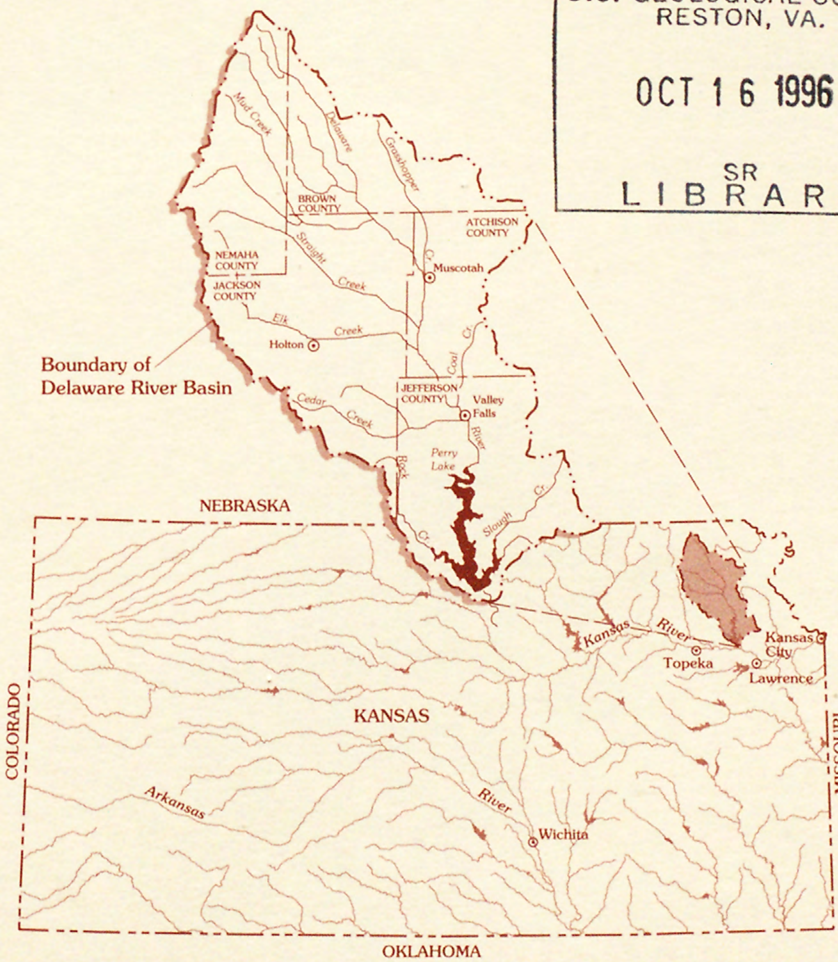
Concentrations and Transport of Atrazine in Surface Water of the Delaware River-Perry Lake System, Northeast Kansas, July 1992 Through September 1995

U.S. GEOLOGICAL SURVEY
Open-File Report 96–331



Prepared in cooperation with the
KANSAS STATE CONSERVATION COMMISSION,
KANSAS STATE UNIVERSITY, and the
KANSAS DEPARTMENT OF AGRICULTURE

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By LARRY M. POPE, LESLEY D. BREWER, GREG A. FOLEY, and SCOTT C. MORGAN

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Lawrence, Kansas
1996

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CONVERSION FACTORS, ABBREVIATIONS, AND VERTICAL DATUM

Multiply	By	To obtain
acre	4,047	square meter
acre-foot (acre-ft)	1,233	cubic meter
cubic foot per second (ft^3/s)	0.02832	cubic meter per second
foot (ft)	0.3048	meter
inch (in.)	25.4	millimeter
mile (mi)	1.609	kilometer
pound (lb)	453.6	gram
pound per acre (lb/acre)	1.121	kilogram per hectare
pound per square mile (lb/mi^2)	175.1	gram per square kilometer
square mile (mi^2)	2.590	square kilometer

Temperature can be converted to degrees Celsius (°C) or degrees Fahrenheit (°F) by the equations:

$$^{o}C = 5/9\ (^{o}F - 32)$$

$$^{o}F = 9/5\ (^{o}C) + 32.$$

Sea level: In this report, "sea level" refers to the National Geodetic Vertical Datum of 1929—a geodetic datum derived from a general adjustment of the first-order level nets of the United States and Canada, formerly called Sea Level Datum of 1929.

Water year: A water year is a 12-month period, from October 1 through September 30, designated by the calendar year in which it ends. Years are water years in this report unless otherwise stated.

Crop year: A crop year, as used in this report, is a 12-month period from April 1 through March 31, designated by the calendar year in which it begins.

Concentrations and Transport of Atrazine in Surface Water of the Delaware River-Perry Lake System, Northeast Kansas, July 1992 Through September 1995

By Larry M. Pope, Lesley D. Brewer, Greg A. Foley, *and* Scott C. Morgan

Abstract

A study of the distribution and transport of atrazine in surface water in the 1,117 square-mile Delaware River Basin in northeast Kansas was conducted from July 1992 through September 1995. The purpose of this report is to present information to assess the present (1992–95) conditions and possible future changes in the distribution and magnitude of atrazine concentrations, loads, and yields spatially, temporally, and in relation to hydrologic conditions and land-use characteristics.

A network of 11 stream-monitoring and sample-collection sites was established within the basin. Stream-water samples were collected during a wide range of hydrologic conditions throughout the study. Nearly 5,000 samples were analyzed by enzyme-linked immunosorbent assay (ELISA) for triazine herbicide concentrations. Daily mean triazine herbicide concentrations were calculated for all sampling sites and subsequently used to estimate daily mean atrazine concentrations with a linear-regression relation between ELISA-derived triazine concentrations and atrazine concentrations determined by gas chromatography/mass spectrometry for 141 dual-analyzed surface-water samples.

During May, June, and July, time-weighted, daily mean atrazine concentrations in streams in the Delaware River Basin commonly exceeded the value of the 3.0-μg/L (micrograms per liter) annual mean Maximum Contaminant Level (MCL) established by the U.S. Environmental Protection Agency for drinking-water supplies. Time-weighted, daily mean concentrations equal to or greater than 20 μg/L were not uncommon. However, most time-weighted, daily mean concentrations were less than 1.0 μg/L from August through April.

The largest time-weighted, monthly mean atrazine concentrations occurred during May, June, and July. Most monthly mean concentrations between August and April were less than 0.50 μg/L. Large differences were documented in monthly mean concentrations within the basin. Sites receiving runoff from the northern and northeastern parts of the Delaware River Basin had the largest monthly and annual mean atrazine concentrations.

Time-weighted, annual mean atrazine concentrations did not exceed the MCL in water from any sampling site for either the 1993 or 1994 crop years (April–March); however, concentrations were larger during 1994 than during 1993. Time-weighted, annual mean concentrations in water from among the 11 sampling sites during the 1993 crop year ranged from 0.27 to 1.5 μg/L and from 0.36 to 2.8 μg/L during the 1994 crop year. Furthermore, concentrations in samples from the outflow of Perry Lake were larger during the first 6 months of the 1995 crop year than during the previous year.

Flow-weighted, annual mean atrazine concentrations were larger than time-weighted, annual mean concentrations in water from all sampling

sites upstream of Perry Lake, and samples from several sites had concentrations that were substantially larger than the MCL. This difference explained why time-weighted, annual mean concentrations in the outflow of Perry Lake were larger than corresponding time-weighted concentrations in water from sampling sites upstream of Perry Lake. Flow-weighted, annual mean concentrations in water from among the 11 sampling sites during the 1993 crop year ranged from 1.0 to 4.4 μg/L and from 1.0 to 8.9 μg/L during the 1994 crop year.

Statistically significant linear-regression equations were identified relating the percentage of subbasin in cropland to time- and flow-weighted, average annual mean atrazine concentrations. The relations indicate that time-weighted, average annual mean atrazine concentrations may not exceed the MCL in water from subbasins with at least about 70-percent cropland. However, flow-weighted, average annual mean atrazine concentrations may exceed the MCL when the percentage of cropland is greater than about 40 percent.

Approximately 90 percent of the annual atrazine load is transported from May through July. Atrazine loads and yields were larger during the 1993 crop year than during the 1994 crop year because of much greater runoff in 1993. Yields at sampling sites upstream of Perry Lake ranged from 2.4 to 17 lb/mi^2 (pounds per square mile) during the 1993 crop year and from 0.29 to 4.4 lb/mi^2 during the 1994 crop year. Loads and yields were largest at sampling sites receiving runoff from the northern and northeastern parts of the Delaware River Basin. A statistically significant linear-regression equation was identified relating percentage of subbasin in cropland to atrazine yields.

About 283,000 lb (pounds) of atrazine are applied each year in the Delaware River Basin. Annual atrazine loads (5,200 and 2,000 lb), yields (4.7 and 1.8 lb/mi^2), and transport ratios (1.8 and 0.7 percent) were estimated for the entire Delaware River Basin for the 1993 and 1994 crop years, respectively. Differences between the 1993 and 1994 crop years are the result of differences in rainfall amounds and subsequent runoff volumes.

INTRODUCTION

Crop yields have increased during the last 40 years due in part to the use of herbicides in reducing weed growth and competition for moisture and nutrients. However, concern on the part of water suppliers, health officials, and the public also has increased regarding the safe and effective use of herbicides.

Since about 1960, atrazine has been used as a pre- and post-emergent herbicide in the production of corn, grain sorghum, sugar cane, pineapple, and certain other plants and has become the most extensively applied herbicide in the United States (U.S. Environmental Protection Agency, 1989). Nonagricultural uses include nonselective weed control around commercial and industrial areas and along railroad rights-of-way. About 95 percent of the atrazine applied in the United States is used in corn and grain sorghum production (CIBA-GEIGY Corporation, 1992). Atrazine is the most consistently detected herbicide in Kansas surface-water samples. Eastern Kansas streams and lakes show the most consistent patterns of pesticide detection, which are probably related to land use and runoff conditions (Butler and Arruda, 1985).

The widespread use of atrazine may pose a potential threat to public-water supplies in areas where it is used intensively because of possible adverse effects on human health and potential toxicity to aquatic life (Hersh and Crumpton, 1987; Kettle and others, 1987; Stay and others, 1989). In 1992, the U.S. Environmental Protection Agency (1992) established an annual mean Maximum Contaminant Level (MCL) for atrazine of 3.0 μg/L (micrograms per liter) in finished drinking-water supplies.

Because of concerns that some surface-water supplies in northeast Kansas may exceed the MCL for atrazine, the Kansas State Board of Agriculture (currently the Kansas Department of Agriculture) conducted a series of hearings concerning the extent of atrazine contamination. As a result of these hearings, which indicated that long-term average concentrations of atrazine in Perry Lake (a Federal reservoir located at the downstream end of the Delaware River Basin, fig. 1) may exceed the 3.0-μg/L MCL, the Nation's first inland surface-water Pesticide Management Area (PMA) was established in the Delaware River Basin in

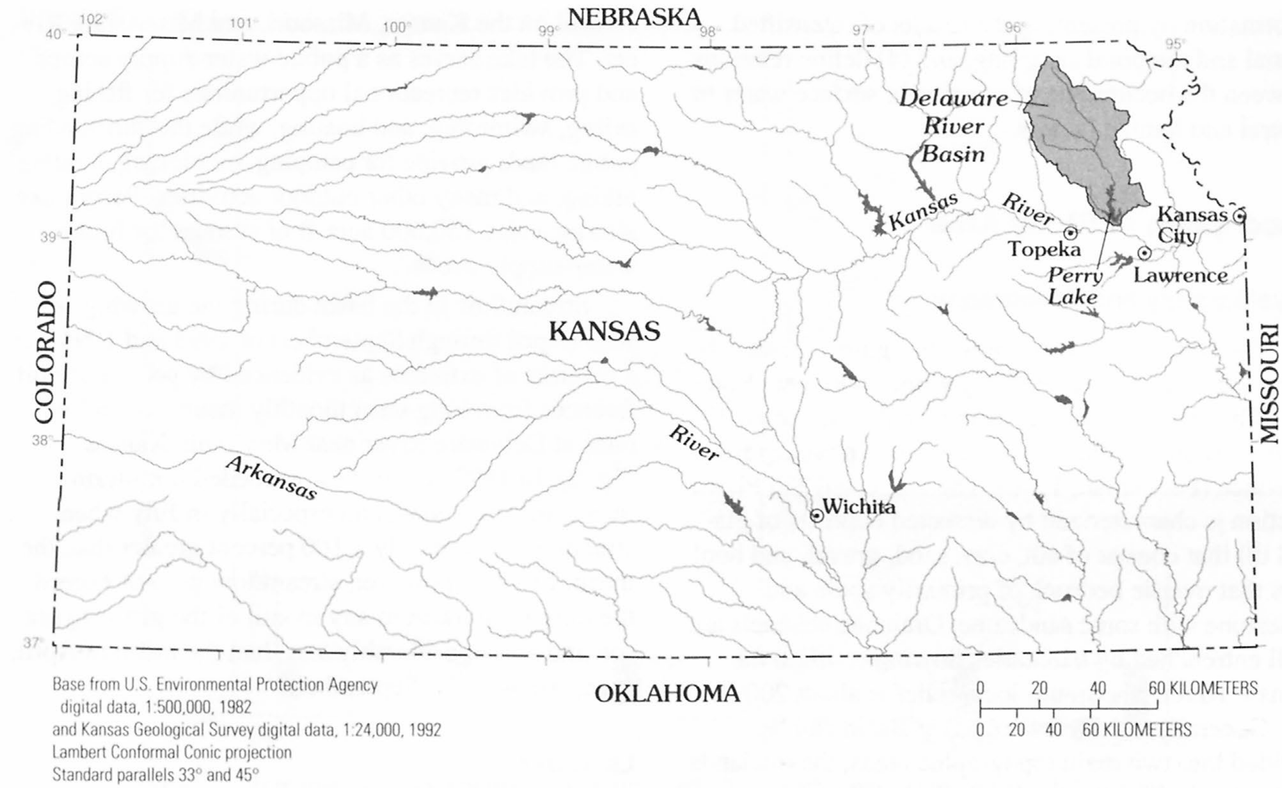


Figure 1. Location of Delaware River Basin in northeast Kansas.

April 1992 by the Kansas State Board of Agriculture. The goal of the PMA is to limit the input of atrazine into surface water in the Delaware River Basin. Components of the PMA included voluntary management and conservation practices, education, monitoring, research, enforcement, and evaluation.

Public-water supplies are withdrawn from Perry Lake and the Delaware River upstream of Perry Lake. Withdrawals from Perry Lake supply two rural-water districts and several Federal- and State-owned recreational areas. Water from Perry Lake receives no special treatment to remove atrazine from the finished water, and there is the potential for annual mean concentrations of atrazine in these public supplies to exceed the MCL (Stamer and Zelt, 1994). Additionally, discharge from Perry Lake enters the Kansas River, which serves as a supply source for the city of Lawrence and the Kansas City, Kansas, metropolitan area.

A study of the distribution and transport of atrazine in the 1,117-mi^2 Delaware River Basin in northeast Kansas was conducted by the U.S. Geological Survey (USGS) in cooperation with the Kansas State Conservation Commission, Kansas State University, and the Kansas Department of Agriculture from July 1992 through September 1995. Data and results from this study will be used by State and Federal conservation, regulatory, research, and informational agencies to: (1) evaluate the perception of a long-term atrazine problem in the basin, (2) identify areas of the basin where additional educational activities may be required, (3) evaluate the effectiveness of selected land-management and agricultural practices, and (4) improve the understanding of herbicide transport in areas of similar agriculture and hydrology.

Purpose and Objectives

The purpose of this report is to present the information necessary to assess the present and possible future changes in the distribution and magnitude of atrazine concentrations, loads, and yields spatially, temporally, and in relation to hydrologic conditions and land-use characteristics. Specific objectives of this report are to: (1) present estimates of annual mean concentrations and loads of atrazine, (2) compare annual mean atrazine concentrations determined by this study with historical data and explain observed differences, (3) reduce the uncertainty of atrazine information by presenting the results of intensified spatial and temporal sampling, and (4) define relations between the occurrence of atrazine in surface water to natural and human factors.

Description of Study Area

Physiography and Topography

The Delaware Basin, shown in figure 1, is an 1,117-mi^2 area located entirely within northeast Kansas. The Delaware River Basin is in the Dissected Till Plains Section of the Central Lowlands physiographic province (Fenneman, 1946). The Dissected Till Plains Section is characterized by dissected deposits of glacial till that consist of silt, clay, sand, gravel, and boulders that overlie bedrock of primarily shale and limestone with some sandstone. Drainage channels are well entrenched by tributaries flowing south to the Kansas River. Maximum local relief is about 200 ft.

Generally, the Delaware River Basin can be divided into two main topographic areas, the lowlands and uplands. The lowlands occur along the streams. They vary in width from 0.25 to 0.75 mi and generally are level and fairly well drained. The uplands are subdivided into smooth to gently sloping areas, steeply sloping areas, and rough hilly areas. The smooth to gently sloping areas are on broad divides, generally at some distance from the larger streams. The steeply sloping areas are in the vicinity of the streams. The rough hilly areas are along the creeks (Eikleberry and Templin, 1960).

Surface-Water Hydrology

The Delaware River is a tributary of the Kansas River and on average contributes about 9 percent of the annual flow in the Kansas River downstream at DeSoto, Kansas (Geiger and others, 1994). A prominent hydrologic feature of the basin is Perry Lake, which is a Federal reservoir formed by the construction of a 7,750-ft-long rolled-earth-filled dam completed in 1969. The multipurpose pool has a surface area of 11,150 acres, with a storage of 209,500 acre-ft, at an elevation of 891.5 ft above sea level. The flood-control pool has a surface area of 25,300 acres, with a storage of 725,300 acre-ft, at an elevation of 920.6 ft above sea level.

Perry Lake provides flood protection on the Delaware River and is used in conjunction with other U.S. Army Corps of Engineer projects to provide flood control on the Kansas, Missouri, and Mississippi Rivers. The lake serves as a public water-supply source and provides recreational opportunities for fishing, skiing, swimming, and boating, while the surrounding public lands provide for camping, picnicking, hunting, hiking, and many other outdoor activities. Perry Lake also provides 150,000 acre-ft of storage for future water-supply needs.

Streamflow in the basin during the growing seasons (April through September) of 1993 and 1994 was a contrast of extremes as evidenced by percentage differences from long-term monthly mean streamflow rates at Delaware River near Muscotah, Kansas (fig. 2). In 1993, streamflow exceeded long-term means in April, May, and especially in July when streamflow was nearly 1,100 percent greater than the mean. In 1994, however, streamflow did not exceed the long-term mean in any month of the growing season and was considerably less than the mean in April, June, August, and September.

Land Use

Land use in the Delaware River Basin (fig. 3) is typical of the agricultural region of the Midwestern United States. Agriculture accounts for about 85 percent of the land use within the basin, with about 40 percent in crops such as corn, grain sorghum, soybeans, and wheat (Pope, 1995). The remaining agricultural land is devoted to pasture and rangeland. Nearly all cropland is nonirrigated. Only about 1.5 percent of the agricultural land in the basin is irrigated (U.S. Soil Conservation Service, 1987). The most intensely cultivated parts of the study area are the extreme northern and northeastern sections.

Climate

The climate of the study area is controlled by the movement of frontal air masses over the open inland-plains topography, and seasonal temperature and precipitation extremes are common. During the summer months, the weather is dominated by warm, moist air from the Gulf of Mexico or hot, dry air from the desert southwest, and temperatures near or above 100 °F can occur. Winter months are characterized by influxes of cold, dry polar air with temperatures as low as -20 °F. Mean annual precipitation is about 36 to 38 in., with more than 70 percent of this occurring during the growing season, April through September (Dickey and others, 1977). Mean annual runoff is about 8 in.

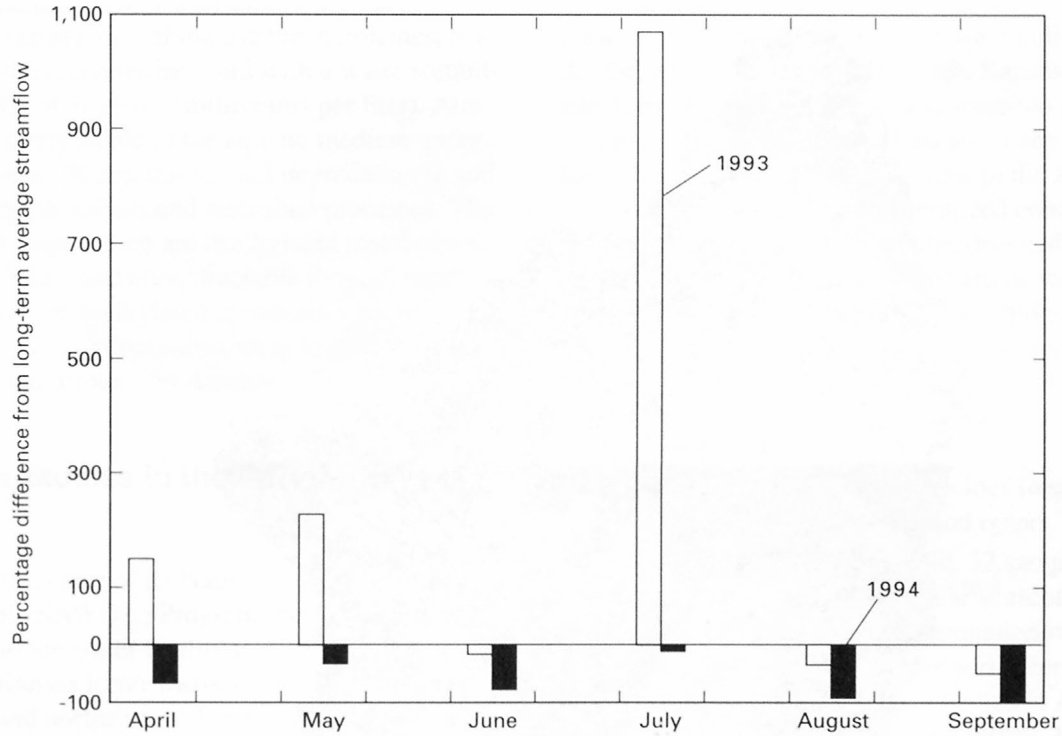


Figure 2. Percentage difference from long-term (1969–92) monthly mean streamflow of Delaware River near Muscotah, Kansas (sampling site 4, fig. 4), for April through September 1993 and 1994.

(Stamer and others, 1994). The average annual snowfall for northeastern Kansas is about 20 in.

Precipitation during the early part of the spring and the latter part of the fall occurs in association with frontal air masses that produce low-intensity rainfall of regional coverage and relatively lengthy duration. Summer precipitation generally occurs as evening or early morning thundershowers of short duration that can produce large amounts of rain. In May and June, 3 to 5 in. of rain may fall in 24 hours (Eikleberry and Templin, 1960). This is the time when much of the cropland has been recently tilled and planted, which results in limited cover on the soil surface. The intense rains may produce a large volume of runoff and commonly cause floods and severe sheet and gully erosion.

The average date of the last frost in spring is about April 19. The latest frost recorded was on May 15. The average date of the first frost in autumn is about October 15. The earliest frost recorded was on September 17. The average growing season is about 179 days (Eikleberry and Templin, 1960).

Uses and Properties of Atrazine

The occurrence of atrazine in water in the Delaware River Basin originates as a result of its use in the production of corn and grain sorghum. Atrazine is the most extensively used herbicide in the basin for pre- and postemergent control of selected broadleaf weeds and annual grasses. Its effectiveness lies in its ability to inhibit the photosynthetic reaction and, thus, the cellular production of glucose and adenosine triphosphate, an energy source for other cellular chemical reactions (Kleiner and Orten, 1966).

Atrazine may be used alone, in tank mixes with other herbicides such as alachlor and metolachlor, or as part of a premix with acetochlor, alachlor, bentazon, bromoxynil, butylate, cyanazine, dicamba, dimethenamid, imazethapyr, or propachlor. Atrazine and its many combinations may be surface applied or incorporated into the soil profile as a preplant and(or) preemergent up to 45 days before planting or as postemergent weed control when mixed with crop-oil concentrate in water (Regehr and others, 1994).

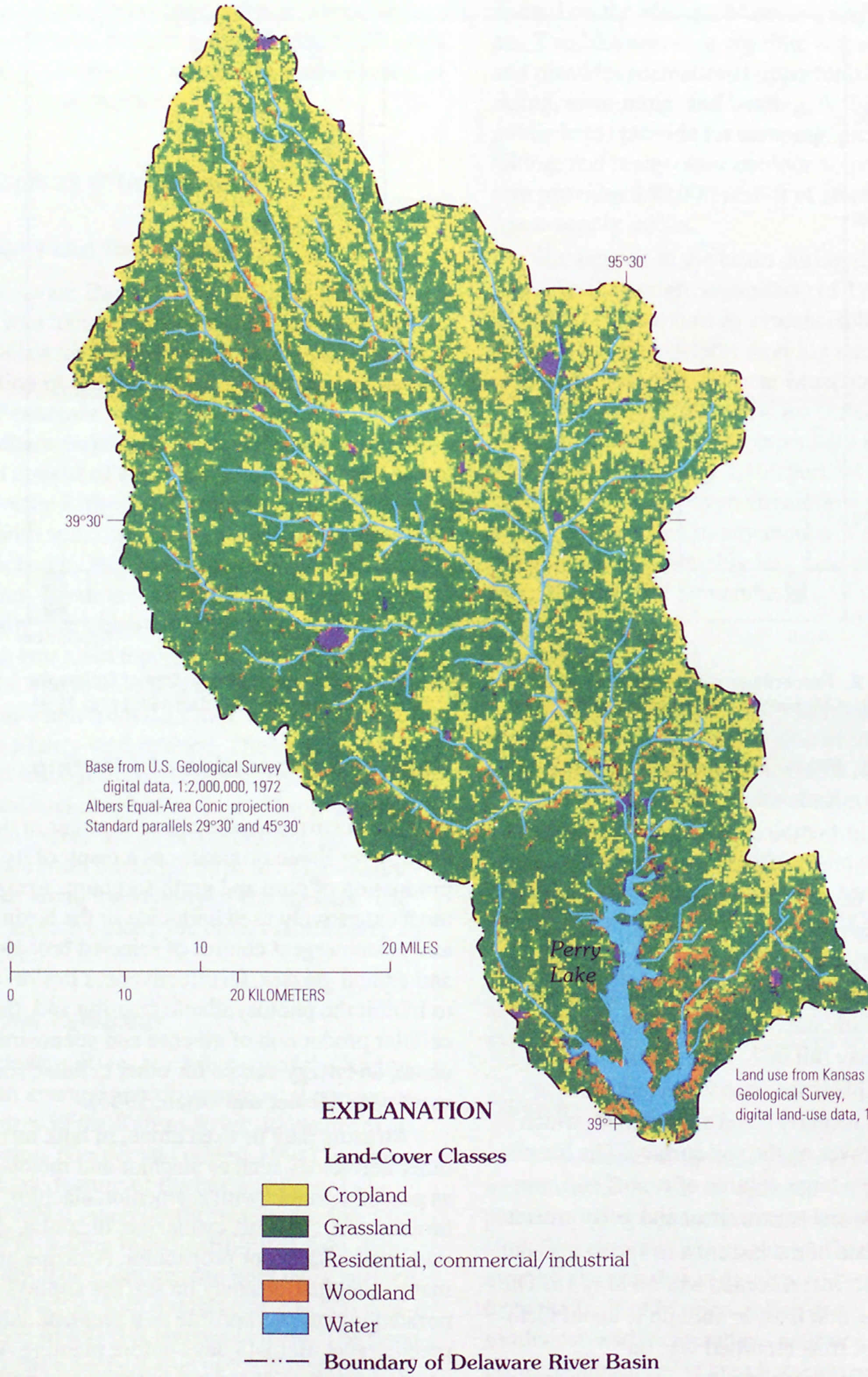


Figure 3. Land use in the Delaware River Basin, 1992.

Atrazine (2-chloro-4-ethylamino-6-isopropylamine-s-triazine), one of the triazine herbicides, is a white, odorless, crystalline solid with a water solubility (at 22 °C) of 70 mg/L (milligrams per liter). Atrazine is relatively stable in the aquatic medium under environmental pH conditions, and degradation in soil is mainly by photolysis and microbial processes. The products of degradation are dealkylated metabolites, hydroxyatrazine, and nonextractable (bound) residues. Atrazine and the dealkylated metabolites are relatively mobile, whereas hydroxyatrazine is immobile (U.S. Environmental Protection Agency, 1989).

Previous Studies in the Delaware River Basin

In 1986, as part of its National Water-Quality Assessment (NAWQA) Program, the USGS began a study of surface-water quality in a 15,300-mi^2 area of the lower Kansas River Basin in southeastern Nebraska and northeastern Kansas. The Delaware River Basin is a subbasin of the lower Kansas River Basin.

From January 1989 through February 1990, water samples were collected at least monthly from the Delaware River near Muscotah, Kansas (sampling site 4, fig. 4), and the Delaware River below Perry Dam, Kansas (sampling site 11, fig. 4), as part of the lower Kansas River Basin NAWQA study. Atrazine concentrations from the Delaware River near Muscotah, Kansas, were smallest in January, March, and April before the spring 1989 herbicide application and largest in May, June, and July after application. The largest determined atrazine concentration was 22 μg/L in June 1989. The mean atrazine concentration for the 1989 calendar year, based on 16 samples, was 2.8 μg/L (Stamer and others, 1994).

In contrast to the unregulated upstream reach of the Delaware River, atrazine concentrations in water samples collected from the Delaware River at the outflow of Perry Lake showed little or no seasonal variability. Concentrations of atrazine gradually decreased from 5.0 μg/L in January 1989 to 1.7 μg/L in February 1990. The mean atrazine concentration for the 1989 calendar year was 3.5 μg/L, based on 13 samples (Stamer and others, 1994).

The USGS through its Toxic Substances Hydrology Program began a series of regional studies in a 10-state Midwest area in 1989 to address the issue of contamination of surface water by agricultural chemicals. The Delaware River Basin was included in these studies. Only three samples were collected from the Delaware River near Muscotah, Kansas (sampling site 4, fig. 4), during 1989. These were too few samples to draw specific conclusions about any one site or basin, but when all 149 stream sites in the Midwest area were evaluated, some generalized conclusions were reached. First, the herbicides detected most frequently and in the largest concentrations were atrazine, alachlor, cyanazine, and metolachlor. Second, herbicide concentrations during the postapplication period generally were one or two orders of magnitude larger than those measured before application and in the fall during low streamflow. Third, atrazine is the most persistent of the major herbicides in surface water of the Midwest (Goolsby and others, 1990).

Between April and June 1990, 32 samples were collected from Delaware River near Muscotah, Kansas (sampling site 4, fig. 4), as a continuation of the regional study begun by Goolsby and others (1990). Two of these 32 samples were collected in April, 18 in May, and 12 in June (Scribner and others, 1994). The mean concentrations of atrazine for these monthly sample groups were 0.32, 6.7, and 13 μg/L, respectively. The mean atrazine concentration of all 32 samples was 8.9 μg/L. Most of these samples were collected during storm runoff and at a time of the year when the largest concentrations would be expected.

DATA-COLLECTION AND ANALYSIS METHODS

Data-collection methods for this study were designed to provide a base of information adequate to calculate daily mean streamflow rates and daily mean triazine herbicide concentrations. These data in turn would be used to estimate monthly and annual mean concentrations and loads of atrazine, to determine loading rates for each of the subbasins within the Delaware River Basin, and to determine the relations between these characteristics and possible causal factors such as percentage of basin in cropland.

A network of 11 streamflow-monitoring and sampling sites was established in the Delaware River Basin in July 1992. The sites were geographically distributed to acquire information on most of the major subbasins within the Delaware River Basin. Sampling-site names and locations are given in table 1, and the corresponding map locations are shown in figure 4.

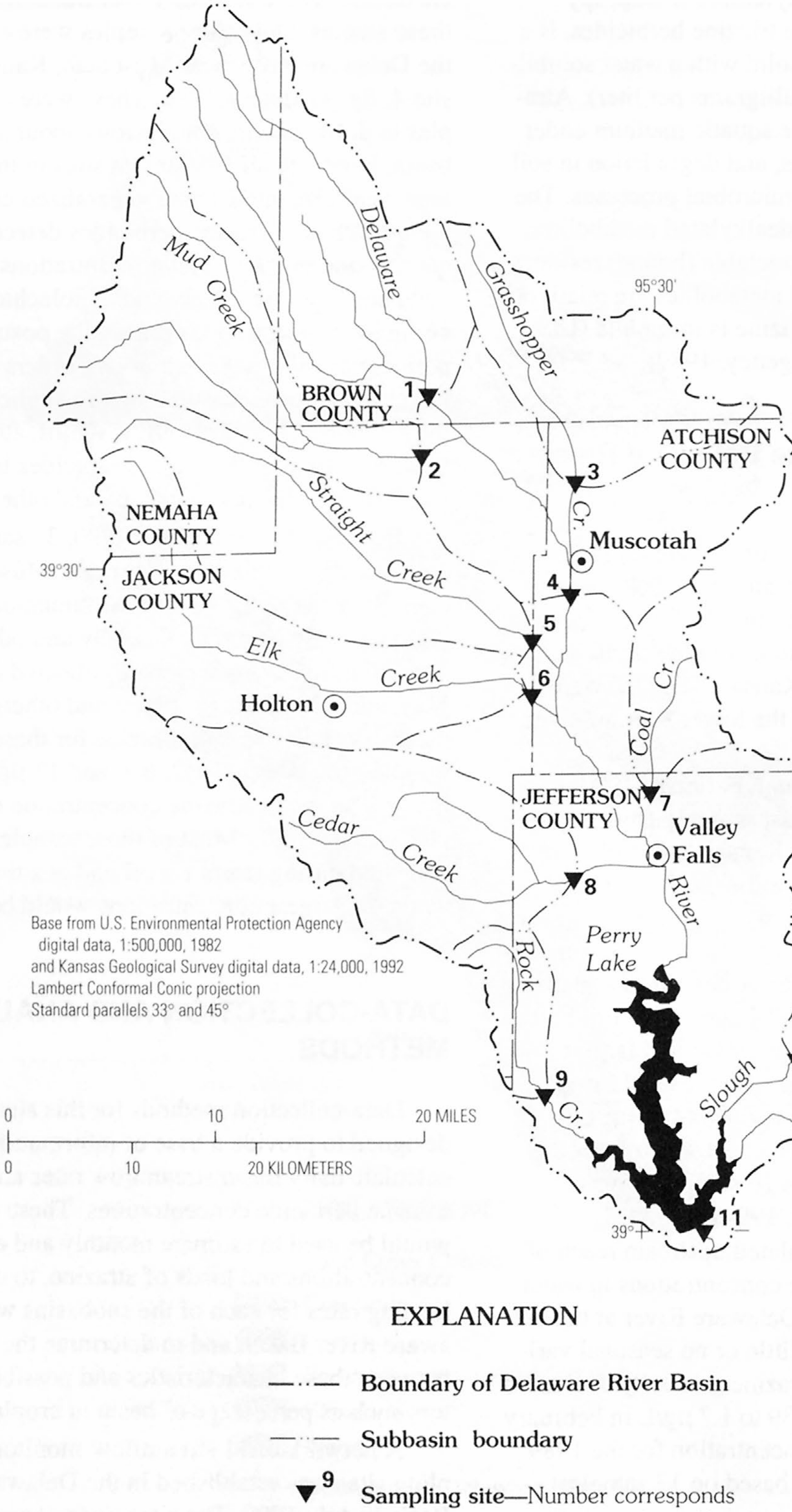


Figure 4. Location of sampling sites in the Delaware River Basin.

Streamflow

Stream-stage records at the 10 stream sites upstream of Perry Lake (fig. 4) were collected with either a manometer, bubble-gage sensor system (sampling sites 1, 3, 4, and 10) or a stilling-well and float (sampling sites 2, 5, 6, 7, 8, and 9) combination (Buchanan and Somers, 1978). Stream stage was recorded in 15-minute increments and was related to periodic current-meter streamflow measurements (Buchanan and Somers, 1976) to develop and adjust stage-streamflow ratings (Kennedy, 1983) for each sampling site. Streamflow at sampling site 11 (Delaware River below Perry Dam, Kansas) was calculated on the basis of a relation between service-gate openings at Perry Dam and Perry Lake water-surface elevation.

A continuous record of stream stage was obtained at the manometer-equipped sampling sites. During winter and periods of extreme low flow, the stage-sensing float at the stilling-well sites may have been frozen in ice or out of water. Daily mean streamflow for these periods was estimated on the basis of hydrologic comparisons with nearby continuous-record sites, periodic streamflow measurements, and weather records. Daily mean streamflow for all sampling sites is presented in tables 14–24 in the "Supplemental Information" section of this report.

Sample Collection

Samples for determination of triazine herbicide concentrations were collected either automatically using ISCO Model 3700 samplers capable of collect-

Table 1. Description of sampling-site locations and drainage areas in the Delaware River Basin

Map-index number (fig. 4)	U.S. Geological Survey site identification number	Site name	County	Drainage area (square miles)
1	06889990	Delaware River near Horton, Kansas	Brown	143
2	06889992	Mud Creek near Horton, Kansas	Jackson	99.0
3	06890092	Grasshopper Creek near Muscotah, Kansas	Atchison	93.3
4	06890100	Delaware River near Muscotah, Kansas	Atchison	431
5	06890350	Straight Creek near Muscotah, Kansas	Atchison	124
6	06890380	Elk Creek near Larkinburg, Kansas	Atchison	139
7	06890450	Coal Creek west of Coal Creek Church, Kansas	Jefferson	27.0
8	06890490	Cedar Creek west of Valley Falls, Kansas	Jefferson	68.1
9	06890595	Rock Creek northeast of Meriden, Kansas	Jefferson	21.7
10	06890810	Slough Creek west of Oskaloosa, Kansas	Jefferson	37.0
11	06890900	Delaware River below Perry Dam, Kansas	Jefferson	1,117

ing 1 to 24 discrete 350-milliliter samples or manually by dipping a sample bottle near the centroid of flow. Automatic samplers were installed at sampling sites 1–10. Sampling site 11 was sampled manually. Automatically collected samples generally were removed from the samplers within 24 hours of collection. The samples were subsequently transported to the USGS laboratory in Lawrence, Kansas, and refrigerated until analyzed.

Triazine concentrations may vary considerably during periods of runoff when fluctuations in concentrations of two orders of magnitudes are common. To define this variability, several samples per day generally were collected during periods of runoff. Samples were collected automatically during these periods at 3- to 8-hour intervals depending on the size of the sampling-site drainage basin, season, and anticipated storm characteristics. Samples were collected manually during periods of low or stable flow, during winter, prior to anticipated rainfall, and at other times when the automatic samplers were not operational. Samples were collected July 1992 through March 1995 at sampling sites 2, 8, 9, and 10 and July 1992 through September 1995 at sampling sites 1, 3, 4, 5, 6, 7, and 11 (fig. 4).

Sample Analysis

Procedures

All samples selected for determination of atrazine concentrations were analyzed by enzyme-linked immunosorbent assay (ELISA). ELISA systems have been used previously in detecting herbicides in surface water (Goolsby and others,1990; Thurman and others, 1990, 1991, 1992; Scribner and others, 1994). The ELISA system chosen for this study was the Atrazine RaPID Assay test developed and manufactured by Ohmicron (Newtown, Pennsylvania). This ELISA is based on combining selective antibodies attached to solid supports, with sensitive enzyme reaction, to produce analytical systems capable of detecting very low levels of chemicals (Baum, 1991). The immunochemical reaction contributes high selectivity due to extraordinary discriminatory capability of the antibodies and high sensitivity because of the powerful catalytic ability of enzymes. The selected analytical system is based on the use of magnetic particles as the solid support and means of separation. Because the particles are dispersed evenly throughout the reaction mixture, they allow rapid reaction kinetics, provide for precise addition of antibody, and facilitate ease of use.

Although ELISA methods are sensitive to the presence of atrazine (0.04-µg/L detection level), the methods are not totally specific to atrazine; other triazine compounds such as ametryn, prometon, prometryn, propazine, and possibly the degradation products of atrazine can be detected (Thurman and others, 1990). Therefore, results of these methods are reported as concentrations of triazine herbicides even though only small concentrations, if any, of these other triazine compounds are detected by gas chromatography/mass spectrometry (GC/MS) procedures. GC/MS also was used to analyze selected samples, as discussed later in this report.

During the immunoassay test (fig. 5), 200 µL (microliters) of each settled water sample was transferred to disposable polystyrene test tubes. Atrazine enzyme conjugate (horseradish peroxidase), 250 µL, was added along with 500 µL of atrazine antibody-coupled paramagnetic particles (rabbit anti-atrazine covalently bound to paramagnetic particles). The test tubes were vortexed for 2 seconds. After 15 minutes, a magnetic-separation rack was used to separate the magnetic particles. After 2 minutes, the tubes were rinsed with distilled water and blotted twice and the magnetic-separation rack removed. Color solution (hydrogen peroxide and 3,3',5,5'-tetramethylbenzidine) was added and vortexed for 2 seconds. After 20 minutes, the color was fixed by adding a solution of 0.5-percent sulfuric acid. The percentage absorbance was read at 450 nanometers on a photometer.

Quality Assurance

Analytical quality assurance consisted of duplicate analyses of selected stream samples, analysis of atrazine standard-reference samples, and analysis of blank-water samples. Precision and reproducibility of the ELISA were evaluated by duplicate analyses on randomly selected stream samples. An analytical method with a high degree of precision generally produces similar results on duplicate samples. Table 2 summarizes the results of 294 duplicate analyses. The mean concentrations of duplicate groups A and B are essentially the same, the variances are similar, and the correlation coefficient between the two groups is 0.997. The correlation coefficient, an expression of the degree of the linear relation, ranges from -1.0 to 1.0. If all data points plot on a straight line and the relation is inverse or direct, the correlation coefficient will be

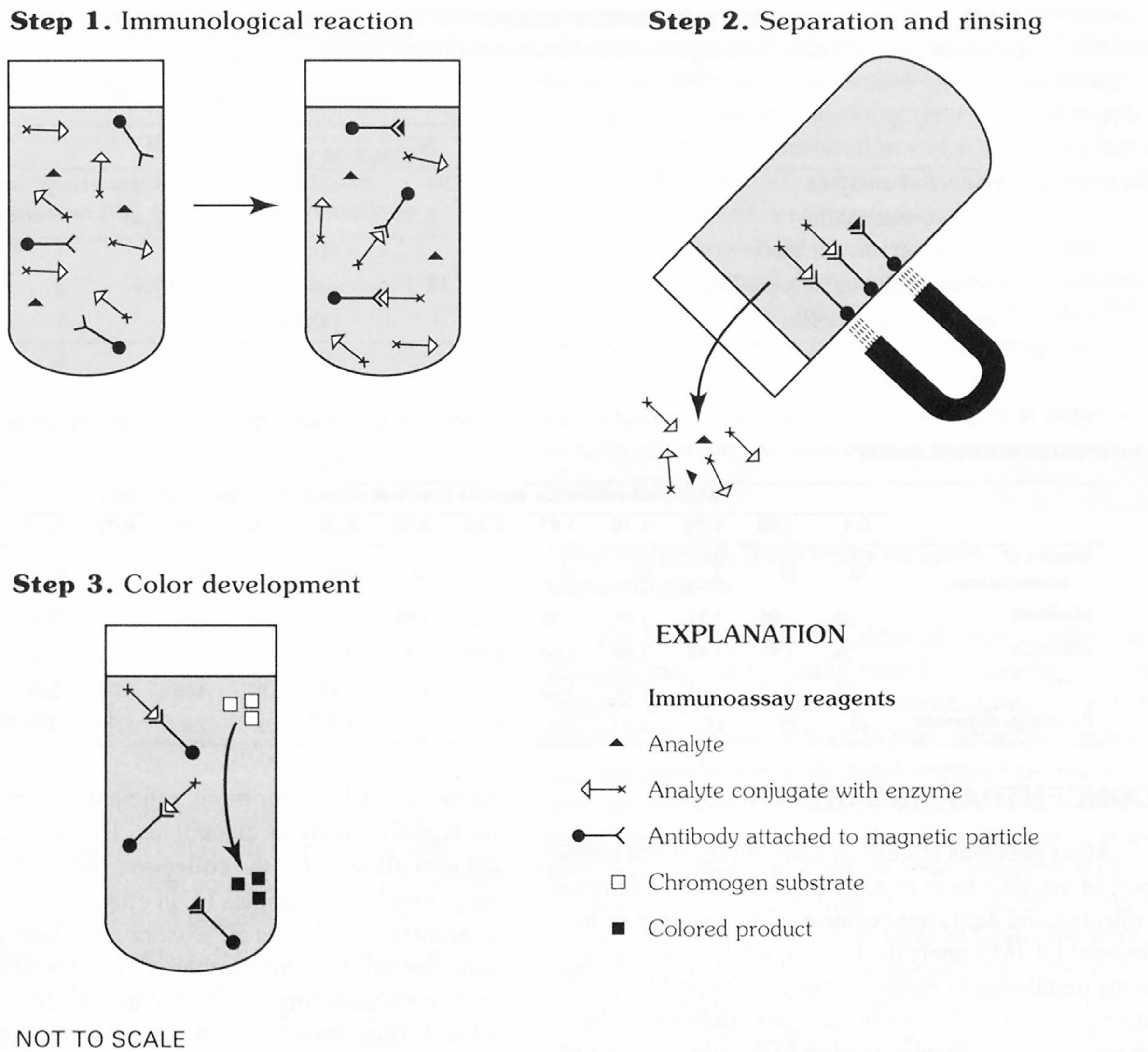


Figure 5. Three major steps in the immunoassay procedure.

-1.0 or 1.0, respectively. However, if the data points are randomly scattered, the correlation coefficient will be zero, and no linear relation exists. The larger the magnitude of the correlation coefficient, the stronger the relation (Blalock, 1972, p. 376–377). These results indicate that the ELISA used in this study has a high degree of precision.

The accuracy of the ELISA was evaluated on the basis of 461 analyses of 13 standard-reference samples (table 3). With the exception of the three smallest atrazine reference concentrations (0.10, 1.00, and 1.15 µg/L), the mean concentrations of the analytical results were all within plus or minus 9 percent of the atrazine reference values. Generally, the ELISA tended to overestimate the actual concentration with the exception of reference samples greater than 4.0 µg/L, which on average, were underestimated by about 4 percent.

The probability of the ELISA producing a false-positive result was examined through the analysis of 158 blank-water samples, which were analyzed throughout the duration of this study. Of these 158 analyses, five reported detectable concentrations of atrazine, a false-positive rate of 3.2 percent. None of these false positives were greater than 0.08 µg/L. Because of the small percentage of false positives, associated small concentrations, and the fact that in most stream samples the atrazine concentration was many times larger than the false-positive values, potential analytical error introduced by false positives was not a concern in this study.

Table 2. Statistical summary of duplicate analyses of selected water samples from the Delaware River Basin by enzyme-linked immunosorbent assay

	Duplicate samples	
	A	**B**
Number of analyses	294	294
Mean concentration (micrograms per liter)	2.39	2.41
Variance (micrograms per liter)	18.3	19.4
Correlation coefficient	0.997	

Table 3. Statistical summary of standard-reference sample concentrations determined by enzyme-linked immunosorbent assay

	Standard-reference sample concentration (micrograms per liter)												
	0.1	**1.00**	**1.15**	**1.19**	**1.21**	**2.20**	**2.22**	**2.30**	**3.00**	**3.78**	**4.00**	**4.17**	**5.00**
Number of determinations	12	17	7	50	49	7	35	44	164	30	7	32	7
Minimum	.06	.96	1.21	1.05	.98	2.22	1.98	1.86	2.57	3.41	3.82	3.20	4.58
Maximum	.24	1.74	1.49	1.48	1.60	2.60	2.70	2.97	3.54	4.71	4.33	5.00	5.70
Mean	.14	1.22	1.35	1.26	1.28	2.39	2.32	2.37	3.07	4.05	4.06	3.99	4.80
Percentage difference	40	22	17	5.9	5.8	8.6	4.5	3.0	2.3	7.1	1.5	-4.3	-4.0

CONCENTRATIONS OF ATRAZINE

Most previous studies of concentration and transport of atrazine have restricted the number of samples collected and analyzed because of the expense of traditional GC/MS analysis. Consequently, the conclusions pertaining to mean concentrations and loads of atrazine presented in these previous studies may be based on a few samples randomly distributed throughout a year. Because atrazine is applied to farmland each year and subsequently transported in spring and summer runoff, there exist large seasonal and hydrological variability in concentrations in surface water (Goolsby and others, 1990; Thurman and others, 1991; Scribner and others, 1994; Pope, 1995). Unless these variabilities are taken into consideration when planning surface-water studies of atrazine occurrence and movement, conclusions about mean concentrations and loads may represent only crude estimates and(or) be biased either low or high depending on the temporal and hydrological distribution of the samples.

Estimation of Atrazine Concentrations from Triazine Concentrations

The study of the Delaware River Basin described in this report had the advantage of recently developed methods (ELISA) for rapid, efficient, and relatively inexpensive analysis of samples. The reduced analytical cost allowed for the collection and analysis of a large number of samples to, in effect, verify triazine concentrations during all seasons and under all streamflow conditions. The number of samples analyzed from each sampling site during this study is given in table 4. Data from these individual sampling sites were used to calculate daily mean triazine concentrations.

Selected samples were analyzed by both ELISA and GC/MS methods to define the relation between ELISA triazine concentrations and GC/MS-derived atrazine concentrations. This relation was used to estimate daily mean atrazine concentrations.

Time-Weighted, Daily Mean Triazine Concentrations

As previously described in the "Sample Collection" section of this report, multiple samples for the analysis of triazine concentrations by ELISA were collected on days with storm runoff. During low flow, a single sample was collected every few days. Daily mean triazine concentrations for days with multiple samples were calculated using a midinterval-subdivision method similar to that used for the computation of

Table 4. Number of samples from each sampling site analyzed by enzyme-linked immunosorbent assay for triazine concentrations from July 1992 through September 1995

Sampling-site map-index number (fig. 4)	Number of discrete triazine determinations
1	511
2	469
3	571
4	500
5	533
6	487
7	460
8	451
9	349
10	378
11	211
Study total	**4,920**

a daily mean streamflow water-surface elevation as described by Kennedy (1983). This method produces a time-weighted, daily mean concentration. An example of this calculation method is presented in table 5.

Total hours (time interval) associated with each discrete concentration in table 5 are equal to one-half the time since the previous concentration to one-half the time to the next concentration. For the first concentration, the time interval is from the beginning of the day (0 hours) to one-half the time to the second concentration. For the last concentration, the time interval is from one-half the time since the previous concentration to the end of the day (24 hours). The time-weighted, mean concentration is equal to the summation of the products of concentration (C) multiplied by the time interval (H) for each individual concentration divided by total hours (24).

Time-weighted, daily mean triazine concentrations for days of low streamflow were estimated on the basis of previously collected single samples. Generally, linear interpolation between days with low-flow samples was used to estimate time-weighted, daily mean concentrations for the intervening days between samples. This is considered to be an acceptable method because triazine concentrations during low flow vary little and generally show a continued and steady decline. However, in cases where a low-flow sample was not collected prior to storm runoff, the last previously defined concentration was held constant throughout the period preceding the runoff, or an estimate of prerunoff concentration was made on the basis of either initial runoff concentrations or judgement of previously defined concentration and hydrologic responses, followed by linear interpolation. Time-weighted, daily mean triazine concentrations for sampling sites 1–10 from July 1992 through March 1995 are presented in tables 25–34, and time-weighted, daily mean triazine concentrations for sampling site 11 from July 1992 through September 1995 are presented in table 35 in the "Supplemental Information" section of this report.

Time-Weighted, Daily Mean Atrazine Concentrations

The ELISA procedure, although very sensitive to atrazine, may not be totally specific to atrazine. Therefore, the daily mean triazine concentrations presented in tables 25–35 may reflect, in part, other cross-reacting compounds with a chemical structure similar to atrazine. Because the MCL for atrazine is an annual mean and is based solely on the concentration of atrazine, it is necessary to estimate time-weighted, daily mean atrazine concentrations from the ELISA-derived triazine concentrations. To do this, 141 samples were analyzed by both ELISA to determine a triazine concentration and GC/MS to determine an atrazine concentration. Correlation and linear-regression analyses were used to relate these two procedurally derived concentrations. A plot of these data is presented in figure 6.

Linear-regression analysis was used to define the relation between ELISA-determined triazine concentrations and GC/MS-determined atrazine concentrations. The procedure develops an equation useful for estimating one variable from another and is in the form:

$$Y = a + bx, \tag{1}$$

where

Y is the predicted (estimated) concentration of atrazine, in micrograms per liter, as computed by equation 1;

a is the y-intercept value, a constant determined by the regression analysis;

b is the slope of the regression line, a constant determined by the regression analysis; and

Table 5. Example calculation of time-weighted, daily mean triazine concentration for a day with multiple samples

[--, no sample; μg/L, micrograms per liter]

Hour of day	Concentration (C) (μg/L)	Total hours (H)	C x H
Sampling site 1 (fig. 4) May 31, 1993			
0	--	--	--
1	19	2.0	38
2	--	--	--
3	14	2.0	28
4	--	--	--
5	17	2.0	34
6	--	--	--
7	22	3.0	66
8	--	--	--
9	--	--	--
10	--	--	--
11	17	4.0	68
12	--	--	--
13	--	--	--
14	--	--	--
15	10	5.0	50
16	--	--	--
17	--	--	--
18	--	--	--
19	--	--	--
20	--	--	--
21	6.5	6.0	39
22	--	--	--
23	--	--	--
24	--	--	--
	Sum	**24.0**	**323**
Time-weighted, mean concentration (μg/L) = 323/24=13			

x is the concentration of triazine, in micrograms per liter, as determined by ELISA.

Initially, correlation and regression analyses were conducted using all 141 data pairs (fig. 6). Results of these analyses are given in table 6. Although the correlation between the two analytical procedures is high (0.967) and the probability that the relation exists only by chance is extremely small (p-value = 1.36×10^{-85}), the slope coefficient of the ELISA value (independent variable) is 0.728, which means that prior to the addition of the y-intercept value (0.207) the ELISA triazine concentration is reduced by 27 percent in estimating GC/MS atrazine concentrations. For example, using this relation, an ELISA value of 3.0 μg/L would convert to an estimated atrazine concentration of 2.4 μg/L [(0.728)(3.0)+0.207)]. There is a substantial decrease from an ELISA triazine concentration to a GC/MS atrazine concentration; therefore, further regression analyses were performed to determine if this large a decrease was indicative of the full range of ELISA concentrations. The standard error of estimate (SEE) presented in table 6 is equivalent to the standard deviation of points about the regression line and, for a normal distribution, two-thirds of the points should be within one standard deviation above and below the regression line (Riggs, 1968, p. 22)

An examination of the data plot in figure 6 indicates that data scatter increases at concentrations larger than about 5.0 μg/L. This scatter may have a substantial effect on determining the regression parameters. This observation was tested by splitting the data set into two groups—one with ELISA concentrations less than 5.0 μg/L and the other with ELISA concentrations greater than 5.0 μg/L. Correlation and regression analyses were performed on both these data groups. Results are presented in table 6.

The regression results in table 6 indicate that ELISA triazine concentrations less than 5.0 μg/L almost are a one-to-one estimator for atrazine concentrations based on a slope of 0.966. However, at very small ELISA concentrations, the addition of the y-intercept value (-0.083) may represent a large percentage change in the estimated atrazine concentration compared to the corresponding ELISA concentration. For example, an ELISA triazine concentration of 0.10 μg/L would estimate an atrazine concentration of 0.014 μg/L [(0.10)(0.966)-0.083]; an 86-percent reduction from the ELISA concentration. However, from the perspective of a monthly or annual mean concentration or load, this will be insignificant because at other times of the month or year concentrations or loads could be several orders of magnitude larger and, thus, have a much greater effect on the calculated mean or total load.

The regression analysis for the greater-than-5.0-μg/L data group shows a slightly lower correlation coefficient (0.914) and a much reduced slope (0.732) when compared to the results of the less-than-5.0-μg/L

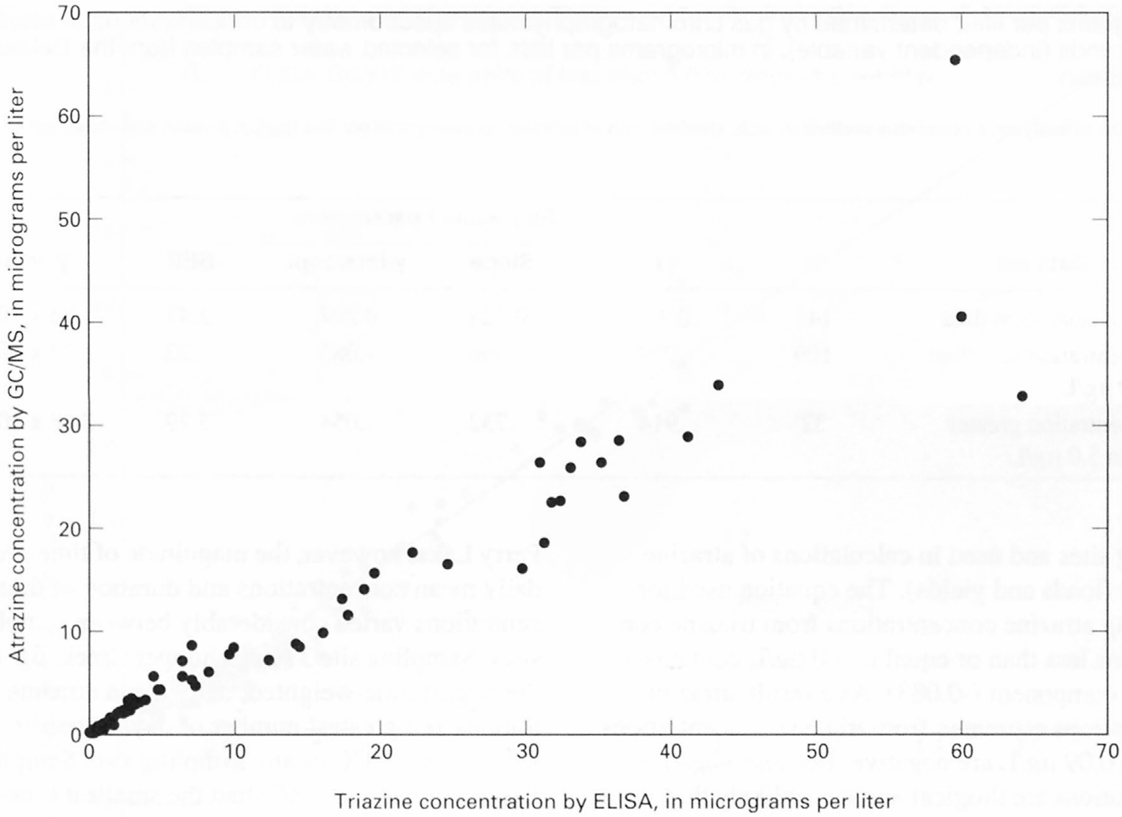


Figure 6. Relation between triazine concentrations determined by enzyme-linked immunosorbent assay (ELISA) and atrazine concentrations determined by gas chromatography/mass spectrometry (GC/MS) for 141 samples from the Delaware River Basin, July 1992 through July 1994.

data group (table 6). The greater-than-5.0-µg/L analysis closely resembles the results of the all-data-set analysis and seems to indicate that the scatter of these 32 data pairs in the greater-than-5.0-µg/L group have the most effect on the result of the all-data-set regression analysis. Two reasons for this may be: (1) samples with large triazine concentrations may contain larger quantities of other herbicides or degradation products of atrazine that cross react in the ELISA analysis producing an erroneously large estimated atrazine concentration (Thurman and others, 1990); and (2) the analytical range of the ELISA method is 0.04–5.0 µg/L, and sample concentrations greater than 5.0 µg/L need to be diluted to within this analytical range. This dilution process may introduce variability into the analytical results of these samples and, consequently, increase data scatter at larger triazine concentrations. This potential dilution error may be associated with either the ELISA and(or) the GC/MS procedures.

Currently (1996), atrazine is a restricted-use herbicide with an enforceable annual mean MCL of 3.0 µg/L in finished water supplies (U.S. Environmental Protection Agency, 1992). Because results from this study may be used by regulatory agencies for comparison to that standard, the need for reliable estimates of daily mean atrazine concentrations is critical, particularly in the immediate magnitude of the enforceable standard. Therefore, in this report, two regression relations are used for estimating time- and flow-weighted, daily mean atrazine concentrations—one for ELISA concentrations less than or equal to 5.0 µg/L and another for ELISA concentrations greater than 5.0 µg/L. The results of regression analyses for these relations are presented in table 6 and shown with their respective data sets and regression equations in figure 7.

Estimated time-weighted, daily mean atrazine concentrations were calculated from the time-weighted, daily mean triazine concentrations presented in tables 25–35 in the "Supplemental Information" section of this report. These estimated daily mean values subsequently were used to calculate monthly and annual mean concentrations at all

Table 6. Summary of linear-regression analysis relating concentrations of atrazine (dependent variable), in micrograms per liter, determined by gas chromatography/mass spectrometry to concentrations of triazine compounds (independent variable), in micrograms per liter, for selected water samples from the Delaware River Basin

[N, number of analyses; r, correlation coefficient; SEE, standard error of estimate, in micrograms per liter (µg/L); p-value, probability value]

Data set	N	r	Regression parameters		SEE	p-value
			Slope	y-intercept		
All concentration data	141	0.967	0.728	0.207	2.47	1.36×10^{-85}
Concentration less than 5.0 µg/L	109	.979	.966	-.083	.22	1.75×10^{-75}
Concentration greater than 5.0 µg/L	32	.914	.732	.054	5.29	2.68×10^{-13}

sampling sites and used in calculations of atrazine transport (loads and yields). The equation used for estimating atrazine concentrations from triazine concentrations less than or equal to 5.0 µg/L contains a negative component (-0.083). As a result, atrazine concentrations estimated from triazine concentrations less than 0.09 µg/L are negative. Because negative concentrations are illogical and it is unlikely that a true zero concentration now occurs in this system, all calculated negative daily mean atrazine concentrations arbitrarily were set at a concentration of 0.01 µg/L.

Temporal and Spatial Distribution

Time-weighted, daily mean atrazine concentrations in samples from streams in the Delaware River Basin commonly exceeded the value of the MCL during May, June, and July (fig. 8). Time-weighted, daily mean concentrations equal to or greater than 20 µg/L were not uncommon during this period. However, time-weighted, daily mean concentrations greater than the value of the MCL were rare at other times of the year. Most time-weighted, daily mean concentrations were less than 1.0 µg/L from August through April.

Time-weighted, daily mean atrazine concentrations during the period immediately following application (April through early June) generally responded directly to streamflow; when streamflow increased, so did atrazine concentrations, However, after about August, time-weighted, daily mean atrazine concentrations increased little, regardless of streamflow conditions.

The atrazine-streamflow relation shown in figure 8 was characteristic of all 10 sampling sites upstream of Perry Lake; however, the magnitude of time-weighted, daily mean concentrations and duration of those concentrations varied considerably between sampling sites. Sampling site 3 (Grasshopper Creek, fig. 8*A*) had the largest time-weighted, daily mean atrazine concentrations and greatest number of days exceeding the value of the MCL of any sampling site. Sampling site 8 (Cedar Creek, fig. 8*C*) had the smallest time-weighted, daily mean concentrations and fewest days greater than the value of the MCL. In general, the largest time-weighted, daily mean concentrations occurred at sampling sites receiving runoff from the northern and northeastern parts of the Delaware River Basin. This difference may be the result of differences in the extent of cropland (fig. 3) in the subbasins (fig. 4).

Time-weighted, daily mean atrazine concentrations in water from Perry Lake, as determined from samples of the lake outflow (sampling site 11, fig. 4), are affected largely by the timing and magnitude of inflow (fig. 9). Late-season runoff in November and December 1992, combined with preapplication runoff in March and April 1993 (fig. 8), decreased time-weighted, daily mean concentrations in the lake from about 3.0 µg/L in October 1992 to about 0.4 µg/L in May 1993. Runoff from the basin upstream of the lake during these periods contained small atrazine concentrations ranging from about 0.01 to about 0.90 µg/L. Most atrazine application in 1993 was delayed until May or June because of wet field conditions.

Postapplication runoff in 1993 produced substantial increases in time-weighted, daily mean atrazine concentrations in the outflow of Perry Lake. Measured concentrations peaked at about 3.6 µg/L in mid-July during a period of severe flooding, as shown by the increase in lake water-surface elevation (fig. 9);

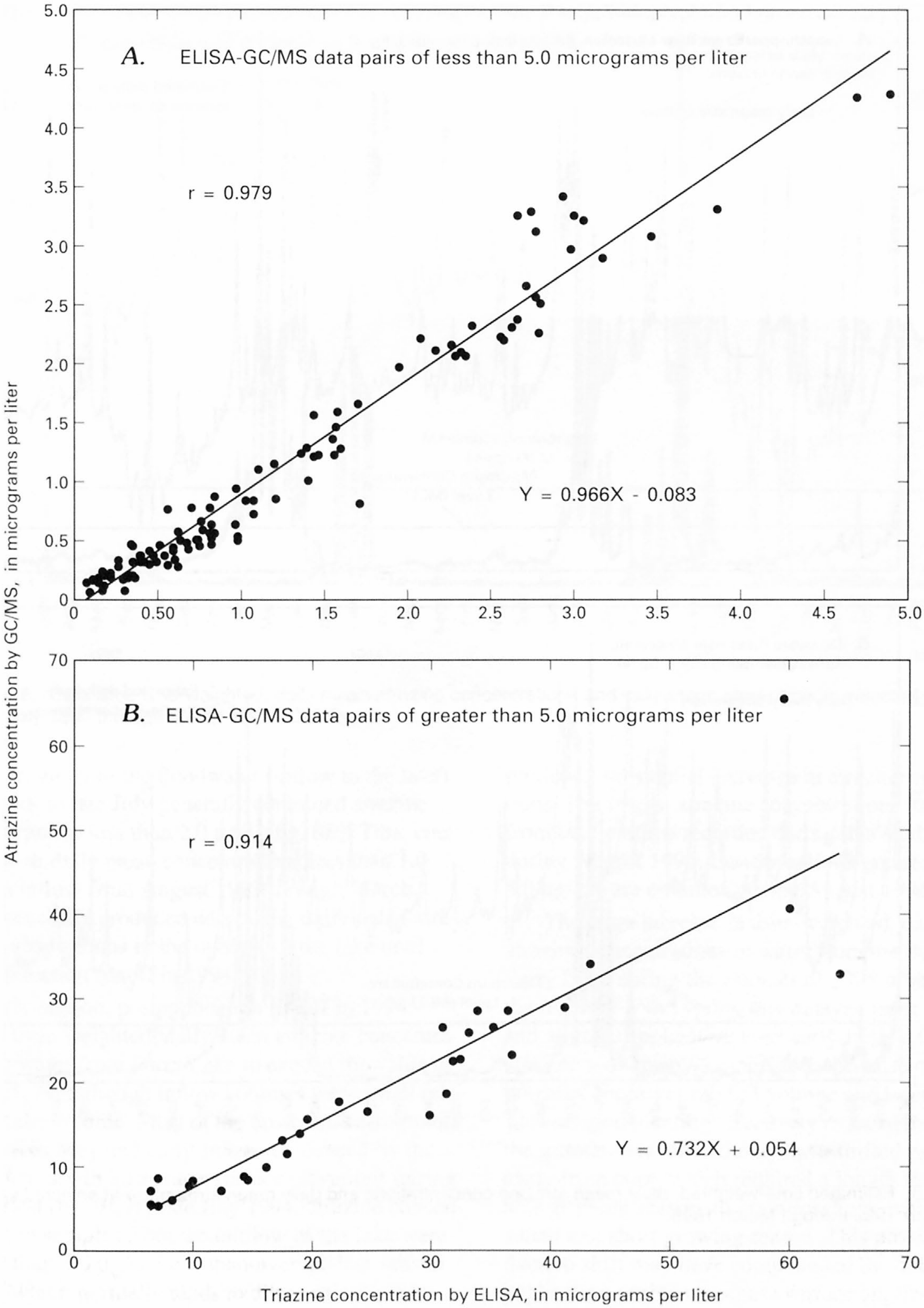


Figure 7. Relation between triazine concentrations determined by enzyme-linked immunosorbent assay (ELISA) and atrazine concentrations determined by gas chromatography/mass spectrometry (GC/MS) for data pairs of (*A*) less than 5.0 and (*B*) greater than 5.0 micrograms per liter, July 1992 through July 1994.

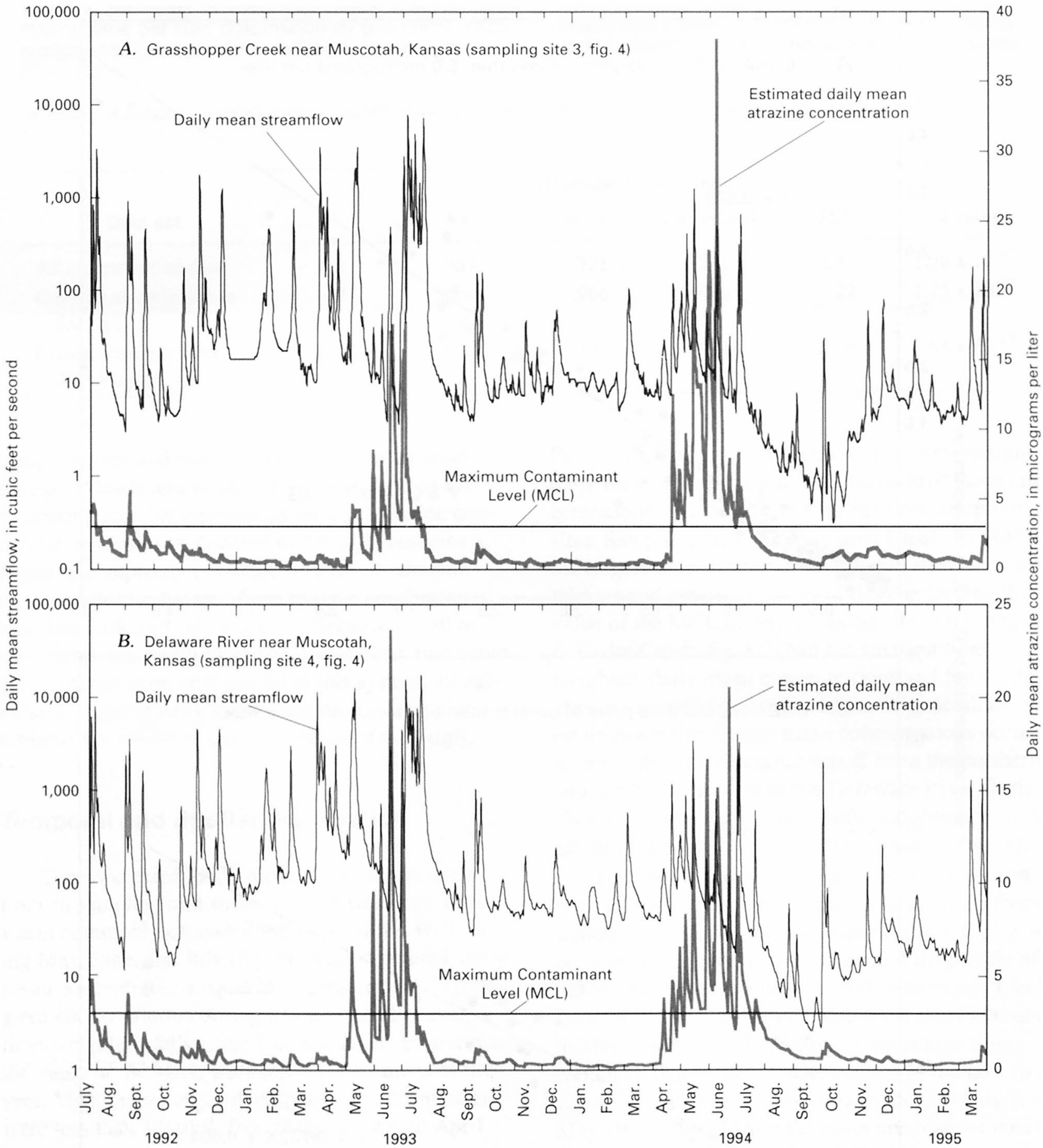


Figure 8. Estimated time-weighted, daily mean atrazine concentrations and daily mean streamflow at selected sampling sites, July 1992 through March 1995.

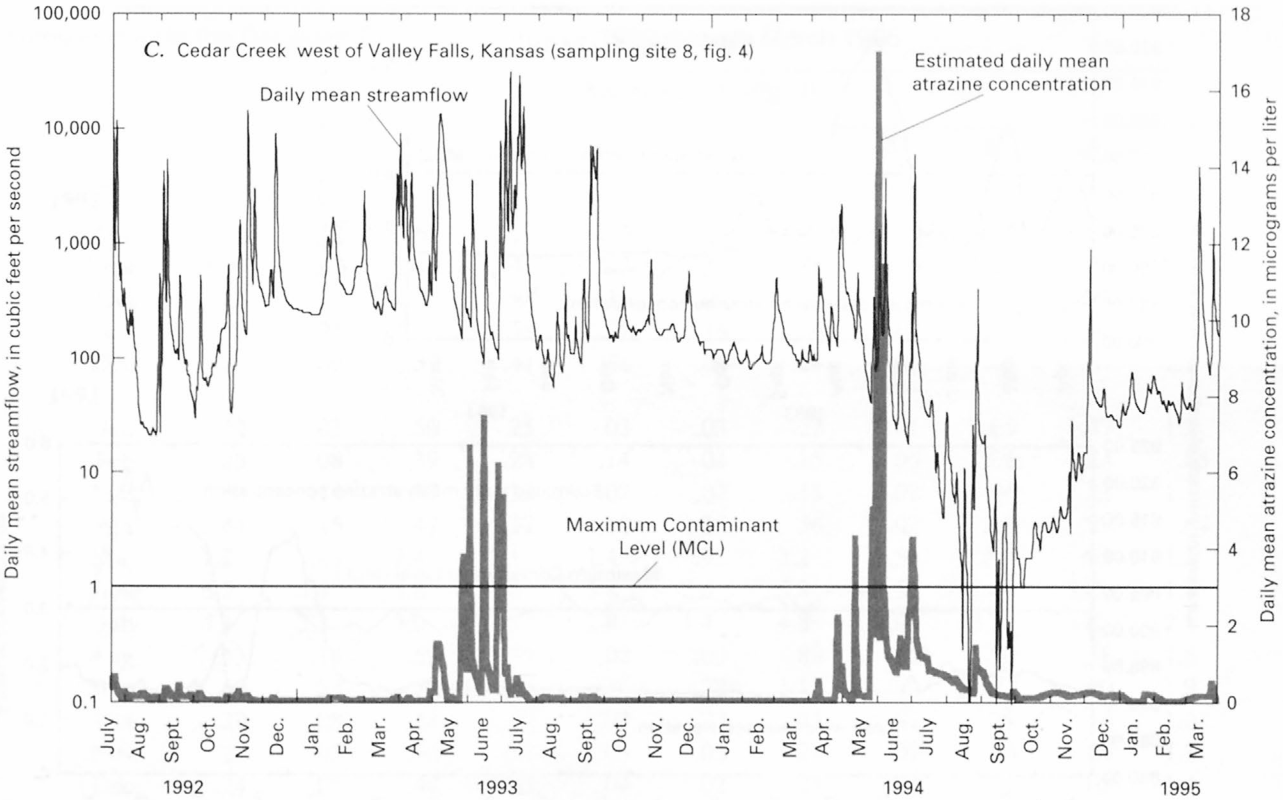


Figure 8. Estimated time-weighted, daily mean atrazine concentrations and daily mean streamflow at selected sampling sites, July 1992 through March 1995—Continued.

however, much of the floodwater (inflow to the lake) from mid- to late July generally contained atrazine concentrations less than 2.0 µg/L (fig. 8*B*). This, combined with daily mean concentrations less than 1.0 µg/L in inflow from August 1993 through March 1994, generally produced decreasing daily mean atrazine concentrations in the outflow of the lake until postapplication runoff in 1994.

Early-season, postapplication runoff in 1994 caused time-weighted, daily mean atrazine concentrations in water from Perry Lake to exceed the value of the MCL even though inflow volumes were small relative to lake volume. Most of the upstream basin runoff occurred in May and early July as evidenced by the small increase in lake water-surface elevations during this period (fig. 9). By late July 1994, atrazine concentrations in samples from the outflow of the lake were greater than 3.0 µg/L. Less-than-average late-season runoff, which normally tends to dilute existing concentrations, did not temper the effects of early-season runoff in 1994. Atrazine concentrations in samples from the lake outflow were greater than 3.0 µg/L through the end of 1994 and gradually declined until postapplication runoff during May and June 1995 produced substantial increases in atrazine concentrations. The largest atrazine concentrations in water from lake outflow recorded during this study occurred during August 1995. Concentrations greater than 5.0 µg/L were common during August 1995.

The large increase in time-weighted, daily mean atrazine concentrations in water from the outflow of Perry Lake during the summer of 1995 probably was the result of a wet spring that delayed most planting and atrazine application until early June, a time when atrazine movement is more likely because of the potential for larger rainfall volume and intensities. This delayed planting effectively reduced the length of the growing season and may have shifted production away from corn, which required a longer than available growing season, to grain sorghum, which is more suited to a short growing season. This possible production shift may have compounded the delayed-application problem because surface application of atrazine is used routinely in grain-sorghum production in the Delaware River Basin. Surface application, as contrasted to soil incorporation, increases the runoff potential of atrazine particularly at a time of year of large rainfall.

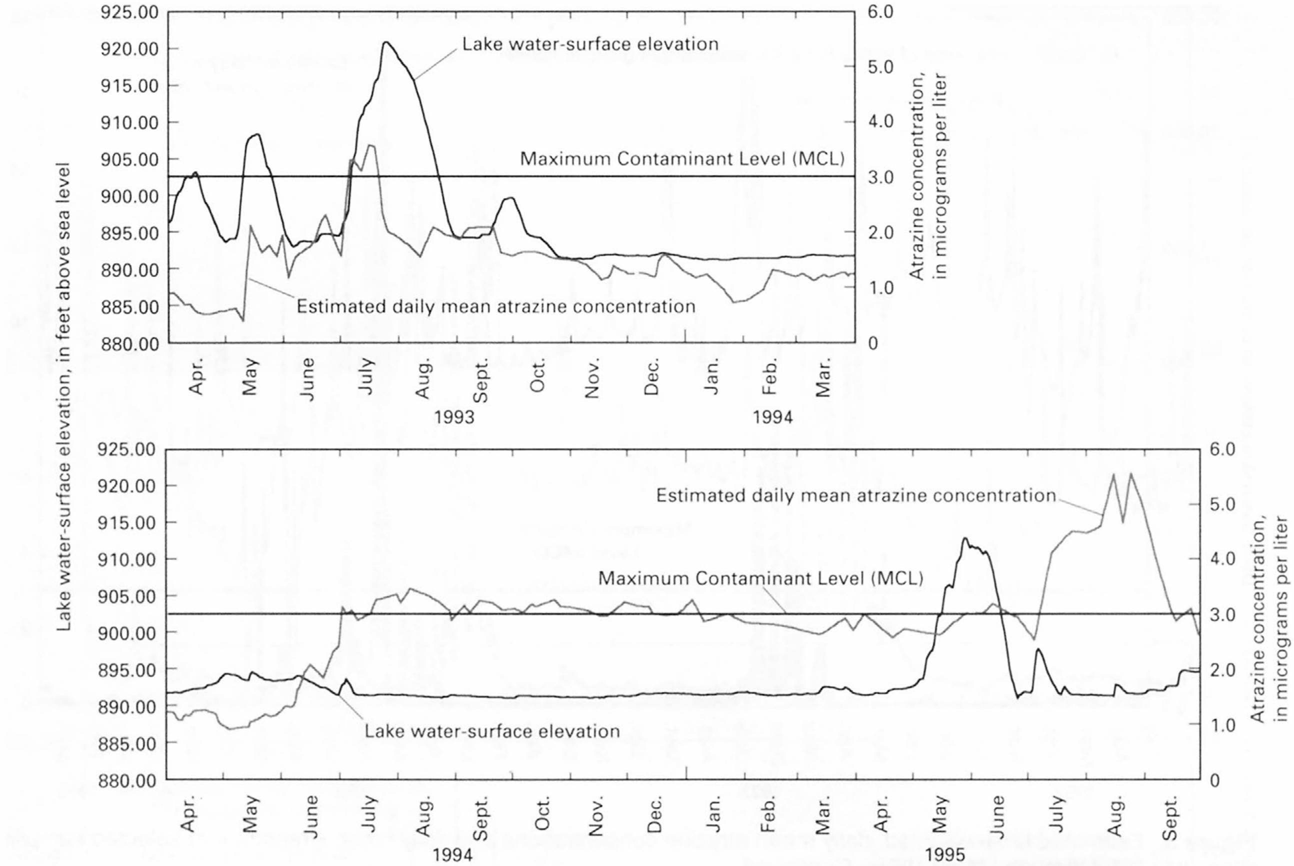


Figure 9. Estimated time-weighted, daily mean atrazine concentrations and Perry Lake water-surface elevations, April 1993 through September 1995.

Time-weighted, monthly mean atrazine concentrations for the sampling sites upstream of Perry Lake (sites 1–10, table 7) reflected patterns similar to those observed in the analysis of daily mean concentrations (fig. 10). The largest monthly mean concentrations were for the months of May, June, and July. At most sampling sites, the largest monthly concentration occurred during June of both the 1993 and 1994 crop years. Monthly mean concentrations from August through April at the 10 upstream sites (sites 1–10) were minimal compared to May through July. August through April rarely had monthly mean concentrations greater than 1.0 μg/L, with most months substantially less than 0.50 μg/L.

Time-weighted, monthly mean concentrations during the 1994 crop year were mostly larger than corresponding monthly mean concentrations during the 1993 crop year (fig. 10). Several factors may be responsible for this difference: (1) preapplication, low-flow concentrations were larger in 1994 than in 1993, thereby establishing a larger baseline concentration preceding planting, application, and runoff; (2) 1994 was a much drier year than 1993 and, consequently, produced below-average streamflow (fig. 2) and potentially reduced the dilution effect from major storm runoff such as occurred during July 1993 (fig. 8); (3) most runoff in 1994 occurred during a short period after May application, which produced larger runoff concentrations for the few storms that did occur (fig. 8); (4) reduced runoff in June and July 1994 may have kept more atrazine available for subsequent runoff later in the year; and (5) the generally larger monthly mean concentrations from August 1994 through March 1995 may have been the result of less-intense rainfall patterns, which allowed more atrazine to move downward into the shallow alluvial ground-water system, with subsequent discharge into streams during the last 8 months of the 1994 crop year. These factors are suggested under the assumption that total basin atrazine application was about the same for both the 1993 and 1994 crop years. If, however, greater application was made in 1994, that in itself would be potential reason for the larger monthly mean atrazine concentrations in 1994. Data currently (1996) are not

Table 7. Time-weighted, monthly and annual mean atrazine concentrations, in micrograms per liter, at 11 sampling sites in the Delaware River Basin, August 1992 through March 1995

	Sampling site (fig. 4)										
	1	2	3	4	5	6	7	8	9	10	11
1992											
Aug.	1.1	0.42	1.6	1.1	0.15	0.19	1.4	0.12	0.44	0.58	2.9
Sept.	1.0	.44	2.1	1.4	.43	.33	.86	.15	.36	.49	2.6
Oct.	.28	.10	1.2	.48	.16	.08	.45	.06	.10	.27	2.6
Nov.	.55	.25	1.1	.76	.32	.16	.56	.07	.19	.99	2.5
Dec.	.35	.09	.57	.41	.06	.04	.24	.02	.09	.67	2.1
1993											
Jan.	.22	.05	.50	.25	.03	.03	.22	.01	.05	.47	1.3
Feb.	.25	.08	.39	.28	.14	.04	.15	.05	.06	.24	.85
Mar.	.34	.14	.57	.32	.07	.04	.18	.02	.06	.21	1.1
Apr.	.44	.15	.47	.32	.10	.05	.36	.02	.13	.29	.64
May	1.2	.46	2.4	2.1	1.4	.95	3.2	.56	.09	.83	1.3
June	6.2	4.4	5.8	5.6	3.8	2.6	5.8	1.5	1.4	2.2	1.8
July	4.1	3.3	5.0	4.1	2.8	1.4	4.8	1.0	3.3	2.6	2.8
Aug.	.53	.14	.59	.43	.02	.05	.89	.06	.33	.48	1.8
Sept.	.60	.23	.77	.53	.16	.28	1.1	.04	.27	.40	1.9
Oct.	.39	.08	.58	.37	.03	.03	.45	.01	.18	.14	1.6
Nov.	.23	.03	.40	.18	.03	.02	.24	.01	.06	.04	1.3
Dec.	.24	.06	.44	.33	.07	.02	.25	.01	.01	.05	1.4
1994											
Jan.	.08	.02	.33	.14	.01	.01	.15	.01	.01	.03	1.0
Feb.	.05	.02	.34	.09	.01	.01	.06	.01	.01	.02	1.1
Mar.	.18	.07	.42	.15	.03	.02	.10	.01	.01	.05	1.2
Apr.	1.7	.55	2.4	1.8	1.1	.38	1.6	.22	.14	1.3	1.2
May	2.4	1.6	10	5.6	2.7	2.1	5.0	.76	.23	2.4	1.0
June	2.9	.74	11	6.7	3.2	1.9	9.1	2.7	1.7	1.5	1.8
July	3.9	3.6	3.2	3.9	3.4	.70	3.0	1.5	1.2	1.8	3.1
Aug.	.98	.92	.97	1.2	.10	.23	1.4	.51	.38	.51	3.3
Sept.	.43	.51	.50	.52	.09	.17	.87	.36	.26	.24	3.1
Oct.	.69	.58	.87	.74	.08	.08	.51	.12	.18	.25	3.2
Nov.	.29	.25	1.1	.46	.06	.08	.32	.19	.16	.33	3.1
Dec.	.30	.19	.94	.38	.03	.02	.29	.19	.05	.26	3.1
1995											
Jan.	.21	.09	.95	.28	.01	.03	.20	.08	.01	.11	3.0
Feb.	.11	.02	.65	.21	.01	.01	.10	.05	.01	.15	2.8
Mar.	.34	.28	.85	.42	.15	.09	.50	.14	.01	.20	2.7
1993 crop year[1] annual mean	1.2	.75	1.5	1.2	.70	.45	1.4	.27	.48	.60	1.5
1994 crop year[1] annual mean	1.2	.78	2.8	1.8	.91	.48	1.9	.57	.36	.75	2.6

[1]Crop year is the 12-month period from April 1 through March 31 and is designated by the calendar year in which it begins.

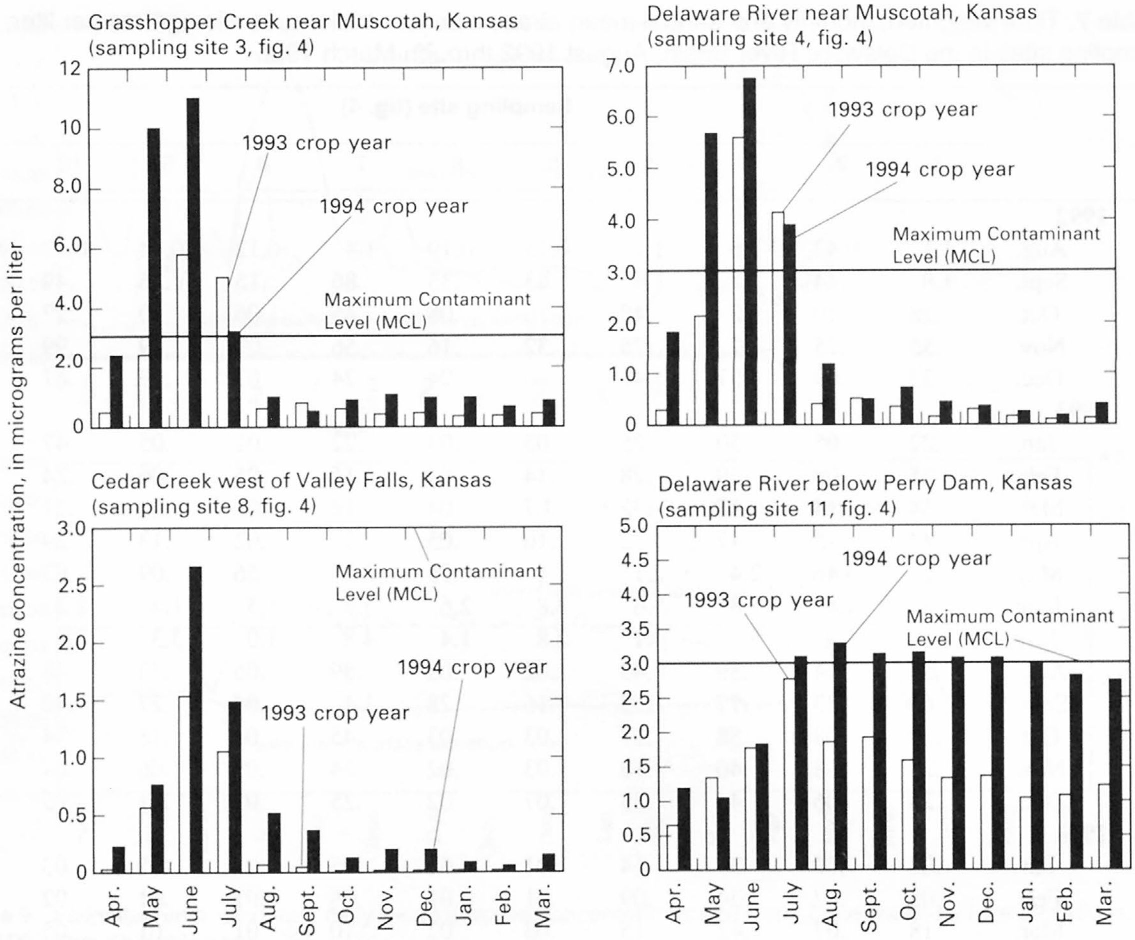


Figure 10. Time-weighted, monthly mean atrazine concentrations for 1993 and 1994 crop years in water from selected sampling sites in the Delaware River Basin.

available to verify differences in annual atrazine application.

Substantial between-site differences are evident in time-weighted, monthly mean atrazine concentrations in water from the 10 upstream sampling sites. The largest monthly mean concentrations were in water from sites receiving runoff from the northern and northeastern part of the Delaware River Basin (sites 1, 3, 4, and 7), whereas the smallest concentrations were in water from the most downstream locations (sites 8, 9, and 10). For example, monthly mean concentrations at sampling site 3 for June 1993 and 1994 were 5.8 and 11 µg/L, respectively. Corresponding monthly mean concentrations in water from sampling site 8 were 1.5 and 2.7 µg/L, respectively. These differences may be due to differences in land use within the subbasins.

Time-weighted, monthly mean atrazine concentrations in the outflow of Perry Lake (sampling site 11) showed a somewhat similar seasonal-fluctuation pattern to that of the 10 upstream sampling sites, although delayed, attenuated, and persistent (fig. 10). The largest monthly mean concentrations in the outflow of Perry Lake occurred in July 1993 and August 1994 for the two complete crop years monitored in this study. This contrasts with the upstream sites where the largest monthly mean concentrations occurred in June or July in 1993 and 1994.

The magnitude of change in time-weighted, monthly mean concentrations in water from sampling site 11 was not as great as at upstream sites. The maximum change in monthly mean atrazine concentrations between successive months in the outflow of Perry Lake was slightly greater than 1.0 µg/L, whereas an equivalent time-period change in concentration in water from an upstream site may have been several micrograms per liter.

The decline from peak time-weighted, monthly mean concentrations in water from sampling site 11 took several months to produce a substantial decrease.

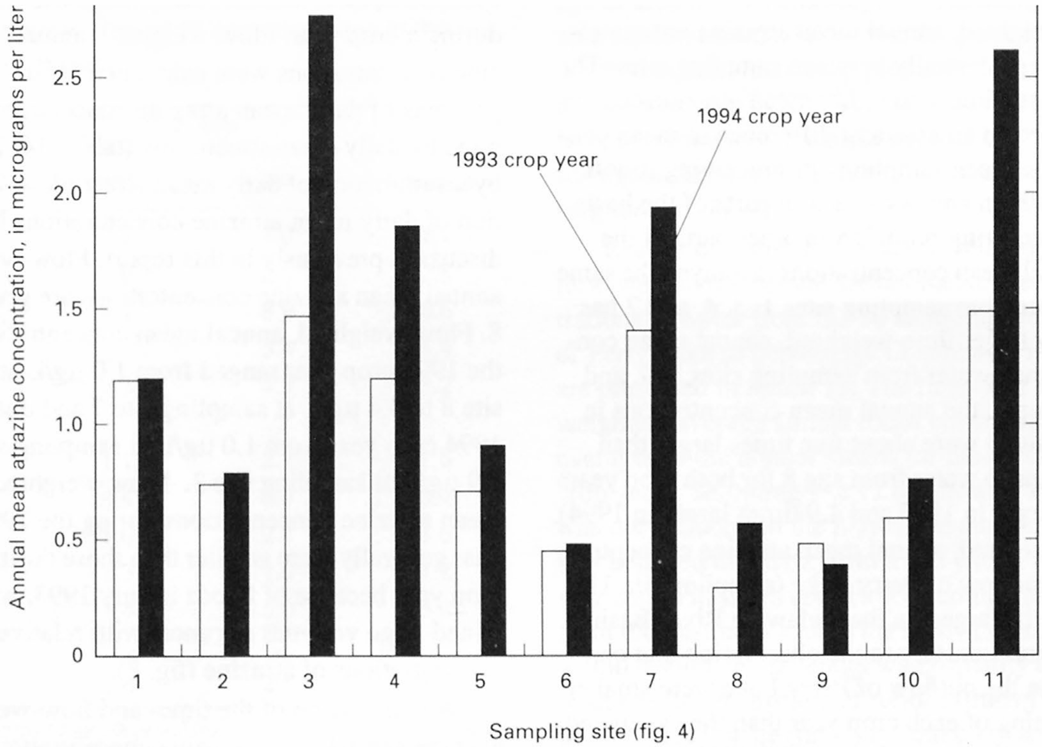


Figure 11. Time-weighted, annual mean atrazine concentrations for 1993 and 1994 crop years in water from 11 sampling sites in the Delaware River Basin.

For example, during the 1994 crop year, monthly mean concentrations peaked at 3.3 µg/L in August and did not decrease to less than 3.0 µg/L until February 1995. The fairly substantial change in monthly mean concentration between June and July 1993 and July and August 1993 represents the inflow and release of large volumes of runoff (approximately three conservation-pool volumes) from near-record floods in early to mid-July 1993. A new maximum water-surface elevation was established for Perry Lake in July 1993. Fluctuations in concentrations this large in Perry Lake are considered to be unusual and do not represent normal, expected conditions.

The aforementioned characteristics of atrazine concentrations in the outflow of Perry Lake are indicative of a large reservoir with substantial storage capacity. Therefore, because of the large solubility of atrazine and its slow degradation rate in water, it is expected that after seasonal peak concentrations are reached in Perry Lake it could take many months before a substantial decrease in monthly mean concentrations is achieved.

Annual mean concentrations in water from 11 sampling sites in the Delaware River Basin are presented in table 7 and a between-site comparison is shown in figure 11. Annual mean concentrations were calculated by summing daily mean concentrations for the crop year and dividing by 365. The derivation of the daily mean concentrations has been discussed previously in the "Time-Weighted, Daily Mean Atrazine Concentrations" section of this report. The resultant annual mean atrazine concentration represents, in effect, a time-weighted, annual mean concentration.

Time-weighted, annual mean concentrations did not exceed the 3.0-µg/L MCL in water from any sampling site for either the 1993 or 1994 crop years; however, concentrations generally were larger in 1994 than in 1993. Annual mean atrazine concentrations during the 1993 crop year ranged from 0.27 µg/L in water from sampling site 8 to 1.5 µg/L in water from sampling sites 3 and 11, and during the 1994 crop year from 0.36 µg/L in water from sampling site 9 to 2.8 µg/L in water from sampling site 3. Concentrations during the first 6 months of the 1995 crop year were larger than in 1994, at least for the outflow of Perry Lake (fig. 9). The 1995-crop-year annual mean concentration in water from the outflow of Perry Lake may exceed the MCL unless substantial inflow to the lake dilutes existing concentrations.

Time-weighted, annual mean atrazine concentrations varied substantially between sampling sites. The previous discussion of monthly mean atrazine concentrations indicated an apparent difference in mean concentrations between sampling sites receiving runoff from the northern and northeastern parts of the basin with those receiving runoff from other parts of the basin. Annual mean concentrations displayed the same pattern. Water from sampling sites 1, 3, 4, and 7 has substantially larger time-weighted, annual mean concentrations than water from sampling sites 8, 9, and 10. For example, the annual mean concentrations in water from site 3 were about five times larger than concentrations in water from site 8 for both crop years (5.6 times larger in 1993 and 4.9 times larger in 1994).

Time-weighted, annual mean atrazine concentrations in the outflow of Perry Lake (sampling site 11) are some of the largest in the Delaware River Basin. This fact seems contrary to the observation that concentrations in the outflow of Perry Lake were smaller at the beginning of each crop year than the calculated annual means. For example, in April 1993, the monthly mean atrazine concentration was about 0.64 µg/L, whereas the 1993 crop year annual mean was 1.5 µg/L. It would follow then that concentrations in at least some inflow streams should have been substantially larger than 1.5 µg/L to raise the annual mean concentration in a body of water as large as Perry Lake to that level. An analysis of flow-weighted, annual mean concentrations was performed to explain this apparent contradiction.

Flow-Weighted Concentrations

All mean atrazine concentrations previously presented in this report are, by the method of calculation, time-weighted concentrations and, as such, can be used to evaluate compliance with Federal drinking-water-quality regulations that, by the nature of the regulation's sampling requirements, approximate time-weighted averages. However, to evaluate the potential effect that a stream may have on a downstream reservoir and to hydrologically evaluate subbasins relative to each other, flow-weighted concentrations are more appropriate.

Flow-weighted, mean concentrations represent, in effect, the average concentration of a specific volume of water. A flow-weighted, annual mean atrazine concentration, therefore, is an estimate of the mean concentration of all the water that flowed past a site during a crop year. Flow-weighted, annual mean atrazine concentrations were calculated by summing the products of daily mean atrazine concentrations multiplied by daily mean streamflow (tables 14–24) divided by a summation of daily mean streamflow. The estimation of daily mean atrazine concentrations has been discussed previously in this report. Flow-weighted, annual mean atrazine concentrations are given in table 8. Flow-weighted, annual mean concentrations during the 1993 crop year ranged from 1.0 µg/L at sampling site 8 to 4.4 µg/L at sampling site 7 and during the 1994 crop year from 1.0 µg/L at sampling site 9 to 8.9 µg/L at sampling site 3. Flow-weighted, annual mean atrazine concentrations during the 1993 crop year generally were smaller than those during the 1994 crop year because of floods in July 1993, which contained large volumes of runoff with relatively small concentrations of atrazine (fig. 8).

A comparison of the time- and flow-weighted, average annual mean atrazine concentrations for the 1993 to 1994 crop years in water from 11 sampling sites in the Delaware River Basin is presented in figure 12. Time-weighted, average annual mean concentrations are substantially less than the MCL in water from all sampling sites, and none are appreciably larger than concentrations in the outflow of Perry Lake (sampling site 11). However, in water from several sampling sites (1, 3, 4, and 7), the flow-weighted, average annual mean concentrations are considerably larger than both the MCL and the time-weighted, average annual mean atrazine concentrations in the outflow of Perry Lake (sampling site 11).

As was the case regarding time-weighted atrazine concentrations, sites receiving runoff from the northern and northeastern parts of the Delaware River Basin (sites 1, 3, 4, and 7) also have the largest flow-weighted atrazine concentrations. Flow-weighted, average annual mean concentrations (table 8 and fig. 12) ranged from 1.2 µg/L in water from sampling site 9 to 6.6 µg/L at sampling site 3. Time- and flow-weighted, average annual mean atrazine concentrations in the outflow of Perry Lake (sampling site 11) are similar because seasonal and hydrologically related fluctuations common at upstream sites are tempered by the storage and mixing effects of the lake.

Table 8. Flow-weighted, annual mean atrazine concentrations for the 1993 and 1994 crop years, in micrograms per liter, at 11 sampling sites in the Delaware River Basin

Sampling site (fig. 4)	Crop year[1] 1993	1994	Average
1	4.2	4.0	4.1
2	2.9	2.6	2.8
3	4.2	8.9	6.6
4	3.5	5.4	4.4
5	2.2	4.3	3.2
6	1.1	2.2	1.6
7	4.4	6.5	5.4
8	1.0	2.2	1.6
9	1.3	1.0	1.2
10	1.4	5.0	3.2
11	1.6	2.1	1.8

[1]Crop year is the 12-month period from April 1 through March 31 and is designated by the calendar year in which it begins.

Relation to Land Use

Data previously presented indicate large differences in annual mean atrazine concentrations between sampling sites. Water from sampling sites receiving runoff from the northern and northeastern part of the Delaware River Basin (sites 1, 3, 4, and 7) had the largest annual mean concentrations of any of the 11 sampling sites. An implication is that these differences may be due to differences in land use, particularly differences in percentage of subbasins in cropland. This implication was tested with regression analysis relating percentage of subbasin in cropland (independent variable) to average annual mean concentrations for the 1993 to 1994 crop years (dependent variable).

Land-use percentages for selected categories were developed for the subbasin represented by each sampling site from digital land-use data provided by the Data Access and Support Center of the Kansas Geological Survey, Lawrence, Kansas (table 9). The cropland category was the most relevant to a potential relation to atrazine concentrations. Cropland percentages in table 9 include all major crops produced in the Delaware River Basin. These crops include corn, grain sorghum, soybeans, and wheat. Atrazine is not used in the production of soybeans or wheat; therefore, the actual causal relation would be between the percentage of area in corn and sorghum production and atrazine concentrations. However, the percentages of area devoted to individual crop production currently (1996) are not available on a subbasin or basin scale. Therefore, percentage of subbasin in cropland was used as a surrogate variable for percentage of basin in corn and sorghum production.

Results of regression analysis relating time- and flow-weighted, average annual mean atrazine concentrations in water from the 10 sampling sites upstream of Perry Lake to percentage of subbasin in cropland are presented in figure 13. The time- and flow-weighted, average annual mean concentrations are averages of the annual means for the 1993 and 1994 crop years. Sampling site 11 (outflow of Perry Lake) was not included in the regression analysis because it was believed that data from a site with a major reservoir within its basin could not be comparable with data from the upstream sites. This lack of comparability would result from potential water-quality effects of the reservoir due to storage of runoff, time of residence, mixing, atrazine degradation, and completely regulated outflow rates.

Both relations presented in figure 13 are direct and statistically significant. A direct relation is one in which the dependent variable varies in the same direction as the independent variable. In this case, as percentage of subbasin in cropland increases, annual mean atrazine concentration also increases. The significance of a relation is evaluated by the probability value (p-value) calculated from the relation of the two variables. For the purpose of this report, a relation with a p-value less than 0.05 is considered to be statistically significant.

The relations in figure 13 indicate that time-weighted, average annual mean atrazine concentrations may not exceed the 3.0-µg/L MCL in subbasins with at least about 70-percent cropland. However, flow-weighted, average annual mean atrazine concentrations may exceed the MCL when percentage of cropland is greater than about 40 percent of the subbasin.

The relations presented in figure 13 should be valid for any subbasin in the Delaware River Basin as long as the area ratios of individual crops remain at about the same levels as during this study. Although ratios of individual crops to cropland were not available for the Delaware River Basin, these ratios were calculated for each county from data provided by the

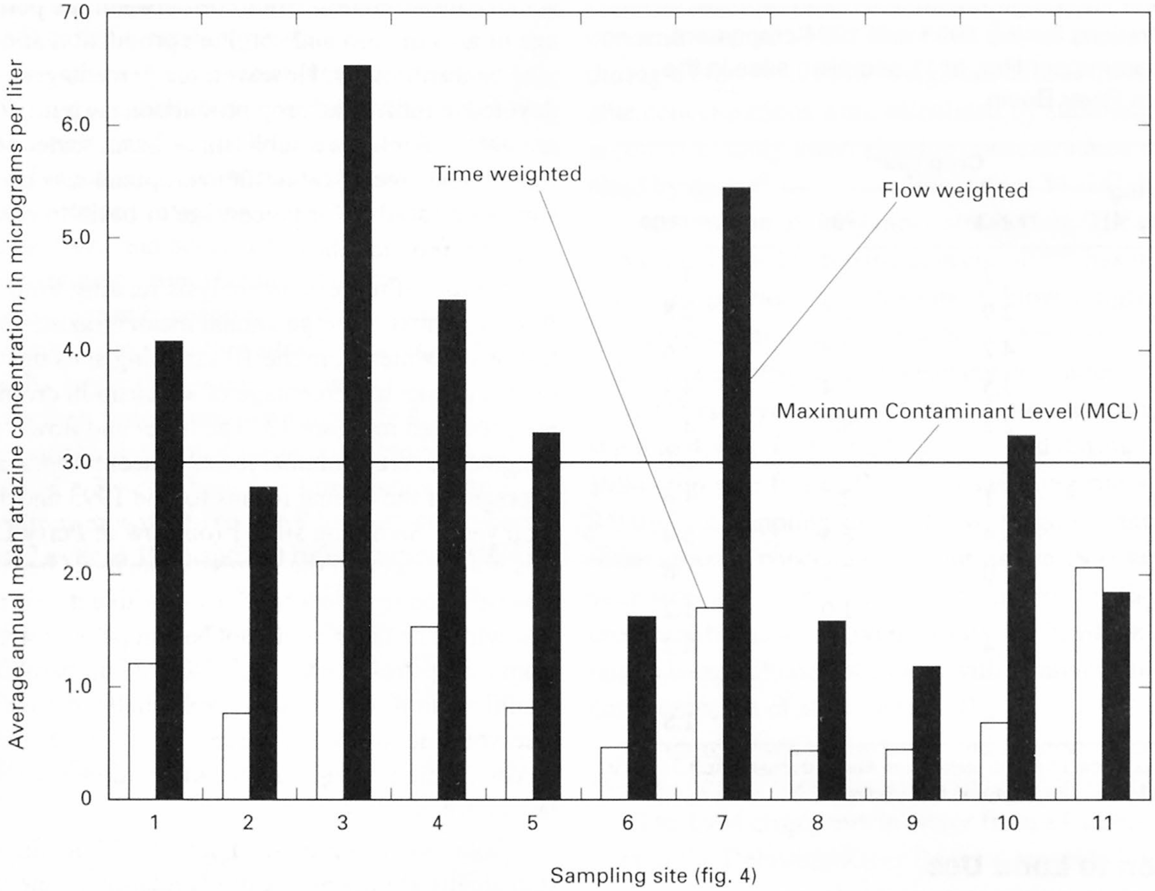


Figure 12. Time- and flow-weighted, average annual mean atrazine concentrations for 1993 and 1994 crop years in water from 11 sampling sites in the Delaware Rvier Basin.

Kansas State Board of Agriculture and U.S. Department of Agriculture (1988–93). Ratios of corn, grain sorghum, soybeans, and wheat areas to total cropland area for the five counties of the Delaware River Basin are given in table 10 for selected years from 1988–93. Generally, corn and grain-sorghum production in the five-county area account for about 44 percent, soybeans 34 percent, and wheat about 22 percent of the total cropland area on a fairly consistent basis.

TRANSPORT OF ATRAZINE

The amount of atrazine transported in a stream is a function of atrazine concentration and volume of water in the stream. A study of herbicide transport in surface water in the Tuttle Creek Lake-stream system of northeast Kansas (Bevans and others, 1995) showed that herbicides with solubilities similar to or greater than that of atrazine are transported in the dissolved phase and do not accumulate in sediment or biota. Therefore, a measure of dissolved atrazine concentration (as provided by ELISA) would provide a reliable estimate for calculation of atrazine load (mass of atrazine). An examination of atrazine loads and yields (load divided by drainage area) is important in determining distributions of atrazine contributions to Perry Lake. Mean atrazine concentrations in Perry Lake are a function of mass of atrazine transported into the lake; therefore, a knowledge of those distributions may help basin planners in directing available resources or educational information to achieve the most positive benefits.

Table 9. Percentages of selected land-use categories for subbasins represented by 11 sampling sites in the Delaware River Basin, 1992

[Percentages from the Data Access and Support Center of the Kansas Geological Survey (Lawrence, Kansas), digital land-use data, 1992]

Land-use category	Sampling site (fig. 4)										
	1	2	3	4	5	6	7	8	9	10	11
Cropland	61	41	65	56	33	23	48	26	32	28	40
Grassland	34	50	31	39	61	69	49	64	63	59	50
Woodland	4	8	2	4	6	7	3	9	4	11	7
Water	0	0	1	0	0	0	0	0	0	1	2
Urban	0	0	1	0	0	1	0	0	0	1	0
Total[1]	99	99	100	99	100	100	100	99	99	100	99

[1]Because of rounding, total may not equal 100.

Table 10. Ratio of individual crop area to total cropland area by county for selected years from 1988–93

[Data from Kansas State Board of Agriculture and U.S. Department of Agriculture, 1988–93]

Crop	Year	County					Total five-county area
		Atchison	Brown	Jackson	Jefferson	Nemaha	
Corn	1988	0.19	0.23	0.10	0.21	0.07	0.16
	1989	.14	.21	.09	.19	.06	.14
	1992	.20	.24	.16	.25	.08	.18
	1993	.22	.24	.15	.26	.09	.19
Grain sorghum	1988	.23	.17	.30	.21	.49	.29
	1989	.31	.18	.31	.25	.48	.30
	1992	.22	.18	.20	.13	.49	.26
	1993	.19	.16	.20	.12	.47	.24
Soybeans	1988	.41	.39	.33	.44	.19	.34
	1989	.35	.37	.22	.34	.16	.29
	1992	.41	.40	.36	.44	.18	.34
	1993	.45	.44	.42	.47	.22	.39
Wheat	1988	.16	.20	.27	.15	.26	.21
	1989	.20	.25	.37	.22	.30	.26
	1992	.17	.19	.28	.18	.24	.21
	1993	.14	.17	.22	.15	.22	.18

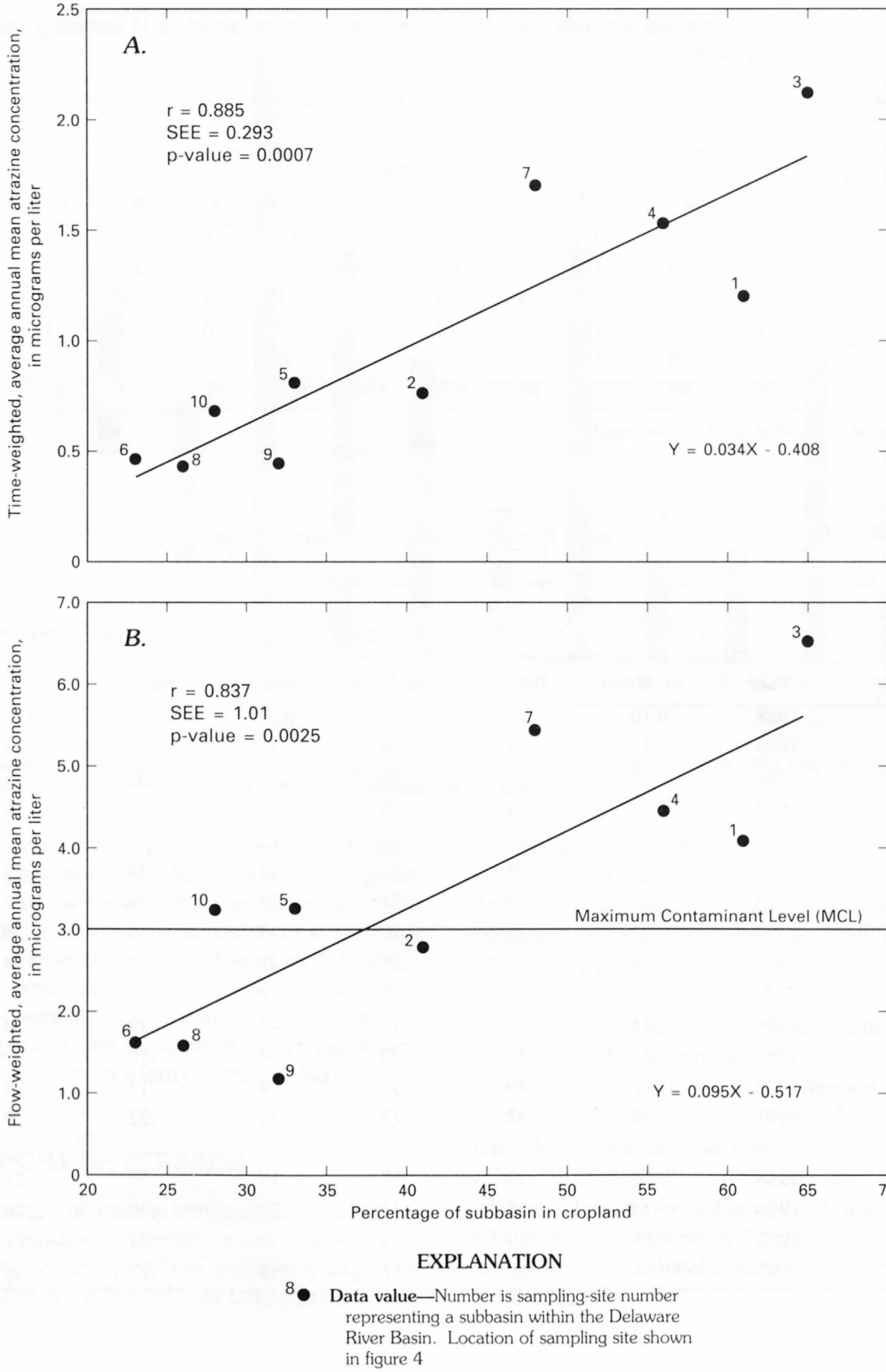


Figure 13. Relations between (*A*) time- and (*B*) flow-weighted, average annual mean atrazine concentrations for 1993 and 1994 crop years and percentages of subbasins in cropland.

Daily loads of atrazine (in pounds) were calculated by multiplying time-weighted, daily mean atrazine concentrations (in micrograms per liter) by daily mean streamflow (in cubic feet per second) and by a unit conversion factor of 0.00538. Estimation of time-weighted, daily mean atrazine concentrations has been discussed previously in this report. Daily mean streamflow at all sampling sites are given in tables 14–24 in the "Supplemental Information" section of this report.

Monthly and Annual Atrazine Loads

Monthly and annual atrazine loads were calculated by summing daily loads on a monthly or annual basis. Monthly loads for August 1992 through March 1995 and annual loads for the 1993 and 1994 crop years at 11 sampling sites in the Delaware River Basin are given in table 11.

Atrazine loads are directly related to atrazine concentration and streamflow volume, which means that as concentration and(or) streamflow increase, atrazine loads increase. Monthly or annual variation in either concentration or streamflow will produce variations in atrazine loads. As previously shown (fig. 8), large concentrations and periods of large streamflow generally occur concurrently in northeast Kansas and usually are most pronounced immediately after atrazine application (May–July). As a result, atrazine loads in streams in the Delaware River Basin are typically largest in May, June, and July. For example, figure 14 shows the monthly atrazine load distribution at sampling site 4 for the 1993 and 1994 crop years. Monthly load distribution is highly skewed and temporally restricted to the May through July period on nonregulated streams in northeast Kansas. During this period, which represents 25 percent of the year, 98 percent of the 1993 crop-year annual load was transported, and 91 percent was transported during the same 3 months of the 1994 crop year.

Extreme between-year variations in atrazine loads may occur as a direct result of hydrologic conditions. Figure 14 shows substantial differences in loads between the 1993 and 1994 crop years. These differences reflect the effects of an unusually wet year in 1993 followed by a relatively dry year in 1994 as indicated by deviations from long-term means in monthly streamflow (fig. 2). The most pronounced single monthly loading difference between the 1993 and 1994 crop years occurred in July (fig. 14). The atrazine load in July 1993 was more than seven times larger than the July 1994 load and is the result of major flooding during July 1993 (figs. 2 and 8).

The monthly atrazine load distribution patterns at the outflow of Perry Lake (sampling site 11, fig. 15) are similar to the pattern at sampling site 4 (fig. 14); however, because the outflow of Perry Lake is completely regulated, loads may be more temporally delayed and somewhat more distributed throughout the year relative to nonregulated upstream sites. Atrazine loads for the 1993 crop year were largest in July at sampling site 4 but were largest for August at the outflow of Perry Lake. This difference is due to temporary storage of floodwater in the lake during July 1993 and subsequent release of that water in August (fig. 9). Atrazine load transport for May through July equalled 33 percent of the 1993 crop-year load and 63 percent of the 1994 crop-year load. These outflow loads contrast to 98 and 91 percent of annual loads, respectively, during May through July at sampling site 4.

Skewed, nonrandom distribution of atrazine loads at sampling sites in the Delaware River Basin provide insight into the possible design of sampling programs to monitor loads of agricultural chemicals. The quantification of loads of chemicals in relation to annual application periods requires that monitoring be conducted continually from the time of application through at least July. This should, in most years, ensure an accurate quantification of about 90 percent of the annual load. A monitoring program designed with a limited number of randomly placed samples may not ensure definition during those few flow periods when most of the annual load is transported and may produce results biased extremely high or low depending on when the samples were collected. This becomes more obvious when daily load distribution is examined.

Distribution of daily atrazine loads in Delaware River near Muscotah, Kansas (sampling site 4), is shown in figure 16. Most of the annual transport of atrazine, as previously shown, occurs from May through July, the period immediately following application. Furthermore, a large percentage of the atrazine transported during these months can occur during just a few days. For example, at sampling site 4, the seven largest daily loads in each of the 1993 and 1994 crop years accounted for 45 percent and 67 percent, respectively, of the annual loads. Additionally, short time periods at some of the smaller tributary sites

Table 11. Calculated monthly atrazine loads, in pounds and percentage of annual load, for August 1992 through March 1995 and calculated annual loads for the 1993 and 1994 crop years at 11 sampling sites in the Delaware River Basin

Date	Sampling site (fig. 4) 1 Load (pounds)	1 Load (percent of annual load)	2 Load (pounds)	2 Load (percent of annual load)	3 Load (pounds)	3 Load (percent of annual load)	4 Load (pounds)	4 Load (percent of annual load)
1992								
Aug.	14	--	2.9	--	15	--	38	--
Sep.	20	--	13	--	41	--	110	--
Oct.	.61	--	.25	--	1.3	--	3.3	--
Nov.	22	--	8.5	--	26	--	77	--
Dec.	18	--	5.3	--	15	--	54	--
1993								
Jan.	1.4	--	.26	--	2.3	--	4.6	--
Feb.	6.7	--	1.9	--	6.4	--	22	--
Mar.	31	--	10	--	239	--	70	--
Apr.	37	1.5	6.2	0.76	22	1.5	71	1.6
May	280	12	42	5.1	240	16	880	20
June	500	21	240	29	40	2.7	750	17
July	1,600	67	530	65	1,200	80	2,700	61
Aug.	5.3	.22	.40	.049	1.1	.073	8.7	.20
Sep.	9.9	.41	1.6	.20	4.0	.27	22	.50
Oct.	1.7	.071	.27	.033	.90	.060	3.8	.086
Nov.	.84	.035	.11	.013	.83	.055	2.0	.045
Dec.	1.0	.042	.20	.024	1.4	.093	5.1	.12
1994								
Jan.	.22	.009	.055	.007	.57	.038	1.3	.030
Feb.	.11	.005	.035	.004	.42	.028	.75	.017
Mar.	1.2	.050	.32	.039	1.3	.087	2.6	.059
Apr.	33	12	5.8	6.4	18	5.0	69	6.3
May	95	34	54	59	180	50	490	45
June	14	5.0	1.4	1.5	120	33	140	13
July	120	43	24	26	33	9.2	360	33
Aug.	.79	.28	.30	.33	.29	.081	2.9	.26
Sep.	.21	.075	.065	.071	.12	.033	.53	.048
Oct.	12	4.3	1.8	2.0	.33	.092	12	1.1
Nov.	.41	.15	.28	.31	1.3	.36	1.6	.15
Dec.	.94	.34	.52	.57	1.7	.47	2.3	.21
1995								
Jan.	.45	.16	.12	.13	1.5	.42	1.5	.14
Feb.	.18	.064	.023	.025	.50	.14	.62	.056
Mar.	5.8	2.1	2.3	2.5	5.4	1.5	16	1.5
1993 crop year[1]	**2,400**	**102**	**820**	**100**	**1,500**	**101**	**4,400**	**101**
1994 crop year[1]	**280**	**101**	**91**	**99**	**360**	**100**	**1,100**	**101**

Table 11. Calculated monthly atrazine loads, in pounds and percentage of annual load, for August 1992 through March 1995 and calculated annual loads for the 1993 and 1994 crop years at 11 sampling sites in the Delaware River Basin—Continued

Date	Sampling site (fig. 4)							
	5		6		7		8	
	Load (pounds)	Load (percent of annual load)	Load (pounds)	Load (percent of annual load)	Load (pounds)	Load (percent of annual load)	Load (pounds)	Load (percent of annual load)
1992								
Aug.	1.1	--	0.69	--	1.8	--	0.21	--
Sep.	20	--	5.0	--	3.6	--	1.6	--
Oct.	.95	--	.33	--	.13	--	.12	--
Nov.	14	--	7.0	--	4.7	--	1.9	--
Dec.	5.2	--	3.2	--	2.6	--	.96	--
1993								
Jan.	.23	--	.26	--	.41	--	.065	--
Feb.	2.4	--	.64	--	.61	--	.58	--
Mar.	11	--	2.8	--	3.1	--	.34	--
Apr.	8.0	0.90	2.9	0.88	3.6	1.3	1.1	0.50
May	240	27	120	36	70	25	54	25
June	120	13	64	19	12	4.3	23	10
July	520	58	140	42	180	64	140	64
Aug.	.13	.015	.34	.10	.87	.31	.10	.045
Sep.	4.0	.45	6.1	1.8	8.4	3.0	1.3	.59
Oct.	.14	.016	.18	.055	.33	.12	.033	.015
Nov.	.14	.016	.086	.026	.30	.11	.042	.019
Dec.	.42	.047	.16	.048	.60	.21	.034	.015
1994								
Jan.	.048	.005	.035	.011	.10	.036	.019	.009
Feb.	.036	.004	.031	.009	.033	.012	.015	.007
Mar.	.13	.015	.10	.030	.073	.026	.028	.013
Apr.	14	6.1	7.7	5.9	11	9.2	4.7	7.6
May	140	61	73	56	24	20	4.3	6.9
June	18	7.8	34	26	13	11	35	56
July	56	24	15	12	70	58	16	26
Aug.	.10	.043	.47	.36	.36	.30	.23	.37
Sep.	.051	.022	.069	.053	.18	.15	.066	.11
Oct.	.12	.052	.040	.031	.14	.12	.007	.011
Nov.	.14	.061	.098	.075	.20	.17	.020	.032
Dec.	.19	.083	.054	.041	.070	.058	.23	.37
1995								
Jan.	.021	.009	.071	.055	.027	.022	.057	.092
Feb.	.016	.007	.017	.013	.030	.025	.044	.071
Mar.	2.8	1.2	2.50	1.9	.58	.48	1.2	1.9
1993 crop year[1]	**890**	**99**	**330**	**100**	**280**	**98**	**220**	**100**
1994 crop year[1]	**230**	**100**	**130**	**102**	**120**	**100**	**62**	**99**

Table 11. Calculated monthly atrazine loads, in pounds and percentage of annual load, for August 1992 through March 1995 and calculated annual loads for the 1993 and 1994 crop years at 11 sampling sites in the Delaware River Basin—Continued

	Sampling site (fig. 4)					
	9		10		11	
Date	Load (pounds)	Load (percent of annual load)	Load (pounds)	Load (percent of annual load)	Load (pounds)	Load (percent of annual load)
1992						
Aug.	0.23	--	0.58	--	730	--
Sep.	1.2	--	.28	--	320	--
Oct.	.012	--	.097	--	11	--
Nov.	1.7	--	7.9	--	530	--
Dec.	1.2	--	8.1	--	910	--
1993						
Jan.	.13	--	2.1	--	85	--
Feb.	.16	--	1.4	--	140	--
Mar.	1.2	--	2.0	--	120	--
Apr.	1.4	1.7	4.9	2.6	280	5.5
May	2.9	3.5	30	16	1,000	20
June	8.4	10	19	10	270	5.3
July	63	77	120	63	420	8.2
Aug.	.23	.28	1.7	.89	2,400	47
Sep.	5.7	7.0	9.4	4.9	51	1.0
Oct.	.34	.41	.64	.34	520	10
Nov.	.094	.11	.18	.095	31	.61
Dec.	.012	.015	.16	.084	73	1.4
1994						
Jan.	.007	.009	.055	.029	33	.65
Feb.	.006	.007	.026	.014	22	.43
Mar.	.009	.011	.097	.051	35	.69
Apr.	1.3	21	37	67	5.3	.56
May	.56	9.0	12	22	130	14
June	3.5	56	1.5	2.7	210	22
July	.70	11	4.1	7.5	260	27
Aug.	.049	.77	.006	.011	17	1.8
Sep.	.000	.000	.005	.009	13	1.4
Oct.	.000	.000	.010	.018	15	1.6
Nov.	.015	.24	.071	.13	13	1.4
Dec.	.040	.64	.057	.10	26	2.7
1995						
Jan.	.002	.032	.19	.35	26	2.7
Feb.	.003	.048	.042	.076	49	5.2
Mar.	.016	.26	.088	.16	190	20
1993 crop year[1]	**82**	**100**	**190**	**98**	**5,100**	**101**
1994 crop year[1]	**6.2**	**99**	**55**	**100**	**950**	**100**

[1]Because of rounding, the annual summation of percentages may not equal 100.

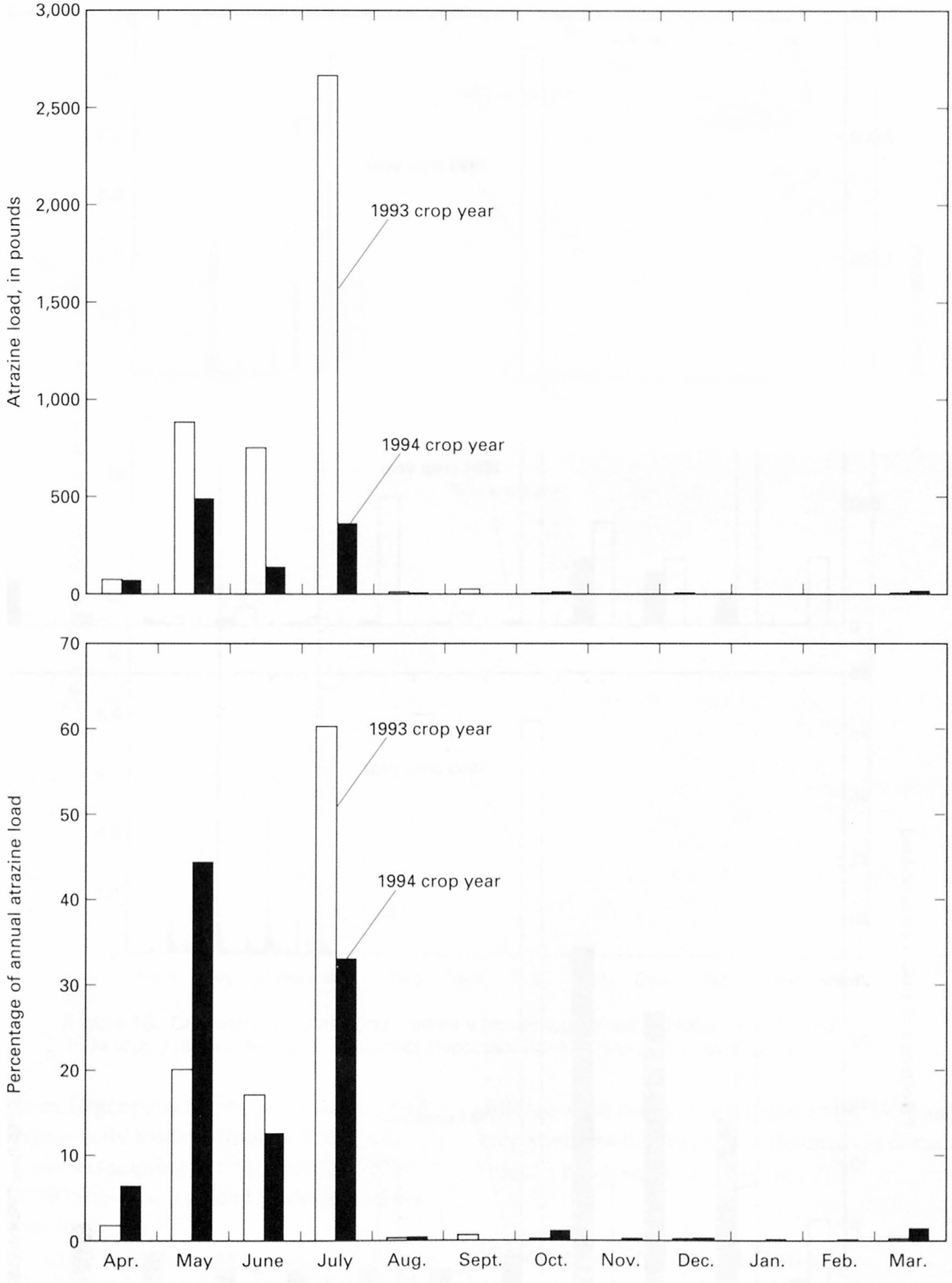


Figure 14. Calculated monthly atrazine load, in pounds and as a percentage of annual load, for Delaware River near Muscotah, Kansas (sampling site 4, fig. 4), for 1993 and 1994 crop years.

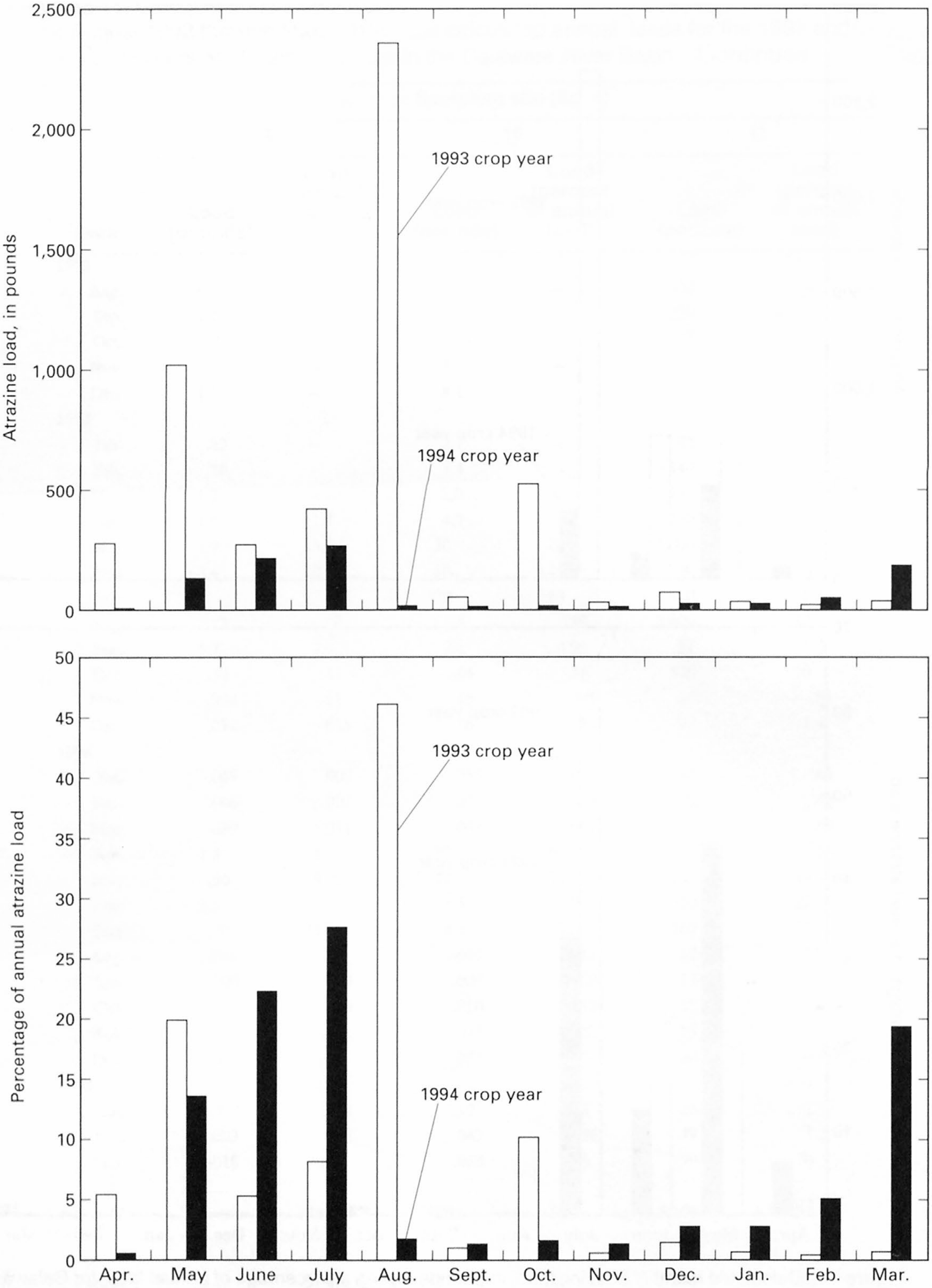


Figure 15. Calculated monthly atrazine load distribution, in pounds and as a percentage of annual load, for Delaware River below Perry Dam, Kansas (sampling site 11, fig. 4), for 1993 and 1994 crop years.

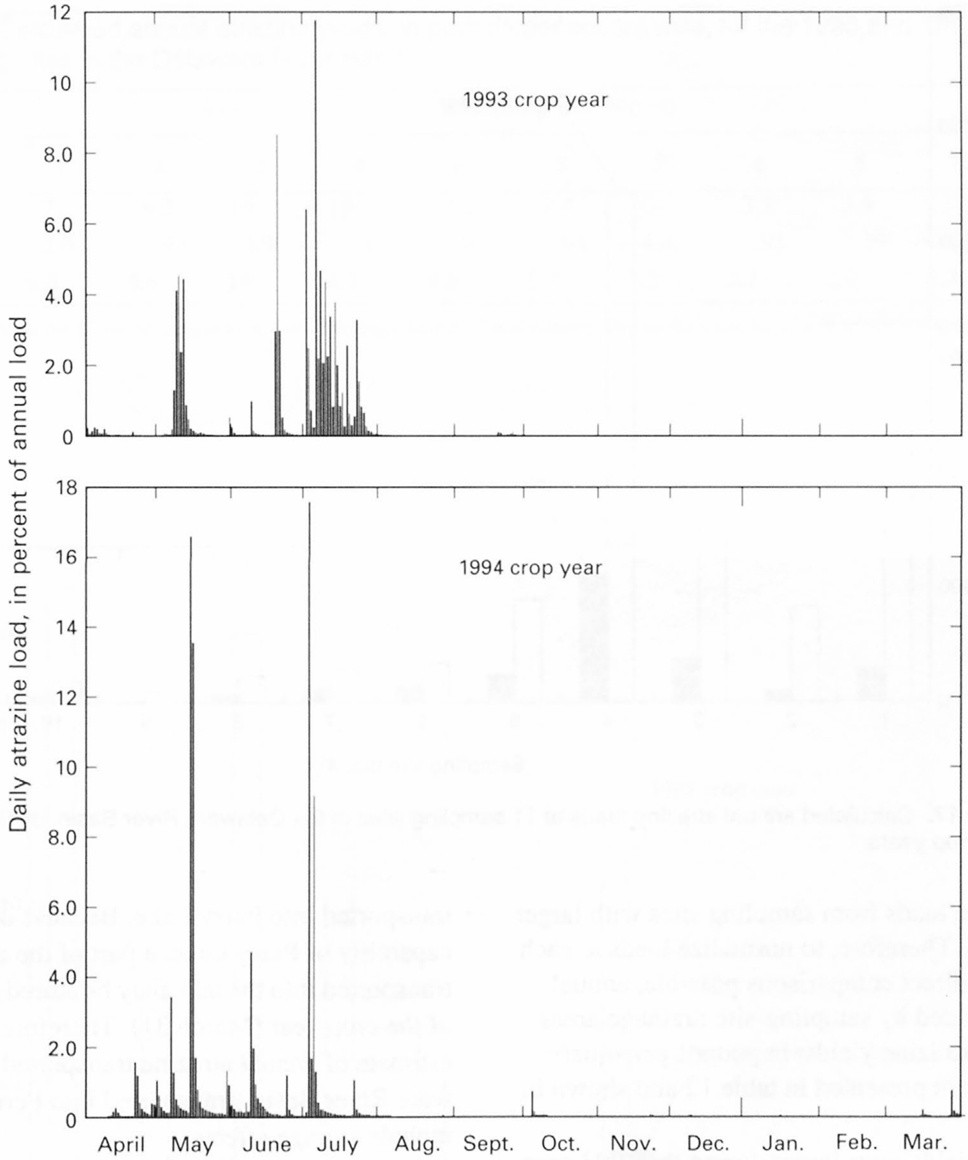


Figure 16. Calculated daily atrazine load as a percentage of annual load for 1993 and 1994 crop years at Delaware River near Muscotah, Kansas (sampling site 4, fig. 4).

account for even larger percentages of the annual load. The seven largest daily loads in Straight Creek near Muscotah, Kansas (sampling site 5), equalled 53 percent of the 1993 crop-year load and 79 percent of the 1994 crop-year load.

Annual atrazine loads varied considerably between the 1993 and 1994 crop years and among sampling sites (fig. 17). Annual loads during the 1993 crop year were larger than during the 1994 crop year at all sampling sites. The largest relative within-site difference was at sampling site 9 where the annual load of 82 lb during the 1993 crop year was 13 times larger than the 6.2 lb calculated for the 1994 crop year. These differences in annual loads between the 1993 and 1994 crop years are the result of differences in streamflow (runoff) between the 2 years (fig. 2).

Yields and Transport Ratios

Among-site comparisons of atrazine-loading characteristics cannot be made strictly by a comparison of annual atrazine mass (pounds) because of large differences in sampling-site drainage areas and the direct relation between drainage area and streamflow volume. This direct relation gives rise to potentially

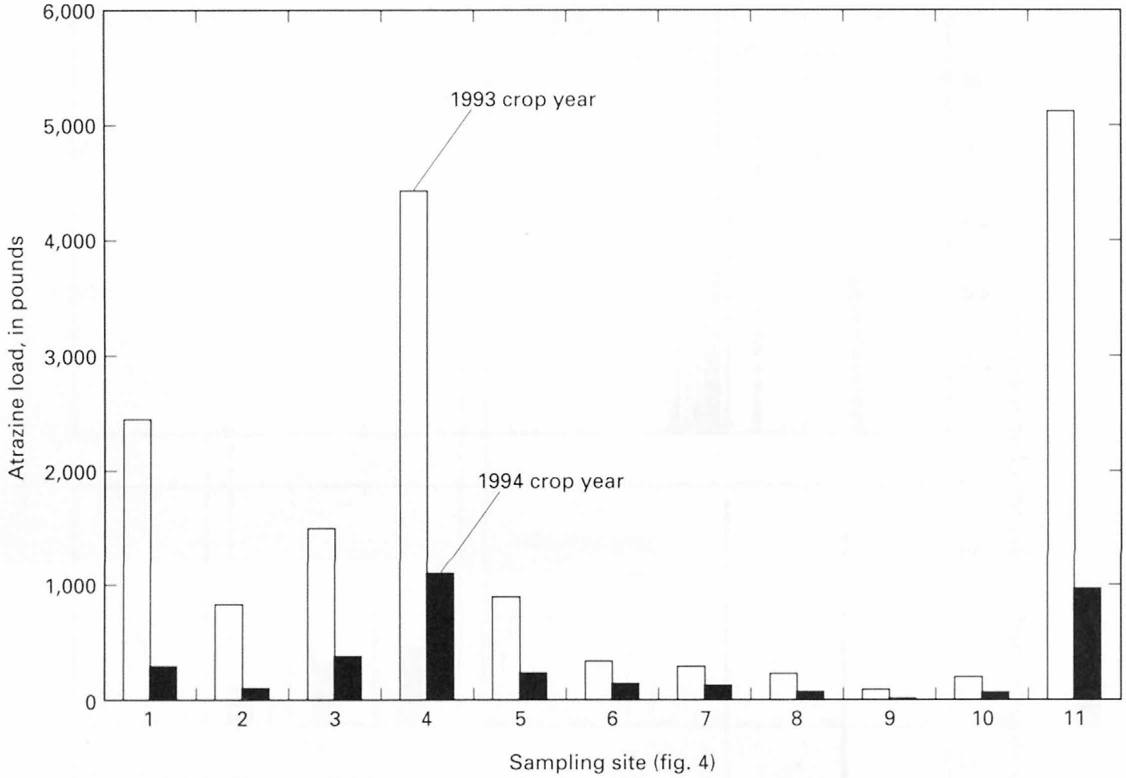


Figure 17. Calculated annual atrazine loads at 11 sampling sites in the Delaware River Basin for 1993 and 1994 crop years.

greater atrazine loads from sampling sites with larger drainage areas. Therefore, to normalize loads at each site and make direct comparisons possible, annual loads were divided by sampling-site drainage areas. The resulting atrazine yields, in pounds per square mile (lb/mi^2), are presented in table 12 and shown in figure 18.

Atrazine yields were larger during the 1993 crop year than during the 1994 crop year. Yields during the 1993 crop year ranged from 2.4 lb/mi^2 at sampling site 6 to 17 lb/mi^2 at sampling site 1. Yields during the 1994 crop year ranged from 0.29 lb/mi^2 at sampling site 9 to 4.4 lb/mi^2 at sampling site 7. Yields were largest at sampling sites receiving runoff from the northern and northeastern part of the Delaware River Basin (sampling sites 1, 3, 4, and 7) and smallest at those sampling sites in other parts of the basin (sampling sites 6, 8, 9, and 10). These results mirror the results previously discussed in regards to annual atrazine concentrations.

The atrazine yields listed in table 12 for sampling site 11 (outflow of Perry Lake) were calculated from the measured atrazine load at that sampling site but may not represent accurate yields based on total load transported into Perry Lake. Because of the storage capability of Perry Lake, a part of the annual load transported into the lake may be stored there at the end of the crop year (March 31). Therefore, a reasonable estimate of annual atrazine transported from the Delaware River Basin (transported into Perry Lake) must include storage effects.

Annual atrazine transport load from the Delaware River Basin can be estimated by the summation of measured load at sampling site 11 (table 11) plus the difference between estimated atrazine mass in Perry Lake at the end of the crop year (March 31) and the estimated atrazine mass in Perry Lake at the start of the crop year (April 1). Estimates of atrazine mass in Perry Lake were calculated by multiplying the volume (acre-feet) of Perry Lake at either the start or end of the crop year by estimated mean atrazine concentration (micrograms per liter) in the lake and by a unit conversion factor of 0.00272 (table 13). Mean atrazine concentrations in Perry Lake were estimated by averaging concentrations at sampling site 11 (outflow of the lake) from the dates indicated in table 13 to a subsequent date where concentrations started to

Table 12. Calculated annual atrazine yields, in pounds per square mile, for the 1993 and 1994 crop years at 11 sampling sites in the Delaware River Basin

Crop year[1]	Sampling site (fig. 4) 1	2	3	4	5	6	7	8	9	10	11
1993	17	8.3	16	10	7.2	2.4	10	3.2	3.8	5.1	4.6
1994	2.0	.92	3.9	2.5	1.9	.94	4.4	.91	.29	1.5	.85
Mean	**9.5**	**4.6**	**10**	**6.2**	**4.6**	**1.7**	**7.2**	**2.1**	**2.0**	**3.3**	**2.7**

[1]Crop year is the 12-month period from April 1 through March 31 and is designated by the calendar year in which it begins.

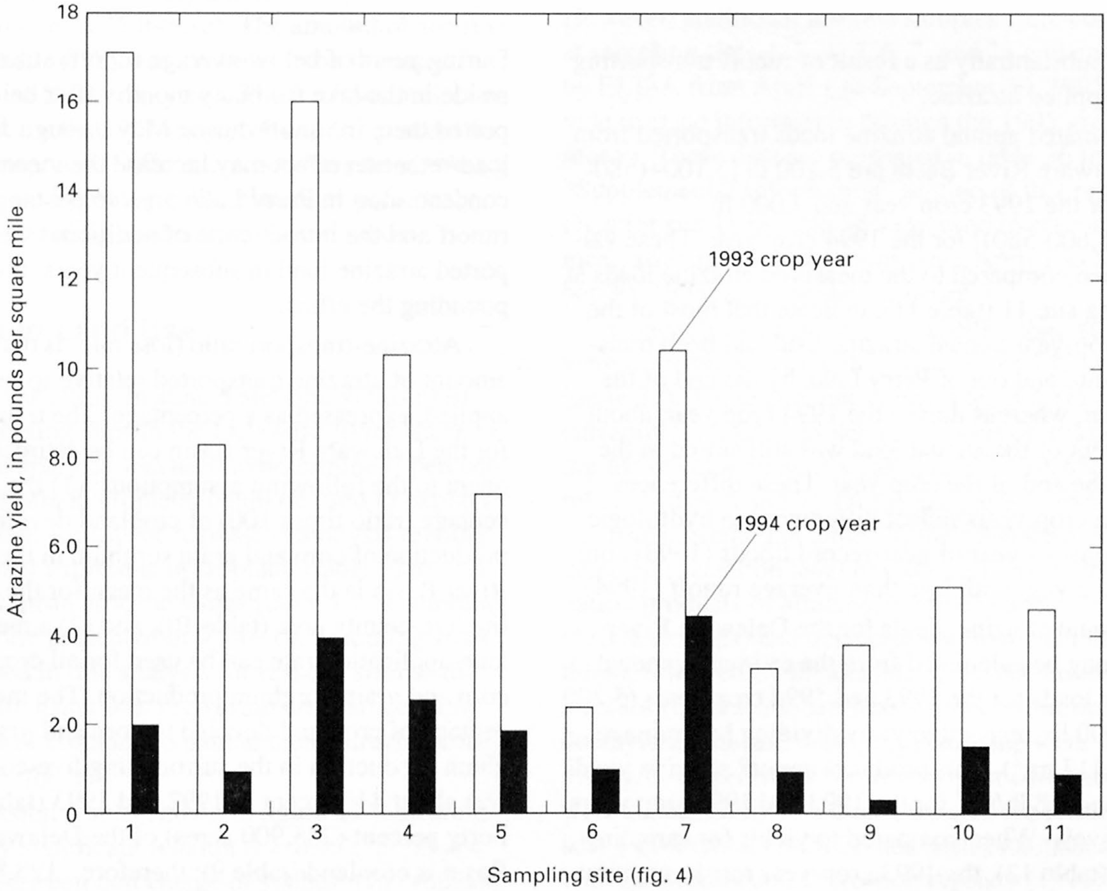


Figure 18. Calculated annual atrazine yields at 11 sampling sites in the Delaware River Basin for 1993 and 1994 crop years.

Table 13. Water-surface elevation, storage, estimated mean atrazine concentration, and mass of atrazine in Perry Lake for selected dates

Date	Water-surface elevation[1] (feet above sea level)	Storage[2] (acre-feet)	Estimated mean atrazine concentration (micrograms per liter)	Estimated atrazine mass (pounds)
April 1, 1993	896.33	269,000	0.60	440
March 31, 1994	891.74	212,000	1.0	580
April 1, 1994	891.75	212,000	1.0	580
March 31, 1995	891.72	212,000	2.7	1,600

[1]From Geiger and others (1994, 1995) or data on file with the U.S. Geological Survey, Lawrence, Kansas.

[2]From U.S. Army Corps of Engineers elevation area-capacity tables for Perry Lake, revised May 1990.

change substantially as a result of runoff transporting newly applied atrazine.

Estimated annual atrazine loads transported from the Delaware River Basin are 5,200 lb [5,100+(580-440)] for the 1993 crop year and 2,000 lb [950+(1,600-580)] for the 1994 crop year. These values, when compared to the measured atrazine loads at sampling site 11 (table 11), indicate that most of the 1993 crop-year annual atrazine load had been transported into and out of Perry Lake by the end of the crop year, whereas during the 1994 crop year, about 50 percent of the annual load was still stored in the lake at the end of the crop year. These differences between crop years reflect differences in hydrologic conditions—a year of near-record floods (1993) compared to a year with less-than-average runoff (1994).

Annual atrazine yields for the Delaware River Basin may be calculated from the estimated annual atrazine loads for the 1993 and 1994 crop years (5,200 and 2,000 lb, respectively) by dividing by drainage area (1,117 mi^2). This produces annual atrazine yields of 4.7 and 1.8 lb/mi^2 for the 1993 and 1994 crop years, respectively. When compared to yields for sampling site 11 (table 12), the 1993 crop-year results are similar, but the 1994 crop-year results are twice as large as presented before lake storage effects were considered. This indicates that in some years much of the annual load of atrazine may be kept in storage in Perry Lake long after the end of the crop year.

The storage effect of atrazine in Perry Lake can have important implications for annual mean atrazine concentrations in the lake when two or more successive years of below-average runoff occur. During years of below-average runoff, atrazine may reside in the lake for many months after being transported there in runoff during May through July. This load-retention effect may increase the mean atrazine concentration in Perry Lake prior to postapplication runoff and the introduction of additional, newly transported atrazine load in subsequent years, thus, compounding the effect.

Atrazine-transport ratio (loss rate) is defined as the amount of atrazine transported relative to the amount applied, expressed as a percentage. The transport ratio for the Delaware River Basin can be estimated subsequent to the following assumptions: (1) the mean percentage (ratio times 100) of cropland devoted to the production of corn and grain sorghum in the Delaware River Basin is the same as the mean for the surrounding five-county area (table 10), and (2) a mean atrazine-application rate can be used for all cropland in corn and grain-sorghum production. The mean percentage of cropland devoted to corn and grain-sorghum production in the surrounding five-county area was about 44 percent in 1992 and 1993 (table 10). Forty percent (285,900 acres) of the Delaware River Basin is cropland (table 9); therefore, 125,800 acres (44 percent) of that is devoted to corn and grain-sorghum production (from assumption 1).

The maximum atrazine-application rate established by PMA voluntary recommendations is 2.25 lb of active ingredient per acre per year. It is believed that 2.25 lb of active ingredient per acre per year is a reasonable estimate of average application rate for the following reasons: (1) the effectiveness of atrazine to inhibit weed development begins to diminish substantially at application rates less than about 2.00 lb/acre, (2) 2.25 lb/acre is 0.25 lb/acre less than the maximum label rate, (3) some producers may inadvertently exceed recommended rates, or (4) producers making both a straight atrazine application and a subsequent premix application may not take into consideration the atrazine that may be included in the premix formulation. However, should the reader of this report believe that 2.25 lb/acre is not a reasonable estimate of average atrazine application, it is a simple calculation to modify the transport ratio.

The atrazine-transport ratio for the Delaware River Basin is the atrazine load transported into Perry Lake divided by the amount applied. The amount applied is equal to the area in corn and grain-sorghum production (125,800 acres) multiplied by the average application rate (2.25 lb/acre). The amount of atrazine applied (283,000 lb) was assumed to be the same for the 1993 and 1994 crop years. The transport ratio was 1.8 percent for the 1993 crop year and 0.7 percent for the 1994 crop year. Differences between these two crop years are hydrologically related, as previously discussed regarding concentrations and loads.

Relation to Land Use

Large variations in annual atrazine yields exist among sampling sites in the Delaware River Basin. Regression analysis was used to determine if percentage of subbasin in cropland could be used to explain this variation. Results of regression analysis relating percentage of subbasins in cropland (table 9) to average annual mean atrazine yields (table 12) at sampling sites 1–10 are presented in figure 19. Sampling site 11 was not used in this analysis for reasons similar to those for not using it in regression analysis relating percentage of cropland to annual mean atrazine concentrations (fig. 13).

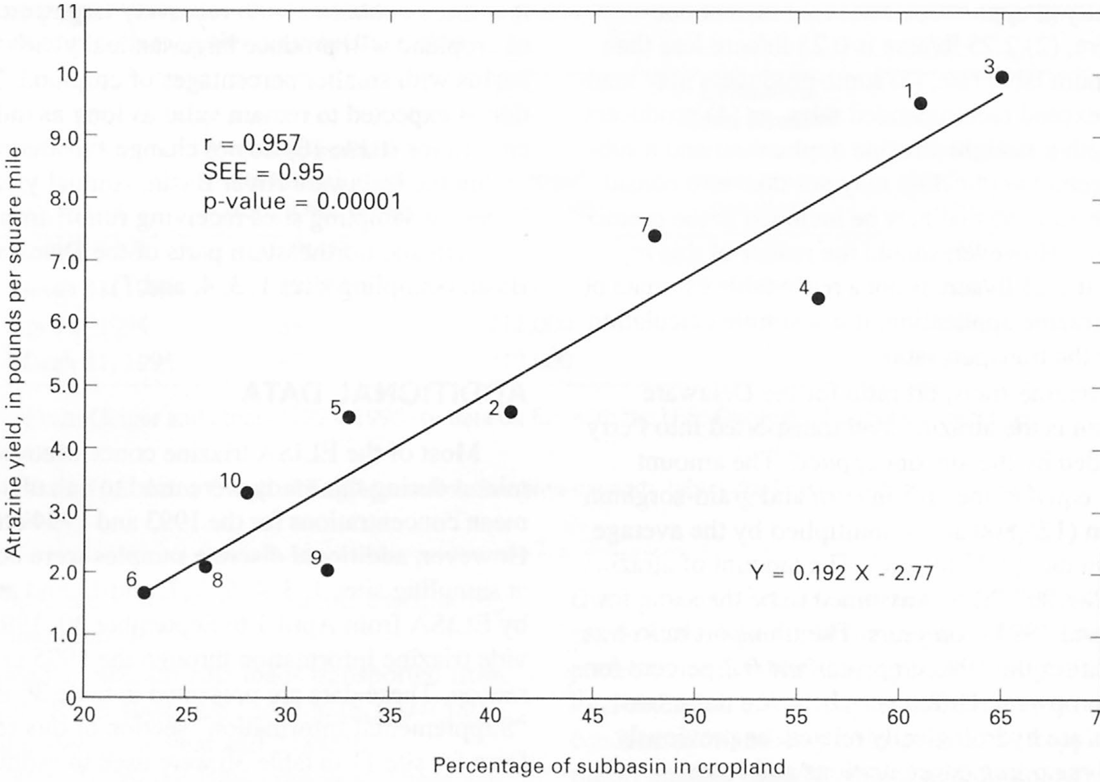
Regression results shown in figure 19 indicate a statistically significant relation ($r = 0.957$, p-value = 0.00001) between percentage of subbasin in cropland and atrazine yields based on data from the 1993 and 1994 crop years. The coefficient of determination (r^2), the square of the correlation coefficient, is a measure of the amount of variation in a dependent variable explained by an independent variable. For this relation, the single variable, cropland, explains almost 92 percent (0.957^2) of the variation in annual yields for sites within the Delaware River Basin. Because the relation in figure 19 is direct, the conclusion is made that those subbasins with relatively large percentages of cropland will produce larger annual yields than subbasins with smaller percentages of cropland. This relation is expected to remain valid as long as individual crop ratios (table 10) do not change substantially within the Delaware River Basin. Annual yields were largest at sampling sites receiving runoff from the northern and northeastern parts of the Delaware River Basin (sampling sites 1, 3, 4, and 7).

ADDITIONAL DATA

Most of the ELISA triazine concentrations determined during this study were used to calculate daily mean concentrations for the 1993 and 1994 crop years. However, additional discrete samples were collected at sampling sites 1, 3, 4, 5, 6, 7, and 11 and analyzed by ELISA from April 1 to September 30, 1995, to provide triazine information through the 1995 growing season. These data are presented in table 36 in the "Supplemental Information" section of this report. Data for site 11 in table 36 were used to estimate daily mean atrazine concentrations from April 1 to September 30, 1995, as presented in figure 9.

Concentrations of herbicides other than atrazine were determined by GC/MS analysis of 142 samples (table 37). These concentrations were determined concurrently with GC/MS determinations of atrazine during the development of an atrazine/ELISA triazine relation (figs. 6 and 7). Of the herbicides other than atrazine presented in table 37, the most frequently detected (detection level of 0.05 μg/L) were the degradation products of atrazine, deethylatrazine (133 detections) and deisopropylatrazine (117 detections), followed by metolachlor (112 detections) and alachlor (63 detections). Maximum concentrations of deethylatrazine and deisopropylatrazine were 3.8 and 1.9 μg/L, respectively; however, most concentrations were substantially less than 1.0 μg/L. No Health Advisory Level (HAL) or MCL has been established by the U.S. Environmental Protection Agency (1995) for the atrazine degradation products.

Alachlor and metolachlor both are used in the production of corn and grain sorghum. Alachlor can be used for preplant, postplant, or postemergent weed control up until the corn is about 5 in. tall (Regehr and others, 1994). Metolachlor is used for preplant control of grasses with some control of broadleaf weeds. Unlike atrazine, alachlor and metolachlor also can be used in soybean production. About 34 percent of the



EXPLANATION

8 ● **Data value**—Number is sampling-site number representing a subbasin within the Delaware River Basin. Location of sampling site shown in figure 4

Figure 19. Relation between percentages of subbasins in cropland and average annual mean atrazine yields for 1993 and 1994 crop years at sampling sites 1–10.

crop area in the Delaware River Basin is used for soybean production (table 10).

Concentrations of alachlor and metolachlor generally were less than 1.0 µg/L. Maximum concentrations were 9.4 and 58 µg/L, respectively. The largest concentrations were in samples collected during May and June 1993 at sites receiving runoff from the northern and northeastern parts of the Delaware River Basin. No metolachlor concentration exceeded the 200-µg/L lifetime HAL (U.S. Environmental Protection Agency, 1995); however, 16 alachlor concentrations (11.3 percent) were larger than the 2.0-µg/L MCL.

From January 1993 through December 1994, samples for the determination of biochemical oxygen demand, total suspended solids, selected nutrients, and fecal coliform and fecal streptococcus bacteria were collected manually at all 11 sampling sites in the Delaware River Basin. These samples were collected mostly during low flow and at about 2-week intervals to provide basic water-quality information for the basin. These samples were analyzed at the KDHE laboratory in Topeka, Kansas. Results of these analyses are presented in table 38 in the "Supplemental Information" section of this report.

SUMMARY

Since about 1960, atrazine has been used extensively in the production of corn and grain sorghum in the Midwestern United States. The use of atrazine may pose a potential threat to public-water supplies in areas where it is used intensively because of possible adverse effects on human health and potential toxicity to aquatic life. Because of concerns that some surface-water-supply sources in northeast Kansas may exceed the Maximum Contaminant Level (MCL) established for atrazine in drinking water by the

U.S. Environmental Protection Agency, the Kansas State Board of Agriculture (currently the Kansas Department of Agriculture) conducted a series of hearings concerning the extent of atrazine contamination in northeast Kansas. On the basis of available information which indicated that long-term mean concentrations of atrazine in Perry Lake may exceed the 3.0-μg/L MCL, the Nation's first inland surface-water Pesticide Management Area (PMA) was established in the Delaware River Basin.

A study of the distribution and transport of atrazine in the 1,117 mi^2 Delaware River Basin was conducted by the U.S. Geological Survey in cooperation with the Kansas State Conservation Commission, Kansas State University, and the Kansas Department of Agriculture. Data and results from this study will be used by State and Federal conservation, regulatory, research, and information agencies to: (1) evaluate the perception of a long-term atrazine problem, (2) identify areas where producer-oriented educational activities may be required, (3) evaluate the effectiveness of selected land-management and agricultural practices, and (4) improve the understanding of herbicide transport in areas of similar agriculture and hydrology. The purpose of this report is to present the information necessary to assess the present and possible future changes in the distribution and magnitude of atrazine concentrations, loads, and yields spatially, temporally, and in relation to hydrologic conditions and land-use characteristics.

The Delaware River Basin is an 1,117-mi^2 area located in northeast Kansas. A prominent hydrologic feature of the basin is Perry Lake. Perry Lake is a Federal reservoir with a multipurpose-pool surface area of 11,150 acres and is used for water supply, flood control, and recreational activities. Agriculture accounts for about 85 percent of the land use within the basin, with about 40 percent in crops such as corn, grain sorghum, soybeans, and wheat.

This study, conducted between July 1992 and September 1995, used 11 sampling sites instrumented to record stream stage and to automatically collect stream samples during runoff. These samples were analyzed by enzyme-linked immunosorbent assay (ELISA) for triazine concentrations and subsequently time-weighted to produce daily mean values. Estimates of daily mean atrazine concentrations were calculated from linear-regression relations between ELISA-derived triazine concentrations and atrazine concentrations determined by gas chromatography/mass spectrometry (GC/MS). These relations were based on dual analyses of 141 surface-water samples. Analytical quality assurance included duplicate analyses of selected stream-water samples, analysis of atrazine standard-reference samples, and analysis of blank-water samples.

Daily mean atrazine concentrations in samples from streams in the Delaware River Basin commonly exceeded the 3.0-μg/L MCL during May, June, and July. Daily mean concentrations equal to or greater than 20 μg/L were not uncommon during this period. However, daily mean concentrations greater than the MCL were rare at other times of the year. Most daily mean concentrations were less than 1.0 μg/L from August through April. Daily mean atrazine concentrations in water from Perry Lake were largely affected by the timing and magnitude of inflow.

The largest time-weighted, monthly mean atrazine concentrations in water from the sampling sites upstream of Perry Lake occurred during May, June, and July. In water from most sampling sites, the largest monthly concentrations occurred during June of both the 1993 and 1994 crop years. August through April rarely had monthly mean concentrations greater than 1.0 μg/L, with most months substantially less than 0.50 μg/L. The largest monthly mean concentrations were in water from sites receiving runoff from the northern and northeastern parts of the Delaware River Basin. For example, monthly mean concentrations in water from Grasshopper Creek near Muscotah, Kansas, for June 1993 and 1994 were 5.8 and 11 μg/L, respectively. Corresponding monthly mean concentrations in water from Cedar Creek west of Valley Falls, Kansas, were 1.5 and 2.7 μg/L, respectively. Most monthly mean atrazine concentrations in water from all sites were larger in 1994 than in 1993.

Time-weighted, monthly mean atrazine concentrations in samples from the outflow of Perry Lake showed a somewhat similar seasonal fluctuation pattern to those samples from the 10 upstream sampling sites although larger concentrations were more persistent. For example, during 1994, monthly mean concentrations peaked at 3.3 μg/L in August and did not decrease to less than 3.0 μg/L until February 1995.

Time-weighted, annual mean atrazine concentrations did not exceed the 3.0-μg/L MCL in water from any sampling site for either the 1993 or 1994 crop years; however, concentrations were larger in 1994 than in 1993. Time-weighted, annual mean concentrations in water from the 11 sampling sites during the

1993 crop year ranged from 0.27 to 1.5 μg/L and during the 1994 crop year from 0.36 to 2.8 μg/L. Concentrations in water from the outflow of Perry Lake were larger during the first 6 months of the 1995 crop year than during the same period in 1994. By August 1995, concentrations were greater than 5.0 μg/L. The 1995 crop-year annual mean concentration in water from the outflow of Perry Lake may exceed the MCL unless substantial inflow to the lake dilutes existing concentrations. The largest time-weighted, annual mean atrazine concentrations were in water from sampling sites receiving runoff from the northern and northeastern parts of the Delaware River Basin.

At all sampling sites, except the outflow of Perry Lake, flow-weighted, annual mean atrazine concentrations were considerably larger than time-weighted, annual mean concentrations, and at several upstream sites, the flow-weighted, average annual mean concentration substantially exceeded the MCL. Flow-weighted, annual mean concentrations among the 11 sampling sites during the 1993 crop year ranged from 1.0 to 4.4 μg/L and during the 1994 crop year from 1.0 to 8.9 μg/L.

Statistically significant linear-regression relations (correlation coefficient of 0.837 or better) were identified relating percentage of subbasin in cropland to time- and flow-weighted, average annual mean atrazine concentrations. The relations indicate that time-weighted, average annual mean atrazine concentrations may not exceed the MCL in subbasins with at least about 70-percent cropland. However, flow-weighted, average annual mean atrazine concentrations may exceed the MCL when the percentage of cropland is greater than about 40 percent of the subbasin.

Atrazine loads in streams in the Delaware River Basin typically are largest in May, June, and July. Approximately 90 percent or more of the annual load of atrazine is transported during these 3 months. Annual loads in 1993 were several times larger than loads in 1994 due in large part to a considerably wetter year in 1993, which produced more runoff and associated transport of atrazine.

Atrazine yields were larger during the 1993 crop year than during the 1994 crop year. Yields at the sampling sites upstream of Perry Lake during the 1993 crop year ranged from 2.4 to 17 lb/mi^2 and during the 1994 crop year from 0.29 to 4.4 lb/mi^2. Yields were largest at sampling sites receiving runoff from the northern and northeastern parts of the Delaware River Basin. A statistically significant linear-regression relation (correlation coefficient of 0.957) was identified relating percentage of subbasin in cropland to atrazine yields.

It was estimated that 283,000 lb of atrazine were applied in the Delaware River Basin during each of the 1993 and 1994 crop years. Annual atrazine loads, yields, and transport ratios for the entire Delaware River Basin were estimated for the 1993 and 1994 crop years. Atrazine loads were 5,200 and 2,000 lb, yields were 4.7 and 1.8 lb/mi^2, and transport ratios were 1.8 and 0.7 percent of atrazine applied in the basin, respectively. Differences between the 1993 and 1994 crop years are the result of differences in rainfall amounts and subsequent runoff volumes.

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SUPPLEMENTAL INFORMATION

Table 14. Daily mean streamflow at Delaware River near Horton, Kansas, for water years 1992–95

[All values in cubic feet per second, except as noted. Max, maximum; min, minimum; ac-ft, acre-feet; e, estimated; ---, no data]

Day	Oct. 1991 to Sept. 1992											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	---	---	---	---	---	---	---	---	---	---	158	241
2	---	---	---	---	---	---	---	---	---	---	237	145
3	---	---	---	---	---	---	---	---	---	---	90	33
4	---	---	---	---	---	---	---	---	---	---	64	22
5	---	---	---	---	---	---	---	---	---	---	54	393
6	---	---	---	---	---	---	---	---	---	---	49	490
7	---	---	---	---	---	---	---	---	---	---	135	73
8	---	---	---	---	---	---	---	---	---	---	94	46
9	---	---	---	---	---	---	---	---	---	---	57	32
10	---	---	---	---	---	---	---	---	---	---	40	23
11	---	---	---	---	---	---	---	---	---	---	34	20
12	---	---	---	---	---	---	---	---	---	---	32	18
13	---	---	---	---	---	---	---	---	---	---	31	17
14	---	---	---	---	---	---	---	---	---	---	31	16
15	---	---	---	---	---	---	---	---	---	---	30	16
16	---	---	---	---	---	---	---	---	---	---	29	15
17	---	---	---	---	---	---	---	---	---	---	28	14
18	---	---	---	---	---	---	---	---	---	---	26	15
19	---	---	---	---	---	---	---	---	---	---	25	14
20	---	---	---	---	---	---	---	---	---	---	24	781
21	---	---	---	---	---	---	---	---	---	---	23	215
22	---	---	---	---	---	---	---	---	---	---	23	50
23	---	---	---	---	---	---	---	---	---	---	22	27
24	---	---	---	---	---	---	---	---	---	---	21	22
25	---	---	---	---	---	---	---	---	---	97	20	20
26	---	---	---	---	---	---	---	---	---	2,340	20	22
27	---	---	---	---	---	---	---	---	---	256	22	22
28	---	---	---	---	---	---	---	---	---	102	21	20
29	---	---	---	---	---	---	---	---	---	77	21	17
30	---	---	---	---	---	---	---	---	---	e3,740	19	17
31	---	---	---	---	---	---	---	---	---	417	17	---
TOTAL	---	---	---	---	---	---	---	---	---	---	**1,497**	**2,856**
MEAN	---	---	---	---	---	---	---	---	---	---	**48.3**	**95.2**
MAX	---	---	---	---	---	---	---	---	---	---	**237**	**781**
MIN	---	---	---	---	---	---	---	---	---	---	**17**	**14**
AC-FT	---	---	---	---	---	---	---	---	---	---	**2,970**	**5,660**

Table 14. Daily mean streamflow at Delaware River near Horton, Kansas, for water years 1992–95—Continued

Day	Oct. 1992 to Sept. 1993											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	168	35	24	223	255	712	67	63	1,160	e198	23
2	13	119	38	e24	456	1,560	290	82	87	384	e140	20
3	13	37	37	e24	777	315	617	98	72	125	e110	22
4	12	22	30	e24	625	148	1,540	81	64	64	e94	21
5	12	17	27	24	253	106	1,060	68	61	9,570	e80	19
6	12	14	27	24	194	83	376	131	75	2,350	e73	100
7	13	15	26	23	174	73	417	601	220	3,810	e69	46
8	41	16	27	23	110	65	579	3,820	347	865	e66	28
9	31	16	74	17	60	57	216	3,500	97	3,640	e58	22
10	15	17	96	e20	54	50	145	3,190	62	1,810	e52	18
11	9.2	18	51	e21	189	47	112	6,700	50	2,050	e49	15
12	8.3	30	38	e22	215	41	97	852	46	580	e47	14
13	7.6	18	1,080	e23	72	41	291	547	43	2,490	44	12
14	7.4	15	1,830	e23	50	51	277	315	40	1,060	41	12
15	6.7	15	546	e23	43	39	125	251	37	834	37	12
16	6.8	15	165	e23	e41	40	103	191	34	2,030	34	12
17	7.8	15	90	e23	e39	35	111	159	50	789	35	12
18	7.8	15	68	e23	37	34	194	223	1,010	3,700	33	59
19	8.1	2,420	56	24	e35	39	679	154	1,940	1,050	29	480
20	8.0	1,010	47	28	e33	45	1,710	142	436	609	31	162
21	8.0	183	43	31	e31	45	262	117	128	1,100	32	57
22	8.2	88	40	31	29	43	154	104	77	7,870	32	167
23	8.2	56	35	34	28	39	125	106	58	3,080	28	176
24	9.2	44	33	27	25	37	108	93	53	3,990	27	155
25	9.2	108	e32	29	26	36	92	79	46	1,860	25	255
26	10	84	e31	29	29	34	82	72	39	1,330	23	108
27	11	51	e29	45	30	34	78	68	36	e1,100	21	102
28	12	43	e28	136	58	35	79	62	35	e850	35	50
29	13	39	e27	120	---	41	81	189	31	e550	26	36
30	12	37	e26	80	---	455	71	199	27	e330	26	30
31	14	---	24	70	---	5,520	---	80	---	e240	26	---
TOTAL	**367.5**	**4,745**	**4,736**	**1,092**	**3,936**	**9,443**	**10,783**	**22,341**	**5,364**	**61,270**	**1,621**	**2,245**
MEAN	**11.9**	**158**	**153**	**35.2**	**141**	**305**	**359**	**721**	**179**	**1,976**	**52.3**	**74.8**
MAX	**41**	**2,420**	**1,830**	**136**	**777**	**5,520**	**1,710**	**6,700**	**1,940**	**9,570**	**198**	**480**
MIN	**6.7**	**14**	**24**	**17**	**25**	**34**	**71**	**62**	**27**	**64**	**21**	**12**
AC-FT	**729**	**9,410**	**9,390**	**2,170**	**7,810**	**18,730**	**21,390**	**44,310**	**10,640**	**121,500**	**3,220**	**4,450**

Table 14. Daily mean streamflow at Delaware River near Horton, Kansas, for water years 1992–95—Continued

	Oct. 1993 to Sept. 1994											
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	21	22	19	12	15	13	62	17	87	5.0	3.3
2	24	21	21	19	12	16	14	45	19	1,490	5.1	3.0
3	22	22	20	16	11	58	14	43	21	46	5.1	3.0
4	22	22	19	19	12	274	12	39	21	41	5.2	6.3
5	20	20	18	18	12	133	11	35	22	21	4.9	6.2
6	20	19	17	18	13	71	11	176	22	13	4.8	4.0
7	20	20	17	9.4	11	61	11	79	20	11	4.7	3.5
8	22	20	16	10	8.7	43	11	54	100	13	4.4	3.1
9	25	20	17	14	9.4	32	12	45	58	15	4.3	3.1
10	24	20	16	16	e10	27	25	40	30	11	4.1	3.0
11	25	20	16	17	e11	25	32	35	22	9.2	4.1	2.9
12	24	42	17	17	e12	24	54	32	20	8.2	4.2	2.8
13	22	50	32	18	e13	23	43	30	18	7.8	4.0	2.5
14	22	36	48	15	e14	21	31	935	17	7.6	3.7	2.7
15	24	32	42	13	e15	21	22	165	14	7.3	3.2	2.7
16	26	27	50	11	e18	19	18	63	12	8.3	3.3	2.4
17	37	24	43	10	20	19	16	45	11	8.7	3.1	1.9
18	37	22	43	8.8	27	18	15	38	10	8.4	3.1	1.9
19	43	21	33	8.3	31	17	14	33	9.3	7.6	3.3	2.1
20	39	20	27	8.9	26	16	14	31	8.6	558	4.3	2.0
21	30	19	25	9.2	22	15	849	28	8.1	210	4.4	2.2
22	26	19	20	10	14	15	120	26	7.6	41	3.3	2.1
23	25	19	20	16	16	13	63	25	13	29	3.2	2.6
24	24	18	20	21	13	13	47	24	12	19	2.9	3.3
25	23	15	19	24	13	12	40	22	9.8	10	2.7	3.8
26	22	17	21	22	11	14	36	21	7.8	9.0	18	3.3
27	21	17	18	26	12	15	31	20	7.6	8.2	14	3.2
28	21	19	13	17	13	14	52	19	17	6.5	6.1	3.2
29	21	19	17	21	---	13	52	20	17	5.7	4.6	2.8
30	19	21	15	16	---	13	73	21	17	5.2	4.4	2.8
31	19	---	16	12	---	13	---	19	---	5.2	3.8	---
TOTAL	**774**	**682**	**738**	**479.6**	**412.1**	**1,083**	**1,756**	**2,270**	**588.8**	**2,727.9**	**151.3**	**91.7**
MEAN	**25.0**	**22.7**	**23.8**	**15.5**	**14.7**	**34.9**	**58.5**	**73.2**	**19.6**	**88.0**	**4.88**	**3.06**
MAX	**43**	**50**	**50**	**26**	**31**	**274**	**849**	**935**	**100**	**1,490**	**18**	**6.3**
MIN	**19**	**15**	**13**	**8.3**	**8.7**	**12**	**11**	**19**	**7.6**	**5.2**	**2.7**	**1.9**
AC-FT	**1,540**	**1,350**	**1,460**	**951**	**817**	**2,150**	**3,480**	**4,500**	**1,170**	**5,410**	**300**	**182**

Table 14. Daily mean streamflow at Delaware River near Horton, Kansas, for water years 1992–95—Continued

Day	Oct. 1994 to Sept. 1995											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.4	5.7	5.6	9.8	e14	9.9	24	391	---	---	---	---
2	2.8	5.5	5.6	e8.8	e14	9.6	23	117	---	---	---	---
3	1,800	5.4	5.4	e8.0	13	9.7	21	94	---	---	---	---
4	65	6.4	5.4	e7.2	13	10	20	376	---	---	---	---
5	16	6.4	5.0	e6.6	12	11	19	135	---	---	---	---
6	9.6	6.1	38	e7.5	12	e10	18	83	---	---	---	---
7	29	6.0	89	e8.0	10	e9.0	18	2,800	---	---	---	---
8	20	5.4	24	e8.8	10	e9.0	18	---	---	---	---	---
9	8.7	6.3	16	9.5	12	e10	18	---	---	---	---	---
10	6.3	6.4	e14	9.9	12	e12	468	---	---	---	---	---
11	5.4	6.3	e14	11	9.8	20	456	---	---	---	---	---
12	5.1	6.3	e13	16	e9.0	19	102	---	---	---	---	---
13	4.9	6.7	13	22	e9.0	435	54	---	---	---	---	---
14	4.8	6.9	13	23	e8.8	465	44	---	---	---	---	---
15	5.3	6.5	13	e22	e9.0	73	35	---	---	---	---	---
16	6.2	6.2	15	e19	e9.2	39	32	---	---	---	---	---
17	6.2	6.2	21	e18	e10	28	34	---	---	---	---	---
18	6.5	5.7	17	e17	e11	23	453	---	---	---	---	---
19	7.6	5.7	e14	e16	12	20	88	---	---	---	---	---
20	5.8	40	e12	e15	12	20	273	---	---	---	---	---
21	5.2	24	e12	e14	12	18	103	---	---	---	---	---
22	4.8	11	e12	e14	11	17	61	---	---	---	---	---
23	4.7	7.5	e11	e13	11	15	54	---	---	---	---	---
24	4.6	6.5	e11	e13	11	15	45	---	---	---	---	---
25	4.5	6.2	11	e14	11	77	39	---	---	---	---	---
26	4.8	5.9	11	e15	11	558	40	---	---	---	---	---
27	5.0	6.0	11	e15	11	75	72	---	---	---	---	---
28	5.2	5.7	11	e16	11	41	52	---	---	---	---	---
29	4.9	5.3	11	e15	---	30	39	---	---	---	---	---
30	5.2	5.4	11	e14	---	28	39	---	---	---	---	---
31	5.3	---	11	e13	---	26	---	---	---	---	---	---
TOTAL	**2,071.8**	**239.6**	**476.0**	**419.1**	**310.8**	**2,142.2**	**2,762**	---	---	---	---	---
MEAN	**66.8**	**7.99**	**15.4**	**13.5**	**11.1**	**69.1**	**92.1**	---	---	---	---	---
MAX	**1,800**	**40**	**89**	**23**	**14**	**558**	**468**	---	---	---	---	---
MIN	**2.4**	**5.3**	**5.0**	**6.6**	**8.8**	**9.0**	**18**	---	---	---	---	---
AC-FT	**4,110**	**475**	**944**	**831**	**616**	**4,250**	**5,480**	---	---	---	---	---

Table 15. Daily mean streamflow at Mud Creek near Horton, Kansas, for water years 1992–95

[All values in cubic feet per second, except as noted. Max, maximum; min, minimum; ac-ft, acre-feet; e, estimated; ---, no data]

	Oct. 1991 to Sept. 1992											
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	---	---	---	---	---	---	---	---	---	---	63	e200
2	---	---	---	---	---	---	---	---	---	---	129	255
3	---	---	---	---	---	---	---	---	---	---	61	52
4	---	---	---	---	---	---	---	---	---	---	42	33
5	---	---	---	---	---	---	---	---	---	---	38	286
6	---	---	---	---	---	---	---	---	---	---	37	1,360
7	---	---	---	---	---	---	---	---	---	---	52	109
8	---	---	---	---	---	---	---	---	---	---	53	55
9	---	---	---	---	---	---	---	---	---	---	37	39
10	---	---	---	---	---	---	---	---	---	---	e30	e28
11	---	---	---	---	---	---	---	---	---	---	e24	e21
12	---	---	---	---	---	---	---	---	---	---	e21	e22
13	---	---	---	---	---	---	---	---	---	---	e19	e21
14	---	---	---	---	---	---	---	---	---	---	e18	e20
15	---	---	---	---	---	---	---	---	---	---	e18	e16
16	---	---	---	---	---	---	---	---	---	---	e17	e13
17	---	---	---	---	---	---	---	---	---	---	e17	e12
18	---	---	---	---	---	---	---	---	---	---	e17	e20
19	---	---	---	---	---	---	---	---	---	---	e17	e13
20	---	---	---	---	---	---	---	---	---	---	e17	174
21	---	---	---	---	---	---	---	---	---	---	e11	194
22	---	---	---	---	---	---	---	---	---	---	e10	39
23	---	---	---	---	---	---	---	---	---	158	e9.0	31
24	---	---	---	---	---	---	---	---	---	70	e8.4	e23
25	---	---	---	---	---	---	---	---	---	91	e11	e22
26	---	---	---	---	---	---	---	---	---	1,370	e9.0	e23
27	---	---	---	---	---	---	---	---	---	179	e8.1	e20
28	---	---	---	---	---	---	---	---	---	78	e8.3	e18
29	---	---	---	---	---	---	---	---	---	54	e8.4	e14
30	---	---	---	---	---	---	---	---	---	858	e8.5	e13
31	---	---	---	---	---	---	---	---	---	135	e8.6	---
TOTAL	---	---	---	---	---	---	---	---	---	---	**827.3**	**3,146**
MEAN	---	---	---	---	---	---	---	---	---	---	**26.7**	**105**
MAX	---	---	---	---	---	---	---	---	---	---	**129**	**1,360**
MIN	---	---	---	---	---	---	---	---	---	---	**8.1**	**12**
AC-FT	---	---	---	---	---	---	---	---	---	---	**1,640**	**6,240**

Table 15. Daily mean streamflow at Mud Creek near Horton, Kansas, for water years 1992–95—Continued

Day	Oct. 1992 to Sept. 1993											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	e14	57	28	e21	179	e90	514	58	47	502	41	14
2	e13	87	27	e20	291	e250	241	83	60	90	32	14
3	e13	23	25	e20	400	e310	387	96	54	46	29	14
4	e13	20	23	e20	e300	e150	685	77	50	33	29	14
5	e12	20	23	e20	e240	e80	500	61	47	5,140	26	14
6	e12	20	24	e20	e190	e60	e330	90	48	1,210	27	71
7	15	20	23	e20	e140	e50	e300	579	108	1,590	22	20
8	44	19	25	e19	e90	e40	e360	2,070	139	338	20	14
9	37	19	44	e17	e60	e37	e170	2,450	56	1,360	18	14
10	28	19	56	e18	e43	e34	e130	1,990	42	515	17	14
11	20	20	31	e20	e130	e31	e100	2,700	37	418	18	14
12	e13	21	26	e21	e140	e30	e84	e500	35	118	23	13
13	e10	20	518	e22	e75	e30	e180	e350	33	608	18	14
14	e8.0	20	1,010	e22	e44	38	e160	e250	31	e300	16	14
15	e7.0	19	360	e22	e37	38	e140	e200	27	e225	14	14
16	e6.0	19	132	e22	e34	36	e92	e150	26	e500	14	14
17	e7.0	20	76	e22	e32	32	e80	e130	33	265	14	14
18	e7.2	20	59	e22	e30	32	e100	e115	384	2,070	13	22
19	e7.2	1,600	50	e23	e28	34	e440	e150	1,210	358	14	244
20	e7.2	699	40	e26	e27	42	e380	e110	204	149	14	79
21	e7.4	152	39	e30	e25	38	e170	e93	76	263	14	22
22	e7.8	73	35	e34	e24	36	e140	80	50	6,590	13	15
23	e8.2	49	33	e34	e23	33	e110	87	39	950	14	29
24	e8.8	39	30	e31	e21	31	e90	76	37	690	13	e60
25	e8.8	94	e28	e28	e21	30	e80	66	32	301	13	e30
26	e10	69	e27	e28	e23	29	e70	61	26	150	13	e20
27	e11	40	e25	e33	e24	29	65	58	25	91	13	e17
28	e12	34	23	e127	e26	30	65	54	24	67	18	15
29	e11	32	e22	e110	---	36	67	72	23	53	13	15
30	e12	31	e22	e84	---	202	60	76	24	47	14	14
31	16	---	e21	e70	---	3,340	---	53	---	42	14	---
TOTAL	**406.6**	**3,375**	**2,905**	**1,026**	**2,697**	**5,278**	**6,290**	**12,985**	**3,027**	**25,079**	**571**	**882**
MEAN	**13.1**	**112**	**93.7**	**33.1**	**96.3**	**170**	**210**	**419**	**101**	**809**	**18.4**	**29.4**
MAX	**44**	**1,600**	**1,010**	**127**	**400**	**3,340**	**685**	**2,700**	**1,210**	**6,590**	**41**	**244**
MIN	**6.0**	**19**	**21**	**17**	**21**	**29**	**60**	**53**	**23**	**33**	**13**	**13**
AC-FT	**806**	**6,690**	**5,760**	**2,040**	**5,350**	**10,470**	**12,480**	**25,760**	**6,000**	**49,740**	**1,130**	**1,750**

Table 15. Daily mean streamflow at Mud Creek near Horton, Kansas, for water years 1992–95—Continued

Day	Oct. 1993 to Sept. 1994											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	e15	e16	e17	e14	e10	e12	e10	e45	e15	31	2.0	1.2
2	e15	e17	e17	e15	e10	e15	e10	e37	e16	247	2.6	.80
3	e16	e17	e15	e13	e10	e43	e10	e35	e18	33	2.5	.71
4	e17	e17	e14	e15	e10	e136	e10	e30	e18	70	3.6	3.4
5	e17	e17	e13	e15	e10	e58	e9.0	e45	e18	27	2.1	7.8
6	e18	e16	e12	e13	e11	e45	e9.0	e83	e18	26	1.7	1.9
7	e18	e16	e11	e10	e9.0	e35	e9.0	e50	e17	25	2.0	.95
8	e18	e16	e10	e9.5	e7.5	e30	e9.2	e35	e50	19	1.8	.71
9	e19	e16	e10	e11	e7.6	e25	e11	e30	e20	8.0	1.5	.62
10	e20	e16	e10	e19	e8.0	e23	e15	e25	e11	6.1	1.3	.55
11	e20	e16	e10	e23	e9.0	e21	e30	e24	9.3	6.0	1.2	.44
12	e20	e30	e10	e24	e9.5	e21	e45	e22	8.2	6.0	1.1	.29
13	e18	e40	e11	e24	e10	e20	e30	e21	7.4	7.2	1.0	.24
14	e18	e30	e35	e22	e11	e20	e23	e600	6.7	6.5	.82	.21
15	e19	e26	e30	e20	e12	e18	e18	e285	6.6	3.8	.61	.12
16	e22	e22	e35	e18	e14	e17	e14	e100	6.6	4.5	.40	.09
17	e29	e19	e30	e15	e16	e16	e13	e70	6.5	4.4	.36	.03
18	e30	e18	e30	e11	e22	e15	e12	e45	6.5	6.2	.21	.01
19	e35	e17	e27	e10	e25	e14	e11	e35	6.3	4.2	.61	.01
20	e30	e16	e23	e10	e20	e13	e60	e30	6.2	8.0	.74	0
21	e25	e16	e20	e11	e15	e12	e200	e25	6.2	59	.33	0
22	e21	e15	e17	e13	e12	e12	e100	e22	6.2	8.5	.16	0
23	e20	e14	e16	e15	e13	e11	e50	e22	6.9	4.9	.09	.33
24	e20	e13	e16	e18	e11	e11	e37	e21	6.7	3.9	.06	.50
25	e19	e13	e15	e20	e10	e10	e32	e19	6.3	4.3	.05	1.4
26	e18	e13	e17	e18	e9.0	e11	e26	e19	6.3	5.0	22	1.2
27	e17	e13	e15	e20	e9.5	e12	e30	e18	6.4	4.6	8.6	.78
28	e17	e14	e11	e15	e10	e11	e40	e17	6.4	2.8	1.9	.64
29	e16	e15	e13	e17	---	e11	e45	e17	6.2	2.4	1.3	.48
30	e16	e16	e12	e11	---	e10	e60	e18	6.0	2.3	1.7	.38
31	e15	---	e13	e10	---	e10	---	e16	---	2.2	1.9	---
TOTAL	**618**	**540**	**535**	**479.5**	**331.1**	**718**	**978.2**	**1,861**	**334.9**	**648.8**	**66.24**	**25.79**
MEAN	**19.9**	**18.0**	**17.3**	**15.5**	**11.8**	**23.2**	**32.6**	**60.0**	**11.2**	**20.9**	**2.14**	**.86**
MAX	**35**	**40**	**35**	**24**	**25**	**136**	**200**	**600**	**50**	**247**	**22**	**7.8**
MIN	**15**	**13**	**10**	**9.5**	**7.5**	**10**	**9.0**	**16**	**6.0**	**2.2**	**.05**	**0**
AC-FT	**1,230**	**1,070**	**1,060**	**951**	**657**	**1,420**	**1,940**	**3,690**	**664**	**1,290**	**131**	**51**

Table 15. Daily mean streamflow at Mud Creek near Horton, Kansas, for water years 1992–95—Continued

Day	Oct. 1994 to Sept. 1995											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.24	2.9	4.9	e6.5	10	e5.5	---	---	---	---	---	---
2	.32	3.5	5.0	e6.0	9.0	e5.0	---	---	---	---	---	---
3	300	3.2	4.9	e5.5	e9.5	e4.5	---	---	---	---	---	---
4	44	5.4	4.8	e5.0	e8.0	e4.5	---	---	---	---	---	---
5	8.6	5.4	4.5	e6.0	e7.5	e5.0	---	---	---	---	---	---
6	5.3	4.8	26	e7.0	e8.0	e5.0	---	---	---	---	---	---
7	19	3.9	59	e5.5	e6.5	e4.5	---	---	---	---	---	---
8	13	4.3	28	e6.5	e6.0	e4.5	---	---	---	---	---	---
9	4.1	4.8	e15	e7.5	e6.0	e5.0	---	---	---	---	---	---
10	2.6	5.4	e12	e9.0	e6.5	e6.0	---	---	---	---	---	---
11	2.1	5.0	e11	e12	e6.0	e10	---	---	---	---	---	---
12	1.7	5.0	e10	e15	e5.5	e20	---	---	---	---	---	---
13	1.6	5.2	e10	e20	e5.0	e40	---	---	---	---	---	---
14	1.5	4.9	e9.5	e23	e5.0	e200	---	---	---	---	---	---
15	1.8	5.0	e9.5	e18	e6.0	e60	---	---	---	---	---	---
16	3.3	5.0	e11	e13	e6.0	e40	---	---	---	---	---	---
17	3.7	5.1	e12	e11	e5.5	e30	---	---	---	---	---	---
18	3.0	5.4	e14	e10	e5.5	e25	---	---	---	---	---	---
19	3.2	5.3	e12	e9.0	e5.8	e20	---	---	---	---	---	---
20	2.4	18	e11	8.2	e6.2	e16	---	---	---	---	---	---
21	2.0	18	e10	8.5	e6.2	e14	---	---	---	---	---	---
22	2.0	8.7	e9.5	8.3	e6.0	e13	---	---	---	---	---	---
23	1.7	5.7	e9.0	8.2	e5.8	e11	---	---	---	---	---	---
24	1.8	5.3	e8.0	8.1	e5.4	e10	---	---	---	---	---	---
25	1.6	5.2	e7.5	8.0	e5.0	e50	---	---	---	---	---	---
26	1.9	5.1	e7.5	8.2	e7.0	e200	---	---	---	---	---	---
27	2.2	5.7	e7.5	8.6	e8.0	e80	---	---	---	---	---	---
28	2.3	5.4	e7.5	9.4	e6.0	e40	---	---	---	---	---	---
29	2.5	4.7	e7.5	10	---	e29	---	---	---	---	---	---
30	3.2	4.3	e7.5	9.9	---	e23	---	---	---	---	---	---
31	3.6	---	e7.5	9.5	---	e21	---	---	---	---	---	---
TOTAL	**446.26**	**175.6**	**363.1**	**300.4**	**182.9**	**1,001.5**	---	---	---	---	---	---
MEAN	**14.4**	**5.85**	**11.7**	**9.69**	**6.53**	**32.3**	---	---	---	---	---	---
MAX	**300**	**18**	**59**	**23**	**10**	**200**	---	---	---	---	---	---
MIN	**.24**	**2.9**	**4.5**	**5.0**	**5.0**	**4.5**	---	---	---	---	---	---
AC-FT	**885**	**348**	**720**	**596**	**363**	**1,990**	---	---	---	---	---	---

Table 16. Daily mean streamflow at Grasshopper Creek near Muscotah, Kansas, for water years 1992–95

[All values in cubic feet per second, except as noted. Max, maximum; min, minimum; ac-ft, acre-feet; e, estimated; ---, no data]

Day	Oct. 1991 to Sept. 1992											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	---	---	---	---	---	---	---	---	---	---	246	203
2	---	---	---	---	---	---	---	---	---	---	373	892
3	---	---	---	---	---	---	---	---	---	---	134	231
4	---	---	---	---	---	---	---	---	---	---	50	131
5	---	---	---	---	---	---	---	---	---	---	32	129
6	---	---	---	---	---	---	---	---	---	---	26	375
7	---	---	---	---	---	---	---	---	---	---	e30	70
8	---	---	---	---	---	---	---	---	---	---	e29	41
9	---	---	---	---	---	---	---	---	---	---	e25	19
10	---	---	---	---	---	---	---	---	---	---	e16	12
11	---	---	---	---	---	---	---	---	---	---	e13	8.5
12	---	---	---	---	---	---	---	---	---	---	e12	9.0
13	---	---	---	---	---	---	---	---	---	---	e12	9.0
14	---	---	---	---	---	---	---	---	---	---	13	8.4
15	---	---	---	---	---	---	---	---	---	---	12	6.6
16	---	---	---	---	---	---	---	---	---	---	9.8	5.7
17	---	---	---	---	---	---	---	---	---	---	8.9	5.2
18	---	---	---	---	---	---	---	---	---	---	7.7	8.3
19	---	---	---	---	---	---	---	---	---	---	7.4	5.6
20	---	---	---	---	---	---	---	---	---	---	6.6	293
21	---	---	---	---	---	---	---	---	---	---	6.2	453
22	---	---	---	---	---	---	---	---	---	---	5.5	141
23	---	---	---	---	---	---	---	---	---	---	5.0	36
24	---	---	---	---	---	---	---	---	---	45	4.6	18
25	---	---	---	---	---	---	---	---	---	42	4.4	12
26	---	---	---	---	---	---	---	---	---	813	4.6	14
27	---	---	---	---	---	---	---	---	---	175	4.4	12
28	---	---	---	---	---	---	---	---	---	64	4.5	11
29	---	---	---	---	---	---	---	---	---	198	3.8	8.5
30	---	---	---	---	---	---	---	---	---	3,210	3.1	7.7
31	---	---	---	---	---	---	---	---	---	586	3.0	---
TOTAL	---	---	---	---	---	---	---	---	---	---	**1,112.5**	**3,175.5**
MEAN	---	---	---	---	---	---	---	---	---	---	**35.9**	**106**
MAX	---	---	---	---	---	---	---	---	---	---	**373**	**892**
MIN	---	---	---	---	---	---	---	---	---	---	**3.0**	**5.2**
AC-FT	---	---	---	---	---	---	---	---	---	---	**2,210**	**6,300**

Table 16. Daily mean streamflow at Grasshopper Creek near Muscotah, Kansas, for water years 1992–95—Continued

Day	Oct. 1992 to Sept. 1993											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.3	88	34	e18	163	131	673	16	11	e2,700	24	5.9
2	6.4	172	38	e18	412	752	358	34	13	518	20	5.1
3	5.4	44	33	e18	455	240	663	28	12	159	17	5.5
4	5.1	27	33	e18	375	87	778	20	12	51	16	5.1
5	4.5	16	24	e18	201	53	355	17	10	6,910	15	4.9
6	3.8	13	23	e18	122	38	141	362	10	2,660	14	24
7	5.1	11	27	e18	89	31	351	778	13	1,840	13	14
8	23	10	30	e18	57	25	997	1,840	55	624	12	8.0
9	20	9.4	48	e18	37	20	205	2,030	23	2,560	12	6.3
10	12	15	62	e18	34	26	80	1,380	12	613	11	5.4
11	8.3	18	42	e18	e31	14	53	3,350	7.1	697	10	4.6
12	6.1	39	32	e18	e29	14	43	564	5.6	360	11	4.3
13	5.4	27	942	e18	e27	16	173	333	4.3	4,640	11	3.9
14	4.4	18	1,230	e18	25	16	125	163	3.9	1,090	10	4.6
15	5.9	12	481	e18	e24	12	64	102	159	655	9.4	4.5
16	9.1	10	130	e18	e24	15	39	59	461	457	8.8	4.0
17	5.6	9.8	55	e18	e23	11	37	41	276	298	8.0	3.9
18	e5.1	10	41	e18	e23	9.5	47	51	83	1,420	7.4	8.5
19	e4.8	1,630	37	e18	e22	15	135	33	23	316	7.1	143
20	e4.7	979	25	e19	e22	15	355	28	11	326	9.0	99
21	e4.6	334	24	e19	e22	14	86	23	8.5	636	7.9	26
22	e4.5	108	23	e20	e22	16	39	20	8.9	6,560	7.5	15
23	e4.3	46	19	e22	e22	14	32	21	5.9	4,200	7.1	28
24	e4.3	37	e18	e24	22	12	27	20	5.4	1,690	6.2	41
25	e4.4	131	e18	e30	26	11	23	14	5.2	696	5.8	151
26	e4.5	119	e18	43	29	10	19	13	4.6	363	5.4	58
27	e4.7	61	e18	53	30	10	17	11	3.7	118	5.0	23
28	e4.9	46	e18	91	38	10	18	10	e20	63	9.5	16
29	5.1	39	e18	93	---	11	21	21	e100	38	7.4	13
30	5.6	36	e18	70	---	114	16	39	e500	31	6.3	11
31	11	---	e18	69	---	3,300	---	17	---	26	7.3	---
TOTAL	**209.9**	**4,115.2**	**3,577**	**895**	**2,406**	**5,062.5**	**5,970**	**11,438**	**1,867.1**	**43,315**	**321.1**	**746.5**
MEAN	**6.77**	**137**	**115**	**28.9**	**85.9**	**163**	**199**	**369**	**62.2**	**1,397**	**10.4**	**24.9**
MAX	**23**	**1,630**	**1,230**	**93**	**455**	**3,300**	**997**	**3,350**	**500**	**6,910**	**24**	**151**
MIN	**3.8**	**9.4**	**18**	**18**	**22**	**9.5**	**16**	**10**	**3.7**	**26**	**5.0**	**3.9**
AC-FT	**416**	**8,160**	**7,090**	**1,780**	**4,770**	**10,040**	**11,840**	**22,690**	**3,700**	**85,920**	**637**	**1,480**

Table 16. Daily mean streamflow at Grasshopper Creek near Muscotah, Kansas, for water years 1992–95—Continued

Day	Oct. 1993 to Sept. 1994											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.9	7.4	7.9	e11	e8.2	e8.0	7.1	84	14	38	2.0	2.0
2	8.9	7.4	6.3	e11	e8.5	e9.0	7.2	42	14	307	2.1	1.2
3	7.6	7.5	9.3	e11	e9.0	39	8.3	33	14	43	2.2	1.6
4	6.7	7.7	9.1	e11	e9.5	101	7.9	27	13	640	2.8	7.4
5	6.5	13	9.2	e11	e11	71	11	22	13	83	2.3	4.2
6	6.5	9.3	13	e10	e10	46	7.8	386	14	25	2.0	1.8
7	6.2	7.4	8.1	e9.0	e9.0	44	6.8	130	11	18	2.0	1.7
8	6.6	7.4	9.2	e10	e8.0	32	6.6	53	444	17	2.1	1.3
9	11	7.3	8.8	e10	e7.0	22	7.2	37	122	13	2.0	1.4
10	7.7	7.3	9.2	e10	e7.0	21	20	28	39	10	1.8	1.4
11	7.1	7.2	8.5	e10	e7.5	17	20	23	21	8.3	1.8	1.2
12	6.8	39	7.6	e10	e8.0	16	29	25	18	6.5	1.9	.86
13	6.8	46	23	e10	e8.4	16	28	28	16	5.8	1.8	1.0
14	6.9	23	47	e10	e8.8	14	18	1,080	13	5.0	1.5	.89
15	9.5	20	36	e10	e9.0	16	18	448	11	4.6	1.3	1.0
16	10	15	61	e10	e9.2	12	11	91	9.7	6.1	1.2	.75
17	14	13	47	e9.0	e9.5	11	9.2	45	8.3	5.4	1.1	.97
18	17	12	37	e8.0	e10	12	8.3	31	7.1	4.3	1.1	.83
19	19	17	25	e8.8	e12	9.6	7.6	26	7.1	3.7	1.8	.66
20	18	10	25	e9.2	e13	10	7.4	22	7.0	5.0	2.3	.50
21	13	8.5	18	e10	e7.0	13	114	20	6.8	5.1	1.5	.57
22	9.7	8.5	e16	e11	e5.0	7.9	91	17	10	3.7	1.1	.77
23	9.0	7.9	e14	e12	e5.2	7.6	28	15	31	3.2	1.2	.89
24	7.9	13	e13	e13	e5.6	8.9	17	13	16	2.8	1.1	.96
25	7.8	24	e12	e13	e6.0	7.2	14	12	8.2	2.8	1.0	1.1
26	9.1	14	e12	e12	e6.2	7.3	13	13	6.4	5.1	1.4	1.2
27	9.4	13	e12	e11	e6.5	7.8	15	11	6.2	3.9	1.7	.95
28	7.8	12	e13	e10	e7.0	8.5	40	10	8.5	2.6	1.4	.94
29	12	9.0	e13	e9.0	---	7.4	36	53	7.0	2.4	1.8	.85
30	9.0	5.9	e10	e8.5	---	7.4	95	30	5.0	2.3	3.0	.75
31	8.5	---	e11	e8.0	---	7.1	---	16	---	2.1	2.4	---
TOTAL	**295.9**	**399.7**	**551.2**	**316.5**	**231.1**	**616.7**	**709.4**	**2,871**	**921.3**	**1,284.7**	**54.7**	**41.64**
MEAN	**9.55**	**13.3**	**17.8**	**10.2**	**8.25**	**19.9**	**23.6**	**92.6**	**30.7**	**41.4**	**1.76**	**1.39**
MAX	**19**	**46**	**61**	**13**	**13**	**101**	**114**	**1,080**	**444**	**640**	**3.0**	**7.4**
MIN	**6.2**	**5.9**	**6.3**	**8.0**	**5.0**	**7.1**	**6.6**	**10**	**5.0**	**2.1**	**1.0**	**.50**
AC-FT	**587**	**793**	**1,090**	**628**	**458**	**1,220**	**1,410**	**5,690**	**1,830**	**2,550**	**108**	**83**

Table 16. Daily mean streamflow at Grasshopper Creek near Muscotah, Kansas, for water years 1992–95—Continued

Day	Oct. 1994 to Sept. 1995											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.62	e2.9	e4.0	e6.4	5.4	5.0	10	60	---	---	---	---
2	.35	e2.4	5.4	e6.0	6.1	4.9	9.1	39	---	---	---	---
3	22	e2.4	5.4	e5.6	5.8	4.5	7.6	22	---	---	---	---
4	30	e2.6	5.7	e5.2	e5.5	3.6	6.8	177	---	---	---	---
5	6.4	e3.0	5.8	e6.0	e5.0	4.4	6.3	57	---	---	---	---
6	.68	e2.8	13	e8.0	e5.2	e4.0	5.6	22	---	---	---	---
7	.64	e2.6	77	e7.0	e5.0	e4.0	5.8	627	---	---	---	---
8	2.3	e2.4	33	e8.0	e4.0	e4.0	5.4	---	---	---	---	---
9	2.3	e2.3	e14	e10	e3.6	e4.0	5.1	---	---	---	---	---
10	1.4	e2.3	e11	20	e4.0	e5.0	8.1	---	---	---	---	---
11	.90	e2.4	e10	29	e4.5	e7.0	46	---	---	---	---	---
12	.67	e2.5	e9.0	17	e4.2	13	23	---	---	---	---	---
13	.39	e3.0	e8.0	17	e4.0	47	9.3	---	---	---	---	---
14	.31	e4.0	e8.0	18	e4.4	177	6.3	---	---	---	---	---
15	.35	e3.0	e8.0	11	e5.0	44	5.1	---	---	---	---	---
16	.65	e3.2	e8.2	9.0	e4.9	22	4.9	---	---	---	---	---
17	.96	e4.0	11	e8.0	e4.8	16	6.1	---	---	---	---	---
18	1.1	e5.0	14	e7.5	e4.8	15	132	---	---	---	---	---
19	1.1	9.5	10	e7.0	e4.8	11	42	---	---	---	---	---
20	.88	19	8.7	e6.5	e5.0	9.2	29	---	---	---	---	---
21	.78	59	8.0	e6.0	5.8	7.8	35	---	---	---	---	---
22	.75	18	7.5	e5.5	4.9	7.0	12	---	---	---	---	---
23	.62	8.8	7.1	e5.2	4.3	6.4	7.9	---	---	---	---	---
24	.59	6.2	6.8	e5.0	4.7	5.3	6.2	---	---	---	---	---
25	.47	3.8	6.4	e5.0	4.8	13	5.0	---	---	---	---	---
26	.53	5.3	6.7	e5.2	8.1	211	4.6	---	---	---	---	---
27	.64	e5.0	6.8	5.8	10	47	6.8	---	---	---	---	---
28	.79	e4.7	6.7	7.1	5.7	21	5.2	---	---	---	---	---
29	1.3	e4.3	6.8	11	---	16	3.6	---	---	---	---	---
30	2.2	e4.0	6.8	12	---	13	3.2	---	---	---	---	---
31	3.0	---	e6.6	7.6	---	11	---	---	---	---	---	---
TOTAL	**85.67**	**200.4**	**345.4**	**287.6**	**144.3**	**763.1**	**463.0**	---	---	---	---	---
MEAN	**2.76**	**6.68**	**11.1**	**9.28**	**5.15**	**24.6**	**15.4**	---	---	---	---	---
MAX	**30**	**59**	**77**	**29**	**10**	**211**	**132**	---	---	---	---	---
MIN	**.31**	**2.3**	**4.0**	**5.0**	**3.6**	**3.6**	**3.2**	---	---	---	---	---
AC-FT	**170**	**397**	**685**	**570**	**286**	**1,510**	**918**	---	---	---	---	---

Table 17. Daily mean streamflow at Delaware River near Muscotah, Kansas, for water years 1992–95

[All values in cubic feet per second, except as noted. Max, maximum; min, minimum; ac-ft, acre-feet; e, estimated; ---, no data]

	Oct. 1991 to Sept. 1992											
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.16	93	5.9	14	11	11	179	112	26	9.6	587	365
2	.21	24	7.8	27	10	9.6	138	102	31	8.8	830	2,370
3	.63	18	e12	33	9.7	9.2	123	87	32	8.3	419	414
4	.84	16	e8.0	28	9.1	12	117	80	31	7.9	211	214
5	4.0	4.5	e6.0	42	8.5	385	103	74	23	13	170	420
6	1.8	3.7	e5.0	81	7.9	2,290	95	68	36	91	148	3,520
7	1.2	5.7	4.0	70	e7.0	586	88	62	62	69	187	392
8	.92	17	4.0	54	e6.5	245	85	60	50	62	272	224
9	.73	7.1	3.7	35	6.8	199	82	58	90	70	203	164
10	.50	3.0	3.1	20	7.4	165	77	55	250	201	135	118
11	.44	3.0	2.7	15	7.6	117	208	55	465	145	102	90
12	.40	3.4	5.7	19	7.9	107	125	58	165	652	87	76
13	.37	3.6	8.2	23	10	96	87	57	94	5,850	80	69
14	.16	3.3	5.5	23	30	87	84	48	68	9,030	76	64
15	.08	3.0	e4.5	e18	125	76	88	44	58	1,350	73	56
16	.08	3.0	e4.0	e15	82	70	89	44	53	646	66	48
17	.08	28	e3.5	e13	400	68	87	40	58	330	60	45
18	.08	30	e3.5	e12	914	2,760	79	32	51	233	56	47
19	.03	10	e4.5	e11	350	2,920	357	30	40	182	53	41
20	.07	7.6	20	e10	138	1,130	812	33	27	776	49	725
21	.17	5.3	61	e10	79	483	1,420	42	24	257	46	1,600
22	.24	4.1	48	e15	62	307	920	44	21	1,630	41	330
23	.24	e3.7	162	45	52	200	1,830	31	24	813	34	152
24	.63	e3.5	188	53	47	173	774	25	29	306	29	101
25	.48	e3.3	93	56	35	153	357	23	33	243	24	81
26	1.2	e3.2	55	30	23	137	234	29	26	5,980	22	80
27	1.3	e3.2	37	24	24	114	184	31	16	1,100	26	83
28	31	e3.5	21	21	19	114	156	28	13	382	26	71
29	46	4.6	14	14	14	943	141	23	12	221	21	57
30	3.9	5.5	10	15	---	617	126	18	11	7,580	16	50
31	3.4	--	9.4	13	---	253	---	16	---	1,690	12	---
TOTAL	**101.34**	**326.8**	**820**	**859**	**2,503.4**	**14,836.8**	**9,245**	**1,509**	**1,919**	**39,936.6**	**4,161**	**12,067**
MEAN	**3.27**	**10.9**	**26.5**	**27.7**	**86.3**	**479**	**308**	**48.7**	**64.0**	**1,288**	**134**	**402**
MAX	**46**	**93**	**188**	**81**	**914**	**2,920**	**1,830**	**112**	**465**	**9,030**	**830**	**3,520**
MIN	**.03**	**3.0**	**2.7**	**10**	**6.5**	**9.2**	**77**	**16**	**11**	**7.9**	**12**	**41**
AC-FT	**201**	**648**	**1,630**	**1,700**	**4,970**	**29,430**	**18,340**	**2,990**	**3,810**	**79,210**	**8,250**	**23,930**

Table 17. Daily mean streamflow at Delaware River near Muscotah, Kansas, for water years 1992–95—Continued

Day	Oct. 1992 to Sept. 1993											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	45	304	142	106	499	441	2,700	185	144	3,940	246	63
2	38	670	149	103	1,040	2,940	1,160	274	165	1,380	219	55
3	30	198	138	142	1,740	1,120	2,130	341	167	491	194	56
4	26	110	126	149	1,410	516	3,320	259	144	259	188	55
5	21	79	91	105	808	356	2,610	207	132	14,900	173	49
6	16	66	104	103	611	272	1,300	668	128	10,400	171	215
7	16	59	98	91	516	235	1,380	2,840	168	5,780	159	151
8	112	58	96	90	370	204	3,020	5,210	717	3,280	145	82
9	180	55	204	72	253	174	962	7,960	228	7,690	136	64
10	83	73	315	85	227	166	574	5,890	127	3,960	127	52
11	53	84	196	e90	362	134	440	12,400	96	7,050	123	44
12	38	193	145	e76	642	118	379	2,760	83	1,560	139	38
13	30	123	2,750	e66	286	102	929	1,690	76	6,980	125	31
14	25	79	4,570	e70	202	103	1,080	889	69	3,600	114	30
15	22	66	2,250	e86	164	118	494	649	59	1,540	103	31
16	21	62	735	e100	100	119	374	484	51	2,290	92	32
17	20	59	401	e92	153	103	337	390	53	1,170	89	28
18	17	57	297	e84	135	95	529	557	1,580	7,480	86	60
19	17	4,480	255	e78	152	108	694	401	2,980	2,730	77	981
20	18	4,040	192	e78	132	141	3,040	413	1,340	1,170	89	662
21	18	1,010	176	e85	143	137	772	317	318	2,020	87	190
22	17	456	163	e94	128	135	454	276	161	16,400	84	130
23	14	260	147	e88	115	124	366	269	111	9,440	75	367
24	13	193	86	e86	118	111	321	248	97	5,310	67	330
25	15	536	146	e92	116	106	274	204	87	2,750	62	836
26	16	505	121	94	117	104	240	181	67	1,270	57	325
27	19	251	129	116	122	102	219	166	57	755	52	202
28	21	189	121	275	143	103	217	152	54	644	99	128
29	20	164	130	334	---	120	233	165	47	387	85	97
30	24	153	117	231	---	365	201	481	35	312	66	83
31	27	---	57	186	---	10,700	---	201	---	270	77	---
TOTAL	**1,032**	**14,632**	**14,647**	**3,547**	**10,804**	**19,672**	**30,749**	**47,127**	**9,541**	**127,208**	**3,606**	**5,467**
MEAN	**33.3**	**488**	**472**	**114**	**386**	**635**	**1,025**	**1,520**	**318**	**4,103**	**116**	**182**
MAX	**180**	**4,480**	**4,570**	**334**	**1,740**	**10,700**	**3,320**	**12,400**	**2,980**	**16,400**	**246**	**981**
MIN	**13**	**55**	**57**	**66**	**100**	**95**	**201**	**152**	**35**	**259**	**52**	**28**
AC-FT	**2,050**	**29,020**	**29,050**	**7,040**	**21,430**	**39,020**	**60,990**	**93,480**	**18,920**	**252,300**	**7,150**	**10,840**

Table 17. Daily mean streamflow at Delaware River near Muscotah, Kansas, for water years 1992–95—Continued

	Oct. 1993 to Sept. 1994											
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72	48	59	62	e47	e43	43	278	59	106	19	9.3
2	64	48	60	66	e47	56	42	163	60	3,910	19	7.3
3	59	49	59	65	e47	136	46	140	73	329	21	6.1
4	56	49	56	60	e47	558	45	125	66	3,270	21	15
5	53	50	53	62	e47	328	44	112	63	368	19	28
6	50	46	54	58	e47	202	42	851	125	125	16	15
7	49	42	47	55	e45	184	40	390	65	83	16	8.7
8	50	46	45	48	e42	147	40	202	764	90	15	6.8
9	64	46	48	45	e36	112	39	154	304	69	14	5.7
10	60	52	48	e41	e33	99	83	126	127	59	13	5.0
11	57	46	45	e38	e32	92	98	106	82	49	12	4.6
12	60	139	44	e35	e33	87	140	96	70	41	11	4.1
13	55	199	86	e37	e35	83	144	86	62	36	11	3.5
14	52	114	171	e44	e40	78	106	3,200	54	32	10	3.3
15	62	97	149	e47	e47	74	86	1,910	44	30	9.2	3.1
16	69	82	241	e44	e55	69	70	386	38	31	7.8	3.2
17	83	72	173	e41	63	63	59	229	33	32	7.3	3.0
18	97	66	139	e38	82	62	54	167	35	29	6.7	2.8
19	112	66	108	e35	116	58	49	127	34	27	8.3	2.8
20	99	58	95	e37	126	54	45	109	24	56	8.7	2.6
21	78	54	75	e60	67	58	1,050	96	25	604	9.3	2.6
22	64	53	73	e80	65	48	516	85	39	106	8.7	2.6
23	60	52	79	e85	53	45	187	81	117	66	6.6	3.1
24	56	56	96	e90	e48	43	131	73	61	54	5.9	3.5
25	54	62	82	e92	e45	41	109	68	34	39	5.8	4.7
26	53	56	75	e92	e40	42	99	63	26	34	15	6.0
27	51	56	69	e92	e40	48	87	61	22	33	60	5.5
28	48	54	e66	e80	e40	47	182	53	20	27	22	4.5
29	51	54	e64	e66	---	44	195	178	21	23	15	3.7
30	48	55	e60	e60	---	44	325	110	18	20	14	3.2
31	44	---	58	e50	---	43	---	68	---	20	12	---
TOTAL	**1,930**	**1,967**	**2,577**	**1,805**	**1,465**	**3,088**	**4,196**	**9,893**	**2,565**	**9,798**	**439.3**	**179.3**
MEAN	**62.3**	**65.6**	**83.1**	**58.2**	**52.3**	**99.6**	**140**	**319**	**85.5**	**316**	**14.2**	**5.98**
MAX	**112**	**199**	**241**	**92**	**126**	**558**	**1,050**	**3,200**	**764**	**3,910**	**60**	**28**
MIN	**44**	**42**	**44**	**35**	**32**	**41**	**39**	**53**	**18**	**20**	**5.8**	**2.6**
AC-FT	**3,830**	**3,900**	**5,110**	**3,580**	**2,910**	**6,130**	**8,320**	**19,620**	**5,090**	**19,430**	**871**	**356**

Table 17. Daily mean streamflow at Delaware River near Muscotah, Kansas, for water years 1992–95—Continued

Day	Oct. 1994 to Sept. 1995											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.8	9.7	14	e21	e24	17	64	537	5,780	143	---	---
2	3.0	10	14	e19	e25	e16	59	395	1,250	122	---	---
3	1,650	11	15	e18	e22	e15	54	220	648	113	---	---
4	334	12	16	e16	e19	e15	47	962	2,490	10,600	---	---
5	84	15	14	e19	e20	e16	45	1,090	1,040	6,290	---	---
6	40	14	21	e22	e20	e17	46	---	519	1,220	---	---
7	34	13	248	e17	e17	e15	47	1,090	351	621	---	---
8	88	12	99	e20	e17	e14	46	---	2,890	390	---	---
9	35	11	48	e22	e17	e15	43	---	1,530	289	---	---
10	23	11	39	e30	e18	e20	189	---	655	210	---	---
11	18	11	e36	38	e20	e25	914	1,010	394	175	---	---
12	15	11	e33	48	e18	e40	320	1,000	295	---	---	---
13	14	13	e31	66	e16	255	142	11,900	244	135	---	---
14	12	16	e30	75	e15	1,280	105	2,550	213	120	---	---
15	12	15	31	63	e20	303	---	919	187	108	---	---
16	14	14	34	45	e18	145	---	537	169	102	---	---
17	18	13	39	e40	e17	100	74	4,930	148	97	---	---
18	17	13	43	e34	e17	79	861	7,090	134	88	---	---
19	18	13	37	e29	e18	63	353	1,270	124	214	---	---
20	17	35	34	e26	e19	54	358	572	114	---	---	---
21	14	131	31	e24	e20	47	311	386	106	---	---	---
22	12	49	30	e22	20	42	---	307	99	---	---	---
23	11	27	28	e21	19	37	116	1,440	93	---	---	---
24	10	21	26	e20	18	31	103	4,610	351	---	---	---
25	10	18	23	e20	16	71	---	686	368	---	---	---
26	9.1	17	24	e21	21	1,300	85	382	198	---	---	---
27	8.9	16	24	e23	25	296	120	8,000	143	---	---	---
28	10	16	24	e26	22	135	125	3,190	1,430	---	---	---
29	9.7	16	23	e25	---	97	90	809	517	---	---	---
30	9.2	14	23	e24	---	80	85	437	216	---	---	---
31	9.2	---	23	e23	---	71	---	---	---	---	---	---
TOTAL	2,561.9	597.7	1,155	917	538	4,711	---	---	22,696	---	---	---
MEAN	82.6	19.9	37.3	29.6	19.2	152	---	---	757	---	---	---
MAX	1,650	131	248	75	25	1,300	---	---	5,780	---	---	---
MIN	2.8	9.7	14	16	15	14	---	---	93	---	---	---
AC-FT	5,080	1,190	2,290	1,820	1,070	9,340	---	---	45,020	---	---	---

Table 18. Daily mean streamflow at Straight Creek near Muscotah, Kansas, for water years 1992–95

[All values in cubic feet per second, except as noted. Max, maximum; min, minimum; ac-ft, acre-feet; e, estimated; ---, no data]

	Oct. 1991 to Sept. 1992											
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	---	---	---	---	---	---	---	---	---	---	58	166
2	---	---	---	---	---	---	---	---	---	---	71	1,010
3	---	---	---	---	---	---	---	---	---	---	71	115
4	---	---	---	---	---	---	---	---	---	---	48	49
5	---	---	---	---	---	---	---	---	---	---	42	408
6	---	---	---	---	---	---	---	---	---	---	40	2,990
7	---	---	---	---	---	---	---	---	---	---	47	237
8	---	---	---	---	---	---	---	---	---	---	46	111
9	---	---	---	---	---	---	---	---	---	---	38	75
10	---	---	---	---	---	---	---	---	---	---	35	52
11	---	---	---	---	---	---	---	---	---	---	30	40
12	---	---	---	---	---	---	---	---	---	---	28	34
13	---	---	---	---	---	---	---	---	---	---	27	31
14	---	---	---	---	---	---	---	---	---	---	26	28
15	---	---	---	---	---	---	---	---	---	---	26	25
16	---	---	---	---	---	---	---	---	---	---	25	23
17	---	---	---	---	---	---	---	---	---	---	24	21
18	---	---	---	---	---	---	---	---	---	---	23	22
19	---	---	---	---	---	---	---	---	---	---	22	21
20	---	---	---	---	---	---	---	---	---	---	22	46
21	---	---	---	---	---	---	---	---	---	---	21	174
22	---	---	---	---	---	---	---	---	---	---	20	51
23	---	---	---	---	---	---	---	---	---	393	19	36
24	---	---	---	---	---	---	---	---	---	132	18	31
25	---	---	---	---	---	---	---	---	---	97	17	28
26	---	---	---	---	---	---	---	---	---	1,870	17	29
27	---	---	---	---	---	---	---	---	---	261	18	32
28	---	---	---	---	---	---	---	---	---	107	17	24
29	---	---	---	---	---	---	---	---	---	69	16	21
30	---	---	---	---	---	---	---	---	---	e280	15	21
31	---	---	---	---	---	---	---	---	---	87	15	---
TOTAL	---	---	---	---	---	---	---	---	---	---	**942**	**5,951**
MEAN	---	---	---	---	---	---	---	---	---	---	**30.4**	**198**
MAX	---	---	---	---	---	---	---	---	---	---	**71**	**2,990**
MIN	---	---	---	---	---	---	---	---	---	---	**15**	**21**
AC-FT	---	---	---	---	---	---	---	---	---	---	**1,870**	**11,800**

Table 18. Daily mean streamflow at Straight Creek near Muscotah, Kansas, for water years 1992–95—Continued

Day	Oct. 1992 to Sept. 1993											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	63	64	e41	253	131	625	66	88	456	e60	27
2	21	127	60	e40	316	499	273	99	96	138	e56	27
3	20	40	55	e40	356	182	904	109	93	83	e54	28
4	19	30	50	e40	254	110	841	86	90	77	52	26
5	18	27	43	e40	143	83	472	71	86	e1,800	47	25
6	18	25	47	e40	122	74	319	317	87	e2,000	51	91
7	19	24	45	e40	103	67	415	622	104	e800	45	39
8	66	25	43	e39	85	61	551	e1,600	434	357	42	30
9	71	24	82	e39	72	55	238	e1,800	106	e1,300	41	28
10	33	29	83	e39	e64	51	169	e700	77	e900	40	25
11	26	30	57	e39	e62	45	132	e2,100	71	e700	39	24
12	23	65	53	e39	e58	43	135	693	69	278	57	23
13	22	41	1,060	e38	e56	40	317	376	67	e1,000	41	21
14	21	30	1,420	e38	e54	41	206	264	64	e600	40	22
15	19	27	460	e38	e52	47	133	212	59	316	35	23
16	18	27	206	e38	51	45	115	171	58	351	32	23
17	18	26	131	e37	51	38	110	155	61	314	33	22
18	18	25	108	e37	e49	38	170	263	242	e1,200	33	26
19	18	2,410	94	e37	e48	45	200	201	376	653	28	367
20	18	904	73	e36	e47	54	504	211	151	420	35	161
21	18	237	e62	e36	65	47	150	149	83	1,040	36	e120
22	18	129	e56	e36	120	46	114	132	69	e1,900	34	e110
23	18	91	e53	e36	155	42	103	133	65	e1,000	30	107
24	18	75	50	e36	155	40	93	120	67	e700	29	189
25	18	267	e48	e39	e130	39	82	106	64	e400	27	313
26	19	180	e47	43	e115	38	75	101	58	e230	27	74
27	20	95	e46	54	e108	38	73	97	58	e160	26	38
28	19	82	e44	166	98	38	73	93	60	e110	45	32
29	20	73	e43	194	---	47	77	98	58	e92	33	28
30	22	70	e43	147	---	127	69	170	56	e74	28	28
31	22	---	e42	77	---	e1,100	---	97	---	e65	38	---
TOTAL	**720**	**5,298**	**4,768**	**1,639**	**3,242**	**3,351**	**7,738**	**11,412**	**3,117**	**19,514**	**1,214**	**2,097**
MEAN	**23.2**	**177**	**154**	**52.9**	**116**	**108**	**258**	**368**	**104**	**629**	**39.2**	**69.9**
MAX	**71**	**2,410**	**1,420**	**194**	**356**	**1,100**	**904**	**2,100**	**434**	**2,000**	**60**	**367**
MIN	**18**	**24**	**42**	**36**	**47**	**38**	**69**	**66**	**56**	**65**	**26**	**21**
AC-FT	**1,430**	**10,510**	**9,460**	**3,250**	**6,430**	**6,650**	**15,350**	**22,640**	**6,180**	**38,710**	**2,410**	**4,160**

Table 18. Daily mean streamflow at Straight Creek near Muscotah, Kansas, for water years 1992–95—Continued

	Oct. 1993 to Sept. 1994											
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	25	26	32	e20	e20	19	76	22	29	5.9	3.0
2	25	24	25	26	e20	25	19	41	27	209	5.8	2.7
3	25	23	23	27	e21	55	20	40	40	37	6.0	2.7
4	24	23	23	30	e23	101	19	35	27	878	5.9	4.9
5	23	23	23	28	e27	45	19	32	27	498	5.3	6.1
6	23	22	22	25	e28	36	19	89	69	20	5.1	3.2
7	23	23	22	25	e25	36	18	50	26	14	5.3	2.7
8	24	24	20	25	e20	33	17	36	48	15	4.8	2.7
9	26	23	22	30	e20	29	18	34	36	12	3.9	2.6
10	23	23	21	37	e20	27	31	29	27	10	3.5	2.5
11	25	23	20	35	e22	25	31	27	24	9.5	4.0	2.5
12	25	37	22	e30	e26	24	54	25	23	9.0	3.9	2.6
13	23	48	31	e28	e27	23	41	24	22	8.8	3.5	2.6
14	23	30	42	e26	e27	23	30	961	21	8.5	3.7	2.9
15	26	29	32	e24	e25	23	26	606	19	8.4	3.5	3.0
16	27	27	48	e23	e25	22	22	141	18	9.3	3.5	2.8
17	29	26	36	e23	26	22	20	77	18	8.8	3.4	2.9
18	29	25	30	e22	30	21	20	58	17	8.2	3.3	2.7
19	34	25	27	e23	40	20	19	47	17	7.8	4.0	2.7
20	28	24	27	e24	33	20	18	40	17	10	4.5	2.9
21	26	24	24	e26	24	20	44	36	16	10	3.6	2.7
22	25	23	24	e32	25	19	59	33	19	7.7	3.2	2.8
23	24	23	24	40	22	18	29	31	34	6.9	3.2	3.4
24	24	24	30	52	e20	18	26	29	22	6.8	3.2	3.7
25	24	24	27	39	e19	18	24	27	19	7.5	2.9	3.5
26	23	27	27	29	e18	20	24	25	18	7.8	15	3.1
27	22	52	26	31	e17	21	22	23	17	8.4	8.0	2.6
28	23	48	28	27	e18	19	57	23	17	6.5	3.2	2.7
29	23	26	34	23	---	19	51	31	16	6.2	4.4	2.6
30	23	24	39	e22	---	19	120	28	15	6.1	6.0	2.5
31	23	---	39	e20	---	19	---	23	---	5.8	4.4	---
TOTAL	**771**	**822**	**864**	**884**	**668**	**840**	**936**	**2,777**	**738**	**1,890.0**	**145.9**	**90.3**
MEAN	**24.9**	**27.4**	**27.9**	**28.5**	**23.9**	**27.1**	**31.2**	**89.6**	**24.6**	**61.0**	**4.71**	**3.01**
MAX	**34**	**52**	**48**	**52**	**40**	**101**	**120**	**961**	**69**	**878**	**15**	**6.1**
MIN	**22**	**22**	**20**	**20**	**17**	**18**	**17**	**23**	**15**	**5.8**	**2.9**	**2.5**
AC-FT	**1,530**	**1,630**	**1,710**	**1,750**	**1,320**	**1,670**	**1,860**	**5,510**	**1,460**	**3,750**	**289**	**179**

Table 18. Daily mean streamflow at Straight Creek near Muscotah, Kansas, for water years 1992–95—Continued

	Oct. 1994 to Sept. 1995											
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.8	5.6	5.5	12	14	8.5	18	105	---	---	---	---
2	3.5	5.4	5.4	13	14	8.7	17	57	---	---	---	---
3	42	5.7	5.3	11	14	8.3	16	96	---	---	---	---
4	13	6.1	5.2	11	11	9.5	14	563	---	---	---	---
5	4.2	7.3	4.9	e10	10	10	14	137	---	---	---	---
6	3.9	5.9	8.6	e11	9.3	12	14	71	---	---	---	---
7	3.7	5.4	126	e10	8.9	e11	14	959	---	---	---	---
8	3.7	5.2	29	e10	e8.0	e11	14	1,730	---	---	---	---
9	2.7	5.3	e13	e12	e8.0	e11	13	---	---	---	---	---
10	2.6	5.1	e12	15	e8.5	e11	56	---	---	---	---	---
11	2.6	5.0	e11	18	e10	e12	142	---	---	---	---	---
12	2.6	5.1	e11	19	e15	e13	49	---	---	---	---	---
13	2.7	5.7	e11	17	e14	264	30	---	---	---	---	---
14	2.8	6.3	e12	15	e11	440	25	---	---	---	---	---
15	3.1	5.3	13	13	9.7	67	23	---	---	---	---	---
16	3.8	4.7	15	e12	11	35	23	---	---	---	---	---
17	4.2	4.8	14	e11	11	25	26	---	---	---	---	---
18	3.7	4.8	13	e11	11	21	435	---	---	---	---	---
19	4.1	4.6	13	e10	13	19	82	---	---	---	---	---
20	4.5	15	13	e10	12	18	144	---	---	---	---	---
21	4.3	25	12	e10	10	16	68	---	---	---	---	---
22	4.9	8.5	12	e10	10	14	39	---	---	---	---	---
23	7.4	6.2	11	e10	9.8	13	32	---	---	---	---	---
24	7.9	5.9	10	e11	8.9	12	29	---	---	---	---	---
25	4.1	5.7	9.8	11	9.2	38	25	---	---	---	---	---
26	4.5	5.6	12	12	10	409	25	---	---	---	---	---
27	5.6	6.0	11	13	12	58	35	---	---	---	---	---
28	5.2	5.6	10	16	9.9	31	26	---	---	---	---	---
29	5.0	5.0	10	14	---	26	23	---	---	---	---	---
30	4.9	4.6	10	11	---	22	22	---	---	---	---	---
31	5.4	---	11	12	---	20	---	---	---	---	---	---
TOTAL	**175.4**	**196.4**	**459.7**	**381**	**303.2**	**1,674.0**	**1,493**	---	---	---	---	---
MEAN	**5.66**	**6.55**	**14.8**	**12.3**	**10.8**	**54.0**	**49.8**	---	---	---	---	---
MAX	**42**	**25**	**126**	**19**	**15**	**440**	**435**	---	---	---	---	---
MIN	**2.6**	**4.6**	**4.9**	**10**	**8.0**	**8.3**	**13**	---	---	---	---	---
AC-FT	**348**	**390**	**912**	**756**	**601**	**3,320**	**2,960**	---	---	---	---	---

Table 19. Daily mean streamflow at Elk Creek near Larkinburg, Kansas, for water years 1992–95

[All values in cubic feet per second, except as noted. Max, maximum; min, minimum; ac-ft, acre-feet; e, estimated; ---, no data]

	Oct. 1991 to Sept. 1992											
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	---	---	---	---	---	---	---	---	---	---	31	4.2
2	---	---	---	---	---	---	---	---	---	---	46	713
3	---	---	---	---	---	---	---	---	---	---	33	116
4	---	---	---	---	---	---	---	---	---	---	25	41
5	---	---	---	---	---	---	---	---	---	---	22	31
6	---	---	---	---	---	---	---	---	---	---	20	961
7	---	---	---	---	---	---	---	---	---	---	23	104
8	---	---	---	---	---	---	---	---	---	---	22	46
9	---	---	---	---	---	---	---	---	---	---	19	145
10	---	---	---	---	---	---	---	---	---	---	18	42
11	---	---	---	---	---	---	---	---	---	---	15	25
12	---	---	---	---	---	---	---	---	---	---	13	19
13	---	---	---	---	---	---	---	---	---	---	13	16
14	---	---	---	---	---	---	---	---	---	---	13	14
15	---	---	---	---	---	---	---	---	---	---	12	13
16	---	---	---	---	---	---	---	---	---	---	11	10
17	---	---	---	---	---	---	---	---	---	---	10	8.7
18	---	---	---	---	---	---	---	---	---	---	9.0	9.0
19	---	---	---	---	---	---	---	---	---	---	8.1	7.6
20	---	---	---	---	---	---	---	---	---	---	8.7	44
21	---	---	---	---	---	---	---	---	---	---	7.4	71
22	---	---	---	---	---	---	---	---	---	---	6.4	32
23	---	---	---	---	---	---	---	---	---	341	5.9	19
24	---	---	---	---	---	---	---	---	---	120	5.3	15
25	---	---	---	---	---	---	---	---	---	70	4.8	12
26	---	---	---	---	---	---	---	---	---	e820	4.8	14
27	---	---	---	---	---	---	---	---	---	205	5.8	15
28	---	---	---	---	---	---	---	---	---	80	5.5	11
29	---	---	---	---	---	---	---	---	---	52	4.7	8.0
30	---	---	---	---	---	---	---	---	---	265	4.0	8.2
31	---	---	---	---	---	---	---	---	---	45	3.7	---
TOTAL	---	---	---	---	---	---	---	---	---	---	**430.1**	**2,574.7**
MEAN	---	---	---	---	---	---	---	---	---	---	**13.9**	**85.8**
MAX	---	---	---	---	---	---	---	---	---	---	**46**	**961**
MIN	---	---	---	---	---	---	---	---	---	---	**3.7**	**4.2**
AC-FT	---	---	---	---	---	---	---	---	---	---	**853**	**5,110**

Table 19. Daily mean streamflow at Elk Creek near Larkinburg, Kansas, for water years 1992–95—Continued

Day	Oct. 1992 to Sept. 1993											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.2	42	81	e41	285	99	e660	61	132	573	90	26
2	7.0	80	75	e41	333	462	e360	115	158	165	71	e22
3	6.4	32	68	e41	351	213	e920	120	138	111	63	e19
4	5.9	21	62	e41	256	122	e850	85	130	123	59	e18
5	5.6	18	59	e40	156	90	e520	67	122	e700	55	27
6	5.2	17	62	e40	129	77	e330	366	202	e2,000	56	33
7	5.8	17	64	e40	110	69	e400	964	232	e750	52	28
8	73	18	60	e39	92	62	e540	e1,800	480	e400	46	27
9	68	17	86	e39	78	56	e300	e2,100	182	e1,300	41	e21
10	26	23	94	e39	e70	53	e210	e800	125	e850	38	e17
11	16	26	61	e39	e66	49	e150	e2,600	109	e600	39	e14
12	14	71	54	e39	e62	48	e135	997	100	e400	69	e14
13	12	45	e1,100	e39	e58	48	e300	506	94	e1,200	44	e16
14	11	28	e1,440	e39	e56	48	e220	413	89	e650	38	e15
15	8.6	23	e560	e39	e54	47	e140	354	81	e500	32	e13
16	7.9	21	e220	e39	e52	46	e120	303	76	e600	31	e12
17	8.1	20	e130	e38	e50	47	e110	281	72	e350	28	e13
18	9.2	19	e110	e38	e49	47	e170	380	126	e1,400	28	30
19	9.6	e1,300	e94	e38	e49	48	e250	299	211	e800	e22	434
20	11	1,310	e74	e40	e48	50	e520	315	150	e550	45	183
21	10	324	e66	e44	e48	47	e180	236	90	e350	43	427
22	10	187	e58	e48	e48	47	e120	211	76	e700	34	590
23	9.5	131	e54	e45	e48	47	e105	206	68	e1,100	25	534
24	9.1	107	e50	e43	e48	47	e94	186	72	e2,100	e23	406
25	10	394	e47	e43	e49	47	e86	167	67	e800	e20	591
26	11	276	e47	e43	e49	46	e78	156	60	e500	e18	137
27	13	141	e46	95	e50	46	68	147	65	e350	25	68
28	12	112	e44	218	52	46	68	138	66	e200	45	49
29	12	97	e44	267	---	46	75	278	57	e120	33	39
30	14	89	e44	258	---	53	64	296	56	88	e21	35
31	14	---	e42	203	---	e1,500	---	160	---	83	43	---
TOTAL	**443.1**	**5,006**	**5,096**	**2,096**	**2,796**	**3,753**	**8,143**	**15,107**	**3,686**	**20,413**	**1,277**	**3,858**
MEAN	**14.3**	**167**	**164**	**67.6**	**99.9**	**121**	**271**	**487**	**123**	**658**	**41.2**	**129**
MAX	**73**	**1,310**	**1,440**	**267**	**351**	**1,500**	**920**	**2,600**	**480**	**2,100**	**90**	**591**
MIN	**5.2**	**17**	**42**	**38**	**48**	**46**	**64**	**61**	**56**	**83**	**18**	**12**
AC-FT	**879**	**9,930**	**10,110**	**4,160**	**5,550**	**7,440**	**16,150**	**29,960**	**7,310**	**40,490**	**2,530**	**7,650**

Table 19. Daily mean streamflow at Elk Creek near Larkinburg, Kansas, for water years 1992–95—Continued

Day	Oct. 1993 to Sept. 1994											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	e34	e29	e30	e26	e15	e19	e17	131	20	9.1	2.1	7.0
2	e32	e29	e29	e26	e15	e21	e18	69	22	39	2.9	3.9
3	e30	e30	e28	e22	e15	e40	e17	66	194	19	4.1	2.8
4	e30	e30	e25	e26	e15	e85	e15	55	46	1,420	2.9	3.7
5	e28	e28	e23	e25	e15	e60	e14	46	34	130	2.1	6.2
6	e28	e26	e22	e25	e17	e45	e14	71	214	46	1.7	2.9
7	e28	e27	e21	e13	e14	e40	e14	52	46	27	1.7	1.8
8	e31	e27	e21	e15	e11	e35	e14	41	443	31	1.5	1.9
9	e35	e28	e21	e20	e12	e32	e18	38	110	20	1.5	1.5
10	e34	e28	e21	e22	e13	e30	e30	32	58	16	1.4	1.5
11	e34	e35	e22	e23	e14	e29	e45	29	43	13	1.4	1.4
12	e33	e60	e28	e24	e15	e28	e60	27	36	11	1.4	1.4
13	e30	e70	e50	e24	e16	e27	e48	25	31	9.3	1.3	1.3
14	e31	e49	e64	e20	e17	e26	39	379	28	8.4	1.4	1.3
15	e32	e42	e56	e18	e19	e25	33	649	23	7.6	1.4	1.4
16	e40	e36	e66	e15	e22	e24	25	121	20	10	1.4	1.5
17	e50	e32	e60	e13	e26	e23	22	73	19	8.5	1.4	1.5
18	e52	e30	e54	e12	e35	e22	21	58	18	7.0	1.3	1.5
19	e60	e28	e44	e12	e40	e21	20	50	17	6.7	1.5	1.5
20	e50	e27	e35	e12	e30	e20	18	45	16	13	1.8	1.5
21	e44	e26	e33	e12	e23	e19	41	40	15	19	1.4	1.5
22	e37	e26	e28	e15	e18	e18	53	37	16	6.7	1.4	1.6
23	e34	e26	e27	e22	e21	e17	30	33	47	4.0	1.4	1.7
24	e33	e24	e26	e30	e16	e16	25	30	27	3.4	1.3	1.6
25	e32	e21	e27	e30	e16	e16	23	28	16	4.1	1.3	1.6
26	e30	e22	e29	e28	e14	e18	23	26	12	4.3	53	1.6
27	e29	e24	e22	e32	e15	e19	20	24	10	4.3	18	1.6
28	e28	e25	e18	e22	e17	e17	120	23	8.6	3.0	2.3	1.6
29	e28	e26	e23	e26	---	e17	92	46	8.1	2.3	192	1.5
30	e27	e29	e20	e19	---	e16	166	30	7.6	2.4	40	1.4
31	e27	---	e22	e15	---	e16	---	22	---	2.0	16	---
TOTAL	**1,071**	**940**	**995**	**644**	**516**	**841**	**1,095**	**2,396**	**1,605.3**	**1,907.1**	**364.3**	**63.2**
MEAN	**34.5**	**31.3**	**32.1**	**20.8**	**18.4**	**27.1**	**36.5**	**77.3**	**53.5**	**61.5**	**11.8**	**2.11**
MAX	**60**	**70**	**66**	**32**	**40**	**85**	**166**	**649**	**443**	**1,420**	**192**	**7.0**
MIN	**27**	**21**	**18**	**12**	**11**	**16**	**14**	**22**	**7.6**	**2.0**	**1.3**	**1.3**
AC-FT	**2,120**	**1,860**	**1,970**	**1,280**	**1,020**	**1,670**	**2,170**	**4,750**	**3,180**	**3,780**	**723**	**125**

Table 19. Daily mean streamflow at Elk Creek near Larkinburg, Kansas, for water years 1992–95—Continued

Day	Oct. 1994 to Sept. 1995											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.4	3.6	4.6	10	20	5.6	26	54	---	---	---	---
2	1.5	3.7	4.6	10	16	e5.4	23	43	---	---	---	---
3	6.2	3.8	4.0	10	15	e5.2	21	51	---	---	---	---
4	13	4.1	4.7	11	13	e5.0	20	526	---	---	---	---
5	2.7	5.6	4.5	12	12	e5.2	19	132	---	---	---	---
6	1.6	4.9	10	11	15	e6.0	19	69	---	---	---	---
7	e1.4	4.2	104	11	12	e5.5	18	453	---	---	---	---
8	e1.3	5.9	38	11	e11	e5.0	18	2,330	---	---	---	---
9	e1.3	4.2	21	10	e11	e6.0	17	549	---	---	---	---
10	e1.2	3.7	17	10	e13	e7.0	26	329	---	---	---	---
11	e1.2	4.6	e15	10	e11	e9.0	83	179	---	---	---	---
12	e1.2	4.0	e13	17	e11	e12	43	144	---	---	---	---
13	e1.3	5.0	e12	34	e10	302	26	5,680	---	---	---	---
14	e1.4	6.0	e11	34	e10	860	23	1,190	---	---	---	---
15	e1.5	4.8	e11	31	e11	125	20	355	---	---	---	---
16	1.8	3.8	e12	24	e10	63	20	210	---	---	---	---
17	2.3	5.4	e14	e20	e9.2	45	23	1,300	---	---	---	---
18	2.9	5.0	e13	e18	e8.8	38	494	3,040	---	---	---	---
19	3.4	4.7	e12	e17	e8.5	33	100	591	---	---	---	---
20	2.0	18	e11	e16	9.6	30	88	331	---	---	---	---
21	1.7	33	e11	e15	8.4	26	64	243	---	---	---	---
22	4.5	12	e11	e15	8.2	24	40	195	---	---	---	---
23	2.9	6.6	e10	e15	8.4	22	33	1,120	---	---	---	---
24	1.8	4.8	e10	e15	6.9	19	29	4,690	---	---	---	---
25	1.9	4.3	9.9	e15	5.9	40	29	4,690	---	---	---	---
26	1.9	3.7	11	e15	7.8	521	27	4,700	---	---	---	---
27	2.4	3.7	10	e17	15	90	35	5,380	---	---	---	---
28	3.4	3.1	11	e22	9.9	45	28	6,410	---	---	---	---
29	3.0	2.6	11	28	---	35	33	6,410	---	---	---	---
30	3.1	3.5	11	27	---	31	31	---	---	---	---	---
31	4.0	---	12	26	---	28	---	---	---	---	---	---
TOTAL	**81.2**	**182.3**	**454.3**	**537**	**307.6**	**2,453.9**	**1,476**	---	---	---	---	---
MEAN	**2.62**	**6.08**	**14.7**	**17.3**	**11.0**	**79.2**	**49.2**	---	---	---	---	---
MAX	**13**	**33**	**104**	**34**	**20**	**860**	**494**	---	---	---	---	---
MIN	**1.2**	**2.6**	**4.0**	**10**	**5.9**	**5.0**	**17**	---	---	---	---	---
AC-FT	**161**	**362**	**901**	**1,070**	**610**	**4,870**	**2,930**	---	---	---	---	---

Table 20. Daily mean streamflow at Coal Creek west of Coal Creek Church, Kansas, for water years 1992–95

[All values in cubic feet per second, except as noted. Max, maximum; min, minimum; ac-ft, acre-feet; e, estimated; ---, no data]

	Oct. 1991 to Sept. 1992											
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	---	---	---	---	---	---	---	---	---	---	10	1.4
2	---	---	---	---	---	---	---	---	---	---	41	4.2
3	---	---	---	---	---	---	---	---	---	---	12	1.4
4	---	---	---	---	---	---	---	---	---	---	8.2	1.0
5	---	---	---	---	---	---	---	---	---	---	7.5	2.6
6	---	---	---	---	---	---	---	---	---	---	7.8	24
7	---	---	---	---	---	---	---	---	---	---	33	2.8
8	---	---	---	---	---	---	---	---	---	---	11	1.7
9	---	---	---	---	---	---	---	---	---	---	e14	429
10	---	---	---	---	---	---	---	---	---	---	e8.4	34
11	---	---	---	---	---	---	---	---	---	---	e6.0	9.2
12	---	---	---	---	---	---	---	---	---	---	e5.1	e5.8
13	---	---	---	---	---	---	---	---	---	---	e4.2	e4.2
14	---	---	---	---	---	---	---	---	---	---	e3.3	e3.7
15	---	---	---	---	---	---	---	---	---	---	2.9	e3.4
16	---	---	---	---	---	---	---	---	---	---	5.0	3.0
17	---	---	---	---	---	---	---	---	---	---	4.7	2.8
18	---	---	---	---	---	---	---	---	---	---	3.5	3.1
19	---	---	---	---	---	---	---	---	---	---	2.8	2.3
20	---	---	---	---	---	---	---	---	---	---	2.4	7.7
21	---	---	---	---	---	---	---	---	---	---	2.2	5.0
22	---	---	---	---	---	---	---	---	---	169	2.1	2.3
23	---	---	---	---	---	---	---	---	---	92	2.0	1.8
24	---	---	---	---	---	---	---	---	---	18	1.9	1.7
25	---	---	---	---	---	---	---	---	---	9.5	1.7	1.6
26	---	---	---	---	---	---	---	---	---	778	1.9	1.9
27	---	---	---	---	---	---	---	---	---	65	2.0	1.5
28	---	---	---	---	---	---	---	---	---	24	1.7	1.2
29	---	---	---	---	---	---	---	---	---	13	1.6	1.2
30	---	---	---	---	---	---	---	---	---	126	1.4	1.2
31	---	---	---	---	---	---	---	---	---	18	1.3	---
TOTAL	---	---	---	---	---	---	---	---	---	---	**212.6**	**566.7**
MEAN	---	---	---	---	---	---	---	---	---	---	**6.86**	**18.9**
MAX	---	---	---	---	---	---	---	---	---	---	**41**	**429**
MIN	---	---	---	---	---	---	---	---	---	---	**1.3**	**1.0**
AC-FT	---	---	---	---	---	---	---	---	---	---	**422**	**1,120**

Table 20. Daily mean streamflow at Coal Creek west of Coal Creek Church, Kansas, for water years 1992–95—Continued

Day	Oct. 1992 to Sept. 1993											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.2	25	11	e7.4	83	39	96	10	7.1	619	e8.5	4.8
2	1.2	20	9.6	e7.4	110	190	41	87	7.3	70	e7.5	4.5
3	1.1	5.8	9.1	e7.4	80	51	306	37	6.6	29	e7.0	4.1
4	.99	4.2	8.4	e7.5	43	28	154	22	6.4	107	e6.5	3.7
5	.94	3.8	21	e7.6	28	21	52	15	6.1	989	e6.2	3.8
6	.90	3.6	26	e7.8	22	e16	30	44	5.8	135	e6.0	10
7	3.3	3.6	26	e7.8	19	e13	149	133	5.3	68	e6.4	4.0
8	8.4	3.7	19	e7.8	15	e12	253	555	5.0	31	e6.6	3.3
9	4.1	3.6	16	e7.8	13	e10	55	505	4.8	196	e6.0	2.7
10	1.5	14	12	e7.8	e12	e9.2	33	301	3.6	92	e5.6	2.3
11	1.1	12	8.6	e7.8	e11	8.6	27	181	2.5	22	e5.2	2.1
12	1.1	48	8.3	e7.8	e11	9.0	50	51	2.4	11	e4.7	2.0
13	1.1	10	359	e7.8	e10	12	171	33	2.2	20	e4.3	12
14	1.0	6.2	316	e7.8	e9.8	10	68	27	2.1	11	e4.0	8.0
15	.89	5.0	89	e7.5	e9.3	8.9	34	22	1.9	8.6	e3.7	2.6
16	.83	4.6	35	e7.4	e9.2	8.3	28	18	1.8	6.4	e3.3	2.1
17	.86	4.1	25	e7.4	e8.9	7.6	26	17	1.8	65	e2.4	1.9
18	.91	4.3	20	e7.4	e8.7	7.7	25	24	55	793	e2.0	2.9
19	.95	537	16	e7.4	e8.5	14	23	19	26	74	e1.8	500
20	1.0	277	13	e7.5	e8.2	12	20	16	5.7	34	e2.1	93
21	.94	71	12	e8.2	e8.2	12	e16	12	3.9	192	e3.5	24
22	.93	39	11	e9.0	e8.2	12	e12	11	3.5	878	e8.0	12
23	.85	27	8.8	e8.5	e8.2	9.9	e11	10	2.8	374	e6.4	135
24	.90	19	e8.2	e8.6	e8.2	9.3	9.7	9.9	2.9	e140	e3.3	145
25	.93	118	e8.0	e10	e8.4	9.2	8.8	9.5	2.9	e47	e2.3	346
26	1.0	47	e8.0	27	e9.5	8.9	8.5	9.1	2.6	e23	e2.0	38
27	1.2	20	e7.8	40	13	8.6	8.7	8.7	2.4	e15	e1.9	6.3
28	.97	16	e7.6	84	15	8.5	12	8.3	2.1	e13	e2.2	3.1
29	1.0	13	e7.5	98	---	9.2	20	8.2	2.1	e11	4.3	1.5
30	1.3	12	e7.4	75	---	35	11	8.4	2.6	e10	24	.80
31	1.4	---	e7.4	53	---	786	---	7.4	---	e9.0	14	---
TOTAL	**44.79**	**1,377.5**	**1,141.7**	**573.4**	**598.3**	**1,395.9**	**1,758.7**	**2,219.5**	**187.2**	**5,093.0**	**171.7**	**1,381.50**
MEAN	**1.44**	**45.9**	**36.8**	**18.5**	**21.4**	**45.0**	**58.6**	**71.6**	**6.24**	**164**	**5.54**	**46.0**
MAX	**8.4**	**537**	**359**	**98**	**110**	**786**	**306**	**555**	**55**	**989**	**24**	**500**
MIN	**.83**	**3.6**	**7.4**	**7.4**	**8.2**	**7.6**	**8.5**	**7.4**	**1.8**	**6.4**	**1.8**	**.80**
AC-FT	**89**	**2,730**	**2,260**	**1,140**	**1,190**	**2,770**	**3,490**	**4,400**	**371**	**10,100**	**341**	**2,740**

Table 20. Daily mean streamflow at Coal Creek west of Coal Creek Church, Kansas, for water years 1992–95—Continued

	Oct. 1993 to Sept. 1994											
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.59	4.1	5.4	e5.0	e3.4	e7.0	2.2	40	1.3	3.1	e0.90	3.1
2	.67	4.0	5.2	e5.0	e3.7	10	2.5	14	1.6	562	e.76	2.7
3	1.1	4.0	4.8	e5.0	e4.0	11	2.5	11	3.3	72	e1.5	2.3
4	1.3	3.9	4.6	e5.0	e4.4	11	2.3	7.7	2.0	664	e1.3	3.9
5	1.6	3.9	4.2	e4.5	e4.5	6.8	2.3	5.8	1.7	547	e1.0	6.9
6	2.0	3.9	3.8	e3.9	e4.2	5.9	2.4	140	32	24	e.80	4.5
7	2.6	3.8	3.7	e3.4	e3.7	6.0	2.2	37	8.1	15	e.55	1.6
8	4.5	3.8	3.8	e3.8	e3.2	5.5	2.2	13	29	13	e.45	1.5
9	5.0	3.8	3.7	e4.0	e3.0	5.3	3.1	8.4	8.8	12	e.40	1.2
10	4.4	3.8	3.6	e4.0	e3.2	4.8	11	6.3	4.4	12	e.36	1.0
11	4.5	3.7	3.5	e4.0	e3.5	4.2	5.8	4.8	3.0	9.9	e.33	.84
12	4.6	45	3.5	e4.0	e3.7	4.0	7.5	4.6	2.6	6.4	e.31	.69
13	4.3	20	23	e4.0	e3.9	4.1	6.2	3.4	2.2	5.5	e.29	.59
14	4.2	8.7	20	e4.0	e4.0	4.1	4.1	36	2.0	3.9	e.27	.46
15	7.1	7.4	31	e3.8	e4.3	3.2	3.4	38	1.7	1.8	e.26	.44
16	6.8	5.9	56	e3.5	e4.5	2.3	2.9	6.4	1.4	2.1	e.25	.41
17	6.4	5.8	30	e3.3	e4.8	2.4	2.7	4.1	1.3	1.7	e.25	.26
18	11	5.6	11	e3.2	e5.0	2.0	2.7	3.3	1.3	1.6	e.25	.18
19	9.9	5.6	8.5	e3.3	e4.0	2.0	2.6	3.2	1.2	1.5	e.25	.14
20	6.3	5.2	7.5	e3.7	e3.7	2.1	2.5	3.2	1.2	2.4	e.25	.10
21	5.8	5.1	e6.6	e4.0	e3.6	2.0	7.8	3.1	1.6	2.1	e.25	.09
22	5.4	4.9	e6.3	e4.5	e3.6	2.0	4.6	3.1	4.6	1.4	e.25	.11
23	5.0	4.8	e6.2	e4.7	e3.6	1.9	3.4	3.0	11	1.2	e.25	.24
24	4.8	4.7	e6.0	e4.8	e3.7	1.8	3.2	2.4	5.0	1.2	e.25	.28
25	4.6	4.9	e5.5	e4.9	e3.8	1.9	3.1	1.4	3.5	1.4	e.30	.22
26	4.5	4.9	e5.3	e4.5	e4.0	2.5	3.2	1.4	3.2	1.8	e.70	.15
27	4.4	4.9	e5.5	e4.0	e4.3	2.3	3.1	1.3	1.7	1.5	e.40	.09
28	4.2	4.9	e5.4	e3.8	e5.0	2.0	80	1.2	1.3	1.3	e.30	.06
29	4.2	5.7	e5.2	e3.6	---	2.2	30	3.2	1.1	e1.2	e3.0	.04
30	4.2	6.0	e4.5	e3.4	---	2.2	102	2.1	1.1	e1.1	24	.04
31	4.1	---	e4.8	e3.2	---	2.2	---	1.4	---	e1.0	14	---
TOTAL	**140.06**	**202.7**	**298.1**	**125.8**	**110.3**	**126.7**	**313.5**	**413.8**	**144.2**	**1,976.1**	**54.43**	**34.13**
MEAN	**4.52**	**6.76**	**9.62**	**4.06**	**3.94**	**4.09**	**10.4**	**13.3**	**4.81**	**63.7**	**1.76**	**1.14**
MAX	**11**	**45**	**56**	**5.0**	**5.0**	**11**	**102**	**140**	**32**	**664**	**24**	**6.9**
MIN	**.59**	**3.7**	**3.5**	**3.2**	**3.0**	**1.8**	**2.2**	**1.2**	**1.1**	**1.0**	**.25**	**.04**
AC-FT	**278**	**402**	**591**	**250**	**219**	**251**	**622**	**821**	**286**	**3,920**	**108**	**68**

Table 20. Daily mean streamflow at Coal Creek west of Coal Creek Church, Kansas, for water years 1992–95—Continued

Day	Oct. 1994 to Sept. 1995											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.97	0.35	e0.90	e1.8	4.0	6.8	0	---	---	---	---
2	0	.97	.34	e.60	e1.7	4.0	3.1	0	---	---	---	---
3	0	1.4	.25	e.35	e1.7	4.3	3.0	.74	---	---	---	---
4	.64	24	.28	e.20	e1.7	5.0	2.6	6.2	---	---	---	---
5	6.0	38	.28	e.01	e1.6	5.0	3.0	.01	---	---	---	---
6	17	21	e1.0	e.50	e1.6	e4.4	3.3	0	---	---	---	---
7	9.0	9.1	e4.0	e.40	1.5	e4.0	3.6	4.9	---	---	---	---
8	.22	4.5	e1.8	e.42	1.5	e3.9	3.6	74	---	---	---	---
9	.15	1.5	e.89	e.44	1.4	e3.9	3.6	---	---	---	---	---
10	.08	1.2	e.35	e.46	1.6	e3.8	6.0	---	---	---	---	---
11	.02	1.3	e.40	e.60	1.6	e3.9	7.9	---	---	---	---	---
12	0	1.0	e.60	e.80	1.6	4.6	5.9	---	---	---	---	---
13	0	.91	e2.0	e1.0	1.6	9.8	5.0	---	---	---	---	---
14	0	.69	e1.6	e2.0	1.6	6.1	5.6	---	---	---	---	---
15	0	.44	e1.3	e1.8	1.7	4.0	5.1	---	---	---	---	---
16	.69	.29	e1.2	e1.5	1.5	4.5	8.6	---	---	---	---	---
17	1.8	.22	e1.6	e1.3	1.5	4.5	7.1	---	---	---	---	---
18	1.3	.30	e4.0	e1.2	1.7	5.6	3.6	---	---	---	---	---
19	1.3	.26	e3.5	e1.1	1.6	6.3	0	---	---	---	---	---
20	.85	.69	e3.1	e1.1	1.6	6.9	0	---	---	---	---	---
21	.55	.39	e2.8	e1.0	1.5	6.0	0	---	---	---	---	---
22	.43	.08	e2.4	e1.0	1.6	6.3	0	---	---	---	---	---
23	.24	.03	e2.2	e1.0	2.2	8.0	0	---	---	---	---	---
24	.18	.05	e1.9	e1.1	2.8	8.9	0	---	---	---	---	---
25	.34	.09	e1.8	e1.1	3.5	11	0	---	---	---	---	---
26	.20	.17	e1.7	e1.3	4.3	14	0	---	---	---	---	---
27	.09	.26	e1.6	e1.5	4.5	8.6	0	---	---	---	---	---
28	.87	.30	e1.5	e1.8	4.1	8.3	0	---	---	---	---	---
29	.97	.23	e1.4	e1.8	---	9.5	0	---	---	---	---	---
30	.97	.23	e1.3	e1.7	---	9.9	0	---	---	---	---	---
31	1.3	---	e1.2	e1.6	---	10	---	---	---	---	---	---
TOTAL	**45.19**	**110.57**	**48.64**	**31.58**	**56.6**	**199.0**	**87.40**	---	---	---	---	---
MEAN	**1.46**	**3.69**	**1.57**	**1.02**	**2.02**	**6.42**	**2.91**	---	---	---	---	---
MAX	**17**	**38**	**4.0**	**2.0**	**4.5**	**14**	**8.6**	---	---	---	---	---
MIN	**0**	**.03**	**.25**	**.01**	**1.4**	**3.8**	**0**	---	---	---	---	---
AC-FT	**90**	**219**	**96**	**63**	**112**	**395**	**173**	---	---	---	---	---

Table 21. Daily mean streamflow at Cedar Creek west of Valley Falls, Kansas, for water years 1992–95

[All values in cubic feet per second, except as noted. Max, maximum; min, minimum; ac-ft, acre-feet; e, estimated; ---, no data]

Day	Oct. 1991 to Sept. 1992											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	---	---	---	---	---	---	---	---	---	---	28	e2.4
2	---	---	---	---	---	---	---	---	---	---	40	52
3	---	---	---	---	---	---	---	---	---	---	27	9.8
4	---	---	---	---	---	---	---	---	---	---	19	2.4
5	---	---	---	---	---	---	---	---	---	---	17	118
6	---	---	---	---	---	---	---	---	---	---	16	423
7	---	---	---	---	---	---	---	---	---	---	26	70
8	---	---	---	---	---	---	---	---	---	---	19	33
9	---	---	---	---	---	---	---	---	---	---	26	534
10	---	---	---	---	---	---	---	---	---	---	19	63
11	---	---	---	---	---	---	---	---	---	---	13	29
12	---	---	---	---	---	---	---	---	---	---	11	20
13	---	---	---	---	---	---	---	---	---	---	8.2	16
14	---	---	---	---	---	---	---	---	---	---	6.7	14
15	---	---	---	---	---	---	---	---	---	---	4.4	12
16	---	---	---	---	---	---	---	---	---	---	3.5	11
17	---	---	---	---	---	---	---	---	---	---	2.9	11
18	---	---	---	---	---	---	---	---	---	---	2.6	12
19	---	---	---	---	---	---	---	---	---	---	2.7	9.8
20	---	---	---	---	---	---	---	---	---	---	2.5	51
21	---	---	---	---	---	---	---	---	---	59	2.4	39
22	---	---	---	---	---	---	---	---	---	543	2.4	16
23	---	---	---	---	---	---	---	---	---	1,270	2.3	12
24	---	---	---	---	---	---	---	---	---	200	e2.2	9.7
25	---	---	---	---	---	---	---	---	---	92	e2.1	8.7
26	---	---	---	---	---	---	---	---	---	1,140	e2.1	9.6
27	---	---	---	---	---	---	---	---	---	206	e2.1	8.6
28	---	---	---	---	---	---	---	---	---	84	2.4	7.0
29	---	---	---	---	---	---	---	---	---	47	2.3	e7.0
30	---	---	---	---	---	---	---	---	---	67	e2.2	e5.5
31	---	---	---	---	---	---	---	---	---	35	e2.1	---
TOTAL	---	---	---	---	---	---	---	---	---	---	**319.1**	**1,616.5**
MEAN	---	---	---	---	---	---	---	---	---	---	**10.3**	**53.9**
MAX	---	---	---	---	---	---	---	---	---	---	**40**	**534**
MIN	---	---	---	---	---	---	---	---	---	---	**2.1**	**2.4**
AC-FT	---	---	---	---	---	---	---	---	---	---	**633**	**3,210**

Table 21. Daily mean streamflow at Cedar Creek west of Valley Falls, Kansas, for water years 1992–95—Continued

	Oct. 1992 to Sept. 1993											
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	e5.0	43	39	e27	112	90	367	36	25	734	e17	13
2	e4.5	62	36	e27	169	286	146	294	27	118	e15	11
3	e4.0	12	34	e26	167	125	864	132	23	68	e12	11
4	e3.5	5.4	30	e26	128	81	535	67	22	62	e13	11
5	e3.0	3.6	28	e26	91	59	175	49	19	1,620	e15	11
6	5.5	3.3	29	e26	75	50	112	194	330	1,790	16	23
7	5.2	6.3	29	e25	62	45	330	477	148	e190	13	16
8	51	8.3	29	e25	51	40	358	1,310	59	e130	11	13
9	42	8.5	58	e25	45	36	153	1,350	37	e800	9.8	12
10	11	49	58	e25	44	32	102	e1,150	26	e3,000	8.9	10
11	6.6	51	38	e25	e42	28	71	e900	20	e250	9.1	9.3
12	6.5	158	34	e25	e40	28	104	e700	17	e133	11	9.0
13	6.3	53	857	e25	e39	27	406	e540	15	e220	12	47
14	6.6	30	903	e24	e37	31	199	e420	13	e320	9.5	49
15	5.8	23	287	e24	36	29	106	e340	11	e210	8.2	22
16	5.6	20	109	e24	e36	28	74	252	9.9	e830	6.9	17
17	5.8	17	69	e24	e36	24	63	145	9.0	e600	6.5	14
18	6.7	16	55	e24	e36	25	63	55	100	e2,900	6.2	15
19	7.0	1,300	47	e24	e37	30	55	46	63	e560	5.6	671
20	8.8	613	40	e24	e39	39	45	46	30	e450	14	179
21	8.4	156	38	e24	e43	42	39	34	22	e860	25	678
22	9.4	86	35	e25	e54	39	38	30	18	e1,530	19	500
23	11	57	32	e27	61	35	37	29	16	e430	12	463
24	13	45	e31	e29	63	32	34	25	17	e170	9.6	373
25	11	289	e30	e35	63	31	31	21	15	e100	8.3	657
26	16	128	e29	e42	62	30	29	19	13	e60	7.7	118
27	18	67	e29	54	62	e28	29	17	12	e49	7.4	60
28	18	52	28	87	63	e27	39	15	12	e34	43	38
29	18	44	e27	114	---	e26	78	81	11	e26	24	29
30	19	41	e27	100	---	e26	41	112	9.9	e23	15	28
31	20	---	e27	73	---	395	---	34	---	e20	16	---
TOTAL	**362.2**	**3,447.4**	**3,142**	**1,111**	**1,793**	**1,844**	**4,723**	**8,920**	**1,149.8**	**18,287**	**406.7**	**4,107.3**
MEAN	**11.7**	**115**	**101**	**35.8**	**64.0**	**59.5**	**157**	**288**	**38.3**	**590**	**13.1**	**137**
MAX	**51**	**1,300**	**903**	**114**	**169**	**395**	**864**	**1,350**	**330**	**3,000**	**43**	**678**
MIN	**3.0**	**3.3**	**27**	**24**	**36**	**24**	**29**	**15**	**9.0**	**20**	**5.6**	**9.0**
AC-FT	**718**	**6,840**	**6,230**	**2,200**	**3,560**	**3,660**	**9,370**	**17,690**	**2,280**	**36,270**	**807**	**8,150**

Table 21. Daily mean streamflow at Cedar Creek west of Valley Falls, Kansas, for water years 1992–95—Continued

	Oct. 1993 to Sept. 1994											
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	e26	18	20	e12	e9.0	19	9.3	108	7.7	4.3	e.40	2.3
2	e23	18	20	e12	e9.2	25	13	65	10	38	1.0	2.0
3	e21	17	19	e12	e9.6	48	13	57	130	8.8	3.3	1.9
4	e19	18	17	e12	e10	51	11	46	37	601	2.8	1.8
5	e18	18	17	e12	e12	33	9.7	37	22	16	1.5	1.8
6	e16	19	14	e11	e11	26	11	38	16	18	1.2	2.1
7	15	19	14	e10	e10	25	9.6	35	18	13	1.2	1.2
8	16	21	14	e11	e9.0	23	9.7	30	360	11	.91	.81
9	16	22	15	e11	e8.2	20	10	28	71	e10	.64	.68
10	14	24	15	e12	e8.0	18	61	26	38	e8.0	.60	.52
11	17	20	15	e12	e8.4	16	36	23	23	e6.0	.55	.35
12	17	71	16	e12	e8.8	15	50	17	17	e5.0	1.0	.29
13	15	47	33	e12	e9.2	14	41	15	15	e4.5	.78	.24
14	15	25	39	e12	e9.4	14	29	21	11	e4.0	.38	.21
15	20	24	31	e12	e9.6	13	24	56	5.3	e3.5	.22	.39
16	23	20	58	e11	e9.9	13	19	28	3.6	e3.3	.19	.74
17	23	18	38	e10	e10	13	17	21	e3.0	e3.2	.13	0
18	28	17	27	e9.0	e11	12	16	18	e2.8	e3.1	.03	.10
19	42	17	22	e9.5	e13	11	14	14	e2.5	e3.1	1.0	.17
20	e30	16	20	e10	e10	11	12	13	e2.4	4.1	.48	.02
21	e23	16	19	e11	e9.5	9.9	28	10	3.5	4.3	.18	.04
22	e20	16	e17	e12	e9.2	9.7	26	9.4	8.9	3.9	.11	.19
23	19	17	e16	e12	e9.0	9.8	19	8.0	16	2.3	.03	.35
24	18	18	e15	e13	e9.0	8.7	16	7.1	6.7	1.3	0	.37
25	18	18	e14	e14	e9.0	8.3	15	6.2	3.5	e1.0	0	.37
26	17	18	e13	e13	e9.2	10	15	5.1	e2.9	1.5	2.5	.16
27	19	18	e14	e12	e10	12	13	4.4	e2.5	e1.0	1.7	.03
28	19	18	e14	e11	e13	10	170	4.1	e2.2	e.80	.53	.05
29	17	18	e14	e10	---	9.7	91	33	e2.0	e.60	37	.03
30	16	19	e11	e9.5	---	9.6	220	24	e1.8	e.50	8.5	.04
31	17	---	e12	e9.0	---	9.4	---	10	---	e.40	4.1	---
TOTAL	**617**	**645**	**623**	**351.0**	**273.2**	**527.1**	**1,028.3**	**817.3**	**845.3**	**785.50**	**72.96**	**19.25**
MEAN	**19.9**	**21.5**	**20.1**	**11.3**	**9.76**	**17.0**	**34.3**	**26.4**	**28.2**	**25.3**	**2.35**	**.64**
MAX	**42**	**71**	**58**	**14**	**13**	**51**	**220**	**108**	**360**	**601**	**37**	**2.3**
MIN	**14**	**16**	**11**	**9.0**	**8.0**	**8.3**	**9.3**	**4.1**	**1.8**	**.40**	**0**	**0**
AC-FT	**1,220**	**1,280**	**1,240**	**696**	**542**	**1,050**	**2,040**	**1,620**	**1,680**	**1,560**	**145**	**38**

Table 21. Daily mean streamflow at Cedar Creek west of Valley Falls, Kansas, for water years 1992–95—Continued

Day	Oct. 1994 to Sept. 1995											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	e0.30	1.0	e2.7	e6.0	4.2	---	---	---	---	---	---
2	.28	e.30	1.3	e2.6	7.0	e3.9	---	---	---	---	---	---
3	1.3	e.31	1.5	e2.5	6.4	e3.7	---	---	---	---	---	---
4	.49	e.33	1.5	e2.6	5.9	e3.6	---	---	---	---	---	---
5	.18	e.40	1.5	e3.2	e5.2	e3.9	---	---	---	---	---	---
6	.18	e.40	9.4	e4.0	e4.9	e4.1	---	---	---	---	---	---
7	.18	e.37	89	e3.5	e5.2	e3.9	---	---	---	---	---	---
8	.13	e.35	9.6	e3.2	e5.0	e3.6	---	---	---	---	---	---
9	.10	e.30	6.1	e3.3	e4.5	e3.5	---	---	---	---	---	---
10	.10	e.32	e5.5	e3.6	e4.0	e4.0	---	---	---	---	---	---
11	.10	e.35	e5.0	e4.0	e4.3	e5.0	---	---	---	---	---	---
12	.14	e.50	e4.6	e5.0	e4.0	7.3	---	---	---	---	---	---
13	.18	e.45	e4.4	e6.0	e3.6	440	---	---	---	---	---	---
14	.18	e.42	e4.2	e7.5	e3.4	268	---	---	---	---	---	---
15	.18	e.40	e4.0	e6.0	e4.3	71	---	---	---	---	---	---
16	.18	e.40	e3.9	e4.8	e4.1	39	---	---	---	---	---	---
17	.18	e.40	e3.8	e4.3	e3.9	26	---	---	---	---	---	---
18	.18	e.45	e3.8	e4.0	e4.0	20	---	---	---	---	---	---
19	.28	e.50	4.0	e3.8	e4.2	16	---	---	---	---	---	---
20	.35	e1.0	5.4	e3.6	4.0	13	---	---	---	---	---	---
21	.37	e.30	4.6	e3.5	3.6	11	---	---	---	---	---	---
22	.34	2.7	3.4	e3.4	3.4	9.3	---	---	---	---	---	---
23	.27	1.4	3.1	e3.4	3.3	8.2	---	---	---	---	---	---
24	.27	1.2	3.1	e3.3	3.0	7.3	---	---	---	---	---	---
25	.21	.99	3.1	e3.4	2.7	17	---	---	---	---	---	---
26	.22	.86	3.2	e3.8	3.0	138	---	---	---	---	---	---
27	.33	1.4	3.2	e4.5	6.1	39	---	---	---	---	---	---
28	.37	1.5	3.1	e6.0	4.9	25	---	---	---	---	---	---
29	.37	1.4	2.9	e5.5	---	20	---	---	---	---	---	---
30	.37	1.1	2.9	e5.2	---	17	---	---	---	---	---	---
31	e.35	---	2.9	e5.0	---	16	---	---	---	---	---	---
TOTAL	**8.36**	**21.10**	**205.0**	**127.2**	**123.9**	**1,251.5**	---	---	---	---	---	---
MEAN	**.27**	**.70**	**6.61**	**4.10**	**4.42**	**40.4**	---	---	---	---	---	---
MAX	**1.3**	**2.7**	**89**	**7.5**	**7.0**	**440**	---	---	---	---	---	---
MIN	**0**	**.30**	**1.0**	**2.5**	**2.7**	**3.5**	---	---	---	---	---	---
AC-FT	**17**	**42**	**407**	**252**	**246**	**2,480**	---	---	---	---	---	---

Table 22. Daily mean streamflow at Rock Creek northeast of Meriden, Kansas, for water years 1992–95

[All values in cubic feet per second, except as noted. Max, maximum; min, minimum; ac-ft, acre-feet; e, estimated; ---, no data]

	Oct. 1991 to Sept. 1992											
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	---	---	---	---	---	---	---	---	---	---	4.3	0.19
2	---	---	---	---	---	---	---	---	---	---	4.2	1.5
3	---	---	---	---	---	---	---	---	---	---	4.0	.89
4	---	---	---	---	---	---	---	---	---	---	3.2	.30
5	---	---	---	---	---	---	---	---	---	---	2.7	42
6	---	---	---	---	---	---	---	---	---	---	2.6	225
7	---	---	---	---	---	---	---	---	---	---	9.0	15
8	---	---	---	---	---	---	---	---	---	---	3.6	6.7
9	---	---	---	---	---	---	---	---	---	---	27	6.6
10	---	---	---	---	---	---	---	---	---	---	7.3	3.4
11	---	---	---	---	---	---	---	---	---	---	3.4	2.1
12	---	---	---	---	---	---	---	---	---	---	2.6	1.6
13	---	---	---	---	---	---	---	---	---	---	2.2	1.4
14	---	---	---	---	---	---	---	---	---	---	2.0	1.1
15	---	---	---	---	---	---	---	---	---	---	1.9	.84
16	---	---	---	---	---	---	---	---	---	---	1.6	.60
17	---	---	---	---	---	---	---	---	---	---	1.3	.80
18	---	---	---	---	---	---	---	---	---	---	2.7	1.6
19	---	---	---	---	---	---	---	---	---	---	2.5	.96
20	---	---	---	---	---	---	---	---	---	---	1.4	4.0
21	---	---	---	---	---	---	---	---	---	3.6	.98	2.6
22	---	---	---	---	---	---	---	---	---	86	.67	1.3
23	---	---	---	---	---	---	---	---	---	295	.56	.77
24	---	---	---	---	---	---	---	---	---	26	.46	.61
25	---	---	---	---	---	---	---	---	---	11	.38	.55
26	---	---	---	---	---	---	---	---	---	395	.41	1.3
27	---	---	---	---	---	---	---	---	---	35	.50	1.1
28	---	---	---	---	---	---	---	---	---	14	.40	.66
29	---	---	---	---	---	---	---	---	---	8.8	.27	.53
30	---	---	---	---	---	---	---	---	---	9.7	.19	.46
31	---	---	---	---	---	---	---	---	---	5.4	.16	---
TOTAL	---	---	---	---	---	---	---	---	---	---	**94.48**	**326.46**
MEAN	---	---	---	---	---	---	---	---	---	---	**3.05**	**10.9**
MAX	---	---	---	---	---	---	---	---	---	---	**27**	**225**
MIN	---	---	---	---	---	---	---	---	---	---	**.16**	**.19**
AC-FT	---	---	---	---	---	---	---	---	---	---	**187**	**648**

Table 22. Daily mean streamflow at Rock Creek northeast of Meriden, Kansas, for water years 1992–95—Continued

Day	Oct. 1992 to Sept. 1993											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.40	3.0	8.9	e7.8	43	25	78	11	4.4	35	8.7	1.5
2	.39	7.4	7.7	e7.8	49	115	29	295	5.1	13	7.3	1.3
3	.34	2.6	7.1	e7.8	41	59	333	52	4.7	8.0	6.7	1.7
4	.29	1.5	6.4	e7.6	32	28	136	24	5.0	4.9	7.2	1.0
5	.27	1.0	5.8	e7.6	21	18	39	16	4.5	294	7.8	1.0
6	.22	1.1	5.8	e7.6	16	14	25	14	323	44	8.4	4.9
7	.30	1.2	6.1	e7.4	14	12	151	45	42	20	6.0	2.1
8	1.9	1.4	6.9	e7.4	11	10	114	585	21	12	5.1	2.2
9	2.3	1.4	12	e7.4	10	9.0	35	435	12	148	4.6	1.4
10	1.2	9.6	10	e7.4	9.8	7.7	22	149	7.9	1,460	4.0	.77
11	.69	17	6.8	e7.4	e11	6.8	16	78	6.2	91	4.0	.95
12	.56	31	7.0	e7.4	e11	6.6	59	30	6.0	41	4.5	.87
13	.58	7.8	264	e7.4	e10	6.9	140	22	5.2	35	3.6	1.6
14	.50	4.4	307	e7.4	e10	8.7	45	16	4.1	36	3.1	3.0
15	.45	3.4	65	e7.4	e9.6	7.0	24	13	3.3	55	2.3	1.4
16	.43	3.1	23	e7.2	e9.4	6.5	19	11	3.1	27	1.7	.70
17	.40	3.0	15	e7.0	e9.2	5.0	67	11	2.8	16	1.4	.49
18	.45	3.1	12	e7.0	e9.0	5.6	34	14	22	324	1.1	1.9
19	.55	454	9.4	e7.0	e8.8	8.1	20	13	19	50	.83	299
20	.59	190	7.8	e7.0	e8.6	9.9	15	12	6.6	60	3.4	35
21	.67	32	7.0	e7.0	e8.6	8.3	12	9.1	4.3	242	5.5	697
22	.83	18	6.3	e8.0	e8.6	8.7	11	8.3	3.3	446	3.7	137
23	.96	12	5.2	e8.6	e8.6	7.3	11	8.5	3.1	148	1.7	246
24	.87	9.6	4.5	e8.0	e8.6	6.6	9.8	6.9	3.7	52	1.2	256
25	.95	83	4.5	e8.0	e8.6	6.2	8.7	6.2	3.0	200	.92	313
26	1.2	33	4.5	e12	e9.0	5.9	8.0	5.8	2.2	40	.62	63
27	1.1	16	e8.6	19	e9.0	5.8	7.9	5.5	2.2	27	.77	39
28	1.3	13	e8.2	81	e9.4	6.2	15	4.9	1.9	19	8.5	29
29	1.6	11	e8.2	111	---	7.1	33	6.0	2.0	14	3.9	23
30	1.7	10	e8.2	94	---	58	13	9.1	1.6	12	8.6	19
31	1.7	---	e8.0	53	---	549	---	4.9	---	10	4.2	---
TOTAL	**25.69**	**984.6**	**866.9**	**557.6**	**413.8**	**1,037.9**	**1,530.4**	**1,921.2**	**535.2**	**3,983.9**	**131.34**	**2,184.78**
MEAN	**.83**	**32.8**	**28.0**	**18.0**	**14.8**	**33.5**	**51.0**	**62.0**	**17.8**	**129**	**4.24**	**72.8**
MAX	**2.3**	**454**	**307**	**111**	**49**	**549**	**333**	**585**	**323**	**1,460**	**8.7**	**697**
MIN	**.22**	**1.0**	**4.5**	**7.0**	**8.6**	**5.0**	**7.9**	**4.9**	**1.6**	**4.9**	**.62**	**.49**
AC-FT	**51**	**1,950**	**1,720**	**1,110**	**821**	**2,060**	**3,040**	**3,810**	**1,060**	**7,900**	**261**	**4,330**

Table 22. Daily mean streamflow at Rock Creek northeast of Meriden, Kansas, for water years 1992–95—Continued

Day	Oct. 1993 to Sept. 1994											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	5.4	5.6	e5.2	e3.5	e3.8	3.4	33	1.2	1.2	0.02	0.01
2	11	5.4	5.0	e5.2	e3.8	9.2	3.7	20	1.4	31	.06	0
3	9.8	5.7	4.3	e5.2	e4.0	15	3.8	17	1.8	1.5	.37	0
4	8.7	6.5	4.2	e5.0	e4.5	10	3.6	14	1.8	.77	.20	0
5	7.2	5.5	4.0	e4.5	e4.7	7.3	3.3	11	1.4	.63	.07	0
6	6.6	5.1	3.4	e4.0	e4.6	6.5	3.5	48	1.2	.38	.04	0
7	6.0	6.7	3.5	e3.5	e4.2	6.9	3.4	20	1.5	.30	.04	0
8	6.9	7.2	3.3	e3.8	e3.4	5.9	2.6	14	53	.29	.03	0
9	6.2	6.5	3.8	e4.1	e3.0	5.0	2.8	11	5.2	.25	0	0
10	5.6	6.5	3.5	e4.1	e3.1	4.6	9.3	8.5	2.9	.20	0	0
11	7.7	6.8	2.8	e4.0	e3.6	4.2	5.6	7.5	2.1	.15	0	0
12	6.1	55	3.2	e4.0	e3.7	4.1	6.9	6.3	1.7	.13	0	0
13	5.3	25	16	e4.0	e3.9	3.9	5.7	5.7	2.1	.13	0	0
14	5.0	16	14	e4.0	e4.1	4.2	4.7	7.2	1.3	.12	0	0
15	30	13	14	e3.8	e4.3	4.1	3.9	8.8	.83	.12	0	0
16	15	9.7	28	e3.7	e4.8	3.5	2.5	5.2	.71	.16	0	0
17	11	8.7	14	e3.4	e5.1	3.9	2.4	4.3	.67	.15	0	0
18	45	7.8	9.7	e3.3	e5.2	3.6	2.4	3.7	.60	.12	0	0
19	18	7.5	8.0	e3.4	e4.5	3.2	2.3	3.2	.55	.09	0	0
20	12	6.5	7.3	e3.7	e3.0	3.5	2.3	2.9	.50	.25	.01	0
21	10	6.5	6.6	e4.2	e2.8	3.3	4.8	2.8	.45	.20	0	0
22	8.9	6.0	e6.4	e4.5	e2.7	3.0	4.0	2.5	.65	.10	0	0
23	8.2	5.9	e6.2	e4.8	e2.7	3.0	3.0	2.3	2.8	.07	0	.02
24	8.1	5.6	e6.0	e5.1	e2.7	2.6	3.0	2.1	1.3	.07	0	.01
25	7.6	4.9	e5.8	e5.2	e2.7	2.4	2.9	1.9	.60	.10	0	0
26	7.0	5.0	e5.4	e4.8	e2.8	3.1	2.8	1.7	.42	.42	1.3	0
27	6.6	5.0	e5.6	e4.2	e2.8	4.4	4.6	1.6	.31	.16	.05	0
28	7.0	5.1	e5.6	e3.8	e2.9	2.7	83	1.5	.26	.09	0	0
29	5.8	5.1	e5.2	e3.7	---	2.8	27	1.6	.21	.06	18	0
30	5.1	5.2	e4.5	e3.5	---	2.8	93	1.9	.17	.05	.22	0
31	5.1	---	e5.0	e3.3	---	3.0	---	1.5	---	.03	.06	---
TOTAL	**316.5**	**270.8**	**219.9**	**129.0**	**103.1**	**145.5**	**306.2**	**272.7**	**89.63**	**39.29**	**20.47**	**.04**
MEAN	**10.2**	**9.03**	**7.09**	**4.16**	**3.68**	**4.69**	**10.2**	**8.80**	**2.99**	**1.27**	**.66**	**.001**
MAX	**45**	**55**	**28**	**5.2**	**5.2**	**15**	**93**	**48**	**53**	**31**	**18**	**.02**
MIN	**5.0**	**4.9**	**2.8**	**3.3**	**2.7**	**2.4**	**2.3**	**1.5**	**.17**	**.03**	**0**	**0**
AC-FT	**628**	**537**	**436**	**256**	**204**	**289**	**607**	**541**	**178**	**78**	**41**	**.08**

Table 22. Daily mean streamflow at Rock Creek northeast of Meriden, Kansas, for water years 1992–95—Continued

	Oct. 1994 to Sept. 1995											
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.05	0.13	e0.27	2.9	e2.5	---	---	---	---	---	---
2	0	.03	.14	e.20	2.3	e2.2	---	---	---	---	---	---
3	0	.04	.15	e.16	2.1	e2.1	---	---	---	---	---	---
4	0	.06	.15	e.08	1.5	e2.2	---	---	---	---	---	---
5	0	.06	.14	e.05	1.6	e2.4	---	---	---	---	---	---
6	0	.04	10	e.10	1.1	e2.2	---	---	---	---	---	---
7	0	.03	38	e.20	e1.0	e2.1	---	---	---	---	---	---
8	0	.04	16	e.10	e.90	e2.2	---	---	---	---	---	---
9	0	.05	.67	e.18	e1.0	2.7	---	---	---	---	---	---
10	0	.04	.54	e.25	e1.1	6.0	---	---	---	---	---	---
11	0	.04	.49	e.45	e1.8	4.6	---	---	---	---	---	---
12	0	.05	.42	e.60	e1.7	3.0	---	---	---	---	---	---
13	0	.09	.42	e.80	e1.5	55	---	---	---	---	---	---
14	0	.09	.49	e.70	e1.4	50	---	---	---	---	---	---
15	0	.05	.50	e.80	e1.7	16	---	---	---	---	---	---
16	0	.05	.66	e1.0	e1.6	8.6	---	---	---	---	---	---
17	0	.05	.55	e1.2	e1.4	5.5	---	---	---	---	---	---
18	0	.07	.44	e1.0	e1.5	4.4	---	---	---	---	---	---
19	0	.08	.41	e.90	e1.5	3.7	---	---	---	---	---	---
20	0	4.7	.43	e.85	1.4	3.4	---	---	---	---	---	---
21	0	1.7	.49	e.77	1.3	2.8	---	---	---	---	---	---
22	0	.28	.42	e.72	1.3	2.7	---	---	---	---	---	---
23	0	.15	.38	e.68	1.2	2.4	---	---	---	---	---	---
24	0	.14	.36	e.68	.96	2.1	---	---	---	---	---	---
25	0	.12	.36	e.68	.98	4.6	---	---	---	---	---	---
26	0	.12	.39	e.70	2.0	27	---	---	---	---	---	---
27	0	.20	.44	e1.3	14	6.3	---	---	---	---	---	---
28	0	.18	.43	e3.3	3.4	3.9	---	---	---	---	---	---
29	0	.16	.40	e4.0	---	3.2	---	---	---	---	---	---
30	.02	.14	.40	e3.8	---	2.9	---	---	---	---	---	---
31	.07	---	e.35	e3.3	---	2.8	---	---	---	---	---	---
TOTAL	**.09**	**8.90**	**75.15**	**29.82**	**56.14**	**241.5**	---	---	---	---	---	---
MEAN	**.003**	**.30**	**2.42**	**.96**	**2.00**	**7.79**	---	---	---	---	---	---
MAX	**.07**	**4.7**	**38**	**4.0**	**14**	**55**	---	---	---	---	---	---
MIN	**0**	**.03**	**.13**	**.05**	**.90**	**2.1**	---	---	---	---	---	---
AC-FT	**.2**	**18**	**149**	**59**	**111**	**479**	---	---	---	---	---	---

Table 23. Daily mean streamflow at Slough Creek west of Oskaloosa, Kansas, for water years 1992–95

[All values in cubic feet per second, except as noted. Max, maximum; min, minimum; ac-ft, acre-feet; e, estimated; ---, no data]

Day	Oct. 1991 to Sept. 1992											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	---	---	---	---	---	---	---	---	---	---	9.0	0.24
2	---	---	---	---	---	---	---	---	---	---	29	6.1
3	---	---	---	---	---	---	---	---	---	---	16	1.9
4	---	---	---	---	---	---	---	---	---	---	10	.64
5	---	---	---	---	---	---	---	---	---	---	6.9	3.6
6	---	---	---	---	---	---	---	---	---	---	5.8	36
7	---	---	---	---	---	---	---	---	---	---	7.4	4.9
8	---	---	---	---	---	---	---	---	---	---	6.4	2.8
9	---	---	---	---	---	---	---	---	---	---	5.4	2.3
10	---	---	---	---	---	---	---	---	---	---	4.3	1.4
11	---	---	---	---	---	---	---	---	---	---	2.8	.81
12	---	---	---	---	---	---	---	---	---	---	2.4	.63
13	---	---	---	---	---	---	---	---	---	---	2.3	.53
14	---	---	---	---	---	---	---	---	---	---	2.4	.37
15	---	---	---	---	---	---	---	---	---	---	3.4	.28
16	---	---	---	---	---	---	---	---	---	---	2.1	.19
17	---	---	---	---	---	---	---	---	---	---	1.7	1.7
18	---	---	---	---	---	---	---	---	---	---	1.4	2.0
19	---	---	---	---	---	---	---	---	---	---	1.6	1.1
20	---	---	---	---	---	---	---	---	---	---	1.1	14
21	---	---	---	---	---	---	---	---	---	---	.90	9.0
22	---	---	---	---	---	---	---	---	---	---	.84	3.2
23	---	---	---	---	---	---	---	---	---	---	.67	1.6
24	---	---	---	---	---	---	---	---	---	---	.52	1.2
25	---	---	---	---	---	---	---	---	---	---	.37	.96
26	---	---	---	---	---	---	---	---	---	479	1.9	2.4
27	---	---	---	---	---	---	---	---	---	84	1.3	2.6
28	---	---	---	---	---	---	---	---	---	40	.78	1.3
29	---	---	---	---	---	---	---	---	---	19	.50	.77
30	---	---	---	---	---	---	---	---	---	50	.32	.78
31	---	---	---	---	---	---	---	---	---	15	.25	---
TOTAL	---	---	---	---	---	---	---	---	---	---	**129.75**	**105.30**
MEAN	---	---	---	---	---	---	---	---	---	---	**4.19**	**3.51**
MAX	---	---	---	---	---	---	---	---	---	---	**29**	**36**
MIN	---	---	---	---	---	---	---	---	---	---	**.25**	**.19**
AC-FT	---	---	---	---	---	---	---	---	---	---	**257**	**209**

Table 23. Daily mean streamflow at Slough Creek west of Oskaloosa, Kansas, for water years 1992–95—Continued

Day	Oct. 1992 to Sept. 1993											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.7	13	20	e20	63	55	134	37	18	43	34	17
2	1.6	19	19	e20	64	203	70	201	27	24	25	15
3	1.6	7.8	18	e20	66	118	510	151	21	13	22	14
4	1.5	4.4	19	e19	62	70	256	72	20	1,680	22	12
5	1.4	3.5	16	e19	54	48	108	48	19	381	22	11
6	1.4	2.9	17	e19	47	38	67	47	162	167	23	16
7	1.6	2.8	16	e19	43	32	299	110	70	98	20	12
8	5.7	3.0	18	e19	38	27	228	1,210	90	120	19	13
9	6.0	2.9	23	e19	34	24	110	1,110	65	330	18	11
10	2.2	18	23	e19	34	20	69	360	38	2,630	16	9.5
11	1.4	33	19	e19	37	18	51	e100	29	233	28	8.8
12	1.3	54	16	e19	36	17	87	e70	26	113	32	7.9
13	1.2	20	429	e19	31	17	195	e50	22	92	20	412
14	1.4	13	488	e19	28	17	118	e40	19	72	17	264
15	1.2	9.8	179	e19	26	16	83	e38	16	78	15	92
16	1.1	9.2	80	e19	e18	15	62	e36	15	54	13	60
17	1.0	7.9	56	e19	e18	13	91	e35	14	39	12	43
18	1.4	7.6	43	16	e18	13	93	e35	17	57	11	35
19	1.5	396	37	16	e18	16	60	e60	17	40	9.8	679
20	1.7	270	32	e18	e18	19	49	326	15	42	20	195
21	1.9	71	e30	e18	e18	18	38	155	16	127	18	375
22	1.9	42	e28	e18	e18	18	35	32	12	491	16	199
23	1.8	28	21	e17	e18	17	31	33	11	182	12	735
24	2.0	22	e24	e17	20	15	28	28	13	133	10	696
25	2.1	76	e23	e17	24	15	25	25	12	81	9.6	425
26	2.7	55	e23	32	28	15	23	24	10	103	8.8	124
27	2.2	34	e22	56	21	15	22	22	9.8	73	8.1	75
28	2.6	28	17	88	22	15	42	20	9.2	48	114	55
29	4.2	24	e20	85	---	16	143	20	8.7	37	43	45
30	5.3	22	e20	57	---	32	53	27	7.6	31	28	37
31	4.8	---	e20	54	---	420	---	20	---	28	25	---
TOTAL	**69.4**	**1,299.8**	**1,816**	**835**	**922**	**1,392**	**3,180**	**4,542**	**829.3**	**7,640**	**691.3**	**4,693.2**
MEAN	**2.24**	**43.3**	**58.6**	**26.9**	**32.9**	**44.9**	**106**	**147**	**27.6**	**246**	**22.3**	**156**
MAX	**6.0**	**396**	**488**	**88**	**66**	**420**	**510**	**1,210**	**162**	**2,630**	**114**	**735**
MIN	**1.0**	**2.8**	**16**	**16**	**18**	**13**	**22**	**20**	**7.6**	**13**	**8.1**	**7.9**
AC-FT	**138**	**2,580**	**3,600**	**1,660**	**1,830**	**2,760**	**6,310**	**9,010**	**1,640**	**15,150**	**1,370**	**9,310**

Table 23. Daily mean streamflow at Slough Creek west of Oskaloosa, Kansas, for water years 1992–95—Continued

	Oct. 1993 to Sept. 1994											
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31	16	13	e12	e9.0	e9.0	7.3	80	4.0	2.1	0.11	0.18
2	28	16	12	e12	e9.4	25	7.2	52	4.0	87	.10	.14
3	26	15	12	e12	e9.8	43	8.0	43	5.0	9.9	.09	.12
4	24	16	12	e11	e10	33	7.8	34	4.9	4.5	.12	.10
5	23	15	11	e11	e11	22	6.3	28	4.3	2.7	.08	.10
6	21	13	10	e10	e12	18	6.7	55	4.5	1.8	.06	.09
7	21	14	10	e9.2	e11	17	6.4	39	3.9	1.5	.06	.09
8	26	14	9.8	e9.8	e8.5	14	6.3	29	22	1.5	.05	.09
9	23	13	11	e9.6	e8.0	13	7.7	25	8.5	1.1	.05	.08
10	20	13	9.7	e9.2	e8.5	11	18	21	6.1	.92	.05	.08
11	21	14	8.9	e9.0	e8.8	11	16	18	4.7	.72	.04	.08
12	20	74	9.4	e8.9	e9.2	10	17	16	3.9	.52	.04	.09
13	19	52	22	e9.0	e9.8	10	15	15	3.9	.45	.03	.09
14	18	39	29	e9.0	e10	10	13	15	3.1	.38	.03	.09
15	52	33	27	e9.0	e11	10	11	16	2.4	.31	.03	.09
16	41	25	44	e8.9	e10	9.1	9.1	13	1.9	.35	.03	.09
17	32	22	33	e8.8	e9.6	9.3	8.5	12	1.8	.42	.03	.08
18	52	20	25	e8.6	e10	8.9	8.2	11	1.6	.36	.03	.09
19	50	19	21	e8.6	e9.6	8.5	7.4	9.7	1.5	.31	.07	.11
20	33	17	19	e9.0	e8.0	8.9	6.7	9.2	1.4	.38	.03	.11
21	27	16	19	e10	e7.2	8.3	22	8.7	1.3	.66	.02	.13
22	24	15	18	e11	e7.0	8.5	17	8.0	1.4	.34	.02	.18
23	22	15	e17	e12	e7.0	8.1	13	7.1	2.4	.20	.02	.22
24	20	14	e16	e13	e7.0	6.2	12	6.5	1.9	.16	.03	.23
25	19	15	e15	e13	e7.0	6.3	11	5.4	1.3	.20	.03	.19
26	18	19	e14	e13	e6.8	7.9	10	5.0	1.1	.53	.07	.18
27	17	21	e14	e11	e6.5	8.6	19	4.4	.92	.44	.05	.17
28	17	15	e15	e10	e6.5	7.3	335	4.3	.87	.20	.04	.17
29	16	19	e14	e9.6	---	7.2	97	6.2	.54	.14	.36	.16
30	15	13	e13	e9.0	---	7.8	164	6.6	.28	.12	.41	.14
31	15	---	e12	e8.8	---	7.5	---	4.7	---	.13	.25	---
TOTAL	**791**	**622**	**515.8**	**315.0**	**248.2**	**384.4**	**893.6**	**607.8**	**105.41**	**120.34**	**2.43**	**3.76**
MEAN	**25.5**	**20.7**	**16.6**	**10.2**	**8.86**	**12.4**	**29.8**	**19.6**	**3.51**	**3.88**	**.078**	**.13**
MAX	**52**	**74**	**44**	**13**	**12**	**43**	**335**	**80**	**22**	**87**	**.41**	**.23**
MIN	**15**	**13**	**8.9**	**8.6**	**6.5**	**6.2**	**6.3**	**4.3**	**.28**	**.12**	**.02**	**.08**
AC-FT	**1,570**	**1,230**	**1,020**	**625**	**492**	**762**	**1,770**	**1,210**	**209**	**239**	**4.8**	**7.5**

Table 23. Daily mean streamflow at Slough Creek west of Oskaloosa, Kansas, for water years 1992–95—Continued

	Oct. 1994 to Sept. 1995											
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.10	0.02	0.04	0.13	5.3	0.83	---	---	---	---	---	---
2	.33	.02	.03	.09	3.4	.81	---	---	---	---	---	---
3	2.9	.02	.03	.07	3.0	.87	---	---	---	---	---	---
4	.13	.02	.03	.16	2.1	1.3	---	---	---	---	---	---
5	.07	.03	.03	e.10	1.7	1.7	---	---	---	---	---	---
6	.04	.03	6.1	.03	2.0	e1.3	---	---	---	---	---	---
7	.03	.03	16	.18	1.3	e1.7	---	---	---	---	---	---
8	.03	.03	1.2	.09	e1.1	4.5	---	---	---	---	---	---
9	.03	.03	.51	.05	e1.1	3.0	---	---	---	---	---	---
10	.02	.03	.25	.09	e1.4	5.5	---	---	---	---	---	---
11	.02	.03	.24	.70	e1.2	5.7	---	---	---	---	---	---
12	.02	.03	.15	1.7	e1.0	3.4	---	---	---	---	---	---
13	.02	.05	.14	1.2	e.90	4.0	---	---	---	---	---	---
14	.02	.06	.13	.28	e.80	3.8	---	---	---	---	---	---
15	.02	.07	.14	.17	e1.0	2.8	---	---	---	---	---	---
16	.02	.06	.26	.26	e1.7	2.4	---	---	---	---	---	---
17	.02	.05	.23	.57	e1.5	2.0	---	---	---	---	---	---
18	.02	.05	.13	e.20	e1.3	1.9	---	---	---	---	---	---
19	.01	.06	.12	e.15	e1.1	2.0	---	---	---	---	---	---
20	.01	12	.15	e.08	e1.0	1.8	---	---	---	---	---	---
21	.01	3.7	.09	e.07	.89	1.4	---	---	---	---	---	---
22	.01	.18	.08	e.07	1.0	1.4	---	---	---	---	---	---
23	.01	.07	.08	e.06	1.0	1.2	---	---	---	---	---	---
24	.01	.04	.08	e.06	.74	1.0	---	---	---	---	---	---
25	.01	.03	.07	e.06	.88	2.3	---	---	---	---	---	---
26	.01	.03	.10	.09	1.6	8.4	---	---	---	---	---	---
27	.01	.84	.09	3.6	2.6	3.1	---	---	---	---	---	---
28	.01	.29	.08	67	1.5	1.9	---	---	---	---	---	---
29	.01	.07	.07	18	---	1.5	---	---	---	---	---	---
30	.01	.04	.07	13	---	1.4	---	---	---	---	---	---
31	.02	---	.08	14	---	1.4	---	---	---	---	---	---
TOTAL	**3.98**	**18.01**	**26.80**	**122.31**	**44.11**	**76.31**	---	---	---	---	---	---
MEAN	**.13**	**.60**	**.86**	**3.95**	**1.58**	**2.46**	---	---	---	---	---	---
MAX	**2.9**	**12**	**16**	**67**	**5.3**	**8.4**	---	---	---	---	---	---
MIN	**.01**	**.02**	**.03**	**.03**	**.74**	**.81**	---	---	---	---	---	---
AC-FT	**7.9**	**36**	**53**	**243**	**87**	**151**	---	---	---	---	---	---

Table 24. Daily mean streamflow at Delaware River below Perry Dam, Kansas, for water years 1992–95

[All values in cubic feet per second, except as noted. Max, maximum; min, minimum; ac-ft, acre-feet; e, estimated; ---, no data]

	Oct. 1991 to Sept. 1992											
Day	**Oct.**	**Nov.**	**Dec.**	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**June**	**July**	**Aug.**	**Sept.**
1	200	56	25	25	25	25	500	1,750	100	30	30	25
2	200	25	25	25	25	25	406	1,000	100	30	2,070	30
3	200	25	25	25	25	25	162	688	100	30	3,930	274
4	289	25	25	25	25	25	100	490	100	30	3,940	495
5	182	25	25	25	25	25	100	246	100	30	3,900	495
6	140	25	25	25	25	25	100	100	100	30	3,920	1,040
7	147	25	25	25	25	25	100	100	100	30	3,920	1,500
8	150	25	25	25	25	25	100	100	100	30	3,740	2,440
9	150	25	25	25	25	25	100	100	100	30	3,680	2,940
10	317	25	25	25	25	25	100	100	100	30	3,600	2,900
11	438	25	25	25	25	25	100	100	100	30	3,780	3,000
12	516	25	25	25	25	25	100	100	290	30	3,960	2,900
13	624	25	25	25	25	25	150	100	420	30	2,790	3,000
14	624	25	25	25	25	25	200	100	480	30	1,150	1,390
15	562	25	25	25	25	25	200	100	460	828	500	22
16	562	25	25	25	25	25	264	100	430	3,040	216	13
17	562	25	25	25	25	25	300	100	410	3,940	30	0
18	562	25	25	25	28	25	300	100	304	3,940	30	0
19	562	25	25	25	28	1,070	300	100	100	3,970	30	0
20	562	25	25	25	28	2,000	534	100	100	3,920	30	0
21	562	25	25	25	28	2,000	1,460	100	100	3,930	30	0
22	926	25	25	25	28	2,000	1,950	100	100	3,920	30	0
23	1,000	25	25	25	28	2,000	1,960	100	61	3,960	30	0
24	844	25	25	25	28	2,000	2,610	100	30	3,920	25	0
25	624	25	25	25	28	2,000	2,970	100	30	3,900	30	14
26	624	25	25	25	26	2,000	2,970	100	30	1,660	30	25
27	340	25	25	25	25	1,420	2,950	100	30	30	30	25
28	100	25	25	25	25	500	2,950	100	30	30	25	25
29	100	25	25	25	25	500	2,960	100	30	30	25	25
30	100	25	25	25	---	500	2,970	100	30	30	25	25
31	100	---	25	25	---	500	---	100	---	30	25	---
TOTAL	**12,869**	**781**	**775**	**775**	**750**	**18,940**	**29,966**	**6,774**	**4,565**	**41,498**	**45,551**	**22,603**
MEAN	**415**	**26.0**	**25.0**	**25.0**	**25.9**	**611**	**999**	**219**	**152**	**1,339**	**1,469**	**753**
MAX	**1,000**	**56**	**25**	**25**	**28**	**2,000**	**2,970**	**1,750**	**480**	**3,970**	**3,960**	**3,000**
MIN	**100**	**25**	**25**	**25**	**25**	**25**	**100**	**100**	**30**	**30**	**25**	**0**
AC-FT	**25,530**	**1,550**	**1,540**	**1,540**	**1,490**	**37,570**	**59,440**	**13,440**	**9,050**	**82,310**	**90,350**	**44,830**

Table 24. Daily mean streamflow at Delaware River below Perry Dam, Kansas, for water years 1992–95—Continued

Day	Oct. 1992 to Sept. 1993											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	25	2,000	388	570	438	270	1,650	6,800	215	5,000	450
2	25	272	2,000	388	868	766	270	1,000	4,880	30	5,000	334
3	25	500	2,000	388	1,270	1,580	270	1,000	3,460	30	5,000	250
4	25	500	2,000	388	1,500	2,000	270	1,000	3,000	30	5,000	250
5	25	500	2,000	388	1,500	2,000	270	1,000	3,000	30	5,060	250
6	25	213	1,900	388	1,500	2,000	270	1,000	2,420	30	5,000	250
7	25	25	1,900	388	1,500	2,000	270	1,000	826	30	5,000	250
8	25	25	2,560	388	1,500	2,000	260	1,000	30	30	5,000	250
9	25	25	3,000	388	1,500	1,080	248	447	30	30	6,860	168
10	25	25	3,000	388	1,500	500	248	25	30	30	9,920	100
11	25	25	3,000	388	1,500	358	1,540	25	261	30	10,000	100
12	25	133	3,000	388	1,500	250	3,900	25	400	30	10,000	100
13	25	250	3,000	388	1,500	250	1,860	25	400	30	9,960	100
14	25	250	3,000	388	1,500	250	25	25	400	30	9,950	100
15	25	250	3,100	388	1,500	250	1,350	25	400	28	9,960	100
16	25	250	3,100	388	1,500	250	5,020	25	400	25	9,900	100
17	25	250	3,100	388	1,500	250	8,140	25	400	25	9,880	100
18	25	396	3,100	388	904	250	9,000	826	400	25	9,750	100
19	25	500	3,000	388	438	250	9,000	3,740	400	25	9,890	100
20	25	1,710	3,000	388	438	250	7,040	7,720	400	25	9,890	100
21	25	3,500	3,000	388	438	250	5,000	9,960	400	25	10,000	100
22	25	3,460	3,000	388	438	250	4,900	10,000	400	25	9,970	100
23	25	3,440	3,000	388	438	250	4,960	9,960	400	25	9,900	100
24	25	3,400	3,000	388	438	250	5,000	7,200	400	2,790	9,850	100
25	25	3,380	3,000	388	438	250	4,960	6,040	400	5,000	9,640	100
26	25	3,370	3,000	388	438	250	4,900	8,540	400	5,000	9,860	100
27	25	3,330	3,000	388	438	250	4,900	9,960	400	5,000	6,890	100
28	25	3,280	3,000	388	438	250	3,830	9,940	400	5,000	5,250	100
29	25	3,280	2,580	388	---	250	2,900	8,820	400	5,000	5,020	100
30	25	2,580	1,140	388	---	250	2,900	7,960	380	5,000	2,870	529
31	25	---	688	388	---	260	---	8,040	---	5,000	640	---
TOTAL	**775**	**39,144**	**81,168**	**12,028**	**28,992**	**19,732**	**93,771**	**118,003**	**32,317**	**38,623**	**235,910**	**4,981**
MEAN	**25.0**	**1,305**	**2,618**	**388**	**1,035**	**637**	**3,126**	**3,807**	**1,077**	**1,246**	**7,610**	**166**
MAX	**25**	**3,500**	**3,100**	**388**	**1,500**	**2,000**	**9,000**	**10,000**	**6,800**	**5,000**	**10,000**	**529**
MIN	**25**	**25**	**688**	**388**	**438**	**250**	**25**	**25**	**30**	**25**	**640**	**100**
AC-FT	**1,540**	**77,640**	**161,000**	**23,860**	**57,510**	**39,140**	**186,000**	**234,100**	**64,100**	**76,610**	**467,900**	**9,880**

Table 24. Daily mean streamflow at Delaware River below Perry Dam, Kansas, for water years 1992–95—Continued

	Oct. 1993 to Sept. 1994											
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,350	156	244	500	100	244	35	30	100	56	25	32
2	4,890	100	244	500	100	244	38	595	100	25	25	30
3	4,720	100	244	500	100	244	41	1,000	100	762	25	25
4	4,770	100	234	363	100	244	44	1,000	100	1,480	25	25
5	4,970	100	0	280	100	244	38	1,000	100	2,350	26	25
6	5,000	100	0	280	100	244	25	1,290	100	2,980	28	25
7	4,870	100	107	280	100	244	25	1,480	100	2,980	30	25
8	2,920	100	244	280	100	244	25	1,450	491	2,980	42	25
9	1,400	100	244	280	100	244	25	1,460	1,000	1,340	55	25
10	964	100	244	171	100	244	25	1,480	1,000	250	63	27
11	450	100	244	100	100	244	25	1,210	1,000	170	71	29
12	476	100	244	100	100	244	25	708	1,000	100	51	28
13	500	100	244	100	100	244	25	349	1,000	100	25	25
14	500	100	244	100	100	244	25	250	1,000	73	25	25
15	1,300	100	244	100	100	244	25	250	1,000	50	25	25
16	1,950	100	244	100	100	244	25	1,000	1,000	50	24	25
17	1,900	101	246	100	100	244	25	1,490	1,000	50	24	25
18	1,920	102	248	100	100	244	25	1,480	1,000	50	24	25
19	1,960	103	248	100	100	244	25	1,460	1,000	34	24	25
20	1,960	104	395	100	100	244	25	1,180	1,000	25	24	25
21	1,940	106	500	100	100	244	25	1,000	688	25	27	25
22	1,990	192	500	100	100	115	25	1,000	500	25	25	25
23	1,940	244	500	100	189	22	25	698	365	25	25	25
24	1,890	244	500	100	244	28	25	349	716	25	25	25
25	860	244	500	100	244	25	25	250	1,000	25	25	25
26	252	244	500	100	244	25	25	250	1,000	25	25	25
27	246	244	500	100	244	25	25	162	1,000	25	25	25
28	246	244	500	100	244	27	25	100	1,000	25	25	25
29	246	244	500	100	---	29	30	100	688	25	26	25
30	246	244	500	100	---	31	30	100	283	25	28	25
31	246	---	500	100	---	33	---	100	---	25	30	---
TOTAL	**60,872**	**4,316**	**9,906**	**5,534**	**3,609**	**5,484**	**831**	**24,271**	**20,431**	**16,180**	**947**	**771**
MEAN	**1,964**	**144**	**320**	**179**	**129**	**177**	**27.7**	**783**	**681**	**522**	**30.5**	**25.7**
MAX	**5,000**	**244**	**500**	**500**	**244**	**244**	**44**	**1,490**	**1,000**	**2,980**	**71**	**32**
MIN	**246**	**100**	**0**	**100**	**100**	**22**	**25**	**30**	**100**	**25**	**24**	**25**
AC-FT	**120,700**	**8,560**	**19,650**	**10,980**	**7,160**	**10,880**	**1,650**	**48,140**	**40,520**	**32,090**	**1,880**	**1,530**

Table 24. Daily mean streamflow at Delaware River below Perry Dam, Kansas, for water years 1992–95—Continued

Day	Oct. 1994 to Sept. 1995											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	25	26	102	110	25	500	---	---	---	---	---
2	25	25	26	102	115	25	500	---	---	---	---	---
3	25	25	26	103	194	25	500	---	---	---	---	---
4	25	25	26	101	246	25	500	---	---	---	---	---
5	26	25	27	100	246	25	266	---	---	---	---	---
6	26	25	27	100	246	25	102	---	---	---	---	---
7	26	25	27	100	246	25	59	---	---	---	---	---
8	27	25	27	100	246	25	28	---	---	---	---	---
9	28	25	28	100	246	25	28	---	---	---	---	---
10	28	25	28	56	246	25	28	---	---	---	---	---
11	29	25	28	25	246	25	28	---	---	---	---	---
12	29	25	28	25	246	25	303	---	---	---	---	---
13	29	25	29	25	161	25	500	---	---	---	---	---
14	30	25	27	25	58	25	495	---	---	---	---	---
15	30	26	26	25	25	218	495	---	---	---	---	---
16	30	26	26	25	25	485	490	---	---	---	---	---
17	31	26	26	25	25	475	490	---	---	---	---	---
18	31	26	27	25	25	480	485	---	---	---	---	---
19	31	26	27	25	25	485	485	---	---	---	---	---
20	32	26	27	25	25	485	480	---	---	---	---	---
21	32	26	72	25	25	485	401	---	---	---	---	---
22	33	26	100	25	25	470	244	---	---	---	---	---
23	34	26	100	25	25	460	244	---	---	---	---	---
24	34	27	101	25	25	445	244	---	---	---	---	---
25	34	27	101	25	25	468	155	---	---	---	---	---
26	35	27	101	25	25	495	56	---	---	---	---	---
27	30	27	101	25	25	1,080	25	---	---	---	---	---
28	25	26	101	25	25	1,500	---	---	---	---	---	---
29	25	25	102	25	---	1,500	---	---	---	---	---	---
30	25	25	102	59	---	1,500	---	---	---	---	---	---
31	25	---	102	105	---	917	---	---	---	---	---	---
TOTAL	**895**	**768**	**1,622**	**1,603**	**3,202**	**12,298**	---	---	---	---	---	---
MEAN	**28.9**	**25.6**	**52.3**	**51.7**	**114**	**397**	---	---	---	---	---	---
MAX	**35**	**27**	**102**	**105**	**246**	**1,500**	---	---	---	---	---	---
MIN	**25**	**25**	**26**	**25**	**25**	**25**	---	---	---	---	---	---
AC-FT	**1,780**	**1,520**	**3,220**	**3,180**	**6,350**	**24,390**	---	---	---	---	---	---

Table 25. Daily mean triazine concentrations determined by immunoassay in samples from Delaware River near Horton, Kansas, from July 1992 through March 1995

[Bold type indicates an estimated value. Values less than 0.04 were assigned a value of 0.02 for computation of mean. -----, no data]

	1992						1993								
Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		2.3	1.5	**0.43**	0.36	0.43	**0.33**	**0.42**	**1.0**	0.96	**0.24**	**4.0**	15	**1.1**	**0.66**
2		2.6	3.6	.38	.84	**.41**	**.33**	**.42**	1.0	.90	.25	2.8	3.2	**1.0**	**.59**
3		2.4	1.6	**.38**	.64	**.38**	**.38**	**.42**	**.92**	.85	.21	**2.7**	**3.2**	**.90**	**.52**
4		**1.9**	1.3	**.38**	**.62**	**.36**	**.38**	**.42**	**.83**	**.98**	**.30**	**2.6**	**3.2**	**.80**	**.46**
5		1.4	1.3	**.38**	**.60**	**.33**	.38	**.42**	.73	1.1	**.39**	**2.6**	10	**.70**	**.39**
6		**1.4**	2.1	**.38**	.59	**.31**	**.37**	**.42**	**.67**	**.82**	.43	**2.5**	**7.8**	.59	.43
7		2.0	2.0	.40	**.55**	**.28**	**.36**	**.42**	**.61**	.55	2.2	5.6	5.0	**.58**	.55
8		3.0	**1.6**	.65	**.50**	.26	**.35**	**.42**	**.55**	**.61**	3.2	15	7.1	**.57**	**.53**
9		3.1	**1.2**	.54	**.46**	.19	**.34**	**.42**	**.49**	.68	3.1	**7.7**	6.9	**.55**	**.50**
10		2.0	.84	**.50**	.41	**.19**	**.34**	**.42**	.43	**.58**	2.5	4.8	7.7	**.54**	**.48**
11		**1.5**	**.79**	**.47**	**.41**	.56	**.33**	.57	**.40**	**.48**	**2.5**	**4.2**	5.0	**.53**	**.45**
12		**1.4**	**.73**	**.43**	.62	**.56**	**.32**	**.54**	**.38**	.38	**1.9**	**3.5**	4.5	.52	**.43**
13		**1.2**	**.68**	.40	.55	.69	**.31**	**.50**	**.35**	.35	**1.3**	**2.9**	**9.5**	**.53**	**.41**
14		.98	**.62**	**.38**	**.49**	1.1	**.30**	**.46**	**.33**	**.41**	.74	**2.2**	9.5	**.55**	.38
15		**.99**	.57	**.36**	**.43**	1.1	**.29**	**.43**	**.30**	.48	**.71**	1.6	**7.4**	**.56**	**.37**
16		**1.0**	**.52**	**.34**	**.37**	**.85**	**.28**	**.40**	**.27**	**.48**	**.68**	**1.4**	5.3	**.57**	**.36**
17		1.0	.47	.33	.31	.63	**.27**	**.36**	.25	**.48**	**.66**	1.9	**5.3**	**.58**	**.35**
18		**.94**	**.47**	**.33**	**.31**	**.58**	**.27**	**.32**	**.25**	**.48**	**.63**	29	**5.3**	**.60**	.37
19		**.86**	**.47**	**.33**	.91	**.53**	**.26**	**.29**	**.25**	.46	**.60**	37	3.7	.61	.88
20		.79	.89	**.33**	1.5	**.48**	**.25**	**.26**	**.25**	.85	.57	23	**2.8**	**.60**	1.2
21		**.75**	1.8	**.33**	1.2	**.43**	**.24**	**.22**	**.25**	.52	**.52**	16	1.8	**.59**	**1.0**
22		**.71**	**1.6**	**.33**	**1.1**	**.38**	.23	**.18**	**.25**	**.47**	**.47**	**14**	3.5	**.58**	.88
23		**.67**	1.4	**.33**	.92	.33	**.23**	.15	**.25**	**.42**	**.42**	**12**	3.8	**.57**	1.0
24	4.8	**.63**	**1.2**	.37	**.77**	**.33**	**.23**	**.15**	**.25**	**.37**	**.37**	**10**	4.9	**.56**	1.1
25	**4.8**	.59	**1.1**	.35	.61	**.33**	**.23**	**.15**	**.25**	**.32**	**.32**	**8.6**	3.3	**.55**	1.2
26	4.6	.57	**.90**	**.33**	.86	**.33**	**.23**	**.15**	.25	**.27**	**.27**	**6.9**	**3.0**	.54	**1.2**
27	4.9	**.56**	**.74**	**.31**	**.77**	**.33**	**.23**	**.15**	**.25**	.22	**.22**	**5.1**	**2.7**	**.54**	1.2
28	**3.9**	.54	.58	**.29**	**.69**	**.33**	**.42**	**.15**	**.25**	**.23**	.17	3.4	2.4	**.62**	**1.1**
29	2.9	**.50**	**.53**	.27	**.60**	**.33**	.42	-----	**.25**	**.24**	1.7	**3.0**	**1.8**	**.70**	**1.0**
30	2.4	**.46**	**.48**	**.27**	**.52**	**.33**	**.42**	-----	.32	**.24**	14	**2.5**	1.3	.79	.92
31	2.7	**.43**	-----	**.27**	-----	**.33**	**.42**	-----	.72	-----	**5.3**	-----	**1.2**	**.72**	-----
SUM	**31**	**39**	**34**	**12**	**20**	**14**	**9.7**	**9.6**	**14**	**16**	**46**	**240**	**157**	**20**	**21**
MEAN	**3.9**	**1.3**	**1.1**	**.37**	**.65**	**.45**	**.31**	**.34**	**.44**	**.54**	**1.5**	**8.0**	**5.1**	**.64**	**.71**

Table 25. Daily mean triazine concentrations determined by immunoassay in samples from Delaware River near Horton, Kansas, from July 1992 through March 1995—Continued

	1993			1994												1995		
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	0.83	0.43	0.23	0.26	0.22	0.14	0.18	2.2	0.73	0.99	2.0	0.74	0.38	0.38	0.38	0.32	0.21	0.18
2	.74	.43	.25	.26	.22	.14	.17	1.5	.95	16	1.9	.70	.37	.38	.38	.33	.20	.18
3	.66	.42	.26	.25	.21	.20	.17	1.4	.94	17	1.8	.67	1.2	.38	.38	.34	.18	.18
4	.57	.42	.28	.25	.19	.28	.16	1.3	.94	11	1.7	.63	1.8	.38	.38	.35	.18	.18
5	.48	.39	.30	.24	.18	.39	.17	1.3	1.0	11	1.6	.59	1.4	.38	.38	.36	.19	.18
6	.39	.35	.31	.24	.17	.39	.18	11	1.1	11	1.5	.55	1.1	.38	.50	.34	.19	.18
7	.39	.32	.33	.22	.15	.39	.18	6.1	.83	6.0	1.4	.56	1.2	.38	.71	.32	.19	.18
8	.38	.28	.34	.21	.14	.39	.18	2.5	13	4.1	1.3	.56	1.1	.38	.60	.31	.19	.18
9	.38	.25	.36	.19	.13	.39	.18	2.1	14	3.9	1.2	.57	1.1	.38	.50	.29	.20	.18
10	.38	.25	.36	.17	.11	.39	.40	1.9	15	3.7	1.2	.58	1.1	.38	.46	.27	.20	.18
11	.38	.25	.36	.16	.10	.35	.69	1.7	7.0	3.6	1.2	.59	1.0	.37	.44	.25	.20	.18
12	.37	.28	.36	.14	.10	.32	4.0	1.5	4.0	3.5	1.1	.60	1.0	.37	.43	.26	.21	.18
13	.37	.28	.20	.14	.09	.28	2.8	1.5	3.3	3.3	1.1	.60	.96	.37	.43	.26	.21	.27
14	.42	.25	.39	.14	.09	.24	2.6	19	3.4	3.2	1.0	.61	.92	.37	.42	.27	.21	.80
15	.46	.30	.40	.13	.08	.24	2.2	8.4	3.4	3.0	.98	.59	.88	.36	.42	.28	.21	.80
16	.51	.35	.41	.13	.08	.25	2.0	6.0	3.6	2.8	.93	.56	.84	.36	.41	.28	.22	.80
17	.55	.40	.41	.13	.10	.26	1.9	4.0	3.4	2.6	.89	.54	.80	.36	.40	.29	.22	.60
18	.60	.39	.41	.13	.12	.27	1.8	3.0	3.2	2.5	.84	.51	.77	.36	.40	.30	.22	.55
19	.57	.38	.41	.12	.13	.26	1.8	2.0	2.9	2.4	.82	.49	.73	.36	.39	.31	.21	.50
20	.55	.37	.41	.12	.14	.26	1.8	1.8	2.7	4.0	.81	.46	.69	.42	.39	.31	.21	.48
21	.52	.35	.41	.12	.14	.25	6.2	1.6	2.5	4.2	.79	.44	.65	.65	.38	.32	.20	.46
22	.50	.34	.39	.11	.14	.25	6.2	1.4	2.4	3.8	.77	.43	.61	.45	.37	.33	.20	.44
23	.49	.33	.38	.10	.14	.24	3.5	1.3	3.2	3.2	.75	.43	.60	.42	.35	.33	.20	.43
24	.48	.32	.36	.10	.14	.24	2.9	1.2	2.5	2.9	.74	.42	.53	.40	.34	.34	.19	.42
25	.48	.30	.35	.09	.14	.23	2.3	1.2	2.2	2.7	.72	.41	.50	.39	.32	.32	.19	.42
26	.47	.29	.33	.08	.14	.22	2.2	1.2	1.8	2.5	.85	.41	.46	.39	.31	.31	.18	.78
27	.46	.28	.32	.20	.14	.22	2.2	1.1	1.4	2.4	.82	.40	.43	.38	.29	.29	.18	.92
28	.45	.27	.30	.21	.14	.21	2.3	1.0	1.2	2.3	.80	.40	.42	.38	.28	.28	.18	.81
29	.45	.26	.29	.22	-----	.20	2.2	.91	1.1	2.3	.78	.39	.41	.38	.29	.26	-----	.70
30	.44	.24	.27	.22	-----	.20	4.7	.82	1.0	2.2	.82	.38	.40	.38	.30	.24	-----	.59
31	.44	-----	.27	.22	-----	.19	-----	.73	-----	2.1	.78	-----	.39	-----	.31	.23	-----	.48
SUM	15	10	10	5.3	3.9	8.3	58	93	105	146	34	16	25	12	12	9.3	5.6	13
MEAN	.49	.33	.34	.17	.14	.27	1.9	3.0	3.5	4.7	1.1	.53	.80	.39	.40	.30	.20	.43

Table 26. Daily mean triazine concentrations determined by immunoassay in samples from Mud Creek near Horton, Kansas, from July 1992 through March 1995

[Bold type indicates an estimated value. Values less than 0.04 were assigned a value of 0.02 for computation of mean. -----, no data]

	1992						1993								
Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		1.1	0.38	**0.25**	0.45	0.15	**0.05**	**0.20**	**0.60**	0.39	**0.21**	**2.7**	19	**0.31**	**0.22**
2		1.2	1.4	.22	.50	**.15**	**.04**	**.20**	.93	.26	.15	2.4	21	**.26**	**.21**
3		1.0	1.2	**.20**	.53	**.14**	.02	**.25**	**.73**	.22	.70	**2.0**	**13**	**.22**	**.20**
4		**.90**	1.0	**.19**	**.43**	**.14**	**.02**	**.25**	**.54**	.39	**.65**	**1.6**	4.1	**.18**	**.19**
5		.74	1.1	**.17**	**.33**	**.13**	.22	**.25**	.34	.40	**.61**	**1.2**	12	**.14**	**.18**
6		**.66**	1.0	**.16**	.23	**.13**	**.21**	**.25**	**.30**	**.32**	.56	**.74**	5.7	.14	.34
7		.59	1.0	.14	**.23**	**.12**	**.20**	**.25**	**.27**	.24	.51	1.7	5.2	**.15**	.10
8		1.1	.64	.24	**.23**	.12	**.19**	**.25**	**.23**	**.24**	.99	6.8	3.5	**.15**	**.11**
9		**.93**	.59	.27	**.23**	**.12**	**.18**	**.25**	**.20**	.24	1.1	**4.0**	4.4	**.15**	**.11**
10		.77	.39	**.27**	.31	**.12**	**.17**	**.36**	.16	**.21**	.82	1.9	3.4	**.15**	**.12**
11		**.69**	**.37**	**.27**	**.31**	**.12**	**.16**	.36	**.15**	**.19**	**.49**	**1.7**	4.0	**.15**	**.12**
12		**.61**	**.35**	**.27**	.52	**.12**	**.15**	**.25**	**.13**	.17	**.16**	**1.5**	1.7	.15	**.13**
13		**.53**	**.33**	.29	.31	.41	**.14**	**.15**	**.12**	.23	**.16**	**1.3**	2.0	**.19**	**.13**
14		.45	**.31**	**.25**	**.27**	.65	**.12**	**.12**	**.10**	.39	.16	**1.2**	3.0	**.23**	.14
15		**.42**	.29	**.21**	**.22**	.62	**.11**	**.10**	**.09**	.28	.18	.97	2.2	**.27**	**.14**
16		**.39**	**.26**	**.16**	**.18**	**.44**	**.10**	**.08**	**.07**	**.25**	.11	**.97**	2.4	**.31**	**.14**
17		.36	.23	.12	.13	.25	**.09**	**.06**	.06	**.23**	**.34**	.97	1.9	**.31**	**.14**
18		**.34**	**.23**	**.12**	**.13**	**.22**	**.08**	**.04**	**.06**	**.20**	.34	28	2.7	**.31**	.19
19		**.33**	**.23**	**.12**	.58	**.19**	**.07**	**.04**	**.06**	.20	.28	34	1.9	.31	.51
20		.32	.61	**.12**	.85	**.15**	**.06**	**.02**	**.07**	**.20**	.32	22	1.4	**.30**	.78
21		**.31**	.71	**.12**	.61	.12	**.05**	**.02**	**.07**	**.20**	**.29**	9.6	1.0	**.28**	**.59**
22		**.29**	.72	**.12**	**.45**	**.12**	.02	**.02**	**.07**	**.20**	**.26**	**8.5**	1.2	**.27**	.40
23		**.28**	.47	**.12**	.29	.13	**.02**	.02	**.07**	**.20**	**.22**	**7.5**	1.0	**.26**	.54
24	2.6	**.27**	**.44**	.23	**.27**	**.12**	**.02**	**.02**	**.07**	**.21**	**.19**	**6.4**	1.8	**.25**	.61
25	**2.6**	.26	**.41**	**.21**	.24	**.11**	**.02**	**.02**	**.08**	**.21**	**.16**	**5.3**	1.3	**.23**	.88
26	3.9	**.26**	**.38**	**.19**	.35	**.10**	**.15**	**.02**	.08	**.21**	**.13**	**4.2**	**1.1**	.22	**.72**
27	3.6	**.25**	**.35**	**.17**	.35	**.09**	**.15**	**.02**	**.08**	.21	**.10**	**3.2**	**.95**	**.22**	.56
28	**2.4**	.25	.31	**.15**	**.30**	**.08**	**.15**	**.10**	**.08**	**.21**	.06	2.1	**.76**	.24	**.47**
29	1.2	**.24**	**.29**	.13	**.24**	**.08**	.15	-----	**.10**	**.21**	.53	**1.7**	**.58**	**.24**	**.37**
30	2.1	**.23**	**.27**	**.13**	**.19**	**.07**	**.15**	-----	**.35**	**.21**	3.4	1.3	.39	.24	.28
31	2.0	**.22**	-----	**.13**	-----	**.06**	**.15**	-----	.49	-----	**3.1**	-----	**.35**	**.23**	-----
SUM	**20**	**16**	**16**	**5.7**	**10**	**5.6**	**3.4**	**4.0**	**6.8**	**7.3**	**17**	**168**	**126**	**7.1**	**9.6**
MEAN	**2.6**	**.53**	**.54**	**.19**	**.34**	**.18**	**.11**	**.14**	**.22**	**.24**	**.56**	**5.6**	**4.0**	**.23**	**.32**

Table 26. Daily mean triazine concentrations determined by immunoassay in samples from Mud Creek near Horton, Kansas, from July 1992 through March 1995—Continued

	1993			1994												1995		
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	0.26	0.15	0.07	0.12	0.14	0.13	0.14	2.3	0.58	0.42	1.8	0.68	0.60	0.32	0.23	0.23	0.12	0.08
2	.24	.15	.08	.13	.14	.13	.15	.90	.54	14	1.6	.64	.60	.32	.23	.24	.11	.07
3	.23	.15	.10	.14	.13	.18	.15	.66	.47	16	1.4	.61	.78	.33	.22	.25	.10	.06
4	.21	.12	.11	.15	.12	.20	.15	.57	.47	7.4	1.4	.57	1.7	.34	.22	.26	.10	.06
5	.19	.10	.12	.16	.11	.20	.15	.50	.50	7.8	1.3	.53	1.5	.34	.22	.27	.10	.06
6	.17	.08	.13	.17	.10	.19	.15	4.8	.53	8.4	1.3	.49	1.2	.34	.22	.25	.11	.05
7	.16	.07	.14	.15	.09	.19	.19	1.7	.53	6.0	1.2	.51	.87	.35	.75	.22	.11	.04
8	.15	.06	.15	.13	.08	.18	.19	1.0	1.2	3.6	1.2	.54	.95	.36	.50	.20	.11	.04
9	.14	.05	.15	.11	.07	.18	.19	.70	1.6	3.6	1.1	.56	.90	.36	.45	.18	.11	.04
10	.13	.05	.15	.10	.06	.18	.19	.67	2.2	3.6	1.1	.58	.86	.35	.40	.15	.11	.04
11	.12	.05	.14	.08	.05	.18	.38	.64	1.6	3.7	1.1	.61	.82	.34	.38	.13	.12	.04
12	.11	.12	.14	.07	.05	.19	1.6	.60	1.2	3.5	1.1	.63	.77	.34	.34	.13	.12	.04
13	.10	.14	.15	.07	.06	.20	.57	.60	.92	3.4	1.0	.66	.74	.33	.32	.14	.12	.27
14	.10	.14	.20	.07	.07	.20	.44	17	.90	3.2	1.0	.68	.71	.32	.30	.14	.12	.50
15	.18	.16	.25	.06	.08	.18	.30	4.4	.88	3.1	1.0	.68	.68	.32	.28	.15	.13	.77
16	.22	.18	.22	.06	.08	.16	.30	3.5	.86	2.9	.98	.68	.66	.31	.27	.15	.13	.77
17	.22	.20	.20	.06	.08	.14	.30	2.5	.82	2.7	.95	.67	.63	.30	.26	.15	.13	.70
18	.22	.18	.19	.06	.09	.12	.30	2.0	.78	2.6	.93	.66	.60	.29	.25	.16	.12	.65
19	.21	.16	.18	.05	.09	.12	.30	1.4	.75	2.4	.93	.66	.57	.28	.24	.16	.12	.60
20	.19	.14	.17	.05	.10	.12	.30	1.4	.71	1.9	.92	.66	.54	.51	.23	.16	.12	.50
21	.17	.12	.16	.05	.10	.12	1.9	1.2	.67	3.5	.92	.65	.52	.75	.22	.17	.11	.45
22	.15	.10	.15	.05	.10	.12	2.6	1.1	.64	3.8	.91	.65	.49	.50	.22	.17	.10	.42
23	.15	.08	.14	.05	.11	.11	1.3	.95	1.8	3.5	.91	.64	.46	.40	.22	.18	.10	.40
24	.15	.08	.14	.05	.11	.11	.97	.90	1.1	3.3	.90	.64	.43	.35	.21	.18	.10	.38
25	.15	.08	.13	.05	.12	.11	.78	.86	.93	3.1	.90	.64	.42	.30	.21	.17	.09	.36
26	.15	.08	.12	.05	.12	.13	.75	.81	.76	2.9	.69	.63	.42	.28	.20	.16	.08	.50
27	.15	.08	.12	.06	.13	.13	.65	.77	.58	2.7	.72	.62	.41	.26	.20	.16	.08	.88
28	.15	.07	.11	.08	.13	.14	.83	.73	.41	2.5	.74	.62	.39	.24	.20	.15	.08	.76
29	.15	.07	.10	.09	-----	.14	.85	.70	.39	2.4	.77	.61	.37	.24	.20	.14	-----	.64
30	.15	.07	.09	.11	-----	.14	2.7	.66	.37	2.2	.76	.60	.36	.23	.21	.13	-----	.51
31	.15	-----	.11	.13	-----	.14	-----	.62	-----	2.0	.72	-----	.34	-----	.22	.12	-----	.39
SUM	5.2	3.3	4.4	2.8	2.7	4.8	20	57	26	132	32	19	21	10	8.6	5.4	3.0	11
MEAN	.17	.11	.14	.09	.10	.15	.66	1.8	.86	4.3	1.0	.62	.69	.34	.28	.18	.11	.36

Table 27. Daily mean triazine concentrations determined by immunoassay in samples from Grasshopper Creek near Muscotah, Kansas, from July 1992 through March 1995

[Bold type indicates an estimated value. Values less than 0.04 were assigned a value of 0.02 for computation of mean. -----, no data]

	1992						1993								
Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		3.1	1.1	**1.7**	0.63	0.85	**0.56**	**0.55**	**0.70**	1.0	**0.28**	**3.1**	16	**1.1**	**0.54**
2		2.7	2.5	1.7	1.7	**.81**	**.56**	**.60**	.90	1.1	.82	3.1	21	**.94**	**.57**
3		3.1	3.3	**1.6**	1.8	**.77**	**.56**	**.67**	**.86**	.82	.65	**2.8**	18	**.79**	**.60**
4		**2.7**	4.1	**1.5**	1.8	**.73**	**.56**	**.67**	**.83**	.95	**.65**	**2.4**	24	**.64**	**.63**
5		2.3	7.4	**1.4**	**1.6**	**.69**	.79	**.67**	.79	1.0	**.65**	**2.1**	9.1	**.64**	**.65**
6		**2.1**	2.7	**1.3**	1.5	**.65**	**.77**	**.67**	**.79**	**.79**	.58	**1.8**	11	.64	.67
7		1.9	3.1	1.2	**1.4**	**.61**	**.76**	**.67**	**.79**	.56	4.8	1.5	9.2	**.64**	.74
8		2.1	2.9	1.2	**1.3**	.57	**.74**	**.67**	**.79**	**.80**	5.8	10	8.3	**.64**	**.71**
9		**2.0**	**2.6**	1.2	**1.2**	**.57**	**.72**	**.67**	**.79**	.80	4.0	**8.6**	7.3	**.65**	**.68**
10		2.0	2.3	**1.2**	1.1	**.57**	**.70**	**.67**	1.0	**.69**	4.1	6.9	6.0	**.65**	**.65**
11		**2.0**	**2.2**	**1.2**	**1.1**	**.57**	**.69**	.67	**.93**	**.58**	**4.4**	**5.8**	5.3	**.65**	**.62**
12		**2.0**	**2.1**	**1.2**	1.4	**.57**	**.67**	**.67**	**.86**	.47	**5.6**	**4.6**	3.9	.65	**.58**
13		**2.0**	**2.0**	1.2	1.1	.81	**.65**	**.60**	**.78**	.51	**5.6**	**3.5**	**4.1**	**.68**	**.55**
14		2.2	**1.9**	**1.2**	**1.2**	1.1	**.64**	**.40**	**.71**	.70	5.6	**2.4**	4.3	**.70**	.52
15		**1.9**	1.8	**1.2**	**1.2**	1.1	**.62**	**.38**	**.63**	.65	4.4	2.4	4.3	**.73**	**.52**
16		**1.7**	**1.6**	**2.0**	**1.2**	**.91**	**.60**	**.54**	**.56**	**.46**	3.4	**2.4**	4.3	**.76**	**.52**
17		1.4	1.4	2.0	1.3	.76	**.59**	**.42**	.48	.27	2.1	2.4	3.5	**.78**	**.52**
18		**1.4**	**1.4**	**1.9**	**1.3**	**.73**	**.57**	**.29**	**.48**	.28	2.0	23	4.6	**.81**	**.52**
19		**1.3**	**1.4**	**1.8**	1.1	**.69**	**.55**	**.29**	**.48**	.36	1.3	22	3.9	.84	.75
20		1.3	1.5	**1.7**	1.6	**.66**	**.53**	**.29**	**.49**	.74	1.4	24	3.8	**.81**	1.9
21		**1.3**	2.1	**1.5**	1.5	**.63**	**.52**	**.29**	**.49**	.78	**1.3**	19	3.6	**.77**	**1.7**
22		**1.2**	2.8	**1.4**	**1.3**	**.59**	.50	**.29**	**.50**	**.56**	**1.3**	**16**	2.5	**.74**	1.5
23		**1.2**	2.6	**1.3**	1.0	.56	**.51**	.29	**.50**	.34	**1.2**	**13**	2.8	**.71**	1.2
24	4.3	**1.1**	**2.4**	1.2	**1.0**	**.56**	**.52**	**.29**	**.50**	**.32**	**1.1**	**10**	3.3	**.67**	.97
25	**4.3**	1.1	**2.2**	**1.2**	**1.1**	**.56**	**.52**	**.29**	**.51**	**.30**	**1.0**	**7.3**	2.9	**.64**	**1.1**
26	4.5	**1.1**	**2.0**	**1.1**	**1.1**	**.56**	**.53**	**.29**	.51	**.28**	**.95**	**4.3**	**2.1**	.61	**1.3**
27	4.8	**1.0**	**1.9**	**1.0**	1.1	**.56**	**.53**	**.29**	**.51**	.28	**.88**	**4.3**	1.3	**.58**	1.4
28	**4.5**	1.0	1.7	**.95**	**1.0**	**.56**	**.54**	**.49**	**.51**	**.28**	.80	4.3	1.5	**.56**	**1.4**
29	4.1	**1.0**	**1.7**	.89	**.98**	**.56**	.54	-----	**.51**	**.28**	4.2	**4.0**	**1.5**	**.53**	**1.3**
30	2.7	**1.0**	**1.7**	**.81**	**.91**	**.56**	**.54**	-----	**.77**	**.28**	11	**3.7**	1.4	.51	1.2
31	2.6	**1.0**	-----	.72	-----	**.56**	**.54**	-----	1.0	-----	**7.3**	-----	**1.2**	**.51**	-----
SUM	32	53	70	42	37	21	19	14	21	17	89	220	195	22	26
MEAN	4.0	1.7	2.3	1.3	1.2	.67	.60	.48	.68	.58	2.9	7.4	6.3	.70	.88

Table 27. Daily mean triazine concentrations determined by immunoassay in samples from Grasshopper Creek near Muscotah, Kansas, from July 1992 through March 1995—Continued

	1993			1994												1995		
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	1.2	0.51	0.35	0.61	0.42	0.40	0.46	6.0	27	4.1	1.5	0.81	0.40	0.73	1.6	1.1	0.69	0.65
2	1.1	.51	.36	.60	.44	.40	.44	4.5	24	9.2	1.5	.79	.40	.78	1.5	1.2	.65	.64
3	1.1	.50	.37	.59	.44	.41	.42	5.4	20	11	1.4	.76	.60	.84	1.4	1.2	.66	.62
4	1.0	.50	.38	.58	.44	.41	.41	4.7	18	5.2	1.4	.74	.83	.89	1.3	1.2	.68	.60
5	.94	.50	.39	.58	.44	.44	.43	3.5	15	7.7	1.3	.72	.87	.94	1.2	1.3	.69	.58
6	.88	.48	.42	.57	.44	.47	.45	13	12	7.2	1.3	.70	.90	1.0	1.1	1.3	.71	.57
7	.83	.47	.43	.54	.44	.50	.47	12	7.4	5.7	1.2	.70	.93	1.0	.99	1.2	.72	.55
8	.77	.46	.44	.52	.44	.51	.47	10	51	4.1	1.2	.69	.93	1.1	1.0	1.2	.74	.53
9	.72	.45	.43	.49	.40	.52	.47	9.2	26	4.3	1.1	.69	.94	1.2	1.0	1.2	.75	.51
10	.66	.44	.41	.46	.64	.52	.30	8.5	30	4.3	1.1	.68	.94	1.1	1.0	1.2	.77	.50
11	.61	.42	.39	.44	.64	.50	.34	7.9	28	4.3	1.1	.68	.95	1.1	1.1	1.2	.78	.48
12	.56	.30	.38	.41	.50	.48	.65	7.2	26	4.0	1.1	.68	.95	1.1	1.1	1.2	.80	.46
13	.50	.40	.40	.40	.46	.44	.62	7.2	24	3.8	1.1	.67	.99	1.1	1.1	1.1	.81	.46
14	.50	.56	.60	.40	.42	.40	.60	15	18	3.5	1.1	.67	1.0	1.0	1.1	1.1	.83	.95
15	.52	.60	.60	.39	.41	.37	1.1	26	13	3.3	1.1	.65	1.1	1.0	1.1	1.1	.84	.95
16	.53	.70	.60	.39	.41	.60	1.0	22	8.0	3.0	1.1	.63	1.1	1.0	1.0	1.1	.86	.95
17	.55	.75	.60	.38	.41	.65	.85	20	7.3	2.8	1.1	.61	1.1	.99	1.0	1.1	.87	.91
18	.57	.70	.60	.38	.41	.73	.80	19	6.5	2.5	1.1	.58	1.2	.97	.98	1.1	.85	.88
19	.60	.66	.60	.37	.41	.71	.75	18	5.7	2.4	1.1	.56	1.2	.95	.95	1.1	.83	.84
20	.63	.61	.70	.37	.41	.68	.70	18	5.0	2.3	1.0	.54	1.2	1.1	.93	1.0	.82	.81
21	.66	.56	.74	.36	.41	.66	7.3	18	4.2	2.2	1.0	.52	1.3	1.5	.90	1.0	.80	.77
22	.69	.52	.73	.35	.40	.63	17	18	8.0	2.2	1.0	.50	1.3	1.5	.90	1.0	.78	.74
23	.69	.47	.71	.34	.40	.61	12	18	11	2.1	.98	.48	1.4	1.5	.91	1.0	.76	.70
24	.63	.46	.70	.33	.40	.58	8.0	14	7.8	2.0	.96	.46	1.4	1.5	.92	1.0	.74	.67
25	.61	.44	.69	.32	.40	.56	6.2	12	6.9	2.0	.94	.44	1.2	1.5	.93	.96	.73	.63
26	.58	.42	.67	.32	.40	.54	5.0	11	5.9	1.9	.90	.43	1.1	1.6	.94	.92	.71	2.4
27	.55	.41	.66	.34	.40	.53	4.0	7.0	4.9	1.8	.86	.42	.99	1.6	.95	.88	.69	2.3
28	.54	.40	.65	.35	.40	.52	3.8	5.5	4.0	1.8	.81	.41	.94	1.6	.96	.84	.67	2.2
29	.54	.38	.63	.37	-----	.50	9.5	19	3.5	1.7	.77	.40	.89	1.6	1.0	.81	-----	2.1
30	.53	.36	.62	.39	-----	.48	8.8	31	3.2	1.6	.85	.40	.83	1.6	1.0	.77	-----	2.0
31	.52	-----	.61	.41	-----	.47	-----	31	-----	1.6	.83	-----	.78	-----	1.1	.73	-----	1.9
SUM	21	15	17	13	12	16	93	420	430	120	34	18	31	35	33	33	21	30
MEAN	.69	.50	.54	.43	.44	.52	3.1	14	14	3.7	1.1	.60	.99	1.2	1.1	1.1	.76	.96

Table 28. Daily mean triazine concentrations determined by immunoassay in samples from Delaware River near Muscotah, Kansas, from July 1992 through March 1995

[Bold type indicates an estimated value. Values less than 0.04 were assigned a value of 0.02 for computation of mean. -----, no data]

Day	1992						1993								
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		2.7	0.55	**0.85**	0.41	0.49	**0.45**	**0.34**	**0.40**	0.78	**0.18**	**6.0**	18	**0.98**	**0.40**
2		2.2	3.0	.79	1.2	**.46**	**.46**	**.55**	.84	.58	.34	1.8	20	**.86**	**.37**
3		2.3	2.9	**.74**	1.2	**.44**	**.47**	**.55**	**.81**	.57	1.7	**1.8**	**16**	**.74**	**.35**
4		**1.9**	4.2	**.69**	1.0	**.41**	**.48**	**.55**	**.81**	.68	**1.4**	**1.8**	**10**	**.61**	**.32**
5		1.6	3.9	**.64**	**.94**	**.38**	.50	**.50**	.81	.69	**1.1**	**1.7**	8.8	**.49**	**.32**
6		**1.4**	1.4	**.59**	.84	**.35**	**.48**	**.48**	**.72**	**.59**	2.2	**1.7**	1.9	.37	.37
7		1.2	2.0	.54	**.79**	**.33**	**.47**	**.46**	**.62**	.49	5.0	1.7	9.0	**.37**	.47
8		1.4	1.8	.84	**.74**	.30	**.45**	**.44**	**.53**	**.60**	8.8	15	7.0	**.38**	**.46**
9		**1.9**	1.6	.99	**.69**	**.45**	**.44**	**.42**	**.43**	.72	4.9	**7.0**	4.9	**.39**	**.45**
10		2.4	1.6	**.88**	.63	**.59**	**.42**	**.40**	.34	**.63**	3.5	5.1	4.9	**.39**	**.44**
11		1.7	1.4	**.77**	.73	**.74**	**.41**	.61	**.32**	**.53**	**3.1**	**4.4**	5.3	**.40**	**.43**
12		1.4	**1.3**	**.66**	.91	**.88**	**.39**	**.57**	**.30**	.44	**2.8**	**3.7**	4.6	.40	**.41**
13		1.3	**1.2**	.55	1.1	1.0	**.38**	**.54**	**.28**	.39	**2.4**	**3.1**	**4.7**	**.43**	**.40**
14		1.3	**1.1**	**.55**	**.98**	.82	**.36**	**.50**	**.26**	.30	2.0	**2.4**	4.8	**.45**	.39
15		**1.2**	.93	**.56**	**.87**	1.1	**.35**	**.46**	**.24**	.44	**1.9**	1.7	**4.7**	**.48**	**.39**
16		**1.2**	**.90**	**.57**	**.75**	**.84**	**.33**	**.42**	**.22**	**.40**	**1.7**	**1.8**	4.6	**.51**	**.39**
17		1.2	.86	.57	.64	.62	**.32**	**.39**	.20	**.36**	**1.6**	2.0	**2.0**	**.53**	**.39**
18		**1.0**	**.81**	**.55**	**.64**	**.56**	**.30**	**.35**	**.20**	.32	**1.4**	21	**3.0**	**.56**	**.39**
19		**.95**	**.75**	**.54**	.86	**.50**	**.29**	**.31**	**.20**	**.34**	**1.3**	32	2.0	.59	.83
20		.85	.74	**.52**	1.6	**.44**	**.27**	**.28**	**.24**	.37	1.1	25	**2.2**	**.59**	1.2
21		**.84**	1.6	**.51**	1.4	**.38**	**.26**	**.24**	**.27**	**.34**	**1.0**	18	2.4	**.58**	**1.0**
22		**.83**	2.0	**.49**	**1.2**	.32	.24	**.20**	**.31**	**.31**	**.95**	**12**	1.8	.57	.87
23		**.82**	1.8	**.48**	.96	.34	**.24**	.16	**.35**	**.29**	**.86**	**10**	1.5	.57	.85
24	5.0	**.81**	1.4	.46	**.71**	**.35**	**.24**	**.16**	**.35**	**.26**	**.78**	**7.0**	1.4	**.56**	1.1
25	**5.0**	.80	1.3	**.44**	.47	**.36**	**.24**	**.16**	**.35**	**.23**	**.69**	**5.0**	2.1	**.56**	1.0
26	3.6	**.70**	1.2	**.42**	1.1	**.38**	**.24**	**.16**	.35	**.20**	**.61**	**4.5**	**1.9**	.56	**1.0**
27	5.0	**.61**	1.2	**.41**	.85	**.39**	**.24**	**.16**	**.35**	.17	**.52**	**4.0**	**1.7**	**.53**	1.0
28	**4.0**	.51	1.0	**.39**	**.76**	**.40**	**.24**	**.16**	**.35**	**.17**	.44	3.6	1.5	**.51**	**1.0**
29	3.0	**.51**	**.96**	.37	**.67**	**.41**	**.26**	-----	**.35**	**.17**	1.2	**3.6**	**1.4**	**.48**	**.97**
30	2.6	**.51**	**.90**	**.37**	**.58**	**.42**	**.28**	-----	**.35**	.18	12	**3.6**	1.2	.46	.95
31	2.8	**.51**	-----	**.37**	-----	**.44**	**.31**	-----	.89	-----	13	-----	**1.0**	**.44**	-----
SUM	31	39	46	18	26	16	11	11	13	13	80	210	160	16	19
MEAN	3.8	1.2	1.5	.58	.87	.51	.35	.38	.42	.42	2.6	7.1	5.1	.53	.63

Table 28. Daily mean triazine concentrations determined by immunoassay in samples from Delaware River near Muscotah, Kansas, from July 1992 through March 1995—Continued

	1993			1994												1995		
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	0.86	0.35	0.27	0.31	0.24	0.21	0.28	6.0	10	2.6	2.2	0.80	0.55	0.51	0.50	0.42	0.24	0.33
2	.77	.31	.27	.31	.25	.21	.30	3.6	7.1	12	1.9	.77	.55	.52	.49	.42	.24	.33
3	.69	.26	.28	.32	.24	.22	.30	2.9	6.0	14	1.7	.75	.98	.53	.47	.43	.25	.34
4	.60	.22	.28	.32	.23	.22	.30	2.4	5.8	7.7	1.7	.72	.90	.54	.45	.43	.25	.34
5	.51	.21	.28	.33	.22	.25	.31	2.4	5.6	9.5	1.6	.70	.85	.56	.43	.44	.26	.35
6	.42	.21	.29	.33	.21	.26	.32	11	9.1	9.0	1.6	.67	.80	.57	.42	.45	.27	.35
7	.41	.20	.29	.31	.19	.27	.33	8.9	4.7	7.0	1.6	.65	1.4	.58	.40	.46	.28	.35
8	.40	.20	.29	.30	.18	.28	.33	6.7	17	5.0	1.6	.64	1.4	.60	.45	.47	.28	.36
9	.39	.19	.29	.28	.17	.29	.33	4.5	18	4.8	1.6	.63	1.3	.61	.50	.48	.29	.36
10	.38	.19	.29	.26	.16	.29	1.0	4.3	20	4.5	1.5	.62	1.2	.58	.55	.50	.30	.37
11	.37	.19	.29	.25	.15	.27	1.2	4.0	18	4.3	1.5	.61	1.1	.56	.61	.51	.31	.37
12	.36	.15	.29	.23	.14	.26	2.4	3.8	16	4.0	1.4	.60	1.1	.54	.66	.49	.31	.38
13	.35	.34	.29	.22	.13	.25	3.9	3.4	13	3.8	1.4	.59	1.0	.51	.71	.47	.32	.38
14	.35	.30	.35	.22	.12	.24	2.7	14	11	3.6	1.4	.58	1.0	.48	.67	.45	.33	.39
15	.36	.32	.40	.21	.11	.23	1.5	20	9.1	3.3	1.3	.58	.96	.46	.64	.43	.34	.40
16	.36	.34	.58	.20	.10	.24	1.0	12	7.1	3.1	1.3	.58	.93	.44	.60	.41	.34	.40
17	.37	.35	.60	.20	.10	.26	1.0	9.5	6.3	2.9	1.2	.59	.90	.41	.56	.39	.35	.41
18	.37	.34	.62	.19	.14	.27	1.0	7.0	5.6	2.6	1.2	.59	.86	.49	.52	.38	.35	.42
19	.38	.34	.63	.18	.18	.26	1.0	4.4	4.8	2.4	1.2	.60	.82	.56	.48	.36	.34	.42
20	.39	.33	.65	.18	.20	.25	1.0	4.2	4.0	2.2	1.1	.60	.79	.64	.45	.34	.34	.43
21	.41	.32	.67	.17	.21	.24	3.2	3.9	3.2	3.6	1.1	.60	.76	.72	.41	.32	.34	.44
22	.42	.32	.67	.17	.21	.23	6.3	3.6	3.2	3.8	1.1	.60	.72	.70	.41	.30	.34	.45
23	.42	.31	.67	.17	.21	.22	4.7	3.3	28	3.5	1.1	.59	.68	.68	.40	.28	.33	.46
24	.58	.30	.67	.17	.21	.21	3.8	3.3	9.6	3.2	1.0	.59	.65	.65	.40	.26	.33	.46
25	.58	.30	.61	.17	.21	.21	3.0	3.3	6.0	3.0	1.0	.58	.63	.63	.40	.26	.33	.47
26	.58	.30	.55	.17	.21	.22	2.2	3.4	4.0	2.8	1.1	.58	.62	.61	.40	.26	.32	1.3
27	.58	.29	.48	.18	.21	.23	1.8	3.4	3.0	2.6	1.0	.57	.60	.59	.39	.25	.32	1.2
28	.53	.28	.42	.19	.21	.24	4.4	3.4	2.8	2.5	.96	.57	.58	.56	.39	.25	.32	1.1
29	.49	.28	.36	.20	-----	.25	3.9	20	2.4	2.4	.89	.56	.56	.54	.40	.25	-----	1.0
30	.44	.28	.30	.22	-----	.26	8.7	22	2.2	2.3	.85	.56	.54	.52	.40	.25	-----	.93
31	.40	-----	.30	.23	-----	.27	-----	13	-----	2.2	.82	-----	.53	-----	.41	.24	-----	.83
SUM	15	8.3	13	7.2	5.1	7.6	63	220	260	140	41	19	26	17	15	12	8.6	16
MEAN	.47	.28	.43	.23	.18	.24	2.1	7.0	8.8	4.5	1.3	.62	.85	.56	.48	.38	.31	.52

Table 29. Daily mean triazine concentrations determined by immunoassay in samples from Straight Creek near Muscotah, Kansas, from July 1992 through March 1995

[Bold type indicates an estimated value. Values less than 0.04 were assigned a value of 0.02 for computation of mean. -----, no data]

	1992						1993								
Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0.58	0.15	**0.25**	0.56	0.10	**0.02**	**0.10**	**0.41**	0.30	0.09	**4.2**	20	**0.17**	**0.07**
2		.59	.90	.23	1.3	**.09**	.02	**.20**	.50	.26	.36	1.5	20	**.13**	**.07**
3		.70	.87	**.20**	.63	**.08**	.10	**.30**	**.38**	.54	.58	**1.4**	**11**	**.10**	**.07**
4		**.50**	.87	**.17**	**.50**	**.07**	**.13**	**.37**	**.27**	**.46**	**.51**	**1.2**	2.6	**.07**	**.07**
5		.29	.47	**.13**	**.36**	**.06**	.16	**.37**	.15	.39	**.44**	**1.1**	6.1	**.07**	**.07**
6		.18	.75	**.10**	.23	**.05**	**.16**	**.37**	**.13**	**.39**	.37	**.97**	8.9	.07	.26
7		.21	.92	.07	**.23**	**.04**	**.16**	**.37**	**.11**	.20	5.5	.84	5.1	**.07**	.19
8		.44	.62	.60	**.23**	.02	**.16**	**.37**	**.10**	**.22**	3.8	20	3.0	**.08**	**.16**
9		**.35**	.59	.93	**.23**	**.12**	**.16**	**.37**	**.08**	.23	3.3	**7.8**	2.5	**.08**	**.13**
10		.25	.49	**.79**	.38	**.20**	**.15**	**.37**	.06	**.18**	2.3	2.3	2.6	**.08**	**.09**
11		**.23**	.38	**.66**	.47	**.18**	**.15**	.37	**.06**	**.12**	**1.9**	**2.0**	1.5	**.08**	**.06**
12		**.21**	**.34**	**.52**	.88	**.15**	**.14**	**.34**	.06	.07	**1.5**	**1.8**	1.4	.08	**.06**
13		**.18**	**.31**	.39	.52	.42	**.14**	**.32**	.06	.26	**1.2**	**1.5**	**2.0**	**.09**	**.06**
14		.16	**.27**	**.32**	**.42**	.39	**.13**	**.29**	.06	**.18**	.77	**1.2**	2.0	**.10**	.06
15		**.18**	.24	**.26**	**.31**	.38	**.13**	**.26**	.06	.11	.58	.95	**2.2**	**.10**	**.06**
16		**.20**	**.21**	**.19**	**.22**	**.24**	**.12**	**.23**	**.06**	**.11**	.53	**.90**	2.5	**.11**	**.06**
17		.21	.19	.13	.22	.11	**.12**	**.21**	.06	**.12**	.35	1.1	**2.5**	**.12**	**.06**
18		**.21**	**.19**	**.12**	**.22**	**.11**	**.11**	**.18**	**.06**	**.12**	3.0	24	**2.5**	**.13**	**.06**
19		**.20**	**.19**	**.12**	.68	**.10**	**.11**	**.15**	**.05**	.12	.65	23	1.3	.14	.79
20		.20	.88	**.11**	.76	**.10**	**.10**	**.13**	**.05**	.28	1.7	22	**1.6**	**.13**	.69
21		**.18**	1.8	**.11**	.47	.10	**.10**	**.10**	**.05**	.08	**1.5**	6.0	1.6	**.12**	**.50**
22		**.16**	.89	**.10**	**.35**	**.08**	.10	**.07**	**.04**	**.08**	**1.3**	**4.0**	.93	**.11**	.31
23		**.15**	.64	**.10**	.24	.06	**.09**	.02	**.04**	**.07**	**1.1**	**3.0**	.85	**.10**	.47
24	1.1	**.13**	**.57**	.10	**.20**	**.06**	**.09**	**.02**	**.02**	**.07**	**.93**	**2.6**	1.1	**.09**	.51
25	1.2	.11	**.51**	**.09**	.43	**.20**	**.08**	**.02**	**.02**	**.06**	**.74**	**2.1**	.57	**.08**	.68
26	2.0	**.09**	**.44**	**.08**	.52	.20	**.08**	**.02**	**.02**	**.06**	**.55**	**1.8**	**.50**	.08	**.53**
27	1.4	**.07**	**.38**	**.07**	.38	**.10**	**.08**	**.02**	.02	.06	**.36**	**1.5**	**.43**	**.08**	**.37**
28	**1.0**	.05	.31	**.06**	**.31**	.02	.07	**.02**	**.02**	.07	.16	1.3	**.37**	**.07**	.22
29	.65	**.05**	**.29**	.06	**.24**	**.02**	**.07**	-----	**.02**	.12	.35	**1.2**	**.30**	**.07**	**.19**
30	1.2	**.05**	**.27**	**.06**	**.17**	**.02**	**.07**	-----	**.24**	**.09**	9.7	1.1	.23	.07	.16
31	.83	**.05**	-----	**.39**	-----	**.02**	**.07**	-----	.44	-----	**7.0**	-----	**.20**	**.07**	-----
SUM	**9.4**	**7.2**	**16**	**7.5**	**13**	**3.9**	**3.4**	**6.0**	**3.7**	**5.4**	**53**	**140**	**110**	**2.9**	**7.1**
MEAN	**1.2**	**.23**	**.53**	**.24**	**.42**	**.13**	**.11**	**.21**	**.12**	**.18**	**1.7**	**4.8**	**3.5**	**.09**	**.24**

Table 29. Daily mean triazine concentrations determined by immunoassay in samples from Straight Creek near Muscotah, Kansas, from July 1992 through March 1995—Continued

	1993			1994												1995		
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	0.13	0.07	0.10	0.06	0.02	0.02	0.18	8.0	0.79	79	0.31	0.21	0.07	0.09	0.07	0.02	0.02	0.06
2	.10	.07	.08	.06	.02	.02	.18	2.2	1.2	7.8	.30	.20	.07	.09	.07	.02	.02	.06
3	.07	.07	.07	.06	.02	.10	.18	1.7	33	12	.28	.19	.24	.09	.06	.02	.02	.05
4	.04	.07	.06	.06	.02	.14	.18	1.2	26	7.3	.27	.30	.90	.09	.06	.02	.02	.05
5	.02	.06	.04	.06	.02	.14	.17	1.0	19	4.7	.26	.45	.37	.08	.06	.02	.02	.05
6	.02	.05	.03	.06	.02	.13	.16	26	12	3.4	.25	.45	.28	.08	.25	.02	.02	.05
7	.02	.04	.02	.06	.02	.12	.16	2.3	1.5	2.6	.23	.40	.23	.08	.30	.02	.02	.05
8	.05	.03	.02	.05	.02	.12	.16	1.6	4.2	1.8	.22	.35	.21	.08	.25	.02	.02	.05
9	.05	.02	.02	.04	.02	.11	.16	.92	3.1	1.6	.21	.30	.19	.08	.15	.02	.02	.04
10	.05	.02	.02	.03	.02	.10	.16	.78	2.0	1.4	.20	.25	.18	.07	.12	.02	.02	.04
11	.06	.02	.02	.02	.02	.09	.41	.64	1.7	1.2	.18	.20	.16	.07	.10	.02	.02	.04
12	.06	.20	.02	.02	.02	.08	1.0	.50	1.4	1.1	.17	.16	.14	.06	.09	.02	.02	.04
13	.07	.09	.20	.02	.02	.07	.56	.40	1.2	1.0	.16	.14	.14	.05	.08	.02	.02	.16
14	.07	.15	.40	.02	.02	.06	.36	22	1.0	.97	.14	.12	.13	.04	.07	.03	.02	.30
15	.12	.15	.40	.02	.02	.06	.16	13	.89	.88	.13	.12	.12	.03	.06	.03	.02	.30
16	.12	.16	.47	.02	.02	.06	.16	3.6	.75	.80	.12	.11	.12	.02	.06	.03	.02	.30
17	.20	.16	.35	.02	.02	.05	.16	3.0	.69	.71	.10	.10	.12	.02	.05	.03	.02	.30
18	.25	.16	.30	.02	.02	.05	.16	2.6	.62	.63	.09	.10	.11	.02	.04	.04	.02	.29
19	.22	.15	.25	.02	.02	.05	.16	2.1	.56	.61	.09	.09	.10	.02	.04	.04	.03	.29
20	.19	.14	.20	.02	.02	.06	.16	1.8	.49	.59	.09	.08	.10	.13	.03	.04	.03	.29
21	.16	.13	.18	.02	.02	.07	.46	1.5	.43	.57	.09	.08	.10	.83	.02	.04	.04	.28
22	.13	.12	.16	.02	.02	.08	1.2	1.3	1.0	.58	.09	.08	.09	.50	.02	.05	.04	.28
23	.11	.11	.14	.02	.02	.08	.90	1.0	7.9	.58	.09	.08	.08	.30	.02	.05	.04	.28
24	.09	.11	.12	.02	.02	.09	.60	.88	.90	.59	.09	.08	.08	.20	.02	.05	.05	.27
25	.06	.11	.10	.02	.02	.10	.29	.76	.74	.60	.09	.08	.08	.15	.02	.05	.05	.27
26	.04	.11	.08	.02	.02	.12	.29	.64	.57	.60	.36	.08	.08	.12	.02	.04	.06	.87
27	.02	.10	.06	.02	.02	.12	.29	.60	.40	.60	.31	.07	.08	.10	.02	.04	.06	.54
28	.02	.10	.04	.02	.02	.14	12	.60	.24	.54	.27	.07	.08	.09	.02	.04	.06	.44
29	.07	.10	.03	.02	-----	.14	2.0	.60	.20	.48	.22	.07	.08	.08	.02	.03	-----	.35
30	.07	.10	.02	.02	-----	.18	20	.60	.20	.43	.24	.07	.08	.07	.02	.03	-----	.26
31	.07	-----	.02	.02	-----	.18	-----	.79	-----	.37	.22	-----	.09	-----	.02	.03	-----	.16
SUM	2.8	3.0	4.0	.96	.56	2.9	44	100	120	140	5.9	5.1	4.9	3.7	2.2	.95	.82	6.8
MEAN	.09	.10	.13	.03	.02	.09	1.5	3.4	4.1	4.4	.19	.17	.16	.12	.07	.03	.03	.22

Table 30. Daily mean triazine concentrations determined by immunoassay in samples from Elk Creek at Larkinburg, Kansas, from July 1992 through March 1995

[Bold type indicates an estimated value. Values less than 0.04 were assigned a value of 0.02 for computation of mean. -----, no data]

	1992						1993								
Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		**0.71**	0.16	**0.21**	0.21	0.18	**0.11**	**0.04**	**0.08**	0.25	**0.02**	0.96	7.3	**0.19**	**0.16**
2		.75	.35	.21	.38	**.16**	**.13**	**.10**	.22	.16	1.8	1.5	7.1	**.17**	**.16**
3		.77	.73	**.19**	.28	**.15**	**.15**	**.16**	**.19**	.18	1.1	**1.1**	**5.5**	**.14**	**.16**
4		**.58**	.77	**.17**	**.24**	**.13**	**.17**	**.16**	**.16**	**.10**	**.86**	**.74**	**3.9**	**.12**	**.16**
5		.39	.53	**.14**	**.21**	**.12**	.17	**.16**	.13	.02	**.59**	.38	2.3	**.10**	**.16**
6		**.35**	.45	.12	.17	**.10**	**.16**	**.16**	**.13**	**.02**	.33	.98	2.4	.07	**.34**
7		.30	.55	.07	**.16**	**.09**	**.16**	**.16**	**.12**	.16	2.4	2.5	2.6	**.07**	.34
8		.30	.81	.22	**.15**	.07	**.15**	**.16**	**.11**	**.16**	2.7	8.3	2.1	**.07**	**.37**
9		**.28**	.56	.48	**.14**	**.07**	**.15**	**.16**	**.10**	.14	2.2	**5.4**	1.4	**.08**	**.41**
10		.26	.53	**.40**	.13	**.07**	**.14**	**.16**	.10	**.11**	1.8	2.4	1.4	**.08**	**.44**
11		**.24**	.50	**.33**	**.13**	**.07**	**.14**	.16	**.09**	**.08**	**2.0**	**2.1**	.91	**.08**	**.47**
12		**.23**	**.46**	**.25**	.45	**.07**	**.13**	**.15**	**.08**	.06	**1.5**	**1.8**	.97	.08	**.50**
13		**.21**	**.42**	.17	.38	.27	**.13**	**.14**	**.06**	.34	**.60**	**1.4**	.90	**.09**	**.54**
14		.19	**.38**	**.17**	**.34**	.27	**.12**	**.13**	**.04**	**.24**	.36	**1.1**	1.1	**.11**	.57
15		**.20**	.34	**.17**	**.31**	.24	**.12**	**.12**	**.02**	.13	.35	.78	**1.0**	**.12**	**.57**
16		**.21**	**.33**	**.17**	**.27**	**.18**	**.11**	**.11**	**.02**	**.13**	.28	**.62**	1.0	**.13**	**.57**
17		.23	.32	.17	.23	.11	**.11**	**.10**	.02	**.13**	.24	.45	**1.0**	**.14**	**.57**
18		**.24**	**.32**	**.16**	**.23**	**.11**	**.10**	**.09**	**.02**	**.13**	.73	1.9	**1.1**	**.16**	**.57**
19		**.26**	**.32**	**.16**	.35	**.11**	**.10**	**.08**	**.04**	**.15**	.37	14	1.0	.17	.44
20		.27	.44	**.15**	.55	**.12**	**.09**	**.07**	**.06**	.17	.38	16	**1.0**	.17	.47
21		**.24**	.54	**.15**	.34	.12	**.09**	**.06**	**.08**	**.15**	**.35**	5.7	.97	**.17**	.51
22		**.21**	.65	**.14**	**.27**	**.09**	.08	**.05**	**.09**	**.13**	**.32**	**5.0**	.82	**.16**	.32
23		**.18**	.47	**.14**	.21	.05	**.07**	.05	**.10**	**.12**	**.29**	**4.4**	.97	**.16**	.33
24	1.9	**.15**	**.42**	.13	**.21**	**.05**	**.07**	**.05**	**.12**	**.10**	**.26**	**3.8**	.62	**.16**	.39
25	1.9	.12	**.37**	**.11**	.25	**.09**	**.06**	**.05**	**.13**	**.08**	**.22**	**3.1**	.22	**.15**	.43
26	2.1	**.12**	**.32**	**.10**	.11	.13	**.05**	**.05**	.15	**.06**	**.19**	**2.4**	.60	.15	**.39**
27	1.2	**.13**	**.27**	**.08**	.24	**.09**	**.04**	**.05**	**.15**	.02	**.16**	**1.8**	**.51**	**.15**	**.34**
28	**.97**	.14	.22	**.07**	**.23**	.05	.02	**.05**	**.15**	**.02**	.13	1.1	.42	.22	.30
29	.76	**.14**	**.22**	.05	**.21**	.07	**.02**	-----	**.15**	**.02**	2.4	**1.0**	**.33**	**.19**	**.23**
30	.79	**.15**	**.22**	**.05**	**.20**	**.07**	**.02**	-----	**.20**	**.02**	7.9	**1.0**	.24	.16	.17
31	.71	**.16**	-----	**.05**	-----	.09	**.02**	-----	.36	-----	2.0	-----	**.22**	**.16**	-----
SUM	**10**	**8.7**	**13**	**5.2**	**7.6**	**3.6**	**3.2**	**3.0**	**3.5**	**3.6**	**35**	**94**	**52**	**4.2**	**11**
MEAN	**1.3**	**.28**	**.43**	**.17**	**.25**	**.12**	**.10**	**.11**	**.11**	**.12**	**1.1**	**3.1**	**1.7**	**.13**	**.38**

Table 30. Daily mean triazine concentrations determined by immunoassay in samples from Elk Creek at Larkinburg, Kansas, from July 1992 through March 1995—Continued

	1993			1994												1995		
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	0.16	0.10	0.09	0.09	0.02	0.10	0.07	2.6	1.6	0.48	0.43	0.39	0.19	0.14	0.11	0.10	0.03	0.09
2	.15	.11	.08	.08	.02	.10	.07	.82	1.4	2.6	.41	.38	.18	.14	.12	.11	.02	.10
3	.14	.12	.08	.07	.02	.12	.07	.78	9.0	.70	.39	.37	.18	.15	.12	.11	.02	.10
4	.13	.13	.07	.06	.02	.16	.07	.75	8.0	1.7	.37	.36	.30	.16	.12	.12	.03	.10
5	.12	.12	.06	.05	.02	.14	.05	.70	7.5	1.9	.35	.35	.30	.16	.13	.12	.03	.10
6	.12	.10	.06	.05	.02	.12	.03	6.2	6.9	1.6	.33	.35	.26	.16	.13	.12	.04	.10
7	.12	.08	.05	.05	.02	.10	.02	3.0	3.4	1.4	.31	.34	.23	.17	.13	.13	.04	.11
8	.11	.06	.05	.05	.02	.09	.03	1.0	7.2	1.3	.31	.32	.21	.18	.12	.13	.04	.11
9	.10	.04	.05	.05	.02	.08	.05	.43	2.8	1.2	.31	.30	.19	.18	.11	.14	.05	.11
10	.09	.02	.05	.06	.02	.07	.06	.35	2.3	1.0	.31	.29	.18	.18	.10	.14	.05	.11
11	.09	.02	.05	.06	.02	.08	.08	.30	2.0	.89	.31	.28	.17	.18	.09	.14	.06	.12
12	.08	.08	.05	.06	.03	.09	.08	.25	1.7	.84	.30	.26	.16	.18	.08	.14	.06	.12
13	.08	.09	.12	.06	.04	.10	.44	.20	1.4	.80	.30	.24	.16	.18	.08	.13	.06	.12
14	.08	.15	.18	.06	.05	.10	.26	22	1.3	.75	.30	.23	.15	.18	.08	.13	.07	.30
15	.08	.12	.18	.06	.06	.08	.12	11	1.2	.70	.30	.23	.15	.18	.08	.12	.07	.30
16	.08	.10	.18	.06	.06	.06	.10	3.3	1.2	.65	.30	.23	.14	.18	.08	.12	.08	.30
17	.08	.08	.14	.06	.08	.04	.09	2.5	1.1	.61	.29	.23	.14	.18	.08	.11	.08	.25
18	.08	.08	.10	.06	.09	.02	.08	1.8	1.0	.56	.29	.23	.14	.18	.09	.11	.08	.20
19	.17	.08	.06	.06	.09	.02	.08	.99	.94	.56	.29	.23	.13	.18	.09	.10	.08	.19
20	.17	.07	.04	.06	.10	.02	.08	.89	.87	.42	.29	.23	.13	.24	.09	.10	.08	.18
21	.17	.07	.02	.06	.10	.04	.24	.80	.80	.37	.29	.23	.12	.24	.09	.09	.08	.17
22	.17	.06	.02	.06	.10	.04	.20	.70	.73	.37	.29	.23	.12	.20	.09	.09	.08	.16
23	.13	.06	.02	.06	.10	.04	.18	.60	1.2	.37	.29	.22	.11	.18	.09	.08	.08	.15
24	.10	.06	.02	.07	.10	.06	.16	.58	1.5	.38	.29	.22	.11	.17	.09	.08	.09	.15
25	.07	.07	.02	.07	.10	.06	.15	.56	1.2	.38	.29	.21	.12	.16	.09	.07	.09	.15
26	.06	.07	.02	.07	.10	.06	.15	.54	.99	.38	.24	.21	.13	.15	.09	.07	.09	.40
27	.05	.08	.02	.06	.10	.06	.15	.52	.74	.39	.30	.21	.15	.14	.09	.06	.09	.48
28	.06	.08	.02	.05	.10	.06	4.9	.50	.48	.39	.30	.20	.15	.13	.09	.05	.09	.35
29	.07	.08	.10	.04	-----	.07	1.5	11	.48	.40	.34	.20	.15	.12	.09	.05	-----	.20
30	.08	.09	.12	.03	-----	.07	4.4	3.0	.48	.41	.41	.19	.14	.11	.10	.04	-----	.12
31	.09	-----	.10	.02	-----	.07	-----	1.8	-----	.42	.40	-----	.14	-----	.10	.03	-----	.08
SUM	3.3	2.5	2.2	1.8	1.6	2.3	14	80	71	25	9.9	8.0	5.1	5.1	3.0	3.1	1.8	5.5
MEAN	.11	.08	.07	.06	.06	.07	.46	2.6	2.4	.81	.32	.27	.17	.17	.10	.10	.06	.18

Table 31. Daily mean triazine concentrations determined by immunoassay in samples from Coal Creek west of Coal Creek Church, Kansas, from July 1992 through March 1995

[Bold type indicates an estimated value. Values less than 0.04 were assigned a value of 0.02 for computation of mean. -----, no data]

Day	1992						1993								
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		2.2	0.79	**0.66**	0.41	0.43	**0.45**	**0.25**	**0.50**	0.47	**0.50**	**1.0**	22	**1.4**	**1.7**
2		2.2	1.3	.64	.99	**.41**	.49	**.33**	.72	.34	28	1.7	16	**1.3**	**1.6**
3		2.4	.75	**.59**	.86	**.38**	.42	**.33**	.58	.44	11	**1.8**	13	**1.2**	**1.5**
4		**2.0**	**.71**	**.55**	**.76**	**.36**	**.44**	**.33**	**.45**	**.38**	**8.3**	**1.9**	11	**1.1**	**1.4**
5		**1.8**	.67	**.52**	**.65**	**.33**	.48	**.33**	.31	.35	**6.0**	**2.0**	13	**.96**	**1.4**
6		**1.6**	1.0	**.48**	.55	**.31**	**.46**	**.33**	**.28**	**.35**	3.6	**2.2**	9.6	.85	**1.3**
7		1.4	1.1	.44	**.54**	**.28**	**.45**	**.33**	**.25**	.57	5.0	2.3	4.8	**.85**	1.2
8		1.7	**1.0**	1.1	**.53**	**.26**	**.43**	**.33**	**.21**	**.48**	12	1.4	6.1	**.86**	**1.2**
9		1.6	1.3	.79	**.51**	.23	**.42**	**.33**	**.18**	.40	6.7	**1.2**	9.0	**.86**	**1.2**
10		1.5	1.9	**.79**	.60	**.23**	**.40**	**.33**	.15	**.34**	4.5	1.1	9.7	**.87**	**1.2**
11		**1.4**	1.5	**.78**	.73	**.23**	**.38**	.33	**.16**	**.29**	**4.0**	**1.1**	6.9	**.88**	**1.2**
12		**1.3**	**1.4**	**.78**	.99	**.23**	**.37**	**.30**	**.16**	.23	**3.5**	**1.0**	4.8	.88	**1.2**
13		**1.2**	**1.3**	.77	.94	.53	**.35**	**.27**	**.17**	.67	**3.0**	**1.0**	**4.8**	**.91**	**1.2**
14		1.1	**1.3**	**.73**	**.78**	.71	**.34**	**.23**	**.18**	.62	2.4	**.98**	4.9	**.95**	1.2
15		**1.1**	1.2	**.69**	**.62**	.69	**.32**	**.20**	**.19**	**.60**	**2.2**	.96	**4.4**	**.98**	**1.2**
16		**2.6**	**1.2**	**.65**	.46	**.50**	**.30**	**.17**	**.19**	**.58**	**2.1**	**1.0**	4.0	**1.0**	**1.2**
17		2.6	1.1	.61	**.46**	.31	**.29**	**.17**	.20	**.55**	1.9	1.1	3.9	**1.0**	**1.2**
18		**2.2**	**.96**	**.57**	**.46**	**.30**	**.27**	**.17**	**.20**	**.53**	1.7	25	5.1	**1.1**	**1.2**
19		**1.7**	**.79**	**.54**	.70	**.30**	**.26**	**.17**	**.21**	.51	**1.8**	36	4.5	1.1	1.2
20		1.3	.62	**.50**	.90	**.29**	**.24**	**.17**	**.22**	**.49**	1.8	**27**	**4.0**	**1.1**	2.1
21		**1.3**	.75	**.47**	1.1	**.27**	.24	**.17**	**.23**	**.48**	**1.7**	19	3.4	**1.0**	**1.7**
22		**1.3**	**.75**	**.43**	**.87**	**.27**	**.23**	**.17**	**.24**	**.47**	**1.6**	**17**	3.9	**1.0**	1.3
23		**1.2**	.76	**.40**	.67	.25	**.22**	.17	**.25**	**.46**	**1.5**	**15**	2.7	**.97**	.93
24	3.2	**1.2**	**.75**	.36	**.52**	**.24**	**.21**	**.17**	**.25**	**.45**	**1.4**	**14**	2.3	**.93**	1.1
25	3.2	1.2	**.75**	**.35**	.36	**.23**	**.20**	**.17**	**.25**	**.44**	**1.2**	**12**	**2.0**	**.90**	1.3
26	2.8	**1.1**	**.74**	**.33**	.89	.22	**.18**	**.17**	.25	**.44**	**1.1**	**10**	1.8	.86	**1.2**
27	2.6	**1.1**	**.74**	**.32**	.62	**.26**	**.17**	**.17**	**.25**	.44	**1.0**	**8.8**	**1.7**	**.89**	**1.2**
28	**2.4**	1.0	.73	**.31**	**.57**	**.30**	**.16**	**.17**	**.25**	**.44**	.89	7.2	**1.7**	**.93**	1.1
29	2.1	**.95**	**.71**	**.29**	**.53**	**.34**	**.16**	-----	.17	**.60**	**.93**	**7.3**	**1.6**	**.96**	**.90**
30	2.2	**.90**	**.69**	**.28**	**.48**	**.38**	**.16**	-----	.23	**.50**	**1.0**	7.4	1.6	1.0	.74
31	2.3	**.84**	-----	**.26**	-----	**.42**	**.16**	-----	.58	-----	1.0	-----	**1.5**	1.8	-----
SUM	**21**	**47**	**29**	**17**	**20**	**10**	**9.6**	**6.5**	**8.5**	**14**	**120**	**230**	**190**	**31**	**38**
MEAN	**2.6**	**1.5**	**.98**	**.55**	**.67**	**.34**	**.31**	**.23**	**.27**	**.46**	**4.0**	**7.7**	**6.0**	**1.0**	**1.3**

Table 31. Daily mean triazine concentrations determined by immunoassay in samples from Coal Creek west of Coal Creek Church, Kansas, from July 1992 through March 1995—Continued

	1993			1994												1995		
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	0.73	0.26	0.34	0.35	0.15	0.15	0.18	8.0	2.5	2.7	1.9	1.1	0.81	0.39	0.39	0.58	0.14	0.19
2	.73	.24	.32	.33	.15	.15	.25	4.4	2.4	11	3.7	1.1	.79	.40	.38	.56	.13	.18
3	.72	.23	.30	.32	.15	.18	.30	4.5	4.6	11	3.3	1.1	.78	.41	.38	.54	.10	.18
4	.72	.22	.28	.30	.15	.27	.33	4.6	6.0	8.7	3.0	1.1	.77	.42	.37	.52	.11	.18
5	.71	.22	.26	.29	.15	.25	.30	4.5	8.0	7.3	2.6	1.1	.76	.43	.37	.50	.12	.17
6	.71	.22	.24	.28	.15	.24	.28	19	26	6.4	2.2	1.1	.75	.44	.36	.46	.13	.17
7	.68	.22	.22	.28	.16	.23	.26	10	20	4.7	1.8	1.1	.75	.45	.36	.41	.14	.16
8	.65	.22	.21	.28	.16	.22	.24	7.0	38	3.1	1.4	1.1	.74	.47	.35	.36	.15	.16
9	.62	.22	.20	.28	.16	.21	.22	5.0	27	3.2	1.4	1.1	.73	.48	.34	.32	.16	.16
10	.59	.22	.20	.27	.16	.21	1.0	4.2	17	3.2	1.4	1.0	.72	.48	.33	.28	.17	.15
11	.56	.22	.20	.27	.16	.20	2.2	3.5	15	3.3	1.4	1.0	.71	.47	.32	.23	.18	.15
12	.52	.35	.20	.27	.15	.20	2.5	2.7	12	3.2	1.4	1.0	.69	.46	.30	.23	.19	.15
13	.49	.68	.38	.27	.14	.19	2.9	2.0	10	3.1	1.4	1.0	.68	.46	.29	.23	.20	.51
14	.49	.56	.38	.27	.14	.18	1.0	12	8.5	3.0	1.3	1.0	.67	.46	.29	.23	.21	1.0
15	.55	.40	.49	.27	.13	.18	.86	42	7.1	2.8	1.3	.99	.66	.45	.28	.23	.22	1.2
16	.61	.38	.83	.27	.13	.20	.82	10	8.9	2.7	1.3	.98	.65	.44	.27	.23	.24	1.2
17	.61	.36	.60	.26	.13	.22	.80	7.0	8.7	2.6	1.3	.97	.64	.44	.26	.24	.25	1.2
18	.61	.36	.40	.26	.13	.23	.78	5.0	8.5	2.5	1.3	.96	.63	.42	.25	.24	.24	1.2
19	.61	.37	.38	.26	.13	.21	.76	3.2	8.4	2.2	1.3	.95	.62	.40	.24	.24	.24	1.1
20	.60	.37	.35	.26	.14	.19	.74	3.1	8.2	1.9	1.3	.94	.60	.38	.23	.24	.23	1.0
21	.60	.38	.32	.26	.14	.17	4.2	2.9	8.0	1.9	1.3	.92	.59	.36	.23	.24	.23	1.0
22	.60	.38	.32	.24	.14	.16	3.0	2.8	7.8	1.9	1.2	.91	.58	.36	.29	.24	.22	.96
23	.54	.38	.33	.20	.14	.15	2.0	2.6	37	1.9	1.2	.90	.57	.37	.36	.24	.22	.92
24	.48	.38	.34	.18	.14	.14	1.2	2.5	18	1.9	1.2	.89	.56	.37	.42	.24	.21	.86
25	.43	.37	.34	.14	.15	.13	.69	2.4	15	1.9	1.2	.88	.54	.37	.48	.23	.21	.82
26	.37	.37	.35	.12	.15	.13	.65	2.2	11	1.8	1.2	.86	.52	.38	.54	.22	.20	.78
27	.31	.36	.36	.12	.15	.14	.60	2.1	7.9	1.8	1.2	.85	.50	.38	.61	.20	.20	.73
28	.30	.36	.37	.13	.15	.15	6.9	2.0	4.5	1.9	1.2	.84	.48	.38	.67	.19	.19	.65
29	.29	.35	.38	.13	-----	.16	6.0	2.1	3.9	1.9	1.2	.83	.45	.39	.65	.18	-----	.58
30	.28	.35	.39	.14	-----	.17	19	2.3	3.3	1.9	1.2	.82	.43	.39	.63	.17	-----	.50
31	.27	-----	.37	.14	-----	.18	-----	2.7	-----	1.9	1.2	-----	.41	-----	.61	.16	-----	.42
SUM	17	10	11	7.4	4.1	5.8	61	190	360	110	49	28	20	12	12	9.2	5.2	19
MEAN	.55	.33	.34	.24	.15	.19	2.0	6.1	12	3.6	1.6	.95	.64	.42	.38	.30	.19	.60

Table 32. Daily mean triazine concentrations determined by immunoassay in samples from Cedar Creek west of Valley Falls, Kansas, from July 1992 through March 1995

[Bold type indicates an estimated value. Values less than 0.04 were assigned a value of 0.02 for computation of mean. -----, no data]

	1992						1993								
Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		**0.21**	0.21	**0.24**	0.05	0.08	**0.05**	**0.05**	**0.15**	0.02	**0.12**	**3.7**	8.2	**0.10**	**0.06**
2		.14	.15	.26	.21	**.08**	**.06**	**.19**	.15	.02	**.35**	**2.3**	4.3	**.09**	**.05**
3		.33	.21	**.22**	.23	**.08**	**.07**	**.19**	**.11**	.20	**.35**	.94	**3.5**	**.08**	**.05**
4		**.30**	**.13**	**.17**	**.20**	**.07**	**.08**	**.19**	**.08**	**.14**	**.35**	**.94**	**3.0**	**.07**	**.05**
5		**.27**	.05	**.12**	**.16**	**.07**	**.08**	**.19**	.02	.08	**.35**	**.94**	2.6	**.06**	**.04**
6		**.24**	.17	.08	.13	**.07**	.09	**.19**	**.02**	**.06**	.31	9.0	7.2	.06	**.04**
7		.21	.08	**.12**	**.13**	**.07**	**.09**	**.19**	**.02**	.05	1.5	3.3	.98	**.08**	.02
8		.14	.07	.16	**.14**	**.07**	**.09**	**.19**	**.02**	**.05**	1.6	1.3	.82	**.11**	**.02**
9		**.14**	.44	.30	**.14**	.06	**.09**	**.19**	**.02**	.02	1.5	**1.2**	1.0	**.13**	**.02**
10		.24	.42	**.26**	.14	**.06**	**.10**	**.19**	.02	**.02**	1.6	.97	.98	**.16**	**.02**
11		**.23**	.39	**.22**	.24	**.06**	**.10**	.19	**.02**	**.02**	**1.4**	**.86**	.52	**.18**	**.02**
12		**.22**	**.34**	**.17**	.26	**.06**	**.10**	**.18**	**.02**	.02	**1.3**	**.75**	.39	.21	**.02**
13		**.22**	**.30**	.13	.35	.16	**.10**	**.16**	**.02**	.19	**1.1**	**.64**	.27	**.20**	.08
14		.21	**.25**	**.13**	.18	.19	**.10**	**.15**	**.02**	**.13**	.93	**.53**	.43	**.19**	.23
15		**.21**	.20	**.13**	**.15**	.14	**.10**	**.13**	**.02**	.07	**.66**	.42	**.40**	**.19**	**.20**
16		**.20**	**.20**	**.13**	.12	**.10**	**.10**	**.12**	**.02**	**.07**	**.39**	**.36**	.37	**.18**	**.17**
17		.20	.23	.13	**.12**	.06	**.10**	**.11**	.02	**.07**	.12	.31	**.37**	**.17**	**.15**
18		**.24**	**.21**	**.13**	**.12**	**.06**	**.10**	**.09**	**.02**	**.07**	.14	9.8	**.70**	**.16**	**.12**
19		**.28**	**.19**	**.13**	.22	**.05**	**.10**	**.08**	**.02**	**.07**	.10	7.2	.53	.15	.09
20		.30	.17	**.12**	.20	**.05**	**.10**	**.06**	**.02**	**.06**	.20	**4.2**	.29	**.15**	.20
21		**.28**	.52	**.12**	.24	**.04**	.10	**.05**	**.02**	**.06**	**.18**	1.2	.52	.15	.08
22		**.25**	**.36**	**.12**	**.17**	**.02**	**.09**	**.04**	**.02**	**.06**	**.17**	**1.0**	.53	**.16**	.18
23		**.23**	.22	**.12**	.12	.02	**.08**	.02	**.02**	**.06**	**.15**	**.90**	.37	**.17**	.15
24	0.68	**.20**	**.22**	.12	**.10**	**.02**	**.07**	**.02**	**.02**	**.06**	**.14**	**.77**	.30	**.18**	.12
25	.45	.18	**.22**	**.12**	.09	**.02**	**.06**	**.02**	**.02**	**.06**	**.12**	**.64**	**.30**	**.19**	.23
26	.75	**.16**	**.21**	**.08**	.13	**.02**	**.05**	**.02**	.02	**.05**	**.10**	**.50**	.27	.19	**.13**
27	.60	**.13**	**.21**	**.08**	.09	**.02**	**.04**	**.02**	**.02**	**.05**	**.09**	**.37**	**.23**	.19	.02
28	**.48**	.11	.21	**.08**	**.09**	**.02**	.02	**.02**	**.02**	.05	.07	.37	**.19**	.04	.15
29	.36	**.13**	**.21**	.08	**.08**	**.02**	**.02**	-----	.02	.05	1.2	**.37**	**.15**	**.05**	**.10**
30	.32	**.16**	**.22**	**.08**	**.08**	**.02**	**.02**	-----	**.02**	**.05**	3.4	**.37**	.11	.06	.05
31	.28	**.19**	-----	**.08**	-----	**.02**	**.02**	-----	**.16**	-----	5.1	-----	**.10**	**.06**	-----
SUM	**3.9**	**6.6**	**7.0**	**4.4**	**4.7**	**1.9**	**2.4**	**3.2**	**1.2**	**2.0**	**25**	**56**	**40**	**4.2**	**2.9**
MEAN	**.49**	**.21**	**.23**	**.14**	**.16**	**.06**	**.08**	**.12**	**.04**	**.07**	**.81**	**1.9**	**1.3**	**.13**	**.10**

Table 32. Daily mean triazine concentrations determined by immunoassay in samples from Cedar Creek west of Valley Falls, Kansas, from July 1992 through March 1995—Continued

	1993			1994												1995		
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	0.05	0.02	0.02	0.06	0.03	0.05	0.02	1.0	2.0	2.3	0.82	0.98	0.20	0.28	0.28	0.22	0.28	0.10
2	.06	.02	.02	.06	.02	.06	.07	.42	23	2.5	.80	.95	.35	.29	.28	.24	.28	.11
3	.06	.02	.02	.06	.02	.07	.08	.65	15	2.6	.78	.92	.35	.30	.28	.25	.26	.12
4	.07	.02	.02	.06	.02	.09	.08	1.0	4.0	4.4	.76	.90	.30	.30	.28	.27	.25	.13
5	.08	.02	.02	.06	.02	.07	.08	.50	3.0	4.5	.74	.88	.26	.31	.28	.28	.23	.14
6	.08	.02	.02	.06	.02	.06	.08	.30	1.8	3.8	.72	.85	.21	.32	.50	.26	.21	.15
7	.08	.02	.02	.05	.02	.05	.08	.28	2.0	3.2	.70	.76	.16	.32	.56	.23	.19	.16
8	.08	.02	.02	.04	.02	.04	.08	.26	16	1.9	.68	.68	.17	.33	.54	.20	.18	.17
9	.08	.02	.02	.04	.02	.03	.09	.25	3.4	1.7	.66	.59	.17	.34	.53	.18	.16	.18
10	.07	.11	.02	.03	.02	.02	.16	.22	2.9	1.5	.64	.53	.18	.33	.52	.16	.14	.19
11	.08	.11	.02	.03	.02	.02	.31	.15	2.2	1.3	.60	.48	.18	.33	.51	.13	.12	.20
12	.08	.04	.02	.02	.02	.02	.33	.12	1.7	1.3	.70	.42	.19	.32	.50	.12	.11	.21
13	.07	.05	.07	.02	.02	.02	.64	.09	1.4	1.3	.66	.37	.19	.32	.49	.11	.09	.22
14	.07	.12	.09	.02	.02	.02	.20	.43	1.3	1.3	.61	.31	.19	.31	.48	.10	.07	.23
15	.07	.10	.09	.02	.02	.02	.15	5.7	1.2	1.3	.56	.30	.19	.30	.48	.10	.05	.24
16	.05	.08	.09	.02	.02	.02	.13	2.0	1.2	1.3	.52	.30	.19	.30	.47	.09	.04	.25
17	.02	.06	.09	.02	.02	.02	.10	1.0	1.1	1.2	.48	.29	.19	.29	.46	.08	.02	.25
18	.02	.06	.07	.02	.02	.02	.09	.50	1.1	1.2	.43	.28	.19	.28	.45	.07	.03	.25
19	.02	.06	.05	.02	.02	.02	.08	.25	1.0	1.0	.42	.27	.19	.26	.44	.06	.03	.25
20	.06	.06	.03	.02	.03	.02	.08	.25	.93	.91	.42	.27	.19	.24	.43	.05	.04	.25
21	.08	.06	.02	.02	.03	.02	.12	.24	.86	.94	.41	.26	.19	.23	.43	.05	.05	.25
22	.08	.06	.02	.03	.03	.02	.10	.24	1.0	.92	.40	.26	.19	.24	.39	.04	.06	.25
23	.07	.10	.03	.04	.04	.02	.09	.24	1.3	.91	.39	.25	.19	.24	.36	.03	.06	.25
24	.07	.09	.03	.05	.04	.02	.08	.23	1.8	.90	.38	.25	.19	.25	.32	.02	.07	.25
25	.06	.08	.04	.06	.04	.02	.07	.22	1.6	.88	.37	.24	.20	.25	.28	.02	.08	.25
26	.06	.07	.04	.07	.05	.02	.07	.21	1.4	.86	.34	.24	.21	.26	.24	.02	.08	.40
27	.06	.06	.05	.07	.05	.02	.07	.21	1.2	.85	.32	.23	.22	.26	.21	.30	.09	.60
28	.06	.05	.05	.06	.05	.02	1.0	.21	1.0	.85	.30	.23	.24	.27	.17	.30	.09	.48
29	.05	.04	.06	.06	-----	.02	2.2	2.9	1.0	.84	.52	.22	.25	.27	.18	.29	-----	.36
30	.04	.03	.06	.04	-----	.02	2.3	6.8	1.0	.83	1.5	.21	.26	.28	.20	.29	-----	.24
31	.02	-----	.06	.03	-----	.02	-----	2.9	-----	.82	1.0	-----	.27	-----	.21	.28	-----	.12
SUM	1.9	1.7	1.3	1.3	.75	.96	9.0	30	98	50	19	14	6.6	8.6	12	4.8	3.4	7.2
MEAN	.06	.06	.04	.04	.03	.03	.30	.96	3.3	1.6	.60	.46	.21	.29	.38	.16	.12	.23

Table 33. Daily mean triazine concentrations determined by immunoassay in samples from Rock Creek northeast of Meriden, Kansas, from July 1992 through March 1995

[Bold type indicates an estimated value. Values less than 0.04 were assigned a value of 0.02 for computation of mean. NF, indicates days with no streamflow. -----, no data]

	1992						1993								
Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		**0.87**	0.19	0.31	**0.18**	0.19	**0.09**	**0.16**	**0.18**	0.33	**0.22**	**0.14**	17	**0.72**	**0.31**
2		**.81**	.30	**.28**	.21	**.18**	**.09**	**.16**	.25	.27	.23	**.26**	**13**	**.64**	**.30**
3		.76	.27	**.25**	.09	**.17**	.08	**.17**	**.22**	.32	.28	.32	**12**	**.56**	**.30**
4		**.68**	**.28**	**.22**	**.09**	**.16**	**.14**	**.18**	**.18**	.44	**.28**	**.32**	12	**.47**	**.29**
5		**.59**	.29	**.19**	**.09**	**.15**	**.17**	**.19**	.15	.30	**.28**	**.32**	9.7	**.39**	**.28**
6		**.51**	.90	**.16**	.10	**.14**	.23	**.20**	**.14**	**.24**	**.29**	5.1	4.0	.31	**.28**
7		.42	1.1	.13	**.10**	**.13**	**.22**	**.21**	**.13**	.18	.30	1.0	3.3	**.31**	.27
8		.50	**1.0**	**.13**	**.10**	**.12**	**.21**	**.22**	**.13**	**.21**	.57	2.3	2.7	**.31**	**.26**
9		.85	**.89**	.18	**.10**	.11	**.20**	**.22**	**.12**	.24	.40	**1.7**	3.9	**.31**	**.25**
10		**.82**	.76	**.17**	.42	**.11**	**.19**	**.23**	.11	**.19**	.35	1.2	3.2	**.31**	**.24**
11		**.80**	**.70**	**.15**	.40	**.11**	**.18**	.24	**.11**	**.15**	**.29**	**1.0**	3.6	**.32**	**.23**
12		**.77**	**.64**	**.14**	.56	**.11**	**.17**	**.22**	**.10**	.10	**.23**	**.93**	3.7	.32	**.21**
13		**.75**	**.59**	.12	.49	.30	**.16**	**.20**	**.10**	.28	**.17**	**.80**	**3.1**	**.35**	**.22**
14		.72	**.53**	**.12**	**.37**	.50	**.15**	**.18**	**.10**	.24	.11	**.68**	**2.4**	**.38**	.19
15		**.66**	.47	**.15**	**.26**	**.42**	**.14**	**.16**	**.09**	.14	.06	.56	**1.8**	**.41**	**.17**
16		**.60**	**.47**	**.17**	.14	**.33**	**.13**	**.14**	**.09**	**.12**	**.06**	**.52**	1.2	**.44**	**.16**
17		.54	.48	.19	**.14**	.25	**.12**	**.12**	.09	.22	**.05**	.48	**3.0**	**.47**	**.15**
18		**.47**	**.44**	**.19**	**.14**	**.24**	**.11**	**.10**	**.10**	**.22**	.05	3.2	**2.5**	**.50**	**.14**
19		**.41**	**.41**	**.20**	.36	**.22**	**.10**	**.08**	**.10**	**.22**	**.07**	5.3	2.2	.53	.39
20		.34	**.38**	**.20**	.62	**.21**	**.09**	**.06**	**.11**	**.21**	.09	**4.1**	**2.1**	**.52**	1.1
21		**.34**	.35	**.21**	.57	**.19**	.08	**.04**	**.12**	**.21**	**.09**	3.0	2.0	**.51**	.83
22		**.34**	**.28**	**.21**	**.46**	**.18**	**.08**	**.04**	**.12**	**.21**	**.09**	**2.6**	1.6	**.50**	.74
23		**.34**	.21	**.22**	.35	.16	**.08**	.02	**.13**	**.21**	**.08**	**2.3**	2.1	**.49**	.50
24	2.2	**.35**	**.21**	.22	**.34**	**.15**	**.08**	**.02**	**.14**	**.21**	**.08**	**2.0**	1.9	**.47**	.45
25	**2.2**	.35	**.21**	**.21**	.33	**.15**	**.08**	**.02**	**.15**	**.20**	**.08**	**1.7**	**1.8**	**.46**	.42
26	1.9	**.38**	**.25**	**.20**	.29	**.14**	**.08**	**.02**	.15	**.20**	**.07**	**1.4**	1.8	.45	**.44**
27	2.0	**.41**	**.26**	**.18**	.31	**.13**	**.09**	**.02**	**.17**	**.20**	**.07**	**1.1**	**1.5**	**.42**	**.47**
28	**1.5**	.44	.26	**.17**	**.28**	**.12**	**.11**	**.11**	**.20**	**.20**	.07	.77	**1.3**	**.42**	.49
29	1.0	**.38**	**.27**	.16	**.26**	**.12**	.13	-----	**.22**	.19	**.09**	**.77**	**1.1**	**.35**	**.46**
30	.97	**.32**	**.28**	**.16**	**.23**	**.11**	**.14**	-----	.25	**.20**	**.12**	**.77**	.88	.32	.44
31	**.92**	**.25**	-----	**.16**	-----	**.10**	**.15**	-----	.41	-----	.14	-----	**.80**	**.31**	-----
SUM	**13**	**17**	**14**	**5.8**	**8.4**	**5.7**	**4.1**	**3.7**	**4.7**	**6.6**	**5.4**	**47**	**120**	**13**	**11**
MEAN	**1.6**	**.54**	**.46**	**.19**	**.28**	**.18**	**.13**	**.13**	**.15**	**.22**	**.17**	**1.6**	**4.0**	**.43**	**.37**

Table 33. Daily mean triazine concentrations determined by immunoassay in samples from Rock Creek northeast of Meriden, Kansas, from July 1992 through March 1995—Continued

	1993			1994												1995		
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	0.42	0.13	0.10	0.07	0.07	0.07	0.03	1.2	0.29	1.1	0.56	0.50	NF	0.27	0.17	0.12	0.06	0.06
2	.40	.12	.10	.07	.07	.06	.02	.48	.30	5.1	.48	NF	NF	.26	.16	.12	.06	.06
3	.38	.10	.10	.07	.07	.06	.02	.37	.32	3.0	.40	NF	NF	.26	.16	.12	.06	.06
4	.36	.09	.10	.06	.06	.06	.02	.26	.33	2.9	.39	NF	NF	.25	.16	.12	.05	.06
5	.34	.09	.10	.06	.06	.06	.02	.22	.34	2.9	.38	NF	NF	.24	.15	.12	.05	.06
6	.32	.08	.09	.06	.05	.05	.02	.58	.35	2.5	.37	NF	NF	.24	.15	.11	.05	.06
7	.30	.08	.09	.06	.05	.04	.02	.52	.35	2.0	.36	NF	NF	.23	.21	.10	.05	.06
8	.32	.08	.09	.06	.04	.04	.02	.45	15	1.6	.36	NF	NF	.23	.20	.09	.04	.07
9	.29	.07	.09	.06	.03	.03	.02	.39	6.0	1.4	NF	NF	NF	.22	.19	.08	.04	.07
10	.26	.07	.09	.07	.02	.02	.10	.34	3.3	1.3	NF	NF	NF	.22	.18	.08	.04	.07
11	.22	.07	.09	.07	.02	.02	.12	.30	3.0	1.2	NF	NF	NF	.22	.17	.07	.04	.07
12	.19	.15	.08	.07	.02	.02	.13	.26	2.6	1.1	NF	NF	NF	.22	.16	.07	.03	.07
13	.16	.16	.08	.07	.02	.02	.14	.21	2.3	1.1	NF	NF	NF	.23	.15	.07	.03	.07
14	.16	.19	.07	.06	.02	.02	.10	.22	2.2	1.1	NF	NF	NF	.23	.14	.07	.03	.10
15	.25	.19	.07	.06	.02	.02	.07	.24	2.0	1.1	NF	NF	NF	.24	.14	.08	.03	.11
16	.25	.20	.07	.06	.02	.02	.06	.24	1.8	1.1	NF	NF	NF	.24	.13	.08	.02	.11
17	.25	.20	.07	.06	.02	.02	.06	.24	1.8	1.0	NF	NF	NF	.24	.12	.08	.02	.11
18	.40	.20	.06	.05	.03	.02	.06	.24	1.7	1.0	NF	NF	NF	.24	.12	.08	.02	.10
19	.36	.20	.06	.05	.03	.03	.06	.24	1.7	.91	NF	NF	NF	.24	.11	.08	.03	.10
20	.31	.20	.06	.05	.04	.04	.06	.24	1.6	.79	.36	NF	NF	.50	.10	.08	.03	.10
21	.26	.19	.06	.05	.04	.06	.24	.24	1.6	.91	NF	NF	NF	.41	.10	.09	.04	.10
22	.22	.19	.06	.06	.04	.08	.21	.25	1.6	.88	NF	NF	NF	.30	.10	.09	.04	.10
23	.26	.19	.06	.06	.05	.10	.18	.25	.81	.84	NF	.28	NF	.28	.10	.09	.04	.09
24	.30	.18	.07	.06	.05	.12	.16	.26	1.9	.80	NF	.28	NF	.26	.10	.09	.05	.09
25	.30	.17	.07	.07	.06	.12	.13	.27	1.6	.77	NF	NF	NF	.25	.10	.08	.05	.09
26	.24	.16	.07	.07	.06	.10	.12	.28	1.4	.74	.73	NF	NF	.23	.11	.08	.06	.09
27	.18	.15	.08	.07	.07	.08	.40	.28	1.2	.70	.67	NF	NF	.22	.11	.07	.06	.09
28	.17	.14	.08	.07	.07	.07	.93	.28	1.0	.67	NF	NF	NF	.20	.11	.07	.06	.07
29	.16	.12	.08	.07	-----	.06	.70	.28	1.0	.64	.54	NF	NF	.19	.11	.07	-----	.05
30	.15	.11	.08	.07	-----	.05	1.9	.28	1.0	.62	.58	NF	.27	.17	.11	.06	-----	.03
31	.14	-----	.08	.07	-----	.04	-----	.28	-----	.59	.54	-----	.27	-----	.11	.06	-----	.02
SUM	8.3	4.3	2.4	2.0	1.2	1.6	6.1	10	61	42	6.7	1.1	.54	7.5	4.2	2.7	1.2	2.4
MEAN	.27	.14	.08	.06	.04	.05	.20	.33	2.0	1.4	.48	.35	.27	.25	.14	.09	.04	.08

Table 34. Daily mean triazine concentrations determined by immunoassay in samples from Slough Creek west of Oskaloosa, Kansas, from July 1992 through March 1995

[Bold type indicates an estimated value. Values less than 0.04 were assigned a value of 0.02 for computation of mean. -----, no data]

	1992						1993								
Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		**1.2**	0.37	0.57	0.29	1.0	**0.36**	**0.54**	**0.27**	0.53	0.42	**0.60**	11	0.56	**0.70**
2		1.1	.55	**.54**	.58	**.96**	**.35**	**.52**	.37	.42	**.86**	1.8	6.5	**.54**	.67
3		1.4	.42	**.51**	.75	**.89**	.33	**.50**	**.47**	.25	1.3	.64	**6.5**	**.53**	**.64**
4		**1.2**	**.42**	**.48**	**.62**	**.83**	.86	**.49**	**.58**	.45	**1.2**	**.64**	7.2	**.52**	**.61**
5		**1.0**	.45	**.44**	**.49**	**.77**	**.75**	**.47**	.68	.46	**1.2**	**.64**	2.6	**.50**	**.59**
6		**.81**	.50	**.41**	.36	**.70**	.64	**.45**	**.63**	**.41**	1.1	11	7.7	**.48**	**.56**
7		.62	.79	.38	**.36**	**.64**	**.63**	**.43**	**.58**	.37	1.1	9.3	**7.7**	.47	.53
8		**.63**	**.74**	**.38**	**.36**	**.57**	**.63**	**.41**	**.52**	**.47**	1.3	4.9	9.4	**.47**	**.49**
9		**.64**	**.70**	.39	**.36**	.51	**.62**	**.41**	**.47**	.58	1.8	13	3.6	**.47**	**.44**
10		.65	.65	**.38**	.43	**.51**	**.61**	**.41**	.42	**.48**	2.3	3.8	2.3	**.47**	**.40**
11		**.65**	**.64**	**.36**	.91	**.51**	**.61**	.41	**.39**	**.39**	**2.1**	**3.5**	**2.4**	.49	**.36**
12		**.65**	**.63**	**.35**	1.3	**.51**	**.60**	**.39**	**.36**	.29	**1.8**	**3.2**	2.6	.72	**.31**
13		**.64**	**.61**	.33	1.1	.61	**.60**	**.37**	**.33**	.28	**1.6**	**2.9**	**2.5**	**.73**	.27
14		.64	**.60**	**.34**	**.83**	1.1	**.59**	**.35**	**.30**	.33	1.4	**2.6**	**2.4**	**.74**	.73
15		**.62**	.59	**.35**	**.60**	1.5	**.58**	**.33**	**.26**	.32	.83	2.3	**2.3**	**.75**	**.74**
16		**.59**	**.54**	**.36**	.37	**1.5**	**.58**	**.31**	**.23**	**.32**	.76	**1.7**	2.2	**.76**	**.75**
17		.57	.50	.38	**.35**	1.6	**.57**	**.29**	.20	.36	.60	**1.0**	1.9	**.77**	**.77**
18		**.56**	**.50**	**.36**	**.30**	**1.4**	**.56**	**.27**	**.20**	**.36**	.66	.37	1.7	**.79**	.78
19		**.54**	**.50**	**.35**	.58	**1.2**	**.56**	**.25**	**.19**	**.36**	.58	**.37**	1.7	.80	**.73**
20		.54	.70	**.33**	1.2	**1.1**	**.55**	**.23**	**.19**	**.36**	.57	**.37**	1.1	.47	.68
21		**.56**	.71	**.32**	4.0	**.88**	**.55**	**.21**	**.18**	**.36**	**.56**	1.2	1.5	**.49**	.23
22		**.58**	**.70**	**.30**	**3.6**	**.69**	**.54**	**.19**	**.18**	**.36**	**.55**	**1.2**	1.4	**.51**	.56
23		**.60**	.68	.30	3.2	.51	**.53**	.17	**.18**	**.36**	**.54**	**1.2**	1.5	**.53**	.45
24	2.9	**.62**	**.66**	**.30**	**2.2**	**.49**	**.53**	**.17**	**.17**	**.36**	**.53**	**1.2**	1.2	**.55**	.38
25	**2.3**	.65	**.63**	**.30**	1.2	**.48**	.52	**.17**	**.17**	**.36**	**.51**	**1.2**	1.3	**.57**	.32
26	1.7	**.60**	**.61**	**.30**	1.2	**.46**	**.54**	**.17**	.16	**.36**	**.50**	**1.2**	1.4	.59	**.30**
27	1.8	**.56**	**.58**	**.30**	1.7	**.44**	**.56**	**.17**	**.14**	**.36**	**.49**	**1.2**	**1.3**	**.59**	.29
28	**1.7**	.51	.56	**.30**	**1.5**	**.43**	**.58**	**.17**	**.12**	**.42**	.48	1.2	**1.2**	.37	**.29**
29	1.6	**.48**	**.56**	.30	**1.4**	**.41**	.60	-----	**.11**	**.48**	**.52**	**1.2**	**1.2**	**.53**	**.28**
30	1.4	**.44**	**.56**	**.30**	**1.2**	**.40**	**.58**	-----	.09	.48	**.60**	**1.2**	1.1	.69	.28
31	1.3	**.41**	-----	**.29**	-----	**.38**	**.56**	-----	.32	-----	.60	-----	**1.1**	.74	-----
SUM	15	21	18	11	33	24	18	9.2	9.5	12	29	77	99	18	15
MEAN	1.8	.69	.59	.36	1.1	.78	.57	.33	.31	.39	.94	2.6	3.2	.59	.50

Table 34. Daily mean triazine concentrations determined by immunoassay in samples from Slough Creek west of Oskaloosa, Kansas, from July 1992 through March 1995—Continued

	1993			1994												1995		
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	0.27	0.15	0.10	0.15	0.08	0.12	0.08	7.0	1.2	0.73	0.90	0.37	0.25	0.24	0.57	0.19	0.39	0.15
2	.25	.14	.10	.13	.07	.12	.09	4.8	1.2	10	.87	.37	.40	.24	.56	.20	.39	.16
3	.24	.12	.10	.12	.08	.13	.09	4.0	1.1	6.6	.85	.38	.63	.24	.55	.21	.38	.17
4	.23	.11	.10	.11	.08	.13	.09	3.4	1.1	5.2	.82	.38	.59	.25	.55	.22	.36	.18
5	.21	.11	.10	.10	.09	.13	.09	3.0	1.1	4.3	.80	.38	.56	.25	.54	.23	.35	.19
6	.20	.11	.09	.09	.10	.14	.08	11	1.1	3.6	.77	.38	.53	.25	.53	.22	.33	.20
7	.20	.12	.09	.10	.10	.14	.08	6.3	1.1	2.8	.75	.38	.50	.26	.52	.20	.32	.22
8	.20	.12	.09	.11	.11	.15	.08	4.5	9.2	2.1	.72	.38	.47	.26	.50	.18	.31	.23
9	.20	.12	.09	.12	.12	.16	.09	3.5	4.0	1.9	.71	.38	.45	.26	.47	.16	.29	.24
10	.21	.11	.09	.13	.12	.16	.10	3.2	2.4	1.8	.70	.38	.42	.26	.45	.14	.28	.25
11	.22	.10	.09	.14	.13	.16	.10	2.8	2.2	1.7	.69	.37	.40	.26	.43	.13	.26	.26
12	.22	.15	.09	.15	.13	.15	.13	2.5	2.1	1.6	.68	.37	.37	.26	.40	.13	.25	.27
13	.23	.19	.16	.15	.12	.14	.17	2.3	1.9	1.5	.67	.37	.36	.26	.38	.13	.24	.28
14	.23	.19	.16	.14	.11	.13	.14	2.2	1.8	1.5	.66	.37	.34	.26	.36	.13	.22	.30
15	.21	.18	.17	.14	.10	.13	.12	2.0	1.7	1.4	.65	.36	.33	.27	.35	.13	.21	.33
16	.23	.18	.17	.13	.10	.14	.12	1.9	1.5	1.4	.64	.34	.32	.27	.33	.13	.19	.35
17	.25	.18	.16	.12	.10	.20	.12	1.8	1.5	1.3	.63	.33	.31	.27	.32	.13	.18	.35
18	.28	.16	.16	.12	.10	.25	.12	1.6	1.5	1.2	.62	.32	.30	.27	.30	.14	.18	.36
19	.33	.15	.16	.11	.10	.20	.12	1.5	1.4	1.2	.60	.31	.28	.27	.28	.14	.17	.36
20	.32	.14	.15	.10	.10	.15	.12	1.5	1.4	1.1	.57	.29	.27	.90	.27	.14	.16	.37
21	.31	.13	.15	.10	.10	.13	1.3	1.5	1.4	1.1	.55	.28	.26	.85	.25	.14	.16	.38
22	.30	.12	.15	.10	.10	.11	1.2	1.5	2.0	1.1	.53	.28	.24	.80	.24	.14	.16	.39
23	.27	.11	.15	.11	.11	.09	1.1	1.4	2.1	1.1	.51	.28	.23	.75	.23	.14	.15	.40
24	.25	.11	.15	.12	.11	.08	1.1	1.4	1.0	1.1	.48	.27	.22	.70	.22	.14	.14	.41
25	.23	.11	.16	.13	.11	.07	1.0	1.4	.95	1.1	.46	.27	.22	.68	.21	.14	.14	.42
26	.21	.11	.16	.13	.11	.07	.93	1.3	.90	1.1	.42	.27	.22	.66	.20	.40	.14	.43
27	.19	.11	.16	.12	.11	.07	1.6	1.3	.85	1.1	.39	.26	.23	.64	.18	.40	.13	.44
28	.19	.10	.16	.12	.11	.07	18	1.3	.80	1.0	.36	.26	.23	.62	.17	.40	.14	.36
29	.18	.10	.17	.11	-----	.08	9.0	1.2	.77	1.0	.32	.26	.23	.60	.17	.39	-----	.29
30	.17	.10	.17	.10	-----	.08	14	1.2	.75	.98	.37	.26	.24	.58	.18	.39	-----	.22
31	.16	-----	.17	.09	-----	.08	-----	1.4	-----	.94	.37	-----	.24	-----	.18	.39	-----	.14
SUM	7.2	3.9	4.2	3.7	2.9	4.0	51	85	52	65	19	9.9	11	13	11	6.4	6.6	9.1
MEAN	.23	.13	.13	.12	.10	.13	1.7	2.8	1.7	2.1	.61	.33	.34	.42	.35	.20	.24	.29

Table 35. Daily mean triazine concentrations determined by immunoassay in samples from Delaware River below Perry Dam, Kansas, from July 1992 through September 1995

[Bold type indicates an estimated value. Values less than 0.04 were assigned a value of 0.02 for computation of mean. -----, no data]

	1992						1993											
Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1		3.2	2.6	2.8	2.4	2.8	1.9	1.0	0.81	1.0	0.68	1.8	1.7	2.0	2.0	1.7	1.6	1.4
2		3.1	2.7	2.8	2.5	2.8	1.9	1.0	.81	1.0	.69	1.6	2.1	2.0	2.0	1.7	1.6	1.4
3		3.0	2.7	2.8	2.5	2.8	1.9	1.0	.95	1.0	.70	1.3	2.4	2.0	2.1	1.8	1.6	1.4
4		3.0	2.8	2.8	2.6	2.9	1.9	1.0	1.1	.98	.70	1.4	2.8	2.0	2.1	1.8	1.6	1.4
5		3.1	2.8	2.8	2.6	2.8	1.9	1.0	1.2	.95	.71	1.5	3.2	1.9	2.2	1.8	1.6	1.4
6		3.1	2.9	2.8	2.6	2.8	1.9	1.0	1.2	.91	.72	1.6	3.5	1.9	2.2	1.8	1.6	1.4
7		3.2	3.0	2.8	2.7	2.7	1.9	1.0	1.3	.87	.66	1.7	3.5	1.9	2.2	1.8	1.6	1.4
8		3.2	2.9	2.7	2.8	2.6	1.8	1.1	1.3	.83	.61	1.7	3.5	1.8	2.2	1.8	1.6	1.4
9		3.3	2.9	2.6	2.9	2.6	1.8	1.1	1.3	.79	.55	1.8	3.4	1.8	2.2	1.8	1.5	1.4
10		3.4	2.8	2.6	3.0	2.5	1.7	1.1	1.3	.79	.49	1.8	3.4	1.8	2.2	1.8	1.5	1.4
11		3.3	2.7	2.6	2.9	2.5	1.7	1.1	1.3	.80	.94	1.8	3.4	1.7	2.2	1.8	1.5	1.4
12		3.2	2.7	2.7	2.8	2.4	1.6	1.1	1.3	.80	1.4	1.8	3.3	1.7	2.2	1.8	1.4	1.4
13		3.2	2.7	2.7	2.8	2.4	1.6	1.0	1.3	.75	1.8	1.8	3.4	1.8	2.2	1.8	1.4	1.3
14		3.1	2.7	2.8	2.7	2.3	1.5	1.0	1.3	.70	2.3	1.9	3.5	1.8	2.2	1.8	1.4	1.3
15		3.2	2.7	2.9	2.6	2.2	1.5	1.0	1.3	.66	2.2	1.9	3.7	1.9	2.2	1.8	1.3	1.3
16		3.2	2.7	2.9	2.5	2.1	1.4	.98	1.3	.65	2.1	1.9	3.8	2.0	2.2	1.8	1.3	1.4
17		3.3	2.7	3.0	2.4	2.0	1.4	.96	1.3	.64	2.0	2.0	3.8	2.1	2.2	1.7	1.2	1.6
18		3.2	2.8	3.0	2.5	2.0	1.3	.94	1.3	.63	1.9	2.1	3.8	2.2	2.2	1.7	1.3	1.6
19		3.1	2.8	2.9	2.6	2.0	1.3	.92	1.3	.62	1.8	2.2	3.8	2.3	2.2	1.7	1.3	1.7
20		2.9	2.8	2.9	2.7	2.0	1.2	.90	1.4	.61	1.8	2.3	3.5	2.2	2.2	1.7	1.3	1.7
21		2.9	2.8	2.8	2.7	2.0	1.2	.88	1.4	.61	1.8	2.4	3.3	2.2	2.1	1.7	1.3	1.7
22		2.9	2.9	2.8	2.7	2.0	1.2	.86	1.4	.61	1.8	2.4	2.9	2.2	2.0	1.7	1.4	1.7
23		3.0	2.9	2.8	2.7	2.0	1.1	.84	1.4	.62	1.9	2.5	2.5	2.2	1.9	1.7	1.5	1.7
24	3.4	3.0	3.0	2.7	2.7	2.0	1.1	.84	1.4	.63	1.9	2.4	2.4	2.1	1.8	1.6	1.5	1.6
25	3.5	3.0	3.0	2.7	2.7	2.0	1.1	.83	1.4	.64	1.8	2.3	2.3	2.1	1.8	1.6	1.5	1.6
26	3.6	2.9	3.0	2.7	2.7	2.0	1.0	.83	1.5	.65	1.8	2.2	2.2	2.1	1.8	1.6	1.5	1.6
27	3.7	2.9	3.0	2.6	2.7	2.0	1.0	.82	1.4	.66	1.8	2.0	2.1	2.2	1.7	1.6	1.4	1.5
28	3.6	2.9	3.1	2.6	2.7	2.0	1.0	.82	1.3	.67	1.7	2.0	2.1	2.1	1.7	1.6	1.4	1.5
29	3.5	2.8	3.0	2.6	2.8	2.0	.98	-----	1.2	.67	1.8	1.9	2.1	2.1	1.7	1.6	1.4	1.5
30	3.4	2.8	2.9	2.5	2.8	2.0	.99	-----	1.1	.67	2.0	1.8	2.1	2.1	1.7	1.6	1.4	1.4
31	3.3	2.7	-----	2.5	-----	2.0	1.0	-----	.99	-----	2.1	-----	2.1	2.0	-----	1.6	-----	1.4
SUM	28	95	85	85	80	71	45	27	39	22	45	58	92	62	62	53	44	46
MEAN	3.5	3.1	2.8	2.8	2.7	2.3	1.4	.96	1.3	.75	1.5	1.9	3.0	2.0	2.1	1.7	1.4	1.5

Table 35. Daily mean triazine concentrations determined by immunoassay in samples from Delaware River below Perry Dam, Kansas, from July 1992 through September 1995—Continued

	1994												1995								
Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.4	0.86	1.3	1.4	1.1	1.4	2.6	3.6	3.2	3.3	3.3	3.4	3.3	3.0	2.9	2.9	2.9	3.2	2.9	4.7	5.0
2	1.4	.86	1.3	1.4	1.1	1.4	3.0	3.5	3.2	3.3	3.3	3.4	3.4	3.0	2.9	3.0	2.9	3.2	2.8	4.7	4.9
3	1.4	.88	1.4	1.4	1.0	1.5	3.3	3.4	3.2	3.3	3.3	3.4	3.4	3.0	2.9	3.0	2.9	3.2	2.8	4.7	4.7
4	1.3	.91	1.4	1.4	1.0	1.4	3.3	3.5	3.3	3.3	3.3	3.4	3.4	3.0	2.9	3.1	2.9	3.2	2.8	4.8	4.7
5	1.3	.93	1.4	1.3	1.0	1.4	3.2	3.5	3.3	3.3	3.3	3.4	3.5	3.0	2.9	3.2	2.9	3.2	2.7	4.8	4.6
6	1.3	.95	1.3	1.2	1.0	1.4	3.2	3.6	3.4	3.2	3.3	3.4	3.4	3.0	2.9	3.2	2.9	3.2	2.9	4.8	4.4
7	1.3	.98	1.3	1.2	1.0	1.5	3.2	3.6	3.3	3.2	3.3	3.4	3.3	3.0	2.9	3.2	2.9	3.2	3.1	4.8	4.3
8	1.3	1.0	1.3	1.2	1.0	1.5	3.3	3.7	3.3	3.2	3.3	3.4	3.3	3.0	2.9	3.1	2.8	3.2	3.3	4.8	4.2
9	1.3	1.0	1.3	1.2	1.0	1.8	3.2	3.7	3.2	3.3	3.3	3.4	3.2	3.0	2.8	3.1	2.8	3.3	3.4	4.8	4.0
10	1.3	1.0	1.2	1.3	1.0	1.8	3.1	3.6	3.3	3.3	3.3	3.3	3.1	3.0	2.8	3.1	2.8	3.3	3.6	5.0	3.9
11	1.4	1.1	1.3	1.3	1.1	1.9	3.1	3.6	3.3	3.4	3.2	3.3	3.1	3.0	2.8	3.0	2.8	3.3	3.8	5.1	3.8
12	1.4	1.2	1.3	1.3	1.1	2.0	3.1	3.6	3.4	3.4	3.2	3.3	3.1	3.0	2.8	3.0	2.8	3.3	4.0	5.3	3.7
13	1.3	1.2	1.3	1.3	1.1	2.1	3.1	3.6	3.4	3.4	3.2	3.3	3.1	3.0	2.8	3.0	2.8	3.4	4.2	5.4	3.5
14	1.3	1.3	1.3	1.3	1.1	2.2	3.1	3.6	3.4	3.4	3.2	3.3	3.1	3.0	2.8	3.0	2.8	3.4	4.3	5.5	3.4
15	1.3	1.4	1.3	1.4	1.2	2.2	3.2	3.6	3.4	3.4	3.2	3.2	3.1	3.0	2.8	2.9	2.8	3.3	4.4	5.7	3.3
16	1.2	1.4	1.3	1.4	1.2	2.2	3.2	3.6	3.4	3.4	3.2	3.2	3.1	3.0	2.9	2.9	2.8	3.3	4.4	5.8	3.2
17	1.2	1.4	1.3	1.4	1.2	2.2	3.2	3.6	3.4	3.4	3.2	3.2	3.1	3.0	2.9	2.9	2.8	3.3	4.5	5.6	3.2
18	1.2	1.4	1.3	1.4	1.2	2.2	3.2	3.5	3.4	3.4	3.2	3.2	3.1	3.0	2.9	2.8	2.9	3.3	4.5	5.5	3.0
19	1.1	1.4	1.3	1.4	1.2	2.1	3.3	3.5	3.4	3.4	3.2	3.2	3.2	3.0	2.9	2.8	2.9	3.3	4.5	5.3	3.1
20	1.1	1.4	1.3	1.4	1.2	2.1	3.4	3.5	3.4	3.4	3.2	3.2	3.2	3.0	2.9	2.8	2.9	3.2	4.6	5.1	3.1
21	1.1	1.4	1.3	1.4	1.3	2.1	3.5	3.5	3.4	3.4	3.2	3.2	3.2	3.0	3.0	2.8	3.0	3.2	4.6	4.9	3.2
22	1.0	1.4	1.4	1.4	1.3	2.0	3.5	3.4	3.4	3.4	3.2	3.2	3.2	3.0	3.0	2.8	3.0	3.2	4.7	5.1	3.2
23	.97	1.4	1.4	1.4	1.3	2.0	3.5	3.4	3.4	3.4	3.2	3.2	3.2	3.0	3.0	2.8	3.0	3.2	4.7	5.4	3.2
24	.93	1.4	1.4	1.3	1.3	2.1	3.5	3.4	3.3	3.5	3.2	3.2	3.2	3.0	3.0	2.8	3.0	3.2	4.7	5.6	3.2
25	.88	1.4	1.4	1.3	1.3	2.2	3.5	3.4	3.3	3.4	3.3	3.2	3.2	3.0	3.1	2.9	3.1	3.1	4.7	5.8	3.3
26	.83	1.3	1.4	1.3	1.3	2.3	3.5	3.4	3.3	3.4	3.3	3.2	3.2	3.0	3.1	2.9	3.1	3.1	4.7	5.7	3.3
27	.83	1.3	1.4	1.3	1.3	2.4	3.5	3.3	3.3	3.3	3.3	3.2	3.1	2.9	3.1	2.9	3.1	3.1	4.7	5.7	3.2
28	.84	1.3	1.3	1.2	1.3	2.5	3.5	3.3	3.3	3.3	3.4	3.2	3.1	2.9	3.1	2.9	3.2	3.0	4.7	5.6	3.0
29	.84	-----	1.4	1.1	1.3	2.5	3.5	3.3	3.3	3.3	3.4	3.2	3.1	-----	3.0	2.9	3.2	3.0	4.7	5.5	2.9
30	.85	-----	1.4	1.1	1.3	2.6	3.6	3.1	3.3	3.3	3.4	3.2	3.1	-----	3.0	2.9	3.2	3.0	4.7	5.7	2.8
31	.85	-----	1.4	-----	1.4	-----	3.6	3.1	-----	3.3	-----	3.3	3.1	-----	2.9	-----	3.2	-----	4.7	5.3	-----
SUM	36	34	41	39	36	59	100	110	100	100	98	100	99	84	91	89	91	26	120	160	110
MEAN	1.2	1.2	1.3	1.3	1.2	2.0	3.3	3.5	3.3	3.3	3.3	3.3	3.2	3.0	2.9	3.0	2.9	3.2	4.0	5.0	3.7

Table 36. Streamflow and concentrations of triazine herbicides as determined by immunoassay (ELISA) procedures for water from selected sampling sites in the Delaware River Basin, April through September 1995

[ft^3/s, cubic feet per second; µg/L, micrograms per liter; e, estimated]

Site no. (fig. 4)	Sample: Date (1995)	Sample: Time (24-hour)	Streamflow, instantaneous (ft^3/s)	Triazine concentration, by ELISA (µg/L)
1	4/06	1230	17	0.38
	4/10	1302	112	2.0
	4/11	1302	424	8.0
	4/12	1302	88	4.1
	4/21	1500	83	2.9
	4/27	0220	64	1.0
	4/27	0738	59	.82
	4/27	1100	68	.87
	4/27	1420	82	.93
	4/27	2020	76	1.0
	5/01	0053	106	2.6
	5/01	0820	493	3.3
	5/01	1420	491	2.7
	5/01	2020	277	4.6
	5/02	1400	103	3.6
	5/02	2400	78	2.8
	5/04	0600	386	4.0
	5/04	1200	556	3.1
	5/04	1800	356	3.9
	5/04	2400	232	4.0
	5/07	0800	74	1.7
	5/08	1400	1,550	3.0
	5/08	1800	930	2.8
	5/09	1200	636	2.1
	5/10	1200	461	3.2
	5/12	1200	112	1.7
	5/12	2000	3,120	2.7
	5/13	0400	4,570	2.8
	5/13	1200	7,210	2.6
	5/13	2000	2,000	1.5
	5/14	0400	675	2.1
	5/14	2000	330	1.2
	5/15	1200	225	1.0
	5/16	1200	154	1.1
	5/17	0400	1,310	2.4
	5/17	2000	1,550	1.5
	5/18	0400	6,130	.90
	5/18	2000	753	1.3
	5/19	1200	324	1.2
	5/20	1200	160	.79
	5/22	1200	103	.49
	5/23	1200	134	.48
	5/23	2000	419	.60
	5/24	0400	589	1.4
	5/24	1200	259	1.5

Table 36. Streamflow and concentrations of triazine herbicides as determined by immunoassay (ELISA) procedures for water from selected sampling sites in the Delaware River Basin, April through September 1995—Continued

Site no. (fig. 4)	Sample		Streamflow, instantaneous (ft^3/s)	Triazine concentration, by ELISA ($\mu g/L$)
	Date (1995)	Time (24-hour)		
1	5/24	2000	162	0.90
	5/27	0400	153	.64
	5/27	1200	8,160	1.5
	5/27	2000	3,740	1.0
	5/28	0400	850	1.0
	5/28	1200	458	1.0
	5/30	1200	107	.69
	6/08	1500	3,990	4.4
	6/09	2400	176	2.8
	6/10	1200	147	2.4
	6/14	2203	43	.75
	6/23	1545	20	.49
	6/24	1931	162	27
	6/25	0331	53	32
	6/25	1925	43	12
	6/25	1931	43	12
	6/26	0331	59	18
	6/26	1530	39	13
	6/28	0527	43	4.8
	6/28	1327	1,430	18
	6/28	2127	225	20
	7/04	0142	43	3.3
	7/04	0527	5,690	10
	7/04	1327	1,440	18
	7/04	2127	5,310	9
	7/05	0527	1,710	16
	7/05	1327	442	14
	7/19	1515	18	1.4
	7/19	2206	19	1.3
	7/20	0606	247	8.6
	7/20	2206	33	5.5
	7/21	1406	35	5.6
	7/26	1315	14	2.3
	8/02	1400	.59	1.1
	8/09	1320	5.7	.84
	8/14	1241	7.9	.57
	8/16	1415	427	2.8
	8/17	1241	46	2.4
	8/21	1530	8.5	1.5
	8/25	1500	8.5	.90
	8/31	1345	80	.32
	9/08	1315	7.6	.37
	9/15	1300	10	1.1

Table 36. Streamflow and concentrations of triazine herbicides as determined by immunoassay (ELISA) procedures for water from selected sampling sites in the Delaware River Basin, April through September 1995—Continued

Site no. (fig. 4)	Sample Date (1995)	Sample Time (24-hour)	Streamflow, instantaneous (ft^3/s)	Triazine concentration, by ELISA (µg/L)
1	9/19	1430	3,540	1.6
	9/29	1245	216	.95
	9/30	1445	99.6	1.2
3	4/06	1200	6.8	1.3
	4/11	0259	47	1.3
	4/11	0659	68	2.5
	4/11	1059	59	6.8
	4/11	1459	54	13
	4/18	0021	55	3.9
	4/18	0406	125	3.5
	4/18	0806	203	7.6
	4/20	1031	37	10
	4/20	1138	38	10
	4/21	1400	39	15
	5/01	0759	39	8.1
	5/01	1359	135	6.9
	5/01	1959	135	17
	5/02	1245	54	15
	5/02	0159	100	14
	5/02	2400	35	15
	5/03	1531	35	12
	5/03	1937	52	15
	5/04	0137	137	18
	5/07	0137	35	14
	5/07	1322	43	12
	5/07	1550	546	17
	5/07	2150	2,250	14
	5/08	0350	3,330	14
	5/08	0950	1,440	17
	5/08	1800	689	18
	5/09	1200	316	24
	5/10	1200	233	20
	5/16	1430	137	9.2
	5/17	0400	210	6.7
	5/17	2000	755	9.5
	5/18	0400	3,250	6.2
	5/18	2000	748	8.4
	5/19	1200	331	8.0
	5/20	1200	104	5.7
	5/22	1200	46	4.9
	5/23	1415	153	7.9
	5/23	2000	1,970	17

Table 36. Streamflow and concentrations of triazine herbicides as determined by immunoassay (ELISA) procedures for water from selected sampling sites in the Delaware River Basin, April through September 1995—Continued

Site no. (fig. 4)	Sample Date (1995)	Sample Time (24-hour)	Streamflow, instantaneous (ft^3/s)	Triazine concentration, by ELISA (µg/L)
3	5/24	0800	1,280	5.3
	5/24	2000	424	5.7
	5/26	2000	81	4.2
	5/27	0800	2,000	6.6
	5/27	2000	1,910	5.8
	5/28	0800	745	7.3
	5/30	0800	94	5.1
	6/01	2000	907	6.6
	6/02	0800	521	5.7
	6/02	2000	333	9.1
	6/03	0800	222	8.2
	6/05	0800	210	7.0
	6/07	2000	52	3.5
	6/08	0800	135	3.6
	6/10	0800	140	3.3
	6/10	2000	106	2.9
	6/12	2308	43	3.1
	6/23	1400	11	1.7
	6/24	1531	25	1.3
	6/24	2331	312	23
	6/25	0731	128	18
	6/25	1531	88	15
	6/25	2331	79	14
	6/26	0731	62	14
	6/28	0501	28	8
	6/28	1301	565	11
	6/28	2101	353	11
	6/29	0501	247	9.6
	7/04	0156	28	7
	7/04	0903	4,460	12
	7/04	1703	3,040	7.3
	7/05	0103	5,030	12
	7/05	0903	1,300	12
	7/19	1630	8.4	2.0
	7/19	2121	14	.78
	7/20	1139	658	4.6
	7/21	1139	99	4.7
	7/22	1139	46	5.2
	7/26	1400	17	4.3
	8/02	1430	8.1	2.0
	8/09	1245	6.2	1.6
	8/14	2316	41	.73
	8/15	1638	391	1.2
	8/15	1913	335	.86
	8/16	0313	173	1.0

Table 36. Streamflow and concentrations of triazine herbicides as determined by immunoassay (ELISA) procedures for water from selected sampling sites in the Delaware River Basin, April through September 1995—Continued

Site no. (fig. 4)	Sample Date (1995)	Sample Time (24-hour)	Streamflow, instantaneous (ft^3/s)	Triazine concentration, by ELISA (µg/L)
3	8/16	1113	446	2.4
	8/17	2400	52	2.6
	8/21	1600	12	2.0
	8/25	1430	7.1	1.7
	8/31	1315	5.9	1.1
	9/08	1400	5.4	.77
	9/15	1330	6.5	1.5
	9/19	1245	2,300	1.1
	9/29	1230	25	1.2
	9/30	1530	95	1.1
4	4/06	1200	44	.48
	4/10	1946	203	.78
	4/11	0146	1,540	11
	4/11	0746	1,190	4.9
	4/18	0159	182	4.0
	4/18	0303	392	20
	4/18	0903	904	17
	4/20	0947	197	4.9
	4/20	1250	224	6.5
	4/20	1850	856	4.0
	4/21	1300	325	4.6
	5/01	0744	220	2.1
	5/01	1344	855	3.9
	5/01	1944	1,190	4.7
	5/02	1215	396	5.9
	5/02	0144	742	5.3
	5/08	1100	6,010	9.6
	5/08	1700	2,820	4.9
	5/09	1100	2,290	5.0
	5/10	1230	1,960	7.9
	5/16	1245	537	5.6
	5/17	1530	8,715	4.8
	5/18	1115	10,600	3.2
	5/23	1445	700	4.0
	5/30	1400	440	1.7
	6/08	1345	4,130	3.7
	6/14	1415	207	1.2
	6/18	1200	124	.91
	6/23	1315	78	.57
	6/25	0400	587	6.2
	6/25	1200	303	6.2
	6/25	2000	225	24
	6/26	0400	216	23

Table 36. Streamflow and concentrations of triazine herbicides as determined by immunoassay (ELISA) procedures for water from selected sampling sites in the Delaware River Basin, April through September 1995—Continued

Site no. (fig. 4)	Sample Date (1995)	Sample Time (24-hour)	Streamflow, instantaneous (ft^3/s)	Triazine concentration, by ELISA (μg/L)
4	6/26	1200	205	24
	7/05	1345	555	14
	7/19	1345	64	1.6
	7/26	1415	81	2.8
	8/02	1445	53	1.4
	8/09	1230	24	1.2
	8/16	1500	3,520	2.7
	8/21	1415	44	2.6
	8/25	1420	21	1.8
	8/31	1145	14	.82
	9/08	1215	11	.73
	9/15	1215	22	1.7
	9/19	1215	13,300	.68
	9/29	1200	358	.52
	9/29	1700	542	.72
	9/30	1410	549	.85
	9/30	1545	558	.87
5	4/06	1015	14	.13
	4/10	1846	42	.52
	4/11	0046	245	6.5
	4/11	0646	124	7.8
	4/17	2317	42	.74
	4/18	0150	389	21
	4/18	0750	709	8.7
	4/20	0750	51	2.9
	4/20	1350	300	4.3
	4/21	1200	59	3.6
	4/23	1200	33	1.5
	4/27	0430	33	.85
	4/27	1141	40	.61
	4/27	1741	36	.75
	5/01	0505	35	.67
	5/01	0953	117	1.2
	5/01	1553	126	2.6
	5/02	1145	51	3.3
	5/02	2400	85	2.2
	5/03	2400	601	5.0
	5/04	0600	846	9.2
	5/04	1200	567	9.0
	5/04	1800	323	8.7
	5/07	1200	56	1.7
	5/07	1800	1,480	8.2

Table 36. Streamflow and concentrations of triazine herbicides as determined by immunoassay (ELISA) procedures for water from selected sampling sites in the Delaware River Basin, April through September 1995—Continued

Site no. (fig. 4)	Sample: Date (1995)	Sample: Time (24-hour)	Streamflow, instantaneous (ft³/s)	Triazine concentration, by ELISA (µg/L)
5	5/07	2400	3,520	4.2
	5/08	0600	3,090	4.1
	5/08	1200	1,240	4.1
	5/08	1800	640	3.0
	5/10	0600	339	2.1
	5/10	1200	724	3.3
	5/13	0809	7,620	4.4
	5/13	2038	3,430	3.2
	5/14	0438	841	1.1
	5/14	1238	507	.70
	5/16	0438	150	.63
	5/16	1238	132	.59
	5/17	0400	173	.70
	5/17	2000	1,260	2.0
	5/18	1243	2,220	1.4
	5/18	2312	637	.70
	5/19	1354	348	.78
	5/20	1354	196	.50
	5/23	1500	640	2.7
	5/28	2253	376	.50
	5/30	1345	161	.29
	5/31	2400	3,840	.66
	6/01	1200	958	.98
	6/03	1200	149	.33
	6/03	2400	2,210	1.6
	6/06	1200	202	.51
	6/07	2400	113	.26
	6/08	1200	2,890	3.7
	6/10	1200	295	1.1
	6/13	1200	80	.25
	6/18	1200	49	.16
	6/23	1245	37	.11
	6/25	1200	53	4.8
	6/25	2000	47	2.0
	6/26	0400	44	.90
	6/26	1200	43	.72
	6/28	1200	166	6.0
	6/28	2000	202	9.0
	6/29	1200	58	3.8
	7/03	1200	31	.36
	7/04	0400	4,030	3.4
	7/04	1200	9,060	3.8
	7/07	1200	196	2.2
	7/10	1200	65	1.2
	7/19	1100	34	.33

Table 36. Streamflow and concentrations of triazine herbicides as determined by immunoassay (ELISA) procedures for water from selected sampling sites in the Delaware River Basin, April through September 1995—Continued

Site no. (fig. 4)	Sample Date (1995)	Sample Time (24-hour)	Streamflow, instantaneous (ft^3/s)	Triazine concentration, by ELISA (µg/L)
5	7/26	1430	e31	0.98
	8/02	1500	e25	.33
	8/09	1215	e12	.16
	8/16	1300	e80	2.1
	8/21	1400	e25	.77
	8/25	1410	e10	.38
	8/31	1115	e7.0	.19
	9/08	1200	e6.0	.47
	9/15	1145	e20	.47
	9/19	1200	1,200	.33
	9/29	1145	e50	.24
	9/29	1715	e50	.27
	9/30	1400	e100	.58
6	4/06	1000	19	.06
	4/11	0137	79	.20
	4/11	0737	108	.31
	4/11	1337	78	.19
	4/18	0202	178	1.1
	4/18	0619	518	2.3
	4/18	1219	702	1.0
	4/20	1220	72	.47
	4/20	1800	143	.58
	4/21	1130	63	.35
	5/01	1750	72	.18
	5/01	2350	73	.14
	5/02	1100	41	.12
	5/03	2041	88	1.4
	5/04	0843	674	1.1
	5/04	2043	311	.82
	5/05	0843	139	.61
	5/05	2043	89	.57
	5/06	0843	71	.40
	5/07	1423	130	.25
	5/07	2238	1,420	2.2
	5/08	0438	2,620	2.1
	5/08	1200	1,630	1.5
	5/08	1800	773	1.0
	5/09	1200	664	.67
	5/10	0600	269	1.3
	5/10	1200	316	1.2
	5/17	0400	217	.72
	5/17	2000	1,310	.60
	5/18	0400	2,380	1.1

Table 36. Streamflow and concentrations of triazine herbicides as determined by immunoassay (ELISA) procedures for water from selected sampling sites in the Delaware River Basin, April through September 1995—Continued

Site no. (fig. 4)	Sample: Date (1995)	Sample: Time (24-hour)	Streamflow, instantaneous (ft^3/s)	Triazine concentration, by ELISA (μg/L)
6	5/18	2000	989	0.59
	5/19	1200	515	.49
	5/20	1200	329	.39
	5/22	1200	194	.18
	5/23	1200	339	1.0
	5/30	1300	e300	.34
	6/08	1215	e1,700	1.2
	6/14	1115	105	.26
	6/23	1230	e28	.18
	6/26	1300	31	.50
	7/05	1245	e1,400	3.4
	7/26	1430	e17	.52
	8/02	1515	e20	.26
	8/09	1210	e12	.21
	8/16	1300	e100	.73
	8/21	1330	e26	.36
	8/25	1400	e16	.21
	8/31	1115	e50	.18
	9/08	1130	e13	.24
	9/15	1130	e22	.66
	9/19	1130	e2,000	.15
	9/29	1730	e62	.15
	9/30	1345	e68	.16
7	4/06	0930	3.3	.38
	4/21	1300	1.4	4.2
	5/02	1500	6.1	2.4
	5/08	0945	236	16
	5/08	1400	176	16
	5/08	2000	138	18
	5/09	1400	54	13
	5/10	0600	62	14
	5/10	1200	73	18
	5/12	1715	26	13
	5/13	0115	206	12
	5/13	0915	131	12
	5/13	1715	83	15
	5/15	1359	36	10
	5/16	2154	18	6.1
	5/17	1416	408	15
	5/18	1416	234	12
	5/19	1416	66	9.7
	5/20	1416	65	7.2

Table 36. Streamflow and concentrations of triazine herbicides as determined by immunoassay (ELISA) procedures for water from selected sampling sites in the Delaware River Basin, April through September 1995—Continued

Site no. (fig. 4)	Sample Date (1995)	Sample Time (24-hour)	Streamflow, instantaneous (ft^3/s)	Triazine concentration, by ELISA (μg/L)
7	5/21	1416	65	6.9
	5/22	0622	65	6.9
	5/23	1130	236	5.0
	5/23	2000	445	10
	5/30	1215	76	7.0
	5/31	2000	73	4.5
	6/01	0800	160	12
	6/02	2000	77	6.8
	6/04	2000	89	12
	6/05	0800	78	9.0
	6/08	0800	1,180	4.8
	6/12	0800	91	3.3
	6/23	1100	3.7	2.7
	6/26	1200	3.6	2.4
	6/28	1200	38	6.7
	6/28	2000	22	7.0
	6/29	0400	15	5.8
	7/04	1200	391	10
	7/04	0400	852	2.0
	7/05	1130	122	9.7
	7/26	1500	e6.5	6.0
	8/02	1530	e4.3	2.3
	8/09	1140	e3.5	1.8
	8/16	1230	215	4.8
	8/21	1200	6.3	2.8
	8/25	1345	3.3	2.2
	8/31	1045	2.4	1.8
	9/08	1100	2.6	1.2
	9/15	1415	2.7	.75
	9/19	1100	8.4	.56
	9/30	1315	2.9	.49
11	4/06	0845	102	3.2
	4/21	1130	401	2.8
	4/27	1600	25	2.9
	5/08	0900	245	2.8
	5/16	1530	2,000	2.8
	5/23	1030	4,000	3.0
	5/30	1030	5,660	3.2
	6/01	1030	12,600	3.2
	6/08	1015	7,000	3.2
	6/13	0915	7,000	3.4
	6/23	1000	8,840	3.2
	6/26	1045	1,870	3.1
	7/05	1000	500	2.6
	7/14	1315	2,960	3.7

Table 36. Streamflow and concentrations of triazine herbicides as determined by immunoassay (ELISA) procedures for water from selected sampling sites in the Delaware River Basin, April through September 1995—Continued

Site no. (fig. 4)	Sample: Date (1995)	Sample: Time (24-hour)	Streamflow, instantaneous (ft^3/s)	Triazine concentration, by ELISA (µg/L)
11	7/21	1315	2,380	3.4
	7/25	1945	500	4.4
	8/02	1630	100	4.7
	8/09	1040	25	4.8
	8/16	1130	720	5.8
	8/21	1030	1,500	4.9
	8/25	1300	30	5.8
	8/31	0930	25	5.3
	9/08	1015	25	4.2
	9/15	1015	25	3.3
	9/18	1000	25	3.1
	9/26	1445	500	3.3
	9/30	1200	100	2.8

Table 37. Streamflow and results of samples analyzed by gas chromatography/mass spectrometry and immunoassay (ELISA) methodologies for atrazine and other herbicides at selected sampling sites in the Delaware River Basin, 1992–94

[µg/L, micrograms per liter; <, less than indicated detection level; --, no data]

Site no. (fig. 4)	Station no.	Date	Time (24-hour)	Streamflow, instantaneous (cubic feet per second)	Atrazine, water filtered, recoverable (µg/L)	Triazine, screen (ELISA) water filtered, recoverable (µg/L)	Alachlor, water filtered, recoverable (µg/L)	Ametryn, water filtered, recoverable (µg/L)	Cyanazine, water filtered, recoverable (µg/L)	Deethylatrazine, water filtered, recoverable (µg/L)	Deisopropylatrazine, water filtered, recoverable (µg/L)	Metolachlor, water filtered, recoverable (µg/L)	Metribuzin, water filtered, recoverable (µg/L)	Prometon, water filtered, recoverable (µg/L)	Prometryn, water filtered, recoverable (µg/L)	Propazine, water filtered, recoverable (µg/L)	Simazine, water filtered, recoverable (µg/L)	Terbutryn, water filtered, recoverable (µg/L)
1	06889990	07-30-92	1200	6,030	2.3	2.6	<0.05	<0.05	0.45	0.28	<0.05	0.81	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
		08-01-92	1522	143	2.1	2.3	<.05	<.05	<.05	.47	.23	.52	<.05	<.05	<.05	<.05	<.05	<.05
		08-05-92	1550	84	1.2	1.4	<.05	<.05	<.05	.30	.15	.36	<.05	<.05	<.05	<.05	.05	<.05
		08-07-92	1559	162	1.3	1.6	<.05	<.05	<.05	.28	.13	.27	<.05	<.05	<.05	<.05	<.05	<.05
		08-28-92	1445	21	.38	.54	<.05	<.05	<.05	.10	<.05	.07	<.05	<.05	<.05	<.05	<.05	<.05
		09-01-92	2225	939	8.6	7.0	<.05	<.05	<.05	.54	.22	.21	<.05	<.05	<.05	.09	<.05	<.05
		09-05-92	2355	3,460	1.2	1.4	<.05	<.05	<.05	.32	.17	.33	<.05	<.05	<.05	<.05	<.05	<.05
		09-06-92	0355	714	1.6	1.6	<.05	<.05	<.05	.44	.20	.43	<.05	<.05	<.05	<.05	<.05	<.05
		09-10-92	1445	23	.88	.84	<.05	<.05	<.05	.27	.10	.24	<.05	<.05	<.05	<.05	<.05	<.05
		09-20-92	1420	73	.41	.59	<.05	<.05	<.05	.19	.08	.13	<.05	<.05	<.05	<.05	<.05	<.05
		05-29-93	2306	761	8.5	14	.83	<.05	.09	.44	.17	6.1	<.05	<.05	<.05	.09	<.05	<.05
		05-30-93	0106	507	14	19	.76	<.05	.06	.61	.32	11	<.05	<.05	<.05	.18	<.05	<.05
		05-30-93	0306	338	8.7	14	.66	<.05	.09	.45	.17	6.4	<.05	<.05	<.05	.10	<.05	<.05
		05-30-93	0706	186	18	22	.39	<.05	.10	.64	.21	14	<.05	<.05	<.05	.23	<.05	<.05
		05-30-93	1106	153	13	17	.36	<.05	.07	.47	.16	9.4	<.05	<.05	<.05	.16	<.05	<.05
		06-19-93	0800	651	23	37	4.9	<.05	1.9	2.2	1.1	16	.93	<.05	<.05	.34	.07	<.05
		06-19-93	1600	4,640	16	30	3.5	<.05	.25	1.6	.85	11	<.05	<.05	<.05	.25	.06	<.05
2	06889992	07-30-92	1111	2,030	2.2	2.6	.06	--	<.05	.38	.21	.90	<.05	<.05	--	<.05	<.05	--
		08-01-92	1441	60	1.1	1.1	.06	--	<.05	.26	.12	.49	<.05	<.05	--	<.05	<.05	--
		08-07-92	2116	102	.47	.34	<.05	--	<.05	.14	.06	.18	<.05	<.05	--	<.05	<.05	--
		09-01-92	1620	34	.22	.21	<.05	--	<.05	.05	<.05	.05	<.05	<.05	--	<.05	<.05	--
		09-02-92	0014	276	1.2	1.2	<.05	--	<.05	.25	.12	.40	<.05	<.05	--	<.05	<.05	--
		09-05-92	2236	1,830	.85	1.2	.14	--	<.05	.13	.09	.43	<.05	<.05	--	<.05	.05	--
		09-06-92	0136	2,020	.50	.98	<.05	--	<.05	.15	.10	.27	<.05	<.05	--	<.05	.15	--
		09-20-92	1348	34	.73	1.1	<.05	--	<.05	.28	.12	.53	<.05	<.05	--	<.05	<.05	--
		09-23-92	1315	32	.38	.47	<.05	--	<.05	.14	.06	.13	<.05	<.05	--	<.05	.13	--
		06-18-93	1800	381	33	64	8.7	<.05	<.05	2.9	1.2	41	.73	<.05	<.05	.63	.08	<.05
		06-18-93	2100	730	29	41	5.9	<.05	.08	2.4	1.1	20	1.3	<.05	<.05	.40	.11	<.05
		06-18-93	2400	620	34	43	4.3	<.05	.07	2.3	1.1	21	.87	<.05	<.05	.47	.09	<.05
		06-19-93	1200	1,680	26	33	6.1	<.05	.23	1.3	.58	16	1.0	<.05	<.05	.35	<.05	<.05

Table 37. Streamflow and results of samples analyzed by gas chromatography/mass spectrometry and immunoassay (ELISA) methodologies for atrazine and other herbicides at selected sampling sites in the Delaware River Basin, 1992–94—Continued

Site no. (fig. 4)	Station no.	Date	Time (24-hour)	Stream-flow, instan-taneous (cubic feet per second)	Atra-zine, water filtered, recover-able (µg/L)	Tria-zine, screen (ELISA) water filtered, recover-able (µg/L)	Ala-chlor, water filtered, recover-able (µg/L)	Ame-tryn, water filtered, recover-able (µg/L)	Cyan-azine, water filtered, recover-able (µg/L)	Deethyl-atrazine, water filtered, recover-able (µg/L)	Deiso-propyl-atrazine, water filtered, recover-able (µg/L)	Metola-chlor, water filtered, recover-able (µg/L)	Metri-buzin, water filtered, recover-able (µg/L)	Prome-ton, water filtered, recover-able (µg/L)	Prome-tryn, water filtered, recover-able (µg/L)	Propa-zine, water filtered, recover-able (µg/L)	Sima-zine, water filtered, recover-able (µg/L)	Ter-butryn, water filtered, recover-able (µg/L)
3	06890092	07-26-92	2301	335	4.3	4.7	0.13	--	0.06	1.1	0.55	1.5	0.06	<0.05	--	0.05	<0.05	--
		07-29-92	2205	123	3.3	3.9	.08	--	<.05	.97	.46	.98	<.05	<.05	--	<.05	<.05	--
		08-05-92	1310	32	2.3	2.4	.06	--	.05	.53	.30	.61	<.05	<.05	--	<.05	<.05	--
		08-07-92	1242	60	1.7	1.7	.05	--	<.05	.47	.23	.49	<.05	<.05	--	<.05	<.05	--
		08-28-92	1515	4.4	.84	1.0	<.05	--	<.05	.22	.09	.19	.05	<.05	--	<.05	<.05	--
		09-01-92	2034	38	.56	.81	<.05	--	<.05	.17	.11	.11	<.05	<.05	--	<.05	<.05	--
		09-01-92	2334	1,960	.81	1.7	<.05	--	<.05	.28	.16	.26	<.05	<.05	--	<.05	<.05	--
		09-05-92	1100	70	6.1	8.2	<.05	--	<.05	.58	.27	.60	<.05	.06	--	.06	<.05	--
		09-05-92	2000	65	5.2	7.0	<.05	--	<.05	.45	.21	.46	<.05	.06	--	.05	<.05	--
		09-05-92	2300	637	2.7	2.7	<.05	--	<.05	.36	.19	.49	<.05	<.05	--	<.05	<.05	--
		09-06-92	0500	565	2.1	2.2	.06	--	<.05	.40	.23	.40	<.05	<.05	--	<.05	<.05	--
		09-07-92	2300	95	3.1	3.8	.06	--	<.05	.50	.27	.46	<.05	<.05	--	<.05	<.05	--
		09-17-92	1450	5.4	1.6	1.4	<.05	--	<.05	.35	.17	.26	<.05	<.05	--	<.05	<.05	--
		09-20-92	1601	25	1.2	1.6	<.05	--	<.05	.28	.13	.19	.14	<.05	--	<.05	<.05	--
		09-23-92	1300	31	2.2	2.6	<.05	--	<.05	.53	.26	.41	<.05	<.05	--	<.05	<.05	--
		05-29-93	2243	73	16	20	.22	<0.05	.09	.77	.40	16	<.05	<.05	<0.05	.20	<.05	<0.05
		05-30-93	0043	88	12	18	.16	<.05	.10	.56	.56	11	.10	<.05	<.05	.13	<.05	<.05
		05-30-93	2130	35	7.2	12	.37	<.05	.24	.33	.14	5.5	.66	<.05	<.05	.08	<.05	<.05
		06-18-93	0611	109	26	35	7.1	<.05	1.2	2.1	1.3	12	<.05	<.05	<.05	.33	.06	<.05
		06-18-93	0911	92	23	32	6.0	<.05	.36	2.0	1.0	12	.76	<.05	<.05	.32	<.05	<.05
		05-06-94	1300	--	9.8	16	2.1	<.05	.95	.91	.37	3.6	<.05	<.05	<.05	.10	<.05	<.05
4	06890100	07-30-92	1410	10,100	2.6	2.8	.06	--	<.05	.50	.29	.96	<.05	<.05	--	<.05	<.05	--
		08-02-92	1030	422	2.1	2.3	.05	--	<.05	.47	.24	.71	<.05	<.05	--	<.05	<.05	--
		08-05-92	0900	172	1.5	1.6	<.05	--	<.05	.38	.19	.50	<.05	<.05	--	<.05	<.05	--
		08-10-92	1430	125	2.1	2.4	<.05	--	<.05	.42	.21	.54	<.05	<.05	--	<.05	<.05	--
		08-28-92	1310	27	.46	.51	<.05	--	<.05	.12	<.05	.10	<.05	<.05	--	<.05	<.05	--
		09-20-92	1544	112	.78	.70	<.05	--	<.05	.22	.09	.20	<.05	<.05	--	<.05	<.05	--
		09-24-92	1200	101	1.2	1.5	<.05	--	<.05	.39	.16	.27	<.05	<.05	--	<.05	.05	--
		10-08-92	2000	199	.56	.84	<.05	<.05	<.05	.17	.10	.18	<.05	<.05	<.05	<.05	<.05	<.05
		11-23-92	1200	253	.64	.96	<.05	<.05	<.05	.21	.11	.20	<.05	<.05	<.05	<.05	<.05	<.05
		12-01-92	1330	141	.32	.49	.10	<.05	<.05	.12	.06	.10	<.05	<.05	<.05	<.05	<.05	<.05

Table 37. Streamflow and results of samples analyzed by gas chromatography/mass spectrometry and immunoassay (ELISA) methodologies for atrazine and other herbicides at selected sampling sites in the Delaware River Basin, 1992–94—Continued

Site no. (fig. 4)	Station no.	Date	Time (24-hour)	Stream-flow, instan-taneous (cubic feet per second)	Atra-zine, water filtered, recover-able (µg/L)	Tria-zine, screen (ELISA) water filtered, recover-able (µg/L)	Ala-chlor, water filtered, recover-able (µg/L)	Ame-tryn, water filtered, recover-able (µg/L)	Cyan-azine, water filtered, recover-able (µg/L)	Deethyl-atrazine, water filtered, recover-able (µg/L)	Deiso-propyl-atrazine, water filtered, recover-able (µg/L)	Metola-chlor, water filtered, recover-able (µg/L)	Metri-buzin, water filtered, recover-able (µg/L)	Prome-ton, water filtered, recover-able (µg/L)	Prome-tryn, water filtered, recover-able (µg/L)	Propa-zine, water filtered, recover-able (µg/L)	Sima-zine, water filtered, recover-able (µg/L)	Ter-butryn, water filtered, recover-able (µg/L)
4	06890100	12-14-92	1400	5,400	0.64	0.82	<0.05	<0.05	<0.05	0.20	0.12	0.22	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
		05-30-93	0126	654	16	25	.34	<.05	<.05	.68	.26	7.7	.08	<.05	<.05	.22	.05	<.05
		05-30-93	0326	978	7.1	6.4	.44	<.05	.05	.35	.12	5.4	.08	<.05	<.05	.07	<.05	<.05
		05-30-93	0726	618	5.6	6.4	1.0	<.05	<.05	.36	.20	4.1	.12	<.05	<.05	<.05	<.05	<.05
		05-30-93	0926	486	7.8	9.6	1.2	<.05	.08	.44	.24	5.1	.10	<.05	<.05	<.05	<.05	<.05
		05-30-93	1726	298	8.3	9.9	.89	<.05	.08	.43	.16	6.8	.28	<.05	<.05	.09	<.05	<.05
5	06890350	07-29-92	2140	62	.50	.63	<.05	--	<.05	.14	.07	.20	<.05	<.05	--	<.05	<.05	--
		08-02-92	1126	51	.38	.40	<.05	--	<.05	.09	.05	.16	<.05	<.05	--	<.05	<.05	--
		08-07-92	1500	50	.27	.26	<.05	--	<.05	.07	<.05	.12	<.05	<.05	--	<.05	<.05	--
		09-02-92	0007	1,570	.52	.82	.08	--	<.05	.10	.07	.36	<.05	<.05	--	<.05	<.05	--
		09-05-92	1946	40	.32	.41	<.05	--	<.05	.10	.05	.09	<.05	<.05	--	<.05	<.05	--
		09-05-92	2349	5,210	.45	.75	<.05	--	<.05	.10	.07	.27	<.05	<.05	--	<.05	<.05	--
		09-09-92	1130	75	.44	.59	<.05	--	<.05	.16	.08	.17	<.05	<.05	--	<.05	.21	--
		09-20-92	1558	46	.84	1.1	.12	--	<.05	.28	.12	.43	<.05	<.05	--	<.05	<.05	--
		12-13-92	1115	619	.30	.45	<.05	<.05	<.05	.11	.06	.13	<.05	<.05	<.05	<.05	<.05	<.05
		06-08-93	0150	1,150	22	32	4.3	<.05	.26	.90	.40	12	.46	<.05	<.05	.34	.05	<.05
		06-08-93	0350	869	28	36	4.1	<.05	.11	1.1	.57	17	.64	<.05	<.05	.43	<.05	<.05
		06-18-93	1047	281	28	34	9.4	<.05	.13	2.3	1.0	18	.96	<.05	<.05	.41	.05	<.05
		05-06-94	0403	--	65	60	.49	<.05	<.05	3.2	1.1	58	<.05	<.05	<.05	.30	<.05	<.05
		05-06-94	0803	--	26	31	.94	<.05	.13	1.5	.57	15	.22	<.05	<.05	.24	<.05	<.05
		06-03-94	1230	--	5.6	--	.17	<.05	4.4	.65	.85	1.2	<.05	<.05	<.05	.05	<.05	<.05
6	06890380	07-29-92	2113	46	.51	.74	<.05	--	<.05	.14	.07	.16	<.05	<.05	--	<.05	<.05	--
		08-02-92	0858	40	.51	.73	<.05	--	<.05	.21	.11	.10	<.05	<.05	--	<.05	<.05	--
		08-05-92	1640	21	.38	.39	<.05	--	<.05	.09	.05	.09	<.05	<.05	--	<.05	<.05	--
		08-10-92	1055	18	.33	.26	<.05	--	<.05	.07	<.05	.07	<.05	<.05	--	<.05	<.05	--
		09-02-92	0525	167	.45	.35	.05	--	<.05	.09	.05	.06	.08	.17	--	<.05	<.05	--
		09-05-92	2357	78	1.3	1.4	<.05	--	<.05	.20	.10	.32	<.05	<.05	--	<.05	<.05	--
		09-06-92	0557	2,280	.32	.40	<.05	--	<.05	.11	.06	.13	<.05	<.05	--	<.05	<.05	--
		09-17-92	1145	9.6	.18	.32	<.05	--	<.05	.07	<.05	.05	<.05	<.05	--	<.05	<.05	--
		09-20-92	1330	26	.18	.36	<.05	--	<.05	.09	<.05	<.05	<.05	<.05	--	<.05	<.05	--
		12-13-92	2257	1,500	.20	.33	<.05	<.05	<.05	.07	<.05	.10	<.05	<.05	<.05	<.05	<.05	<.05
		05-30-93	1200	269	4.7	7.3	2.6	<.05	<.05	.23	.08	1.0	<.05	<.05	<.05	<.50	<.05	<.05

Table 37. Streamflow and results of samples analyzed by gas chromatography/mass spectrometry and immunoassay (ELISA) methodologies for atrazine and other herbicides at selected sampling sites in the Delaware River Basin, 1992–94—Continued

Site no. (fig. 4)	Station no.	Date	Time (24-hour)	Stream-flow, instan-taneous (cubic feet per second)	Atra-zine, water filtered, recover-able (µg/L)	Tria-zine, screen (ELISA) water filtered, recover-able (µg/L)	Ala-chlor, water filtered, recover-able (µg/L)	Ame-tryn, water filtered, recover-able (µg/L)	Cyan-azine, water filtered, recover-able (µg/L)	Deethyl-atrazine, water filtered, recover-able (µg/L)	Deiso-propyl-atrazine, water filtered, recover-able (µg/L)	Metola-chlor, water filtered, recover-able (µg/L)	Metri-buzin, water filtered, recover-able (µg/L)	Prome-ton, water filtered, recover-able (µg/L)	Prome-tryn, water filtered, recover-able (µg/L)	Propa-zine, water filtered, recover-able (µg/L)	Sima-zine, water filtered, recover-able (µg/L)	Ter-butryn, water filtered, recover-able (µg/L)
7	06890450	07-29-92	1205	14	2.2	2.3	0.09	--	<0.05	0.60	0.29	0.17	<0.05	<0.05	--	<0.05	<0.05	--
		08-07-92	1310	59	1.4	1.6	.18	--	<.05	.49	.24	.31	<.05	<.05	--	<.05	<.05	--
		09-05-92	2242	10	.48	.67	<.05	--	<.05	.14	.08	.07	<.05	<.05	--	<.05	<.05	--
		09-06-92	0442	46	.47	.82	<.05	--	<.05	.14	.08	.15	<.05	<.05	--	<.05	<.05	--
		09-09-92	0501	1,120	.53	.98	.05	--	<.05	.18	.23	<.05	<.05	<.05	--	<.05	.39	--
		09-20-92	1321	6.9	.76	.56	.29	--	<.05	.15	.08	.20	<.05	<.05	--	<.05	<.05	--
		09-23-92	1040	1.8	.66	.76	<.05	--	<.05	.22	.10	.08	<.05	<.05	--	<.05	<.05	--
		06-18-93	1855	219	40	60	8.0	<0.05	<.05	3.8	1.9	2.2	<.05	<.05	<.05	<.05	<.05	<0.05
8	06890490	07-30-92	0317	56	.08	.30	<.05	--	<.05	<.05	<.05	<.05	<.05	<.05	--	<.05	<.05	--
		08-02-92	0849	34	.24	0.17	<0.05	--	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	--	<0.05	<0.05	--
		08-02-92	1358	48	.16	.11	<.05	--	<.05	.05	<.05	<.05	<.05	<.05	--	<.05	<.05	--
		08-28-92	1115	2.3	.17	.11	<.05	--	<.05	<.05	<.05	<.05	<.05	<.05	--	<.05	<.05	--
		09-01-92	1115	2.3	.19	.21	<.05	--	<.05	<.05	<.05	<.05	<.05	<.05	--	<.05	<.05	--
		09-02-92	0802	38	.08	.17	<.05	--	<.05	<.05	<.05	<.05	<.05	<.05	--	<.05	<.05	--
		09-08-92	1141	31	.14	.07	<.05	--	<.05	<.05	<.05	<.05	<.05	<.05	--	<.05	<.05	--
		09-09-92	0150	31	.14	.14	<.05	--	<.05	<.05	<.05	<.05	<.05	<.05	--	<.05	<.05	--
		09-20-92	1528	32	.18	.14	<.05	--	<.05	.05	<.05	<.05	<.05	<.05	--	<.05	<.05	--
		09-23-92	1035	12	.20	.18	<.05	--	<.05	.08	.05	<.05	<.05	<.05	--	<.05	<.05	--
		11-23-92	1200	57	.06	.09	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
		12-13-92	1800	1,620	.12	.18	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
		05-30-93	0437	164	4.3	4.9	7.7	<.05		.25	.08	.34	1.5	<.05	<.05	<.05	.05	<.05
9	06890595	07-30-92	0920	12	.94	.97	<.05	--	<.05	.20	.08	<.05	<.05	<.05	--	<.05	<.05	--
		08-09-92	0912	31	.94	.97	.06	--	<.05	.24	.12	<.05	<.05	<.05	--	<.05	<.05	--
		08-25-92	1010	.40	.32	.35	<.05	--	<.05	.07	<.05	<.05	<.05	<.05	--	<.05	<.05	--
		09-05-92	2203	19	.17	.29	<.05	--	<.05	.07	<.05	<.05	<.05	<.05	--	<.05	<.05	--
		09-06-92	0403	427	.27	.62	<.05	--	<.05	.18	.08	<.05	<.05	<.05	--	<.05	<.05	--
		09-21-92	1015	2.7	.20	.35	.05	--	<.05	.10	<.05	<.05	<.05	<.05	--	<.05	<.05	--
		09-23-92	1015	.76	.20	.21	<.05	--	<.05	.09	<.05	<.05	<.05	.06	--	<.05	<.05	--
		07-01-93	0710	33	19	31	3.8	<.05		2.6	1.3	<.05	.39	<.05	<.05	.45	.14	<.05
10		07-30-92	0456	66	2.2	2.1	.40	--	<.05	.50	.29	<.05	<.05	<.05	--	<.05	<.05	--
		08-02-92	1446	83	1.0	1.4	.05	--	<.05	.49	.17	<.05	<.05	<.05	--	<.05	<.05	--
		08-07-92	1530	10	.57	.62	<.05	--	<.05	.18	.08	<.05	<.05	<.05	--	<.05	<.05	--
		09-05-92	2315	18	.41	.45	<.05	--	<.05	.09	.05	<.05	<.05	<.05	--	<.05	<.05	--
		09-20-92	1303	22	.59	.77	<.05	--	<.05	.25	.13	<.05	<.05	<.05	--	<.05	<.05	--

Table 37. Streamflow and results of samples analyzed by gas chromatography/mass spectrometry and immunoassay (ELISA) methodologies for atrazine and other herbicides at selected sampling sites in the Delaware River Basin, 1992–94—Continued

Site no. (fig. 4)	Station no.	Date	Time (24-hour)	Streamflow, instantaneous (cubic feet per second)	Atrazine, water filtered, recoverable (µg/L)	Triazine, screen (ELISA) water filtered, recoverable (µg/L)	Alachlor, water filtered, recoverable (µg/L)	Ametryn, water filtered, recoverable (µg/L)	Cyanazine, water filtered, recoverable (µg/L)	Deethylatrazine, water filtered, recoverable (µg/L)	Deisopropylatrazine, water filtered, recoverable (µg/L)	Metolachlor, water filtered, recoverable (µg/L)	Metribuzin, water filtered, recoverable (µg/L)	Prometon, water filtered, recoverable (µg/L)	Prometryn, water filtered, recoverable (µg/L)	Propazine, water filtered, recoverable (µg/L)	Simazine, water filtered, recoverable (µg/L)	Terbutryn, water filtered, recoverable (µg/L)
10	06890810	09-23-92	0945	1.6	0.43	0.68	<0.05	--	<0.05	0.20	0.08	<0.05	<0.05	<0.05	--	<0.05	<0.05	--
		09-28-92	0930	1.4	.29	.56	<.05	--	<.05	.11	.05	<.05	<.05	<.05	--	<.05	<.05	--
11	06890900	08-07-92	1230	4,000	2.9	3.2	.12	<.05	.07	.50	.20	.65	<.05	<.05	<0.05	<.05	<.05	<0.05
		08-20-92	1500	25	3.4	2.9	.12	<.05	.08	.62	.26	.78	<.05	<.05	<.05	<.05	<.05	<.05
		09-07-92	1445	1,500	3.3	3.0	.09	<.05	.07	.51	.24	.64	<.05	<.05	<.05	<.05	<.05	<.05
		09-11-92	1600	3,000	3.3	2.7	.08	<.05	.08	.51	.26	.64	<.05	<.05	<.05	<.05	<.05	<.05
		09-15-92	1600	25	3.3	2.7	.08	<.05	.07	.53	.25	.63	<.05	<.05	<.05	<.05	<.05	<.05
		09-25-92	1030	14	3.0	3.0	.06	<.05	.07	.53	.25	.52	<.05	<.05	<.05	<.05	<.05	<.05
		09-28-92	1015	25	3.2	3.1	.06	<.05	.07	.59	.26	.56	<.05	<.05	<.05	<.05	<.05	<.05
		10-07-92	1000	25	2.5	2.8	<.05	<.05	.07	.41	.25	.41	<.05	<.05	<.05	<.05	<.05	<.05
		11-23-92	1130	3,500	2.4	2.7	.05	<.05	.07	.41	.26	.41	<.05	<.05	<.05	<.05	<.05	<.05
		12-01-92	1115	2,000	2.3	2.8	<.05	<.05	.06	.39	.22	.38	<.05	<.05	<.05	<.05	<.05	<.05
		12-17-92	1700	3,000	2.0	2.0	.05	<.05	.05	.36	.22	.35	<.05	<.05	<.05	<.05	<.05	<.05
		03-02-93	1445	400	.78	.81	<.05	<.05	<.05	.22	.07	.13	<.05	<.05	<.05	<.05	<.05	<.05
		07-21-94	1000	--	3.1	3.5	.29	<.05	.18	.43	.21	1.0	.05	<.05	<.05	<.05	<.05	<.05

Table 38. Results of onsite determinations and chemical analyses of samples collected for and analyzed by the Kansas Department of Health and Environment, January 1993 through December 1994

[°C, degrees Celsius; mg/L, milligrams per liter; µm, micrometer; mf, membrane filtration; cols, colonies; mL, milliliters; --, no data; <, less than; >, greater than]

Sampling site (fig. 4)	Date (month-day-year)	Time (24-hour)	Temperature, water (°C)	Oxygen demand, biochemical (mg/L)	Total suspended solids, residue total at 105 °C (mg/L)	Nitrogen, nitrate, filter 0.45 µm (mg/L as N)	Nitrogen, ammonia, filter 0.45 µm (mg/L as N)	Phosphorus, total (mg/L as P)	Coliform, fecal, 0.7 µm-mf (cols/100 mL)	Streptococcus, fecal, 0.7 µm-mf (cols/100 mL)
1	01-31-93	1045	--	4.7	36	2.1	0.21	0.25	260	3,400
	02-16-93	1600	--	1.4	98	3.0	<.05	.29	10	50
	03-31-93	1600	--	7.1	2,770	2.9	.53	3.0	32,000	15,000
	04-15-93	1535	--	2.9	156	2.9	.15	.37	1,100	2,100
	05-20-93	1530	17.0	1.2	98	3.0	<.05	.27	790	280
	06-03-93	1500	--	1.5	55	2.7	<.05	.15	900	1,100
	06-17-93	1510	27.0	2.0	49	2.9	<.05	.20	600	600
	07-21-93	1500	22.5	4.6	1,420	2.1	<.05	.55	12,000	6,000
	08-12-93	1215	25.0	3.9	66	2.1	<.05	.18	200	200
	08-26-93	1445	--	7.4	74	1.3	<.05	.15	200	100
	09-14-93	1445	--	<1.0	3	2.5	<.05	.15	50	100
	09-30-93	1430	--	2.0	40	2.8	<.05	.24	400	190
	10-13-93	1430	14.0	<1.0	30	1.8	<.05	.09	100	30
	10-27-93	1350	9.5	3.6	14	1.7	<.05	.09	100	80
	11-09-93	1400	6.0	1.6	2	1.7	<.05	<.05	30	<10
	12-01-93	1315	2.0	1.0	3	2.2	<.05	<.05	10	230
	12-21-93	1500	1.0	4.8	33	1.9	<.05	.09	<10	20
	01-12-94	1345	0	1.9	9	2.4	<.05	.06	100	30
	01-26-94	1215	1.0	3.1	7	2.2	.11	.08	100	200
	02-16-94	1415	.5	3.7	3	2.1	.06	.06	<10	100
	03-10-94	1415	5.0	3.3	53	2.0	.12	.19	<10	10
	04-07-94	1530	--	3.3	11	.40	.05	.06	<10	100
	04-21-94	1515	14.5	14.8	9,270	3.5	.62	2.2	>60,000	56,000
	05-04-94	1515	19.5	2.8	65	1.6	.06	.18	300	20
	05-26-94	1300	23.0	1.7	30	1.0	<.05	.16	120	40
	06-16-94	1215	27.0	3.7	52	1.5	<.05	.20	200	300
	06-28-94	1315	--	2.8	59	.61	<.05	.15	100	20
	07-11-94	1345	--	4.0	22	.50	<.01	.15	60	40
	07-27-94	1215	--	5.1	78	.74	<.01	.26	300	400
	08-18-94	1330	--	9.1	40	<.01	<.01	.11	60	100

Table 38. Results of onsite determinations and chemical analyses of samples collected for and analyzed by the Kansas Department of Health and Environment, January 1993 through December 1994—Continued

Sampling site (fig. 4)	Date (month-day-year)	Time (24-hour)	Temperature, water (°C)	Oxygen demand, biochemical (mg/L)	Total suspended solids, residue total at 105 °C (mg/L)	Nitrogen, nitrate, filter 0.45 μm (mg/L as N)	Nitrogen, ammonia, filter 0.45 μm (mg/L as N)	Phosphorus, total (mg/L as P)	Coliform, fecal, 0.7 μm-mf (cols/100 mL)	Streptococcus, fecal, 0.7 μm-mf (cols/100 mL)
1	09-09-94	1320	--	4.0	52	0.40	0.01	0.19	900	600
	09-21-94	1330	20.0	1.0	49	<.01	.05	.05	100	200
	10-12-94	1330	--	1.9	68	1.1	.03	.26	400	700
	11-01-94	1300	--	2.2	9	.07	.02	.08	--	--
	12-13-94	1330	--	2.2	15	1.5	.08	.07	100	280
	12-28-94	1400	--	3.1	16	1.1	.05	.03	<10	210
2	01-31-93	1035	--	2.9	48	1.2	.14	.19	90	1,200
	02-16-93	1545	--	2.0	84	1.6	<.05	.27	20	<10
	03-17-93	1345	--	1.3	54	1.2	<.05	.15	<10	<10
	03-31-93	1515	--	6.0	2,940	1.7	.37	2.0	32,000	13,000
	04-15-93	1600	--	2.0	216	1.6	<.05	.30	700	620
	05-06-93	1330	20.5	1.9	102	1.2	<.05	.20	500	320
	05-20-93	1515	15.0	1.1	240	1.3	<.05	.27	3,400	3,300
	06-03-93	1440	17.5	1.4	80	1.3	<.05	.15	3,200	2,800
	06-17-93	1445	27.0	1.2	56	1.4	<.05	.20	2,400	<10
	07-21-93	1410	25.0	2.4	770	1.0	<.05	.49	3,600	12,000
	08-12-93	1230	26.0	1.1	60	1.2	<.05	.20	700	700
	08-26-93	1415	--	<1.0	11	.81	<.05	.15	<100	50
	09-14-93	1415	14.0	1.9	15	.95	<.05	.24	900	2,000
	09-30-93	1400	16.5	2.1	40	1.2	<.05	.20	400	600
	10-13-93	1415	13.0	1.2	8	.42	<.05	.10	170	80
	10-27-93	1315	9.0	2.0	5	.39	<.05	.10	300	60
	11-09-93	1330	5.5	2.2	5	.42	<.05	.06	10	10
	12-01-93	1245	3.5	1.1	5	.89	<.05	.06	130	700
	12-21-93	1430	2.0	4.1	17	.80	<.05	.06	50	30
	01-12-94	1200	0	1.9	5	1.0	<.05	.05	10	30
	01-26-94	1145	2.0	2.9	5	1.1	.11	.07	170	200
	02-16-94	1315	.5	2.8	6	.98	.08	.05	300	200
	03-10-94	1330	5.0	2.4	94	1.0	<.05	.20	40	50
	04-07-94	1500	--	2.1	4	.11	<.05	.10	<10	40
	04-21-94	1445	15.0	13.4	11,400	2.2	.48	4.2	27,000	45,000

Table 38. Results of onsite determinations and chemical analyses of samples collected for and analyzed by the Kansas Department of Health and Environment, January 1993 through December 1994—Continued

Samp-ling site (fig. 4)	Date (month-day-year)	Time (24-hour)	Temper-ature, water (°C)	Oxygen demand, bio-chemical (mg/L)	Total sus-pended solids, residue total at 105 °C (mg/L)	Nitrogen, nitrate, filter 0.45 μm (mg/L as N)	Nitrogen, ammonia, filter 0.45 μm (mg/L as N)	Phos-phorus, total (mg/L as P)	Coliform, fecal, 0.7 μm-mf (cols/100 mL)	Streptococcus, fecal, 0.7 μm-mf (cols/100 mL)
2	05-04-94	1430	23.0	2.7	138	0.86	<0.05	0.21	300	400
	05-26-94	1230	22.0	<1.0	66	.73	.05	.25	200	300
	06-16-94	1200	27.0	2.2	42	.40	<.05	.21	600	200
	06-28-94	1245	--	1.3	39	.02	<.05	.10	100	100
	07-11-94	1245	--	1.8	21	.19	<.01	.16	130	100
	07-27-94	1200	--	3.0	16	.15	<.01	.16	1,600	60
	08-08-94	1315	--	5.6	18	<.01	.04	.08	20	1,000
	08-30-94	1300	--	3.4	58	.24	.07	.20	2,100	600
	09-21-94	1245	27.0	<1.0	49	<.01	.08	.16	100	30
	10-12-94	1245	--	2.0	76	.22	.06	.24	400	300
	11-01-94	1200	--	1.9	14	<.01	.02	.14	--	--
	12-13-94	1300	--	2.1	22	.70	.13	.09	10	500
	12-28-94	1345	--	2.2	11	.37	.02	.03	<10	100
3	01-31-93	1130	--	4.7	32	2.1	.17	.26	190	7,800
	02-16-93	1615	--	2.4	70	2.1	.07	.38	490	90
	03-17-93	1430	--	2.1	11	2.0	<.05	.13	<10	50
	03-31-93	1415	--	5.2	1,970	3.0	.41	1.4	9,000	13,000
	04-15-93	1445	--	3.5	124	2.4	.15	.31	1,600	740
	05-06-93	1300	19.0	3.6	31	1.4	<.05	.12	130	40
	05-20-93	1330	--	2.9	172	2.4	<.05	.25	800	480
	06-03-93	1535	18.5	2.1	33	2.3	<.05	.13	1,300	700
	06-17-93	1535	--	2.8	27	2.4	<.05	.22	1,400	440
	07-21-93	1515	24.0	9.0	2,760	.73	.17	.89	20,000	120,000
	08-12-93	1145	24.0	2.4	17	2.9	<.05	.32	1,400	260
	08-26-93	1500	--	2.1	7	1.9	<.05	.18	100	500
	09-14-93	1600	15.0	1.7	16	2.4	<.05	.28	100	200
	09-30-93	1500	18.0	3.8	60	2.0	<.05	.23	800	200
	10-13-93	1515	14.0	1.6	9	1.0	<.05	.16	400	70
	10-27-93	1425	12.0	3.4	8	.94	<.05	.15	30	50
	11-09-93	1500	7.5	3.1	3	1.0	<.05	.07	10	10
	12-01-93	1400	2.0	2.0	7	2.1	<.05	.07	300	210
	12-21-93	1545	1.0	5.1	14	1.7	<.05	.09	70	60
	01-12-94	1530	0	2.1	4	2.4	<.05	.11	150	20

Table 38. Results of onsite determinations and chemical analyses of samples collected for and analyzed by the Kansas Department of Health and Environment, January 1993 through December 1994—Continued

Sampling site (fig. 4)	Date (month-day-year)	Time (24-hour)	Temperature, water (°C)	Oxygen demand, biochemical (mg/L)	Total suspended solids, residue total at 105 °C (mg/L)	Nitrogen, nitrate, filter 0.45 μm (mg/L as N)	Nitrogen, ammonia, filter 0.45 μm (mg/L as N)	Phosphorus, total (mg/L as P)	Coliform, fecal, 0.7 μm-mf (cols/100 mL)	Streptococcus, fecal, 0.7 μm-mf (cols/100 mL)
3	01-26-94	1300	1.0	3.9	12	2.0	0.14	0.08	700	200
	02-16-94	1630	.5	5.6	6	2.2	.14	.13	<10	30
	03-10-94	1445	5.5	4.2	7	1.5	<.05	.23	10	10
	04-07-94	1615	--	3.9	3	.41	<.05	.10	10	10
	04-21-94	1615	14.5	15.9	6,030	2.6	.65	2.4	25,000	23,000
	05-04-94	1600	19.5	4.0	64	1.7	.15	.15	500	80
	05-26-94	1330	21.0	2.2	23	1.8	<.05	.14	400	50
	06-16-94	1330	27.0	4.4	72	2.2	<.05	.24	900	1,300
	06-28-94	1345	--	2.8	196	1.8	<.05	.22	2,300	90
	07-11-94	1400	--	4.4	132	1.2	<.01	.28	800	400
	07-27-94	1300	--	3.9	36	.91	<.01	.16	300	300
	08-08-94	1415	--	7.6	20	.64	.04	.07	1,000	200
	08-30-94	1350	--	5.0	44	.40	.06	.17	900	1,300
	09-21-94	1400	22.0	<1.0	19	<.01	.07	.08	400	500
	10-12-94	1400	--	3.2	42	.77	.02	.33	2,200	600
	11-01-94	1345	--	3.4	12	<.01	.01	.20	--	--
	12-13-94	1430	--	3.1	42	3.0	.32	.28	260	1,400
	12-28-94	1500	--	3.6	13	1.4	.27	.09	100	100
4	01-31-93	1200	--	4.4	96	1.8	.16	.37	200	4,400
	02-16-93	1630	--	1.6	57	2.3	<.05	.20	20	20
	03-17-93	1500	--	1.3	46	1.8	<.05	.21	<10	30
	03-31-93	1200	--	7.1	4,520	2.7	.46	1.8	33,000	16,000
	04-15-93	1345	--	4.3	224	2.3	.10	.43	2,000	1,700
	05-06-93	1230	19.0	3.0	120	1.6	<.05	.17	70	140
	05-20-93	1230	14.5	2.2	324	2.0	<.05	.44	15,000	4,900
	06-03-93	1340	19.0	2.0	10	2.0	<.05	.21	1,100	500
	06-17-93	1330	26.5	2.9	66	1.9	<.05	.23	2,000	160
	07-21-93	1300	23.5	3.0	490	1.6	<.05	.50	2,000	3,100
	08-12-93	1130	24.0	3.2	66	1.6	<.05	.19	1,300	700
	08-26-93	1300	--	9.2	86	<.02	<.05	.20	90	100
	09-14-93	1300	15.5	1.5	22	1.4	<.05	.20	<100	1,000
	09-30-93	1200	16.5	1.6	60	1.8	.05	.23	230	300
	10-13-93	1300	14.0	1.2	9	.80	<.05	.09	20	100

Table 38. Results of onsite determinations and chemical analyses of samples collected for and analyzed by the Kansas Department of Health and Environment, January 1993 through December 1994—Continued

Sampling site (fig. 4)	Date (month-day-year)	Time (24-hour)	Temperature, water (°C)	Oxygen demand, biochemical (mg/L)	Total suspended solids, residue total at 105 °C (mg/L)	Nitrogen, nitrate, filter 0.45 µm (mg/L as N)	Nitrogen, ammonia, filter 0.45 µm (mg/L as N)	Phosphorus, total (mg/L as P)	Coliform, fecal, 0.7 µm-mf (cols/100 mL)	Streptococcus, fecal, 0.7 µm-mf (cols/100 mL)
4	10-27-93	1215	9.5	2.6	8	0.62	<0.05	0.07	<10	30
	11-09-93	1530	7.0	2.1	2	.71	<.05	<.05	10	<10
	12-01-93	1430	2.5	1.3	11	1.6	<.05	<.05	70	240
	12-21-93	1315	2.0	5.0	28	1.7	.05	.11	10	100
	01-12-94	1115	0	1.8	6	1.9	<.05	.05	10	10
	01-26-94	1100	2.0	3.2	14	1.7	.12	.06	400	200
	02-16-94	1215	.5	3.8	6	1.6	<.05	.07	<10	<10
	03-10-94	1200	4.5	3.0	56	1.6	.13	.18	<10	70
	04-07-94	1100	--	2.7	10	.13	<.05	.06	100	30
	04-21-94	1330	16.5	14.8	1,840	.46	.08	.74	9,000	6,900
	05-04-94	1345	17.0	2.7	104	1.6	.07	.17	200	200
	05-26-94	1200	26.0	1.6	40	.93	<.05	.15	80	100
	06-16-94	1130	27.0	5.3	74	1.1	<.05	.20	100	210
	06-28-94	1215	--	2.5	48	.30	<.05	.11	100	<10
	07-11-94	1200	--	4.9	92	.58	.03	.28	400	200
	07-27-94	1330	--	6.3	76	.04	.01	.27	300	400
	08-08-94	1445	--	7.9	64	.01	.14	.13	120	30
	08-30-94	1410	--	5.3	78	<.01	<.01	.20	700	700
	09-21-94	1430	24.5	<1.0	41	<.01	.05	.06	100	30
	10-12-94	1430	--	2.8	58	.73	<.01	.23	500	350
	11-01-94	1415	--	3.1	9	<.01	<.01	.07	--	--
	12-13-94	1215	--	3.4	32	1.7	.13	.16	200	2,600
	12-28-94	1300	--	2.4	12	.75	.02	.03	10	20

Table 38. Results of onsite determinations and chemical analyses of samples collected for and analyzed by the Kansas Department of Health and Environment, January 1993 through December 1994—Continued

Sampling site (fig. 4)	Date (month-day-year)	Time (24-hour)	Temperature, water (°C)	Oxygen demand, biochemical (mg/L)	Total suspended solids, residue total at 105 °C (mg/L)	Nitrogen, nitrate, filter 0.45 µm (mg/L as N)	Nitrogen, ammonia, filter 0.45 µm (mg/L as N)	Phosphorus, total (mg/L as P)	Coliform, fecal, 0.7 µm-mf (cols/100 mL)	Streptococcus, fecal, 0.7 µm-mf (cols/100 mL)
5	01-31-93	1230	--	2.7	112	1.1	0.09	0.18	130	4,900
	02-16-93	1500	--	1.0	72	1.2	<.05	.14	10	30
	03-17-93	1315	--	1.0	66	.93	<.05	.15	<10	40
	03-31-93	1245	--	6.5	2,860	1.7	.47	1.5	33,000	16,000
	04-15-93	1645	--	2.7	164	1.4	<.05	.27	5,100	470
	05-06-93	1115	--	--	--	--	--	--	630	220
	05-20-93	1200	14.0	2.5	344	1.2	<.05	.43	9,700	7,300
	06-03-93	1300	17.5	2.0	292	1.7	<.05	.20	1,400	1,200
	06-17-93	1300	25.0	<1.0	66	1.5	<.05	.22	2,200	800
	07-21-93	1255	23.5	3.7	1,170	1.1	<.05	.53	8,000	18,000
	08-12-93	1100	24.0	1.9	236	1.1	<.05	.30	1,900	2,800
	08-26-93	1255	--	<1.0	25	.80	<.05	.21	<100	500
	09-14-93	1230	13.0	<1.0	30	1.1	<.05	.21	5,000	1,200
	09-30-93	1230	16.0	1.4	86	1.0	.05	.25	300	370
	10-13-93	1245	13.0	<1.0	18	.51	<.05	.13	300	120
	10-27-93	1200	8.0	2.0	16	.58	<.05	.11	80	400
	11-09-93	1130	3.5	1.6	3	.42	<.05	.07	<10	10
	12-01-93	1445	5.5	<1.0	23	.73	<.05	.12	100	30
	12-21-93	1245	2.0	4.0	21	.85	.05	.08	10	100
	01-12-94	1100	0	2.0	11	.79	<.05	.07	20	100
	01-26-94	1045	1.0	1.6	19	.85	.16	.08	210	100
	02-16-94	1145	3.0	4.1	25	.80	.07	.09	<10	20
	03-10-94	1130	6.0	4.0	66	.80	<.05	.19	30	50
	04-07-94	1245	--	1.6	3	.15	<.05	.06	10	<10
	04-21-94	1315	16.0	4.6	104	.49	.05	.26	>60,000	18,000
	05-04-94	1315	18.0	1.7	108	.83	<.05	.20	2,000	1,000
	05-26-94	1145	22.0	1.3	76	.69	<.05	.58	200	200
	06-16-94	1115	26.0	2.8	36	.33	<.05	.27	1,000	600
	06-28-94	1200	--	<1.0	21	.09	<.05	.17	400	100
	07-11-94	1145	--	1.2	18	.20	<.01	.11	300	100

Table 38. Results of onsite determinations and chemical analyses of samples collected for and analyzed by the Kansas Department of Health and Environment, January 1993 through December 1994—Continued

Samp-ling site (fig. 4)	Date (month-day-year)	Time (24-hour)	Temper-ature, water (°C)	Oxygen demand, bio-chemical (mg/L)	Total sus-pended solids, residue total at 105 °C (mg/L)	Nitrogen, nitrate, filter 0.45 μm (mg/L as N)	Nitrogen, ammonia, filter 0.45 μm (mg/L as N)	Phos-phorus, total (mg/L as P)	Coliform, fecal, 0.7 μm-mf (cols/100 mL)	Streptococcus, fecal, 0.7 μm-mf (cols/100 mL)
5	07-27-94	1115	--	3.3	21	0.20	<0.01	0.14	300	170
	08-08-94	1230	--	6.2	19	.06	.05	.11	150	140
	08-30-94	1420	--	3.2	144	.30	.01	.30	900	1,100
	09-21-94	1145	19.0	<1.0	10	<.01	.05	.08	40	130
	10-12-94	1200	--	1.2	7	.07	<.01	.11	800	100
	11-01-94	1130	--	1.5	6	.01	<.01	.11	--	--
	12-13-94	1145	--	2.6	11	.72	.15	.10	5,000	2,800
	12-28-94	1245	--	2.4	9	.56	.03	.07	100	80
6	01-31-93	1300	--	3.8	120	.77	.18	.21	100	780
	02-16-93	1445	--	1.5	34	1.3	.06	.22	<10	20
	03-17-93	1300	--	1.0	33	.79	.06	.15	<10	20
	03-31-93	1315	--	6.7	3,440	1.4	.39	2.3	38,000	18,000
	04-15-93	1700	--	3.3	184	1.1	.05	.27	900	850
	05-20-93	1130	13.5	2.1	268	.89	<.05	.32	9.100	3,600
	06-03-93	1245	17.0	1.6	118	.99	<.05	.19	1,600	3,300
	06-17-93	1245	24.0	<1.0	29	1.1	<.05	.28	700	1,700
	07-21-93	1220	24.0	2.4	524	.79	<.05	.40	4,000	11,000
	08-12-93	1045	24.0	2.7	364	.98	<.05	.33	26,000	12,000
	08-25-93	1230	--	1.1	22	1.1	<.05	.19	100	300
	09-14-93	1145	19.0	<1.0	4	1.2	<.05	.21	400	800
	09-30-93	1215	14.5	<1.0	55	.99	.09	.20	500	700
	10-13-93	1230	12.5	<1.0	13	.68	<.05	.16	100	60
	10-27-93	1145	7.0	1.8	7	.67	<.05	.12	70	200
	11-09-93	1030	3.0	1.8	3	.52	<.05	.10	20	30
	12-01-93	1515	2.5	1.5	30	.90	<.05	.10	200	500
	12-21-93	1230	1.0	4.5	22	.94	.12	.12	<10	30
	01-12-94	1030	0	2.4	10	1.0	.25	.12	30	90
	01-26-94	1000	1.0	2.5	5	.86	.39	.13	10	100

Table 38. Results of onsite determinations and chemical analyses of samples collected for and analyzed by the Kansas Department of Health and Environment, January 1993 through December 1994—Continued

Sampling site (fig. 4)	Date (month-day-year)	Time (24-hour)	Temperature, water (°C)	Oxygen demand, biochemical (mg/L)	Total suspended solids, residue total at 105 °C (mg/L)	Nitrogen, nitrate, filter 0.45 µm (mg/L as N)	Nitrogen, ammonia, filter 0.45 µm (mg/L as N)	Phosphorus, total (mg/L as P)	Coliform, fecal, 0.7 µm-mf (cols/100 mL)	Streptococcus, fecal, 0.7 µm-mf (cols/100 mL)
6	02-16-94	1115	0.5	3.7	7	1.0	0.38	0.15	10	10
	03-10-94	1045	5.0	2.6	33	.83	.14	.18	<10	50
	04-07-94	1300	10.0	2.3	8	.49	<.05	.10	<10	20
	04-21-94	1300	17.0	6.5	28	.82	.05	.31	7,000	2,700
	05-04-94	1300	14.5	2.7	112	.89	<.05	.20	3,000	200
	05-26-94	1130	21.0	1.5	31	.76	<.05	.29	110	200
	06-16-94	1100	25.0	2.2	38	1.1	<.05	.23	800	310
	06-28-94	1140	--	<1.0	14	.66	<.05	.13	300	100
	07-11-94	1130	--	2.0	45	1.2	.02	.22	900	200
	07-27-94	1045	--	3.1	12	.96	.02	.15	200	110
	08-08-94	1200	--	5.9	37	.56	.10	.14	300	400
	08-30-94	1430	--	4.3	448	.64	.04	.57	14,000	18,000
	09-21-94	1115	20.0	<1.0	44	<.01	.06	.07	500	400
	10-12-94	1130	--	1.4	17	.25	.01	.25	200	1,200
	11-01-94	1115	--	1.8	5	.09	.01	.27	--	--
	12-13-94	1115	--	<1.0	15	1.2	.58	.32	16,000	250
	12-28-94	1230	--	3.2	15	1.4	.63	.40	100	130
7	01-31-93	1330	--	2.2	24	1.3	<.05	.10	80	570
	02-16-93	1415	--	1.5	19	1.5	<.05	.06	<10	20
	03-17-93	1130	--	1.2	9	1.2	<.05	.05	30	40
	03-31-93	1115	--	4.4	1,240	2.5	.49	.86	16,000	18,000
	04-15-93	1730	--	2.0	86	1.5	.07	.20	500	680
	05-20-93	1045	12.5	1.1	30	1.2	<.05	.15	2,900	810
	06-03-93	1200	17.0	1.5	14	1.2	<.05	.06	900	900
	06-17-93	1215	25.0	<1.0	7	1.1	.16	.09	1,400	4,000
	07-21-93	1200	24.0	5.4	690	.76	<.05	.44	17,000	60,000
	08-12-93	1030	24.0	1.1	9	1.2	<.05	.07	390	1,300

Table 38. Results of onsite determinations and chemical analyses of samples collected for and analyzed by the Kansas Department of Health and Environment, January 1993 through December 1994—Continued

Sampling site (fig. 4)	Date (month-day-year)	Time (24-hour)	Temperature, water (°C)	Oxygen demand, biochemical (mg/L)	Total suspended solids, residue total at 105 °C (mg/L)	Nitrogen, nitrate, filter 0.45 µm (mg/L as N)	Nitrogen, ammonia, filter 0.45 µm (mg/L as N)	Phosphorus, total (mg/L as P)	Coliform, fecal, 0.7 µm-mf (cols/100 mL)	Streptococcus, fecal, 0.7 µm-mf (cols/100 mL)
7	08-26-93	1200	--	<1.0	10	0.79	<0.05	0.09	100	500
	09-14-93	1330	--	2.4	40	.86	<.05	.25	43,000	8,000
	09-30-93	1145	14.5	1.2	20	1.3	.23	.13	360	300
	10-13-93	1600	14.5	1.4	5	.74	<.05	.06	150	40
	10-27-93	1500	10.5	1.6	5	.73	<.05	.07	40	90
	11-09-93	1515	8.0	1.6	2	.57	<.05	.06	50	10
	12-01-93	1130	3.5	<1.0	3	1.2	<.05	<.05	100	600
	12-21-93	1630	2.0	4.4	27	1.4	<.05	.08	100	70
	01-12-94	1615	0	1.6	8	1.4	<.05	<.05	50	70
	01-26-94	1345	2.0	2.3	8	1.2	.09	.05	200	700
	02-16-94	1000	.5	3.4	3	1.4	<.05	<.05	<10	20
	03-10-94	1000	3.5	1.8	2	.69	<.05	.10	140	10
	04-07-94	1030	5.0	1.8	2	.41	<.05	<.05	40	60
	04-21-94	1700	15.5	6.6	168	.91	.09	.26	13,000	10,000
	05-04-94	1715	20.0	2.4	42	1.7	.08	.12	300	400
	05-26-94	1400	22.0	1.0	8	.91	<.05	.07	500	50
	06-16-94	1445	27.0	1.9	10	.80	<.05	.08	600	1,800
	06-28-94	1430	--	1.0	7	.87	<.05	.08	1,200	2,100
	07-11-94	1445	--	2.8	80	.60	<.01	.21	800	600
	07-27-94	1415	--	2.8	6	.30	<.01	.05	300	700
	08-08-94	1515	--	5.5	4	.27	.04	.07	710	500
	08-30-94	1145	--	3.5	10	.29	.04	.11	1,400	3,500
	11-01-94	1045	--	1.9	6	<.01	.01	.05	--	--
	12-13-94	1045	--	1.6	3	1.0	.08	<.01	1,700	1,400
	12-28-94	1530	--	2.9	10	.35	.01	<.01	60	300
8	01-31-93	1345	--	2.2	150	.54	<.05	.14	10	320
	02-16-93	1345	--	1.2	58	.60	<.05	.06	30	10
	03-17-93	1100		1.0	18	.33	<.05	.05	10	20
	03-31-93	1300	7.0	5.0	1,720	1.8	.31	1.6	30,000	10,000
	04-15-93	1815	--	1.7	88	.68	<.05	.14	600	380

Table 38. Results of onsite determinations and chemical analyses of samples collected for and analyzed by the Kansas Department of Health and Environment, January 1993 through December 1994—Continued

Sampling site (fig. 4)	Date (month-day-year)	Time (24-hour)	Temperature, water (°C)	Oxygen demand, biochemical (mg/L)	Total suspended solids, residue total at 105 °C (mg/L)	Nitrogen, nitrate, filter 0.45 μm (mg/L as N)	Nitrogen, ammonia, filter 0.45 μm (mg/L as N)	Phosphorus, total (mg/L as P)	Coliform, fecal, 0.7 μm-mf (cols/100 mL)	Streptococcus, fecal, 0.7 μm-mf (cols/100 mL)
8	05-06-93	1425	18.5	1.7	59	0.35	<0.05	0.08	1,200	300
	05-20-93	1415	15.5	<1.0	68	.49	<.05	.15	600	1,900
	06-03-93	1500	17.5	1.1	29	.55	<.05	.06	2,500	1,800
	06-17-93	1145	25.5	<1.0	31	.64	<.05	.07	700	3,500
	07-21-93	1015	22.0	4.9	415	.29	<.05	.31	4,000	11,000
	08-12-93	1345	28.0	1.0	29	.52	<.05	.06	170	1,000
	08-26-93	1130	--	<1.0	20	.51	<.05	.07	100	200
	09-14-93	1145	--	2.9	336	.40	<.05	.34	8,000	28,000
	09-30-93	1100	13.5	1.0	36	.49	.42	.09	100	260
	10-13-93	1145	12.5	<1.0	10	.25	<.05	.05	50	80
	10-27-93	1115	8.0	2.2	9	.18	<.05	<.05	40	60
	11-09-93	1415	6.5	2.5	3	.15	<.05	<.05	10	<10
	12-01-93	1100	3.0	1.0	2	.38	<.05	<.05	100	500
	12-21-93	1200	1.0	3.9	25	.42	.09	.05	100	30
	01-12-94	1445	.5	1.6	7	.39	.05	<.05	<10	50
	01-26-94	1130	.5	2.0	7	.48	.13	<.05	20	100
	02-16-94	1300	1.0	2.7	9	.33	<.05	<.05	<10	<10
	03-10-94	1345	8.5	1.6	9	.20	<.05	.05	<10	10
	04-07-94	1415	10.5	2.1	4	.09	<.05	<.05	10	60
	04-21-94	1200	16.0	4.2	190	.39	<.05	.21	200	1,200
	05-04-94	1215	14.5	1.2	62	.62	<.05	.08	300	200
	05-26-94	1115	22.0	1.8	23	.25	<.05	.07	110	700
	06-16-94	1015	25.0	2.5	40	.41	<.05	.08	400	2,100
	06-28-94	1100	--	1.1	10	.26	<.05	.05	900	600
	07-11-94	1200	--	1.2	10	.34	<.01	.05	800	200
	07-27-94	1430	--	2.6	2	.28	<.01	.02	50	70
	08-08-94	1130	--	6.1	12	.36	.04	.04	200	600
	08-30-94	1100	--	3.2	144	.97	<.01	.27	1,200	18,000
	09-21-94	1130	19.5	<1.0	8	<.01	.05	<.01	200	200
	10-12-94	1200	--	1.2	2	<.01	.03	.01	100	100

Table 38. Results of onsite determinations and chemical analyses of samples collected for and analyzed by the Kansas Department of Health and Environment, January 1993 through December 1994—Continued

Sampling site (fig. 4)	Date (month-day-year)	Time (24-hour)	Temperature, water (°C)	Oxygen demand, biochemical (mg/L)	Total suspended solids, residue total at 105 °C (mg/L)	Nitrogen, nitrate, filter 0.45 µm (mg/L as N)	Nitrogen, ammonia, filter 0.45 µm (mg/L as N)	Phosphorus, total (mg/L as P)	Coliform, fecal, 0.7 µm-mf (cols/100 mL)	Streptococcus, fecal, 0.7 µm-mf (cols/100 mL)
8	11-01-94	1430	--	2.8	2	<0.01	<0.01	0.04	--	--
	12-13-94	1400	--	1.9	7	.82	.09	.02	400	5,000
	12-28-94	1145	--	2.5	12	.32	.01	<.01	10	140
9	01-31-93	1415	--	1.8	34	.75	<.05	.06	10	90
	02-16-93	1300	--	1.6	8	1.0	<.05	<.05	30	10
	03-17-93	1030	--	1.4	7	.49	<.05	<.05	10	10
	03-31-93	1145	7.0	4.2	1,950	2.0	.35	1.2	13,000	7,400
	04-15-93	1845	--	2.1	24	1.0	<.05	.07	150	120
	05-06-93	1445	18.0	1.7	20	.89	<.05	.05	230	320
	05-20-93	1345	15.5	1.1	8	.66	<.05	.05	--	--
	06-03-93	1530	17.5	2.7	7	.74	<.05	<.05	810	510
	06-17-93	1130	25.5	<1.0	8	.78	<.05	<.05	250	170
	07-21-93	1045	22.5	3.6	680	.61	.06	.41	24,000	33,000
	08-12-93	1415	29.0	1.3	4	.77	<.05	<.05	100	100
	08-26-93	1045	--	1.0	9	.57	<.05	<.05	100	90
	09-14-93	1045	--	1.1	22	.63	<.05	.08	1,000	200
	09-30-93	1030	14.0	1.4	11	.73	<.05	.06	700	800
	10-13-93	1115	13.0	1.7	12	.25	<.05	<.05	400	100
	10-27-93	1045	7.5	2.1	7	.33	<.05	.05	100	700
	11-09-93	1300	6.5	2.2	2	.34	<.05	<.05	10	50
	12-01-93	1030	2.5	1.5	2	.67	<.05	<.05	100	240
	12-21-93	1115	.5	4.2	9	.70	.07	<.05	100	20
	01-12-94	1330	.5	2.0	3	.94	<.05	<.05	50	280
	01-26-94	1045	.5	1.8	2	.84	.09	<.05	140	300
	02-16-94	1430	3.0	2.8	2	.94	<.05	<.05	10	50
	03-10-94	1245	7.5	1.8	3	.35	.05	.30	40	10
	04-07-94	1530	11.5	2.2	3	.29	<.05	<.05	<10	50
	04-21-94	1145	16.0	3.8	5	.26	<.05	<.05	100	500

Table 38. Results of onsite determinations and chemical analyses of samples collected for and analyzed by the Kansas Department of Health and Environment, January 1993 through December 1994—Continued

Sampling site (fig. 4)	Date (month-day-year)	Time (24-hour)	Temperature, water (°C)	Oxygen demand, biochemical (mg/L)	Total suspended solids, residue total at 105 °C (mg/L)	Nitrogen, nitrate, filter 0.45 µm (mg/L as N)	Nitrogen, ammonia, filter 0.45 µm (mg/L as N)	Phosphorus, total (mg/L as P)	Coliform, fecal, 0.7 µm-mf (cols/100 mL)	Streptococcus, fecal, 0.7 µm-mf (cols/100 mL)
9	05-04-94	1145	15.0	1.4	28	0.79	0.06	0.07	500	200
	05-26-94	1030	17.0	1.6	12	.31	<.05	<.05	260	600
	06-16-94	1100	26.0	3.4	38	.54	.11	.05	1,500	600
	06-28-94	1045	--	2.4	20	.16	<.05	.07	700	600
	07-11-94	1130	--	3.6	33	.02	.02	.07	600	100
	07-27-94	1400	--	5.3	19	.12	<.01	.14	500	120
	08-08-94	1100	--	6.3	25	.02	.05	.06	300	900
	08-30-94	1040	--	5.3	172	.39	.07	.32	18,000	15,000
	11-01-94	1400	--	2.7	11	<.01	<.01	.04	--	--
	12-13-94	1330	--	2.1	22	1.4	.10	.08	200	1,000
	12-28-94	1130	--	2.8	17	.49	.01	<.01	<10	200
10	01-31-93	1445	--	3.2	87	.83	.11	.17	90	340
	02-16-93	1800	--	2.1	10	.85	.09	.09	<10	10
	03-17-93	0945	--	1.2	10	.64	.05	.06	10	40
	03-31-93	1100	5.5	5.9	910	2.4	.41	.98	52,000	10,000
	04-15-93	1930	--	3.4	58	1.1	.11	.20	1,100	3,900
	05-06-93	1330	17.5	2.0	25	.81	<.05	.09	500	360
	05-20-93	1500	16.0	1.2	17	.74	<.05	.10	500	170
	06-03-93	1415	18.0	1.6	8	.46	<.05	.06	880	410
	06-17-93	1015	25.0	1.1	9	.69	<.05	.08	900	800
	07-21-93	0915	22.5	2.2	510	.63	<.05	.37	25,000	34,000
	08-12-93	0930	24.0	3.1	10	.61	<.05	.23	<100	12,000
	08-26-93	1600	--	1.1	12	.17	<.05	.11	<100	100
	09-14-93	1430	--	3.0	340	.38	<.05	.37	15,000	7,000
	09-30-93	1600	18.0	1.9	20	.79	<.05	.13	200	180
	10-13-93	0945	11.5	1.8	7	.40	<.05	.06	200	130
	10-27-93	0930	7.0	2.3	5	.40	<.05	.06	100	200
	11-09-93	1100	3.5	5.2	3	.19	<.05	<.05	20	10
	12-01-93	0900	2.0	1.5	3	.53	<.05	<.05	200	400
	12-21-93	1030	1.0	4.4	7	.55	.06	.05	100	60
	01-12-94	1045	.5	2.0	2	.62	.05	<.05	40	30

Table 38. Results of onsite determinations and chemical analyses of samples collected for and analyzed by the Kansas Department of Health and Environment, January 1993 through December 1994—Continued

Sampling site (fig. 4)	Date (month-day-year)	Time (24-hour)	Temperature, water (°C)	Oxygen demand, biochemical (mg/L)	Total suspended solids, residue total at 105 °C (mg/L)	Nitrogen, nitrate, filter 0.45 µm (mg/L as N)	Nitrogen, ammonia, filter 0.45 µm (mg/L as N)	Phosphorus, total (mg/L as P)	Coliform, fecal, 0.7 µm-mf (cols/100 mL)	Streptococcus, fecal, 0.7 µm-mf (cols/100 mL)
10	01-26-94	0930	0.5	1.9	2	0.61	0.15	<0.05	260	100
	02-16-94	1145	1.5	3.8	2	.54	.06	<.05	<10	20
	03-10-94	1000	2.5	1.7	6	.40	<.05	.06	10	20
	04-07-94	0945	--	2.0	2	.04	<.05	<.05	120	40
	04-21-94	1100	14.0	4.5	22	.18	.22	.17	100	20
	05-04-94	1045	12.5	2.0	26	.94	.06	.09	700	300
	05-26-94	1000	22.0	1.0	7	.25	.05	.06	300	300
	06-16-94	1015	26.0	2.6	12	<.01	<.05	.09	110	400
	06-28-94	1000	--	1.0	12	.02	<.05	.07	230	230
	07-11-94	1015	--	2.5	8	.05	<.01	.07	400	40
	07-27-94	1330	--	4.0	17	.02	<.01	.04	50	170
	08-08-94	1030	--	6.6	22	.01	.02	.05	70	100
	08-30-94	1545	--	4.4	17	<.01	.02	.11	300	600
	09-21-94	1030	18.5	<1.0	4	<.01	.07	.01	10	110
	10-12-94	1030	--	2.0	4	<.01	.02	.04	<10	10
	11-01-94	1515	--	2.6	3	.03	<.01	.10	--	--
	12-13-94	1515	--	2.1	6	.65	.23	.11	40	510
	12-28-94	1045	--	3.2	9	.51	.06	.09	70	120
11	01-31-93	1500	--	1.4	13	1.0	.13	.10	<10	<10
	02-16-93	1830	--	1.7	7	.99	--	--	<10	<10
	03-17-93	1600	--	1.5	8	.84	.11	.11	<10	<10
	03-31-93	1000	7.0	1.0	14	.95	.06	.14	<10	<10
	04-15-93	2015	--	2.4	11	1.1	.17	.10	8	16
	05-06-93	1530	13.0	2.1	13	1.4	.09	.09	<2	4
	05-20-93	1600	17.0	2.2	6	1.2	.07	.12	<10	<10
	06-03-93	1630	19.5	2.2	18	1.1	<.05	.12	<10	<10
	06-17-93	1045	--	5.3	32	1.0	.05	.20	780	160
	07-21-93	1130	25.5	1.6	4	1.4	<.05	.10	10	40

Table 38. Results of onsite determinations and chemical analyses of samples collected for and analyzed by the Kansas Department of Health and Environment, January 1993 through December 1994—Continued

Sampling site (fig. 4)	Date (month-day-year)	Time (24-hour)	Temperature, water (°C)	Oxygen demand, biochemical (mg/L)	Total suspended solids, residue total at 105 °C (mg/L)	Nitrogen, nitrate, filter 0.45 µm (mg/L as N)	Nitrogen, ammonia, filter 0.45 µm (mg/L as N)	Phosphorus, total (mg/L as P)	Coliform, fecal, 0.7 µm-mf (cols/100 mL)	Streptococcus, fecal, 0.7 µm-mf (cols/100 mL)
11	08-12-93	1500	26.0	2.0	4	0.88	<0.05	0.11	20	<100
	08-26-93	1010	--	1.7	4	1.3	<.05	.12	<100	100
	09-14-93	1530	20.5	1.9	22	.49	<.05	.11	<100	<100
	09-30-93	0945	18.0	7.0	82	.51	<.05	.18	90	80
	10-13-93	1030	17.0	2.3	24	.57	<.05	.10	50	10
	10-27-93	0945	14.0	2.7	18	.58	<.05	.08	<10	<10
	11-09-93	1215	10.0	2.1	12	.57	<.05	.10	10	<10
	12-01-93	0945	5.5	1.9	3	.69	<.05	.05	<10	<10
	12-21-93	0945	4.5	4.1	8	.61	.10	.06	<10	<10
	01-12-94	1130	2.0	2.1	6	.50	<.05	<.05	<10	<10
	01-26-94	1015	3.0	2.3	4	.57	.14	<.05	<10	10
	02-16-94	1600	5.5	4.9	2	.30	<.05	.05	<10	<10
	03-10-94	1115	6.0	3.2	4	.18	<.05	<.05	<10	<10
	04-07-94	1615	10.5	2.8	26	.10	.08	.05	<10	<10
	04-21-94	1000	11.0	3.8	21	.26	.14	.12	12,000	59,000
	05-04-94	1015	14.0	1.6	8	.10	.08	<.05	<10	100
	05-26-94	0915	16.0	13.2	16	.23	<.05	<.05	<10	10
	06-16-94	1130	21.5	4.7	22	.22	.08	.06	20	<10
	06-28-94	1530	--	2.4	15	.15	<.05	<.05	<10	<10
	07-11-94	1100	--	5.6	13	.07	.20	.13	10	<10
	07-27-94	1300	--	5.8	70	.03	.57	.41	<10	<10
	08-08-94	0945	--	9.5	100	.02	.45	.22	100	100
	08-30-94	1615	--	4.1	34	.21	<.01	.13	700	1,800
	09-21-94	1400	23.0	1.6	11	.12	.06	.02	100	20
	10-12-94	1100	--	2.4	13	.17	.07	.06	20	20
	11-01-94	1320	--	3.6	14	.17	<.01	.06	--	--
	12-13-94	1545	--	2.1	12	.31	.07	.01	<10	<10
	12-28-94	1000	--	2.7	10	.31	.03	<.01	<10	<10

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