

FINAL 303(d)
LIST FOR KENTUCKY

OCTOBER, 1992

Department for Environmental Protection
Division of Water

Pursuant to Section 303(d) of the Clean Water Act, the State of Kentucky has developed a final list of waterbodies presently not supporting applicable water quality standards. As required by 40 CFR 130.7(b)(4), these waterbodies have been prioritized for total maximum load (TMDL) development. The purpose of this report is to identify the impacted streams, describe efforts being made to address the sources of the problems, and prioritize streams for total maximum daily load (TMDL) activities.

Preliminary 303(d) lists were submitted to USEPA and made available to the public for comment in April, 1992. Press releases were sent to major newspapers and notification was also made in the Environmental Quality Commission's newsletter and the quarterly publication "Land, Air, and Water" of the Natural Resources and Environmental Protection Cabinet. No official comments were received. The lists have now been prioritized for TMDL development. The waterbodies chosen as "High Priority" are targeted for TMDL development in the next two years (by the 1994 305(b) biennial reporting period).

The lists of waters not meeting standards were derived primarily from the "1992 Kentucky Report to Congress on Water Quality" (Kentucky Natural Resources and Environmental Protection Cabinet, 1992) and "Assessment of Water Quality Conditions, Ohio River 1990-1991" (ORSANCO, 1992), hereafter referred to as "305(b) reports." Monitored instream data from the Kentucky Division of

Water (Division), Ohio River Valley Water Sanitation Commission (ORSANCO), U.S. Geological Survey (USGS), and Louisville and Jefferson County Metropolitan Sewer District (MSD) ambient monitoring stations were the primary basis for listing. Other special studies were used in the assessment. Bacteriological data were collected not only on a regular basis at ambient stations, but at numerous other stations in the upper Salt River, North Fork Kentucky River, and lower Licking River basins. Data from studies prior to 1989 on the South Fork Licking River, Elkhorn Creek, Big Sandy River, and Little River were carried over to this reporting period. Dissolved oxygen studies were performed in the Floyds Fork, East Fork Little Sandy River, and Mayfield Creek basins in the summer of 1991. Biological studies were performed at 18 ambient stations and during five intensive surveys over the two-year reporting period. Data gathered from 45 previous biological surveys were also used where conditions have remained largely unchanged since the time of the surveys. Another source of information was from conservation officers of the Department of Fish and Wildlife Resources, who completed questionnaires regarding habitat and fishery conditions in numerous unmonitored streams in the state.

Water quality data were compared with their corresponding criteria. All of the criteria except fecal coliform were used to assess warmwater aquatic habitat (WAH) use support. If the criteria for dissolved oxygen, un-ionized ammonia, temperature, or

pH, collected during the period of October 1989 through September 1991, were exceeded in greater than 25 percent of the measurements, the segment did not support its use for WAH.

Data for mercury, cadmium, copper, lead, and zinc were analyzed for violations of acute criteria listed in state water quality standards using three years of data (from October 1988 through September 1991). The segment was not supporting if one or more exceedences were measured at quarterly or less frequently sampled stations, or two or more exceedences occurred at stations sampled monthly.

Fecal coliform data were used to indicate degree of support for primary contact recreation (swimming) use. Primary contact recreation was not supported if the criterion was exceeded greater than 25 percent of the time based on 2 years of monthly data collected during the recreation season. In addition, streams with pH below 6.0 units caused by acid mine drainage were judged to not support this use. Domestic water supply use was not assessed because the use is applicable at points of withdrawal only and could not be quantified in the format required by the guidelines.

In areas where both chemical and biological data were available, the biological data were generally the determinate factor for establishing warmwater aquatic habitat use support status. This is especially true when copper, lead and zinc

criteria were contradicted by biological criteria. The Division made this decision in recognition of the natural ability of surface waters to sequester metals and make them less bioavailable and therefore less toxic.

The biological assessments were done by means of selected community metrics for fish, macroinvertebrate, and diatom communities, and habitat and physicochemical characteristics. A waterbody did not support its designated uses if the biological community was severely altered (dominated by pollution-tolerant organisms, had very high or low biomass, or possessed other significant functional alterations), or habitat characteristics were severely impacted.

A total of 139 segments on 121 streams and 6,738 acres on nine lakes did not support designated uses for the reporting period (Tables 1, 2 and 3). The most common cause of nonsupport in streams was fecal coliform contamination. In lakes, dissolved oxygen depletion caused by excessive nutrients was the primary cause of use nonsupport.

Sanitary wastewater (municipal) point source discharges were solely responsible for or contributed to nonsupport of swimming because of fecal coliform contamination in 53 segments on 42 streams. Municipal is defined as all point source discharges of sanitary wastewater for 305(b) reporting purposes, which includes

small package treatment plants as well as discharges from city treatment plants. Agricultural inputs were primarily or secondarily responsible for this use nonsupport in 41 segments on 30 streams. Stormwater runoff, combined sewer overflows (CSOs), septic tank seepage, urban runoff, and land disposal were named as the source of fecal coliform bacteria in 28 segments on 19 streams.

Municipal inputs were the primary or secondary source for 23 segments on 21 streams and three lakes that did not support aquatic life because of organic and/or nutrient enrichment (DO problems). Eleven of these waterbodies are also listed for bacterial contamination.

Mining activities were solely or partially responsible for 22 waterbodies not supporting uses, primarily because of low pH (acid drainage) and siltation. Petroleum operations were the source of chloride (nine waterbodies) and oil and grease (two waterbodies) problems in eleven streams. Industrial discharges were identified as the source of pollutants causing use nonsupport in only five waterbodies. Two waterbodies were listed because of priority organics, two for both nutrients and chlorides, and one for chlorides only.

Metals were the cause of nonsupport in eighteen streams; municipal discharges were the metals source in five of these streams. On the Ohio River, metals contributed to use nonsupport

on seven waterbodies (Table 2). The cause of the listing was usually copper. A segment was classified as not supporting its aquatic life use only when the metal data were corroborated by biological data. Otherwise, every waterbody on the Ohio River would have been listed as not supporting aquatic life use because of copper.

The lists of streams not supporting designated uses show that many of the problems are caused by inadequate disinfection of sanitary wastewater, resulting in instream levels of bacteria that pose a health risk to body contact recreational users. These problems are expected to gradually diminish as wastewater treatment plants are upgraded across the state, sewer systems become available to areas that are presently unsewered, and appropriate BMPs for animal waste control are installed.

Some streams are affected by municipalities with combined sewer systems. These systems cause problems when sufficient rainfall occurs to overload the capacity of combined sanitary and storm sewer systems, resulting in untreated discharges from overflow points throughout the systems. ORSANCO identified CSOs as the primary contributor to bacteria problems in the Ohio River downstream of major municipalities (see Table 2). Twenty-seven municipalities on the Ohio River, seven of which are in Kentucky, have combined sewer systems. Ten combined sewer systems have been identified on other streams in Kentucky. All these municipalities

are or will soon be required by their KPDES permits to begin identifying discharge points, dry weather discharges, and mitigation measures. Dry weather discharges are to be completely eliminated. Kentucky will focus on combined sewer systems according to their number, size, and contribution to water quality problems. Technology-based controls will consist of: 1) proper operation and regular maintenance; 2) maximum use of existing collection systems for storage, review and modification of pretreatment programs; 3) steps to maximize flow to publicly-owned treatment works for treatment; 4) prohibition of dry weather flows; and 5) control of solids and floatable material. Additional control measures will be required as necessary.

Agriculture is the second most frequent source of pollutants causing use nonsupport. Besides contributing to fecal coliform contamination, agriculture was identified as the source of excessive siltation and/or nutrient enrichment in nine waterbodies and five lakes.

Runoff from agricultural activities is categorized as nonpoint source (NPS) pollution. The Division established a NPS Section in 1987 under Section 319 of the 1987 Amendments to the Clean Water Act to coordinate water quality efforts with the U.S. Department of Agriculture (USDA) and State agencies. The charge of the NPS Section is to prioritize problem areas, monitor the effects of BMPs, provide educational resources, and distribute monies to be

used on demonstration farms. Controls for NPS pollution are still largely voluntary; however, Federal price subsidies can be withheld if farm plans are not followed. These farm plans set aside highly erodible lands, prohibit the draining of certain wetlands, and spell out other conservation practices. Funds have been distributed by the USDA for BMP implementation in the upper Salt River, Mammoth Cave, and Fleming Creek watersheds. These areas were chosen as a result of prioritizing streams impacted by agricultural activities. The BMPs consist of such measures as waste lagoons, no- or low-till practices, and streambank stabilization/revegetation. Five demonstration farms have been established in the Mammoth Cave area. In cooperation with the National Park Service and State of Tennessee agencies, the NPS Section has helped develop BMPs to treat acid mine drainage into Bear Creek, a tributary of the South Fork Cumberland River.

Citizen involvement is an important factor in the NPS program. Citizen groups have been formed in several watersheds in response to public perception of water quality problems. These groups can be influential in the public/political arena in promoting BMP implementation and other mitigative measures.

Waterbodies not supporting uses have been evaluated to develop a prioritized list for TMDL development (Table 4). Other waterbodies not meeting water quality standards and not listed in Table 4 are considered to be lower priority. The prioritization was

based on the appropriateness of the TMDL process in addressing the source and pollutants. Table 4 does not reflect relative water quality impairment of the affected waterbodies.

The two areas designated as high priority are the North Fork Kentucky River and Taylorsville Lake. Both waterbodies have received considerable attention from the public and resource agencies in recent years.

The Division has been active in the North Fork Kentucky River basin in an effort to curb bacterial contamination that has been a problem in the basin for several years. Improvements have been made to the three largest municipal dischargers (Whitesburg, Hazard, and Jackson). Monitoring of these facilities, 51 package treatment plants, and the river has been an ongoing activity of the Division. Several synoptic sampling trips were made in the 1992 recreational season. On the most recent one, only 12 percent of the permitted facilities were found to be out of compliance, but not before over \$30,000 in fines had been collected from facilities previously in noncompliance. The Division is also cooperating with the Cabinet for Human Resources, Department of Health, in identifying and eliminating illegal straight-pipe discharges that are believed to contribute to the problems in the North Fork Kentucky River.

The 1990 303(d) report identified the upper Salt River basin above the Taylorsville Lake dam as a priority for a watershed or TMDL approach to nutrient control. Taylorsville Lake exhibits oxygen depletion at depths below 8-10 feet in the summer, has experienced fish kills, and is highly eutrophic. Reproduction of gamefish has been poor and the fishery is maintained by an extensive stocking program. Resources of several agencies (USDA, Kentucky Division of Conservation, and the Division of Water) have been used to develop control strategies for NPS contributions in the basin. Several BMPs have been implemented to curb runoff from dairy and other concentrated animal management areas. The Division began an intensive monitoring program in 1991 to document the effectiveness of the BMPs, and to establish the nutrient loading from the subwatersheds and point sources. A total of 12 stream stations are being sampled on a regular basis and during rain events. Composite samples are also being collected from the two primary point sources (the cities of Harrodsburg and Lawrenceburg) at 4-6 week intervals. The monitoring data will be used to identify areas contributing large amounts of nutrients, the temporal differences in those inputs, and the loadings produced by different rain events. Loadings from major point sources will be evaluated to determine if further controls (such as phosphorus removal) would be beneficial. Subwatersheds found to be contributing large nutrient loads will be targeted for BMP implementation.

Several other waterbodies have been designated as medium priority for TMDL development. In most of these areas, work has already begun to address the known water quality problems.

The TMDL process will continue to be used in developing chloride limits for oil and gas facilities, and in limiting new and expanded sewage treatment plants in developed areas. Chloride limits are written to protect not only the immediate receiving stream, but also any downstream water withdrawals. The latter is done by ensuring that the sum of chlorides from all upstream sources is less than the maximum allowable load (with a margin of safety) in a segment with a water withdrawal. Problems arise either when permitted dischargers do not meet limits or discharges occur from unregulated oil and gas operations such as abandoned, unplugged, or illegally operating wells.

The TMDL process for developing WLAs for sanitary wastewater discharges is documented in the State/EPA WLA Agreement. The WLA model considers all point source discharges in a subbasin and is essentially a TMDL for oxygen demanding materials and un-ionized ammonia during critical low-flow conditions. The Division has denied several new discharges in developed areas (i.e. Floyds Fork, Harrods Creek, East Fork Little Sandy River basins) on the basis of WLA modeling results and field verification data. The Division will continue to closely monitor activities in these watersheds.

The Division promotes the regionalization of sanitary wastewater systems to eliminate "package plants," which are often poorly operated. Considerable progress has been made toward this goal. Using the Cabinet's Geographic Information System, maps of 37 selected counties have been prepared in cooperation with the USGS. Local officials will be contacted in these areas to discuss regionalization opportunities and alternatives. Several regionalization projects are currently underway which have eliminated scores of package plants. These areas include:

- Pineville (6-10 facilities),
- Boone County (Sanitation District #1 of Campbell and Kenton counties, 20 - 30 facilities),
- Boyd County south of Ashland (more than 40 facilities),
- Harlan County (2 municipalities and unincorporated areas),
- Hart, Barren, and Edmonson counties (Horse Cave, Cave City, Park City, Mammoth Cave National Park, and 6 private facilities),

- Henry County (consolidation of Eminence and Pleasureville),
- Louisville-Jefferson County MSD (continuing acquisition of numerous package plants),
- Marshall County (Purchase Area Development District assuming ownership of 6 facilities),
- Mt. Vernon (Renfro Valley and 8 private facilities),
- Inez (12 facilities).

Several other regionalization projects are in the planning stage. The Division also requires new and existing facilities in 201 planning areas to connect to available sewer systems.

The watershed approach has also begun to be applied in the upper Dix River basin above the Herrington Lake dam. Herrington Lake is eutrophic to hypertrophic in the headwaters. The Division maintains an ambient monitoring station on the mainstem of the Dix River just above the lake. Total nutrient loading to the lake can be determined from these data. Also, phosphorus monitoring has been placed on the permits of the cities of Danville and Lancaster, the two largest point source dischargers in close proximity to the upper lake. A new USGS gage and Division nutrient sampling is

being established on Clarks Run below Danville to allow loads to be calculated from the urban watershed that is the other major input to the lake. Data from the Danville WWTP will be subtracted to determine loading from sources other than the WWTP. Sampling in the upper rural watershed of the Dix River will eventually be carried out in a manner similar to that being done now in the upper Salt River basin. Lessons learned from the Salt River TMDL process will be applied to the Dix River TMDL. However, it is not expected that a comprehensive sampling program will begin until further work is completed in the upper Salt River basin.

It should be noted that a large number of waterbodies on the original 303(d) lists were there because of poorly operated sewage treatment plants (STPs) or other instances where existing permit limits are adequate to protect water quality, but permit limits were not being met. We have included these affected waterbodies as "water-quality limited," but they do not readily fit into the TMDL concept. The waterbodies listed should meet water quality standards if facilities comply with permit limits. For this reason, such waterbodies are usually listed as "Low Priority," but that does not imply that the Division is not concerned about water quality or that steps are not being taken to address the problems. It means that load development is not the priority. In many instances, facilities known to be the source of instream water quality problems are under enforcement action or are in the process

of constructing new or upgraded facilities in order to comply with existing permits.

Several waterbodies are listed as not supporting uses because of nonpoint source (NPS) pollution, combined sewer overflows (CSOs), and/or urban runoff. The first priority in these instances is to characterize the problem and apply best management practices (BMPs) to control gross pollution. Therefore, waterbodies affected by these sources are not at this time considered to be a high priority for TMDL development.

No TMDL-related activities are planned to specifically address problems on the Ohio River. Because several states lie within the Ohio River watershed, water quality issues in the mainstem are difficult to address. Participation by the member states with coordination from ORSANCO staff is needed. Many of the water quality improvements to tributaries flowing into the Ohio River will have a positive effect on water quality in the mainstem of the Ohio River.

Table 1
List of Streams Not Supporting Uses by River Basin

Uses Not Supported

Stream (Waterbody (I.D.))	Aquatic Life (miles)	Cause	Source	Swimming (miles)	Cause	Source
<u>Big Sandy River Basin</u>						
Tug Fork (KY5070201-001) (KY5070201-004)				57.9	Pathogens	Municipal/ Agriculture
Big Creek (KY5070201-005)	19.7	Siltation	Agriculture/ Mining			
Knox Creek (KY5070201-010)				7.6	Pathogens	Agriculture
Levisa Fork (KY5070202-001) (KY5070203-010) (KY5070203-016) (KY5070203-021)				49.5	Pathogens	Municipal/ Agriculture
Shelby Creek (KY5070202-002)				10.0	Pathogens	Municipal
Russell Fork (KY5070202-004)				16.0	Pathogens	Municipal/ Agriculture
Elkhorn Creek (KY5070202-005)				27.4	Pathogens	Municipal
Paint Creek (KY5070203-005)				1.0	Pathogens	Urban Runoff/ Storm Sewers
Left Fork Middle Creek (KY5070203-014)	9.5	pH	Mining	9.5	pH	Mining
Beaver Creek (KY5070203-018)				7.0	Pathogens	Municipal
Mud Creek (KY5070203-022)	17.0	Siltation/Organic Enrichment	Agriculture/ Mining			
Big Sandy (KY5070204-001)	26.8	Metals	Unknown	26.8	Pathogens	Municipal/ Agriculture

Table 1 (Continued)

Stream (Waterbody (I.D.))		Aquatic Life			Swimming			Uses Not Supported	
		(miles)	Cause	Source	(miles)	Cause	Source		
<u>Little Sandy River Basin</u>									
Little Sandy River	(KY5090104-004)				39.3	Pathogens	Municipal/ Agriculture/ Septic tanks		
East Fork Little Sandy River	(KY5090104-003)	6.0	Organic Enrichment	Municipal					
Shope Creek	(KY5090104-003)	5.4	Organic Enrichment	Municipal					
Newcombe Creek	(KY5090104-009)	11.9	Chlorides	Petroleum Activities					
<u>Licking River Basin</u>									
Licking River	(KY5100101-001) (KY5100101-004) (KY5100101-034)	6.3	Metals	Unknown	56.4	Pathogens	Municipal/ Agriculture/ Combined Sewer Overflows		
North Fork Licking River	(KY5100101-012)				19.5	Pathogens	Agriculture		
Banklick Creek	(KY5100101-002)				19.0	Pathogens	Combined Sewer Overflows		
Three-Mile Creek	(KY5100101-003)				4.7	Pathogens	Urban Runoff/ Storm Sewers		
Lick Creek	(KY5100101-037)	9.2	Chlorides	Petroleum Activities					
Raccoon Creek	(KY5100101-037)	5.2	Chlorides	Petroleum Activities					

Table 1 (Continued)

Uses Not Supported						
Stream (Waterbody (I.D.))	Aquatic Life (miles)	Cause	Source	Swimming (miles)	Cause	Source
<u>Licking River Basin (Continued)</u>						
Burning Fork (KY5100101-038)	7.5	Chlorides	Petroleum Activities			
State Road Fork (KY5100101-038)	5.1	Chlorides	Petroleum Activities			
Rockhouse Fork (KY5100101-038)	5.0	Chlorides	Petroleum Activities			
Indian Creek (KY5100102-009)				0.6	Pathogens	Municipal
Stoner Creek (KY5100102-012)				9.6	Pathogens	Municipal/ Agriculture
Houston Creek (KY5100102-013)				14.0	Pathogens	Agriculture
Hancock Creek (KY5100102-017)				7.6	Pathogens	Agriculture
Strodes Creek (KY5100102-017)				26.5	Pathogens	Municipal/ Agriculture/ Urban Runoff/ Storm Sewers
Brushy Fork (KY5100102-020)	5.0	Nutrients/ Chlorides	Industrial			
U.T. to Brushy Fork (KY5100102-020)	0.2	Nutrients/ Chlorides	Industrial			
Hinkston Creek (KY5100102-024)				19.8	Pathogens	Municipal/ Agriculture

Table 1 (Continued)

		Uses Not Supported				
Stream (Waterbody (I.D.))	Aquatic Life (miles)	Cause	Source	Swimming (miles)	Cause	Source
<u>Kentucky River Basin</u>						
North Fork Kentucky River				55.1	Pathogens	Municipal/Urban Runoff/Storm Sewers
Quicksand Creek				20.8	Pathogens	Agriculture
South Fork Quicksand Creek				13.8	Pathogens	Agriculture
Spring Fork Quicksand Creek	15.0	Siltation	Mining			
Lost Creek	18.5	Siltation	Mining			
Troublesome Creek				49.5	Pathogens	Municipal/Land Disposal
Rockhouse Creek	24.3	Siltation	Mining			
Cutshin Creek	28.8	Oil and Grease/Siltation	Petroleum Activities/Mining			
Raccoon Creek	7.3	Oil and Grease/Siltation	Petroleum Activities/Mining			
Billey Fork	8.1	Chlorides	Petroleum Activities			
Millers Creek	6.4	Chlorides	Petroleum Activities			
Big Sinking Creek	14.1	Chlorides	Petroleum Activities			
Red River	10.0	Metals	Unknown	10.0	Pathogens	Municipal

Table 1 (Continued)

Stream (Waterbody (I.D.))		Aquatic Life (miles)	Cause	Source	Swimming (miles)	Cause	Source
<u>Kentucky River Basin (Continued)</u>							
South Fork Red River	(KY5100204-018)	10.1	Chlorides	Petroleum Activities			
Sand Lick Creek	(KY5100204-018)	5.0	Chlorides	Petroleum Activities			
Cat Creek	(KY5100204-017)	7.7	Organic Enrichment/ Metals	Source Unknown			
Eagle Creek	(KY5100205-003) (KY5100205-005)				38.8	Pathogens	Source Unknown
Kentucky River - Lockport	(KY5100205-011)				40.9	Pathogens	Source Unknown
Kentucky River - Boonesboro	(KY5100205-047)				32.7	Pathogens	Source Unknown
Elkhorn Creek	(KY5100205-018)				17.8	Pathogens	Source Unknown
North Elkhorn Creek	(KY5100205-022)	2.0	Organic Enrichment/ Chlorine	Municipal			
Dry Run	(KY5100205-023)				7.5	Pathogens	Municipal/ Agriculture
U.T. to North Elkhorn Creek	(KY5100205-025)				10.8	Pathogens	Agriculture
South Elkhorn Creek	(KY5100205-026)				17.6	Pathogens	Urban Runoff/ Storm Sewers
Lee Branch	(KY5100205-027)	1.0	Organic Enrichment	Municipal			

Table 1 (Continued)

Stream (Waterbody (I.D.))		Uses Not Supported			Swimming (miles)	Source	Cause	Source
		Aquatic Life (miles)	Cause	Source				
<u>Kentucky River Basin (Continued)</u>								
Town Branch	(KY5100205-028)	11.3	Organic Enrichment/ Metals/ Nutrients	Municipal				
Clarks Run	(KY5100205-039)	8.0	pH/Organic Enrichment	Municipal				
Silver Creek	(KY5100205-052)	2.0	Organic Enrichment/ Nutrients	Municipal				
Brushy Fork	(KY5100205-052)	0.2	Nutrients	Municipal				
<u>Green River Basin</u>								
Nolin River	(KY5110001-010)				49.2	Pathogens		Municipal
Valley Creek	(KY5110001-012)	17.5	Organic Enrichment/ Chlorides	Municipal/ Urban Runoff/ Storm Sewers				
Doty Creek	(KY5110002-012)				4.0	Pathogens		Pasture Land/ Feedlots/ Animal Holding/ Mgt. Areas
Patoka Creek	(KY5110002-018)				4.3	Pathogens		Pasture Land/ Feedlots/ Animal Holding/ Mgt. Areas
Pond Creek	(KY5110003-003)	23.8	pH/Metals	Mining	23.8	pH		Mining

Table 1 (Continued)

Stream (Waterbody (I.D.))		Aquatic Life (miles)	Cause	Source	Swimming (miles)	Cause	Source
Green River Basin (Continued)							
Mud River	(KY5110003-005) (KY5110003-008)	64.8	Priority Organics/ Organic Enrichment	Industrial/ Unknown			
Green River	(KY5110005-001) (KY5110005-003) (KY5110005-011)				55.1	Pathogens	Agriculture/ Urban Runoff/ Storm Sewers
Cypress Creek	(KY5110006-002)	33.3	pH	Mining	33.3	pH	Mining
Harris Branch	(KY5110006-002)	2.6	pH	Mining	2.6	pH	Mining
Flat Creek	(KY5110006-005)	10.6	pH	Mining	10.6	pH	Mining
Drakes Creek	(KY5110006-006)	21.3	pH	Mining	21.3	pH	Mining
Upper Cumberland River Basin							
Cumberland River	(KY5130101-025) (KY5130101-032)				41.1	Pathogens	Municipal/ Land Disposal
Yellow Creek	(KY5130101-031)				9.5	Pathogens	Municipal
Cranks Creek	(KY5130101-038)	15.1	Siltation/pH	Mining			
Big Lily Creek	(KY5130103-011)	2.6	Chlorides	Industrial			
Elk Spring Creek	(KY5130103-018)	1.5	Organic Enrichment	Municipal			
Rock Creek	(KY5130104-007)	4.0	Metals/pH	Mining	4.0	pH	Mining
Roaring Paunch Creek	(KY5130104-008)	15.6	pH	Subsurface Mining/Surface Mining			

Table 1 (Continued)

Stream (Waterbody (I.D.))		Aquatic Life (miles)		Uses Not Supported		Swimming (miles)		Cause		Source	
<u>Upper Cumberland River Basin (Continued)</u>											
Bear Creek	(KY5130104-009)	3.2	pH	Subsurface Mining/Surface Mining	3.2	pH	Surface Mining/ Subsurface Mining				
<u>Lower Cumberland River Basin</u>											
North Fork Little River (inc. Upper Branch)	(KY5130205-009)				18.1	Pathogens	Municipal/ Agriculture				
Elk Fork	(KY5130206-002)	7.0	Organic Enrichment	Municipal/ Agriculture							
<u>Salt River Basin</u>											
Pond Creek	(KY5140102-002)	17.0	Unknown Toxicity/ Organic Enrichment/ Metals	Municipal	17.0	Pathogens	Municipal				
Northern Ditch Pond Creek (inc. Fern Creek)	(KY5140102-002)	10.1	Unknown Toxicity/ Organic Enrichment/ Metals	Municipal	10.1	Pathogens	Municipal				
Southern Ditch Pond Creek	(KY5140102-002)	7.1	Unknown Toxicity/ Organic Enrichment/ Metals	Municipal	7.1	Pathogens	Municipal				

Table 1 (Continued)

Stream (Waterbody (I.D.))		Aquatic Life (miles)	Cause	Source	Swimming (miles)	Cause	Source
Uses Not Supported							
<u>Salt River Basin (Continued)</u>							
Spring Ditch	(KY5140102-002)	2.0	Unknown Toxicity/ Organic Enrichment/ Metals	Municipal	2.0	Pathogens	Municipal
Fishpool Creek	(KY5140102-002)	5.4	Unknown Toxicity/ Organic Enrichment	Municipal	5.4	Pathogens	Municipal
Knob Creek	(KY5140102-002)	15.3	Unknown Toxicity/ Organic Enrichment	Municipal			
Briar Creek	(KY5140102-002)	5.7	Unknown Toxicity/ Organic Enrichment	Municipal			
Mill Creek	(KY5140102-003)				13.5	Pathogens	Municipal
Salt River	(KY5140102-005) (KY5140102-029) (KY5140102-031)				57.5	Pathogens	Septic Tanks/ Urban Runoff/ Storm Sewers/ Municipal/ Pasture Land/ Feedlots/ Animal Holding/ Mgt. Areas

Table 1 (Continued)

Stream (Waterbody (I.D.))		Aquatic Life (miles)		Uses Not Supported		Swimming (miles)	Cause	Source
Salt River Basin (Continued)								
Town Creek	(KY5140102-033)					3.2	Pathogens	Municipal/ Pasture Lands/ Feedlots/ Animal Holding/ Mgt. Areas
Floyds Fork	(KY5140102-007) (KY5140102-011) (KY5140102-014)	13.0		Organic Enrichment		61.6	Pathogens	Municipal/ Urban Runoff/ Storm Sewers/ Flow Regulation
Cedar Creek	(KY5140102-008)	15.2		Organic Enrichment		15.2	Pathogens	Municipal
Pennsylvania Run	(KY5140102-008)					5.5	Pathogens	Municipal
Brooks Run	(KY5140102-009)	6.0		Organic Enrichment		6.0	Pathogens	Municipal
Chenoweth Run	(KY5140102-010)	9.1		Organic Enrichment		9.1	Pathogens	Municipal
Pope Lick Creek	(KY5140102-012)					5.0	Pathogens	Municipal/ Urban Runoff/ Storm Sewers
Long Run	(KY5140102-012)					9.5	Pathogens	Municipal/ Agriculture

Table 1 (Continued)

Uses Not Supported						
Stream (Waterbody (I.D.))	Aquatic Life (miles)	Cause	Source	Swimming (miles)	Cause	Source
Salt River Basin (Continued)						
Beech Creek (KY5140102-026)				30.1	Pathogens	Pasture Lands/ Feedlots/ Manure Lagoons/ Animal Holding/ Mgt. Areas/ Septic Tanks
Crooked Creek (KY5140102-027)				13.9	Pathogens	Pasture Land/ Feedlots/ Septic Tanks/ Animal Holding/ Mgt. Areas
Ashes Creek (KY5140102-028)				10.3	Pathogens	Pasture Land/ Feedlots/ Animal Holding/ Mgt. Areas
Jacks Creek (KY5140102-028)				8.0	Pathogens	Pasture Land/ Feedlots/ Manure Lagoons/ Animals Holding/ Mgt. Areas

Table 1 (Continued)

Stream (Waterbody (I.D.))		Aquatic Life (miles)	Cause	Source	Swimming (miles)	Cause	Source
<u>Salt River Basin (Continued)</u>							
Timber Creek	(KY5140102-028)				4.8	Pathogens	Pasture Land/ Feedlots/ Manure Lagoons/ Animals Holding/ Mgt. Areas
Rolling Fork	(KY5140103-001) (KY5140103-005)				107.4	Pathogens	Municipal/ Agriculture
<u>Tradewater River Basin</u>							
Crab Orchard Creek	(KY5140205-003)	22.6	pH/Siltation	Mining/ Agriculture	22.6	pH	Mining
Vaughn Ditch	(KY5140205-003)	3.2	pH/Siltation	Mining/ Agriculture	3.2	pH	Mining
Clear Creek	(KY5140205-008)	28.1	pH/Siltation	Mining/ Agriculture	28.1	pH	Mining
Lick Creek	(KY5140205-008)	18.1	pH/Siltation	Mining/ Agriculture	18.1	pH	Mining
Caney Creek	(KY5140205-015)	11.3	pH/Siltation	Mining/ Agriculture	11.3	pH	Mining
Buffalo Creek	(KY5140205-016)	7.8	pH/Siltation	Mining/ Agriculture	7.8	pH	Mining

Table 1 (Continued)

Stream (Waterbody (I.D.))		Uses Not Supported	Swimming (miles)	Cause	Source	Swimming (miles)	Cause	Source
		Aquatic Life (miles)						
<u>Tennessee River Basin</u>								
Cypress Creek	(KY6040006-013)	19.4		Unknown Toxicity/ Priority Organics	Industrial			
<u>Mississippi River Basin</u>								
Mayfield Creek	(KY8010201-004)	2.4		Organic Enrichment	Municipal			
<u>Ohio River Tributaries</u>								
Muddy Fork Beargrass Creek	(KY5140101-002)		6.9				Pathogens	Municipal/Urban Runoff/ Storm Sewers
South Fork Beargrass Creek	(KY5140101-002)		14.6				Pathogens	Municipal/Urban Runoff/ Storm Sewers
Middle Fork Beargrass Creek	(KY5140101-002)	2.5	15.2	Organic Enrichment	Urban Runoff/ Storm Sewers		Pathogens	Municipal/Urban Runoff/ Storm Sewers
Goose Creek	(KY5140101-003)		12.2				Pathogens	Municipal
Little Goose Creek	(KY5140101-003)		8.7				Pathogens	Municipal
Little Bayou Creek	(KY5140206-002)	6.5		Priority Organics	Hazardous Waste			
Mill Creek	(KY5140101-001)	16.5	16.5	Metals	Urban Runoff/ Storm Sewers		Pathogens	Urban Runoff/ Storm Sewers

Table 2
Ohio River Waterbodies Not Supporting
Designated Uses^{a,b}

Waterbody	Name	Miles		Cause
		Total Miles	Not Supporting	
OVWB16	Big Sandy R. - Greenup L&D	23.9	23.9	Metals/Pathogens
OVWB17	Greenup L&D - Scioto R.	15.5	?	Tetrachloroethylene
OVWB19	Meldahl L&D - Little Miami R.	27.9	27.9	Pathogens
OVWB20	Little Miami R. - Licking R.	6.1	6.1	Metals/Pathogens
OVWB21	Licking R. - Great Miami R.	20.9	20.9	Pathogens
OVWB22	Great Miami R. - Markland L&D	40.4	40.4	Metals
OVWB23	Markland L&D - Kentucky R.	14.3	6.2	Pathogens
OVWB24	Kentucky R. - McAlpine L&D	61.0	61.0	Pathogens
OVWB25	McAlpine L&D - Salt R.	23.1	23.1	Metals
OVWB27	Cannelton L&D - Newburgh L&D	55.4	27.7	Metals
OVWB29	Green R. - Uniontown L&D	61.8	61.8	Metals
OVWB34	Tennessee R. - Cairo	46.5	46.5	Metals

^afrom ORSANCO (1992)

^bnon-support for metals includes biological assessment

Table 3
Lakes Not Supporting Uses

Lake	Waterbody	Use Not Supported ^a	Criteria ^b	Cause	Source
Briggs	KY5110003-008L01	WAH	1,2	Nutrients	Lake fertilization
Corbin	KY5130101-006L01	DWS	3	Nutrients	Municipal point sources and Agricultural nonpoint sources
Herrington	KY5100205-038L01	WAH	2,4	Nutrients	Municipal point sources and Agricultural nonpoint sources, septic tanks
Jericho	KY5140101-006L01	WAH	1,2	Nutrients	Agricultural nonpoint sources
Loch Mary	KY5140205-008L02	DWS	5	Metals (Mn) and other inorganics (noncarbonate hardness)	Surface mining (abandoned lands)
Mauzy	KY5140202-004L01	WAH	1,2	Nutrients	Lake fertilization
McNeely	KY5140102-008L01	WAH	1,2	Nutrients	In-place contaminants (sediments)
Sympson	KY5140103-011L01	DWS	3	Nutrients	Agricultural nonpoint sources
Taylorville	KY5140102-025L01	WAH	1,2	Nutrients	Municipal point sources and Agricultural nonpoint sources

^aWAH - Warmwater Aquatic Habitat, DWS - Domestic Water Supply
^b1 - Severe hypolimnetic oxygen depletion
2 - Dissolved oxygen average less than 5 mg/l in epilimnion
3 - Chronic taste and odor complaints caused by algae
4 - Fish kills caused by poor water quality
5 - Chronic treatment problems caused by poor water quality

Table 4
Waterbodies from 303(d) List Prioritized
as Candidates for TMDL Development

Waterbody Name	Waterbody Number	Miles (Acres)
<u>HIGH PRIORITY</u>		
North Fork Kentucky River	5100201-002 5100201-005 5100201-008	55.1
Taylorville Lake	5140102-025L01	(3050)
<u>MEDIUM PRIORITY</u>		
Newcombe Creek	5090104-009	11.9
Lick Creek	5100101-037	9.2
Raccoon Creek	5100101-037	5.2
Burning Fork	5100101-038	7.5
State Road Fork	5100101-038	5.1
Rockhouse Fork	5100101-038	5.0
Billey Fork	5100204-009	8.1
Millers Creek	5100204-009	6.4
Big Sinking Creek	5100204-009	14.1
South Fork Red River	5100204-018	10.1
Sand Lick Creek	5100204-018	5.0
East Fork Little Sandy River	5090104-003	6.0
Clarks Run	5100205-039	8.0
Floyds Fork	5140102-007 5140102-011 5140102-014	61.6
Harrods Creek	5140101-004	31.9
Herrington Lake	5100205-038L01	(2940)