN CAPACITY (gpm): 25
2. TYPE OF FILTRATION USED:
3. DESIGN FILTRATION RATE (gpm/sq. ft.):
4. PERCENT BACKWASH WATER USED: #VALUE!
5. DATE FLOCCULATION BASIN(S) LAST CLEANED:
6. DATE SETTLING BASIN(S) LAST CLEANED:

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein. Based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. See KRS 224.99-010 and 401 KAR 8:020. (Penalties under this statute and regulation may include fines up to \$25,000 per violation or by imprisonment for not more than one year, or both).

X

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

KENTUCKY DIVISION OF WATER - DRINKING WATER BRANCH
 WATER TREATMENT PLANT - MONTHLY OPERATING REPORT

PWS ID : KY0180502
 PLANT ID: A

REPORT MONTH/YEAR: 06/2020
 PAGE 1 OF 11

APPLICABLE TO ALL PLANTS

DAY	RAW WATER TREATED GALLONS	HOURS PLANT OPERATED	COAGULANT		COAGULANT		pH ADJUSTMENT		DISINFECTANT		DISINFECTANT	
			LBS	PPM	LBS	PPM	Pre		Pre		Post	
							LBS	PPM	LBS	PPM	LBS	PPM
1	No Meter											
2	No Meter											
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
TOTAL												
AVERAGE												
MAX												

NUMBER DAYS IN OPERATION 0

KENTUCKY DIVISION OF WATER - DRINKING WATER BRANCH
 WATER TREATMENT PLANT - MONTHLY OPERATING REPORT

PWS ID : KY0180502
 PLANT ID: A

APPLICABLE TO ALL PLANTS

REPORT MONTH/YEAR: 06/2020

PAGE 3 OF 11

ANALYTICAL RESULTS (mg/L OR PPM UNLESS OTHERWISE SPECIFIED)														
DAY	pH			TOTAL ALKALINITY		TOTAL HARDNESS		CHLORINE RESIDUAL				TURBIDITY (NTU)		
	RAW	TOP OF FILTER	TAP	RAW	TAP	RAW	TAP	TOP OF FILTER		PLANT TAP		RAW	SETTLED WATER	PLANT TAP
								TOTAL	FREE	TOTAL	FREE			
1										0.59				
2										0.57				
3										0.54				
4										0.61				
5										0.62				
6										0.57				
7										0.56				
8										0.69				
9										0.51				
10										0.52	0.45			
11										0.51	0.63			
12										0.53	0.50			
13										0.52	0.81			
14										0.56	0.64			
15										0.61	0.79			
16										0.52	0.64			
17										0.51	0.58			
18										0.57	0.71			
19										0.61	0.70			
20										0.59	0.76			
21										0.62	0.72			
22										0.57	0.69			
23										0.51	0.69			
24										0.53	0.63			
25										0.51	0.54			
26										0.57	0.67			
27										0.57	0.67			
28										0.50	0.60			
29										0.49	0.57			
30										0.53	0.61			
31														
AVERAGE										0.56	0.65			

APPLICABLE TO ALL PLANTS

*Please answer Y/N question below this chart.

ANALYTICAL RESULTS (mg/L OR PPM UNLESS OTHERWISE SPECIFIED)											
DAY	FLUORIDE		IRON		MANGANESE		PHOSPHATE		Lowest Daily Chlorine Residual Plant Tap On-Line Chlorine Analyzer	RAINFALL INCHES	WATER TEMP. DEGREES F ⁰ /C ⁰
	RAW	TAP	RAW	TAP	RAW	TAP	RAW	TAP	Total		
1									0.59		
2									0.57		
3									0.54		
4									0.61		
5									0.62		
6									0.57		
7									0.56		
8									0.69		
9									0.51		
10									0.52		
11									0.51		
12									0.53		
13									0.52		
14									0.56		
15									0.61		
16									0.52		
17									0.51		
18									0.57		
19									0.61		
20									0.59		
21									0.62		
22									0.57		
23									0.51		
24									0.53		
25									0.51		
26									0.57		
27									0.57		
28									0.50		
29									0.49		
30									0.53		
31											
AVERAGE									Monthly Minimum	Total Rainfall	AVG Temp
									0.49		
									Number of readings	30	0.00
									For Free Chlorine, # less than 0.2 mg/L	0	Y
									For Chloramines, # less than 0.5 mg/L		N

Disinfectant Chloramines? (Y/N) **N**

KENTUCKY DIVISION OF WATER - DRINKING WATER BRANCH
 WATER TREATMENT PLANT - MONTHLY OPERATING REPORT

PWS ID : KY0180502
 PLANT ID: A

ALL WATER SYSTEMS

REPORT MONTH/YEAR: 06/2020

PAGE 7 OF 11

DAY	DISTRIBUTION SYSTEM OPERATION											
	CHEMICALS ADDED			TEST RESULTS								
	CHLORINE BOOSTER LBS	CHLORINE BOOSTER LBS		TOTAL (T) AND FREE (F) CHLORINE RESIDUAL (ppm)								
				NORTH		SOUTH		EAST		WEST		
			T	F	T	F	T	F	T	F		
1												
2												
3												
4												
5												
6												
7												
8												
9												
10				0.38								
11				0.42								
12				0.46								
13				0.55								
14				0.37								
15				0.49								
16				0.39								
17				0.47								
18				0.50								
19				0.61								
20				0.49								
21				0.41								
22				0.56								
23				0.49								
24				0.43								
25				0.46								
26				0.59								
27				0.56								
28				0.47								
29				0.57								
30				0.42								
31												
AVERAGE			Average	0.48								
TOTAL			Total Minimum	0.37								
			Free Minimum									

Total # Chlorine Samples	21	0	0	0	0	0	0	0	0	0
# Less than 0.2 mg/L/0.5 mg/L	14	0	0	0	0	0	0	0	0	0

Number of Free Residuals	0	Minimum Monthly Free Residual	0.00
Number of Total Residuals	21	Minimum Monthly Total Residual	0.37
Total # Less than 0.2 mg/L	0		
Total # Less than 0.5 mg/L			

Disinfectant Chloramines? (Y/N)	N	Y
Number of days of operation?	0	N

**KENTUCKY DIVISION OF WATER / DRINKING WATER BRANCH
MONTHLY OPERATING REPORT (MOR) PLANT SUMMARY FORM**

PWS ID KY0180502

MONITORING PERIOD (MMYYYY) 06/2020

Y **NOTE: COMPLETE ALL APPLICABLE FIELDS!!! NOT ALL OF THE FIELDS ARE PRE-POPULATED FOR YOU!!!**
N

PLANT INFORMATION

APPLICABLE TO ALL PLANTS

PLANT ID <u>A</u>	TOTAL WATER TREATED (gallons)	_____
PLANT NAME <u>Center Ridge Water System #3</u>	AVE. DAILY PRODUCTION (gallons)	_____
AGENCY INTEREST <u>0</u>	MAXIMUM PUMPAGE (gallons per day)	_____

INDIVIDUAL FILTER EFFLUENT TURBIDITY

APPLICABLE TO ALL PLANTS WITH FILTRATION

ANALYTE CODE 0100

Was each filter monitored continuously? (Y/N) _____

Were measurements recorded every 15 minutes? (Y/N) _____

Was there a failure of the continuous monitoring equipment? (Y/N) _____

 If Yes, (1) were individual filter effluent turbidity grab samples collected every four hours of operation? (Y/N) _____

 (2) was the continuously monitoring equipment repaired within 5 working days? (Y/N) _____

Was individual filter level greater than 1.0 NTU in two consecutive measurements? (Y/N) _____

Was individual filter level greater than 0.5 NTU in two consecutive measurements after on line for more than four hours? (Y/N) _____

Was individual filter level greater than 1.0 NTU in two consecutive measurements in three consecutive months? (Y/N) _____

Was individual filter level greater than 2.0 NTU in two consecutive measurements in two consecutive months? (Y/N) _____

If any of the last 4 boxes are YES, fill out the Individual Filter Turbidity Sheet and submit with the MOR

COMBINED FILTER EFFLUENT TURBIDITY
APPLICABLE TO ALL PLANTS WITH FILTRATION

ENTRY POINT RESIDUAL DISINFECTANT CONCENTRATION
APPLICABLE TO ALL PLANTS

ANALYTE CODE <u>0100</u>	ANALYTE CODE <u>0999</u>
Number of hours of plant operation _____ <u>0.0</u>	Number of days of plant operation _____ <u>0</u>
Were samples taken every 4 hours of plant operation? (Y/N) _____ <input type="checkbox"/>	Were samples taken each day of operation? (Y/N) _____ <input checked="" type="checkbox"/>
Number of samples taken _____ <u>0</u>	Number of lowest chlorine samples recorded _____ <u>30</u>
Highest single turbidity reading _____ <u>0.00</u>	Lowest single chlorine reading _____ <u>0.49</u>
For all filtration except slow sand filtration:	If less than required:
Number of samples exceeded 0.1 NTU _____	Was residual restored within 4 hours of plant operation? (Y/N) _____ <input type="checkbox"/>
Number of samples exceeded 0.3 NTU _____	<u>Free Chlorine</u> (for all disinfectants except chloramine):
Number of samples exceeded 1 NTU _____	Number of samples under 0.2 mg/L _____ <u>0</u>
When filtration is slow sand filtration:	<u>Total Chlorine</u> (when disinfectant is Chloramine):
Number of samples exceeded 1 NTU _____	Number of samples under 0.5 mg/L _____
Number of samples exceeded 5 NTU _____	

CHLORINE DIOXIDE ENTRY POINT MONITORING
APPLICABLE TO PLANTS UTILIZING CHLORINE DIOXIDE

CHLORITE ENTRY POINT MONITORING
APPLICABLE TO PLANTS UTILIZING CHLORINE DIOXIDE

ANALYTE CODE <u>1008</u>	ANALYTE CODE <u>1009</u>
Number of days of plant operation _____ <u>0</u>	Number of days of plant operation _____ <u>0</u>
Were samples taken each day of operation? (Y/N) _____ <input type="checkbox"/>	Were samples taken each day of operation? (Y/N) _____ <input type="checkbox"/>
Number of samples taken _____ <u>0</u>	Number of samples taken _____ <u>0</u>
Highest single chlorine dioxide reading _____ <u>0.00</u>	Highest single chlorite reading _____ <u>0.00</u>
Number of chlorine dioxide samples exceeded 0.8 mg/L _____ <u>0</u>	Number of chlorite samples exceeded 1 mg/L _____ <u>0</u>

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein. Based on my inquiry of those individuals immediately responsible for obtaining the information, the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. Violations of 401 KAR Chapter 8 are subject to severe penalties prescribed in KRS 224.99-010, up to \$25,000 fine per day per violation and in some cases a violation may subject the violator to prison.

X
SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

KENTUCKY WELL INSPECTION FORM JUL 12 2001

(2)

(1) AKGWA NUMBER 0 0 0 3 - 3 9 7 4

Attach Well Record Label Here (if applicable)

Note: Water well labels begin with "0", monitoring well labels begin with "8".

(2) OWNER/FACILITY INFORMATION
 Well Owner's Name: Keswina Water Works, Inc. ; Conrad Powell
Last First MI
 Mailing Address: 205 Armes Blvd.
 City: Hamlin State: KY Zip: 42046
 Well Address (if different) Ridge Rd.
 City: Hamlin State: KY Zip: 42046
 Phone: (270) 436-5116

(3) WELL RECORD LABEL LOCATION:
 well casing pressure tank water pipe
 well cap electric box not labeled
 pump other

(4) USGS Quadrangle Name Hamlin County Calloway
 WELL LOCATION Latitude 36° 35' 08" Longitude 88° 04' 34"

(5) PHYSIOGRAPHIC OR HYDROLOGIC REGION
 Blue Grass Ohio River Alluvium
 E. Coal Field W. Coal Field
 Miss. Plateau Jackson Purchase

(6) DRILLER INFORMATION
 Who Constructed Well? unknown
 Address: _____
 City: _____ State: _____ Zip: _____
 Date Well Completed: _____
Month Day Year unknown

(13) WELL USE (check all that apply)
 domestic livestock not used
 public irrigation abandoned
 industrial monitoring
 other
 PWSID# 0180502
 Water Withdrawal Permit # _____

(18) ELEVATION
490 ft. AMSL
 From ground surface
 top of casing
 By map
 survey
 report
 GPS

(7) GENERAL
 Type of Construction:
 drilled/augered
 excavate & backfill
 hand dug/blasted
 Depth of Well: _____ ft.
 measured
 reported
 unknown
 Static Water Level, ft. below surface:
 measured
 reported
 not measured
 can't be measured
 Well Yield:
 gpm gph gpd
 measured
 estimated
 unknown

(9) WELLHEAD
 Is Well Located in a Pit?
 yes no unknown
 Wellhead (casing top):
 well cap sanitary seal
 flush mount locking cap
 open unknown
 Casing Above Ground Level?
 yes no unknown
2 inches above ground.
 Discharge Pipe Below Surface?
 yes no unknown
 Pitless Adapter Used?
 yes no unknown

(14) WELL SERVICE
 Number of People Served: _____
 Number of Service Connections: 45
 Any Quantity Problems? yes no
 Any Quality Problems? yes no
 If "yes", describe in COMMENTS section, below.

(19) TREATMENT SYSTEM
 none
 water softener
 ultraviolet
 chlorination
 aeration
 charcoal filter
 sand filter
 iron treatment
 fluoridation
 other
 Treatment Bypass Available? yes no

(8) SURFACE ANNULAR MATERIAL:
 clay drill cuttings
 cement unknown
 open sand gravel
 concrete pad

(10) PUMP DETAILS
 Date Installed: _____
 unknown Month Day Year
 Pump Type:
 submersible bailer
 turbine jet hand pump
 none other unknown
 Intake Level: _____ ft. below surface
 Electric Connection:
 2 wire 3 wire unknown

(15) COMPLIANCE TO STANDARDS
 Construction in Compliance with KY Standards?
 yes no unknown pre-law
 If "no", describe in COMMENTS section, below.

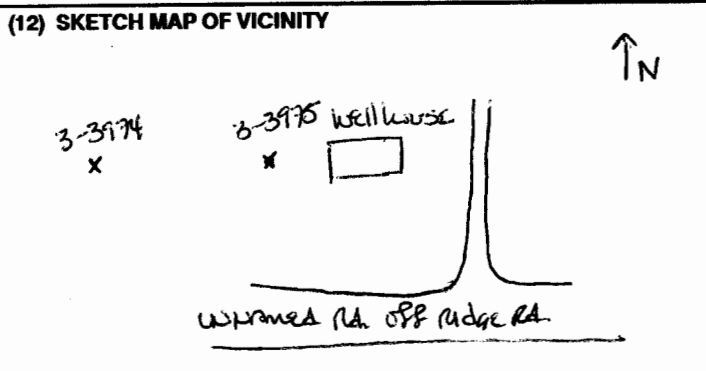
(16) RELATIVE LOCATION
 upgradient sidegradient unknown
 downgradient varying N/A

(17) INSPECTION INFORMATION
 Date of Inspection: 6/15/01
Month Day Year
 Water Quality Sample Taken: yes no
 Reason for Inspection:
 general survey
 specific complaint investigation
 spill or incident response
 contamination site investigation
 enforcement
 general water quality analysis
 ambient groundwater monitoring
 other WSP
 Program Name and Facility ID#: _____

(20) OPTIONAL USE
 Will Owner Allow State Access?
 yes no unknown
 Extent of Monitoring Allowed:
 collect sample
 measure SWL
 pump well
 complete access
 notification required
 other (describe below)
 Monitoring Feasibility: _____

(11) WELL CONSTRUCTION DETAILS

Feet Below Surface From	To	Casing Inside Dia. (in.)	Casing Type	Casing Wall Thickness (in.)



(21) COMMENTS:
Well formerly operated as Keswina Water Works

(22) INSPECTOR IDENTIFICATION
 Name: Hedcoms Stephane A
LAST First MI Inspector ID# _____
 Agency: DOW DWM CHR KGS other Keswina
 Signature of Inspector: Stephane Hedcoms Date: 6/15/01

KENTUCKY WELL INSPECTION FORM

(1) AKGWA NUMBER 0 0 0 3 - 3 9 7 5

Attach Well Record Label Here (if applicable)

Note: Water well labels begin with "0", monitoring well labels begin with "8".

(2) OWNER/FACILITY INFORMATION
Well Owner's Name: Center Ridge wD #3 *Bill Duncan*
Last First MI
Mailing Address: 281 Morris Rd
City: Dexter State: KY Zip: 42036
Well Address (if different)
City: State: Zip:
Phone: (270) 474-8267

(3) WELL RECORD LABEL LOCATION:
 well casing pressure tank water pipe
 well cap electric box not labeled
 pump other

(4) USGS Quadrangle Name Hamlin County Calloway
WELL LOCATION Latitude Longitude

(5) PHYSIOGRAPHIC OR HYDROLOGIC REGION
 Blue Grass Ohio River Alluvium
 E. Coal Field W. Coal Field
 Miss. Plateau Jackson Purchase

(6) DRILLER INFORMATION
Who Constructed Well? unknown
Address: City: State: Zip:
Date Well Completed: Month Day Year unknown

(13) WELL USE (check all that apply)
 domestic livestock not used
 public irrigation abandoned
 industrial monitoring
 other
PWSID# 0180502
Water Withdrawal Permit #

(18) ELEVATION ft. AMSL
From ground surface top of casing
By map survey report GPS

(7) GENERAL Type of Construction:
 drilled/augered
 excavate & backfill
 hand dug/blasted
Depth of Well: 165 ft.
 measured reported unknown
Static Water Level, ft. below surface:
 measured reported not measured can't be measured
Well Yield:
 gpm gph gpd
 measured estimated unknown

(9) WELLHEAD Is Well Located in a Pit?
 yes no unknown
Wellhead (casing top):
 well cap sanitary seal
 flush mount locking cap
 open unknown
Casing Above Ground Level?
 yes no unknown
10 inches above ground.
Discharge Pipe Below Surface?
 yes no unknown
Pitless Adapter Used?
 yes no unknown

(14) WELL SERVICE
Number of People Served: 132
Number of Service Connections:
Any Quantity Problems? yes no
Any Quality Problems? yes no
If "yes", describe in COMMENTS section, below.

(19) TREATMENT SYSTEM
 none
 water softener
 ultraviolet
 chlorination
 aeration
 charcoal filter
 sand filter
 iron treatment
 fluoridation
 other
Treatment Bypass Available? yes no

(8) SURFACE ANNULAR MATERIAL:
 clay drill cuttings
 cement unknown
 open sand gravel
 concrete pad

(10) PUMP DETAILS
Date Installed: Month Day Year
Pump Type:
 submersible bailer
 turbine jet hand pump
 none other unknown
Intake Level: ft. below surface
Electric Connection:
 2 wire 3 wire unknown

(15) COMPLIANCE TO STANDARDS
Construction in Compliance with KY Standards?
 yes no unknown pre-law
If "no", describe in COMMENTS section, below.
(16) RELATIVE LOCATION
 upgradient sidegradient unknown
 downgradient varying N/A

(17) INSPECTION INFORMATION
Date of Inspection: 9 15 13
Month Day Year
Water Quality Sample Taken: yes no
Reason for Inspection:
 general survey
 specific complaint investigation
 spill or incident response
 contamination site investigation
 enforcement
 general water quality analysis
 ambient groundwater monitoring
 other GUDI investigation
Program Name and Facility ID#: _____
Alternate Well ID#: _____

(20) OPTIONAL USE
Will Owner Allow State Access?
 yes no unknown
Extent of Monitoring Allowed:
 collect sample
 measure SWL
 pump well
 complete access
 notification required
 other (describe below)
Monitoring Feasibility: _____

(11) WELL CONSTRUCTION DETAILS

Feet Below Surface From	To	Casing Inside Dia. (in.)	Casing Type	Casing Wall Thickness (in.)

(12) SKETCH MAP OF VICINITY

(21) COMMENTS:
17) well construction on surface inspected in support of GUDI

(22) INSPECTOR IDENTIFICATION
Name: ELLISON ERNIE
Last First MI Inspector ID#
Agency: DOW DWM CHR KGS other
Signature of Inspector: _____ Date: 10/1/13

Attachment 4

WHPP Drinking Water Planning Team

Leader:

Jay Favor, CSWR – Director Environmental Health & Safety
Oversees all facility operations for Bluegrass Water UOC. Directs team to carry out operation tasks.

Team:

Ali Alexander, CSWR – Environmental Compliance Officer
Oversees facility compliance with State and Federal Regulations/Statutes.

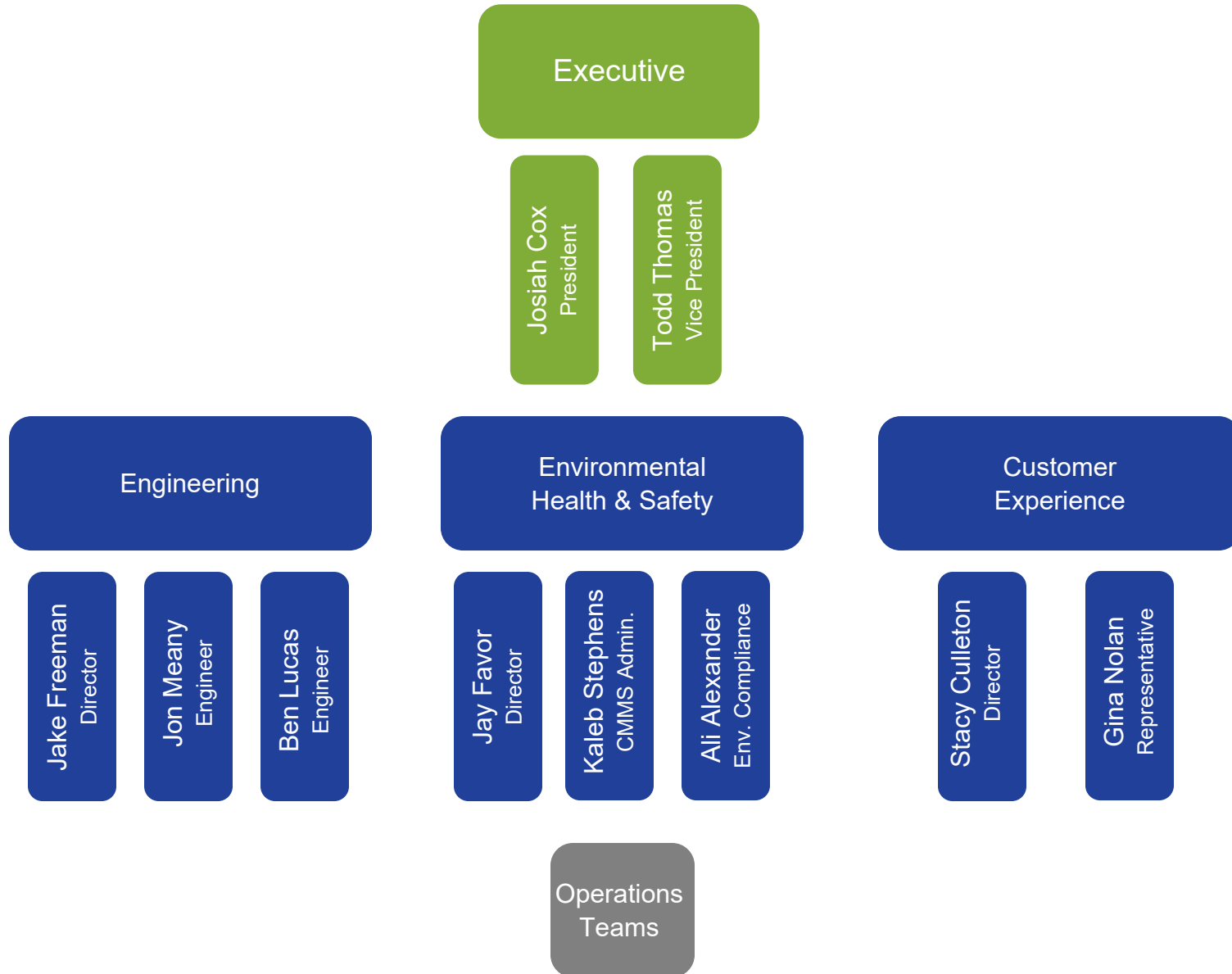
Stacy Culleton, CSWR – Director Customer Experience
Oversees communications between operators and customers.

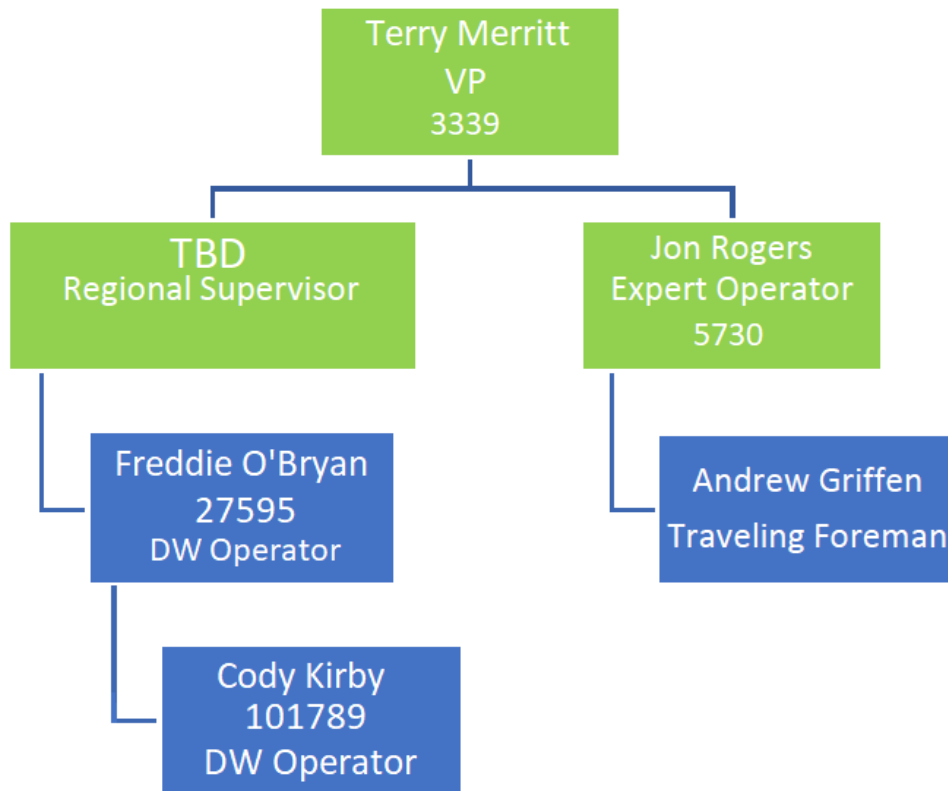
Gina Nolan, CSWR – Customer Experience Representative
Carries out customer communication.

Terry Merritt, Midwest Water Operations – Vice President
Oversees all facility operators and directs staff to carry out daily operation tasks.

Freddie O’Bryan, Midwest – Operator (Primary)
Oversees facility operations.

Cody Kirby, Midwest – Operator (Back-up)
Oversees facility operations.





Attachment 5

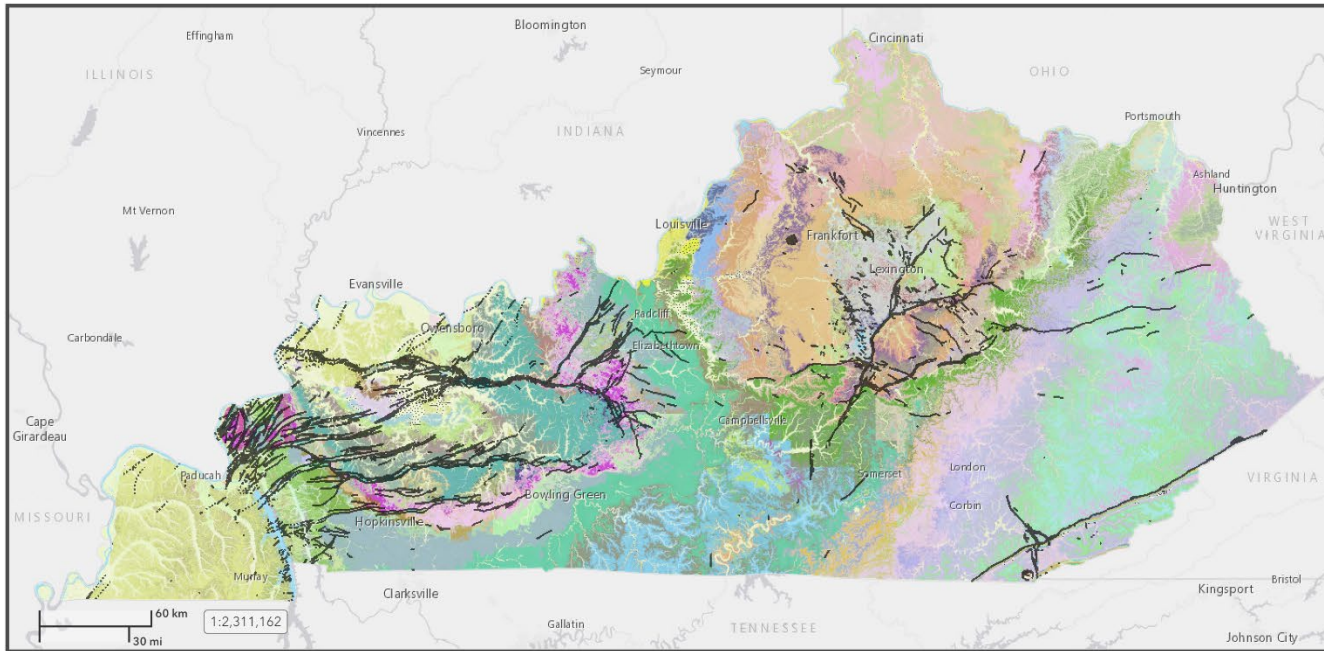
WHPA Delineation Information

The Center Ridge Water District # 3 withdraws water from the Mississippi Embayment (Jackson Purchase) region of Kentucky. According to the Kentucky Division of Water's Guide for Wellhead protection, the hydrologic sensitivity value for the aquifer rates as a two on a scale of one to three (three being the highest).

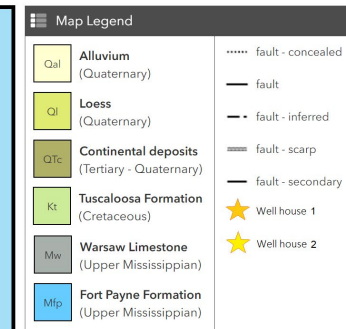
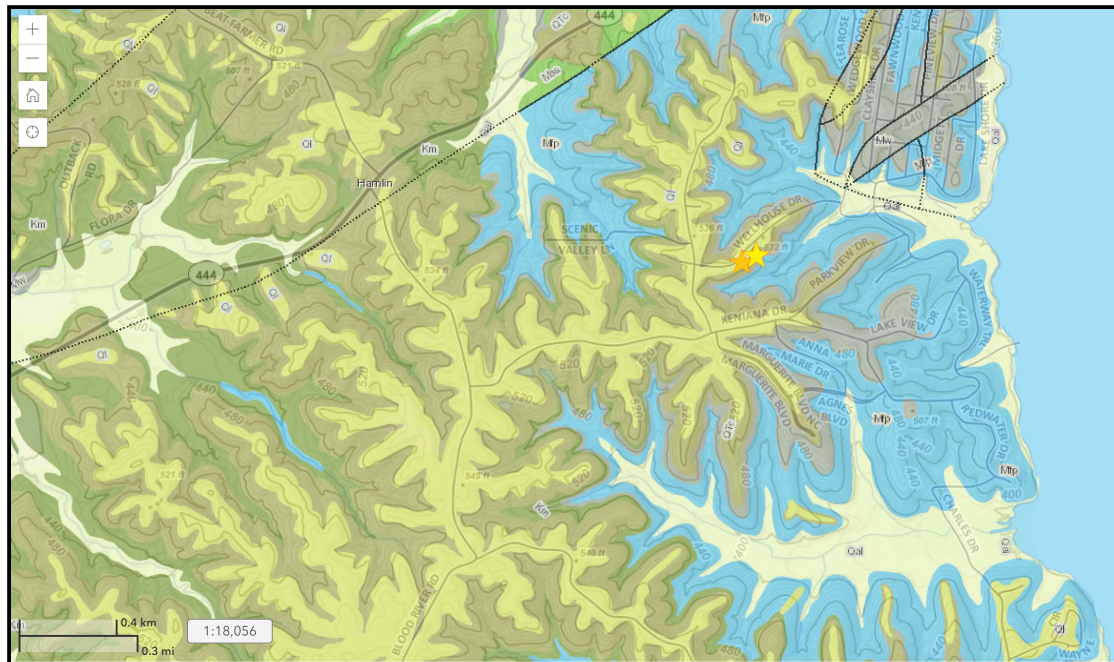
There are a total of ten potential sources of contamination within the Center Ridge Water District's wellhead protection areas. Each of these potential sources is ranked as having a medium risk to contamination of the aquifer. All of the sources identified are septic systems that are found in WHP A's 1, 2, and 3.

Due to the fact that all ten of the potential contaminant sources have a medium ranking the aquifer has been determined to have a medium risk ranking. This ranking is influenced by nature of the aquifer that has a medium sensitivity value, the nature of the potential contaminant sources, and historical water quality results.

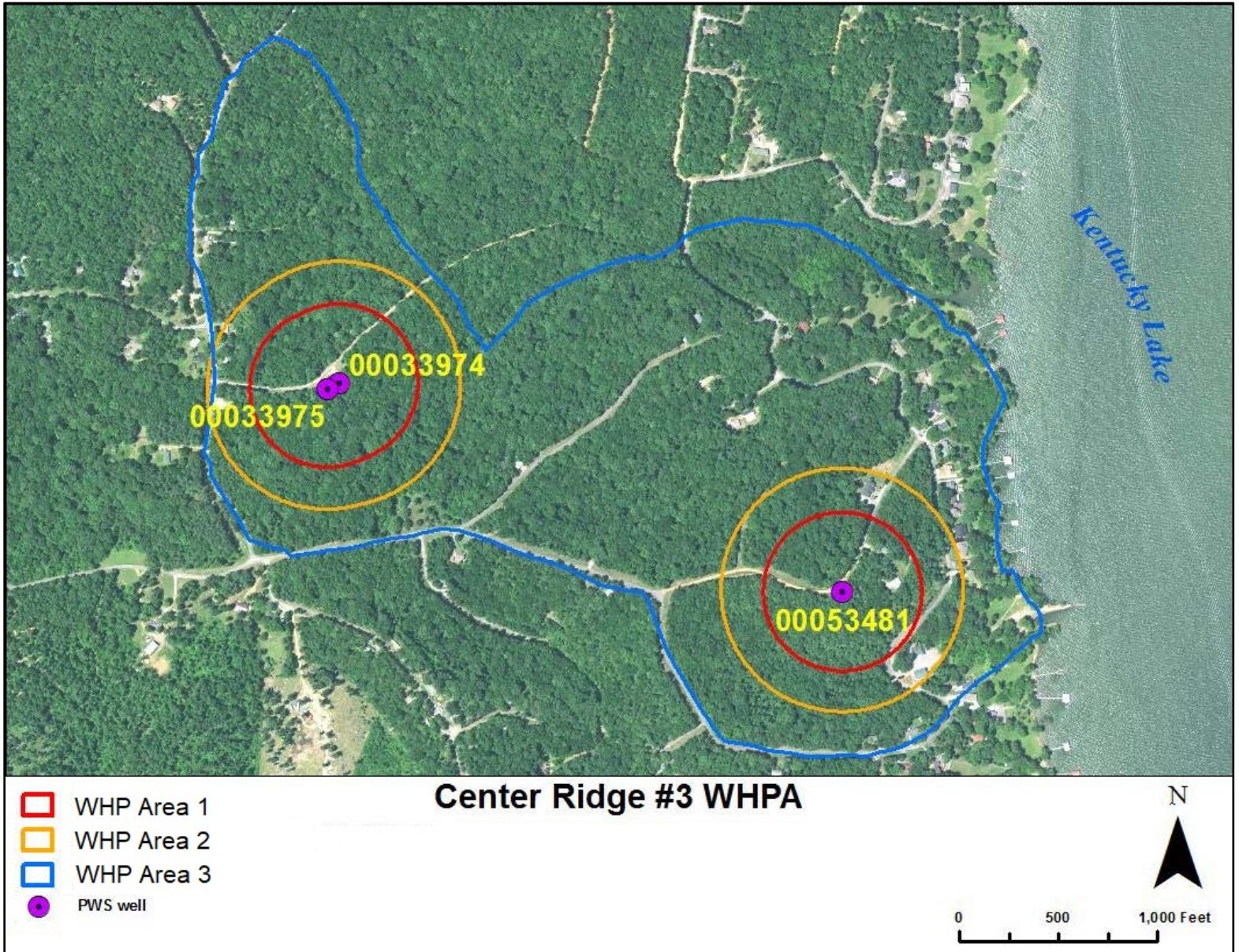
Kentucky Geology



Center Ridge Water District #3 Geology



Attachment 6
Delineation Map

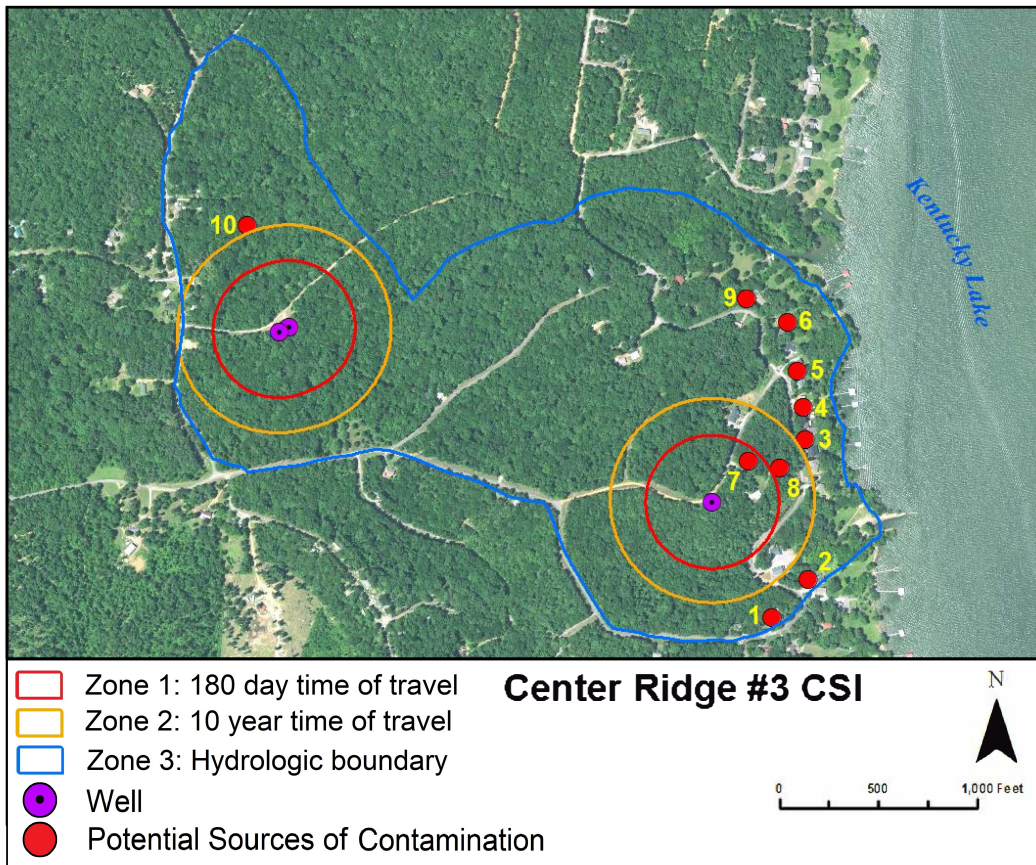


Attachment 7 Contaminant Source Inventor Summary & Map

The Center Ridge Water District # 3 withdraws water from the Mississippi Embayment (Jackson Purchase) region of Kentucky. According to the Kentucky Division of Water's Guide for Wellhead protection, the hydrologic sensitivity value for the aquifer rates as a two on a scale of one to three (three being the highest).

There are a total of ten potential sources of contamination within the Center Ridge Water District's wellhead protection areas. Each of these potential sources is ranked as having a medium risk to contamination of the aquifer. All of the sources identified are septic systems that are found in WHPA's 1, 2, and 3.

Due to the fact that all ten of the potential contaminant sources have a medium ranking the aquifer has been determined to have a medium risk ranking. This ranking is influenced by nature of the aquifer that has a medium sensitivity value, the nature of the potential contaminant sources, and historical water quality results.



Contaminant Source Inventory and Susceptibility Analysis for									
<i>Center Ridge Water District #3</i>									
Contaminant Source ID #	Contaminant Source/Land Use	Address	Quantity	WHPA	Proximity Ranking	Contaminant Value	Hydrologic Sensitivity	Numeric Rating	Susceptibility Ranking
1	Septic System	Center Ridge Water District #3, New Concord, KY	1	3	1	2	4	12	Medium
2	Septic System	Center Ridge Water District #3, New Concord, KY	1	3	1	2	4	12	Medium
3	Septic System	Center Ridge Water District #3, New Concord, KY	1	3	1	2	4	12	Medium
4	Septic System	Center Ridge Water District #3, New Concord, KY	1	3	1	2	4	12	Medium
5	Septic System	Center Ridge Water District #3, New Concord, KY	1	3	1	2	4	12	Medium
6	Septic System	Center Ridge Water District #3, New Concord, KY	1	3	1	2	4	12	Medium
7	Septic System	Center Ridge Water District #3, New Concord, KY	1	1	3	2	4	16	High
8	Septic System	Center Ridge Water District #3, New Concord, KY	1	2	2	2	4	14	Medium
9	Septic System	Center Ridge Water District #3, New Concord, KY	1	3	1	2	4	12	Medium
10	Septic Systems	Center Ridge Water District #3, New Concord, KY	7	3	1	2	4	12	Medium
Susceptibility Ranking Totals:							High	Med	Low
							16	15	0

Attachment 8

Previous Management Strategy and Newly Proposed Management Strategies

The purpose behind managing a wellhead protection area is to minimize the impact of land uses that threaten the quality and quantity of the public's drinking water supply. The underlying theme is simply to prevent pollution. Preventing pollution is the key to keeping groundwater supplies safe and to protect public health. Once a drinking water supply becomes contaminated, the community is faced with the difficult and costly task of installing additional treatment facilities or locating an alternate source.

Virtually all man-made land use activities have the potential to degrade groundwater quality. There are numerous factors that control the impact of land uses upon groundwater. The two most prominent factors are the geology of the area and the type of land use. The geology controls the direction and rate that a contaminant can travel, whereas the land use dictates the quantity and toxicity of the contaminant. This means that a particular land use in a less sensitive geologic setting may never significantly impact groundwater quality, but the same land use in a geologically sensitive setting can render groundwater unusable for human consumption. This is why a management plan must be tailored to each public water system.

The overall strategy of the management plan is to minimize the impact of the threats identified in the contaminant source inventory through regulatory and/or non-regulatory means.

Management Strategies

The Water District well field is located in a rural community in which all of the residents depend on septic systems as the area is not sewered. All of the contaminant sources can be managed through existing regulatory strategies. Therefore, the management strategies for protecting the drinking water supply will be a combination of regulatory compliance and public education.

The rationale for this decision is to use as many management strategies as possible to prevent contamination of the aquifer. Regulatory compliance management strategies will be used for those potential contaminant sources already identified through the contaminant source inventory that are subject to Groundwater Protection Planning regulations (401 KAR 5:037) or Kentucky's Agriculture Water Quality Act of 1994. The purpose of a groundwater protection plan is to ensure protection for all current and future uses of groundwater and to prevent groundwater pollution. Public awareness will be used to educate the surrounding community in their part in protecting the groundwater resource.

The Water District proposes the following management strategies for protecting their water supply.

Regulatory Compliance Objectives:

1. Center Ridge Water District # 3 will comply with groundwater protection planning regulations by completing a groundwater protection plan for their water supply well.

Public Education and Awareness Objectives:

2. A public notice will be posted at the wellhouse to inform residents about their wellhead protection plan.

Attachment 9 WHPP Contingency and Planning

Emergency Response Phone List

Local Emergency Response	Phone Number
Operator: Freddie O'Bryan	(270) 331-8482
Ambulance District: Murray-Calloway Co. EMS	(270) 753-9333
Fire Department: Fire-Rescue	(270) 753-4112
Kentucky State Fire Marshall	(502) 573-0382
Sheriff's Department: Calloway	(270) 753-3151
State Highway Patrol: KSP Post 1	(270) 856-3721

Kentucky DOW: Frankfort	(502) 564-3410
Kentucky DOW RO: Paducah	(270) 898-8468
Kentucky Environmental Response Team	(502) 564-2380
24-hr Emergency Response Line	(800) 928-2380
County Health Department: Calloway	(270) 753-3381
Kentucky Public Service Commission	(502) 564-3940

Bluegrass Water UOC Customer Service	(866) 752-8982
Jay Favor	(314) 380-8525
Ali Alexander	(314) 380-8533
Stacy Culleton	(314) 380-8546
Gina Nolan	(314) 380-8544

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. Provide Jay Favor, Ali Alexander, Stacy Culleton, and Gina Nolan a summary of the issue including time of onset, if the KyDOW was notified, and if the County Health Department was notified. Stacy & Gina will draft public notification and directions for customers which will be provided to customers on the Bluegrass Water UOC website, facebook, by email, and/or by direct handout via the operator. Stacy & Gina will coordinate with Ali to communicate with appropriate regulatory authority as needed. If additional notification is needed use the local newspaper as directed.

Potential Future Problems:

The most common scenario that could threaten the water supply is bacteriological and/or chemical contamination from a leaking septic system.

Alternative Water Supply (Short and Long Term):

Bacteriological contamination is mitigated by disinfecting the water system. If there were indicators of bacteriological contamination in the drinking water the facility would be placed on a boil water advisory until the problem is eliminated. If chemical contamination (such as nitrate/nitrite) is discovered in the water the facility would be placed on a do not drink advisory until the source of contamination was discovered and eliminated. If a long-term solution is needed, the facility would add centralized/localized treatment to eliminate the issue. As needed, water could be hauled in for use during these events.

Schedule for Update and Review:

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

**Attachment 10
Public Education Material**



Energy and Environment Cabinet

**Generic Groundwater Protection Plan:
Residential Septic Systems**

**HOMEOWNER'S SEPTIC SYSTEM GUIDE AND
RECORD KEEPING FOLDER**

The purpose of 401 KAR 5:037 and this groundwater protection plan is to prevent groundwater pollution. Understanding how your septic system works and following good operation and maintenance practices are the keys to preventing groundwater pollution.

This folder provides you with that information. By carefully reading it and following the guidelines, you will not only protect groundwater, but also should receive many years of trouble-free service from your system.

Keeping records will enable you to better protect and maintain your septic system. In case you sell your house, your records will show a prospective buyer that your system has been properly maintained.

FOR YOUR RECORDS

1. Maintenance Log: Date, what was done and reason for the maintenance (Example: measure sludge and scum layers, pump the tank).
2. Inspection Log: Date, what you observed upon walking over the septic system (Example: any unpleasant odors, soggy soil, lush green grass over the lateral lines, surfacing wastewater).
3. Site Drawing: Show accurately the layout of the system on your lot. Include exact distances of each portion of the system from at least two (2) fixed reference points (corner of house, garage, large trees, property line markers).
4. Any permits or receipts.
5. Residential Address _____

Sketch Septic Tank and Drainlines Location Here

Septic System Type:

	Septic tank - drainfield
	Septic tank – constructed wetland - drainfield
	Septic tank – leaching chambers

	Septic tank – low pressure pipe
	Septic tank – sewage lagoon - drainfield
	Septic tank – gravelless pipe

System Inspection Log

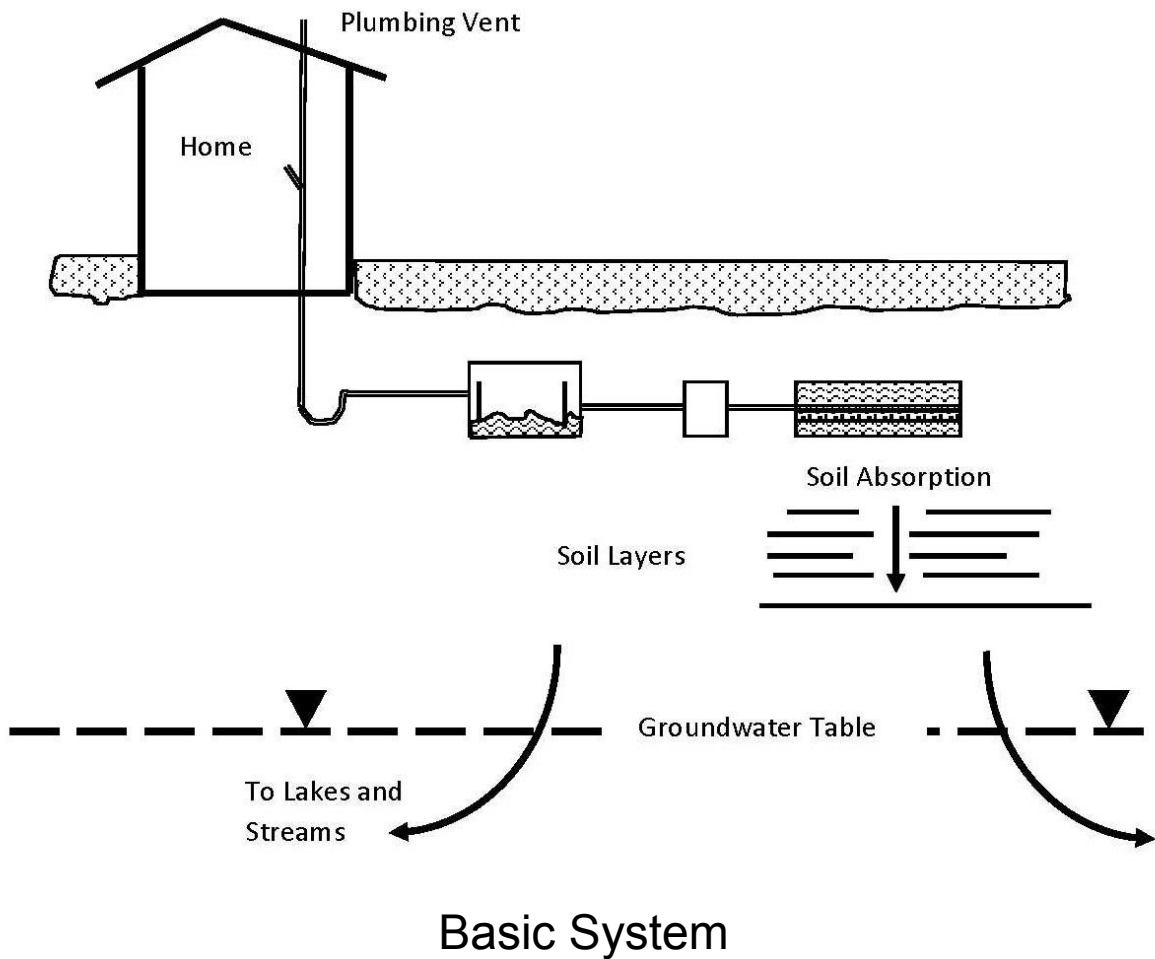
Date	Description

System Maintenance Log

Date	Description

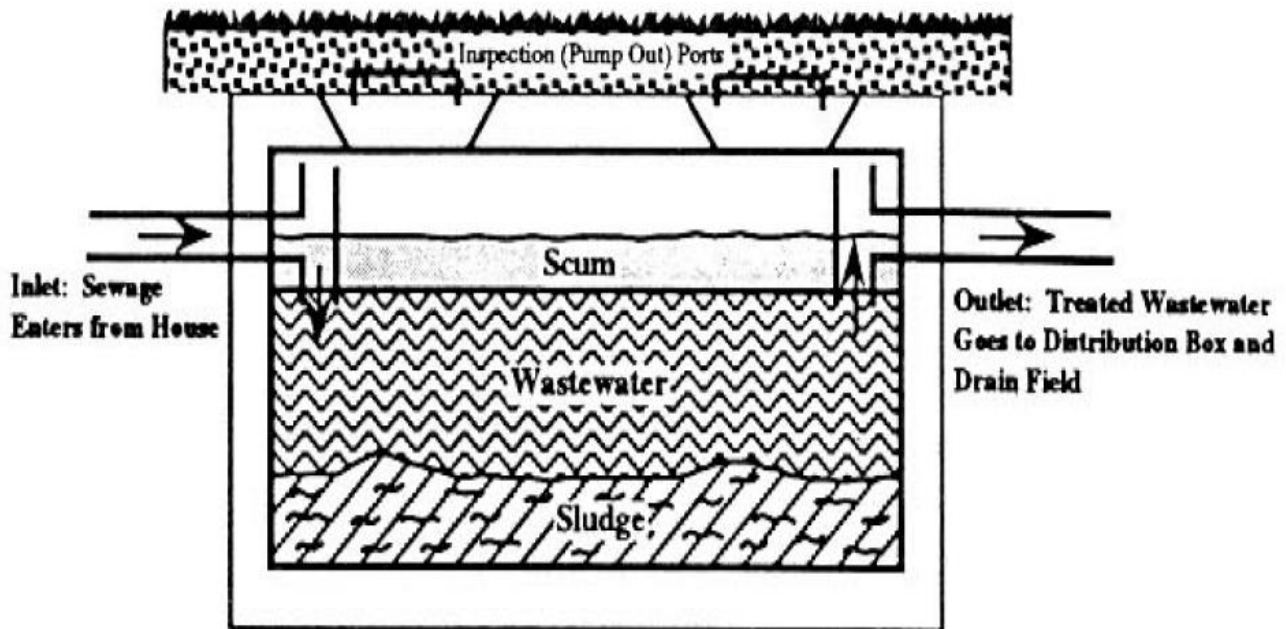
SYSTEM DESCRIPTION

A septic system uses natural processes to treat and dispose of the wastewater in your home. It typically consists of a septic tank and a drainfield (also called a leachfield, lateral field, or subsurface soil absorption beds/trenches). The system accepts both "blackwater" (toilet wastes) and "greywater" (wastes from the kitchen sink, bath tub/showers, and laundry). Water that should not be discharged to the system includes water from foundation or footing drains, roof gutters, and other "clear" water.



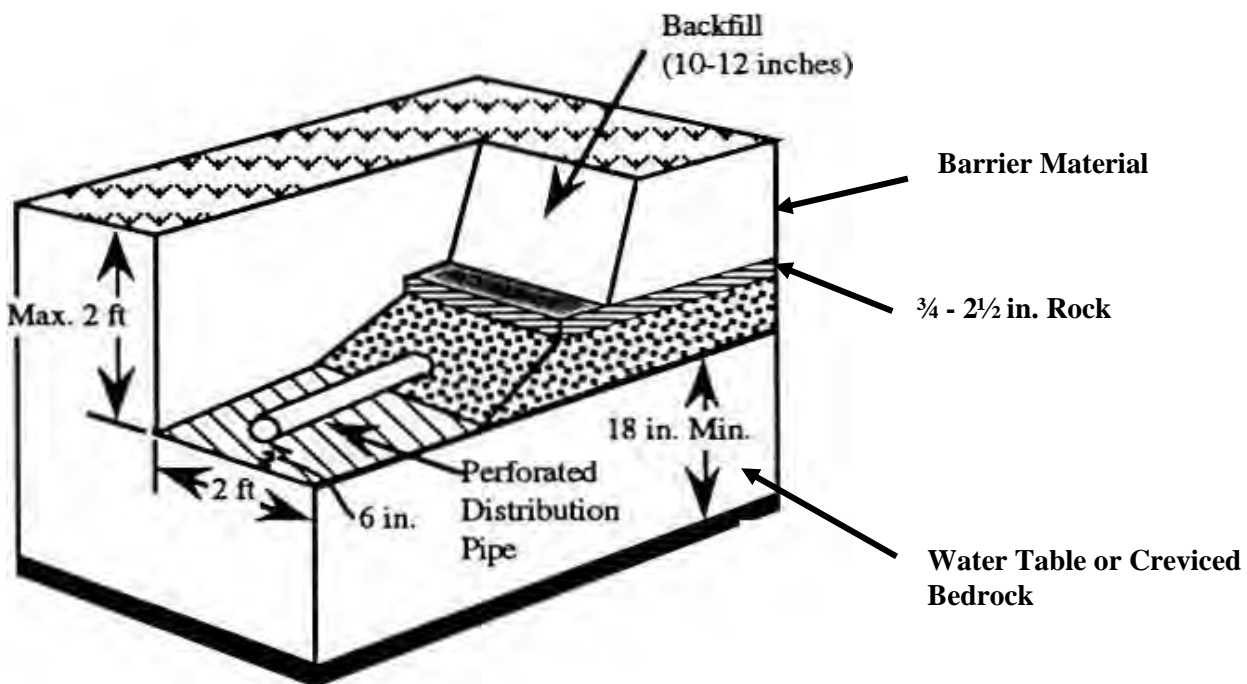
SEPTIC TANK

The septic tank provides the first step in treatment by separating the solids from the liquids. The wastewater is retained in the tank for 24 hours or more. During this time the heavier solids settle the bottom to form a sludge layer while the lighter solids float to the top to form a scum layer. Bacteria break down the solids, producing carbon dioxide, hydrogen sulfide, and other gases in the process. These gases are vented through the plumbing vent on your house roof. Since the bacteria reduce only about 40 percent of the sludge and scum volume, the tank must be pumped regularly (approximately every three to five years) to remove the accumulated solids. If the tank fills with sludge and scum, the solids will overflow into the drainfield and quickly clog the soil, resulting in system failure.



THE DRAINFIELD

The drainfield provides the final treatment of the wastewater and disposes of it through groundwater recharge. The typical drainfield is composed of trenches or beds which are shallow, level excavations installed one to one and a half feet above the groundwater table. Each trench contains a perforated distribution pipe through which wastewater drains into the gravel. The water is stored in the gravel until it can seep into unsaturated soil underlying and adjacent to the trench. As the wastewater moves slowly through the gravel and soil, many of the disease-causing bacteria and viruses are filtered out, or adsorbed and held by the soil particles until they die. Where soils do not permit a drainfield to adequately treat septic tank effluent, an additional or alternative treatment system must be used in conjunction with the drainfield. Alternative systems primarily used in Kentucky are constructed wetlands and sewage lagoons. These alternative systems have their own operation and maintenance guidelines. If you would like information about these guidelines, contact the Groundwater Section.

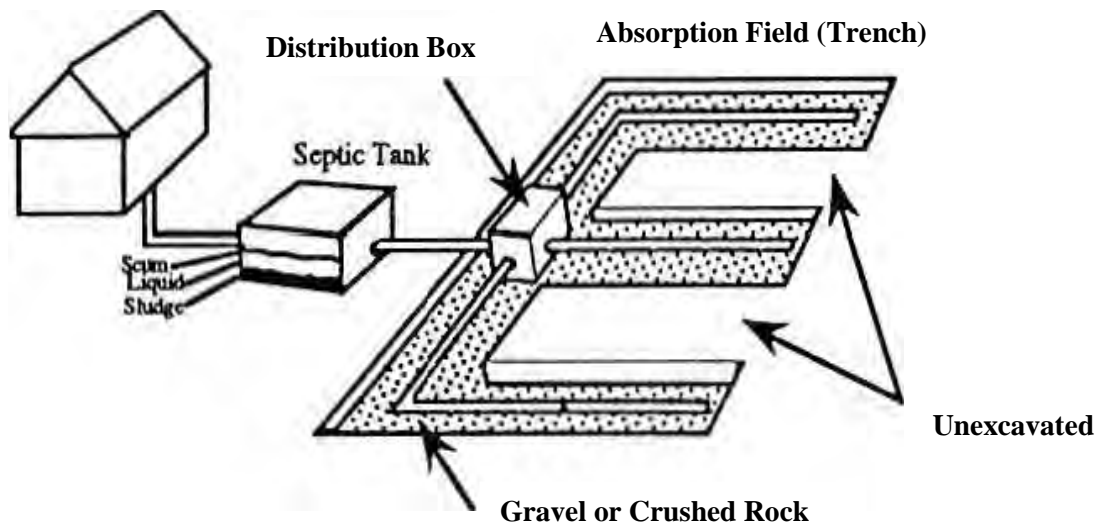


Conventional Rock Drainfield
Trench Cross-Section

TAKING CARE OF YOUR SYSTEM

Your septic system represents a significant investment worth protecting. The old "An ounce of prevention is worth a pound of cure" is so true when it comes to the care of your septic system. If you follow the operation and maintenance guidelines below, your system will function better and last longer, and you will avoid the nightmare and se of a failed system. Most important, your a will not be polluting groundwater.

Conventional Septic System



DO

- Conserve water to reduce the amount of wastewater that must be treated and disposed.
- Repair any leaking faucets and toilets.
- Discharge only biodegradable wastes into system.
- Divert down spouts and other surface water away from your drainfield.
- Keep your septic tank cover accessible for tank inspections and pumping
- Have your septic tank pumped regularly and checked for leaks and cracks.
- Call a professional when you have problems
- Compost your garbage or put in trash.

DON'T

- Use a garbage grinder.
- Flush sanitary napkins, tampons, disposable diapers, condoms and other non-biodegradable products into your system.
- Dump solvents, oils, paints, thinners, disinfectants, pesticides or poisons down the drain. These materials can disrupt the treatment process and contaminate the groundwater.
- Dig in your drainfield or build anything over it.
- Plant anything over the drainfield except grass
- Drive over you drainfield or compact the soil in any way.

If you have any questions or need additional information, contact:

The **Groundwater Protection Program Coordinator**

**Kentucky Energy and Environment Cabinet
Kentucky Division of Water
Watershed Management Branch
Groundwater Section
300 Sower Boulevard, 3rd floor
Frankfort, KY 40601
(502) 564-3410**

Groundwater Protection Plan Regulation 401 KAR 5:037
<http://water.ky.gov/groundwater/Pages/GroundwaterProtection.aspx>

**Kentucky Cabinet for Health and Family Services
Department of Public Health
Environmental Management Branch
275 E. Main St.
Frankfort, Ky. 40621
(502) 564-4856**

**Onsite Regulations 902 KAR 10:085
Septic Tank Servicing Regulation 902 KAR 10:170**
<http://chfs.ky.gov/dph/info/phps/enviromgmt.htm>

Homeowner's Manual Onsite Sewage Disposal Systems
<http://chfs.ky.gov/NR/rdonlyres/CA014E47-2256-444D-8FE4-84C9FF456C8E/0/onsitesewagemanual.pdf>

**Check List
for
Evaluating Your Septic System**

- 1.** Find and mark the location of the septic system, you should map this information in the space provided in your Groundwater Protection Plan: "Homeowner's Septic System Guide and Record Keeping Folder."
- 2.** When was the septic tank last pumped?

- 3.** If the tank was last pumped over three years ago, or if you have recently moved into the house and don't know when the tank was last pumped, contact a septic tank pumper. Have him service the tank and check the baffles.
- 4.** Do toilets flush slowly and does water drain slowly from sinks and tubs, or does either "gurgle"?
Yes No
- 5.** Is there any standing water, soggy ground, or smelly liquid in or near the drainfield?
Yes No
- 6.** Does the ground slope toward the septic system?
Yes No
- 7.** Are your septic tank and drainfield less than 100 feet from a lake, stream, or pond?
Yes No
- 8.** Are water-loving trees such as willows, sycamores, birches, or water maples growing within 10 feet of the septic tank?
Yes No
- 9.** Are there any areas over the septic tank or drainfield where people have frequently driven their cars or trucks?
Yes No
- 10.** Have any additions been made to the house since the present septic system was installed?
Yes No
- 11.** Do you have dripping faucets or a toilet that runs continuously or gradually loses water from its tank?
Yes No
- 12.** Do you put cigarette butts, coffee grounds, cooking fats, disposable diapers, facial tissue, wet-strength towels, or other non-biodegradable materials into your septic tank?
Yes No

If you have answered YES to one or more of questions 4 - 12, the septic system may not be functioning correctly. Call your local health department, or seek other professional help. Should repair of the system be necessary, be sure to engage the services of a professional who has a groundwater protection plan on file.