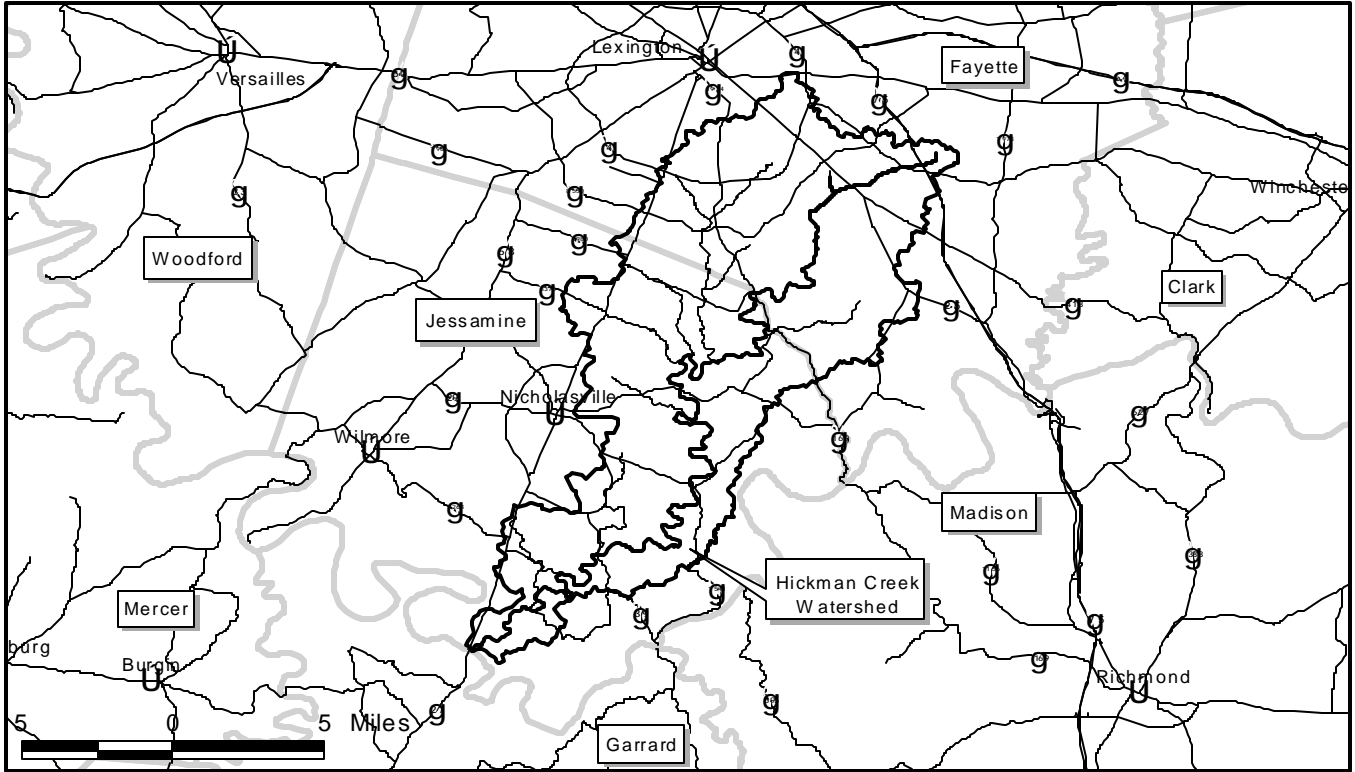


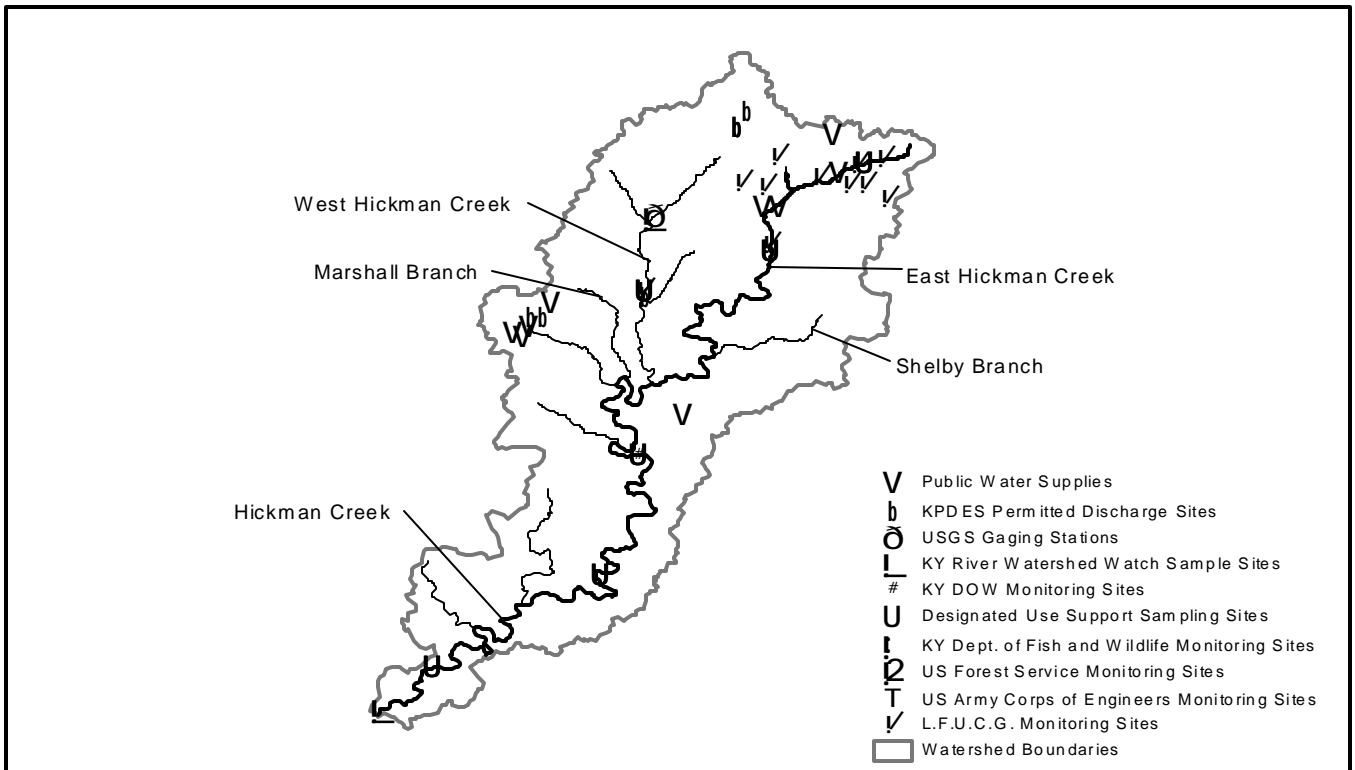
Hickman Creek Watershed

Watershed Number: 05100205120

Location Map



Watershed Features



Geography. The Hickman Creek watershed covers south-central Fayette County and northeastern Jessamine County. The land is in the Bluegrass physiographic region. The watershed lies mainly in the inner subregion of the Bluegrass, characterized by undulating terrain and moderate rates of both surface runoff and groundwater drainage. Part of the watershed south of Hickman Creek in Jessamine County lies in the hills of the bluegrass subregion, characterized by hilly terrain, very rapid surface runoff, and slow groundwater drainage. Most of the watershed lies above thick layers of easily dissolved limestone that form carbonate aquifers. Groundwater flows through channels in the limestone, so caves and springs are common in regions with this geology. Other areas lie above interbedded limestones and shales (>20% limestone, allowing groundwater flow where the clay content is low enough).

Waterways. Hickman Creek empties into the Kentucky River at Camp Nelson (near US 27). Among the creeks that feed it are East Hickman Creek, Shelby Branch, West Hickman Creek, Wymers Branch, and Marshall Branch.

Land and water use. Land in the watershed is about 75% agricultural, almost 5% rural and wooded, almost 5% commercial or industrial, and nearly 15% residential. Surface waters of the watershed contribute to the drinking water for Kentucky-American's system, since the Lexington Reservoir and Lexington Reservoir No. 4 are located on West and East Hickman Creek, respectively. Four 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 two that do not support some or all of their designated uses, based on biological and/or water-quality data. Two others only partially support uses, and one is threatened. Pathogens and nutrients from urban runoff, storm sewers, and agricultural sources contribute to the impairment of these streams. 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. There are monitoring sites on Hickman and West Hickman. Data from the Hickman Creek site indicate phosphorus levels were almost twenty times the level at which nutrient enrichment problems may be caused (> 0.1 mg/L). 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:

<i>Total Land Area (Acres):</i>	<input type="text" value="64,397"/>	<i>Acres</i>	<i>% of Total</i>		
<i>Residential Area:</i>	<input type="text" value="8,654"/>		<input type="text" value="13.4"/>	<i>Number of Mine Permits:</i>	<input type="text" value="0"/>
<i>Commercial Area:</i>	<input type="text" value="2,475"/>		<input type="text" value="3.8"/>	<i>Total Permitted Mining Area (Acres):</i>	<input type="text" value="0"/>
<i>Industrial Area:</i>	<input type="text" value="309"/>		<input type="text" value="0.5"/>	<i>Number of Identified Wetland Areas:</i>	<input type="text" value="78"/>
<i>Agricultural Area:</i>	<input type="text" value="49,204"/>		<input type="text" value="76.4"/>	<i>Total Wetland Area (Acres):</i>	<input type="text" value="39"/>
<i>Rural and Wooded Area:</i>	<input type="text" value="2,918"/>		<input type="text" value="4.5"/>		
<i>Other Land-use Area:</i>	<input type="text" value="808"/>		<input type="text" value="1.3"/>		

Withdrawal and Discharge Sites:

<i>Number of Public Water Supplies and Water Withdrawal Sites:</i>	<input type="text" value="9"/>	<i>Number of KPDES Discharge Permits:</i>	<input type="text" value="8"/>
<i>Surface Water Withdrawals:</i>	<input type="text" value="8"/>		
<i>Groundwater Withdrawals:</i>	<input type="text" value="1"/>		
<i>No. of Potable Water Treatment Facilities:</i>	<input type="text" value="2"/>		

Sampling Site Statistics:

<i>Number of USGS Gaging Stations:</i>	<input type="text" value="0"/>
<i>Number of Kentucky Division of Water Sampling Sites:</i>	<input type="text" value="1"/>
<i>Number of Kentucky Dept. of Fish and Wildlife Sampling Sites:</i>	<input type="text" value="0"/>
<i>Number of US Forest Service Sampling Sites:</i>	<input type="text" value="0"/>
<i>Number of US Army Corps of Engineers Sampling Sites:</i>	<input type="text" value="0"/>
<i>Number of Kentucky River Watershed Watch Sampling Sites:</i>	<input type="text" value="2"/>
<i>Number of Lexington-Fayette Urban Co. Gov. Sampling Sites:</i>	<input type="text" value="11"/>

Watershed Name:

Hickman Creek

11-Digit Watershed Identity Number:

05100205120

Watershed Indicators and Ranking Categories:

Overall Watershed Ranking:

Protection Ranking

Observed Impacts

Potential Impacts

Restoration Ranking

High

High

High

High

High

Protection Categories:

Indicator	Value	Units	Range of All Watersheds	Mean of All Watersheds
Wetland Areas	39	Acres	0 - 106	12
Surface Drinking Water Sources	8	No. of sources	0 - 14	2
Ground Drinking Water Sources	1	No. of sources	0 - 17	1
Groundwater Sensitivity	4.78	Score	2 - 5	3.21
KY Dept. of Fish and Wildlife Management Areas	0	Acres	0 - 2951	93
U.S. Forest Service Management Areas	0	Acres	0 - 155253	12,600
Kentucky State Park Areas	0	Acres	0 - 1928	42
Nature Preserves Commission Areas	0	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	1	No. of resources	0 - 8	1
Kentucky Rivers Assessment Scores	1.54	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	3	Number since 1970	0 - 10	4
Water Supply Inadequacy	1.00	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	1.44	Score	1 - 3	1.33
Contamination Sites Impacting Human Health	28	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	2.00	Score	1 - 3	1.31
Contamination Sites Impacting Ecological Health	28	Number of sites	0 - 71	4

Potential Impact Categories:

Indicator	Value	Units	Range of All Watersheds	Mean of All Watersheds
Potential Contamination Sites	49	Number of sites	1 - 121	12
Potential Pesticide Loading	27	Est. sales in tons	0 - 45	10
Potential Fertilizer Loading	1,132	Est. tons applied	0 - 2747	394
Agricultural Erosion Potential	1.54	Est. tons erosion / acre	0 - 9	3.20
Livestock Operations Potential Impact	18,216	Animal units	55 - 43826	7,021
KPDES Discharge Violations	91	Number of violations	0 - 541	39
KY Division of Water Citizen Complaints	28	Number of complaints	0 - 53	9
Toxic Release Inventory	1,045	Score	0 - 11547626	231,638
Population Change Projection	11,030	Number of persons	-149 - 11030	448
Population Not on Public Sewer Systems	2,277	Number of persons	12 - 4511	1,114
Mining Area	0	Acres	0 - 6305	355
Surface Water Runoff Potential	73.06	SCS Curve Number	60 - 79	68
KPDES Permitted Discharges	8	Number of sites	0 - 56	6

Stream and Waterbody Use Support Summary

Total Stream Miles: <input type="text" value="73.52"/>	<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>
Segments Assessed:	6	40.8	0.0	8.4	7.4	25.0
Designated Uses						
Aquatic Life:	6	40.8	0.0	15.8	0.0	25.0
Primary Contact:	5	40.8	30.4	3.0	7.4	0.0
Fish Consumption:						
Drinking Water:	1	0	0	0	0	0

* Blank values indicate no assessed segments for this category.

Assessed Stream Segments and Waterbodies					
<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>
East Hickman Creek	12.6	14	1.4	PC, AL	Not Supporting
East Hickman Creek	4.2	10.2	6	PC, AL	Not Supporting
Hickman Creek	0	25	25	PC, AL	Threatened
West Hickman Creek	3	8.4	5.4	PC, AL	Partially Supporting
West Hickman Creek	0	3	3	AL, PC	Partially Supporting
Williamstown Lake	0	0	0	AL, DW	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*

Causes for Nonsupport or Impairment of Designated Uses					
<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>
East Hickman Creek	4.2	10.2	6	Primary Contact (Recr)	Not Supporting
East Hickman Creek	4.2	10.2	6	Aquatic Life Support	Partially Supporting
<i>Possible Causes of Impairment:</i>			<i>Possible Sources For Impairment:</i>		
Pathogens, Nutrients			Agriculture, Grazing related Sources, Urban Runoff/Storm Sewers		
East Hickman Creek	12.6	14	1.4	Primary Contact (Recr)	Not Supporting
East Hickman Creek	12.6	14	1.4	Aquatic Life Support	Partially Supporting
<i>Possible Causes of Impairment:</i>			<i>Possible Sources For Impairment:</i>		
Pathogens			Urban Runoff/Storm Sewers		
West Hickman Creek	0	3	3	Primary Contact (Recr)	Partially Supporting
West Hickman Creek	0	3	3	Aquatic Life Support	Partially Supporting

Watershed Name: Hickman Creek

11-Digit Watershed Identity Number: 05100205120

<i>Possible Causes of Impairment:</i> Nutrients, Pathogens		<i>Possible Sources For Impairment:</i> Major Municipal Point Source, Municipal Point Sources, Urban Runoff/Storm Sewers			
West Hickman Creek	3	8.4	5.4	Aquatic Life Support	Partially Supporting
<i>Possible Causes of Impairment:</i> Nutrients		<i>Possible Sources For Impairment:</i> Urban Runoff/Storm Sewers			
<i>*Abbreviations: UT - Unnamed Tributary</i>					

Watershed Name: Hickman Creek

11-Digit Watershed Identity Number: 05100205120

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>
ANDOVER GOLF & COUNTRY CLUB	Surface Water	Water Withdrawal Site	WW1122
ANDOVER GOLF & COUNTRY CLUB	Surface Water	Water Withdrawal Site	WW1123
CONNEMARA GOLF COURSE	Groundwater	Water Withdrawal Site	WW1246
CONNEMARA GOLF COURSE	Surface Water	Water Withdrawal Site	WW1243
CONNEMARA GOLF COURSE	Surface Water	Water Withdrawal Site	WW1244
HIGH POINT GOLF CLUB	Surface Water	Water Withdrawal Site	WW1351
ICEBERG SPRING WATER	Surface Water	Water Treatment Plant	0570588
KENTUCKY-AMERICAN WATER CO	Surface Water	Water Treatment Plant	0340250
KENTUCKY-AMERICAN WATER CO	Surface Water	Water Withdrawal Site	0340250

<i>KPDES Permitted Discharge Facilities</i>			<i>KPDES Site ID Number</i>
<i>Facility</i>	<i>Type of Facility</i>		
ALLTECH BIOTECHNOLOGY INC	PREP FEEDS & INGRED FOR ANIMA	KY0074292	
KY AMERICAN WATER CO	WATER SUPPLY	KY0093301	
LEXINGTON CARTAGE	LOCAL TRUCKING WITHOUT STORAGE	KY0091979	
LEXINGTON WEST HICKMAN STP	SEWERAGE SYSTEMS	KY0021504	

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>
West Hickman Creek	USGS	USGS03284550	Flow

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

<i>Lexington-Fayette Urban County Government Sampling Sites</i>	
<i>Stream Segment</i>	<i>LFUCG Site ID</i>
East Hickman Creek	P-2
East Hickman Creek	L-4
East Hickman Creek	L-5
East Hickman Creek	L-6
East Hickman Creek	L-7
East Hickman Creek	S-4
East Hickman Creek	S-5
East Hickman Creek	S-6
East Hickman Creek	S-7
East Hickman Creek	S-8
West Hickman Creek	West Hickman

<i>KY River Watershed Watch Sampling Sites</i>		
<i>Stream Name</i>	<i>KRWW Sample ID No.</i>	<i>Site Description</i>

Watershed Name: Hickman Creek

11-Digit Watershed Identity Number: 05100205120

Hickman Creek	K20	Between UT and Mouth of Hickman
W Hickman Creek	K53	Behind Tates Creek Shopping Center

Results from 1999 KY River Watershed Watch Sampling:

Conventional Parameters:

Sample ID Number: K20 Stream: Hickman Creek

Physical Data (May):			
pH	8.5	Alkalinity	191
Temperature	19.5	Total Hardness	316
Dissolved Oxygen	9.6	Chlorides	79.4
		Conductivity	983
		Total Organic Carbon	4.8
		Total Suspended Solids	6

Fecal Data (July / August):		
Coliform Count	Strep Count	Coliform/Strep Ratio
July	90	240
August		0.38

Sample ID Number: K53 Stream: West Hickman Creek

Physical Data (May):			
pH	8	Alkalinity	
Temperature	16.7	Total Hardness	
Dissolved Oxygen	8	Chlorides	
		Conductivity	
		Total Organic Carbon	
		Total Suspended Solids	

Fecal Data (July / August):		
Coliform Count	Strep Count	Coliform/Strep Ratio
July	110	400
August		0.28

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: K20 Stream: Hickman Creek

Ammonia		Orthophosphate as Phosphate	8.893	Sulfate	202
Ammonia Nitrogen		Orthophosphate as Phosphorus	2.900		
Total Kjeldahl Nitrogen as NH3		Total Recoverable Phosphorus	1.88		
Total Kjeldahl Nitrogen as N					
Nitrate	57.1				
Nitrate Nitrogen	12.9				

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

Sample ID Number: K53 Stream: West Hickman Creek

Ammonia		Orthophosphate as Phosphate		Sulfate	
Ammonia Nitrogen		Orthophosphate as Phosphorus			
Total Kjeldahl Nitrogen as NH3		Total Recoverable Phosphorus			
Total Kjeldahl Nitrogen as N					
Nitrate					
Nitrate Nitrogen					

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: K20 Stream: Hickman Creek

Aluminum	0.24	Calcium	78.77	Lead		Selenium	0.02	Thallium	
Antimony		Chromium		Lithium	0.03	Silicon	2.15	Vanadium	
Barium	0.03	Cobalt	0.002	Magnesium	32.19	Sodium	78.59	Zinc	0.03
Beryllium		Copper		Manganese	0.007	Strontium	0.44		
Boron	0.47	Iron	0.08	Potassium	13.79	Sulfur	57.76		

Watershed Name: Hickman Creek

11-Digit Watershed Identity Number: 05100205120

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

Sample ID Number: **K53** Stream: **West Hickman Creek**

Aluminum	<input type="text"/>	Calcium	<input type="text"/>	Lead	<input type="text"/>	Selenium	<input type="text"/>	Thallium	<input type="text"/>
Antimony	<input type="text"/>	Chromium	<input type="text"/>	Lithium	<input type="text"/>	Silicon	<input type="text"/>	Vanadium	<input type="text"/>
Barium	<input type="text"/>	Cobalt	<input type="text"/>	Magnesium	<input type="text"/>	Sodium	<input type="text"/>	Zinc	<input type="text"/>
Beryllium	<input type="text"/>	Copper	<input type="text"/>	Manganese	<input type="text"/>	Strontium	<input type="text"/>		
Boron	<input type="text"/>	Iron	<input type="text"/>	Potassium	<input type="text"/>	Sulfur	<input type="text"/>		

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
K20	Hickman Creek	<input type="text"/>	<input type="text"/>	<input type="text"/>
K53	West Hickman Creek	<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).