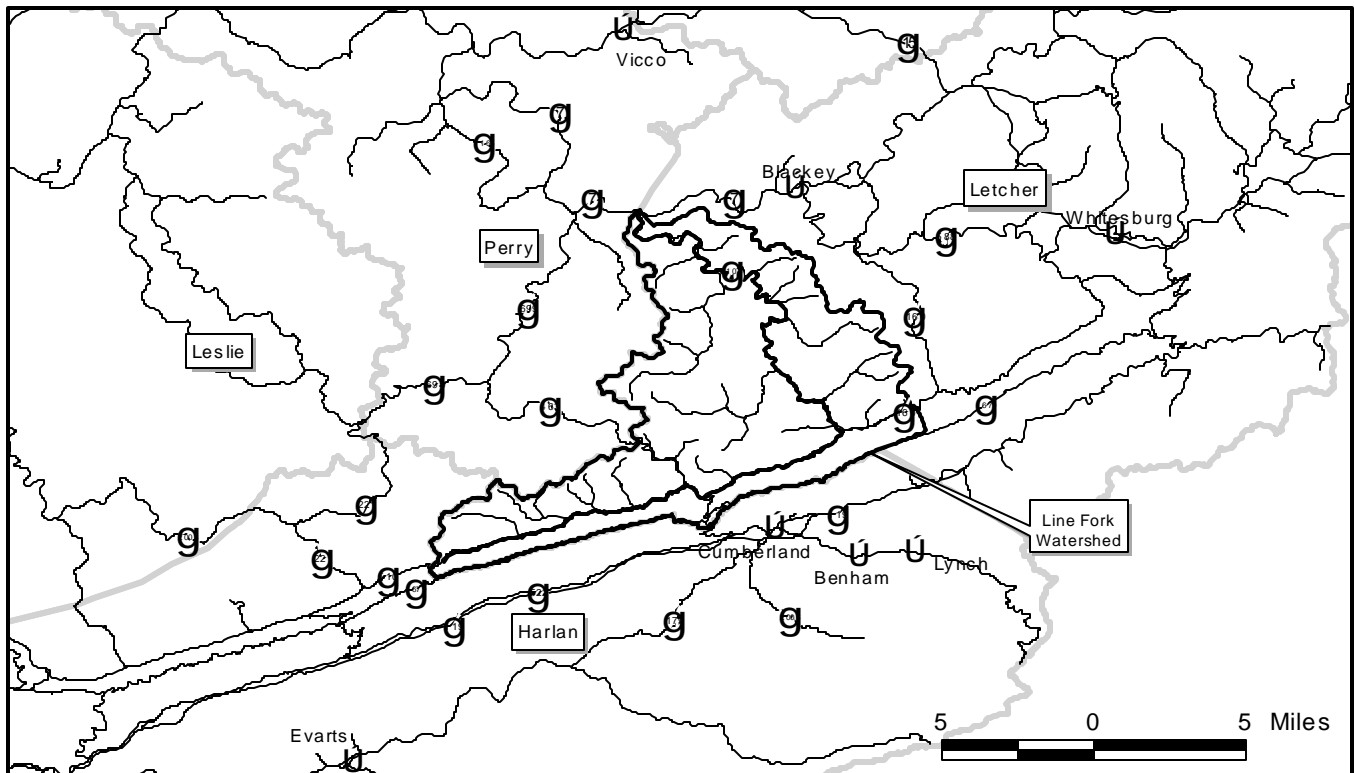


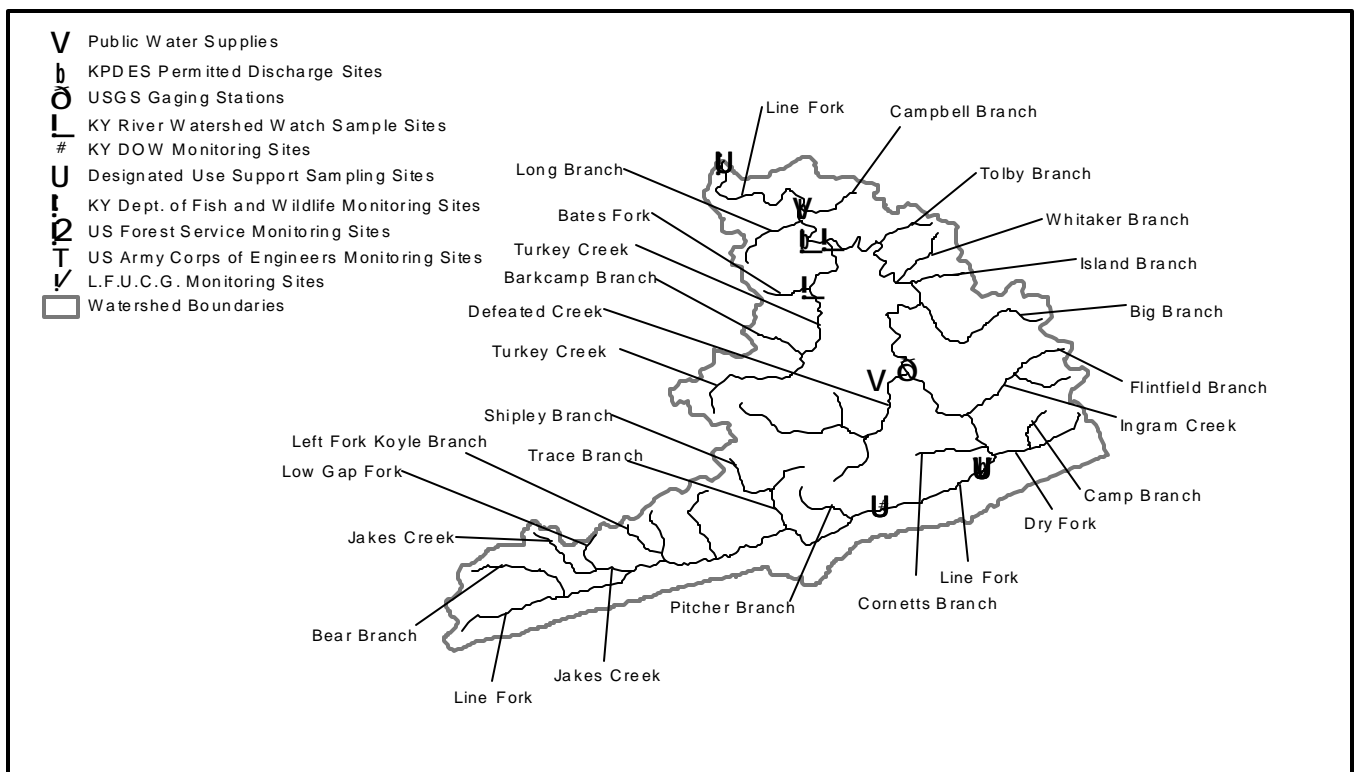
# Line Fork Watershed

## Watershed Number: 05100201040

### Location Map



### Watershed Features



**Geography.** The Line Fork watershed covers eastern Letcher County. The land is in the Eastern Kentucky Coal Field physiographic region, characterized by mountainous terrain, rapid surface runoff, and moderate rates of groundwater drainage. The watershed is underlain by coals, sandstones, and shales: this geology is generally conducive to productive wells, although water quality may be low for wells that draw from coal layers.

**Waterways.** Line Fork empties into the North Fork Kentucky River at Ulvah. Among the creeks that feed it are Turkey Creek, Defeated Creek, and Shipley Branch.

**Land and water use.** Land in the watershed is nearly all rural and wooded. Three businesses and organizations hold permits for discharges into the creeks. See tables for details.

**Agency data assessment.** The assessed creek segments in this watershed include one that only partially supports its designated uses, based on biological and/or water-quality data. Septic tanks and land disposal of waste contribute to the impairment of the stream. See tables for details.

**Watershed rankings.** The ranking formula provides a preliminary ranking by synthesizing a broad spectrum of watershed characteristics, current conditions, and threats. This watershed ranks in the group with the highest need for protection and/or restoration. This rating is for the watershed on average: particular sites and particular waters within the watershed may vary widely. See tables for details.

**Volunteer data.** Two of three sites sampled in 1999 had high levels of bacteria indicative of fecal contamination (above 200 colonies/ml). See tables for details.

This report was prepared by the Kentucky Water Research Institute as a product of the statewide Kentucky Watershed Management process. Information presented in this report was collected from many sources. Reasonable attempts were made to ensure that information and figures are as accurate as possible, but no representation or guarantee is made as to either the correctness or suitability of information for particular purposes. All critical information should be independently verified. Please address questions or corrections to Basin Coordinator, KWRI, Rm. 233 Mining and Minerals Resources Building, University of Kentucky, Lexington, Kentucky 40506-0107.

## Summary of Basin Characteristics and Facilities

### General Land-use Characteristics:

Total Land Area (Acres):	41,862	Acres	% of Total		
Residential Area:	0	0.0		Number of Mine Permits:	29
Commercial Area:	0	0.0		Total Permitted Mining Area (Acres):	1,477
Industrial Area:	0	0.0		Number of Identified Wetland Areas:	1
Agricultural Area:	0	0.0		Total Wetland Area (Acres):	1
Rural and Wooded Area:	41,511	99.4			
Other Land-use Area:	252	0.6			

### Withdrawal and Discharge Sites:

Number of Public Water Supplies and Water Withdrawal Sites:	3	Number of KPDES Discharge Permits:	3
Surface Water Withdrawals:	0		
Groundwater Withdrawals:	0		
No. of Potable Water Treatment Facilities:	2		

### Sampling Site Statistics:

Number of USGS Gaging Stations:	0
Number of Kentucky Division of Water Sampling Sites:	1
Number of Kentucky Dept. of Fish and Wildlife Sampling Sites:	1
Number of US Forest Service Sampling Sites:	0
Number of US Army Corps of Engineers Sampling Sites:	0
Number of Kentucky River Watershed Watch Sampling Sites:	3
Number of Lexington-Fayette Urban Co. Gov. Sampling Sites:	0

**Watershed Indicators and Ranking Categories:**

Overall Watershed Ranking:

Protection Ranking

Observed Impacts

Potential Impacts

Restoration Ranking

High

Medium

High

Low

High

**Protection Categories:**

Indicator	Value	Units	Range of All Watersheds	Mean of All Watersheds
Wetland Areas	1	Acres	0 - 106	12
Surface Drinking Water Sources	0	No. of sources	0 - 14	2
Ground Drinking Water Sources	3	No. of sources	0 - 17	1
Groundwater Sensitivity	3.20	Score	2 - 5	3.21
KY Dept. of Fish and Wildlife Management Areas	0	Acres	0 - 2951	93
U.S. Forest Service Management Areas	385	Acres	0 - 155253	12,600
Kentucky State Park Areas	117	Acres	0 - 1928	42
Nature Preserves Commission Areas	720	Acres	0 - 1430	32
Nature Conservancy Areas	0	Acres	0 - 2473	28
Reference Reach Watersheds	0.00	Score	0 - 100	3.08
Outstanding Resource Watersheds	0.00	Score	0 - 0	0.00
Recognized Stream Resources	2	No. of resources	0 - 8	1
Kentucky Rivers Assessment Scores	0.88	Score	0 - 11	1.80

**Observed Impact Categories:**

*Human Health Impact Categories:*

Indicator	Value	Units	Range of All Watersheds	Mean of All Watersheds
Flood Declarations	9	Number since 1970	0 - 10	4
Water Supply Inadequacy	0.00	Score	0 - 2	0.22
Observed Impacts to Surface Drinking Water	1.00	Score	1 - 1	1.00
Observed Impacts to Fish Consumption	1.00	Score	1 - 1	1.00
Observed Impacts to Primary Water Contact	2.00	Score	1 - 3	1.33
Contamination Sites Impacting Human Health	1	Number of sites	0 - 71	4

*Ecological Health Impact Categories:*

Indicator	Value	Units	Range of All Watersheds	Mean of All Watersheds
Observed Impacts to Aquatic Life	1.00	Score	1 - 3	1.31
Contamination Sites Impacting Ecological Health	1	Number of sites	0 - 71	4

**Potential Impact Categories:**

Indicator	Value	Units	Range of All Watersheds	Mean of All Watersheds
Potential Contamination Sites	11	Number of sites	1 - 121	12
Potential Pesticide Loading	0	Est. sales in tons	0 - 45	10
Potential Fertilizer Loading	0	Est. tons applied	0 - 2747	394
Agricultural Erosion Potential	1.44	Est. tons erosion / acre	0 - 9	3.20
Livestock Operations Potential Impact	218	Animal units	55 - 43826	7,021
KPDES Discharge Violations	0	Number of violations	0 - 541	39
KY Division of Water Citizen Complaints	14	Number of complaints	0 - 53	9
Toxic Release Inventory	0	Score	0 - 11547626	231,638
Population Change Projection	65	Number of persons	-149 - 11030	448
Population Not on Public Sewer Systems	1,146	Number of persons	12 - 4511	1,114
Mining Area	1,478	Acres	0 - 6305	355
Surface Water Runoff Potential	60.04	SCS Curve Number	60 - 79	68
KPDES Permitted Discharges	3	Number of sites	0 - 56	6

### Stream and Waterbody Use Support Summary

<b>Total Stream Miles:</b> <input type="text" value="75.21"/>	<i>Number of Segments</i>	<i>Stream Miles Assessed</i>	<i>Miles * Fully Supportina</i>	<i>Miles * Partially Supportina</i>	<i>Miles * Not Supportina</i>	<i>Miles * Threatened</i>
<b>Segments Assessed:</b>	2	20.7	4.8	15.9	0.0	0.0
<b>Designated Uses</b>						
<b>Aquatic Life:</b>	2	20.7	20.7	0.0	0.0	0.0
<b>Primary Contact:</b>	1	15.9	0.0	15.9	0.0	0.0
<b>Fish Consumption:</b>						
<b>Drinking Water:</b>						

\* Blank values indicate no assessed segments for this category.

<b>Assessed Stream Segments and Waterbodies</b>					
<i>Stream or Waterbody Name *</i>	<i>Starting Milepoint</i>	<i>Ending Milepoint</i>	<i>Segment Length (miles)</i>	<i>Designated Uses *</i>	<i>Overall Level of Support</i>
Line Fork	11.6	27.5	15.9	AL, PC	Partially Supporting
Line Fork	0	4.8	4.8	AL	Fully Supporting

*\*Abbreviations: AL - Aquatic Life Support, PC - Primary Contact Recreation, SC - Secondary Contact Recreation, FC - Fish Consumption, DW - Drinking Water Supply, UT - Unnamed Tributary*

<b>Causes for Nonsupport or Impairment of Designated Uses</b>					
<i>Stream or Waterbody Name *</i>	<i>Starting Milepoint</i>	<i>Ending Milepoint</i>	<i>Segment Length (miles)</i>	<i>Impaired or Threatened Designated Use</i>	<i>Level of Support</i>
Line Fork	11.6	27.5	15.9	Primary Contact (Recr)	Partially Supporting
<b>Possible Causes of Impairment:</b>			<b>Possible Sources For Impairment:</b>		
Pathogens			Land Disposal, Onsite Wastewater Systems (Septic Tanks)		

*\*Abbreviations: UT - Unnamed Tributary*

Watershed Name: Line Fork 11-Digit Watershed Identity Number: 05100201040

**Withdrawal Sites and Discharge Facilities:**

<i>Public Water Supplies and Water Withdrawal</i>			
<i>Facility</i>	<i>Origin of Source</i>	<i>Type of Facility</i>	<i>Permit ID Number</i>
CAMPBELLS BRANCH ELE SCHOOL	Groundwater	Water Treatment Plant	0672688
FOX MINING CORPORATION	Groundwater	Water Withdrawal Site	WW0971
KINGDOM COME SETTLEMENT	Groundwater	Water Treatment Plant	0672690

<i>KPDES Permitted Discharge Facilities</i>		
<i>Facility</i>	<i>Type of Facility</i>	<i>KPDES Site ID Number</i>
LETCHER CO BD OF ED	ELEMENTARY & SECONDARY SCHOOLS	KY0100731
SWENTON, MICHAEL/D LEWIS LEASE	CRUDE PETROLEUM & NATURAL GAS	KY0081361

**Gaging Stations and Sampling Sites:**

<i>US Geological Survey and US Army Corps of Engineers Stream Gaging Stations</i>			
<i>Stream Location</i>	<i>Agency</i>	<i>Station ID Number</i>	<i>Sampling Parameter</i>
Line Fork	USGS	USGS03277370	Flow

<i>KY Division of Water Sampling Sites</i>	
<i>Stream Name</i>	<i>Type of Sampling</i>
Line Fork Creek	Physical/Chemical Monitoring

<i>KY Dept of Fish and Wildlife Sampling / Assessment Sites</i>					
<i>Stream Segment</i>	<i>Upstream Description</i>	<i>Downstream Description</i>	<i>Total Length of Segment</i>	<i>Upstream Mile Point</i>	<i>Downstream Mile Point</i>
Line Fork	Campbell Branch	Mouth	27.6	3.4	0

<i>KY River Watershed Watch Sampling Sites</i>		
<i>Stream Name</i>	<i>KRWW Sample ID No.</i>	<i>Site Description</i>
Line Fork	K93	
Line Fork	K92	
Line Fork	K91	

Watershed Name:

Line Fork

11-Digit Watershed Identity Number:

05100201040

**Results from 1999 KY River Watershed Watch Sampling:**

**Conventional Parameters:**

Sample ID Number: K91 Stream: Line Fork

**Physical Data (May):**

pH	<input type="text"/>	Alkalinity	145
Temperature	<input type="text"/>	Total Hardness	198
Dissolved Oxygen	<input type="text"/>	Chlorides	248
		Conductivity	1103
		Total Organic Carbon	2.2
		Total Suspended Solids	12

**Fecal Data (July / August):**

	Coliform Count	Strep Count	Coliform/Strep Ratio
July	60000	2100	729
August	10	180	0.056

Sample ID Number: K92 Stream: Line Fork

**Physical Data (May):**

pH	<input type="text"/>	Alkalinity	458
Temperature	<input type="text"/>	Total Hardness	126
Dissolved Oxygen	<input type="text"/>	Chlorides	34.6
		Conductivity	1263
		Total Organic Carbon	3.3
		Total Suspended Solids	14

**Fecal Data (July / August):**

	Coliform Count	Strep Count	Coliform/Strep Ratio
July	110	470	0.23
August	<input type="text"/>	<input type="text"/>	<input type="text"/>

Sample ID Number: K93 Stream: Line Fork

**Physical Data (May):**

pH	<input type="text"/>	Alkalinity	418
Temperature	<input type="text"/>	Total Hardness	114
Dissolved Oxygen	<input type="text"/>	Chlorides	44.0
		Conductivity	1180
		Total Organic Carbon	2.4
		Total Suspended Solids	23

**Fecal Data (July / August):**

	Coliform Count	Strep Count	Coliform/Strep Ratio
July	230	1400	0.16
August	600	2100	0.29

Note: Most indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm). Temperature is in Celsius degrees. Alkalinity and hardness are as mg/L of calcium carbonate. Bacterial counts are in colonies per 100 milliliters. Conductivity units are micro-mhos per centimeter

**Nutrient Parameters:**

Sample ID Number: K91 Stream: Line Fork

Ammonia	<input type="text"/>	Orthophosphate as Phosphate	<input type="text"/>	Sulfate	69.8
Ammonia Nitrogen	<input type="text"/>	Orthophosphate as Phosphorus	<input type="text"/>		
Total Kjeldahl Nitrogen as NH3	<input type="text"/>	Total Recoverable Phosphorus	0.09		
Total Kjeldahl Nitrogen as N	<input type="text"/>				
Nitrate	0.1				
Nitrate Nitrogen	0.02				

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

Sample ID Number: K92 Stream: Line Fork

Ammonia	<input type="text"/>	Orthophosphate as Phosphate	<input type="text"/>	Sulfate	185
Ammonia Nitrogen	<input type="text"/>	Orthophosphate as Phosphorus	<input type="text"/>		
Total Kjeldahl Nitrogen as NH3	<input type="text"/>	Total Recoverable Phosphorus	<input type="text"/>		
Total Kjeldahl Nitrogen as N	<input type="text"/>				
Nitrate	0.6				
Nitrate Nitrogen	0.14				

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

Watershed Name:

Line Fork

11-Digit Watershed Identity Number:

05100201040

Sample ID Number: K93 Stream: Line Fork

Ammonia	<input type="text"/>	Orthophosphate as Phosphate	<input type="text" value="0.026"/>	Sulfate	<input type="text" value="162"/>
Ammonia Nitrogen	<input type="text"/>	Orthophosphate as Phosphorus	<input type="text" value="0.008"/>		
Total Kjeldahl Nitrogen as NH3	<input type="text"/>	Total Recoverable Phosphorus	<input type="text"/>		
Total Kjeldahl Nitrogen as N	<input type="text"/>				
Nitrate	<input type="text" value="0.1"/>				
Nitrate Nitrogen	<input type="text" value="0.02"/>				

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

**Metals and Mineral Parameters:**

Sample ID Number: K91 Stream: Line Fork

Aluminum	<input type="text"/>	Calcium	<input type="text" value="23.07"/>	Lead	<input type="text"/>	Selenium	<input type="text"/>	Thallium	<input type="text"/>
Antimony	<input type="text"/>	Chromium	<input type="text"/>	Lithium	<input type="text" value="0.03"/>	Silicon	<input type="text" value="1.67"/>	Vanadium	<input type="text"/>
Barium	<input type="text" value="0.05"/>	Cobalt	<input type="text" value="0.002"/>	Magnesium	<input type="text" value="13.3"/>	Sodium	<input type="text" value="213.8"/>	Zinc	<input type="text" value="0.003"/>
Beryllium	<input type="text" value="0.001"/>	Copper	<input type="text"/>	Manganese	<input type="text" value="0.01"/>	Strontium	<input type="text" value="0.85"/>		
Boron	<input type="text" value="0.14"/>	Iron	<input type="text" value="0.24"/>	Potassium	<input type="text" value="5.86"/>	Sulfur	<input type="text" value="43.51"/>		

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

Sample ID Number: K92 Stream: Line Fork

Aluminum	<input type="text"/>	Calcium	<input type="text" value="43.53"/>	Lead	<input type="text"/>	Selenium	<input type="text"/>	Thallium	<input type="text"/>
Antimony	<input type="text"/>	Chromium	<input type="text"/>	Lithium	<input type="text" value="0.01"/>	Silicon	<input type="text" value="1.48"/>	Vanadium	<input type="text"/>
Barium	<input type="text" value="0.15"/>	Cobalt	<input type="text" value="0.003"/>	Magnesium	<input type="text" value="14.66"/>	Sodium	<input type="text" value="125.9"/>	Zinc	<input type="text"/>
Beryllium	<input type="text" value="0.001"/>	Copper	<input type="text"/>	Manganese	<input type="text" value="0.05"/>	Strontium	<input type="text" value="0.77"/>		
Boron	<input type="text" value="0.10"/>	Iron	<input type="text" value="0.14"/>	Potassium	<input type="text" value="5.93"/>	Sulfur	<input type="text" value="14.8"/>		

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

Sample ID Number: K93 Stream: Line Fork

Aluminum	<input type="text" value="0.45"/>	Calcium	<input type="text" value="19.63"/>	Lead	<input type="text"/>	Selenium	<input type="text"/>	Thallium	<input type="text"/>
Antimony	<input type="text"/>	Chromium	<input type="text"/>	Lithium	<input type="text" value="0.02"/>	Silicon	<input type="text" value="1.63"/>	Vanadium	<input type="text"/>
Barium	<input type="text" value="0.08"/>	Cobalt	<input type="text" value="0.006"/>	Magnesium	<input type="text" value="11.06"/>	Sodium	<input type="text" value="201.4"/>	Zinc	<input type="text" value="0.005"/>
Beryllium	<input type="text" value="0.001"/>	Copper	<input type="text"/>	Manganese	<input type="text" value="0.03"/>	Strontium	<input type="text" value="0.58"/>		
Boron	<input type="text" value="0.14"/>	Iron	<input type="text" value="0.42"/>	Potassium	<input type="text" value="5.76"/>	Sulfur	<input type="text" value="38.42"/>		

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

**Pesticide/Herbicide Parameters:**

Sample ID No.	Stream	2,4-D	Chlorpyrifos	Triazines
K91	Line Fork	<input type="text"/>	<input type="text"/>	<input type="text"/>
K92	Line Fork	<input type="text"/>	<input type="text"/>	<input type="text"/>
K93	Line Fork	<input type="text"/>	<input type="text"/>	<input type="text"/>

Note: All indicators are in micrograms per liter which is equivalent to parts per billion (ppb).