UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER AND STREAMBED-MATERIAL DATA, EAGLE CREEK WATERSHED, AUGUST 1980 AND OCTOBER AND DECEMBER 1982

By David J. Wangsness

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FACTORS FOR CONVERTING INCH-POUND UNITS TO THE INTERNATIONAL SYSTEM OF UNITS (SI)

Multiply inch-pound unit	By	To obtain SI unit
inch (in.)	25.40	millimeter (mm)
foot (ft)	0.3048	meter (m)
square foot (ft^2)	0.093	square meter (m^2)
cubic foot per second (ft^3/s)	0.0283	cubic meter per second (m^3/s)
mile (mi)	1.609	kilometer (km)
square mile (mi^2)	2.590	square kilometer (km^2)

Temperature

$°C = 5/9 (°F-32°)$

USE OF TRADE NAMES

Any use of trade names in this report is for descriptive purpose only and does not imply endorsement by the U.S. Geological Survey.

ABBREVIATIONS AND SYMBOLS

mg/L	milligram per liter
µg/L	microgram per liter
µg/g	microgram per gram
mg/kg	microgram per kilogram
°C	degree Celsius
°F	degree Fahrenheit
ft^3/sec	cubic foot per second
µmho/cm	micromho per centimeter
<	less than
Hwy	highway
St.	street
PCB	polychlorinated biphenyl
PCN	polychlorinated naphthalene
DDD	2,2 bis(p-chlorophenyl)-1,1-dichloroethane
DDE	dichlorodiphenyldichloroethylene
DDT	dichlorodiphenyltrichlorethane
EPA	U.S. Environmental Protection Agency

WATER AND STREAMBED-MATERIAL DATA, EAGLE CREEK WATERSHED, INDIANA, AUGUST 1980 AND OCTOBER AND DECEMBER 1982

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ABSTRACT

Water-quality studies within the Eagle Creek watershed, Indiana, were done by the U.S. Geological Survey in August 1980, October 1982, and December 1982 in cooperation with the city of Indianapolis, Department of Public Works. A fourth study will be done in spring 1983. Streambed-material and water samples were collected from Finley and Eagle Creeks at various flow rates and were analyzed for selected metals, nonmetals, insecticides, and acid-extractable and base-neutral-extractable compounds. Water samples also were analyzed for volatile organics.

This report lists all the data collected and analyzed by the U.S. Geological Survey during the 1980 and 1982 surveys but does not interpret the data.

INTRODUCTION

In late August 1980, the city of Indianapolis, Department of Public Works, participated in a cooperative water-quality study in which the U.S. Geological Survey collected samples of streambed materials to define the general water quality of the upper Eagle Creek watershed. The samples were analyzed for a wide variety of organic and inorganic constituents (appendix 1) at 11 sampling sites (fig. 1). The purpose of the study was to collect water-quality information that could be used by the city of Indianapolis to determine if any toxic substances were entering Eagle Creek Reservoir (where they may pollute the drinking-water supply and ultimately endanger the public safety) and to aid the city in identifying areas that may be contributing these substances to the surface-water supply.

In October 1982, a second survey was made for the city of Indianapolis. The purpose of the survey was to collect water-quality information that could be used by the city to determine if the types and concentration of substances in Eagle Creek in August 1980 had changed. Because toxic substances detected in the 1980 survey entered Finley Creek from a source between sites 3 and 4

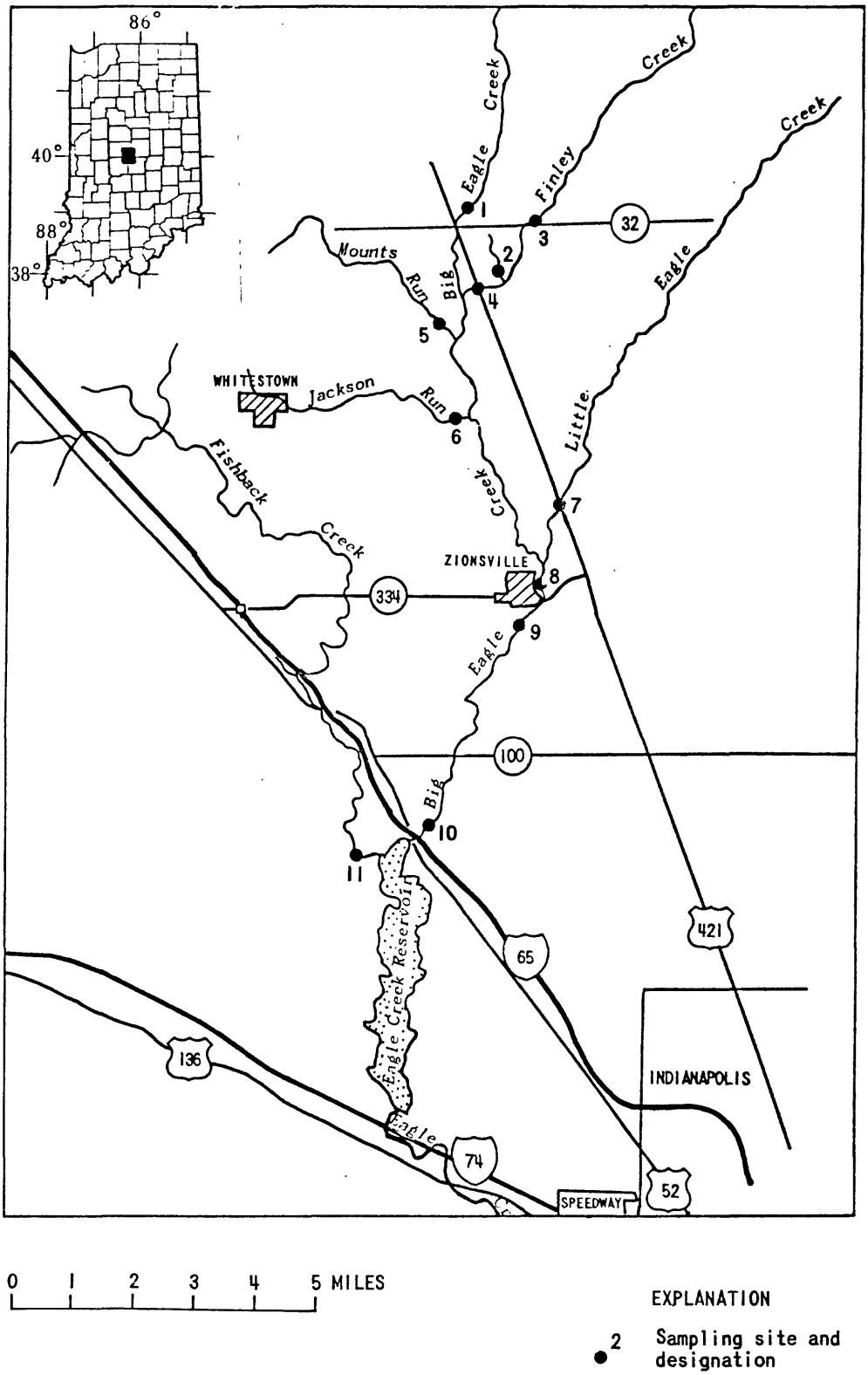

Figure 1.-- Sampling sites in the Eagle Creek watershed, Indiana, 1980.

(fig. 1), the 1982 survey was done at the same sites and at two sites on Eagle Creek downstream from Finley Creek. Four sites were sampled in October 1982, three sites in December 1982, and three sites will be sampled in spring 1983.

APPROACH

Chemical constituents and properties of surface water at four sites were measured and sampled on October 26-27, 1982. Site 1, on Finley Creek at 1100 East North Road, represents background water quality upstream from the identified change in water-quality (fig. 2). Site 2, on Finley Creek at Highway 421, represents a location where water quality is believed likely to be affected. Site 3, on Eagle Creek at West 146th Street, is downstream from the mouth of Finley Creek. Site 4, on Eagle Creek at Highway 100 (86th Street), represents the quality of water before it enters Eagle Creek Reservoir.

Dissolved-oxygen concentration, specific conductance, water temperature, pH, and discharge were measured in the field at four sampling sites, and samples of suspended sediments and streambed materials were collected and returned to the laboratory for size analysis. Water and streambed-material samples were collected and analyzed for selected metals, insecticides, and acid-extractable and base-neutral-extractable compounds. Water samples also were analyzed for volatile organics.

The October 1982 survey was done during an extremely low-flow period; therefore, the samples probably represented the ground-water contribution to the streams (base flow). The samples at site 4 included treated wastewater from Zionsville as another source of water. A third survey done December 14, 1982, after a rainy period, represented high flow. Site 1, the upper site in Finley Creek, was not sampled in December, and only water samples were collected at sites 2, 3, and 4 at that time. A fourth survey is planned for spring 1983, during high flow. Water samples from sites 2, 3, and 4 will be collected, and the water will be analyzed for selected metals and nonmetals, insecticides, volatile organics, and acid-extractable and base-neutral extractable compounds.

METHODS

Dissolved-oxygen concentration, specific conductance, water temperature, and pH were measured at each site. Discharge was measured by current meters or was estimated at low flows. All water samples were collected by dipping the sample bottle from surface to bottom at several points in the stream section to assure a well-mixed sample.

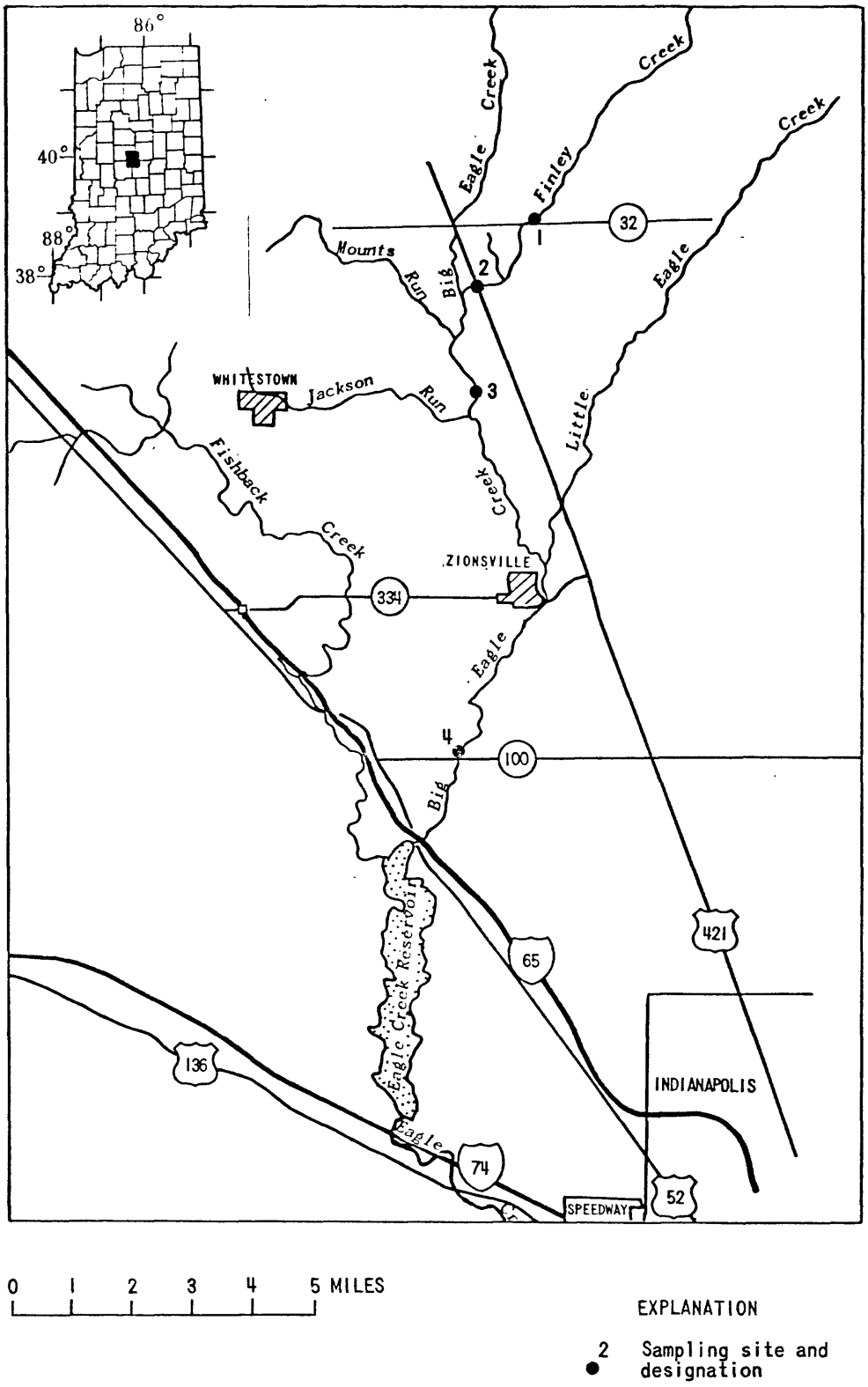

Figure 2.-- Sampling sites in the Eagle Creek watershed, Indiana, 1982.

Streambed-material samples for determining size distribution were collected from several points in the stream section at each sampling site. These samples were slowly dried at about 60°C and were then composited and sieved through a nest of six sieves. The sieved material was weighed, and the percent of the total sample for each size fraction was calculated. Streambed-material samples for chemical analysis were collected from pooled areas where greatest amounts of fines were likely to be deposited. The fine sediments were wet sieved through a number 230 stainless-steel sieve. The smaller than 63-micron fraction that passed through the sieve was composited in glass jars, refrigerated, and allowed to settle for 24 to 48 hours. Most of the water was decanted, and the fine sediments were shipped to the Geological Survey Central Laboratory in Doraville, Ga., for analysis.

DATA

The water and streambed-material data from the 1982 studies are listed in tables 1-19. The tables also include detection limits and units of measurement. Streambed-material data from the 1980 survey are listed in appendix 1. EPA water-quality standards are listed in appendix 2, and select organic compounds whose concentrations exceeded background concentrations in Finley and Eagle Creeks in October and December 1982 are listed in appendix 3.

SELECTED REFERENCES

U.S. Environmental Protection Agency, 1975, National interim primary drinking water regulations: Federal Register, v. 40, no. 248, p. 59566-59588.

_____1979a, National secondary drinking water regulations: Federal Register, v. 44, no. 140, p. 52195-52202.

_____1979b, National interim primary drinking water regualtions; central of trihalomethanes in drinking water: Federal Register, v. 44, no. 231, p. 68624-68707.

Windholz, Martha, ed., 1976, The Merck index: Rahway, N.J., Merck and Co., Inc., 1,900 p.

Tables 1-19

Table 1.--Total concentrations of selected metals and nonmetals in water, Finley Creek and Eagle Creek, October 26-27, 1982

Constituent [1]	Units	Finley Creek at 1100 East Road near Zionsville (site 1)	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
Aluminum [2]	µg/L	80	300	480	120
Arsenic [3]	µg/L	3	6	4	4
Barium [4]	µg/L	200	400	200	200
Cadmium [3]	µg/L	<1	<1	<1	1
Chromium [3]	µg/L	<1	<1	<1	<1
Copper [3]	µg/L	9	9	12	19
Cyanide [5]	Mg/L	<.01	<.01	<.01	<.01
Iron [5]	µg/L	530	3,600	890	280
Lead [3]	µg/L	6	5	6	6
Manganese [5]	µg/L	110	280	120	20
Mercury [5]	µg/L	.4	.4	.1	.1
Selenium [3]	µg/L	<1	<1	<1	<1
Silver [3]	µg/L	<1	3	<1	<1
Zinc [5]	µg/L	10	10	10	10

[1] All constituents except aluminum, barium, iron, and manganese are EPA priority pollutants.
[2] Detection limit: 10 µg/L.
[3] Detection limit: 1 µg/L.
[4] Detection limit: 100 µg/L.
[5] Detection limit: 0.1 µg/L.

Table 2.--Total concentrations of organochlorine insecticides in water, Finley Creek and Eagle Creek, October 26-27, 1982

Constituent [1]	Units	Finley Creek at 1100 East Road near Zionsville (site 1)	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
Aldrin [2]	µg/L	<.01	<.01	<.01	<.01
Chlordane [3]	µg/L	<.1	<.1	<.1	<.1
DDD [2]	µg/L	<.01	<.01	<.01	<.01
DDE [2]	µg/L	<.01	<.01	<.01	<.01
DDT [2]	µg/L	<.01	<.01	<.01	<.01
Dieldrin [2]	µg/L	<.01	<.01	<.01	<.01
Endosulfan [2]	µg/L	<.01	<.01	<.01	<.01
Endrin [2]	µg/L	<.01	<.01	<.01	<.01
Heptachlor epoxide [2]	µg/L	<.01	<.01	<.01	<.01
Heptachlor [2]	µg/L	<.01	<.01	<.01	<.01
Lindane [2]	µg/L	<.01	<.01	<.01	<.01
Methoxychlor [2]	µg/L	<.01	<.01	<.01	<.01
Mirex [2]	µg/L	<.01	<.01	<.01	<.01
PCB (total) [3]	µg/L	<.1	<.1	<.1	<.1
PCN (total) [3]	µg/L	<.1	<.1	<.1	<.1
Perthane [3]	µg/L	<.1	<.1	<.1	<.1
Toxaphene [4]	µg/L	<1	<1	<1	<1

[1] All constituents except methoxychlor, mirex, PCN, and perthane are EPA priority pollutants.
[2] Detection limit: 0.01 µg/L.
[3] Detection limit: 0.1 µg/L.
[4] Detection limit: 1 µg/L.

Table 3.--Total concentrations of organophosphorus insecticides in water, Finley Creek and Eagle Creek, October 26-27, 1982

Constituent [1]	Units	Finley Creek at 1100 East Road near Zionsville (site 1)	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
Diazinon	µg/L	<.01	<.01	<.01	.09
Ethion	µg/L	<.01	<.01	<.01	<.01
Malathion	µg/L	<.01	<.01	<.01	<.01
Methyl parathion	µg/L	<.01	<.01	<.01	<.01
Methyl trithion	µg/L	<.01	<.01	<.01	<.01
Parathion	µg/L	<.01	<.01	<.01	<.01
Trithion	µg/L	<.01	<.01	<.01	<.01

[1] Detection limit: 0.01 µg/L.

Table 4.--Concentrations of volatile organic compounds in water, Finley Creek and Eagle Creek, October 26-27, 1982

Constituent [1]	Units	Finley Creek at 1100 East Road near Zionsville (site 1)	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
Benzene	µg/L	<1	<1	<1	<1
Bromoform	µg/L	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1	<1
Chlorodibromomethane	µg/L	<1	<1	<1	<1
Chloroethane	µg/L	<1	<1	<1	<1
2-Chloroethyl vinyl ether	µg/L	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<1	<1
Dichlorobromomethane	µg/L	<1	<1	<1	<1
Dichlorodifluoromethane	µg/L	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	<1	220	<1	<1
1,2-Dichloroethane	µg/L	<1	<1	<1	<1
1,1-Dichloroethylene	µg/L	<1	<1	<1	<1
1,2-trans-Dichloroethylene	µg/L	<1	1,000	<1	<1
1,2-Dichloropropane	µg/L	<1	<1	<1	<1
1,3-Dichloropropane	µg/L	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1
Methylbromide	µg/L	<1	<1	<1	<1
Methylene chloride	µg/L	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<1	<1

Table 4.--Concentrations of volatile organic compounds in water, Finley Creek and Eagle Creek, October 26-27, 1982--(Continued)

Constituent [1]	Units	Finley Creek at 1100 East Road near Zionsville (site 1)	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
Tetrachloroethylene	µg/L	5	37	<1	<1
Toluene	µg/L	3	7	<1	<1
1,1,1-Trichloroethane	µg/L	<1	510	<1	<1
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1
Trichloroethylene	µg/L	<1	670	<1	<1
Trichlorofluoromethane	µg/L	<1	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1

[1] Detection limit: 1 µg/L. All constituents are EPA priority pollutants.

Table 5.--Concentrations of totally recoverable acid-extractable compounds in water, Finley Creek and Eagle Creek, October 26-27, 1982

Constituent [1]	Units	Finley Creek at 1100 East Road near Zionsville (site 1)	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
4-Chloro-3-methylphenol	µg/L	<1	<1	<1	<1
2-Chlorophenol	µg/L	<1	<1	<1	<1
2,4-Dichlorophenol	µg/L	<1	<1	<1	<1
2,4-Dimethylphenol	µg/L	<1	12	<1	<1
4,6-Dinitro-2-methylphenol	µg/L	<1	<1	<1	<1
2,4-Dinitrophenol	µg/L	<1	<1	<1	<1
2-Nitrophenol	µg/L	<1	<1	<1	<1
4-Nitrophenol	µg/L	<1	<1	<1	<1
Pentachlorophenol	µg/L	<1	<1	<1	<1
Phenol	µg/L	<1	2,200	<1	<1
2,4,6-Trichlorophenol	µg/L	<1	<1	<1	<1

[1] Detection limit: 1 µg/L. All constituents except 4-chloro-3-methylphenol and 4,6-dinitro-2-methylphenol are EPA priority pollutants.

Table 6.--Concentrations of totally recoverable base-neutral-extractable compounds in water, Finley Creek and Eagle Creek, October 26-27, 1982

Constituent [1]	Units	Finley Creek at 1100 East Road near Zionsville (site 1)	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
Acenaphthene	µg/L	<1	<1	<1	<1
Acenaphthylene	µg/L	<1	<1	<1	<1
Anthracene	µg/L	<1	<1	<1	<1
Benzidine	µg/L	<1	<1	<1	<1
Benzo (a) anthracene	µg/L	<1	<1	<1	<1
Benzo (b) fluoranthene	µg/L	<1	<1	<1	<1
Benzo (k) fluoranthene	µg/L	<1	<1	<1	<1
Benzo (g,h,i) perylene	µg/L	<1	<1	<1	<1
Benzo (a) pyrene	µg/L	<1	<1	<1	<1
4-Bromophenyl phenyl ether	µg/L	<1	<1	<1	<1
Butyl benzyl phthalate	µg/L	<1	11	<1	<1
bis (2-Chloroethoxy) methane	µg/L	<1	<1	<1	<1
bis (2-Chloroethyl) ether	µg/L	<1	43	<1	<1
bis (2-Chloroisopropyl) ether	µg/L	<1	<1	<1	<1
2-Chloronaphthalene	µg/L	<1	<1	<1	<1
4-Chlorophenyl phenyl ether	µg/L	<1	<1	<1	<1
Chrysene	µg/L	<1	<1	<1	<1
Dibenz (a,h) anthracene	µg/L	<1	<1	<1	<1
1,2-Dichlorobenzene	µg/L	<1	57	<1	<1
1,3-Dichlorobenzene	µg/L	<1	<1	<1	<1

Table 6.--Concentrations of totally recoverable base-neutral-extractable compounds in water, Finley Creek and Eagle Creek, October 26-27, 1982--(Continued)

Constituent [1]	Units	Finley Creek at 1100 East Road near Zionsville (site 1)	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
1,4-Dichlorobenzene	µg/L	<1	<1	<1	<1
3,3'-Dichlorobenzidine	µg/L	<1	<1	<1	<1
Diethyl phthalate	µg/L	<1	6	<1	<1
Dimethyl phthalate	µg/L	<1	16	<1	<1
Di-n-butyl phthalate	µg/L	<1	27	<1	<1
2,4-Dinitrotoluene	µg/L	<1	<1	<1	<1
2,6-Dinitrotoluene	µg/L	<1	<1	<1	<1
Di-n-octyl phthalate	µg/L	<1	<1	<1	<1
bis (2-Ethylhexyl) phthalate	µg/L	<1	13	<1	<1
Fluoranthene	µg/L	<1	<1	<1	<1
Fluorene	µg/L	<1	<1	<1	<1
Hexachlorobenzene	µg/L	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1	<1
Hexachlorocyclopentadiene	µg/L	<1	<1	<1	<1
Hexachloroethane	µg/L	<1	<1	<1	<1
Indeno (1,2,3) pyrene	µg/L	<1	<1	<1	<1
Isophorone	µg/L	<1	360	<1	<1
Napthalene	µg/L	<1	<1	<1	<1
Nitrobenzene	µg/L	<1	<1	<1	<1
n-Nitrosodimethylamine	µg/L	<1	9	<1	<1

Table 6.--Concentration of totally recoverable base-neutral-extractable compounds in water, Finley Creek and Eagle Creek, October 26-27, 1982--(Continued)

Constituent [1]	Units	Finley Creek at 1100 East Road near Zionsville (site 1)	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
n-Nitrosodiphenylamine	µg/L	<1	<1	<1	<1
n-Nitrosodi-n-propylamine	µg/L	<1	<1	<1	<1
Phenanthrene	µg/L	<1	<1	<1	<1
Pyrene	µg/L	<1	<1	<1	<1
2,3,7,8-Tetrachlorodibenzo-p-dioxin	µg/L	<1	<1	<1	<1
1,2,4-Trichlorobenzene	µg/L	<1	<1	<1	<1

[1] Detection limit: 1 µg/L. All constituents are EPA priority pollutants.

Table 7.--Concentrations of selected metals and nonmetals on streambed materials (<63-micron fraction), Finley Creek and Eagle Creek, October 26-27, 1982

Constituent [1]	Units	Finley Creek at 1100 East Road near Zionsville (site 1)	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
Aluminum [2]	µg/g	1,400	940	890	1,300
Arsenic [3]	µg/g	1	1	<1	<1
Barium [2]	µg/g	120	100	70	160
Cadmium [3]	µg/g	1	2	2	2
Chromium [3]	µg/g	4	4	3	4
Copper [3]	µg/g	11	21	8	15
Cyanide [3]	Mg/L	<1	<1	<1	<1
Iron [3]	µg/g	3,000	3,100	1,700	2,700
Lead [2]	µg/g	20	120	30	30
Manganese [3]	µg/g	330	300	220	580
Mercury [4]	µg/g	<.01	<.01	<.01	<.01
Selenium [3]	µg/g	<1	<1	<1	<1
Silver [5]	µg/g	<1	<1	<1	<1
Zinc [3]	µg/g	24	40	14	26

[1] All constituents except aluminum, barium, iron, and manganese are EPA priority pollutants.
[2] Detection limit: 10 µg/L.
[3] Detection limit: 1.0 µg/L.
[4] Detection limit: 0.01 µg/L.
[5] Detection limit: 0.1 µg/L.

Table 8.--Concentrations of organochlorine insecticides on streambed materials (<63-micron fraction), Finley Creek and Eagle Creek, October 26-27, 1982

Constituent [1]	Units	Finley Creek at 1100 East Road near Zionsville (site 1)	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
Aldrin [2]	µg/kg	<0.1	<0.1	1.8	<0.1
Chlordane [3]	µg/kg	12	13	12	7
DDD [2]	µg/kg	0.7	3.3	0.5	0.4
DDE [2]	µg/kg	<0.1	<0.1	<0.1	<0.1
DDT [2]	µg/kg	2.1	0.5	0.4	0.2
Dieldrin [2]	µg/kg	5.3	5.9	5.2	4.6
Endosulfan [2]	µg/kg	<0.1	<0.1	<0.1	<0.1
Endrin [2]	µg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide [2]	µg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor [2]	µg/kg	<0.1	<0.1	<0.1	<0.1
Lindane [2]	µg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor [2]	µg/kg	<0.1	<0.1	<0.1	<0.1
Mirex [2]	µg/kg	<0.1	<0.1	<0.1	<0.1
PCB (total) [3]	µg/kg	13	72	5	4
PCN (total) [3]	µg/kg	<1	<1	<1	<1
Perthane [3]	µg/kg	<1	<1	<1	<1
Toxaphene [4]	µg/kg	<10	<10	<10	<10

[1] All constituents except methoxychlor, mirex, PCN, and perthane are EPA priority pollutants.
[2] Detection limit: 0.1 µg/kg.
[3] Detection limit: 1.0 µg/kg.
[4] Detection limit: 10 µg/kg.

Table 9.--Concentrations of organophosphorus insecticides on streambed material (<63-micron fraction), Finley Creek and Eagle Creek, October 26-27, 1982

Constituent [1]	Units	Finley Creek at 1100 East Road near Zionsville (site 1)	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
Diazinon	µg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	µg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	µg/kg	<0.1	<0.1	<0.1	<0.1
Methylparathion	µg/kg	<0.1	<0.1	<0.1	<0.1
Methyltrithion	µg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	µg/kg	<0.1	<0.1	<0.1	<0.1
Trithion	µg/kg	<0.1	<0.1	<0.1	<0.1

[1] Detection limit: 0.1 µg/kg.

Table 10.--Concentrations of totally recoverable acid-extractable compounds on streambed materials (<63-micron fraction), Finley Creek and Eagle Creek, October 26-27, 1982

Constituent [1]	Units	Finley Creek at 1100 East Road near Zionsville (site 1)	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
4-Chloro-3-methylphenol	µg/kg	<20	<20	<20	<20
2-Chlorophenol	µg/kg	<20	<20	<20	<20
2,4-Dichlorophenol	µg/kg	<20	<20	<20	<20
2,4-Dimethylphenol	µg/kg	<20	<20	<20	<20
4,6-Dinitro-2-methylphenol	µg/kg	<20	<20	<20	<20
2,4-Dinitrophenol	µg/kg	<20	<20	<20	<20
2-Nitrophenol	µg/kg	<20	<20	<20	<20
4-Nitrophenol	µg/kg	<20	<20	<20	<20
Pentachlorophenol	µg/kg	<20	<20	<20	<20
Phenol	µg/kg	<20	<20	<20	<20
2,4,6-Trichlorophenol	µg/kg	<20	<20	<20	<20

[1] Detection limit: 20 µg/kg. All constituents except 4-chloro-3-methylphenol and 4,6-dinitro-2-methylphenol are EPA priority pollutants.

Table 11.--Concentrations of totally recoverable base-neutral-extractable compounds on streambed materials (<63-micron fraction), Finley Creek and Eagle Creek, October 26-27, 1982

Constituent [1]	Units	Finley Creek at 1100 East Road near Zionsville (site 1)	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
Acenaphthene	µg/kg	<20	<20	<20	<20
Acenaphthylene	µg/kg	<20	<20	<20	<20
Anthracene	µg/kg	<20	<20	<20	<20
Benzidine	µg/kg	<20	<20	<20	<20
Benzo (a) anthracene	µg/kg	<20	<20	<20	<20
Benzo (b) fluoranthene	µg/kg	<20	<20	<20	<20
Benzo (k) fluoranthene	µg/kg	<20	<20	<20	<20
Benzo (g,h,i) perylene	µg/kg	<20	<20	<20	<20
Benzo (a) pyrene	µg/kg	<20	<20	<20	<20
4-Bromophenyl phenyl ether	µg/kg	<20	<20	<20	<20
Butyl benzyl phthalate	µg/kg	<20	<20	<20	<20
bis (2-Chloroethoxy) methane	µg/kg	<20	<20	<20	<20
bis (2-Chloroethyl) ether	µg/kg	<20	<20	<20	<20
bis (2-Chloroisopropyl) ether	µg/kg	<20	<20	<20	<20
2-Chloronaphthalene	µg/kg	<20	<20	<20	<20
4-Chlorophenyl phenyl ether	µg/kg	<20	<20	<20	<20
Chrysene	µg/kg	<20	<20	<20	<20
Dibenz (a,h) anthracene	µg/kg	<20	<20	<20	<20
1,2-Dichlorobenzene	µg/kg	<20	630	<20	<20
1,3-Dichlorobenzene	µg/kg	<20	<20	<20	<20

Table 11.--Concentrations of totally recoverable base-neutral-extractable compounds on streambed materials (<63-micron fraction), Finley Creek and Eagle Creek, October 26-27, 1982--(Continued)

Constituent [1]	Units	Finley Creek at 1100 East Road near Zionsville (site 1)	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
1,4-Dichlorobenzene	µg/kg	<20	<20	<20	<20
3,3'-Dichlorobenzidine	µg/kg	<20	<20	<20	<20
Diethyl phthalate	µg/kg	<20	<20	<20	<20
Dimethyl phthalate	µg/kg	<20	<20	<20	<20
Di-n-butyl phthalate	µg/kg	<20	<20	<20	<20
2,4-Dinitrotoluene	µg/kg	<20	<20	<20	<20
2,6-Dinitrotoluene	µg/kg	<20	<20	<20	<20
Di-n-octylphthalate	µg/kg	<20	<20	<20	<20
bis (2-Ethylhexyl) phthalate	µg/kg	<20	<20	<20	<20
Fluoranthene	µg/kg	<20	<20	<20	<20
Fluorene	µg/kg	<20	<20	<20	<20
Hexachlorobenzene	µg/kg	<20	<20	<20	<20
Hexachlorobutadiene	µg/kg	<20	<20	<20	<20
Hexachlorocyclopentadiene	µg/kg	<20	<20	<20	<20
Hexachloroethane	µg/kg	<20	<20	<20	<20
Indeno (1,2,3) pyrene	µg/kg	<20	<20	<20	<20
Isophorone	µg/kg	<20	<20	<20	<20
Naphthalene	µg/kg	<20	<20	<20	<20
Nitrobenzene	µg/kg	<20	<20	<20	<20
n-Nitrosodimethylamine	µg/kg	<20	<20	<20	<20

Table 11.--Concentrations of totally recoverable base-neutral-extractable compounds on streambed materials (<63-micron fraction), Finley Creek and Eagle Creek, October 26-27, 1982--(Continued)

Constituent [1]	Units	Finley Creek at 1100 East Road near Zionsville (site 1)	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
n-Nitrosodiphenylamine	µg/kg	<20	<20	<20	<20
n-Nitrosodi-n-propylamine	µg/kg	<20	<20	<20	<20
Phenanthrene	µg/kg	<20	<20	<20	<20
Pyrene	µg/kg	<20	<20	<20	<20
2,3,7,8-Tetrachlorodibenzo-p-dioxin	µg/kg	<20	<20	<20	<20
1,2,4-Trichlorobenzene	µg/kg	<20	<20	<20	<20

[1] Detection limit: 20 µg/kg. All constituents are EPA priority pollutants.

Table 12.--Total concentrations of selected metals and nonmetals in water, Finley Creek and Eagle Creek, December 14, 1982

Constituent [1]	Units	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
Aluminum [2]	µg/L	100	100	100
Arsenic [3]	µg/L	3	2	2
Barium [4]	µg/L	100	200	300
Cadmium [3]	µg/L	1	<1	<1
Chromium [3]	µg/L	1	<1	<1
Copper [3]	µg/L	8	4	4
Cyanide [2]	Mg/L	<.01	<.01	<.01
Iron [2]	µg/L	420	340	250
Lead [3]	µg/L	5	3	2
Manganese [2]	µg/L	80	70	40
Mercury [5]	µg/L	<0.1	<0.1	<0.1
Selenium [3]	µg/L	2	2	2
Silver [3]	µg/L	<1	2	1
Zinc [2]	µg/L	30	20	10

[1] All constituents except aluminum, barium, iron, and manganese are EPA priority pollutants.
[2] Detection limit: 10 µg/L.
[3] Detection limit: 1 µg/L.
[4] Detection limit: 100 µg/L.
[5] Detection limit: 0.1 µg/L.

Table 13.--Total concentrations of organochlorine insecticides in water, Finley Creek and Eagle Creek, December 14, 1982

Constituent [1]	Units	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
Aldrin [2]	µg/L	<.01	<.01	<.01
Chlordane [3]	µg/L	<.1	<.1	<.1
DDD [2]	µg/L	<.01	<.01	<.01
DDE [2]	µg/L	<.01	<.01	<.01
DDT [2]	µg/L	<.01	<.01	<.01
Dieldrin [2]	µg/L	<.01	<.01	<.01
Endosulfan [2]	µg/L	<.01	<.01	<.01
Endrin [2]	µg/L	<.01	<.01	<.01
Heptachlor epoxide [2]	µg/L	<.01	<.01	<.01
Heptachlor [2]	µg/L	<.01	<.01	<.01
Lindane [2]	µg/L	<.01	<.01	<.01
Methoxychlor [2]	µg/L	<.01	<.01	<.01
Mirex [2]	µg/L	<.01	<.01	<.01
PCB (total) [3]	µg/L	<.1	<.1	<.1
PCN (total) [3]	µg/L	<.1	<.1	<.1
Perthane [3]	µg/L	<.1	<.1	<.1
Toxaphene [4]	µg/L	<1	<1	<1

[1] All constituents except methoxychlor, mirex, PCN, and perthane are EPA priority pollutants.
[2] Detection limit: 0.01 µg/L.
[3] Detection limit: 0.1 µg/L.
[4] Detection limit: 1 µg/L.

Table 14.--Total concentrations of organophosphorus insecticides in water, Finley Creek and Eagle Creek, December 14, 1982

Constituent [1]	Units	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
Diazinon	µg/L	<.01	<.01	<.01
Ethion	µg/L	<.01	<.01	<.01
Malathion	µg/L	<.01	<.01	<.01
Methyl parathion	µg/L	<.01	<.01	<.01
Methyl trithion	µg/L	<.01	<.01	<.01
Parathion	µg/L	<.01	<.01	<.01
Trithion	µg/L	<.01	<.01	<.01

[1] Detection limit: 0.01 µg/L.

Table 15.--Concentrations of volatile organic compounds in water, Finley Creek and Eagle Creek, December 14, 1982

Constituent [1]	Units	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
Benzene	µg/L	<1	<1	<1
Bromoform	µg/L	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1
Chlorodibromomethane	µg/L	<1	<1	<1
Chloroethane	µg/L	<1	<1	<1
2-Chloroethyl vinyl ether	µg/L	<1	<1	<1
Chloroform	µg/L	<1	<1	<1
Dichlorobromomethane	µg/L	<1	<1	<1
Dichlorodifluoromethane	µg/L	<1	<1	<1
1,1-Dichloroethane	µg/L	<1	<1	<1
1,2-Dichloroethane	µg/L	<1	<1	<1
1,1-Dichloroethylene	µg/L	140	<1	<1
1,2-trans-Dichloroethylene	µg/L	9	<1	<1
1,2-Dichloropropane	µg/L	<1	<1	<1
1,3-Dichloropropane	µg/L	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1
Methylbromide	µg/L	<1	<1	<1
Methylene chloride	µg/L	<1	<1	<1
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<1

Table 15.--Concentrations of volatile organic compounds in water, Finley Creek and Eagle Creek, December 14, 1982--(Continued)

Constituent [1]	Units	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
Tetrachloroethylene	µg/L	<1	1	<1
Toluene	µg/L	2	2	<1
1,1,1-Trichloroethane	µg/L	<1	<1	<1
1,1,2-Trichloroethane	µg/L	<1	<1	<1
Trichloroethylene	µg/L	23	2	<1
Trichlorofluoromethane	µg/L	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1

[1] Detection limit: 1 µg/L. All constituents are EPA priority pollutants.

Table 16.--Concentrations of totally recoverable acid-extractable compounds in water, Finley Creek and Eagle Creek, December 14, 1982

Constituent [1]	Units	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
4-Chloro-3-methylphenol	µg/L	<1	<1	<1
2-Chlorophenol	µg/L	<1	<1	<1
2,4-Dichlorophenol	µg/L	<1	<1	<1
2,4-Dimethylphenol	µg/L	<1	<1	<1
4,6-Dinitro-2-methylphenol	µg/L	<1	<1	<1
2,4-Dinitrophenol	µg/L	<1	<1	<1
2-Nitrophenol	µg/L	<1	<1	<1
4-Nitrophenol	µg/L	<1	<1	<1
Pentachlorophenol	µg/L	<1	<1	<1
Phenol	µg/L	<1	<1	<1
2,4,6-Trichlorophenol	µg/L	<1	<1	<1

[1] Detection limit: 1 µg/L. All constituents except 4-chloro-3-methylphenol and 4,6-dinitro-2-methylphenol are EPA priority pollutants.

Table 17.--Concentrations of totally recoverable base-neutral-extractable compounds in water, Finley Creek and Eagle Creek, December 14, 1982

Constituent [1]	Units	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
Acenaphthene	µg/L	<1	<1	<1
Acenaphthylene	µg/L	<1	<1	<1
Anthracene	µg/L	<1	<1	<1
Benzidine	µg/L	<1	<1	<1
Benzo (a) anthracene	µg/L	<1	<1	<1
Benzo (b) fluoranthene	µg/L	<1	<1	<1
Benzo (k) fluoranthene	µg/L	<1	<1	<1
Benzo (g,h,i) perylene	µg/L	<1	<1	<1
Benzo (a) pyrene	µg/L	<1	<1	<1
4-Bromophenyl phenyl ether	µg/L	<1	<1	<1
Butyl benzyl phthalate	µg/L	<1	<1	<1
bis (2-Chloroethoxy) methane	µg/L	<1	<1	<1
bis (2-Chloroethyl) ether	µg/L	<1	<1	<1
bis (2-Chloroisopropyl) ether	µg/L	<1	<1	<1
2-Chloronaphthalene	µg/L	<1	<1	<1
4-Chlorophenyl phenyl ether	µg/L	<1	<1	<1
Chrysene	µg/L	<1	<1	<1
Dibenz (a,h) anthracene	µg/L	<1	<1	<1
1,2-Dichlorobenzene	µg/L	<1	<1	<1
1,3-Dichlorobenzene	µg/L	<1	<1	<1

Table 17.--Concentrations of totally recoverable base-neutral-extractable compounds in water, Finley Creek and Eagle Creek, December 14, 1982--(Continued)

Constituent [1]	Units	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
1,4-Dichlorobenzene	µg/L	<1	<1	<1
3,3'-Dichlorobenzidine	µg/L	<1	<1	<1
Diethyl phthalate	µg/L	<1	<1	<1
Dimethyl phthalate	µg/L	<1	<1	<1
Di-n-butyl phthalate	µg/L	<1	<1	<1
2,4-Dinitrotoluene	µg/L	<1	<1	<1
2,6-Dinitrotoluene	µg/L	<1	<1	<1
Di-n-octyl phthalate	µg/L	<1	<1	<1
bis (2-Ethylhexyl) phthalate	µg/L	<1	<1	<1
Fluoranthene	µg/L	<1	<1	<1
Fluorene	µg/L	<1	<1	<1
Hexachlorobenzene	µg/L	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1
Hexachlorocyclopentadiene	µg/L	<1	<1	<1
Hexachloroethane	µg/L	<1	<1	<1
Indeno (1,2,3) pyrene	µg/L	<1	<1	<1
Isophorone	µg/L	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1
Nitrobenzene	µg/L	<1	<1	<1
n-Nitrosodimethylamine	µg/L	<1	<1	<1

Table 17.--Concentrations of totally recoverable base-neutral-extractable compounds in water, Finley Creek and Eagle Creek, December 14, 1982--(Continued)

Constituent [1]	Units	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
n-Nitrosodiphenylamine	µg/L	<1	<1	<1
n-Nitrosodi-n-propylamine	µg/L	<1	<1	<1
Phenanthrene	µg/L	<1	<1	<1
Pyrene	µg/L	<1	<1	<1
2,3,7,8-Tetrachlorodibenzo-p-dioxin	µg/L	<1	<1	<1
1,2,4-Trichlorobenzene	µg/L	<1	<1	<1

[1] Detection limie: 1 µg/L. All constituents are EPA priority pollutants.

Table 18.--Field measurements and streambed-material-size analyses, Finley Creek and Eagle Creek, October 26-27, 1982.

Measurement	Units	Finley Creek at 1100 East Road near Zionsville (site 1)	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
Water temperature	°C	6.4	6.0	8.9	6.8
Specific conductance	umho/cm at 25° C	647	1,215	607	887
Dissolved oxygen	mg/L	5.4	5.2	8.3	9.3
pH	--	7.9	7.9	8.1	7.5
Discharge	ft^3/sec	<.1	<.1	0	9
Suspended-sediment concentration	mg/L	86	123	121	48
Percent suspended sediment <63 micron	percent	71	71.5	51.5	91.7
Streambed-material size:					
>2,000μ	percent	48.7	0	45.2	51.2
1,000 - 2,000μ	percent	14.2	0	6.0	12.2
500 - 1,000μ	percent	14.4	0	6.5	16.7
250 - 500μ	percent	14.5	0	7.7	15.7
125 - 250μ	percent	5.3	0	7.8	3.2
63 - 125μ	percent	1.4	0	7.4	0.4
<63μ	percent	1.5	100	19.4	0.6

Table 19.--Field measurements, Finley Creek and Eagle Creek, December 14, 1982

Measurement	Units	Finley Creek at Highway 421 near Zionsville (site 2)	Eagle Creek at West 146 St. near Zionsville (site 3)	Eagle Creek at 100 North Road near Indianapolis (site 4)
Water temperature	°C	0.8	0.6	1.4
Specific conductance	umho/cm at 25° C	621	630	665
Dissolved oxygen	mg/L	12.8	12.3	12.7
pH	--	8.7	8.4	8.3
Discharge	ft^3/sec	3.8	25.3	51
Suspended-sediment concentration	mg/L	77	72	89
Percent suspended sediment <63 micron	percent	89.8	85.4	80.8

Appendix 1.--Water-quality survey of Eagle Creek and tributaries upstream from Eagle Creek Reservoir, August 25-26, 1980

A. Concentrations of selected metals and nonmetals on streambed material (<63-micron fraction)

[µg/g=microgram per gram]

Constituent	Units	Eagle Creek at 300 North Road (site 1)	Ditch to Finley (site 2)	Finley Creek at 1100 East Road (site 3)	Finley Creek at Hwy 421 (site 4)	Mounts Run at 950 East Road (site 5)	Jackson Run at North 68th Road (site 6)	Little Eagle Creek at 121st St. West (site 7)	Eagle Creek at Willow Avenue (site 8)	Eagle Creek below High School Avenue (site 9)	Eagle Creek at Lafayette Road (site 10)	Fishback Creek at Wilson Road (site 11)
Aluminum [1]	µg/g	3,900	7,100	7,000	4,600	4,000	3,600	4,400	4,100	5,100	8,100	3,900
Arsenic [2]	µg/g	<1	3	2	1	<1	<1	<1	<1	2	<1	<1
Barium [3]	µg/g	110	160	130	100	90	130	110	100	80	130	100
Cadmium [1]	µg/g	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chromium [2]	µg/g	10	60	13	10	10	10	20	10	20	30	30
Copper [2]	µg/g	20	20	20	20	10	20	10	20	20	30	20
Iron [2]	µg/g	9,500	14,000	14,000	13,000	8,400	10	8,200	8,400	11,000	20,000	7,000
Lead [1]	µg/g	20	80	30	50	20	20	20	40	30	30	30
Manganese [2]	µg/g	530	710	470	590	490	520	500	450	430	700	470
Mercury [4]	µg/g	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01
Selenium [2]	µg/g	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver [2]	µg/g	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Zinc [2]	µg/g	48	79	70	76	46	50	46	49	56	87	47

[1] Detection limit=10 µg/g.
[2] Detection limit=1 µg/g.
[3] Detection limit=2.5 µg/g.
[4] Detection limit=0.01 µg/g.

B. Concentrations of organochlorine insecticides on streambed material (<63-micron fraction)

Aldrin [1]	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chlordane [2]	µg/kg	7	<1	9	19	29	22	8	23	3	9	9
DDD [1]	µg/kg	<0.1	<0.1	0.6	<0.1	<0.1	<0.1	<0.1	1.2	0.8	<0.1	<0.1
DDE [1]	µg/kg	<0.1	<0.1	0.7	<0.1	<0.1	<0.1	0.7	1.5	<0.1	<0.1	<0.1
DDT [1]	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin [1]	µg/kg	3.1	<0.1	3.7	4.1	19	17	5.7	13	8.9	2.5	9.2
Endosulfan [1]	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin [1]	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor-epoxide [1]	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor [1]	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane [1]	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex [1]	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor [1]	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
PCB (total) [2]	µg/kg	1	10	10	120	3	2	2	31	7	28	3
PCN (total) [2]	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perthane [2]	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Toxaphene [3]	µg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10

[1] Detection limit=0.1 µg/kg.
[2] Detection limit=1 µg/kg.
[3] Detection limit=10 µg/kg.

Appendix 1.--Water-quality survey of Eagle Creek and tributaries upstream from Eagle Creek Reservoir, August 25-26, 1980--(Continued)
C. Concentrations of organophosphorus insecticides on streambed material (<63-micron fraction)

Constituent	Units	Eagle Creek at 300 North Road (site 1)	Ditch to Finley (site 2)	Finley Creek at 1100 East Road (site 3)	Finley Creek at Hwy 421 (site 4)	Mounts Run at 950 East Road (site 5)	Jackson Run at North 68th Road (site 6)	Little Eagle Creek at 121st St. West (site 7)	Eagle Creek at Willow Avenue (site 8)	Eagle Creek below High School Avenue (site 9)	Eagle Creek at Lafayette Road (site 10)	Fishback Creek at Wilson Road (site 11)
Diazinon	µg/kg	<0.1	2.4	2.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methylparathion	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methyltrithion	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Trithion	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

[1] Detection limit=0.1 µg/kg.

D. Concentrations of chlorinated-phenoxy and acid herbicides on streambed material (<63 micron-fraction)

Silvix	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4D	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4DP	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,5-T	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

[1] Detection limit=0.1 µg/kg.

Appendix 1.--Water-quality survey of Eagle Creek and tributaries upstream from Eagle Creek Reservoir, August 25-26, 1980--(Continued)
E. Concentrations of nutrients on streambed material (<63-micron fraction)

Constituent	Units	Eagle Creek at 300 North Road (site 1)	Ditch to Finley (site 2)	Finley Creek at 1100 East Road (site 3)	Finley Creek at Hwy 421 (site 4)	Mounts Run at 950 East Road (site 5)	Jackson Run at North 68th Road (site 6)	Little Eagle Creek at 121st St. West (site 7)	Eagle Creek at Willow Avenue (site 8)	Eagle Creek below High School Avenue (site 9)	Eagle Creek at Lafayette Road (site 10)	Fishback Creek at Wilson Road (site 11)
Inorganic carbon (total) [1]	g/kg	26	29	15	18	23	16	16	18	16	28	15
Organic carbon (total [1]	g/kg	36	37	36	36	41	36	33	36	39	42	38
Phosphorus (total) [2]	g/kg	590	400	690	560	700	530	520	670	680	500	540
Nitrogen (total) [3]	g/kg	4,900	2,900	6,400	4,100	7,300	28,000	7,100	6,400	6,700	6,600	7,200
Oil and grease (total) [1]	g/kg	0	0	0	0	0	0	0	0	0	0	0
Cyanide [4]	ug/g	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5

F. Field measurements and streambed-material-size analyses

Water temperature	°C	19.7	20.9	20.8	22.1	23.0	22.2	22.2	21.8	23.5	29.4	23.8
Specific conductance AT 25° C	umho/cm[2]	689	628	635	621	681	710	610	634	638	554	670
Dissolved oxygen	mg/L	9.3	5.4	9.4	10.4	11.3	10.6	10.2	10.0	10.4	28.0	11.6
pH	--	7.7	7.6	7.8	8.0	8.2	8.1	7.8	8.0	7.9	9.4	8.3
Streambed material size:												
>2000u (gravel)	percent	30.3	0.2	42.5	0.2	40.5	56.2	23.2	7.3	5.6	53.2	78
1000 - 2000u	percent	20.6	12.0	18.7	5.0	28.1	14.6	8.3	8.5	18.8	15.9	7.5
500 - 1000u	percent	21.2	13.5	19.7	40.4	18.8	13.5	19.8	25.1	37.1	8.8	6.1
250 - 500u (sand)	percent	20.2	10.5	14.7	45.0	9.5	10.5	38.0	47.7	33.4	8.9	5.2
125 - 250u	percent	6.6	16.4	3.5	7.3	2.4	3.8	8.8	10.2	4.7	9.1	2.0
63 - 125u	percent	0.8	10.1	0.5	1.4	0.5	0.8	1.2	0.7	0.2	2.1	0.5
<63u (silt/clay)	percent	0.3	37.3	0.4	0.7	0.2	0.6	0.7	0.5	0.2	2.0	0.7

[1] Detection limit varies with amount of sample analyzed.
[2] Detection limit=40 mg/kg.
[3] Detection limit=1 mg/kg.
[4] Detection limit=0.5 ug/g.

Appendix 1.--Water-quality survey of Eagle Creek and tributaries upstream from Eagle Creek Reservoir, August 25-26, 1980--(continued)

G. GC/MS base-neutral scan of streambed material (<63-micron fraction)

The following are results of a GC/MS base neutral scan of priority pollutants on streambed materials (<63 micron) collected from Eagle Creek watershed August 25-26, 1980. Methylene chloride was used as the extraction solvent. The extract was concentrated to 1.0 ml, and approximately 4 microliters of the concentrate was analyzed. No priority pollutants were identified; however, several closely related compounds were identified and some were quantified. Minimum detection limits are approximately 2.0 µg/kg.

Site 1 -- One peak was identified as a phthalate; seven peaks were identified as alcohols; and thirteen peaks were identified as straight-chain, branched, and cyclic hydrocarbons.

Site 2 -- Concentration of strobane (related to Toxaphene) was 98.1 µg/kg. Five peaks were identified as hydrocarbons or complex alcohols.

Site 3 -- One peak was identified as 1,4-dimethoxybenzene, and nine other peaks were identified as acetaldehyde derivatives or complex alcohols.

Site 4 -- Traces of dimethyl and trimethyl phenanthrene were identified. Concentration of strobane was 97.1 µg/kg.

Site 5 -- Traces of nitrobenzene, 1,4-dimethoxybenzene, and acetaldehyde derivatives were identified.

Site 6 -- One peak was identified as an acetaldehyde derivative, one as a fluorophenyl compound, and one as a benzenediol.

Site 7 -- Nothing was detected.

Site 8 -- Four peaks were identified as alcohols, and six were identified as branched or straight-chain hydrocarbons.

Site 9 -- Phenol was identified in trace concentrations. Seven other peaks were identified as alcohols and ketones.

Site 10 -- Three peaks were identified as alcohols, seven as straight-chain, branched, and cyclic hydrocarbons, and one as a complex ester.

Site 11 -- Trimethyloenzenes were identified in trace concentrations. Four peaks were identified as hydrocarbons or complex organic acids.

Appendix 2.--Drinking-water standards for selected inorganic and organic chemicals

[Source, U.S. Environmental Protection Agency (1975, 1979a, 1979b)]

National Interim Primary Drinking Water Regulations

	Constituent	Concentration (µg/L)
Inorganic:	Arsenic	50
	Barium	1,000
	Cadmium	10
	Chromium	50
	Cyanide	200
	Lead	50
	Mercury	2
	Selenium	10
	Silver	50
Organic:	Bromoform	100
	Chloroform	100
	Endrin	0.2
	Lindane	4
	Methoxychlor	100
	Toxaphene	5

National Secondary Drinking Water Regulations

Constituent or property	Concentration (µg/L)
Copper	1,000
Iron	300
Manganese	50
pH	[1] 6.5 - 8.5
Zinc	5,000

[1] Not microgram per liter. pH is the negative logarithm of the hydrogen ion concentration.

Appendix 3.--Select organic compounds that exceeded background concentrations in Finley and Eagle Creek, October and December, 1982

[Source, Windholz, Martha, ed., 1976]

Constituent	Uses	Public Health Concern
bis (2-Chloroethyl) ether	Dissolves oils, fats, greases; purification of oils; scouring textiles; insecticidal fumigant in soils.	Irritating to skin, eyes, mucous membrane.
bis (2-Ethylhexyl) phthalate	Used in vacuum pumps.	--
1,2-Dichlorobenzene	Solvent for waxes, gums, resins, tars, rubbers, oils, asphalts; insecticide for termites and locust borers; degreaser.	May cause liver or kidney injury; high concentrations cause central nervous system (CNS) depression.
1,1-Dichloroethane	--	Narcotic in high concentration.
1,2-trans-Dichloroethylene	Solvent for fats, phenol, camphor; retards fermentation.	Irritant and narcotic in high concentration.
Diethyl phthalate	Solvent for cellulose acetate in the manufacture of varnishes and dopes; fixative for perfumes; denaturing alcohol.	Irritation to mucous membranes; narcotic in high concentrations.
2,4-Dimethylphenol	Preparation of coal tar disinfectants; manufacture of artificial resins.	--
Dimethyl phthalate	Solvent and plasticizer for cellulose acetate and cellulose acetate-butyrate compositives; insect repellant for personal use.	Irritating to eyes and mucous membranes; can cause CNS depresion when ingested; not irritating to or absorbed through skin.
Di-n-butyl phthalate	Insect repellant for impregnation on clothing.	--

Appendix 3.--Select organic compounds that exceeded background concentrations in Finley and Eagle Creek, October and December, 1982--(Continued)

Constituent	Uses	Public Health Concern
n-Nitrosodimethylamine	Found in trace amounts in tobacco smoke condensates.	Carcinogenic; fatal poison; causes liver injury.
PCB (Total)	Coolant in capacitors and transformers; carbonless carbon paper; electromagnets and voltage regulators in fluorescent light fixtures	Causes liver injury; suspected carcinogen; acute dose causes chloracne, headaches, nausea, and diarrhea.
Phenol	Disinfectant; manufacture of artificial resins, medical and industrial organic compounds and dyes; used as reagent in chemical analysis. adsorption.	May cause nausea, vomiting, etc., average fatal dose is 15 g but as little as 1 g has caused death; poisoning may occur by skin
Tetrachlorethylene	Degreasing metals; dry cleaning; solvents.	Narcotic in high concentrations; defatting action on skin can cause dermatitis.
Toluene	Manufacture of benzoic acid, benzaldehyde, explosives, dyes, and other organic compounds; solvent in extraction of various principles from plants.	Narcotic in high concentrations.
1,1,1-Trichloroethane	Cold type metal cleaning; cleaning plastic molds.	Narcotic in high concentrations; irritating to eyes and mucous membranes.
Trichloroethylene	Solvent for fats, waxes, resins, oils, rubber, paint, varnish, cellulose esters and ethers; degreaser; manufacture of organic chemicals and pharmaceuticals such as chloroacetic acid.	Moderate exposure may be similar to alcohol inebriation; narcotic in high concentration; caused deaths by ventricular fibrillation.