December 1962

Pollution-Caused Fish Kills In 1962

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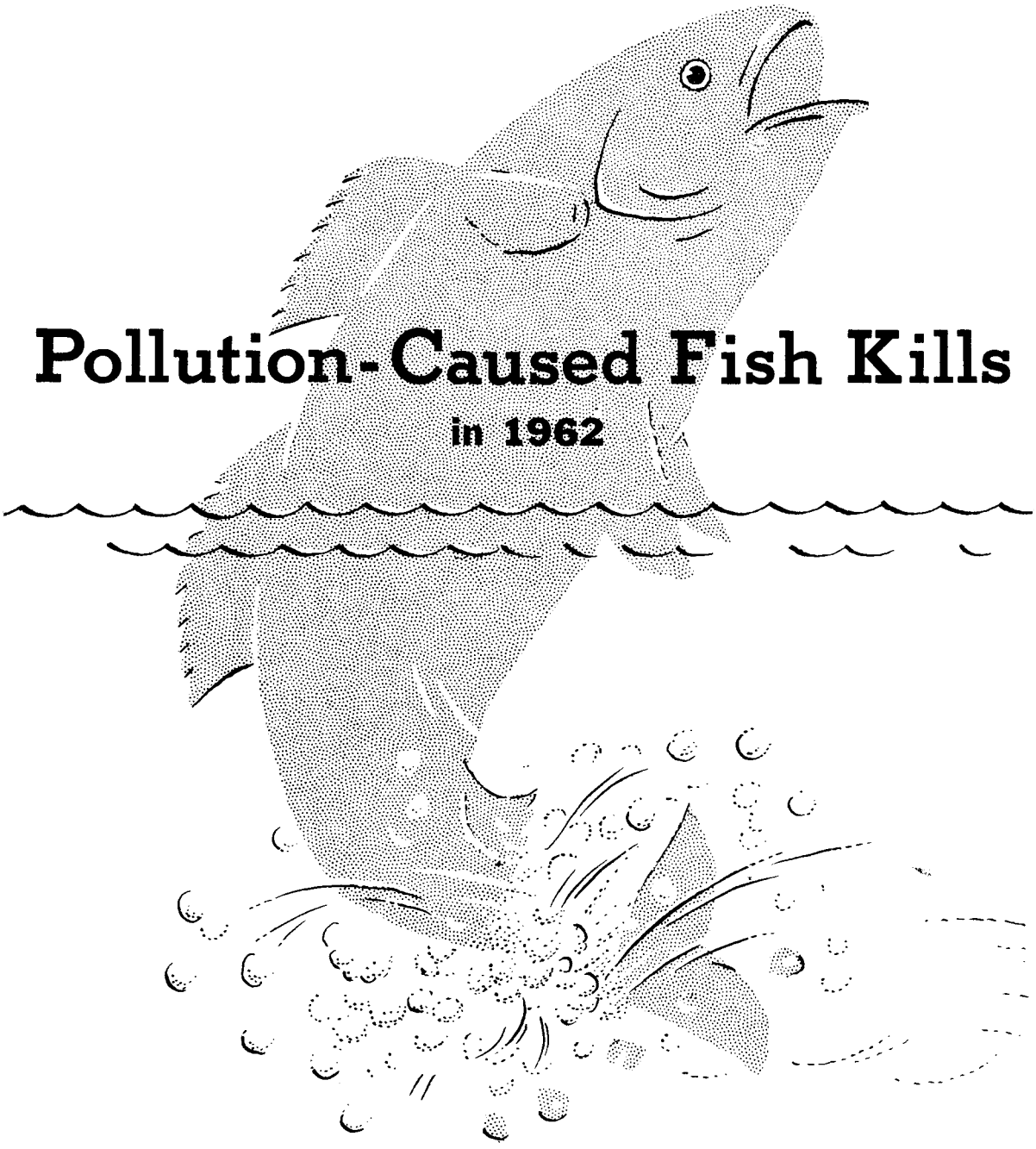

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Public Health Service

Pollution-Caused Fish Kills In 1962

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Division of Water Supply and Pollution Control
Basic Data Branch
Washington 25, D.C.

CONTENTS

INTRODUCTION

This publication is the third annual report of fish kills caused by pollution occurring in the United States. The reporting of pollution-caused fish kills was begun by the Public Health Service in the Spring of 1960 in an effort to secure additional information on the effects of pollution in the Nation's waters, to elicit the cooperation and assistance of conservation groups in the States to help determine causes of fish kills and assist in their abatement, and to place responsibility for fish kills where it belonged.

The Surgeon General asked all State conservation and fish and game agencies to assist him by reporting instances of fish kills attributable to pollutants entering the streams or lakes of the Nation. A self-addressed postcard reporting form was devised in cooperation with the U.S. Fish and Wildlife Service and the various independent conservation organizations. The form, shown in this publication as figure 1, was furnished to the State agencies to be completed as occasions arose and mailed to the Public Health Service. Summary totals and statistical evaluations and conclusions are based upon the information contained in these reporting forms.

The fish kill activity has just completed its third year of operation. As it matures and as the reporting authorities in the States become accustomed to furnishing more complete information about each kill, the resulting publications will undoubtedly become more meaningful, and serve as a more useful tool in helping to identify and abate pollution.

In 1962, a semi-annual report was published listing reported fish kills for the period January-June, 1962. This present report includes all fish kills in 1962 which were reported by the various State agencies. Even though the resulting totals of fish killed are large, they probably represent only a fraction of fish actually killed throughout the United States by man-made pollution.

In an effort to make the reporting of these fish kills more accurate and hence the published summaries more useful and effective, it was found desirable to revise portions of the postcard reporting form. Beginning in January 1963, the revised form was put into use throughout the States and future summaries will indicate more accurately the source of pollution believed to have killed the fish. Most pollution-caused fish kills are attributable to operational activities. The revised reporting form on which next year's publication will be based indicates four principal operations causing the majority of fish kills: agricultural, industrial, municipal, and transportation operations, with appropriate subheadings. When classified in this manner, the responsibility for causing fish kills can be more accurately defined.

As the reporting forms are received from the States, copies are furnished to the U.S. Fish and Wildlife Service. Reports were excluded from the listing if it was apparent that the kill was not related to pollution. Lack of sufficient dissolved oxygen in the water from natural biological activity will kill fish, but is not necessarily related to man-made pollution. Some reports indicated kills had occurred too far in the past to determine the cause or extent. Other reports stated that pollution occurred but no fish were killed, and some referred to shellfish which died of causes not related to pollution. Of the total reports received, however, only a small number are excluded from the summary.

Acceptable reports are coded for machine punch card tabulation so that various statistical tables can be obtained. The punch card method permits the insertion of late reports in the sequence in which they occurred.

PHS–3327
REV. 8-60

DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE

(WASHINGTON USE)

Form Approved: Budget Bureau No. 68–R706

REPORT OF POLLUTION-CAUSED FISH KILL

1. LOCATION:
   Stream or Lake .....
   Nearest Town ..... State .....
2. DATE OF KILL: ..... 3. TYPE WATER: ☐ Fresh ☐ Salt ☐ Estuary
4. SOURCE OF POLLUTION:
   ☐ Mining Operations ☐ Agricultural Poisons ☐ Domestic Sewage
   ☐ Industrial Wastes ☐ Other ..... ☐ Unknown
   Specific cause if known .....
5. TYPE OF FISH KILLED
   ..... % Game
   ..... % Forage
   ..... % Rough or Trash
   100%
6. ESTIMATED NUMBER KILLED .....
7. SEVERITY:
   ☐ Total ☐ Heavy ☐ Moderate ☐ Light
8. EXTENT: Miles of stream or acres of lake affected .....
9. DURATION OF CRITICAL EFFECT: ..... days ..... hrs.

(Fold Here)

10. SIGNIFICANT CHANGES IN AQUATIC FOOD ORGANISMS .....

11. CORRECTIVE ACTION NEEDED .....

12. COMMENTS .....

REPORTING OFFICIAL	AGENCY MAILING ADDRESS	DATE

FIGURE I

POLLUTIONAL SIGNIFICANCE

The reporting and listing of fish kills caused by pollution is admittedly only a rough measure of the pollution itself. The principal fact to be gained is that a sufficient quantity of the pollutant was added to cause death of fish. There is, of course, a marked economic effect on the sport fisheries industry as well as on commercial fishing interests by the unnecessary death of millions of fish each year. But the fish kill reports do not take into account the effects of sub-lethal yet harmful quantities of pollutants discharged to surface waters which may also affect the aquatic food organisms supporting fish life, nor the effects of pollutants causing fish flesh tainting, thus rendering it unpalatable for human consumption.

Conservation organizations have expressed to the Public Health Service an interest in developing a system for reporting information on surface waters adversely affecting odors or tastes in fish flesh. Commercial fishing has been severely curtailed or ruined in areas where certain pollutants have caused off-flavors or odors in fish. The Public Health Service is interested in this problem, even though recognizing that the estab-

lishment of a standardized system of reporting would be quite difficult. It would seem that such an effort would have to be independent of the fish kill reporting activity, and studies are under consideration to determine the feasibility of initiating an effort in this direction.

Some pollution-caused fish kills have public health implications, particularly if the residual substances causing the fish deaths go through a water treatment plant unchanged and subsequently are consumed by the public (as in the case of some synthetic organic liquid wastes), but in others the health significance may be obscure. Identifying a specific toxic substance may be an involved and frequently impossible procedure. The policy has been, however, to accept the opinion of the State agency representative and to list the information submitted as being the considered judgment of the initiating State agency.

With hundreds of representatives reporting, from fish and game inspectors to professional aquatic biologists, the details of the reports do vary widely; but, as a whole, they represent a careful effort on the part of many dedicated public servants.

EXTENT OF COVERAGE

Reported fish kills included in this summary come from 38 States[1] and the District of Columbia, a decrease of 6 from the 45 States which reported fish kills in 1961. It would be a significant achievement in the control of water pollution if it were possible to say conclusively that the lack of fish kills in 12 States were attributable to a dramatic decrease in the quantities of polluting substances discharged to the surface waters in those States. The more probable explanation, however, is that fish kills which did occur went unobserved or possibly in some cases unreported. In some States, extensive efforts are made to collect reports on all fish kills. A casual examination of the numbers of reports contained under the State headings illustrates this fact. In others, this information is developed only when there is a legal prosecution for a fish kill. Not all States have the same area or quantities of surface water. Population densities and industrial and agricultural activities, all of which affect water quality, differ from State to State.

States not reporting any fish kills are: Alaska, Hawaii, Maryland, Mississippi, Nevada, New Hampshire, New Mexico, North Dakota, Oklahoma, South Carolina, South Dakota, and Vermont. These States have indicated that either no known fish kills occurred, were insignificant in size, or were not reported for other reasons. No State has been asked to modify its existing methods of self-notification, but only to pass on to the Public Health Service such information about fish kills as was developed in connection with its normal operating procedures.

[1] Reports from two of these States, Delaware and Utah, were received too late to be included in tabular analyses.

EXCEPTIONALLY LARGE FISH KILLS

During 1962, two exceptionally large fish kills occurred, involving several million fish each. One of these fish kills involved an estimated 37,800,000 anchovies off the coast of California near the San Diego Harbor entrance and is the largest single fish kill that has been reported to the Public Health Service. Although contained in the listing, this *number has been omitted from all summary tabulations* since its very size would tend to obscure any conclusions that otherwise might be obtained from the data for the rest of the United States. The other kill occurred in the Anacostia River near Washington, D.C. Details of these fish kills were thought to be of general interest to the readers of this publication.

Pacific Coastal Waters near San Diego Harbor Entrance. Mr. John F. Janssen, Manager, Region 5, California Department of Fish and Game, supplied the details of this kill.

A report was received on August 23, 1962, that a heavy fish kill had occurred east of the North Island jetty at the San Diego Harbor entrance. A game warden had investigated the kill and found dead anchovies in large deposits on the North Island Beach, the largest of which was about a quarter of a mile long and averaging some 3 feet in depth. Tests were made for dissolved oxygen at a 7-foot depth, one-half mile east of the jetty and 1 mile south of the North Island Beach. Dissolved oxygen was 6.7 ppm, only

slightly below saturation. At the same point there was a large amount of gray flocculent material floating in the water close to the surface. Moving from this area eastward there was a noticeable increase in density of the particulate matter merging into streaks on the surface. The entire area appeared to be covered uniformly with a thin layer of clear, oily material.

About two miles seaward a large crescent-shaped area one-half mile long by one-eighth mile wide was covered with oily buff colored material to a depth of one-half to 1 inch which had the appearance, feel, and smell of paint. A sample was taken for analysis.

Measurements of the dead fish deposit were 1,000 feet by 10 feet wide, with an average depth of 3 feet. At 63 pounds per cubic foot and 20 fish per pound, this amounts to 945 tons or about 37,800,000 fish.

Chemical analysis of the oily paint-like material revealed that it was indeed a fish oil, filtered and winterized and containing no vitamin A. Such oils are processed and not the same as raw oil. The particulate matter mixed in with the oil was found to be a clay-like material such as is used in filtration of oils. Volatile hydrocarbons such as light mineral spirits were found mixed with the oil.

The large amount of fish oil on the water surface was undoubtedly the cause of this fish kill. This particular oil contained light mineral spirits which are known to be toxic to fish. The shallow water area in which this kill occurred normally contains an abundant supply of anchovies and is extensively used by live-bait fishermen.

There appeared to be no sound reason for dumping this oil in such large quantities. Nearly all winterized fish oils are used in paint manufacture and the quantity that was dumped could easily have been salvaged even when mixed with the filter clay. Even after extensive investigation the source of the material remains unknown.

Anacostia River near Washington, D.C. On or about September 20, 1962, approximately 3,180,000 fish were killed in the Anacostia River near Washington, D.C. At the request of the Water Supply and Pollution Abatement Committee of the Metropolitan Washington Council of Governments, a special investigating committee of the Regional Sanitary Advisory Board made an investigation of the circumstances surrounding this fish kill. The investigating committee found that the extremely heavy fish kill appeared to have been caused primarily by the discharge of greater than usual volumes of raw sewage, coupled with the presence of algae blooms. About 40 million gallons of raw sewage were dumped into the river briefly in mid-September during an interruption in the sewerage system by construction of the Anacostia Freeway.

The size of the Anacostia kill was probably due to the chance and coincidental migration downstream of a school of alewives or branch herring. These are a type that go upstream in March from salt to fresh water to spawn. The young migrate downstream through December to return to salt water. Chances are that there would have been only a small kill if this school had not chosen the same time to migrate as the District chose to bypass additional raw sewage.

THE DATA

Fish Kill Totals. During the twelve months of 1962, 36 States[1] and the District of Columbia submitted 381 notifications of pollution-caused fish kills. (See table 1.) This number does not include one report of the exceptionally large kill in Pacific coastal waters discussed in the preceding section. This kill is shown in the individual listings at the end of the report, but is excluded from all summary tabulations.

Of the 381 usable notifications, 233 indicated the number of fish killed. The remainder, if not left blank, reported "many," "several thousand," or gave a figure in pounds or some other unquantifiable indication. These 148 reports are shown in the Cumulative Listing but in the column "Estimated number of fish killed" this item is left blank.

While the number killed is at best only an estimate, the number is used as reported without any attempt at rounding. *No artificial degree of accuracy is implied by this procedure.* It does, however, avoid the troublesome problem of balancing rounded figures between tables.

A total of nearly 6,200,000 fish were reported killed in the 233 instances where a number was given. As reported by 259 notifications, there were 1,448 miles of river affected, 25 miles of lake and bay shore and 2,581 acres of lakes, bays, and reservoirs. Of this category, there was one report covering 1,920 acres of Lake Ponchartrain in Louisiana.

[1] See footnote 1, page 3.

Source of Pollution. Of the 381 reports, 308, or 81 percent, were able to indicate the source of the pollutant. As will be seen in table 2, industrial wastes had the largest number, 163, or 53 percent of the known sources and over three times as many as the next highest category which was agricultural poisons. Since the reporting began in 1960, the relative positions of categories in numbers of reports have not changed.

In numbers of fish reported killed, domestic sewage had the highest of over 3¼ million; however, a single kill, discussed above, accounted for more than 3 million fish. Agricultural poisons had the lowest number, slightly over 91 thousand.

The average size of kills decreased about 13 percent, from 6,500 in 1960 to 5,700. The individual category average varied from 54 percent to 200 percent of the previous year. See table 3. These averages are derived after 11 reports of over 100,000 killed were removed. They were then applied to those reports not giving a number and added to the total number that were reported. On this basis the derived estimated number of fish killed represented by all 381 reports is 7,118,000.

Types of Fish Killed. Eighty-three percent of the reports gave an estimated percentage distribution of the kill among three types of fish: game, forage, and rough or trash fish. Matching percentages against the number of fish, it would appear, from table 4, that about one-fourth of the fish represented by the 381 kills were game fish, two thirds were forage fish and one-tenth were rough or trash fish.

When applied to the estimated total, it would appear that of the total 7,118,000 estimated killed, 1,769,000 were game fish, 4,704,000 were forage fish and 645,000 were rough or trash fish. Table 5 also shows comparable distribution for each pollution source. Some comment should perhaps be made regarding the distribution for domestic sewage. The figures shown were derived as stated. There is, however, some distortion introduced here by the aforementioned large kill of 3,180,000. The original report did not give a percentage distribution by type, but notations on the card plus knowledge of the locale would indicate that none of the kill was game fish type. Adjusting for this, the distribution for domestic sewage would read approximately 32,000 game, 3,262,000 forage, and 168,000 rough or trash fish.

Type of Water Body. As might be expected, most of the kills were in rivers, 85 percent or 324 of the 381 reports (table 6). Of the kills in rivers, 197 reported 5.8 million of the 6.2 million fish. The 259 giving mileage reported 1,448 miles affected, an average of 5.6 miles per kill. The 1961 average on 1,686 miles was 7.0 miles. The remaining 400,000 fish killed in 1962 were in 2,581 acres of lake and bay area and along 25 miles of shore line.

Except for the very large kill near San Diego, all but 294,000 were killed in fresh water (table 7).

Other Data. One question on the reporting form asked whether the respondent believed there was a significant change in aquatic food organisms. One hundred forty gave an opinion: 80 gave an affirmative answer, 60 replied in the negative. While only 37 percent of the reports gave a definite response, this rate of reply is 61 percent better than a year ago. The replies by source of pollution are shown in table 8.

Another item provided the respondent an opportunity to outline corrective action. One hundred forty-eight stated what they thought should be done (table 9), while 13 stated that no action was needed. Usually this meant that action had already been completed.

While only 61 percent of the respondents gave an estimate of the number of fish killed, 94 percent expressed an opinion as to the severity. That is, whether the kill was total, heavy, moderate, or light. A distribution of these replies is shown in table 10.

In addition to indicating the source of pollution, respondents were asked to name the specific causative agent if known. See table 11. Of the 381 reports 63 percent carried such an indication. This is an improvement in reply over last year. Tables 12 through 16 carry other data relating to this report.

EVALUATION OF REPORTING

In an attempt to measure its quality, the reporting was examined as to its completeness. That is, whether a definite response was given. The upper portion of table 17 shows the percentage of reports which gave answers to specific questions. These percentages were compared with the per-

centages in 1961. When the percentage in 1962 divided by the percentage in 1961 results in a value of over 100, an improvement is indicated over the previous year. A value of less than 100 indicates a decrease in completeness. These ratios are shown in the lower half of table 17. In nearly all cases the losses shown last year are offset by gains this year and vice versa. Overall in 1961, 65.6 percent of possible replies were definite responses. In 1962 the percentage was 65.7 percent. Therefore, there is neither gain nor loss in overall degree of reporting.

COMMENTS OF STATE AGENCIES

It has become a practice in this publication to include a sampling of comments contained on the reporting forms which elaborate on the circumstances of the fish kills. These comments are most pertinent and necessary to identify the real or suspected source of pollution, the action if any to correct the causes, and the significance to the aquatic life in the stream. The revised reporting form put into use on January 1, 1963, provides more space for comments to clarify the conditions of the fish kills. Comments by fish and game inspectors and aquatic biologists alike show the seriousness with which these kills are taken. Those appearing below are in most cases direct quotes from the reporting forms.

The rupture of the discharge line allowed great quantities of sulfite waste liquor to be discharged to the estuary. BOD loading was sufficient to reduce dissolved oxygen levels below that necessary to sustain all forms of fish life.

Overflow of irrigation water from treated cotton field was cause of kill. Cotton was sprayed with a solution containing 40 percent toxaphene, 20 percent DDT and 5 percent methyl parathion. Also with endrin and 7½ percent 1-Naphthyl-N-methyl-carbamate dust.

Crop dusting company poisoned cotton for the State and on finishing a trip across the cotton field they pulled up over this lake and must have dropped some into the water. Lots of bass and white crappie, a few catfish, and thousands of shad, some buffalo, and carp lined both banks.

This kill occurs almost every summer when water levels are low. The source is _____ Dye Works. The pollution is year round, but reaches lethal dosages with low water levels. Pollution consists of large quantities of detergents, and some waterproofing compounds–nearly all organic.

Cotton poisons were used extensively for 2 days, prior to heavy rainfall in excess of 3 inches. Quick runoff washed cotton poison into stream resulting in a total kill.

Kill caused by damaged septic tank containing wastes from garbage cooker located at piggeries on State Epileptic grounds. Water supply was affected. Stream was black and smelled like an open sewer. Stream conditions were improved some by flooding the stream with another source of water supply.

Fish killed by hot water. Power plant empties hot water into stream and stream was low due to prolonged hot dry spell.

Caused by blown fuse on motor pumping plant effluent from settling pool to hilltop spray. Pool overflowed.

Bait fish and fish bait killed. Crayfish were crawling out on the banks and stumps so thick that some driftwood was completely covered. This pollution is a yearly occurrence. Sewage disposal plant water loaded with bacteria goes into slow moving stream. Heavy rains take it to Conewango Creek which is stocked with channel catfish. After water runs over a small dam it picks up enough turbulence to restore oxygen so no dead fish are found below this point.

Caused by chemicals used to flush lines of power plant. Lagoon overflowed. Some of the chemicals were sodium nitrite, ammonium bifluoride, flake spec 104, hydrazine, and soda ash, plus several unknowns.

Outfall from paper mill containing lignite. When the wind comes from northeast or east, the outfall from paper company is concentrated in cover and acts as a trap for fish, due to lack of oxygen. Fish come to surface to get oxygen.

Lignite hangs to oil on fish scales after fish die and takes on same coloration as the lignite in the water.

Heavy rains in headwater mining sections caused large slug of mine acid to apparently kill many fish of all types. Estimate 97 percent of fish less than 5 inches in length. There can be very little kill above northern Lyc. Co. line as few fish live in river proper due to continuously low pH.

Caused by cyanide escaping from drains from blast furnaces at steel company. This is not this company's first offense. Witnesses state fish would swim in circles, leap in the air as if the water were too hot. Fish also would swim straight into banks and out onto shore. Many were buried in mud with only tail visible above the mud.

While the kill was caused by the discharge of 4,000 pounds of milk from an evaporating pan, effective treatment is needed for normal wastes, especially since production is being increased.

Kill was caused by oxygen depletion apparently triggered by an unauthorized application of copper sulfate applied at a time of too heavy algal bloom. It has been impossible to date to establish who conducted such treatment.

Lethal concentrations of tetrachloroethylene were found in the stream and the source established. It resulted from the reclamation of the solvent from Fuller's earth with filter material.

Diesel oil hose used to fill construction equipment faulty. Allowed oil to flow after trigger released. Siphoned even when pumps were not running. Soluble toxic materials in the oil killed the fish.

Steam explosion in boilers resulted in release of large amounts of steam and fly ash into the discharge canal. Several thousand dead channel catfish ranging in size from 6″ to 4 pounds were noted in the canal.

Grasshopper spray suspected. Period of heavy spraying was mid-August. First rainfall afterwards was on Labor Day weekend. Fish at lower end of affected area reportedly were slightly affected, but recovered. Five hundred fish were killed.

Effluent from sewage disposal plant largely responsible for prolific algae bloom depleting oxygen, and killing about 5,000 fish. Eutrophication due to effluent from plant has been apparent for several years.

Caused by liner in cooling system coming loose and plugged cooling system causing cyanide-laden water to escape into river. This was a relatively limited kill as stream had not recovered from previous very heavy kills by same steel company. Also, spill was of limited quantity.

Farmer left bags and cans containing endrin and manganese ethylene bisdithiocarbamate in stream and also spilled chemicals into water. Did not realize seriousness of this act. Agreed not to continue this procedure.

Over 1,000 fish killed by protein water from french fry plant. Bottom organisms drastically reduced throughout section and nearly depleted 3 miles below effluent due to bottom coverage by decaying algae, fungi, and protein water sludge, and low oxygen. This potato processing plant built several lagoons to restore oxygen and purify their protein water before discharge. They failed and effluent equaled or exceeded flow of the small stream. The pollution caused health problem as well in swimming pond below.

Fish poisoned by outlaws using rotenone. Investigation underway. Empty rotenone bags recovered from stream bank. This type of deliberate poisoning of fish occurs about 4 or 5 times each year in Kentucky.

Trees adjacent to the small lake were sprayed with DDT for Dutch Elm disease. This toxicant was confirmed by State Hygiene Laboratory. Over 1,000 fish were killed.

Attempt was made to lower a lake level adjacent to Lehner Lake. As the water was pumped into a sulfur pothole, it in turn overflowed into

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Lehner Lake causing the fish kill. The sulfur settled over the entire bottom of the lake.

It appears that the fish were killed by a toxic material. Possibly a slimecide used in washdown of waste plant by a box board industry.

The river was depleted of dissolved oxygen by organic material. It is believed that this was waste from the canning plant lagoon. No discharge was found from the lagoon to the stream, but the lagoon did not contain the volume of wastes that it should have for the amount of tomatoes.

A hole in a heating coil allowed the chromium solution in a plating tank to leak into the sewer system and be discharged into the Warsaw sewer system. The sewage treatment plant could not remove all the chromium.

This kill occurred in a bayou of the river. It appeared that some fisherman may have thrown toxic material into the bayou. There is no source of waste or contamination in the area around the bayou.

A field tile had broken and this allowed the tomato wastes being sprayed on the field to be discharged into the Grassy Fork of Wildcat Creek.

The town needs to install sewage treatment facilities. In April the town was ordered by the Stream Pollution Control Board to construct facilities for the abatement of pollution in Halfway Creek. A rain on the night of August 26, flushed the sewage which had accumulated in the pockets of Halfway Creek further downstream and depleted the stream of dissolved oxygen causing the fish kill.

Over 176,000 fish killed because of acid mine drainage discharged into stream. Total money value of fish killed—$36,764.60

Accidental discharge of sulfuric acid. Eradicated all aquatic life for 5 miles downstream. pH dropped to 2.0 to 3.0. Error was publicly acknowledged by the company as an error in plant operation.

Five cars of sulfuric acid derailed on creek bank. Over 11,000 gallons of acid spilled and some got into creek. Railroad company added lime in an attempt to neutralize kill, but eradication of all aquatic life extended for 4 miles.

Overdose of copper sulfate made in small pond. Party responsible arrested for applying chemicals in waters of State without necessary permit.

Area was sprayed with chloral l.p.c. previous to a heavy rain. Natural drainage of area sprayed was toward pond.

Two hundred gallons of a solution containing chlordane and heptachlor used in treating nearby residence for termites seeped into one of the ground water spring sources for the hatchery. All fish killed were rainbow trout about 8″ long.

Derailment of railroad tank car, spilling portion of load of some type of fuel oil into river, possibly some 5,000 gallons. This caused a complete kill of three species of trout for a distance of 3–4 miles, also aquatic insect life. The kill gradually decreased toward lower end of section. Dead suckers were found 20 miles from point of entry. Many distressed fish that probably will die. Very heavy oily film on water and rocks.

Methyl-mercury dicyandiamide was used to treat cotton seeds. The seeds, while going through a cotton seed delinting plant, were subjected to a concentrated sulfuric acid bath, thus releasing the substance into the sewage. Sewage plant used is inadequate.

Chemical company responsible for fish kill. Have pits under construction which will trap and hold this effluent consisting of caustic wash from vats being cleaned. Sump pump will discharge same into natural filter beds about 150 feet from stream.

TABLE 1.—*Pollution-caused fish kill summary by State*[1]

State	Total number of reports	Reporting number of fish killed		Extent of damage					
		Number of reports	Number of fish	Miles of river		Acres of lake		Miles of shore	
				Number of reports	Miles	Number of reports	Acres	Number of reports	Miles
Alabama	4		(*)	1	5				
Arizona	1		(*)	1	6				
Arkansas	1		(*)	1	2				
California	15	10	203, 105	5	27	5	129		
Colorado	2	2	11, 000	1	25				
Connecticut	9	6	2, 505	3	5	1	1		
District of Columbia	2	1	3, 180, 000	1	2				
Florida	4		(*)	4	22				
Georgia	8		(*)	8	162				
Idaho	1	1	235, 900	1	2				
Illinois	13	13	292, 455	11	126	1	3		
Indiana	21	6	7, 533	15	37	1	4		
Iowa	3	2	5, 825						
Kansas	1	1	5, 000	1	2				
Kentucky	4	2	3, 600	2	31				
Louisiana	4	1	15, 000	3	14	1	1, 920		
Maine	3	2	4, 000	3	11				
Massachusetts	1	1	100						
Michigan	6	6	101, 938	2	16				
Minnesota	3		(*)	1	2				
Missouri	13	11	13, 800	8	31	3	8	2	3
Montana	3	3	1, 850	2	28				
Nebraska	6	1	100, 000	3	12	3	8		
New Jersey	2	1	4, 000	2	16				
New York	28	15	230, 260	19	37				
North Carolina	6	6	60, 000	6	277				
Ohio	19	18	358, 024	15	40				
Oregon	1	1	1, 000	1	1				
Pennsylvania	86	69	1, 010, 260	71	243			3	3
Rhode Island	3	2	350	3	6				
Tennessee	15	11	153, 484	13	73			1	7
Texas	68	19	30, 311	37	131	6	493	1	3
Virginia	6	5	18, 100	1	4	1	2		
Washington	8	6	132, 025	4	10	3	13	1	8
West Virginia	7	7	11, 850	7	35				
Wisconsin	2	2	2, 000	1	1			1	1
Wyoming	2	2	155	2	6				
Total	381	233	6, 195, 430	259	1, 448	25	2, 581	9	25

*Number of fish not reported (see page 4 of text).

[1] Reports from Delaware and Utah received too late to be included in tabular analyses.

TABLE 2.—*Fish kill summary by source of pollution*

Source	1962			1961 [1]
	Total number of reports	Reporting number of fish killed		Reported number of fish killed
		Number of reports	Number of fish	
Mining operations	19	13	694, 932	1, 085, 685
Agricultural poisons	49	28	91, 117	[2] 257, 618
Domestic sewage	32	18	3, 279, 566	162, 335
Industrial wastes	163	107	1, 151, 577	2, 859, 005
Other sources	45	21	446, 935	[2] 5, 571, 812
Unknown	73	46	531, 303	5, 763, 768
Total	381	233	6, 195, 430	[3] 14, 918, 113

[1] 1961 data published to reflect revisions.
[2] Revised.
[3] Adds to 15,700,223 because of 782,110 fish reported from more than one source.

TABLE 3.—*Estimated average size of kill and number killed by source of pollution*

Source of pollution	Estimated average size of kill [1]			Estimated number killed [2]	
	1960	1961	1962	1961	1962
Mining operations	1, 775	5, 710	5, 310	1, 103, 000	727, 000
Agricultural poisons	2, 285	5, 990	3, 255	[3] 443, 000	159, 000
Domestic sewage	2, 830	5, 600	5, 855	291, 000	3, 362, 000
Industrial wastes	3, 950	7, 115	6, 530	3, 186, 000	1, 517, 000
Other sources	1, 910	5, 265	10, 550	[3] 5, 704, 000	700, 000
Unknown	2, 990	7, 470	4, 490	5, 965, 000	653, 000
Average for all reports	2, 925	6, 535	5, 710		
Total				[4] 16, 692, 000	7, 118, 000

[1] Adjusted to exclude reports showing 100,000 or more fish killed.
[2] Includes all fish killed as reported plus the average number killed for each source applied to those reports where no actual number was given.
[3] Revised.
[4] Includes 782,000 from more than one source of pollution.

TABLE 4.—*Estimated percentage distribution of fish killed by type*

Source of pollution	1960			1961			1962		
	Game	Forage	Rough	Game	Forage	Rough	Game	Forage	Rough
Mining operations	19. 9	74. 9	5. 2	14. 8	68. 6	16. 6	32. 2	62. 2	5. 6
Agricultural poisons [1]	46. 6	24. 9	28. 5	15. 1	71. 1	13. 8	43. 8	38. 1	18. 1
Domestic sewage	4. 2	5. 6	90. 2	20. 2	35. 9	43. 9	17. 9	77. 1	5. 0
Industrial wastes	5. 6	20. 2	74. 2	9. 0	46. 7	44. 3	19. 8	67. 2	13. 0
Other sources [1]	37. 7	24. 2	38. 1	4. 0	93. 3	2. 7	62. 7	32. 3	5. 0
Unknown	20. 9	36. 9	42. 2	0. 2	99. 4	0. 4	19. 0	54. 0	27. 0
All reports	7. 0	22. 0	71. 0	4. 9	83. 3	11. 8	24. 8	66. 1	9. 1

[1] 1961 data revised.

TABLE 5.—*Estimated number of fish killed by type by source of pollution*

Source	1961			1962		
	Game	Forage	Rough	Game	Forage	Rough
Mining operations	163, 000	757, 000	183, 000	234, 000	452, 000	41, 000
Agricultural poisons [1]	67, 000	315, 000	61, 000	70, 000	61, 000	28, 000
Domestic sewage	58, 000	105, 000	128, 000	602, 000	2, 592, 000	168, 000
Industrial waste	287, 000	1, 488, 000	1, 411, 000	300, 000	1, 020, 000	197, 000
Other sources [1]	227, 000	5, 320, 000	157, 000	439, 000	226, 000	35, 000
Unknown	12, 000	5, 929, 000	24, 000	124, 000	353, 000	176, 000
Total	814, 000	13, 914, 000	1, 964, 000	1, 769, 000	4, 704, 000	645, 000

[1] 1961 data revised.

TABLE 6.—*Fish kill summary by type of water body*

Type of water body	Total number of reports	Reporting number of fish killed		Extent of damage					
		Number of reports	Number of fish	Miles of River		Acres of Lake		Miles of Shore	
				Number of reports	Miles	Number of reports	Acres	Number of reports	Miles
River	324	197	5, 791, 940	259	1, 448				
Lake	41	25	124, 310			17	2, 439	8	17
Bay	16	11	279, 180			8	142	1	8
Total	381	233	6, 195, 430	259	1, 448	25	2, 581	9	25

TABLE 7.—*Fish kill summary by type of water*

Type of water	Total number of reports	Reporting number of fish killed	
		Number of reports	Number of fish
Fresh	363	221	5, 901, 250
Salt	8	5	91, 150
Brackish	10	7	203, 030
Total	381	233	6, 195, 430

TABLE 8.—*Response as to whether pollution caused significant changes in aquatic food organisms*

Source	Yes	No	Not stated	Total
Mining operations	3	3	13	19
Agricultural poisons	11	3	35	49
Domestic sewage	3	5	24	32
Industrial wastes	45	23	95	163
Other sources	11	10	24	45
Unknown sources	7	16	50	73
Total	80	60	241	381

TABLE 9.—*Response as to whether a specific corrective action was recommended*

Source	Yes	"None needed"	Not stated	Total
Mining operations	12	1	6	19
Agricultural poisons	24	1	24	49
Domestic sewage	12	3	17	32
Industrial wastes	83	3	77	163
Other sources	16	1	28	45
Unknown sources	1	4	68	73
Total	148	13	220	381

TABLE 10.—*Responses as to severity of kill*

Source	Total kill	Heavy kill	Moderate kill	Light kill	Not stated	Total
Mining operations	5	7	2	3	2	19
Agricultural poisons	11	21	7	10		49
Domestic sewage	6	9	8	7	2	32
Industrial wastes	31	52	43	24	13	163
Other sources	10	19	6	7	3	45
Unknown sources	6	14	24	28	1	73
Total	69	122	90	79	21	381

TABLE 11.—*Response as to whether a specific causative agent was named*

Source	Yes	Not stated	Total
Mining operations	15	4	19
Agricultural poisons	37	12	49
Domestic sewage	32	------	32
Industrial wastes	114	49	163
Other sources	37	8	45
Unknown sources	5	68	73
Total	240	141	381

TABLE 12.—*Response as to duration of critical effect of pollution kill*

Source	Yes	Not stated	Total
Mining operations	15	4	19
Agricultural poisons	31	18	49
Domestic sewage	20	12	32
Industrial wastes	124	39	163
Other sources	34	11	45
Unknown sources	41	32	73
Total	265	116	381

TABLE 13.—*Response as to giving geographic extent of kill*

Source	Yes	Not stated	Total
Mining operations	17	2	19
Agricultural poisons	34	15	49
Domestic sewage	25	7	32
Industrial wastes	127	36	163
Other sources	39	6	45
Unknown	47	26	73
Total	288	92	381

TABLE 14.—*Response as to indicating types of fish killed*

	Yes	Not stated	Total
Mining operations	17	2	19
Agricultural poisons	44	5	49
Domestic sewage	22	10	32
Industrial wastes	132	31	163
Other sources	40	5	45
Unknown sources	60	13	73
Total	315	66	381

TABLE 15.—*Fish kill summary by date of kill*

Month	Total number of reports	Reporting number of fish killed	
		Number of reports	Number of fish
January	6	5	241, 567
February	8	4	82, 026
March	12	10	247, 065
April	37	17	44, 765
May	53	38	90, 342
June	56	37	361, 150
July	69	43	475, 477
August	49	24	125, 859
September	47	31	[1] 3, 701, 907
October	31	16	676, 638
November	9	7	144, 634
December	4	1	4, 000
Total	381	233	6, 195, 430

[1] Includes 1 report of 3,180,000.

TABLE 16.—*Frequency distribution of reported duration of critical effect*
(Number of reports showing kills lasting indicated number of days)

Days	Mining operations	Agricultural poisons	Domestic sewage	Industrial wastes	Other sources	Unknown	Total
<1		4	1	21	2	12	40
1	4	5	9	33	7	11	69
2	4	7	4	30	15	7	67
3	2	5	2	19	2	5	35
4	1	3	1	1	4	1	11
5		4		8	2	2	16
6	1		1	1		2	5
7	3	1	1	5		1	11
8							
9				1			1
10		1	1	2	2		6
14		1		1			2
32				1			1
60				1			1
Total	15	31	20	124	34	41	265

TABLE 17.—*Percentage of definite responses to selected questions*

	Number killed	Specific agent	Type of fish	Severity of kill	Miles affected	Duration of effect	Food change	Corrective action
Mining operations	68	79	89	90	89	79	32	68
Agricultural poisons	57	76	90	100	69	63	29	51
Domestic sewage	56	100	69	94	78	62	25	47
Industrial wastes	66	70	81	92	78	76	42	53
Other sources	47	82	89	93	87	76	47	38
Unknown	63	7	82	99	64	56	32	7
All reports	61	63	83	94	76	70	37	42
Ratio of Percentages, 1962 to 1961								
Mining operations	81	107	94	95	100	79	152	86
Agricultural poisons	97	185	94	103	91	80	126	80
Domestic sewage	100	100	87	104	116	98	167	76
Industrial wastes	86	130	96	100	103	100	162	78
Other sources	81	121	102	109	121	112	142	58
Unknown	97	88	105	109	96	84	213	20
All reports	94	121	98	102	104	96	161	69

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RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL			IMPUTED CAUSE OF KILL						TYPE OF FISH KILLED (PERCENT)			ESTIMATED NUMBER OF FISH KILLED	SEVERITY				ESTIMATED MILES OR ACRES AFFECTED	DURATION OF CRITICAL EFFECT	
		MONTH	DAY	YEAR	(1) MINING OPERATIONS	(2) AGRICULTURAL POISONS	(3) DOMESTIC SEWAGE	(4) INDUSTRIAL WASTES	(5) OTHER	(6) UNKNOWN	GAME	FORAGE	TRASH		TOTAL (1)	HEAVY (2)	MODERATE (3)	LIGHT (4)		DA.	HR.
ALABAMA																					
SWAN CREEK	ATHENS	5	14	62			3				-			-				-	-	-	-
CAHABA RIVER	BRENT	9	--	62				4			5	0	95	-		2			-	1	-
TOMBIGBEE RIVER	NAHEOLA	9	--	62				4			-			-				-	-	-	-
BIG CREEK	TUSCALOOSA	8	26	62			3				8	0	92	-	1				5M	-	-
ARIZONA																					
BUCKEYE CANAL	BUCKEYE	10	3	62			3				10	0	90	-		2			6M	7	-
ARKANSAS																					
VILLAGE CREEK	NEWPORT	2	16	62			3				5	5	90	-				4	2M	1	-
CALIFORNIA																					
PALO VERDE N DRN	BLYTHE	10	27	62						6	31	0	69	37,000	1				4M	3	-
PALO VERDE W DRN	BLYTHE	9	22	62		2					15	5	80	9,000	1				11M	-	-
GOLETA SLOUGH	GOLETA	6	8	62			3				20	80	0	60,000		2			20A	1	-
LOS ANGELES RIV	LONG BEACH	10	30	62						6	0	100	0	5,000			3		5M	-	-
MARTINEZ HARBOR	MARTINEZ	7	6	62						6	100	0	0	30				4	-	-	-
SACRAMENTO RIVER	REDDING	2	13	62	1						100	0	0	-		2			4M	2	-
RICHMOND HARBOR	RICHMOND	7	30	62						6	0	100	0	75			3		-	-	12
PALO VERDE CANAL	RIPLEY	10	2	62						6	74	0	26	-	1				3M	-	-
SAN PABLO BAY	RODEO	7	20	62				4			100	0	0	1,000		2			-	-	12
SAN FRNCISCO BAY	SAN FRANCISCO	7	23	62			3				-			-			3		-	-	6
COASTAL WATERS	SAN DIEGO	8	23	62					5		0	100	0	37,800,000		2			-	-	-
LOS ANGELES HARB	SAN PEDRO	1	1	62					5		0	100	0	75,000		2			25A	4	-
LOS ANGELES HARB	SAN PEDRO	9	28	62				4			0	100	0	1,000			3		34A	-	-
LOS ANGELES HARB	SAN PEDRO	11	13	62				4			0	100	0	15,000			3		30A	-	-
SAN FRNCISCO BAY	S SAN FRANCISCO	3	30	62						6	0	100	0	-				4	20A	1	-
DENVERTON SLOUGH	SUISON	10	13	62						6	-			-			3		-	-	-
COLORADO																					
DURANGO HATCHERY	DURANGO	4	24	62		2					100	0	0	7,000		2			-	4	-
EAGLE RIVER	MINTURN	12	2	62					5		95	5	0	4,000	1				25M	10	-
CONNECTICUT																					
MATTABASSET R	BERLIN	5	17	62		2					100	0	0	-				4	-	-	-
CHILD MUSEM POND	CANTON	6	18	62		2					0	100	0	-				4	1A	-	-
CHERRY BROOK	CANTON	6	18	62		2					50	0	50	25				4	1M	7	-
WINNS POND	EAST WINDSOR	8	24	62		2					25	75	0	240	1				-	-	-
FARM RIVER	N BRANFORD	7	25	62					5		10	90	0	220		2			2M	2	-
TRIB BISSELL BRK	NORTH GRANBY	5	21	62		2					-			-				4	2M	-	-
HOCKANUM RIVER	ROCKVILLE	5	7	62						6	0	100	0	20				4	-	-	-
GRAZIANO POND	SUFFIELD	6	20	62		2					100	0	0	1,000		2			-	2	-
MET DIST RFS 263	WEST HARTFORD	5	25	62		2					60	20	20	1,000			3		-	4	-
DELAWARE																					
BROAD CREEK	LAUREL	4	19	62					5		40	60	0	-		2			6M	3	-
DELAWARE RIVER	NEW CASTLE	6	7	62						6	40	60	0	-		2			-	-	-
REHOBOTH BAY	REHOBOTH BEACH	6	8	62						6	10	90	0	-		2			15A	1	-
DIST. OF COLUMBIA																					
POTOMAC RIVER	DIST OF COL	9	10	62			3				-			-		2			2M	2	-
ANACOSTIA RIVER	DIST OF COL	9	20	62			3				-			3,180,000		2			-	-	-

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		MONTH	DAY	YEAR	MINING OPERATIONS (1)	AGRICULTURAL POISONS (2)	DOMESTIC SEWAGE (3)	INDUSTRIAL WASTES (4)	OTHER (5)	UNKNOWN (6)	GAME	FORAGE	TRASH		TOTAL (1)	HEAVY (2)	MODERATE (3)	LIGHT (4)		DA.	HR.
FLORIDA																					
TROUT RIVER	DINSMORE	2	26	62				4			40	20	40	-			3		2M	2	-
ESCAMBIA RIVER	PENSACOLA	5	15	62				4			25	0	75	-		2			2M	-	18
ESCAMBIA RIVER	PENSACOLA	7	6	62				4			90	0	10	-		2			3M	-	12
LITTLE RIVER	QUINCY	6	5	62				4			95	5	0	-		2			15M	3	-
GEORGIA																					
CHATTAHOOCHE RIV	ATLANTA	1	16	62				4			15	0	85	-				4	100M	3	-
OCHLOCKONEE RIV	CAIRO	8	3	62				4			-			-	1				10M	2	-
PETTIT CREEK	CARTERSVILLE	7	26	62					5		-			-				-	4M	-	-
CANOOCHEE RIVER	CLAXTON	9	7	62				4			-			-	1				10M	2	-
ECHECONNEE CREEK	MACON	12	7	62					5		20	0	80	-				4	10M	4	-
OKPIKO CREEK	MOULTRIE	7	26	62				4			-			-	1				17M	-	-
WAHOO CREEK	NEWNAN	2	22	62			3				-			-	1				6M	3	-
OOSTANAULA RIVER	ROME	7	20	62				4			-			-	1				5M	2	-
IDAHO																					
RILEY CREEK	HAGERMAN	3	19	62					5		100	0	0	235,900		2			2M	-	6
ILLINOIS																					
RICHLAND CREEK	BELLEVILLE	5	18	62	1						100	0	0	4,171				4	3M	-	-
SUGAR CREEK	BLOOMINGTON	7	26	62			3				1	5	94	869			3		3M	-	-
BIG MUDDY RIVER	CARBONDALE	5	28	62				4			56	9	35	17,930		2			4M	2	-
MACOUPIN CREEK	CARLINVILLE	8	6	62	1						-			27,341		2			33M	2	-
SPOON RIVER	DAHINDA	9	26	62	1						22	60	18	176,523		2			17M	6	-
E BR KICKAPOO CR	DUNLAP	7	14	62				4			24	76	0	8,709	1				11M	5	-
S FK SAGAMON RIV	EDINBURG	7	15	62	1						37	24	39	2,419				4	22M	-	-
HORSESHOE LAKE	GRANITE CITY	11	19	62				4			100	0	0	17,824			3		3A	5	-
KYTE RIVER	ROCHELLE	11	18	62			3				0	81	19	16,250			3		6M	2	-
SANGAMON RIVER	SPRINGFIELD	8	8	62	1						37	22	41	10,061			3		23M	1	-
YELLOW CREEK	STOCKTON	6	26	62						6	1	84	15	1,695				4	1M	-	-
YELLOW CREEK	STOCKTON	8	14	62				4			3	54	43	6,727	1				3M	2	-
ATWD TRIB YEL CR	STOCKTON	8	11	62				4			1	81	18	1,936		2			-	1	-
INDIANA																					
HALFWAY CREEK	ALBANY	8	27	62			3				-			-				4	2M	1	-
DORSEY DITCH	CHALMERS	6	19	62				4			-			-			3		5M	1	-
BIG MOON DITCH	FRANCESVILLE	6	20	62				4			-			3,708			3		7M	-	6
PRAIRIE CREEK	FRANKFORT	5	2	62				4			-			200			3		2M	-	-
WOLF LAKE	HAMMOND	4	11	62						6	-			-				4	-	-	-
W FORK WHITE RIV	INDIANAPOLIS	10	5	62				4			-			-		2			2M	2	-
BUCK CREEK	LAGRANGE	5	28	62					5		-			-				4	-	-	-
WHITE RIVER	MUNCIE	6	28	62			3				-			100				4	1M	1	-
GR FK WILDCAT CR	POINT ISABEL	9	15	62				4			-			-				4	3M	1	-
UNNAMED STREAM	ROCHESTER	9	7	62						6	-			-			3		-	3	-
KANKAKEE RIVER	SCHNEIDER	7	15	62						6	-			-			3		-	1	-
SLASH CREEK	SHELBYVILLE	6	6	62					5		-			450			3		3M	2	-
LITTLE BUCK CR	SOUTHPORT	5	21	62				4			0	50	50	75				4	-	-	1
EAGLE CREEK	SPEEDWAY	10	--	62					5		0	90	10	-				4	2M	2	-
EAGLE CREEK	TRADERS POINT	10	--	62						6	10	0	90	-				4	1M	-	-
BLACK CREEK	VAN BUREN	10	13	62						6	-			-			3		3M	-	-
WABASH RIVER	WABASH	7	6	62						6	-			-			3		1M	1	-
WABASH RIVER	WABASH	8	3	62				4			-			-			3		1M	1	-
SALAMONIE RIVER	WARREN	9	15	62				4			-			-		2			3M	2	-
WALNUT CREEK	WARSAW	9	19	62				4			-			-			3		1M	1	-
LEHNER LAKE	YOUNGSTOWN	11	15	62					5		2	0	98	3,000				4	4A	2	-
IOWA																					
GRAND VIEW POND	DES MOINES	10	27	62		2					10	0	90	1,000			3		-	3	-
OLD CITY RESERVR	MT AYR	6	8	62					5		100	0	0	4,825		2			-	2	-
FLOYD RIVER	SIOUX CITY	4	6	62				4			0	0	100	-				4	-	1	-

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RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL			IMPUTED CAUSE OF KILL						TYPE OF FISH KILLED (PERCENT)			ESTIMATED NUMBER OF FISH KILLED	SEVERITY				ESTIMATED MILES OR ACRES AFFECTED	DURATION OF CRITICAL EFFECT	
		MONTH	DAY	YEAR	MINING OPERATIONS (1)	AGRICULTURAL POISONS (2)	DOMESTIC SEWAGE (3)	INDUSTRIAL WASTES (4)	OTHER (5)	UNKNOWN (6)	GAME	FORAGE	TRASH		TOTAL (1)	HEAVY (2)	MODERATE (3)	LIGHT (4)		DA.	HR.
KANSAS																					
PAWNEE RIVER	BURDETT	6	15	62				4			40	5	55	5,000		2			2M	-	-
KENTUCKY																					
BANKLICK CREEK	COVINGTON	10	5	62				4			10	30	60	1,600	1				-	1	-
HORSE CREEK	MANCHESTER	9	16	62	1						10	80	10	2,000			3		-	1	-
RED BIRD RIVER	MANCHESTER	7	21	62					5		20	20	60	-	1				1M	4	-
S CUMBERLAND RIV	STEARNS	6	--	62	1						5	10	85	-		2			30M	2	-
LOUISIANA																					
BOGUE LUSA CREEK	BOGALUSA	4	11	62				4			10	20	70	-			3		1M	1	-
OUACHITA RIVER	MONROE	6	29	62		2					3	10	87	-		2			2M	1	-
L PONCHARTRAIN	NEW ORLEANS	6	29	62						6	20	30	50	15,000			3		1,920A	6	-
OUACHITA RIVER	STERLINGTON	7	12	62		2					20	20	60	-				4	11M	2	-
MAINE																					
PRESTILE STREAM	EASTON	6	20	62				4			15	0	85	1,000		2			8M	60	-
MEDUXNEKEAG RIV	HOULTON	7	--	62				4			0	0	100	3,000	1				1M	2	-
HALFMOON STREAM	THORNDIKE	7	31	62		2					0	50	50	-		2			2M	-	-
MASSACHUSETTS																					
SHAWSHEEN RIVER	ANDOVER	6	22	62				4			50	10	40	100		2			-	-	-
MICHIGAN																					
FITTS CREEK	ADDISON	6	16	62					5		7	60	33	12,643				-	6M	-	-
EBERHARD LAKE	BURR OAK	6	25	62		2					75	0	25	3,675		2			-	3	-
STONE LAKE	CASSOPOLIS	9	14	62			3				80	20	0	4,950			3		-	-	-
SHIAWASSEE RIVER	OWOSSO	6	16	62				4			35	0	65	76,875	1				10M	-	-
FISH CREEK	STANTON	6	28	62		2					50	0	50	1,744		2			-	-	-
RABBIT RIVER	WAYLAND	8	25	62				4			1	33	66	2,051			3		-	-	-
MINNESOTA																					
BUFFALO RIVER	GLENCOE	9	17	62				4			0	0	100	-				-	-	-	-
MINNESOTA RIVER	LESUEUR	9	22	62				4			0	0	100	-		2			-	-	-
WILLOW CREEK	ROCHESTER	6	3	62				4			0	50	50	-	1				2M	-	-
MISSOURI																					
STOUTS CREEK	ARCADIA	7	1	62					5		2	80	18	1,500	1				1M	3	-
CENTER CREEK	CARTHAGE	8	6	62				4			-			-		2			8M	2	-
BIG CEDAR CREEK	COLUMBIA	10	25	62	1						50	50	0	8,000		2			12M	2	-
FARM POND	COLUMBIA	7	10	62		2					0	100	0	100		2			2A	-	-
FOXRIVER	KAHOKA	9	4	62		2					30	0	70	500		2			2M	2	-
CNL MONTROSE LK	LADUE	8	11	62				4			100	0	0	-		2			1M	2	-
MONTROSE LAKE	LADUE	2	16	62				4			60	40	0	100			3		1M	1	-
MONTROSE LAKE	LADUE	4	24	62				4			50	50	0	1,000			3		1A	2	-
HONEY CREEK	MARIONVILLE	5	9	62				4			15	0	85	1,500		2			1M	-	12
MEYER LAKE	MARSHALL	5	1	62				4			0	100	0	200			3		5A	10	-
LAKE SPRINGFIELD	SPRINGFIELD	9	5	62				4			50	50	0	600			3		2M	3	-
PEARSON CREEK	SPRINGFIELD	8	3	62				4			10	90	0	100	1				1M	3	-
WILSON CREEK	SPRINGFIELD	5	10	62				4			0	100	0	200			3		5M	2	-

REPORT OF POLLUTION-CAUSED FISH KILLS
CUMULATIVE LISTING OF REPORTS RECEIVED AS OF DATE OF TABULATION

RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL			IMPUTED CAUSE OF KILL						TYPE OF FISH KILLED (PERCENT)			ESTIMATED NUMBER OF FISH KILLED	SEVERITY				ESTIMATED MILES OR ACRES AFFECTED	DURATION OF CRITICAL EFFECT	
		MONTH	DAY	YEAR	MINING OPERATIONS (1)	AGRICULTURAL RUNOFF (2)	DOMESTIC SEWAGE (3)	INDUSTRIAL WASTES (4)	OTHER (5)	UNKNOWN (6)	GAME	FORAGE	TRASH		TOTAL (1)	HEAVY (2)	MODERATE (3)	LIGHT (4)		DA.	HR.
MONTANA																					
L BOULDER RIVER	BOULDER	7	2	62		2					88	12	0	200				4	18M	-	-
COTTONWOOD CREEK	BOZEMAN	7	18	62		2					70	30	0	1,000		2			-	-	-
CLARK FK COL R	DEER LODGE	7	27	62						6	92	0	8	650			3		10M	2	-
NEBRASKA																					
SCHUETZ LAKE	CHENEY	7	9	62		2					90	5	5	-		2			3A	5	-
WOOD RIVER	GRAND ISLAND	10	15	62				4			10	80	10	100,000	1				2M	-	-
REDDISH LAKE	HALLAM	6	10	62						6	0	1	99	-	1				4A	-	-
HEARTWELL PARK L	HASTINGS	4	15	62					5		98	2	0	-		2			1A	5	-
LOST CREEK	SCHUYLER	7	10	62					5		1	0	99	-		2			2M	-	-
SHELL CREEK	SCHUYLER	8	16	62						6	50	2V	5	-		2			8M	-	-
NEW JERSEY																					
DELAWARE RIVER	BURLINGTON	6	1	62						6	10	90	0	4,000		2			15M	5	-
CHESNUT BRANCH	SEWELL	4	28	62			3				0	0	100	-			3		1M	2	-
NEW YORK																					
SUSQUEHANNA RIV	BINGHAMTON	7	17	62			3				-			1,000			3		-	-	-
BROCKPORT CREEK	BROCKPORT	6	30	62				4			-			1,000	1				1M	-	-
COHOCTON RIVER	COHOCTON	8	29	62				4			10	20	70	-		2			2M	-	-
SANDBURG CREEK	ELLENVILLE	6	--	62					5		20	60	20	-	1				1M	-	-
CHEMUNG RIVER	ELMIRA	7	20	62						6	30	40	30	200,000		2			5M	-	-
BUSH KILL	FLEISCHMANNS	10	28	62					5		25	45	30	-		2			3M	2	-
EAST KAY	GAINESVILLE	8	19	62						6	30	40	30	300		2			1M	-	-
LITTLE BLACK CR	GATES	5	17	62						6	-			-				4	-	-	-
OWASCO INLET	GROTON	6	27	62						6	0	0	100	200			3		-	-	-
TRIB 11 18 MI CR	HAMBURG	10	2	62					5		0	60	40	-			3		1M	-	-
WEST CREEK	HAMLIN	10	2	62				4			0	60	40	-	1				2M	2	-
RAMAPO RIVER	HARRIMAN	5	28	62						6	20	60	20	-	1				2M	-	-
JOHNSONS CREEK	LYNDONVILLE	11	18	62						6	10	60	30	-		2			3M	-	-
ORISKANY CREEK	LYONS MILL	8	21	62				4			20	50	30	-		2			3M	-	-
CANANDAIGUA RIV	MANCHESTER	9	24	62				4			10	60	30	3,000		2			2M	2	-
GENESEE RIVER	MT MORRIS	8	30	62				4			-			-				-	-	-	-
NASSAU LAKE	NASSAU	8	25	62					5		10	60	30	10,000		2			-	2	-
L BROKENSTREAM	NIOBE	8	11	62						6	-			-			3		1M	-	-
ONEIDA CREEK	ONEIDA	5	31	62			3				0	60	40	450		2			1M	1	-
HACKENSACK RIVER	ORANGEBURG	6	12	62				4			10	50	40	3,000	1				-	-	12
BEAR CREEK	PIERREPONT MANR	9	9	62				4			0	60	40	2,000	1				-	-	-
SENECA RIVER	SENECA FALLS	9	3	62			3				-			3,000				-	-	-	-
TAYLOR CREEK	SHERRILL	7	5	62				4			0	80	20	1,000	1				1M	-	-
JOE & CATLIN CRS	SLATE HILL	5	9	62				4			0	90	10	250		2			1M	1	-
W BR DELAWARE R	STAMFORD	7	1	62					5		10	30	60	-		2			3M	-	-
LAKE AUTRIM	SUFFERN	5	29	62						6	0	0	100	-				4	-	-	-
ELLICOTT CREEK	TONAWANDA	4	30	62						6	10	70	20	60				4	1M	-	-
BIG CR WTRVIL BR	WATERVILLE	8	8	62				4			15	40	45	5,000	1				3M	-	-
NORTH CAROLINA																					
FRENCH BROAD RIV	BREVARD	7	5	62				4			1	0	99	10,000	1				19M	1	-
NE CAPE FEAR RIV	MT OLIVE	5	30	62				4			25	37	38	10,000				-	3M	-	-
LONG CREEK	ROBBINSVILLE	6	13	62			3				100	0	0	500	1				2M	-	-
ROANOKE RIVER	WELDON	7	14	62						6	-			17,500			3		120M	5	-
ROANOKE RIVER	WELDON	8	2	62						6	1	4	95	20,000		2			130M	6	-
CONTENEA CREEK	WILSON	6	15	62				4			25	0	75	2,000		2			3M	2	-
OHIO																					
WILLS CREEK	CAMBRIDGE	10	9	62						6	35	15	50	1,050				4	1M	-	-
SOUTH CREEK	CLYDE	8	20	62				4			25	25	50	-	1				-	-	-
OLENTANGY RIVER	COLUMBUS	7	12	62				4			2	15	83	18,365			3		2M	1	-
GREAT MIAMI RIV	DAYTON	5	24	62				4			10	0	90	120				4	-	2	-
RILEY CREEK	FOSTORIA	6	27	62				4			5	50	45	10,000	1				5M	4	-
GREAT MIAMI RIV	HAMILTON	6	29	62				4			0	90	10	106,750			3		1M	3	-
BLACK RIVER	LORAIN	9	4	62						6	10	90	0	60,000		2			4M	2	-

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		MONTH	DAY	YEAR	MINING OPERATIONS (1)	AGRICULTURAL POISONS (2)	DOMESTIC SEWAGE (3)	INDUSTRIAL WASTES (4)	OTHER (5)	UNKNOWN (6)	GAME	FORAGE	TRASH		TOTAL (1)	HEAVY (2)	MODERATE (3)	LIGHT (4)		DA.	HR.
OHIO																					
DUCK CREEK	MARIETTA	7	15	62						6	1	97	2	7,000			3		1M	1	-
THORN RUN	MT GILEAD	4	1	62						6	-			65				4	6M	-	-
BARREL RUN	NEW MILFORD	5	14	62				4			5	95	0	800			3		2M	-	-
E FK L MIAMI RIV	NEW VIENNA	9	5	62				4			10	60	30	13,569			3		3M	-	-
S FK LICKING CR	PATASKALA	7	5	62			3				1	99	0	700			3		2M	-	-
STORMS CREEK	SPRINGFIELD	3	28	62				4			-			2,800			3		-	-	-
BROKEN SWORD CR	SYCAMORE	7	3	62					5		1	99	0	1,202			3		1M	1	-
LITTLE CREEK	UNION	9	4	62						6	5	85	10	133,803		2			6M	-	-
GREENVILLE CREEK	UNION CITY	6	20	62			3				15	50	35	850	1				2M	-	-
OTTAWA CREEK	VENTON RIDGE	6	7	62						6	20	50	30	125				4	1M	1	-
E FK POINT CREEK	WASH CT HOUSE	6	16	62						6	5	15	80	800			3		3M	3	-
RATTLESNAKE CR	WASH CT HOUSE	6	18	62						6	10	0	90	25				4	-	-	-
OREGON																					
LOST RIVER	KLAMATH FALLS	7	30	62		2					20	0	80	1,000		2			1M	-	-
PENNSYLVANIA																					
BOW CREEK	WRIGHT TWP	5	31	62				4			90	10	0	50			3		1M	-	-
BRODHEADS CREEK	SMITHFIELD TWP	5	27	62				4			40	60	0	12,380		2			1M	3	-
LITTLE MUDDY CR	ADAMSTOWN	7	3	62					5		50	50	0	225			3		1M	1	-
CONNEAUT CREEK	ALBION	8	22	62				4			40	60	0	1,170			3		-	1	-
L LEHIGH RIVER	ALBURTIS	8	3	62		2					40	60	0	-			3		-	-	12
JORDAN CREEK	ALLENTOWN	5	--	62					5		100	0	0	300		2			1M	1	-
JORDAN CREEK	ALLENTOWN	7	13	62				4			50	50	0	7,625		2			1M	1	-
TROUT CREEK	ALLENTOWN	5	24	62					5		50	50	0	-	1				1M	2	-
TROUT CREEK	ALLENTOWN	9	8	62				4			50	50	0	1,000		2			1M	1	-
QUITTAPAHILLA CR	ANNVILLE	3	29	62				4			100	0	0	2,000		2			3M	7	-
MARTINS CREEK	BANGOR	4	23	62				4			40	60	0	1,075		2			1M	1	-
MONOCACY CREEK	BATH	7	17	62				4			50	50	0	293			3		1M	1	-
KISHACOQUILLA CR	BELLEVILLE	7	24	62				4			55	45	0	3,594		2			2M	3	-
SUSQUEHANNA RIV	BERWICK	8	28	62				4			-			-				-	30M	7	-
L C N CANAL	BETHLEHEM	5	18	62				4			40	60	0	150			3		1M	2	-
LEHIGH RIVER	BETHLEHEM	9	13	62				4			60	40	0	16,000		2			1M	3	-
LEHIGH RIVER	BETHLEHEM	10	26	62				4			50	50	0	1,170			3		3M	5	-
MONOCACY CREEK	BETHLEHEM	5	22	62						6	50	50	0	178			3		1M	7	-
SWAMP CREEK	BOYERTOWN	7	27	62						6	30	70	0	400				4	1M	2	-
TUNUNGWANT CREEK	BRADFORD	6	--	62						6	35	65	0	-		2			-	3	-
CONNOQUENESSING	NO BUTLER	8	17	62				4			10	90	0	13,000		2			1M	3	-
TOWANDA CREEK	CANTON	6	26	62				4			50	50	0	2,520	1				1M	2	-
LETORT SPRNGS RN	CARLISLE	5	15	62			3				100	0	0	350		2			1M	1	-
SUCKER RUN	COATESVILLE	9	13	62				4			35	65	0	783			3		-	1	-
W BR BRANDYWINE	COATESVILLE	9	16	62				4			60	40	0	28				4	-	-	12
PARK RUN	DOWNINGTOWN	7	29	62				4			40	60	0	110				4	1M	-	12
SINNEMAHONING CR	DRIFTWOOD	9	17	62				4			80	20	0	16				4	-	-	6
DELAWARE RIVER	EASTON	8	28	62				4			50	50	0	7,000		2			3M	2	-
CONOY CREEK	ELIZABETHTOWN	5	4	62						6	-			8,100		2			-	-	-
PINE CREEK	ENTERPRISE	8	14	62						6	45	55	0	2,500				-	1M	2	-
COCALICO CREEK	EPHRATA	9	23	62						6	40	60	0	122				4	1M	-	12
LAKE ERIE	ERIE	6	--	62				4			40	60	0	200				4	1M	-	12
LAKE ERIE	ERIE	9	--	62				4			40	60	0	400				4	1M	1	-
DELAWARE RIVER	ERWINNA	1	20	62				4			60	40	0	16,876		2			3M	3	-
QUEEN ANNES CR	FAIRLESS HILLS	9	6	62				4			30	70	0	32				4	-	1	-
FRENCH CREEK	FRANKLIN	5	7	62				4			30	70	0	-			3		2M	1	-
NANCY RUN CREEK	FREEMANSBURG	5	25	62					5		50	50	0	39				4	1M	-	2
JORDAN CREEK	GERMANSVILLE	8	11	62		2					50	50	0	2,000	1				-	-	-
SCRUBGRASS CREEK	GOHEENVILLE	3	28	62	1						-			-				-	-	-	-
KERSHNER CREEK	HAMBURG	10	28	62				4			20	80	0	3,000		2			1M	2	-
KINZUA CREEK	HAMLIN TWP	10	11	62				4			50	50	0	17,318	1				3M	5	-
N W PERKIOMEN CR	HUFFS CHURCH	7	--	62				4			40	60	0	-	1				1M	2	-
SAUCON CREEK	LANARK	8	9	62					5		30	70	0	-			3		1M	1	-
BIG CONESTOGA CR	LANCASTER	7	25	62						6	80	20	0	118				4	1M	-	12
EVENING BRANCH	LEBANON	3	--	62	1						100	0	0	46	1				1M	1	-
BENNETT RUN	LEWISBERRY	8	31	62					5		20	80	0	1,800		2			2M	2	-
SUSQUEHANNA RIV	LEWISBURG	9	2	62	1						40	60	0	-	1				12M	7	-
BLOCKHOUSE CREEK	LIBERTY	5	16	62				4			40	60	0	5,680		2			3M	1	-
DELAWARE RIVER	LUMBERVILLE	2	4	62				4			20	80	0	76,626		2			65M	3	-
SUSQUEHANNA RIV	LYCOMING CO	10	1	62	1						35	65	0	460,000				-	25M	3	-
ONTELAUNEE CREEK	LYNNPORT	7	12	62		2					50	50	0	16,450	1				3M	5	-
COVE CREEK	MCCONNELLSBURG	6	--	62		2					70	30	0	-			3		1M	2	-
OYSTERDALE CREEK	MANATAWNY	10	19	62		2					50	50	0	1,000		2			1M	1	-
TEN MILE CREEK	MARIANNA	8	26	62	1						35	65	0	-	1				5M	7	-
INDIAN CREEK	MELCROFT	7	3	62	1						50	50	0	3,471		2			2M	4	-
MIDDLE CREEK	MIDDLEBURG	7	21	62				4			20	80	0	6,000			3		1M	3	-
WEST MILL CREEK	MONTOURSVILLE	8	--	62			3				-			-				4	-	-	-

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RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL			IMPUTED CAUSE OF KILL						TYPE OF FISH KILLED (PERCENT)			ESTIMATED NUMBER OF FISH KILLED	SEVERITY				ESTIMATED MILES OR ACRES AFFECTED	DURATION OF CRITICAL EFFECT	
		MONTH	DAY	YEAR	(1) MINING OPERATIONS	(2) AGRICULTURAL POISONS	(3) DOMESTIC SEWAGE	(4) INDUSTRIAL WASTES	(5) OTHER	(6) UNKNOWN	GAME	FORAGE	TRASH		TOTAL (1)	HEAVY (2)	MODERATE (3)	LIGHT (4)		DA.	HR.
PENNSYLVANIA CONT.																					
SWAMP CREEK	MORGANTOWN	3	27	62					5		20	80	0	119		2			1M	2	-
TULPEHOCKEN CR	MYERSTOWN	5	29	62		2					100	0	0	83			3		1M	1	-
MILL CREEK	NEW HOLLAND	5	12	62						6	100	0	0	81			3		1M	1	-
BOWMENS CREEK	NOXEN	1	23	62				4			15	85	0	24,341		2			5M	2	-
OIL CREEK	OIL CITY	8	3	62				4			30	70	0	-			3		1M	2	-
OIL CREEK	OIL CITY	10	1	62						6	50	50	0	250			3		1M	1	-
SPRUCE CREEK	PA FURNACE	6	7	62				4			20	80	0	9,000				-	2M	1	-
LITTLE SANDY CR	POLK	5	22	62			3				25	75	0	35				4	1M	1	-
DELAWARE RIVER	PORTLAND	7	26	62				4			100	0	0	8				4	1M	1	-
E BR CODORUS CR	POTOSI	3	27	62				4			20	80	0	300				4	1M	1	-
MAHONING CREEK	PUNXSUTAWNEY	8	22	62				4			0	0	100	500			3		1M	32	-
MOUSE CREEK	RED CROSS	7	30	62				4			20	80	0	5,137			3		1M	1	-
CONEWANGO CREEK	RUSSELL	10	15	62			3				0	100	0	10,000	1				2M	3	-
RAYSTOWN BR	SAXTON	8	6	62				4			65	35	0	3,441		2			5M	3	-
TRIB TO MILL CR	SCHNECKSVILLE	5	26	62					5		25	75	0	-	1				2M	2	-
TRIB PENNS CREEK	SELINSGROVE	8	23	62			3				40	60	0	12				4	1M	2	-
MCCOLLOUGH RUN	SHARPSVILLE	4	13	62				4			10	90	0	24,420		2			-	2	-
LACKAWANNA RIVER	SIMPSON	9	8	62				4			20	80	0	70,262	1				3M	7	-
POQUESSING CREEK	SOMERTON	7	12	62				4			15	85	0	147,232	1				3M	5	-
PEQUEA CREEK	STRASBURG	9	18	62						6	50	50	0	277				4	1M	-	12
TRIB/PARADISE CR	THOMASVILLE	9	26	62					5		10	90	0	8,142		2			3M	2	-
SO BR GLADE RUN	TWIN WILLOWS	7	7	62				4			0	100	0	300				4	1M	-	12
PINE CREEK	VALLEY VIEW	6	30	62				4			100	0	0	40				4	1M	-	12
L CONNEAUTEE CR	WATERFORD	9	3	62	2						0	80	20	100				4	1M	1	-
FIVE FORKS CREEK	WAYNESBORO	6	--	62	2						50	50	0	-		2			1M	1	-
L ANTIETAM CR	WAYNESBORO	6	13	62					5		40	60	0	-		2			1M	1	-
TRIB LAUREL E CR	WELLS TANNERY	5	--	62	1						0	100	0	-	1				1M	7	-
MILL/CODORUS CR	YORK	11	18	62				4			40	60	0	6,985		2			4M	2	-
CROOKED RUN CR	ZIONS GROVE	7	18	62		2					100	0	0	6,000		2			3M	5	-
RHODE ISLAND																					
PAWCATUCK RIVER	ASHAWAY	7	25	62				4			5	15	80	-				4	3M	14	-
PAWTUXET RIVER	COVENTRY	6	22	62				4			0	0	100	100				4	2M	-	3
MESHANICUT BROOK	CRANSTON	4	20	62				4			50	50	0	250	1				1M	3	-
TENNESSEE																					
BIG CREEK	ALTAMONT	3	9	62	1						10	90	0	300	1				10M	-	-
WHITE HORN CREEK	BULLS GAP	11	11	62					5		36	51	13	85,440		2			10M	5	-
FILLAVER CREEK	CLEVELAND	2	2	62		2					5	85	10	5,000	1				5M	14	-
SOUTH MOUSE CR	CLEVELAND	5	16	62			3				5	10	85	-		2			6M	-	-
BOONE L WATAUGA	JOHNSON CITY	10	15	62				4			12	69	19	30,000			3		7M	5	-
SINKING CREEK	JOHNSON CITY	10	22	62					5		1	95	4	250			3		2M	-	-
HURRICANE CREEK	LAVERGNE	12	10	62				4			-			-				-	3M	-	-
SHOAL CREEK	LAWRENCEBURG	4	17	62				4			50	20	30	5,000		2			1M	-	6
DRY HOLLOW CREEK	LIVINGSTON	5	5	62		2					2	95	3	500	1				1M	-	4
STEEKEE CREEK	LOUDON	3	12	62		2					10	80	10	5,000	1				7M	-	-
E FK MULBERRY CR	LYNCHBURG	4	--	62				4			10	70	20	-			3		4M	1	-
LOOSAHATCHIE RIV	MILLINGTON	5	8	62						6	49	1	50	3,494			3		2M	-	-
LOOSAHATCHIE RIV	MILLINGTON	6	28	62				4			-			-			3		10M	3	-
GATTIS CREEK	SAVANNAH	8	13	62						6	0	1	99	6,500				4	-	-	4
BEAVERDAM CREEK	SHADY VALLEY	5	22	62		2					5	93	2	12,000		2			12M	5	-
TEXAS																					
CLEAR FK BRAZOS	ALBANY	4	12	62				4			-			-				-	-	-	-
HALLS BAYOU	ALTA LOMA	6	11	62		2					10	10	80	-		2			5M	3	-
DRAINAGE DITCH	ALVIN	6	12	62		2					33	33	34	-			3		1M	-	-
LAKE RETRIEVE	ANGLETON	9	19	62		2					60	30	10	10,000		2			-	2	-
COLORADO RIVER	AUSTIN	4	5	62						6	0	60	40	200				4	2M	2	-
COLORADO RIVER	AUSTIN	6	7	62						6	-			-				4	2M	-	16
CREEK NR DELWOOD	AUSTIN	4	25	62		2					-			-				4	1M	3	-
TURTLE CREEK	BLESSING	5	4	62				4			-			6				4	5M	1	-
LAKE BUCHANAN	BLUFFTON	6	--	62						6	-			-				4	-	-	-
CANADIAN RIVER	BORGER	7	2	62					5		0	100	0	-				4	10M	10	-
PLUM CREEK	CANADIAN	4	14	62				4			9	0	91	-	1				2M	-	-
GARLAND TERRELL	CHILDRESS	9	15	62		2					50	50	0	-		2			6A	-	-
COOK RANCH LAKE	CLARENDON	10	1	62		2					50	50	0	-		2			5A	-	-
L CRYSTAL CREEK	CONROE	4	14	62				4			10	25	65	-		2			3M	5	-
PINEY CREEK	CORRIGAN	9	1	62						6	30	20	50	500			3		-	-	12
LAKE OF PINES	DAINGERFIELD	10	2	62				4			50	40	10	-		2			300A	9	6
ANGELINA RIVER	DIBOLL	6	30	62				4			2	40	58	200			3		1M	-	5
NAVASOTA RIVER	EASTERLY	7	--	62						6	50	50	0	150			3		1M	-	-
MUSTANG CREEK	EL CAMPO	6	18	62		2					-			-	1				5M	-	-

REPORT OF POLLUTION-CAUSED FISH KILLS
CUMULATIVE LISTING OF REPORTS RECEIVED AS OF DATE OF TABULATION

RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL			IMPUTED CAUSE OF KILL						TYPE OF FISH KILLED (PERCENT)			ESTIMATED NUMBER OF FISH KILLED	SEVERITY				ESTIMATED MILES OR ACRES AFFECTED	DURATION OF CRITICAL EFFECT	
		MONTH	DAY	YEAR	MINING OPERATIONS (1)	AGRICULTURAL POISONS (2)	DOMESTIC SEWAGE (3)	INDUSTRIAL WASTES (4)	OTHER (5)	UNKNOWN (6)	GAME	FORAGE	TRASH		TOTAL (1)	HEAVY (2)	MODERATE (3)	LIGHT (4)		DA.	HR.
TEXAS CONT.																					
BUFFALO CREEK	FLECTRA	4	14	62				4			-			-				-	-	-	-
CLEAR FORK	ELIASVILLE	4	20	62				4			-			-				-	-	-	-
DRAIN CANAL/FARM	FABENS	8	15	62		2					2	0	98	2,000		2			3M	-	5
CADDO CREEK	FRANKSTON	12	18	62				4			45	30	25	-				4	2M	2	-
INTERCOASTAL CNL	FREEPORT	7	26	62						6	1	98	1	-				4	-	-	12
CLEAR CREEK	FRIENDSWOOD	4	12	62						6	0	100	0	200				4	-	-	-
SCARBOROUGH BR	HALLETTSVILLE	6	4	62				4			-			5,000	1				-	10	-
WATER HOLE CREEK	HALLETTSVILLE	3	24	62				4			90	0	10	300			3		3M	3	-
BIG FOSSIL CREEK	HALTOM CITY	4	25	62			3				50	10	40	-		2			1M	4	-
HAMLIN LAKE	HAMLIN	7	3	62				4			-			-			3		3M	1	-
BOWLES CREEK	HENDERSON	7	21	62						6	80	0	20	200			3		4M	4	-
LAKE WICHITA	HOLLIDAY	8	3	62				4			0	0	100	-				4	-	-	-
SAN BERNARD RIV	HUNGERFORD	5	28	62		2					10	40	50	2,000	1				1M	-	-
HARMON CREEK	HUNTSVILLE	4	13	62						6	0	2	98	-		2			-	1	-
CANEY CREEK	JACINTO	5	3	62		2					-			-				4	20M	4	-
SULPHUR CREEK	LAMPASAS	5	30	62			3				50	25	25	200	1				2M	1	2
BIG CANE CREEK	LIVINGSTON	5	16	62						6	10	0	90	100				4	2M	-	6
LAKE OF PINES	LONE STAR	11	27	62				4			20	40	40	-		2			150A	1	12
TANABOGUE CREEK	LOVELADY	5	8	62				4			30	30	40	5,000		2			-	3	-
COLLARD CREEK	MADISONVILLE	4	--	62				4			-			-				4	2M	-	-
SABINE RIVER	MARSHALL	9	8	62				4			10	0	90	2,000		2			8M	2	-
TRIB/KICKAPOO CR	MEGARGEL	4	27	62				4			-			-				-	-	-	-
JACKS CREEK	MEXIA	4	29	62				4			5	85	10	500			3		1M	1	-
CONCHO RIVER	MILES	4	28	62		2					5	10	85	-			3		1M	-	12
WHITE OAK CREEK	MOUNT VERNON	8	14	62					5		50	15	35	1,680		2			2M	2	-
BUCK CREEK	PADUCAH	8	3	62		2					0	50	50	-	1				10M	2	-
COLONY	RANGER	4	27	62					5		-			-				-	3M	-	-
UNNAMED STREAM	SAGINAW	4	6	62				4			50	30	20	-	1				-	7	-
CNL FISH HATCHRY	SAN ANGELO	8	8	62		2					10	50	40	-				4	1M	3	-
SAN ANTONIO RIV	SAN ANTONIO	7	19	62				4			95	0	5	-			3		-	1	-
SAN ANTONIO RIV	SAN ANTONIO	10	10	62						6	0	0	100	-		2			-	1	-
SALADO CREEK	SAN ANTONIO	7	13	62						6	10	20	70	-	1				-	-	-
SALADO CREEK	SAN ANTONIO	10	3	62				4			10	20	70	-		2			-	2	-
GALVESTON BAY	SAN LEON	7	19	62				4			50	50	0	75				-	-	3	-
PECOS RIVER	SHEFFIELD	5	27	62					5		40	20	40	-		2			15M	3	10
GREENS BAYOU	SHELDON	8	5	62			3				20	0	80	-		2			6M	10	-
SPRING CREEK	SHERWOOD	8	21	62					5		5	40	55	-	1				1M	1	-
UNNAMED LAKE	SIMONTON	8	16	62		2					-			-	1				30A	10	-
CLEAR FORK	SOUTH BEND	4	20	62				4			-			-				-	-	-	-
BIG ELM CREEK	TEMPLE	7	26	62					5		30	20	50	-	1				1M	1	-
MARSH AREA	TEXAS CITY	10	1	62						6	0	100	0	-				4	-	-	12
SWAN LAKE	TEXAS CITY	7	26	62				4			-			-				4	-	-	-
COLORADO RIVER	TRAVIS CO	9	27	62						6	50	25	25	-		2			-	2	-
NECHES RIVER	TYLER	7	15	62			3				5	95	0	-			3		1M	1	-
WAXAHACHIE CREEK	WAXAHACHIE	7	11	62						6	10	10	80	-			3		1M	1	6
CLEAR CREEK	WEBSTER	9	19	62						6	0	100	0	-				4	1M	1	-
OLD CANEY CREEK	WHARTON	6	26	62					5		-			-				4	1M	-	-
WICHITA R WTRSHD	WICHITA FALLS	9	7	62					5		75	0	25	-		2			2A	-	-
UNNAMED STREAM	WINNSBORO	9	21	62					5		50	25	25	-		2			-	4	-
UTAH																					
JORDAN RIVER	MIDVALE	10	12	62				4			-			-			3		1M	3	-
VIRGINIA																					
JAMES RIVER	LYNCHBURG	8	29	62					5		0	0	100	-	1				4M	2	-
PEAK CREEK	PULASKI	4	13	62						6	100	0	0	250			3		-	-	12
CHOPAWAMSIC CR	QUANTICO	5	28	62					5		100	0	0	200	1				-	2	-
STAPLES MILL PD	RICHMOND	3	29	62						6	100	0	0	300			3		-	-	-
TALLEYS POND	RICHMOND	1	7	62						6	100	0	0	350		2			-	3	-
LAKE HOLLY	VIRGINIA BEACH	6	26	62				4			95	0	5	17,000		2			2A	3	-
WASHINGTON																					
MARSH CREEK	ARLINGTON	4	5	62				4			100	0	0	3,000		2			3M	-	-
DILLENBAUGH CR	CHEHALIS	4	30	62				4			100	0	0	25				4	1M	-	-
BR MILL CREEK	COLLEGE PLACE	7	2	62				4			50	0	50	-		2			5M	-	-
PORT GARDNER BAY	EVERETT	5	14	62				4			0	95	5	1,500		2			2A	-	2
PORT GARDNER BAY	EVERETT	5	16	62				4			1	98	1	500		2			1A	-	1
GRAYS HARBOR	HOQUIAM	7	28	62				4			50	25	25	-		2			8M	7	-
BULLMAN CREEK	SEKIU	9	12	62						6	100	0	0	2,000	1				1M	-	-
HYLEBOS WATERWAY	TACOMA	1	2	62				4			0	100	0	125,000		2			10A	-	6

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		MONTH	DAY	YEAR	MINING OPERATIONS (1)	AGRICULTURAL RUNOFF (2)	DOMESTIC SEWAGE (3)	INDUSTRIAL WASTES (4)	OTHER (5)	UNKNOWN (6)	GAME	FORAGE	TRASH		TOTAL (1)	HEAVY (2)	MODERATE (3)	LIGHT (4)		DA.	HR.
WEST VIRGINIA																					
BLUESTONE RIVER	BLUEFIELD	7	16	62				4			5	15	80	250			3		3M	5	-
ELK TWO MILE	CHARLESTON	6	16	62				4			0	100	0	10,000	1				1M	-	3
KANAWHA RIVER	GLENVILLE	2	2	62	1						3	7	90	300				4	7M	1	-
TYGART RIVER	HUTTONSVILLE	9	1	62			3				0	0	100	300				4	1M	6	-
POND FORK COAL R	VAN	4	17	62				4			1	9	90	200				4	3M	-	2
ELK RIVER WEB	WEBSTER SPRINGS	5	19	62						6	4	1	95	500				4	17M	2	-
STONECOAL CREEK	WESTON	7	31	62	1						50	10	40	300		2			3M	3	-
WISCONSIN																					
OCONTO RIVER	OCONTO	8	17	62				4			0	0	100	500			3		1M	2	-
WASHOTA LAKE	DELAFIELD	4	12	62		2					99	0	1	1,500		2			1M	2	-
WYOMING																					
DEER CREEK	GLENROCK	4	18	62				4			-			20			3		5M	6	-
E POPO AGIE RIV	LANDER	11	25	62						6	25	0	75	135				4	1M	-	1

NOTE: Reports from Delaware and Utah received too late to be included in the tabular analysis.

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