The Chemical Quality of Overbank Sediment Deposited by the 1993 Floods and Streambed Sediment in Major Streams at Selected Sites in Eastern Nebraska

U.S. GEOLOGICAL SURVEY

Open-File Report 96–419

Prepared in cooperation with the
NEBRASKA DEPARTMENT OF ENVIRONMENTAL QUALITY

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By A.D. Druliner, A.H. Chen, and S.H. Hull

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CONTENTS

Abstract 1
Introduction 1
Purpose and Scope 2
Acknowledgments 2
Description of Eastern Nebraska with Emphasis on the Major Stream Basins 2
Topography 2
Principal Streams and Rivers 2
Land Use 5
Methods 5
Site Selection and Sampling Methods 5
Overbank Sediment Collection 5
Streambed Sediment Collection 6
Analytical Methods 12
Quality-Assurance/Quality-Control Methods 13
Analytical Results 13
Overbank Sediment Quality 13
Grain-Size Distribution 13
Nutrients and Total Carbon 13
Trace Elements 14
Acid and Base/Neutral Extractable Organic Compounds and Total Recoverable Petroleum Hydrocarbons 14
Organochlorine Pesticides and Polychlorinated Organic Compounds 14
Triazine and Related Herbicides 14
Streambed Sediment Quality 14
Grain-Size Distribution 15
Nutrients 15
Trace Elements 15
Acid and Base/Neutral Extractable Organic Compounds and Total Recoverable Petroleum Hydrocarbons 16
Organochlorine Pesticides and Polychlorinated Organic Compounds 16
Triazine and Related Herbicides 16
Quality Assurance 16
Summary 17
Selected References 18
Supplemental Data 21

ILLUSTRATIONS

1. Map showing locations of overbank and streambed sediment-collection sites in southeastern Nebraska, 1994–95 3
2. Map showing locations of overbank sediment-collection sites near (a) Rulo, (b) DeWitt, and (c) Nehawka in eastern Nebraska, 1994 7

TABLES

1. Physical and land-use characteristics of basins containing streambed sediment-collection sites 6
2. Chemical constituents analyzed in overbank and streambed sediment samples, method detection limits, and number of samples analyzed 10
3. Grain-size distribution for overbank and streambed sediment samples from selected sites in eastern Nebraska, 1994–95 22
4. Statistical summary of grain-size distribution in overbank and streambed sediment from selected sites in eastern Nebraska, 1994–95 25

5. Concentrations of nutrients, trace elements, acid and base/neutral organic compounds, total recoverable petroleum hydrocarbons, organochlorine pesticides, and polychlorinated organic compounds that were detected in overbank and streambed sediment and associated quality-assurance samples from selected sites in eastern Nebraska, 1994–95 26
6. Concentrations of triazine and related herbicides and selected metabolites detected in overbank and streambed sediment from selected sites in eastern Nebraska, 1994–95 42
7. Statistical summary of nutrients and total carbon in overbank and streambed sediment from selected sites in eastern Nebraska, 1994–95 48
8. Statistical summary of trace elements in overbank and streambed sediment from selected sites in eastern Nebraska, 1994–95 49
9. Statistical summary of acid and base/neutral extractable organic compounds and total recoverable petroleum hydrocarbons in overbank and streambed sediment from selected sites in eastern Nebraska, 1994–95 51
10. Statistical summary of organochlorine pesticides and polychlorinated organic compounds in overbank and streambed sediment from selected sites in eastern Nebraska, 1994–95 52
11. Statistical summary of triazine and related herbicides and selected metabolites in overbank and streambed sediment from selected sites in eastern Nebraska, 1994–95 53
12. Summary of results of duplicate analyses for overbank and streambed sediment samples, 1994–95 55

The Chemical Quality of Overbank Sediment Deposited by the 1993 Floods and Streambed Sediment in Major Streams at Selected Sites in Eastern Nebraska

By A.D. Druliner, A.H. Chen, *and* S.H. Hull

Abstract

During the fall of 1994, overbank sediment samples deposited by the 1993 floods were collected downstream from three communities in eastern Nebraska. Streambed sediment samples from streams or rivers adjacent to the overbank sites also were collected. Nine streambed sediment samples were collected on eight major streams in eastern Nebraska during the fall of 1994 and the spring and early summer of 1995. Both the overbank and streambed sediment samples were analyzed for nutrients, trace elements, selected acid and base/neutral extractable organic compounds, organochlorine pesticides, polychlorinated biphenyls, polychlorinated naphthalenes, total recoverable petroleum hydrocarbons, triazine and related herbicides, and grain size.

The dominant nutrients found in the sediment samples were ammonium and organic nitrogen and phosphorus. Concentrations of nitrite plus nitrate in overbank sediment samples were much larger than concentrations in streambed sediment samples.

Aluminum, iron, and manganese were the dominant trace elements in both the overbank and streambed sediment samples. Although most concentrations of trace elements were near the method detection limits, concentrations of arsenic, chromium, lead, and mercury were slightly larger in overbank sediment samples than in streambed sediment samples.

Five acid and base/neutral extractable organic compounds and total recoverable petroleum hydrocarbons were detected in one overbank sediment sample from the community of Nehawka. Eight streambed sediment samples contained concentrations of total recoverable petroleum hydrocarbons above the method detection limit of 20 milligrams per kilogram.

Aldrin, chlordane, DDD, DDE, DDT, dieldrin, and polychlorinated biphenyls were commonly detected in both overbank and streambed sediment samples at concentrations near the method detection limits. All of the overbank and more than one-half of the streambed sediment samples contained detectable concentrations of one or more triazine or related herbicides. One overbank sediment sample from the Nehawka site contained hundreds of micrograms per kilogram of alachlor, atrazine, cyanazine, cyanazine amide, and metolachlor.

The overbank sediment samples contained predominantly silt and clay, whereas the streambed sediment samples contained mostly sand and silt-sized particles.

INTRODUCTION

The floods of 1993 caused considerable damage to the southern and eastern part of Nebraska. Levees were broken, much topsoil from valuable farmland was often eroded away or covered with thick layers of sand and silt, bridges were washed out, and local landfills and waste-treatment lagoons were inundated. It was hypothesized that sediments deposited in the summer of 1993 contained elevated concentrations of nutrients, trace metals, acid and base/neutral extractable organic compounds, petroleum products, and pesticides because of increased surface runoff and flooding of landfills and waste impoundments.

Currently little is known about the quality of flood-deposited sediment along the major streams and rivers in Nebraska. It is not known if detectable concentrations of potentially harmful constituents are in flood-deposited sediments, especially in areas downstream from flooded landfills, sewage-treatment plants, and industrial-waste impoundments following the 1993 floods. Furthermore, the quality of stream sediment deposited under nonflood discharges in the major streams and rivers in eastern Nebraska is not known. Nor are data available to compare the quality of these sediments with those resulting from widespread flooding conditions. In the summer of 1994, the Nebraska Department of Environmental Quality entered into a cooperative agreement with the Nebraska District of the U.S. Geological Survey to investigate the quality of flood-deposited overbank sediment and streambed sediment.

Purpose and Scope

The purpose of this report is to provide basic data describing the quality of sediment deposited by the 1993 floods at selected sites and to provide data describing the baseline quality of stream sediment in major drainage basins across the eastern one-half of Nebraska. This report describes the methods used to collect and analyze overbank and streambed sediment samples in the fall of 1994 and the spring and summer of 1995 and the results of those analyses. Tables containing both basic sediment-quality data and summary statistics of those data are also included.

Acknowledgments

We gratefully acknowledge the help of private landowners who granted us access through their land to many of our sampling sites, local residents who provided information about the extent of the 1993 floods, and employees of the Nebraska Department of Environmental Quality (NDEQ) who aided in the initial selection of communities that were flooded in 1993.

DESCRIPTION OF EASTERN NEBRASKA WITH EMPHASIS ON THE MAJOR STREAM BASINS

Nebraska is a leading agricultural state, largely due to an abundant supply of water available from both surface- and ground-water sources. Surface water accounted for 77 percent of the 21,250 million gallons per day of total water use in Nebraska in 1990 (Nebraska Natural Resources Commission, 1994). Irrigation is the predominant water use—approximately 7.5 million acres are irrigated in the State.

Snowmelt in the spring and runoff from rain in the spring and early summer are the primary sources of fresh surface water in the State. Annual rainfall ranges from about 36 centimeters (14 inches) in the west to about 89 centimeters (35 inches) in the southeast.

Topography

Nebraska is physiographically diverse. The eastern one-fourth of the State lies in the Dissected Till Plains section in the Central Lowlands physiographic province (Fenneman, 1946). This part of Nebraska is characterized by deposits of glacial drift as much as 300 meters (984 feet) thick overlain by loess. Most of the remainder of the State lies in the Great Plains Province, the majority of which is composed of Dissected Plains, High Plains, and Sand Hills sections. The Sand Hills, which are sand dunes stabilized by native grasses, are a major physiographic feature of Nebraska that covers about one-fifth of the State.

Topographically, the State slopes from west to east at about 10 meters per kilometer (7.3 feet per mile) towards the Missouri River, which composes Nebraska's eastern boundary. All major streams, which include the Platte, Republican, Niobrara, Loup, Elkhorn, and Big Blue Rivers, generally flow to the east where they empty either into the Missouri River or larger tributaries of the Missouri River.

Principal Streams and Rivers

The Platte, Republican, Loup, Elkhorn, Big Blue, and Missouri Rivers are the major streams in the eastern one-half of the State (fig. 1). They provide

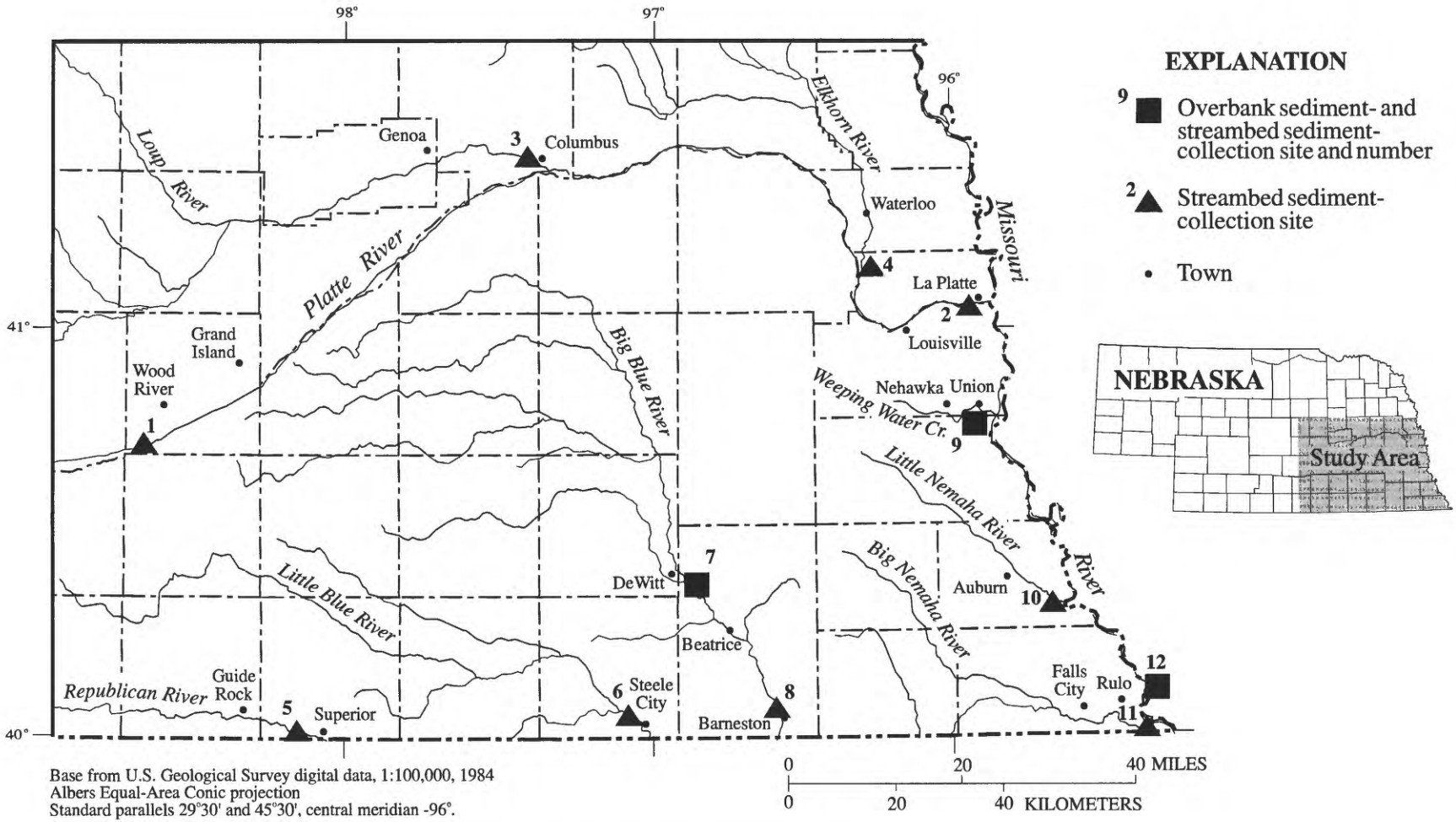


Figure 1. Locations of overbank and streambed sediment-collection sites in southeastern Nebraska, 1994–95.

surface-water supplies for irrigation, wildlife, fish and other aquatic life, industry, recreation, and other uses.

Gentle stream slopes coupled with the general absence of bedrock outcrops along most of these streams account for the predominance of silt and fine sand in both the suspended sediments and streambed sediments associated with the streams and rivers in eastern Nebraska. A greater abundance of silt and clay-sized particles is common in streams where the streams enter the Missouri River flood plain.

The streams vary from braided to mature and meandering with dominant sediment sources ranging from clay silt to fine to medium sand. The Platte River is a braided tributary of the Missouri River and drains much of the west, central, and eastern parts of Nebraska (fig. 1). Its valley varies from a width of 29 kilometers (18 miles) in the central part of the State to less than 1.6 kilometers (1 mile) near its confluence with the Missouri River. The gradient of the river is variable, but the 160-kilometer (100-mile) reach above the mouth of the river has a gradient of 0.87 meter per kilometer (4.6 feet per mile).

The Loup River is a meandering tributary of the Platte River and drains much of the Sand Hills, as well as much of the dissected loess plain north of the Platte River. The streams that comprise the Loup River drainage basin have an average gradient of about 1.4 meters per kilometer (7.5 feet per mile).

The Elkhorn River is a meandering tributary of the Platte River and drains part of the Sand Hills in north-central Nebraska, as well as part of the loess plains in northeastern Nebraska. The gradients of the larger streams within the Elkhorn River drainage basin are generally low, and the stream valleys are broad and shallow.

The Republican River is a meandering tributary of the Kansas River and drains much of the dissected loess plains in south-central Nebraska. The river is incised in rocks of Tertiary and Cretaceous age. The valley walls of the river are steep and are intersected by the steep slopes of many narrow tributaries. The gradient of the Republican River ranges from about 0.8 to 1.9 meters per kilometer (4 to 10 feet per mile).

The Little Blue River is a meandering tributary of the Kansas River and drains loess plains and dissected loess plains in south-central and south-eastern Nebraska. Much of the lower one-third of the Little Blue Basin is incised into Permian and Cretaceous sandstones, limestones, and shales, making steep slopes and bedrock outcrops common. The gradient of the Little Blue River averages about 1 meter per kilometer (5 feet per mile).

The Big Blue River is a meandering tributary of the Kansas River and drains part of the loess plains in southeastern Nebraska.The Big Blue River Valley near Crete, Nebraska, is nearly 3.2 kilometers (2 miles) wide and 30 meters (100 feet) deep. The stream channels in the Big Blue Basin are generally incised in deposits of Quaternary age and underlying deposits of Cretaceous age in some places.

The Big Nemaha River is a meandering tributary of the Missouri River and drains part of the dissected loess-covered till plains in southeastern Nebraska. The valley is about 0.6 to 1.2 kilometers (1 to 2 miles) wide and in many places has very steep walls. The gradient is about 0.4 to 0.6 meter per kilometer (2 to 3 feet per mile) near its confluence with the Missouri River.

The Little Nemaha River is a relatively linear stream that, with its tributaries, drains parts of three counties in eastern Nebraska and flows into the Missouri River. The stream dissects surficial deposits of glacial drift and has a fairly uniform valley width of 0.8 to 1.2 kilometers (0.50 to 0.75 mile). The stream runs between relatively narrow, steep banks of silt and has a gradient of 0.4 to 0.6 meter per kilometer (2 to 3 feet per mile) near its confluence with the Missouri River, where the sediment samples were collected for this study.

Weeping Water Creek is a shallow, meandering stream that drains the southern one-half of one county in the eastern part of the State where it overlies limestones and shales of Paleozoic age. Weeping Water Creek runs through steep, narrow, silty clay banks, and its valley varies from 0.1 to 0.8 kilometer (0.25 to 0.50 mile) in width. The stream has a gradient of about 0.9 meter per kilometer (5 feet per mile) near the community of Nehawka.

The Missouri River is a mature, meandering tributary of the Mississippi River and drains a large portion of the Central Great Plains. The stream morphology and gradient are highly variable throughout the course of the river. Near the town of Rulo, where sediment samples were collected, the Missouri River has a gradient of less than 0.2 meter per kilometer (1 foot per mile).

Land Use

In the 1993–94 agricultural year, farmland in Nebraska totalled about 44.4 million acres (Nebraska Agricultural Statistics Service, 1994), about 90 percent of the total area of the State. The dominant crops grown are corn, soybeans, wheat, oats, barley, and hay. The distribution of crops and the percentage of pastureland changes from east to west as the amount of annual rainfall decreases. Generally more cropland is planted to wheat and hay in the east, and more land is in pasture in the western part of the State. The principal population centers are in the eastern part of the State; therefore, industrial land uses are more common in that area.

METHODS

Site Selection and Sampling Methods

To determine if contaminants might be present in overbank sediment deposits from the 1993 flood downstream from potential sources of contamination, three communities were identified (Rulo, Nehawka, and DeWitt) (fig. 1) with the assistance of the Waste Management Division of the NDEQ. These three communities were selected because they contained a community landfill and waste-treatment lagoon (Rulo), an agricultural chemical-storage facility (Nehawka), and an industrial-waste disposal area (DeWitt) that were located within the flood plain and that were flooded in 1993. These towns represented likely sources of contaminants that had the potential to combine with eroded sediment and be deposited as the flood waters receded. Sediment deposited downstream from these facilities would likely have an increased potential of contamination. Streambed sediment-sampling sites also were selected on the principal streams adjacent to the three communities.

To examine the chemical quality of stream sediment deposited during periods of regular discharge in eastern Nebraska, nine streambed sediment-collection sites were identified for eight streams and rivers (two of them are on the Platte River) that drain the eastern one-half of Nebraska (fig. 1 and table 1). All but one of these sites were located near the downstream end of the drainage basins for each stream so that the sediment-quality data could be representative of sediment throughout the basin. One site was located on the Platte River in the central part of the State, in addition to a site near the downstream end of the basin. The sites also were relatively close to stream-gaging stations operated by the U.S. Geological Survey (USGS) so that stream-sediment concentrations could be compared to stream discharges. Sites for the collection of streambed sediment were located a minimum of 0.4 kilometer (0.25 mile) upstream from bridges to avoid nonrepresentative particulate contamination from automobile emissions and bridge construction materials. Three additional streambed sediment-collection sites were identified on the Missouri River, Weeping Water Creek, and the Big Blue River near the overbank sediment-collection sites adjacent to Rulo, Nehawka, and DeWitt, respectively.

Overbank Sediment Collection

Because more than 1 year had passed since the overbank sediment was deposited by the 1993 floods, it was impossible to know for certain that the chemical integrity of the sediment was not compromised prior to sample collection. It is possible that the composition of the overbank sediment may have been altered after its deposit by both dry and wet atmospheric deposition of contaminants, mixing with older sediment through bioturbation, exposure to runoff from agricultural lands, exposure to floodwaters from the 1994 flood season, and chemical and/or biological degradation of some contaminants. Although the impact of these types of chemical alterations could not be entirely eliminated, site-selection criteria and sample-collection methods were used that attempted to limit their influences where possible on samples collected for this study. Overbank sediment samples were collected only from sites that showed no evidence of excessive bioturbation, that did not appear to be directly influenced by surface runoff from agricultural fields, and that were above the normal flood stages. Sample-collection methods that tended to reduce the potential for exposure to atmospheric deposition also were used.

Downstream from each of the three potential contamination sources (facilities in the towns of Rulo, Nehawka, and DeWitt), three sites were selected for collection of overbank sediment deposits resulting from the 1993 floods (fig. 2). These sites were usually depressions or traps in which finer sediments were

Table 1. Physical and land-use characteristics of basins containing streambed sediment-collection sites

[DDMMSS, degrees minutes seconds; mi^2, square miles; ft^3/s, cubic feet per second; --, data not available]

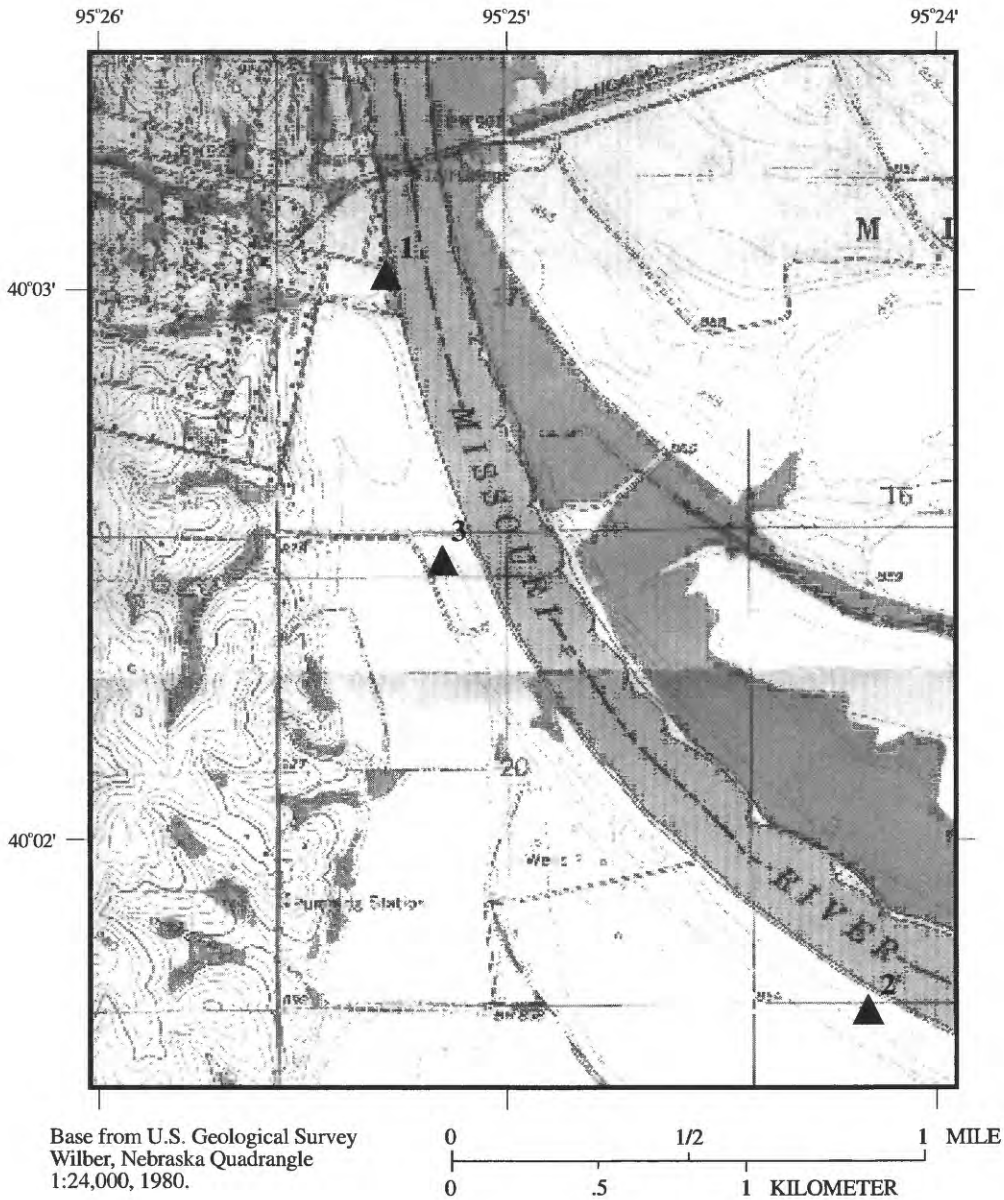
Site number on map (see fig.1)		Identification number		Drainage area (mi^2)	Mean annual discharge for period of record (ft^3/s)[1]	Annual discharge for 1993 (ft^3/s)[1]	Land use	
		Latitude DDMMSS	Longitude DDMMSS				Percent cropland and pasture	Percent rangeland
1	Platte River near Wood River	404335	0983918	2,980	1,560	1,630	46	49
2	Platte River near La Platte	410336	0955710	8,140	6,740	14,700	86	7
3	Loup River near Columbus	412359	0971932	15,220	674	1,990	32	67
4	Elkhorn River near Waterloo	410808	0961836	6,990	1,250	3,870	84	14
5	Republican River near Superior	400111	0980933	9,460	302	488	57	27
6	Little Blue River near Steele City	400330	0970345	2,610	584	1,890	94	--
7	Big Blue River near DeWitt	402202	0965134	3,590	833	2,020	98	--
8	Big Blue River near Barneston	400325	0963517	807	864	2,780	98	--
9	Weeping Water Creek near Nehawka	404913	0955703	169	103	433	96	--
10	Little Nemaha River near Auburn	401938	0954136	899	313	1,390	99	--
11	Big Nemaha River near Rulo	400048	0952327	1,470	634	2,560	93	--
12	Missouri River near Rulo	400425	0952439	414,900	41,200	59,200	--	--

[1]Locations of discharge measurement sites:
1. Platte River near Grand Island, period of record is 1942–93
2. Platte River near Louisville, period of record is 1935–93
3. Loup River near Genoa, period of record is 1944–93
4. Elkhorn near Waterloo, period of record is 1929–93
5. Republican River near Guide Rock, period of record is 1950–93
6. Little Blue River near Hollenberg, Kansas, period of record is 1975–93
7. Big Blue River near Beatrice, period of record is 1975–93
8. Big Blue River near Barneston, period of record is 1933–93
9. Weeping Water Creek near Union, period of record is 1951–93
10. Little Nemaha near Auburn, period of record is 1950–93
11. Big Nemaha River near Falls City, period of record is 1944–93
12. Missouri River at Rulo, period of record is 1950–93

deposited as the floodwater receded. Hand-held sediment collectors were used to gather three samples at each overbank deposition site. The top few centimeters of each sample were shaved with a polytetrafluoroethylene spatula to remove sediment that might be contaminated by airborne particulates. Samples were collected to a depth of about 35 centimeters (14 inches). The samples were placed in either pre-cleaned, acid-rinsed plastic or baked-glass containers and were chilled to 4 degrees Celsius (39 degrees Fahrenheit). The sediment samples were analyzed for selected nutrients, total carbon, trace elements, acid and base/neutral extractable organic compounds, total recoverable petroleum hydrocarbons (TRPH), pesticides, and grain size (table 2).

Streambed Sediment Collection

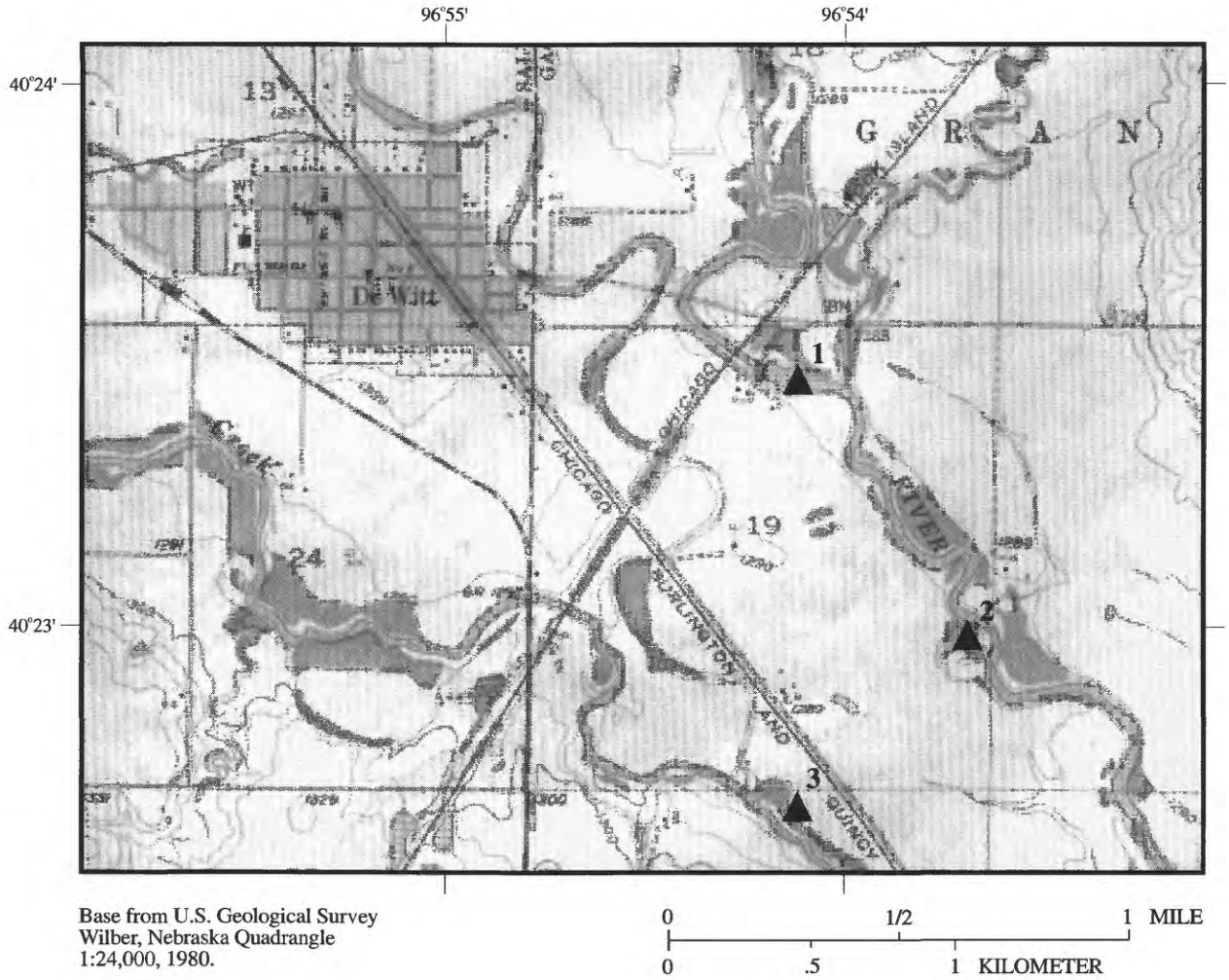
Streambed sediment samples were collected at 12 sites on 11 streams (9 baseline streams and 3 streams near the overbank sites) twice during low-flow conditions. Samples were collected at each site during the fall of 1994 and again in the spring and early summer of 1995. It should be noted that streambed sediment samples collected during this study probably represent a mixture of recently eroded sediment from streambanks and land surfaces in addition to some reworked streambed sediment, which may include sediment from the 1993 floods. A transect across each of the streams was made and samples were collected at 10 to 14 equally spaced intervals.



EXPLANATION

1 ▲ Overbank sediment-collection site with identification number

Figure 2A. Location of overbank sediment-collection sites near Rulo in eastern Nebraska, 1994.



EXPLANATION

▲ 1 Overbank sediment-collection site with identification number

Figure 2B. Location of overbank sediment-collection sites near DeWitt in eastern Nebraska, 1994.

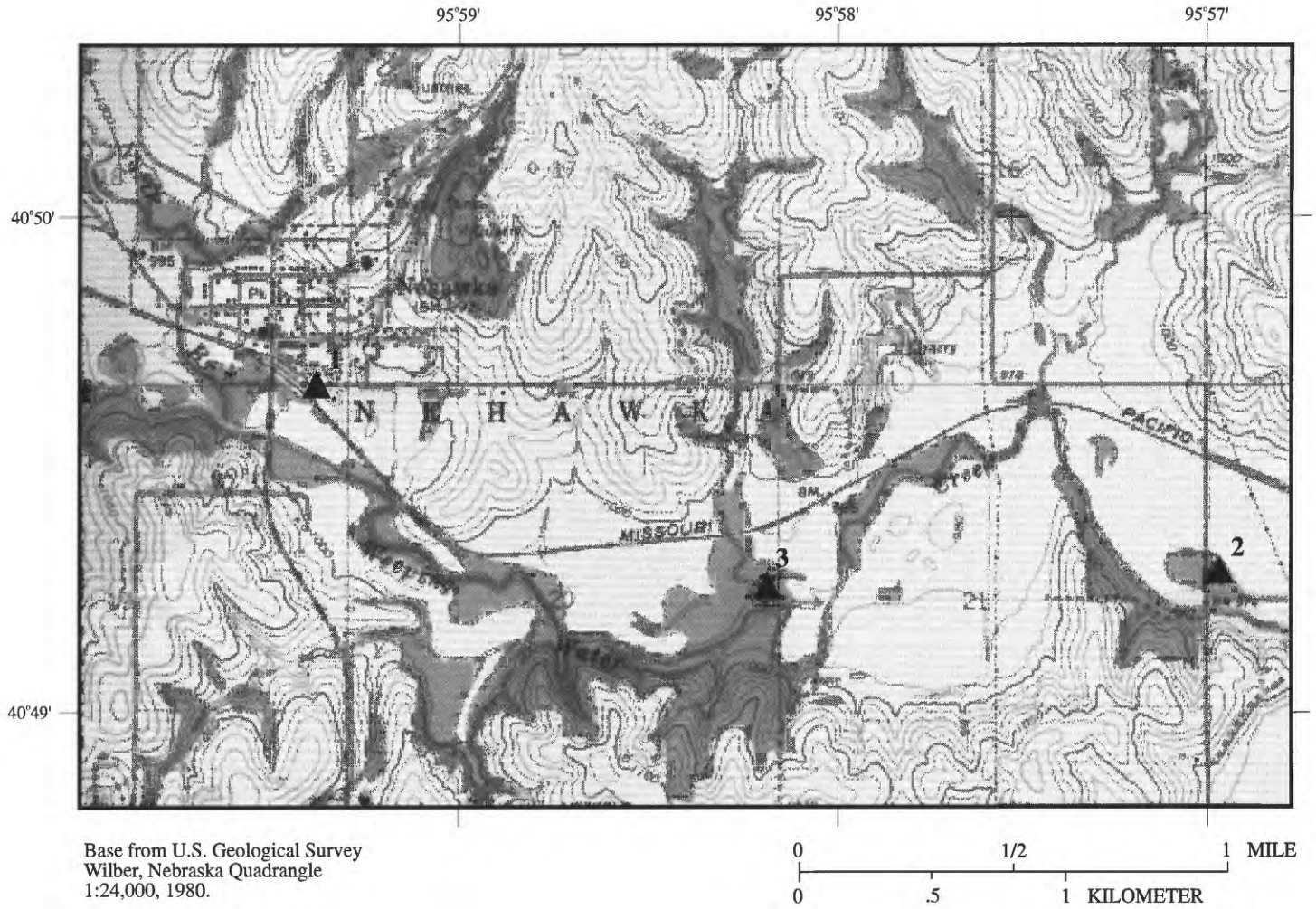


Figure 2C. Location of overbank sediment-collection sites near Nehawka in eastern Nebraska, 1994.

Table 2. Chemical constituents analyzed in overbank and streambed sediment samples, method detection limits, and number of samples analyzed

Constituent	Method detection limit	Number samples analyzed	Constituent	Method detection limit	Number samples analyzed
	Nutrients, in milligrams per kilogram				
Nitrogen, ammonium as N	0.2	57	Nitrogen, Nitrite plus nitrate, as N	2	57
Nitrogen, ammonium plus organic, as N	20	57	Phosphorus	40	57
				.10	57
				1	25
	Trace elements, in micrograms per kilogram				
Aluminum	10	57	Iron	1	57
Arsenic	1	57	Lead	10	57
Boron	10	57	Manganese	.1	57
Cadmium	1	57	Mercury	.01	57
Chromium	1	57	Selenium	1	57
Cobalt	5	57	Strontium	1	57
Copper	1	57	Zinc	1	57
	Semivolatile organic compounds, in micrograms per kilogram, and total recoverable petroleum hydrocarbons, in milligrams per kilogram				
4-Chloro-3-methylphenol	600	36	1,2-Dichlorobenzene	200	36
2-Chlorophenol	200	36	1,3-Dichlorobenzene	200	36
2,4-Dichlorophenol	200	36	1,4-Dichlorobenzene	200	36
2,4-Dimethylphenol	200	36	Diethyl phthalate	200	36
2-Methyl-4,6-dinitrophenol	600	36	Dimethyl phthalate	200	36
2,4-Dinitrophenol	600	36	2,4-Dinitrotoluene	200	36
2-Nitrophenol	200	36	2,6-Dinitrotoluene	200	36
4-Nitrophenol	600	36	Di-n-octyl phthalate	400	36
Pentachlorophenol	600	36	bis(2-ethylhexyl) phthalate	200	36
Phenol	200	36	Fluorene	200	36
2,4,6-Trichlorophenol	600	36	Fluoranthene	200	36
Acenaphthene	200	36	Hexachlorobenzene	200	36
Acenaphthylene	200	36	Hexachlorobutadiene	200	36
Anthracene	200	36	Hexachlorocyclopentadiene	200	36
Benzo[a]anthracene	400	36	Hexachloroethane	200	36
Benzo[b]fluoranthene	400	36	Indeno[1,2,3-cd]pyrene	400	36
Benzo[k]fluoranthene	400	36	Isophorone	200	36
Benzo[a]pyrene	400	36	Naphthalene	200	36
Benzo[g,h,i]perylene	400	36	Nitrobenzene	200	36

Table 2. Chemical constituents analyzed in overbank and streambed sediment samples, method detection limits, and number of samples analyzed—Continued

Constituent	Method detection limit	Number samples analyzed	Constituent	Method detection limit	Number samples analyzed
	Semivolatile organic compounds in micrograms per kilogram, and total recoverable petroleum hydrocarbons, in milligrams per kilogram, continued				
Butylbenzyl phthalate	200	36	N-Nitroso-dimethylamine	200	36
bis(2-chloroethyl)ether	200	36	N-Nitroso-diphenylamine	200	36
bis(2-chloroethoxy)methane	200	36	N-Nitroso-di-n-propylamine	200	36
bis(2-chloroisopropyl)ether	200	36	Phenanthrene	200	36
4-Bromophenyl-phenylether	200	36	Pyrene	200	36
2-Chloronaphthalene	200	36	1,2,4-Trichlorobenzene	200	36
4-Chlorophenyl phenyl ether	200	36	Total recoverable petroleum hydrocarbons	20	57
Chrysene	400	36			
Dibenz[a,h]anthracene	400	36			
Di-n-butylphthalate	200	36			
	Organochlorine and organophosphate pesticides with gross polychlorinated biphenyls (PCBs) and polychlorinated naphthalenes (PCNs), in micrograms per kilogram				
Perthane	1	57	Heptachlor	.1	57
Endosulfan	.1	57	Heptachlor epoxide	.1	57
Aldrin	.1	57	Lindane	.1	57
Chlordane	1	57	Methoxychlor	.1	57
DDD	.1	57	Mirex	.1	57
DDE	.1	57	Toxaphene	10	57
DDT	.1	57	PCBs, gross	1	57
Dieldrin	.1	57	PCNs, gross	1	57
Endrin	.1	57			
	Triazine and related herbicides and atrazine metabolites, in micrograms per kilogram				
Acetochlor	.5	57	Metolachlor	.5	57
Alachlor	.5	57	Metribuzin	.5	57
Ametryn	.5	57	Propazine	.5	57
Atrazine	.5	57	Prometon	.5	57
Cyanazine	.5	57	Prometryn	.5	57
Deethylatrazine	.5	57	Terbutryn	.5	57
Deisopropylatrazine	.5	57	Simazine	.5	57

Sediment cores were collected with a stainless-steel hand corer with both a stainless-steel core-barrel liner and nose piece and with a plastic core-barrel liner and nose piece. The stainless-steel apparatus was used to collect samples for organic and nutrient analyses; the plastic, for analyses of trace elements. The core-barrel liners containing the subsamples from each leg of a given transect were capped, bagged in plastic, and chilled to 4 degrees Celsius (39 degrees Fahrenheit) for transport to the Nebraska District Laboratory in Lincoln for compositing and subsampling. After all samples had been collected along the transect for the composite, a second sample was collected at the location on the transect that yielded the largest amount of fine-grained sediment. Fine-grained sediments tend to contain larger concentrations of many constituents than coarse-grained inorganic sediments because of their larger potential for sorption. The second sediment sample (discrete sample) was collected and analyzed independently of the composite samples to identify maximum concentrations of constituents that might be present in the streambed sediment at each of the sampling sites. Streambed sediment samples were analyzed for the same constituents as the overbank sediment samples.

Sediment samples that were collected for semivolatile, organochlorine pesticide, and TRPH analyses were extruded from the stainless-steel liners onto aluminum foil in the Nebraska District Laboratory. Subsections from the top, middle, and bottom of each core were removed with a stainless-steel knife and immediately placed in the appropriate baked-glass jars, and chilled to 4 degrees Celsius (39 degrees Fahrenheit) for shipment to the U.S. Geological Survey's National Water-Quality Laboratory (NWQL), in Arvada, Colorado.

Sediment samples that were collected for triazine herbicide, nutrients, and grain-size distribution were extruded from the stainless-steel liners and were composited in a 19-liter (20-quart) stainless-steel bowl and mixed for about 20 minutes by an industrial mixer. Subsamples were collected after mixing and placed in the appropriate sample containers for shipment to the NWQL for analysis.

Analytical Methods

All analyses except TRPH, triazine and related herbicides, and grain-size analyses were performed by the NWQL using methods described briefly below.

Nutrient analyses were performed by methods described in Fishman and Friedman (1989). Trace elements were analyzed by first digesting oven-dried sediment samples with a combination of nitric, hydrofluoric, and perchloric acids. The extracts were analyzed by atomic emission spectrometry-inductively coupled plasma (AES-ICP) (Lichte and others, 1987). The precision of the method, including the dissolution step, is ± 5 to 10 percent of the relative standard deviation.

Total carbon, organic and inorganic, was determined by oxidizing the sample in an induction furnace and measuring carbon dioxide through thermal conductivity (Wershaw and others, 1987).

Sediment samples analyzed for semivolatiles and acid base/neutral compounds were extracted with methylene chloride, concentrated, and analyzed by gas chromatography/mass spectrometry (Wershaw and others, 1987).

Samples were analyzed for TRPH within 24 hours of collection by Mid-West Laboratories, Incorporated, of Omaha, Nebraska. U.S. Environmental Protection Agency (USEPA) analytical method 418.1 was used, which involves acidification of the sample and serial extraction with fluorocarbon-113, followed by infrared spectrophotometry.

Organochlorine pesticides, toxaphene, total polychlorinated biphenyls (PCBs), and total polychlorinated naphthalenes (PCNs) were analyzed at the NWQL as described by Foreman and others (1995) using a Soxhlet soil extraction followed by gas chromatography with mass spectrometric detection for semivolatile organic compounds and dual-column gas chromatography with an electron-capture detector for organochlorine pesticides.

Sediment samples were screened for the presence of triazine herbicides through the use of an enzyme-linked immunosorbent assay at the District Laboratory in Lincoln, Nebraska, using methods described by Thurman and others (1990). Sediment samples that tested positive for the presence of triazine herbicides were further analyzed using a solid-phase extraction method followed by gas chromatography/mass spectrometry (Thurman and others, 1990) at the U.S. Geological Survey laboratory in Lawrence,

Kansas. Sediment-size analyses were done by the Natural Resources Conservation Service's National Soil Survey Center in Lincoln, Nebraska, using methods described by the National Soil Survey Center (1996).

Quality-Assurance/Quality-Control Methods

Eleven percent of all sediment samples collected were quality-assurance samples. These included duplicate samples, blank samples, and spiked samples (containing known concentrations of target constituents). The blank and spiked sediment samples were supplied by Environmental Resources Associates of Arvada, Colorado. The duplicate samples were subsampled from the same homogenized composite samples and provided a measure of both precision in subsampling the composites and precision of the analytical methods. The blank samples provided a measure of potential contamination from field equipment and laboratory handling procedures. The spiked samples were disguised as environmental samples and provided a measure of the accuracy of the analytical methods.

In addition to the field-related quality-assurance methods above, the analyzing laboratories used published analytical methods developed by the USGS and/or the USEPA. The analyzing laboratories also strictly followed rigid quality-assurance and quality-control programs. At a minimum, these programs involve the systematic analysis of blank and reference samples at regular intervals each day and the periodic analysis of blind reference samples provided both from internal and external laboratory sources.

ANALYTICAL RESULTS

Tables 3 and 4 at the back of this report present sediment textural analysis data and statistical summaries, respectively. The analytical results of sediment samples collected during the fall of 1994 and the spring and early summer of 1995 are presented in tables 5 and 6 at the back of this report. The headings for some constituents in these tables refer to sediment samples collected from bottom material. Sediment samples are further differentiated as being either streambed sediment samples or overbank sediment samples by the sample-medium column listed on the first page of each table. Statistical summaries of constituent by general categories are presented in tables 7 through 11 at the back of this report.

Overbank Sediment Quality

Grain-Size Distribution

Grain-size distribution for sediment samples is presented in table 3 (at the back of this report) and a statistical summary of the grain-size analyses is presented in table 4 (at the back of this report). The overbank sediment samples contained predominantly silt and clay with median percentages by weight of 59.3 and 24.9 percent, respectively. The median total sand content of the overbank sediment samples was about 3 percent. Overbank site 2 near Rulo had a clay content of 56 percent, which was the largest percent clay content of the overbank sediment samples.

Nutrients and Total Carbon

Generally, concentrations of nutrients and carbon tended to be larger in overbank samples than in streambed samples, with the exception of ammonium (tables 5 and 7 at the back of this report). Ammonium concentrations in overbank samples ranged from 3 to 13 mg/kg (milligrams per kilogram) as nitrogen and because of the oxidizing overbank environment, were about four times smaller than ammonium concentrations in the streambed samples. Ammonium plus organic nitrogen concentrations in overbank samples ranged from 430 to 2,000 mg/kg. The median concentration of ammonium and organic nitrogen for nine overbank samples was 900 mg/kg, which was about 300 mg/kg larger than the median concentration for the streambed samples from the 12 sites. Concentrations of ammonium plus organic nitrogen from the overbank samples also were larger than the concentrations in streambed samples collected near the overbank sites.

Concentrations of nitrite plus nitrate (reported as nitrogen) ranged from less than 2 to 37 mg/kg in overbank samples. The median concentration of nitrite plus nitrate in overbank samples was 9 mg/kg, nearly an order of magnitude larger than concentrations observed in the streambed samples. Concentrations of phosphorus ranged from 360 to 2,200 mg/kg in overbank samples and tended to be larger than

concentrations in streambed samples. Concentrations of total carbon, organic plus inorganic, in overbank samples ranged from 9.5 to 33 mg/kg. Median total carbon concentration (12 mg/kg) of overbank samples was larger than the median concentration of total carbon found in streambed samples (8.4 mg/kg).

Trace Elements

A statistical summary of trace-element concentrations in overbank sediment samples is presented in table 8 (at the back of this report). The more abundant trace elements in the overbank sediment samples were aluminum, boron, iron, and manganese with median concentrations of 9,400, 300, 11,000, and 460 µg/g (micrograms per gram), respectively.

Trace elements analyzed for this study for which relatively small Maximum Contamination Levels (MCLs) for public drinking water have been established by the USEPA are arsenic, cadmium, chromium, lead, mercury, and selenium. Selenium was not detected and cadmium was detected in only one sample at a concentration near the method detection limit of 1 µg/g. Arsenic was detected in all overbank sediment samples at concentrations that were generally near the method detection limit of 1 µg/g. The maximum concentration of arsenic, 6 µg/g, was found in two overbank sediment samples near Rulo. Mercury also was detected in all overbank sediment samples, but generally in concentrations near the method detection limit of 0.01 µg/g. The largest concentration of mercury detected in streambed sediment samples (0.05 µg/g) was found in a sample collected near Rulo. The largest concentration of chromium in overbank sediment samples, 20 µg/g, was found in two samples collected near Rulo. Concentrations of lead were detected in samples mostly near the method detection limit of 10 µg/g. The largest concentration of lead in overbank sediment samples, 40 µg/g, was detected in a sample collected from site 1 near Nehawka.

Acid and Base/Neutral Extractable Organic Compounds and Total Recoverable Petroleum Hydrocarbons

The overbank sample collected from site 1 near Nehawka contained the only detectable concentration of acid and base/neutral extractable organic compounds (table 9 at the back of this report). This sample was collected on the edge of Nehawka, adjacent to Weeping Water Creek, and contained small concentrations of the following petroleum distillates: benzo[b]fluoranthene, benzo[k]fluoranthene, fluoranthene, bis(2-ethylhexyl) phthalate, and pyrene. This site also contained the only detectable concentration of TRPH, 525 mg/kg.

Organochlorine Pesticides and Polychlorinated Organic Compounds

A variety of organochlorine pesticides were detected in overbank samples at or near the method detection limits (table 10). DDT was detected in all of the overbank samples. The largest concentration of DDT, 2.8 µg/kg, was found in the sediment sample collected from site 1 near Nehawka. DDD, DDE, and dieldrin were detected in eight of the nine overbank sediment samples. Again, the largest concentrations of these pesticides (5.3, 0.6, and 38, respectively) were found in the overbank sample collected from site 1 near Nehawka. The largest concentration of organochlorine pesticides detected in overbank sediment samples, 120 µg/kg of chlordane, was present in the sample collected from site 1 near Nehawka.

PCBs were detected in seven of the nine overbank sediment samples. The maximum concentration of PCBs in overbank sediment samples, 3 µg/kg, also was from site 1 near Nehawka.

Triazine and Related Herbicides

Most of the overbank sediment samples contained detectable concentrations of alachlor (8 samples), atrazine (9 samples), and metolachlor (7 samples). Median concentrations of alachlor, atrazine, and metolachlor for the nine overbank sediment samples were 5.8, 3.9, and 2.6 µg/kg, respectively (table 11 at the back of this report). The maximum concentrations of herbicides were detected in overbank sediment samples collected from site 1 near Nehawka. These herbicides included 820 µg/kg of alachlor, 271 µg/kg of atrazine, 576 µg/kg of cyanazine, 250 µg/kg of cyanazine amide, and 180 µg/kg of metolachlor.

Streambed Sediment Quality

Concentrations of many constituents in streambed sediment samples tended to vary between

the composite and discrete samples. The variations between these samples are most likely because the discrete samples, by definition, contained a larger percentage of clays and silts, to which many of the contaminants tend to sorb, than did the composite samples.

Grain-Size Distribution

The streambed sediment samples contained mostly silt and sand-sized particles with median percent weights of 35.1 and 52.4, respectively (tables 3 and 4 at the back of this report). The median percent weight of clay for the streambed sediment samples was 11.7 percent, which was about one-half of the median percent clay for the overbank sediment samples. The clay and silt contents were larger and the sand content was smaller for the discrete streambed sediment samples than for the composite streambed sediment samples.

Nutrients

Concentrations of ammonium in streambed sediment samples ranged from 1.8 to 120 mg/kg, with a median concentration of 18 mg/kg (table 7 at the back of this report). Concentrations of ammonium were about two to four times larger in discrete streambed sediment samples than concentrations from composited samples. The largest concentrations of ammonium were present in streambed sediment samples from the Platte River near La Platte, the Missouri River, the Big Blue River near Barneston, and the Big Nemaha River.

Ammonium plus organic nitrogen was the dominant form of nitrogen present in streambed sediment samples. The median concentration of ammonium plus organic nitrogen was 545 mg/kg. The median concentration of ammonium plus organic nitrogen for the discrete sediment samples was about four times larger than the median concentration of the composited samples. The largest concentrations of ammonium plus organic nitrogen were found in sediment samples from the Big Nemaha, the Big Blue near Barneston, and the Little Blue Rivers. Concentrations of ammonium and organic nitrogen were larger in samples collected in the fall of 1994 than in samples collected during the spring and summer of 1995. These differences could be the result of spring fertilizer application on agricultural lands.

Concentrations of nitrite plus nitrate were detected in about one-half of the streambed sediment samples and mostly in concentrations near the method detection limit of 2 mg/kg. The largest concentration of nitrite plus nitrate in streambed sediment, 35 mg/kg, was present in the discrete streambed sediment sample collected on the Elkhorn River during the fall of 1994. Subsequent samples collected during the early summer of 1995 from the same site revealed concentrations of 3 to 4 mg/kg.

Concentrations of phosphorus ranged from 52 to 3,100 mg/kg in streambed sediment samples. Larger concentrations of phosphorus were found in the discrete sediment samples than in the composite sediment samples; however, when the concentration of phosphorus was divided by the percent weight of clay for each sample, the median concentrations for the composite and discrete samples were about the same.

Concentrations of total carbon ranged from 0.3 to 28 mg/kg in streambed sediment samples. Again the larger concentrations of total carbon were found in the discrete streambed sediment samples. Concentrations of organic carbon, which was analyzed only in the spring streambed sediment samples, ranged from 40 to 1,110 mg/kg and also was found in larger concentrations in the discrete samples.

Trace Elements

The more abundant trace elements in both composite and discrete streambed sediment samples were aluminum, iron, and manganese, with median concentrations of 4,200, 7,900, and 265 µg/g, respectively (table 8 at the back of this report). Trace elements analyzed for this study considered to be priority contaminants in drinking water were arsenic, cadmium, chromium, lead, mercury, and selenium. Cadmium and selenium were not detected, and concentrations of arsenic, lead, and mercury were usually near the method detection limits. One discrete streambed sediment sample collected from the Big Blue River near DeWitt in the fall of 1994 had a lead concentration of 210 µg/g. Lead concentrations in both the composite and discrete streambed sediment samples collected at the same site in June 1995 were below the 10 µg/g detection limit (table 5 at the back of this report).

Concentrations of most trace elements were larger in the discrete streambed sediment samples than in the composite samples. Concentrations of arsenic,

bromide, cobalt, and lead differed little between the two streambed sediment sample types. Concentrations of most trace elements in streambed sediment samples were smaller than concentrations in the overbank sediment samples.

Acid and Base/Neutral Extractable Organic Compounds and Total Recoverable Petroleum Hydrocarbons

The discrete streambed sample collected in the spring of 1995 from the Missouri River was the only streambed sample that contained detectable concentrations of an acid and base/neutral extractable organic compound. The compound was bis(2-ethylhexyl) phthalate and was present in a concentration just above the method detection limit of 200 µg/g (table 5 at the back of this report).

TRPH was detected in eight streambed samples, three from composite samples and five in discrete samples. Streambed samples containing TRPH included both the composite and discrete samples from the Big Nemaha, both the composite and discrete samples from the Republican River, the Big Blue River near Barneston, the Little Blue River, and both the composite and the discrete samples from the Platte River near La Platte. Six of the detections were from samples collected in the fall of 1994 and two of the detections were from the spring of 1995. The largest concentration of TRPH was 98 mg/kg, which was detected in a discrete sample from the Big Nemaha River (table 5 at the back of this report).

Organochlorine Pesticides and Polychlorinated Organic Compounds

A number of organochlorine pesticides were detected in streambed sediment samples, although the detections were not as numerous and the concentrations not as large as those observed in the overbank sediment samples (table 10). The most commonly detected organochlorine pesticides in streambed sediment samples were aldrin (12 samples), DDD (19 samples), DDE (28 samples), DDT (10 samples), and dieldrin (13 samples). Most observed concentrations were near the method detection limits. Detections of organochlorine pesticides were about twice as common in discrete streambed sediment samples as they were in composited streambed sediment samples. Again, the difference in the number of detections may be the result of the smaller grain sizes associated with the discrete streambed sediment samples. The largest numbers of individual pesticides were detected at the streambed sampling sites on the Big Blue River near Barneston, the Big Nemaha River, and Weeping Water Creek (table 5 at the back of this report).

PCBs were detected in only 5 of the 48 streambed sediment samples. The maximum concentration of gross PCBs in streambed sediment samples was 3 µg/kg. Of the five streambed sediment samples containing detectable concentrations of PCBs, three were found in composited streambed sediment samples and two in discrete samples.

Triazine and Related Herbicides

Triazine and related herbicides were commonly detected in many of the streambed sediment samples. The most frequently detected herbicides were alachlor (25 samples), ametryn (17 samples), atrazine (30 samples), and metolachlor (27 samples). Median concentrations of alachlor, ametryn, atrazine, and metolachlor from the 47 streambed sediment samples were 1.0, less than 0.5, 1.2, and less than 1.2 µg/kg, respectively (table 11). Alachlor was detected at a maximum concentration of 38.2 µg/kg in samples collected from the Big Blue River near Barneston. Samples from this site also contained the largest concentrations of ametryn (4.4 µg/kg), atrazine (26 µg/kg), and metolachlor (18.8 µg/kg) (table 6 at the end of this report). In addition to the Big Blue River near Barneston, streambed sediment samples from the Little Nemaha River, the Big Nemaha River, and the Big Blue River near DeWitt displayed a number of detected herbicides.

Triazine and related herbicides were detected almost twice as frequently in discrete streambed sediment samples as in composited samples. Similarly, herbicide concentrations from discrete streambed sediment samples were about twice as large as concentrations from composited streambed sediment samples.

Quality Assurance

Fifty of the 437 sample containers submitted for chemical sediment analyses (about 11 percent) were for quality-assurance purposes. Most of the quality-assurance samples (44 containers, or 6 of 57 samples) were duplicate samples that were intended to identify

precision in both sample-collection methods and analytical methods. A summary of differences in concentrations between initial and duplicate sediment sample pairs for each of the constituents analyzed is in table 12. Generally, the duplicate analyses suggest that the sample preparation and analytical methods were within acceptable limits. Note that cases in which the average percent difference in constituent concentrations was large, the corresponding average difference in concentrations was usually small. Thus, the amount of variation in concentrations between initial and duplicate sediment samples was not large. Much of the variation in concentrations between initial and duplicate sediment samples is believed to be the result of the heterogeneous nature of the sediment and the inherent difficulty in homogenizing both composited and discrete sediment samples prior to splitting the initial and duplicate samples.

Commercially prepared sediment samples spiked with known concentrations of trace elements, semivolatile organic compounds, and organochlorine and organophosphate pesticides, as well as commercially prepared blank sediment samples containing very small to no detectable concentrations of the same constituents, were submitted to the NWQL on two occasions as a means of estimating the accuracy of the analytical methods. The results of the analyses of the sediment samples containing constituents of known concentrations were good. All compounds known to be present were correctly identified by the analytical methods. Reported concentrations were within the performance acceptance limits provided by the source of the sediment samples for all but the following constituents: 1,4-dichlorobenzene, lindane, DDE, and endrin. DDE was the only constituent detected in actual sediment samples for which a value less than the performance acceptance limits (provided by the source of the test samples) was achieved. The results of the analyses of the blank sediment samples yielded either less-than-detection-limit values for the target constituents, or concentrations that were below the threshold guaranteed by the source of the blank sediment samples.

SUMMARY

Overbank sediment samples deposited by the floods of 1993 were collected during the fall of 1994 downstream from three communities in eastern Nebraska that were flooded during 1993. Streambed sediment samples also were collected from one site on a stream or river near each of the three communities once during the fall of 1994 and again during the spring and summer of 1995. The sediment samples were analyzed for nutrients, trace elements, selected acid and base/neutral extractable organic compounds, TRPH, organochlorine and organophosphate pesticides, PCBs, PCNs, triazine and related herbicides, and grain size.

Streambed sediment samples also were collected once during the fall of 1994 and once during the spring and early summer of 1995 at nine sites on eight major streams in the eastern portion of Nebraska. These sites are: the Platte River near Wood River, the Platte River near La Platte, the Loup River near Columbus, the Elkhorn River near Waterloo, the Republican River near Superior, the Little Blue River near Steele City, the Big Blue River near Barneston, the Big Nemaha River near Rulo, and the Little Nemaha River near Auburn. Sediment samples from these sites were analyzed for the same constituents as the overbank sediment samples.

The overbank sediment samples contained predominantly silt and clay with median percent weights of 59.3 and 24.9 percent, respectively. The streambed sediment samples contained mostly silt and sand-sized particles with median percent weights of 35.1 and 52.4, respectively.

The dominant nutrients found in the sediment samples were ammonium and organic nitrogen and phosphorus. Ammonium plus organic nitrogen in overbank sediment samples ranged from 430 to 2,000 mg/kg and from less than 20 to 1,300 mg/kg in streambed sediment samples. Concentrations of phosphorus ranged from 360 to 2,200 mg/kg in overbank sediment samples and from 52 to 3,100 mg/kg in streambed sediment samples. Concentrations of total carbon ranged from 9.5 to 33 mg/kg in the overbank sediment samples and from 0.3 to 28 mg/kg in the streambed sediment samples.

The dominant trace elements were aluminum, iron, and manganese in both the overbank and streambed sediment samples. Concentrations of most trace elements were near the method detection limits for both the overbank and streambed sediment samples. Concentrations of arsenic, chromium, lead, and mercury were slightly larger in overbank sediment samples than in streambed sediment samples. Also, concentrations of most trace elements were slightly

larger in discrete streambed sediment samples than in composite streambed sediment samples.

Five acid and base/neutral extractable organic compounds were present in concentrations at or slightly above the detection limits in one overbank sediment sample near Nehawka. The only detection of TRPHs in overbank sediment was from the same sample site. Bis(2-ethylhexyl) phthalate was detected in one streambed sediment sample, and eight streambed sediment samples contained concentrations of TRPH above the method detection limit of 20 mg/kg.

A variety of organochlorine pesticides were detected, usually in concentrations near the method detection limits, in both overbank and streambed sediment samples. These included aldrin, chlordane, DDD, DDE, DDT, and dieldrin. The largest concentrations of these compounds were detected in sediment samples collected from Rulo. PCBs also were detected in concentrations near the method detection limit in both overbank and streambed sediment samples.

All of the overbank and more than one-half of the streambed sediment samples contained detectable concentrations of one or more triazine or related herbicides. The overbank sediment samples from site 1 near Nehawka contained 820 µg/kg of alachlor, 271 µg/kg of atrazine, 576 µg/kg of cyanazine, 250 µg/kg of cyanazine amide, and 180 µg/kg of metolachlor. These concentrations were several orders of magnitude larger than concentrations observed in other sediment samples. The streambed sampling site on the Big Blue River near Barneston contained the largest concentrations of alachlor, ametryn, atrazine, and metolachlor found among the streambed sampling sites with concentrations of 38.2, 4.4, 26, and 18.8 µg/kg, respectively.

Quality-assurance checks consisted of duplicate analyses of sediment samples, the analyses of spiked sediment samples of known constituent concentrations, and blank sediment samples containing little or no detectable concentrations of selected constituents. The analyses of duplicate sediment samples suggest that some variation was present among the initial and duplicate analyses that may be attributed to the heterogeneous nature of the sediment and the inherent difficulty in homogenizing both composited and discrete sediment samples prior to splitting the initial and duplicate samples. Spiked samples revealed that DDE was the only constituent in which laboratory concentrations did not fall within the performance acceptance limits provided by the source of the test samples.

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SUPPLEMENTAL DATA

Table 3. Grain-size distribution for overbank and streambed sediment samples from selected sites in eastern Nebraska, 1994–95

[Units are in percent weight; SB1, composited streambed sediment; SB2, discrete streambed sediment; OB, overbank sediment; --, not analyzed]

Station number	Local identification	Date	Sample medium	Total			Percent weight by category						
				Clay	Silt	Sand	Fine silt	Coarse silt	Very fine sand	Fine sand	Medium sand	Coarse sand	Very coarse sand
404335098391801	Platte near	10-12-94	SB1	--	0.6	99.4	0.6	--	0.1	9.1	39.2	34.1	16.9
	Wood River	05-17-95	SB1	0.4	.8	98.8	.6	0.2	.9	15.5	34.4	28.9	19.1
404335098391802		10-12-94	SB2	.4	2.6	97.0	1.2	1.4	.2	9.2	56.3	25.3	6.0
		05-17-95	SB2	1.8	3.7	94.5	2.2	1.5	.9	7.7	52.6	26.3	7.0
410336095571001	Platte HW 75	11-08-94	SB1	1.7	6.7	91.6	1.5	5.2	2.8	10.0	32.6	32.1	14.1
		04-13-95	SB1	3.5	15.6	80.9	3.9	11.7	5.4	32.2	30.8	9.2	3.3
410336095571002		11-08-94	SB2	17.5	41.2	41.3	15.8	25.4	8.4	12.4	9.7	8.7	2.1
		04-13-95	SB2	15.6	55.3	29.1	17.9	37.4	13.5	6.4	6.8	2.2	0.2
412359097193201	Loup	10-11-94	SB1	.6	5.9	93.5	.9	5.0	4.1	23.8	46.1	13.1	6.4
		07-03-95	SB1	3.4	9.8	86.8	1.5	8.3	9.6	26.0	41.5	8.0	1.7
412359097193202		10-11-94	SB2	8.2	33.5	58.3	7.2	26.3	21.8	33.5	2.5	.3	.2
		07-03-95	SB2	6.3	22.7	71.0	4.8	17.9	26.8	39.8	4.1	.2	.1
410808096183601	Elkhorn	11-01-94	SB1	1.7	7.6	90.7	.9	6.7	7.3	51.3	26.0	3.5	2.6
		06-28-95	SB1	2.5	14.0	83.5	2.4	11.6	8.5	30.4	30.6	10.7	3.3
410808096183602		11-01-94	SB2	9.6	37.2	53.2	8.6	28.6	21.0	25.3	6.6	.3	--
		06-28-95	SB2	14.1	69.8	16.1	12.4	57.4	14.2	1.5	0.3	0.1	0
400111098093301	Republican	10-04-94	SB1	1.8	.1	98.1	.1	.1	.3	2.5	41.8	40.0	13.5
		04-19-95	SB1	1.5	3.0	95.5	.3	2.7	1.3	5.6	41.0	36.4	11.2
400111098093302		10-04-94	SB2	10.1	27.7	62.2	4.5	23.2	13.4	8.0	24.0	14.8	2.0
		04-19-95	SB2	3.0	11.4	85.6	3.3	8.1	4.8	12.0	39.3	24.6	4.9

Table 3. Grain-size distribution for overbank and streambed sediment samples from selected sites in eastern Nebraska, 1994–95—Continued

Station number	Local identification	Date	Sample medium	Total			Percent weight by category						
				Clay	Silt	Sand	Fine silt	Coarse silt	Very fine sand	Fine sand	Medium sand	Coarse sand	Very coarse sand
400330097034501	Little Blue	10-03-94	SB1	6.1	11.3	82.6	2.6	8.7	4.7	9.7	36.2	23.8	8.2
		04-17-95	SB1	2.8	7.3	89.9	2.2	5.1	2.9	11.3	33.9	27.3	14.5
400330097034502		10-03-94	SB2	12.0	31.5	56.5	7.6	23.9	15.7	16.2	7.9	10.4	6.3
		04-17-95	SB2	11.7	36.8	51.5	11.3	25.5	13.0	18.0	12.4	5.8	2.3
402202096513401	Big Blue	09-27-94	SB1	7.7	17.2	75.1	3.5	13.7	5.0	7.5	26.2	24.2	12.2
	near DeWitt	06-27-95	SB1	4.2	18.2	77.6	4.0	14.2	5.1	4.3	.4	.1	.1
402202096513402		09-27-94	SB2	15.9	58.9	25.2	13.1	45.8	16.3	4.3	1.2	.9	2.5
		06-27-95	SB2	15.2	59.3	25.5	13.1	46.2	20.8	4.1	.4	.1	.1
402328096540801	Near DeWitt1	09-20-94	OB	23.7	73.2	3.1	27.9	45.3	2.9	0.2	--	--	--
402258096534401	Near DeWitt2	09-20-94	OB	24.9	55.5	19.6	18.2	37.3	14.9	4.6	.1	--	--
402241096540801	Near DeWitt3	09-20-94	OB	46.4	51.3	2.3	30.3	21.0	2.0	.1	.1	.1	--
400325096351701	Big Blue	10-25-94	SB1	24.4	62.9	12.7	18.2	44.7	8.2	1.0	1.0	1.8	.7
	near Barneston	06-21-95	SB1	15.3	61.2	23.5	14.3	46.9	9.1	3.4	1.8	4.5	4.7
400325096351702		10-25-94	SB2	27.3	66.9	5.8	22.5	44.4	5.2	.5	.1	--	--
		06-21-95	SB2	20.4	71.5	8.1	19.9	51.6	7.2	8.8	.1	0	0
404913095570301	Weeping Water	09-26-94	SB1	20.2	61.9	17.9	20.3	41.6	7.2	3.5	5.8	1.0	0.4
		06-26-95	SB1	19.7	66.2	14.1	21.9	44.3	6.5	2.5	3.9	1.1	.1
404913095570302		09-26-94	SB2	20.6	65.0	14.4	18.8	46.3	6.5	1.6	3.6	1.8	.9
		06-26-95	SB2	16.1	70.6	13.3	17.9	52.7	10.0	1.9	1.3	0.1	0
404937095592001	Near Nehawka1	09-22-94	OB	25.0	68.4	6.6	33.3	35.1	2.3	1.6	1.2	.7	.8
404917095565901	Near Nehawka2	09-22-94	OB	20.1	76.9	3.0	29.2	47.7	2.7	0.1	0.1	.1	--
404915095581001	Near Nehawka3	09-22-94	OB	18.2	75.7	6.1	22.0	53.7	5.4	.4	.1	.1	.1

Table 3. Grain-size distribution for overbank and streambed sediment samples from selected sites in eastern Nebraska, 1994–95—Continued

Station number	Local identification	Date	Sample medium	Total			Percent weight by category						
				Clay	Silt	Sand	Fine silt	Coarse silt	Very fine sand	Fine sand	Medium sand	Coarse sand	Very coarse sand
401938095413601	Little Nemaha	09-28-94	SB1	29.7	47.4	22.9	27.5	19.9	0.6	2.9	13.6	4.2	1.6
		04-25-95	SB1	23.4	39.4	37.2	22.4	17.0	.6	3.9	21.9	9.0	1.8
401938095413602		09-28-94	SB2	17.4	32.1	50.5	15.9	16.2	.1	2.5	15.0	22.5	10.4
		04-25-95	SB2	35.2	61.3	3.5	34.8	26.5	.9	.3	1.6	.6	.1
400048095232701	Big Nemaha	10-26-94	SB1	42.0	53.7	4.3	39.7	14.0	.3	.2	3.0	.6	.2
		06-20-95	SB1	19.0	36.7	44.3	16.6	20.1	1.2	8.4	30.1	4.5	.1
400048095232702		10-26-94	SB2	40.1	57.9	2.0	40.3	17.6	.3	.1	1.3	.3	--
		06-20-95	SB2	25.7	53.0	21.3	22.5	30.5	2.6	3.8	13.4	1.4	.1
400425095243901	Missouri	10-24-94	SB1	2.1	2.1	95.8	--	2.1	2.2	13.8	5.5	21.1	3.5
		04-24-95	SB1	0	3.0	97.0	0.8	2.2	.4	9.6	63.0	18.8	5.2
400425095243902		10-24-94	SB2	14.6	54.0	31.4	10.0	44.0	25.0	5.9	.5	--	--
		04-24-95	SB2	11.7	50.2	38.1	11.4	38.8	12.0	12.9	10.8	2.4	0
400303095251701	Near Rulo1	09-21-94	OB	15.8	51.8	32.4	13.5	38.3	14.2	16.4	1.4	.3	.1
400141095240801	Near Rulo2	09-21-94	OB	55.8	44.0	0.2	33.7	10.3	.1	.1	--	--	--
400231095250901	Near Rulo3	09-21-94	OB	39.0	59.3	1.7	30.7	28.6	1.5	.1	–	.1	--

Table 4. Statistical summary of grain-size distribution in overbank and streambed sediment from selected sites in eastern Nebraska, 1994–95

[Units are percent weight; top statistic, overbank stream sediment samples; second statistic, all streambed sediment samples; third statistic, composite streambed sediment samples; bottom statistic, discrete streambed sediment samples]

Constituent	Number of samples	Minimum	25th percentile	Median	75th percentile	Maximum
Total clay	9	15.8	19.2	24.9	42.7	44.8
	47	0	2.8	11.7	19.7	42.0
	23	0	1.7	3.5	19.7	42.0
	24	0.4	9.7	14.9	19.7	40.1
Total silt	9	44.0	51.6	59.3	74.4	76.9
	48	.1	8.2	35.1	58.6	71.5
	24	.1	3.7	12.6	45.4	66.2
	24	2.6	31.6	51.6	60.8	71.5
Total sand	9	.2	2.0	3.1	13.1	32.4
	48	2.0	21.7	52.4	89.1	9.4
	24	4.3	26.9	83.0	95.0	99.4
	24	2.0	14.8	34.8	57.8	97.0
Fine silt	9	13.5	20.1	29.2	32.0	33.7
	47	0.1	2.2	10.0	18.2	40.3
	23	0.1	0.9	2.6	18.2	39.7
	24	1.2	7.3	12.8	18.6	40.3
Coarse silt	9	10.3	24.8	37.3	46.5	53.7
	47	.1	8.1	19.9	41.6	57.4
	23	.1	5.0	11.6	19.9	46.9
	24	1.4	19.2	27.6	45.4	57.4
Very fine sand	9	.1	1.8	2.7	9.8	14.9
	48	.1	1.0	5.3	11.5	26.8
	24	.1	.7	3.5	7.0	9.6
	24	.1	3.2	11.0	16.2	26.8
Fine sand	9	.1	.1	0.2	3.1	16.4
	48	.1	3.0	7.8	13.6	51.3
	24	.2	3.4	8.8	15.1	51.3
	24	.1	2.1	7.1	12.8	39.8
Medium sand	6	.1	1.1	.1	1.2	.4
	48	.1	2.0	11.6	33.6	63.0
	24	.4	5.6	30.4	8.4	63.0
	24	.1	1.2	5.4	13.2	56.3
Coarse sand	9	.1	.1	.1	0.4	0.7
	46	0	.8	5.2	22.8	40.0
	24	.1	3.7	10.0	26.5	10.0
	22	0	.3	1.6	11.5	26.3
Very coarse sand	3	.1	.1	.1	0.8	0.8
	44	0	.1	2.2	6.4	19.1
	24	.1	1.0	3.4	12.0	19.1
	20	0	.1	.6	4.3	10.4

Table 5. Concentrations of nutrients, trace elements, acid and base/neutral organic compounds, total recoverable petroleum hydrocarbons, organochlorine pesticides, and polychlorinated organic compounds that were detected in overbank and streambed sediment and associated quality-assurance samples from selected sites in eastern Nebraska, 1994–95

[PCB, polychlorinated biphenyls; SB1, composited streambed sediment; SB2, discrete streambed sediment; OB, overbank sediment; mg/kg, milligrams per kilogram; gm/kg, grams per kilogram; µg/g, micrograms per gram; µg/kg, micrograms per kilogram; H, regular; W, duplicate, SK, spike; BK, blank; <, less than; --, not analyzed]

Station number	Local identification	Date	Sample medium	Sample type	Moisture content, dry weight (percent of total)	Nitrogen, NH_4, total in bottom material (mg/kg as N)	Nitrogen, NH_4 organic, total in bottom material (mg/kg as N)	Nitrogen, NO_2+NO_3, total in bottom material (mg/kg as N)	Phos-phorus, total in bottom material (mg/kg as P)	Carbon, inorganic + organic, total in bottom material (gm/kg as C)	Carbon, organic, total in bottom material (mg/kg as C)
404335098391801	Platte near	10-12-94	SB1	H	9	2.2	<20	<2.0	52	0.3	--
	Wood River	10-12-94	SB1	W	--	--	--	--	--	--	--
		10-12-94	SB1	SK	--	--	--	--	--	--	--
		05-17-95	SB1	H	13	8.2	60	<2.0	--	1.7	100
404335098391802		10-12-94	SB2	H	19	13	330	<2.0	120	4.1	--
		10-12-94	SB2	W	--	--	--	--	--	--	--
		05-17-95	SB2	H	13	17	270	2.0	--	4.6	330
410336095571001	Platte HW 75	11-08-94	SB1	H	11	14	20	<2.0	370	2.4	--
		04-13-95	SB1	H	15	8.1	30	<2.0	69	2.2	180
410336095571002		11-08-94	SB2	H	33	85	620	<2.0	470	10	--
		11-08-94	SB2	W	--	--	--	--	--	11	--
		04-13-95	SB2	H	29	55	330	<2.0	440	13	730
412359097193201	Loup River	10-11-94	SB1	H	--	6.2	30	<2.0	100	.3	--
		10-11-94	SB1	W	13	7.2	40	<2.0	130	--	--
		10-11-94	SB1	BK	--	--	--	--	--	--	--
		07-03-95	SB1	H	15	15	380	<2.0	120	4.4	350
412359097193202		10-11-94	SB2	H	5	30	410	2.0	260	6.5	--
		07-03-95	SB2	H	28	18	710	<2.0	240	21	840
410808096183601	Elkhorn	11-01-94	SB1	H	14	11	<20	<2.0	52	28	--
		06-28-95	SB1	H	39	8.8	150	4.0	100	1.5	120
		06-28-95	SB1	W	31	7.2	960	3.0	180	--	--
410808096183602		11-01-94	SB2	H	26	56	670	35	320	7.3	--
		06-28-95	SB2	H	32	16	1,100	3.0	420	9.1	755
		06-28-95	SB2	W	--	--	--	--	--	10	--

Table 5. Concentrations of nutrients, trace elements, acid and base/neutral organic compounds, total recoverable petroleum hydrocarbons, organochlorine pesticides, and polychlorinated organic compounds that were detected in overbank and streambed sediment and associated quality-assurance samples from selected sites in eastern Nebraska, 1994–95—Continued

Station number	Local identification	Date	Sample medium	Sample type	Moisture content, dry weight (percent of total)	Nitrogen, NH_4, total in bottom material (mg/kg as N)	Nitrogen, NH_4 organic, total in bottom material (mg/kg as N)	Nitrogen, NO_2+NO_3, total in bottom material (mg/kg as N)	Phos-phorus, total in bottom material (mg/kg as P)	Carbon, inorganic + organic, total in bottom material (gm/kg as C)	Carbon, organic, total in bottom material (mg/kg as C)
400111098093301	Republican	10-04-94	SB1	H	6	6.8	20	<2.0	55	3.6	--
		04-19-95	SB1	H	16	2.1	20	3.0	130	1.9	800
400111098093302		10-04-94	SB2	H	--	21	980	<2.0	180	8.5	--
		04-19-95	SB2	H	17	41	40	<2.0	160	9.4	240
		04-19-95	SB2	W	--	--	--	--	--	--	--
400330097034501	Little Blue	10-03-94	SB1	H	--	7.7	1,300	<2.0	180	2.0	--
		10-03-94	SB1	W	--	--	--	--	--	--	--
		04-17-95	SB1	H	13	8.2	40	<2.0	130	1.1	150
400330097034502		10-03-94	SB2	H	--	49	1,200	<2.0	270	6.4	--
		04-17-95	SB2	H	21	41	300	<2.0	250	8.7	760
402202096513401	Big Blue River near Dewitt	09-27-94	SB1	H	29	13	170	<2.0	110	2.7	--
		09-27-94	SB1	W	--	--	--	--	--	--	--
		06-27-95	SB1	H	14	7.8	350	4.0	88	1.7	190
402202096513402		09-27-94	SB2	H	25	56	590	2.0	410	5.2	--
		06-27-95	SB2	H	31	16	710	4.0	520	9.8	860
402328096540801	Near DeWittl	9-20-94	OB	H	21	4.0	900	6.0	670	11	--

Table 5. Concentrations of nutrients, trace elements, acid and base/neutral organic compounds, total recoverable petroleum hydrocarbons, organochlorine pesticides, and polychlorinated organic compounds that were detected in overbank and streambed sediment and associated quality-assurance samples from selected sites in eastern Nebraska, 1994–95—Continued

Local identification	Date	Aluminum, recoverable from bottom material (µg/g)	Arsenic, total in bottom material (µg/g as As)	Boron, recoverable from bottom material (µg/g as B)	Cadmium, recoverable from bottom material (µg/g as Cd)	Chromium, recoverable from bottom material (µg/g)	Cobalt, recoverable from bottom material (µg/g as Co)	Copper, recoverable from bottom material (µg/g as Cu)	Iron, recoverable from bottom material (µg/g as Fe)	Lead, recoverable from bottom material (µg/g as Pb)	Manganese, recoverable from bottom material (µg/g)
Platte near	10-12-94	1,800	1	<10	<1	2	<5	1	1,700	<10	120
Wood River	10-12-94	2,200	1	<10	<1	1	<5	1	2,000	<10	130
	10-12-94	--	--	--	--	--	--	--	--	--	--
	05-17-95	780	<1	<10	<1	1	<5	2	1,300	<10	3
	10-12-94	2,300	1	<10	<1	2	<5	2	2,400	<10	110
	10-12-94	--	--	--	--	--	--	--	--	--	--
	05-17-95	810	1	<10	<1	1	<5	2	1,200	<10	5
Platte HW 75	11-08-94	3,900	2	<10	<1	7	<5	8	8,700	10	380
	04-13-95	610	<1	<10	<1	<1	<5	2	8,800	<10	23
	11-08-94	4,400	5	<10	<1	8	<5	10	9,600	10	520
	11-08-94	--	--	--	--	--	--	--	--	--	--
	04-13-95	3,500	3	<10	<1	9	<5	10	7,700	10	480
Loup River	10-11-94	2,000	<1	<10	<1	2	<5	1	1,500	<10	33
	10-11-94	--	--	--	--	--	--	--	--	--	--
	10-11-94	--	--	--	--	--	--	--	--	--	--
	07-03-95	2,100	<1	<10	<1	3	<5	2	2,300	<10	81
	10-11-94	5,100	2	<10	<1	5	<5	6	600	<10	180
	07-03-95	4,300	<1	<10	<1	5	<5	4	5,000	<10	120
Elkhorn	11-01-94	2,500	<1	<10	<1	4	<5	2	3,200	<10	130
	06-28-95	2,700	<1	<10	<1	4	<5	3	4,500	<10	160
	06-28-95	--	--	--	--	--	--	--	--	--	--
	11-01-94	3,700	2	<10	<1	6	<5	7	7,300	<10	460
	06-28-95	6,200	<1	<10	<1	9	<5	9	10,000	<10	550
	06-28-95	--	--	--	--	--	--	--	--	--	--

Table 5. Concentrations of nutrients, trace elements, acid and base/neutral organic compounds, total recoverable petroleum hydrocarbons, organochlorine pesticides, and polychlorinated organic compounds that were detected in overbank and streambed sediment and associated quality-assurance samples from selected sites in eastern Nebraska, 1994–95—Continued

Local identification	Date	Aluminum, recoverable from bottom material (µg/g)	Arsenic, total in bottom material (µg/g as As)	Boron, recoverable from bottom material (µg/g as B)	Cadmium, recoverable from bottom material (µg/g as Cd)	Chromium, recoverable from bottom material (µg/g)	Cobalt, recoverable from bottom material (µg/g as Co)	Copper, recoverable from bottom material (µg/g as Cu)	Iron, recoverable from bottom material (µg/g as Fe)	Lead, recoverable from bottom material (µg/g as Pb)	Manganese, recoverable from bottom material (µg/g)
Republican	10-04-94	1,500	1	<10	<1	2	<5	1	2,000	<10	90
	04-19-95	1,600	1	<10	<1	2	<5	2	2,100	<10	100
	10-04-94	3,800	2	<10	<1	6	<5	5	4,300	<10	270
Republican	04-19-95	2,800	<1	<10	<1	4	<5	3	3,900	<10	140
	04-19-95	--	--	--	--	--	--	--	--	--	--
Little Blue	10-03-94	2,400	2	<10	<1	2	<5	2	4,300	<10	110
	10-03-94	--	--	--	--	--	--	--	--	--	--
	04-17-95	2,200	1	<10	<1	3	<5	4	5,000	<10	230
	10-03-94	5,600	4	<10	<1	5	<5	8	11,000	<10	41
	04-17-95	3,600	4	<10	<1	8	<5	8	8,100	<10	350
Big Blue River	09-27-94	3,400	2	170	<1	4	<5	3	3,800	<10	160
near DeWitt	09-27-94	3,300	2	160	<1	3	<5	3	3,600	<10	170
	06-27-95	1,900	1	<10	<1	2	<5	2	2,600	<10	110
	09-27-94	7,100	2	270	<1	7	<5	7	6,900	210	260
	06-27-95	6,300	1	<10	<1	7	<5	8	8,900	<10	320
Near DeWitt1	09-20-94	9,000	2	490	<1	10	<5	10	9,400	10	510

Table 5. Concentrations of nutrients, trace elements, acid and base/neutral organic compounds, total recoverable petroleum hydrocarbons, organochlorine pesticides, and polychlorinated organic compounds that were detected in overbank and streambed sediment and associated quality-assurance samples from selected sites in eastern Nebraska, 1994–95—Continued

Local identification	Date	Mercury, recoverable from bottom material (µg/g as Hg)	Selenium, total in bottom material (µg/g)	Strontium, recoverable from bottom material (µg/g)	Zinc, recoverable from bottom material (µg/g as Zn)	Benzo (b) fluoranthene, bottom material (µg/kg)	Benzo (k) fluoranthene, bottom material (µg/kg)	Fluoranthene, bottom material (µg/kg)	Bis (2-ethyihexyi) phthaiate, bottom material (µg/kg)	Pyrene, bottom material (µg/kg)
Platte near	10-12-94	<0.01	<1	10	1	<400	<400	<200	<200	<200
Wood River	10-12-94	<.01	<1	20	5	--	--	--	--	--
	10-12-94	--	--	--	--	2300	2500	<200	5600	4500
	05-17-95	<.01	<1	250	60	<400	<400	<200	<200	<200
	10-12-94	<.01	<1	30	7	<400	<400	<200	<200	<200
	10-12-94	--	--	--	--	<400	<400	<200	<200	<200
	05-17-95	<.01	<1	600	50	<400	<400	<200	<200	<200
Platte HW 75	11-08-94	.01	<1	30	30	<400	<400	<200	<200	<200
	04-13-95	<.01	<1	3	3	--	--	--	--	--
	11-08-94	.02	<1	30	40	<400	<400	<200	<200	<200
	11-08-94	--	--	--	--	--	--	--	--	--
	04-13-95	.02	<1	60	30	<400	<400	<200	<200	<200
Loup River	10-11-94	<.01	<1	10	4	<400	<400	<200	<200	<200
	10-11-94	--	--	--	--	--	--	--	--	--
	10-11-94	--	--	--	--	<400	<400	<200	<200	<200
	07-03-95	<.01	<1	10	6	--	--	--	--	--
	10-11-94	<.01	<1	20	20	<400	<400	<200	<200	<200
	07-03-95	<.01	<1	20	20	<400	<400	<200	<200	<200
Elkhorn	11-01-94	<.01	<1	10	8	<400	<400	<200	<200	<200
	06-28-95	<.01	<1	10	10	--	--	--	--	--
	06-28-95	--	--	--	--	--	--	--	--	--
Elkhorn	11-01-94	.01	<1	30	20	<400	<400	<200	<200	<200
	06-28-95	.02	<1	30	40	<400	<400	<200	<200	<200
	06-28-95	--	--	--	--	--	--	--	--	--

Table 5. Concentrations of nutrients, trace elements, acid and base/neutral organic compounds, total recoverable petroleum hydrocarbons, organochlorine pesticides, and polychlorinated organic compounds that were detected in overbank and streambed sediment and associated quality-assurance samples from selected sites in eastern Nebraska, 1994–95—Continued

Local identification	Date	Mercury, recoverable from bottom material (µg/g as Hg)	Selenium, total in bottom material (µg/g)	Strontium, recoverable from bottom material (µg/g)	Zinc, recoverable from bottom material (µg/g as Zn)	Benzo (b) fluoranthene, bottom material (µg/kg)	Benzo (k) fluoranthene, bottom material (µg/kg)	Fluoranthene, bottom material (µg/kg)	Bis (2-ethylhexyl) phthalate, bottom material (µg/kg)	Pyrene, bottom material (µg/kg)
Republican	10-04-94	<.01	<1	20	4	<400	<400	<200	<200	<200
	04-19-95	<.01	<1	20	6	--	--	--	--	--
	10-04-94	<.01	<1	40	20	<400	<400	<200	<200	<200
Republican	04-19-95	<.01	<1	30	10	--	--	--	--	--
	04-19-95	--	--	--	--	--	--	--	--	--
Little Blue	10-03-94	<.01	<1	9	9	<400	<400	<200	<200	<200
	10-03-94	--	--	--	--	<400	<400	<200	<200	<200
	04-17-95	<.01	<1	8	30	--	--	--	--	--
	10-03-94	.01	<1	20	30	<400	<400	<200	<200	<200
	04-17-95	<.01	<1	20	30	<400	<400	<200	<200	<200
Big Blue River	09-27-94	<.01	<1	10	10	<400	<400	<200	<200	<200
near DeWitt	09-27-94	<.01	<1	10	10	--	--	--	--	--
	06-27-95	<.01	<1	7	7	--	--	--	--	--
	09-27-94	.02	<1	20	30	<400	<400	<200	<200	<200
	06-27-95	.02	<1	20	30	<400	<400	<200	<200	<200
Near DeWitt1	09-20-94	.03	<1	30	50	<400	<400	<200	<200	<200

Table 5. Concentrations of nutrients, trace elements, acid and base/neutral organic compounds, total recoverable petroleum hydrocarbons, organochlorine pesticides, and polychlorinated organic compounds that were detected in overbank and streambed sediment and associated quality-assurance samples from selected sites in eastern Nebraska, 1994–95—Continued

Local identification	Date	Aldrin, total in bottom material (µg/kg)	Chlordane, total in bottom material (µg/kg)	DDD, total in bottom material (µg/kg)	DDE, total in bottom material (µg/kg)	DDT, total in bottom material (µg/kg)	Dieldrin, total in bottom material (µg/kg)	Heptachlor, total in bottom material (µg/kg)	Heptachlor-epoxide total in bottom material (µg/kg)	PCB, total in bottom material (µg/kg)	Total recoverable petroleum hydrocarbons (µg/kg)
Platte near	10-12-94	<0.1	<1.0	<0.1	<0.1	<0.1	<0.8	<0.1	<0.1	<1	<20
Wood River	10-12-94	--	--	--	--	--	--	--	--	--	--
	10-12-94	130	170	73	120	.1	39	180	110	2,800	--
	05-17-95	<.1	<1.0	<.1	<.1	.1	.4	.1	.1	<1	<20
	10-12-94	<.1	1.0	<.1	<.1	.1	.8	.1	.1	<1	<20
	10-12-94	<.1	<1.0	<.1	<.1	.1	.8	.1	.1	<1	<20
	05-17-95	<.1	<1.0	<.1	<.1	.1	.4	.1	.1	<1	<20
Platte HW 75	11-08-94	<.1	<1.0	<.1	<.1	.1	.8	.1	.8	<1	24
	04-13-95	<.1	<1.0	<.1	<.1	.1	.4	.1	.1	<1	<20
	11-08-94	<.1	<1.0	0.2	.2	.9	.8	.1	.8	<1	41
	11-08-94	--	--	--	--	--	--	--	--	--	22
	04-13-95	<.1	<1.0	<.1	<.1	.1	.4	.1	.1	<1	<20
Loup River	10-11-94	<.1	<1.0	.1	.2	.1	.8	.1	.1	<1	<20
	10-11-94	--	--	--	--	--	--	--	--	--	--
	10-11-94	<.1	<1.0	.1	.1	.2	<.8	<.1	<.1	<1	--
	07-03-95	<.1	<1.0	.1	.2	<.1	.1	<.1	<.1	<1	<20
	10-11-94	<.1	<1.0	.2	.3	<.1	<.8	<.1	<.1	<1	<20
	07-03-95	<.1	<1.0	.2	.3	<.1	.2	<.1	<.1	<1	<20
Elkhorn	11-01-94	<.1	<1.0	<.1	<.1	<.1	<.8	<.1	<.1	<1	<20
	06-28-95	<.1	<1.0	<.1	<.1	<.1	<.1	<.1	<.1	<1	<20
	06-28-95	--	--	--	--	--	--	--	--	--	--
	11-01-94	.1	<1.0	<.1	.1	<.1	<.8	.2	<.1	<1	<20
	06-28-95	<.1	1.0	.2	.3	.2	.3	<.1	<.1	<1	<20
	06-28-95	--	--	--	--	--	--	--	--	--	--

Table 5. Concentrations of nutrients, trace elements, acid and base/neutral organic compounds, total recoverable petroleum hydrocarbons, organochlorine pesticides, and polychlorinated organic compounds that were detected in overbank and streambed sediment and associated quality-assurance samples from selected sites in eastern Nebraska, 1994–95—Continued

Local identification	Date	Aldrin, total in bottom material (µg/kg)	Chlordane, total in bottom material (µg/kg)	DDD, total in bottom material (µg/kg)	DDE, total in bottom material (µg/kg)	DDT, total in bottom material (µg/kg)	Dieldrin, total in bottom material (µg/kg)	Heptachlor, total in bottom material (µg/kg)	Heptachlor-epoxide total in bottom material (µg/kg)	PCB, total in bottom material (µg/kg)	Total recoverable petroleum hydrocarbons (µg/kg)
Republican	10-04-94	<.1	<1.0	<.1	.2	<.1	<.8	<.1	<.1	<1	<20
	04-19-95	<.1	<1.0	<.1	<.1	<.1	<.4	<.1	<.1	<1	<20
	10-04-94	.1	<1.0	<.1	.2	<.1	<.8	<.1	<.1	<1	<20
	04-19-95	<.1	<1.0	<.1	<.1	<.1	<.4	<.1	<.1	<1	27
	04-19-95	<.1	<1.0	<.1	<.1	<.1	<.4	<.1	<.1	<1	--
Little Blue	10-03-94	<.1	<1.0	<.1	.1	<.1	<.8	<.1	<.1	<1	<20
	10-03-94	<.1	<1.0	<.1	<.1	<.1	<.8	<.1	<.1	<1	--
	04-17-95	<.1	<1.0	<.1	<.1	<.1	<.4	<.1	<.1	<1	<20
	10-03-94	<.1	<1.0	<.1	.1	<.1	<.8	<.1	<.1	<1	<20
	04-17-95	<.1	<1.0	.1	.1	<.1	.1	<.1	<.1	<1	48
Big Blue River	09-27-94	<.1	<1.0	.1	.2	<.1	<.8	<.1	<.1	1	<20
near DeWitt	09-27-94	--	--	--	--	--	--	--	--	--	<20
	06-27-95	<.1	<1.0	<.1	<.1	<.1	<.1	<.1	<.1	<1	<20
	09-27-94	<.1	<1.0	<.1	.1	<.1	<.8	<.1	<.1	<1	<20
	06-27-95	.1	1.0	.3	.3	.2	.4	<.1	.1	<1	<20
Near DeWitt1	09-20-94	<.1	<1.0	.2	.2	.2	.4	<.1	<.1	1	<20

Table 5. Concentrations of nutrients, trace elements, acid and base/neutral organic compounds, total recoverable petroleum hydrocarbons, organochlorine pesticides, and polychlorinated organic compounds that were detected in overbank and streambed sediment and associated quality-assurance samples from selected sites in eastern Nebraska, 1994–95—Continued

Station number	Local identification	Date	Sample medium	Sample type	Moisture content, dry weight (percent of total)	Nitrogen, NH_4, total in bottom material (mg/kg as N)	Nitrogen, NH_4 + organic, total in bottom material (mg/kg as N)	Nitrogen, NO_2+NO_3, total in bottom material (mg/kg as N)	Phos-phorus, total in bottom material (mg/kg as P)	Carbon, inorganic + organic, total in bottom material (gm/kg as C)	Carbon, organic, total in bottom material (mg/kg as C)
402258096534401	Near DeWitt2	09-20-94	OB	H	26	6.0	900	18	690	11	--
402241096540801	Near DeWitt3	09-20-94	OB	H	17	8.5	2,000	5.0	600	21	--
400325096351701	Big Blue	10-25-94	SB1	H	34	95	740	<2.0	470	10	--
	near Barneston	06-21-95	SB1	H	29	16	670	4.0	570	9.1	940
		06-21-95	SB1	W	--	--	--	--	--	--	--
400325096351702		10-25-94	SB2	H	38	120	1,200	4.0	450	12	--
		10-25-94	SB2	W	26	130	1,000	<2.0	480	--	--
		06-21-95	SB2	H	25	10	880	3.0	3100	9.7	880
404913095570301	Weeping Water	09-26-94	SB1	H	31	48	730	<2.0	400	15	--
	Creek	09-26-94	SB1	W	28	72	1,000	<2.0	480	13	--
		06-26-95	SB1	H	32	28	950	3.0	460	12	1,110
404913095570302		09-26-94	SB2	H	28	20	990	<2.0	570	17	--
		06-26-95	SB2	H	23	8.0	550	3.0	330	9.6	970
		06-26-95	SB2	W	--	--	--	--	--	--	--
404937095592001	Near Nehawka1	09-22-94	OB	H	--	13	1,000	11	2200	33	--
404917095565901	Near Nehawka2	09-22-94	OB	H	--	3.5	1,200	9.0	360	12	--
404915095581001	Near Nehawka3	09-22-94	OB	H	10	3.0	630	4.0	530	9.5	--
401938095413601	Little Nemaha	09-28-94	SB1	H	6	41	580	<2.0	380	8.2	--
		09-28-94	SB1	W	--	--	--	--	--	--	--
		04-25-95	SB1	H	31	64	370	<2.0	410	8.4	710
401938095413602		09-28-94	SB2	H	30	43	670	2.0	320	8.6	--
		04-25-95	SB2	H	23	56	380	<2.0	350	8.8	1,060

Table 5. Concentrations of nutrients, trace elements, acid and base/neutral organic compounds, total recoverable petroleum hydrocarbons, organochlorine pesticides, and polychlorinated organic compounds that were detected in overbank and streambed sediment and associated quality-assurance samples from selected sites in eastern Nebraska, 1994–95—Continued

Station number	Local identification	Date	Sample medium	Sample type	Moisture content, dry weight (percent of total)	Nitrogen, NH_4, total in bottom material (mg/kg as N)	Nitrogen, NH_4 + organic, total in bottom material (mg/kg as N)	Nitrogen, NO_2+NO_3, total in bottom material (mg/kg as N)	Phos-phorus, total in bottom material (mg/kg as P)	Carbon, inorganic + organic, total in bottom material (gm/kg as C)	Carbon, organic, total in bottom material (mg/kg as C)
400048095232701	Big Nemaha	10-26-94	SB1	H	47	110	1,200	<2.0	450	13	--
		06-20-95	SB1	H	28	16	810	3.0	360	7.8	550
		06-20-95	SB1	W	--	--	--	--	--	--	--
400048095232702		10-26-94	SB2	H	47	110	1,200	<2.0	480	11	--
		06-20-95	SB2	H	36	20	1,100	3.0	430	11	550
		06-20-95	SB2	W	35	17	820	5.0	440	--	--
400425095243901	Missouri River	10-24-94	SB1	H	13	1.8	<20	3.0	150	3.3	--
		04-24-95	SB1	H	13	2.7	<20	2.0	150	1.4	40
		04-24-95	SB1	H	--	--	--	--	--	--	--
400425095243902		10-24-94	SB2	H	29	30	610	<2.0	390	12	--
		10-24-94	SB2	W	65	64	610	5.0	560	13	--
		04-24-95	SB2	H	44	90	540	3.0	550	12	590
		04-24-95	SB2	H	--	--	--	--	--	--	--
400303095251701	Near Rulo1	09-21-94	OB1	H	6	4.2	430	<2.0	490	11	--
400141095240801	Near Rulo2	09-21-94	OB2	H	25	7.1	900	37	970	18	--
400231095250901	Near Rulo3	09-21-94	OB3	H	--	4.8	1,300	19	360	16	--

Table 5. Concentrations of nutrients, trace elements, acid and base/neutral organic compounds, total recoverable petroleum hydrocarbons, organochlorine pesticides, and polychlorinated organic compounds that were detected in overbank and streambed sediment and associated quality-assurance samples from selected sites in eastern Nebraska, 1994–95—Continued

Local identification	Date	Aluminum, recoverable from bottom material (µg/g)	Arsenic, total in bottom material (µg/g as As)	Boron, recoverable from bottom material (µg/g as B)	Cadmium, recoverable from bottom material (µg/g as Cd)	Chromium, recoverable from bottom material (µg/g)	Cobalt, recoverable from bottom material (µg/g as Co)	Copper, recoverable from bottom material (µg/g as Cu)	Iron, recoverable from bottom material (µg/g as Fe)	Lead, recoverable from bottom material (µg/g as Pb)	Manganese, recoverable from bottom material (µg/g)
Near DeWitt2	09-20-94	13,000	3	360	<1	10	10	10	10,000	10	470
Near DeWitt3	09-20-94	14,000	2	290	<1	20	10	20	14,000	20	320
Big Blue	10-25-94	8,300	4	<10	<1	10	<5	10	11,000	10	430
near Barneston	06-21-95	6,600	<1	<10	<1	8	<5	8	9,200	<10	280
	06-21-95	3,900	1	<10	<1	4	<5	5	6,600	10	130
	10-25-94	9,700	3	<10	<1	10	<5	10	12,000	10	550
	10-25-94	--	--	--	--	--	--	--	--	--	--
	06-21-95	5,900	<1	<10	<1	8	<5	7	8,000	<10	24
Weeping Water	09-26-94	8,700	4	260	<1	10	10	10	11,000	10	880
Creek	09-26-94	--	--	--	--	--	--	--	--	--	--
	06-26-95	8,300	2	<10	<1	10	<5	10	13,000	10	760
	09-26-94	9,900	3	280	<1	10	<5	10	11,000	10	670
	06-26-95	5,900	2	<10	<1	9	<5	7	7,800	<10	250
	06-26-95	--	--	--	--	--	--	--	--	--	--
Near Nehawka1	09-22-94	9,400	3	490	1	20	<5	20	11,000	40	460
Near Nehawka2	09-22-94	8,800	3	250	<1	10	<5	10	98,000	10	390
Near Nehawka3	09-22-94	7,800	3	230	<1	9	<5	10	8,700	10	410
Little Nemaha	09-28-94	13,000	4	280	<1	10	10	20	13,000	10	560
	09-28-94	9,500	3	290	<1	10	<5	10	10,000	10	480
	04-25-95	9,900	5	10	<1	10	<5	10	14,000	10	460
	09-28-94	7,400	5	250	<1	9	<5	8	8,700	<10	460
	04-25-95	4,200	4	<10	<1	8	<5	9	9,300	10	380
	10-26-94	8,900	6	<10	<1	10	<5	10	10,000	10	540
	06-20-95	6,100	6	<10	<1	9	<5	9	12,000	<10	470
	06-20-95	7,700	2	<10	<1	10	<5	9	12,000	<10	460

Table 5. Concentrations of nutrients, trace elements, acid and base/neutral organic compounds, total recoverable petroleum hydrocarbons, organochlorine pesticides, and polychlorinated organic compounds that were detected in overbank and streambed sediment and associated quality-assurance samples from selected sites in eastern Nebraska, 1994–95—Continued

Local identification	Date	Aluminum, recoverable from bottom material (µg/g)	Arsenic, total in bottom material (µg/g as As)	Boron, recoverable from bottom material (µg/g as B)	Cadmium, recoverable from bottom material (µg/g as Cd)	Chromium, recoverable from bottom material (µg/g)	Cobalt, recoverable from bottom material (µg/g as Co)	Copper, recoverable from bottom material (µg/g as Cu)	Iron, recoverable from bottom material (µg/g as Fe)	Lead, recoverable from bottom material (µg/g as Pb)	Manganese, recoverable from bottom material (µg/g)
Big Nemaha	10-26-94	14,000	6	<10	<1	10	10	20	12,000	10	640
	06-20-95	9,300	3	<10	<1	10	10	10	16,000	30	590
	06-20-95	--	--	--	--	--	--	--	--	--	--
Missouri River	10-24-94	2,700	2	<10	<1	3	<5	1	3,800	<10	120
	04-24-95	1,500	1	<10	<1	3	<5	2	2,700	<10	98
	04-24-95	--	--	--	--	--	--	--	--	--	--
	10-24-94	6,000	4	<10	<1	8	<5	9	9,500	10	570
	10-24-94	7,200	1	<10	<1	10	<5	10	11,000	10	610
	04-24-95	14,000	5	10	<1	20	10	20	17,000	20	610
	04-24-95	--	--	--	--	--	--	--	--	--	--
Near Rulo1	09-21-94	6,300	4	300	<1	9	<5	9	9,000	<10	330
Near Rulo2	09-21-94	17,000	6	390	<1	20	20	30	23,000	20	860
Near Rulo3	09-21-94	12,000	6	300	<1	20	10	20	16,000	20	830

Table 5. Concentrations of nutrients, trace elements, acid and base/neutral organic compounds, total recoverable petroleum hydrocarbons, organochlorine pesticides, and polychlorinated organic compounds that were detected in overbank and streambed sediment and associated quality-assurance samples from selected sites in eastern Nebraska, 1994–95—Continued

Local identification	Date	Mercury, recoverable from bottom material (µg/g as Hg)	Selenium, total in bottom material (µg/g)	Strontium, recoverable from bottom material (µg/g)	Zinc, recoverable from bottom material (µg/g as Zn)	Benzo (b) fluoranthene, bottom material (µg/kg)	Benzo (k) fluoranthene, bottom material (µg/kg)	Fluoranthene, bottom material (µg/kg)	Bis (2-ethylhexyl) phthalate, bottom material (µg/kg)	Pyrene, bottom material (µg/kg)
Near DeWitt2	09-20-94	0.03	<1	30	60	<400	<400	<200	<200	<200
Near DeWitt3	09-20-94	.03	<1	40	60	<400	<400	<200	<200	<200
Big Blue near	10-25-94	.02	<1	30	40	<400	<400	<200	<200	<200
Barneston	06-21-95	.01	<1	20	30	--	--	--	--	--
	06-21-95	<.01	<1	10	20	--	--	--	--	--
	10-25-94	.02	<1	30	50	<400	<400	<200	<200	<200
	10-25-94	--	--	--	--	--	--	--	--	--
	06-21-95	.01	<1	20	30	<400	<400	<200	<200	<200
Weeping Water	09-26-94	.02	<1	30	40	<400	<400	<200	<200	<200
Creek	09-26-94	--	--	--	--	<400	<400	<200	<200	<200
	06-26-95	.02	<1	30	40	--	--	--	--	--
	09-26-94	.02	<1	20	40	<400	<400	<200	<200	<200
	06-26-95	.02	<1	20	30	<400	<400	<200	<200	<200
	06-26-95	--	--	--	--	<400	<400	<200	<200	<200
Near Nehawka1	09-22-94	.03	<1	70	210	550	420	230	480	220
Near Nehawka2	09-22-94	.02	<1	30	440	<400	<400	<200	<200	<200
Near Nehawka3	09-22-94	.02	<1	30	40	<400	<400	<200	<200	<200

Table 5. Concentrations of nutrients, trace elements, acid and base/neutral organic compounds, total recoverable petroleum hydrocarbons, organochlorine pesticides, and polychlorinated organic compounds that were detected in overbank and streambed sediment and associated quality-assurance samples from selected sites in eastern Nebraska, 1994–95—Continued

Local identification	Date	Mercury, recoverable from bottom material (µg/g as Hg)	Selenium, total in bottom material (µg/g)	Strontium, recoverable from bottom material (µg/g)	Zinc, recoverable from bottom material (µg/g as Zn)	Benzo (b) fluoranthene, bottom material (µg/kg)	Benzo (k) fluoranthene, bottom material (µg/kg)	Fluoranthene, bottom material (µg/kg)	Bis (2-ethylhexyl) phthalate, bottom material (µg/kg)	Pyrene, bottom material (µg/kg)
Little Nemaha	09-28-94	.02	<1	40	50	<400	<400	<200	<200	<200
	09-28-94	.02	<1	30	40	--	--	--	--	--
	04-25-95	.02	<1	30	40	--	--	--	--	--
	09-28-94	.01	<1	20	30	<400	<400	<200	<200	<200
	04-25-95	.02	<1	30	30	<400	<400	<200	<200	<200
Big Nemaha	10-26-94	.03	<1	50	40	<400	<400	<200	<200	<200
	06-20-95	.02	<1	30	30	--	--	--	--	--
	06-20-95	.02	<1	30	30	--	--	--	--	--
	10-26-94	.02	<1	60	50	<400	<400	<200	<200	<200
	06-20-95	.02	<1	40	50	<400	<400	<200	<200	<200
	06-20-95	--	--	--	--	--	--	--	--	--
Missouri River	10-24-94	<.01	<1	20	9	<400	<400	<200	<200	<200
	04-24-95	<.01	<1	10	7	--	--	--	--	--
	04-24-95	--	--	--	--	--	--	--	--	--
	10-24-94	.02	<1	50	40	<400	<400	<200	<200	<200
	10-24-94	.02	<1	50	50	<400	<400	<200	<200	<200
	04-24-95	.02	<1	40	60	--	--	--	--	--
	04-24-95	--	--	--	--	<400	<400	<200	200	<200
Near Rulo1	09-21-94	.02	<1	20	40	<400	<400	<200	<200	<200
Near Rulo2	09-21-94	.05	<1	50	100	<400	<400	<200	<200	<200
Near Rulo3	09-21-94	.04	<1	40	70	<400	<400	<200	<200	<200

Table 5. Concentrations of nutrients, trace elements, acid and base/neutral organic compounds, total recoverable petroleum hydrocarbons, organochlorine pesticides, and polychlorinated organic compounds that were detected in overbank and streambed sediment and associated quality-assurance samples from selected sites in eastern Nebraska, 1994–95—Continued

Local identification	Date	Aldrin, total in bottom material (µg/kg)	Chlordane, total in bottom material (µg/kg)	DDD, total in bottom material (µg/kg)	DDE, total in bottom material (µg/kg)	DDT, total in bottom material (µg/kg)	Dieldrin, total in bottom material (µg/kg)	Heptachlor, total in bottom material (µg/kg)	Heptachlor epoxide, total in bottom material (µg/kg)	PCB, total in bottom material (µg/kg)	Total recoverable petroleum hydrocarbons (µg/kg)
Near DeWitt2	09-20-94	<0.1	<1.0	0.2	0.1	0.2	0.4	<0.1	<0.1	1	<20
Near DeWitt3	09-20-94	<.1	1.0	.3	.1	.1	1.6	<.1	<.1	1	<20
Big Blue	10-25-94	<.1	<1.0	.2	.1	<.1	<.8	<.1	<.1	1	79
near Barneston	06-21-95	<.1	1.0	.3	.3	.3	.4	<.1	.1	<1	<20
	06-21-95	--	--	--	--	--	--	--	--	--	<20
	10-25-94	0.1	<1.0	.2	.1	<.1	<.8	<.1	<.1	2	54
	10-25-94	--	--	--	--	--	--	--	--	--	--
	06-21-95	<.1	1.0	.3	.3	.3	.4	<.1	.1	<1	<20
Weeping Water	09-26-94	<.1	<1.0	<.1	.2	<.1	<.4	<.1	<.1	<1	<20
Creek	09-26-94	<.1	<1.0	<.1	.1	<.1	<.8	<.1	<.1	<1	--
	06-26-95	.2	<1.0	.2	.2	<.1	.0	<.1	<.1	<1	<20
	09-26-94	<.1	<1.0	<.1	<.1	<.1	<.4	<.1	<.1	<1	<20
	06-26-95	.2	1.0	.2	.1	.1	.9	<.1	<.1	<1	<20
	06-26-95	--	--	--	--	--	--	--	--	--	--
Near Nehawka1	09-22-94	.8	120	.3	.6	2.8	38	<.7	.8	3	505
Near Nehawka2	09-22-94	.1	<1.0	.1	.1	.2	1.0	<.1	<.1	<1	<20
Near Nehawka3	09-22-94	<.1	<1.0	<.1	<.1	.4	<.4	<.1	<.1	<1	<20
Little Nemaha	09-28-94	.1	<1.0	<.1	.2	<.1	<.8	<.1	<.1	<1	<20
	09-28-94	--	--	--	--	--	--	--	--	--	--
	04-25-95	<.1	<1.0	<.1	<.1	<.1	.4	<.1	<.1	<1	<20
	09-28-94	<.1	<1.0	<.1	.2	<.1	<.8	<.1	<.1	<1	<20
	04-25-95	<.1	<1.0	<.1	<.1	<.1	.4	<.1	<.1	<1	<20

Table 5. Concentrations of nutrients, trace elements, acid and base/neutral organic compounds, total recoverable petroleum hydrocarbons, organochlorine pesticides, and polychlorinated organic compounds that were detected in overbank and streambed sediment and associated quality-assurance samples from selected sites in eastern Nebraska, 1994–95—Continued

Local identification	Date	Aldrin, total in bottom material (µg/kg)	Chlordane, total in bottom material (µg/kg)	DDD, total in bottom material (µg/kg)	DDE, total in bottom material (µg/kg)	DDT, total in bottom material (µg/kg)	Dieldrin, total in bottom material (µg/kg)	Heptachlor, total in bottom material (µg/kg)	Heptachlor epoxide, total in bottom material (µg/kg)	PCB, total in bottom material (µg/kg)	Total recoverable petroleum hydrocarbons (µg/kg)
Big Nemaha	10-26-94	.2	<1.0	<.1	<.1	<.1	<.8	<.1	<.8	1	76
	06-20-95	.1	<1.0	.1	.1	.6	.5	<.1	.1	<1	<20
	06-20-95	--	--	--	--	--	--	--	--	--	--
	10-26-94	.2	<1.0	<.1	<.1	<.1	<.8	<.1	<.8	<1	98
	06-20-95	.1	<1.0	.1	.1	.2	.7	<.1	.1	<1	<20
	06-20-95	--	--	--	--	--	--	--	--	--	--
Missouri River	10-24-94	<.1	<1.0	<.1	<.1	<.1	<.8	<.1	<.1	<1	<20
	04-24-95	--	--	--	--	--	--	--	--	--	<20
	04-24-95	<.1	<1.0	<.1	<.1	<.1	<.4	<.1	<.1	<1	--
	10-24-94	.1	<1.0	.3	.2	.2	<.8	<.1	<.1	3	<20
	10-24-94	<.1	1.0	.2	.2	<.1	<.8	<.1	<.8	2	--
	04-24-95	<.1	<1.0	.3	.3	.2	<.4	<.1	<.1	<1	<20
	04-24-95	<.1	<1.0	.3	.4	.3	.4	<.1	<.1	<1	--
Near Rulo1	09-21-94	<.1	<1.0	.2	.2	.2	.6	<.1	<.1	1	<20
Near Rulo2	09-21-94	<.1	1.0	.4	.4	.1	1.4	<.1	.1	1	<20
Near Rulo3	09-21-94	<.1	2.0	.4	.5	.2	1.0	<.1	<.1	1	<20

Table 6. Concentrations of triazine and related herbicides and selected metabolites detected in overbank and streambed sediment from selected sites in eastern Nebraska, 1994–95

[SB1, composited streambed sediment; SB2, discrete streambed sediment; OB, overbank stream sediment; µg/kg, micrograms per kilogram; <, less than; --, not analyzed; compounds analyzed for, but not detected are listed in table 2]

Station number	Local identification	Date	Sample medium	Acetochlor, total in bottom material (µg/kg)	Alachlor, total in bottom material (µg/kg)	Ametryn, total in bottom material (µg/kg)	Atrazine, total in bottom material (µg/kg)	Cyanazine, total in bottom material (µg/kg)	Cyanazine amide, total bottom material (µg/kg)
404335098391801	Platte near	10-12-94	SB1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Wood River	05-17-95	SB1	<.5	<.5	1.2	.5	<.5	--
404335098391802		10-12-94	SB2	<.5	<.5	<.5	<.5	<.5	<.5
410336095571001	Platte HW 75	11-08-94	SB1	<.5	<.5	<.5	<.5	<.5	<.5
		04-13-95	SB1	<.5	<.5	<.5	<.5	<.5	--
410336095571002		11-08-94	SB2	<.5	1.4	1.4	1.0	<.5	<.5
		04-13-95	SB2	<.5	2.5	2.1	.8	<.5	--
412359097193201	Loup	10-11-94	SB1	<.5	<.5	<.5	<.5	<.5	<.5
		07-03-95	SB1	<.5	<.5	<.5	<.5	<.5	<.5
412359097193202		10-11-94	SB2	<1	<1	<1	<1	<1	--
		07-03-95	SB2	<1	2.0	<1	<1	<1	<1
410808096183601	Elkhorn	11-01-94	SB1	<.5	<.5	.5	<.5	<.5	<.5
		06-28-95	SB1	<1	<1	<1	1.7	<1	--
410808096183602		11-01-94	SB2	<.5	1.1	1.3	1.0	<.5	<.5
		06-28-95	SB2	<1	<1	<1	3.4	<1	--
400111098093301	Republican	10-04-94	SB1	<.5	<.5	<.5	<.5	<.5	<.5
		04-19-95	SB1	<.5	<.5	<.5	<.5	<.5	--
400111098093302		10-04-94	SB2	<.5	1.1	<.5	<.5	<.5	<.5
		04-19-95	SB2	<.5	1.0	<.5	5.4	<.5	--
400330097034501	Little Blue	10-03-94	SB1	--	--	--	--	--	--
		04-17-95	SB1	<.5	<.5	<.5	<.5	<.5	--

Table 6. Concentrations of triazine and related herbicides and selected metabolites detected in overbank and streambed sediment from selected sites in eastern Nebraska, 1994–95—Continued

Station number	Local identification	Date	Sample medium	Acetochlor, total in bottom material (µg/kg)	Alachlor, total in bottom material (µg/kg)	Ametryn, total in bottom material (µg/kg)	Atrazine, total in bottom material (µg/kg)	Cyanazine, total in bottom material (µg/kg)	Cyanazine amide, total bottom material (µg/kg)
400330097034502		10-03-94	SB2	<.5	1.7	2.6	1.8	<.5	<.5
		04-17-95	SB2	1.0	2.2	1.37	1.2	<.5	--
402202096513401	Big Blue	09-27-94	SB1	<.5	1.2	.9	1.0	<.5	<.5
	near DeWitt	06-27-95	SB1	<1	<1	<1	2.2	<1	--
402202096513402		09-27-94	SB2	<.5	3.5	1.9	1.8	<.5	<.5
		06-27-95	SB2	<1	8.8	<1	16.6	1.44	<1
402328096540801	Near DeWitt1	09-20-94	OB	<.5	5.8	<.5	6.1	<.5	<.5
402258096534401	Near DeWitt2	09-20-94	OB	<.5	10.0	1.2	3.8	<.5	<.5
402241096540801	Near DeWitt3	09-20-94	OB	<.5	22.8	<.5	11.1	<.5	<.5
400325096351701	Big Blue	10-25-94	SB1	<.5	5.1	4.2	1.8	<.5	<.5
	near Barneston	06-21-95	SB1	<.5	32.8	<.5	26	<.5	--
400325096351702		10-25-94	SB2	<.5	15.8	4.4	4.0	<.5	<.5
		06-21-95	SB2	<1	38.2	<1	20.7	1.6	<1

Table 6. Concentrations of triazine and related herbicides and selected metabolites detected in overbank and streambed sediment from selected sites in eastern Nebraska, 1994-95—Continued

Local identification	Date	Deethylatrazine, total in bottom material (µg/kg)	Deisopropyl-atrazine, total in bottom material (µg/kg)	Metolachlor, total in bottom material (µg/kg)	Prometon, total in bottom material (µg/kg)	Propachlor, total in bottom material (µg/kg)	Propazine, total in bottom material (µg/kg)	Simazine, total in bottom material (µg/kg)
Platte near	10-12-94	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Wood River	05-17-95	<.5	<.5	<.5	<.5	--	<.5	<.5
	10-12-94	<.5	<.5	<.5	<.5	<.5	<.5	<.5
	05-17-95	<.5	<.5	2.0	<.5	--	<.5	<.5
Platte HW 75	11-08-94	<.5	<.5	<.5	<.5	<.5	<.5	<.5
	04-13-95	<.5	<.5	<.5	<.5	--	<.5	<.5
	11-08-94	<.5	<.5	<.5	<.5	<.5	<.5	<.5
	04-13-95	<.5	<.5	1.3	<.5	--	<.5	<.5
Loup	10-11-94	<.5	<.5	<.5	<.5	<.5	<.5	<.5
	07-03-95	<1	<1	<1	<1	--	<1	<1
	10-11-94	<.5	<.5	<.5	<.5	<.5	<.5	<.5
	07-03-95	<1	<1	1.4	<1	<1	<1	<1
Elkhorn	11-01-94	<.5	<.5	<.5	<.5	<.5	<.5	<.5
	06-28-95	<1	<1	<1	<1	--	<1	<1
	11-01-94	<.5	<.5	.5	<.5	<.5	<.5	<.5
	06-28-95	<1	<1	2.0	<1	--	<1	<1
Republican	10-04-94	<.5	<.5	<.5	<.5	<.5	<.5	<.5
	04-19-95	<.5	<.5	<.5	<.5	--	<.5	<.5
	10-04-94	<.5	<.5	1.2	<.5	<.5	<.5	<.5
	04-19-95	<.5	<.5	<.5	<.5	--	<.5	<.5
Little Blue	10-03-94	--	--	--	--	--	--	--
	04-17-95	<.5	<.5	<.5	<.5	--	<.5	<.5
	10-03-94	.5	<.5	1.7	<.5	<.5	<.5	<.5
	04-17-95	<.5	<.5	4.8	<.5	--	<.5	<.5

Table 6. Concentrations of triazine and related herbicides and selected metabolites detected in overbank and streambed sediment from selected sites in eastern Nebraska, 1994-95—Continued

Local identification	Date	Deethylatrazine, total in bottom material (µg/kg)	Deisopropyl-atrazine, total in bottom material (µg/kg)	Metolachlor, total in bottom material (µg/kg)	Prometon, total in bottom material (µg/kg)	Propachlor, total in bottom material (µg/kg)	Propazine, total in bottom material (µg/kg)	Simazine, total in bottom material (µg/kg)
Big Blue	09-27-94	<.5	<.5	<.5	<.5	<.5	<.5	<.5
near DeWitt	06-27-95	<1	<1	1.5	<1	--	<1	<1
	09-27-94	<.5	<.5	1.2	<.5	<.5	<.5	<.5
	06-27-95	1.9	<1	11.9	<1	<1	<1	<1
Near DeWitt1	09-20-94	2.4	1.4	2.8	<.5	<.5	<.5	<.5
Near DeWitt2	09-20-94	<.5	<.5	3.2	<.5	<.5	<.5	<.5
Near DeWitt3	09-20-94	<.5	<.5	4.9	<.5	<.5	<.5	<.5
Big Blue near	10-25-94	<.5	<.5	1.1	<.5	<.5	<.5	<.5
Barneston	06-21-95	<.5	<.5	18.8	<.5	--	<.5	<.5
	10-25-94	<.5	<.5	2.3	<.5	<.5	<.5	<.5
	06-21-95	1.9	<1	15.7	<1	<1	<1	<1

Table 6. Concentrations of triazine and related herbicides and selected metabolites detected in overbank and streambed sediment from selected sites in eastern Nebraska, 1994-95—Continued

Station number	Local identification	Date	Sample medium	Acetochlor, total in bottom material (µg/kg)	Alachlor, total in bottom material (µg/kg)	Ametryn, total in bottom material (µg/kg)	Atrazine, total in bottom material (µg/kg)	Cyanazine, total in bottom material (µg/kg)	Cyanazine amide, total in bottom material (µg/kg)
404913095570301	Weeping Water	09-26-94	SB1	<0.5	0.9	<0.5	2.2	<0.5	<0.5
		06-26-95	SB1	<1	<1	<1	14.2	9.5	<1
404913095570302		09-26-94	SB2	<.5	<.5	<.5	<.5	<.5	<.5
		06-26-95	SB2	<1	<1	<1	10.4	7.0	<1
404937095592001	Near Nehawka1	09-22-94	OB	<.5	819	<.5	271	576	250
404917095565901	Near Nehawka2	09-22-94	OB	<.5	1.2	<.5	3.3	<.5	<.5
404915095581001	Near Nehawka3	09-22-94	OB	<.5	<.5	<.5	36.1	<.5	<.5
401938095413601	Little Nemaha	09-28-94	SB1	<.5	12.1	2.2	11.6	<.5	<.5
		04-25-95	SB1	<.5	11.2	2.5	5.0	<.5	--
401938095413602		09-28-94	SB2	<.5	9.4	2.1	7.8	<.5	<.5
		04-25-95	SB2	1.1	5.4	1.1	5.6	<.5	--
400048095232701	Big Nemaha	10-26-94	SB1	<.5	22.1	3.6	7.0	<.5	<.5
		06-20-95	SB1	<.5	27.1	<.5	23.0	<.5	--
400048095232702		10-26-94	SB2	<.5	25.7	4.4	6.7	<.5	<.5
		06-20-95	SB2	<.5	29.5	<.5	22.4	<.5	--
400425095243901	Missouri River	10-24-94	SB1	<.5	<.5	<.5	<.5	<.5	<.5
		04-24-95	SB1	<.5	<.5	<.5	<.5	<.5	--
400425095243902		10-24-94	SB2	<.5	<.5	<.5	<.5	<.5	<.5
		04-24-95	SB2	<.5	1.3	<.5	.6	<.5	--
400303095251701	Near Rulo1	09-21-94	OB	<.5	1.3	<.5	1.9	<.5	<.5
400141095240801	Near Rulo2	09-21-94	OB	<.5	1.6	<.5	2.7	<.5	<.5
400231095250901	Near Rulo3	09-21-94	OB	<.5	6.7	<.5	3.9	<.5	<.5

Table 6. Concentrations of triazine and related herbicides and selected metabolites detected in overbank and streambed sediment from selected sites in eastern Nebraska, 1994-95—Continued

Local identification	Date	Deethylatrazine, total in bottom material (µg/kg)	Deisopropyl-atrazine, total in bottom material (µg/kg)	Metolachlor, total in bottom material (µg/kg)	Prometon, total in bottom material (µg/kg)	Propachlor, total in bottom material (µg/kg)	Propazine, total in bottom material (µg/kg)	Simazine, total in bottom material (µg/kg)
Weeping Water	09-26-94	<.5	<.5	<.5	<.5	<.5	<.5	<.5
	06-26-95	1.76	<1	2.3	<1	<1	<1	<1
	09-26-94	<.5	<.5	<.5	<.5	<.5	<.5	<.5
	06-26-95	<1	<1	1.8	<1	<1	<1	<1
Near Nehawka1	09-22-94	6.1	11.5	185	23	9.0	8.3	2.5
Near Nehawka2	09-22-94	<.5	<.5	.9	<.5	<.5	<.5	<.5
Near Nehawka3	09-22-94	<.5	<.5	<.5	<.5	<.5	<.5	<.5
Little Nemaha	09-28-94	<.5	<.5	5.6	<.5	<.5	<.5	<.5
	04-25-95	<.5	<.5	2.1	<.5	--	<.5	<.5
	09-28-94	<.5	<.5	4.5	<.5	<.5	<.5	<.5
	04-25-95	<.5	<.5	1.8	<.5	--	<.5	<.5
Big Nemaha	10-26-94	<.5	<.5	4.2	<.5	<.5	<.5	<.5
	06-20-95	<.5	<.5	4.9	<.5	--	<.5	<.5
	10-26-94	<.5	<.5	4.2	<.5	<.5	<.5	<.5
	06-20-95	<.5	<.5	6.9	<.5	--	<.5	<.5
Missouri River	10-24-94	<.5	<.5	<.5	<.5	<.5	<.5	<.5
	04-24-95	<.5	<.5	<.5	<.5	--	<.5	<.5
	10-24-94	<.5	<.5	.9	<.5	<.5	<.5	<.5
	04-24-95	<.5	<.5	1.7	<.5	--	<.5	<.5
Near Rulo1	09-21-94	<.5	<.5	<.5	<.5	<.5	<.5	<.5
Near Rulo2	09-21-94	<.5	<.5	1.0	<.5	<.5	<.5	<.5
Near Rulo3	09-21-94	<.5	<.5	2.6	<.5	<.5	<.5	<.5

Table 7. Statistical summary of nutrients and total carbon in overbank and streambed sediment from selected sites in eastern Nebraska, 1994–95

[All concentrations are in milligrams per kilogram; top statistic, overbank stream sediment samples; second statistic, all streambed sediment samples; third statistic, composite streambed sediment samples; bottom statistic, discrete streambed sediment samples; <, less than]

Constituent	Number of samples	Minimum	25th percentile	Median	75th percentile	Maximum
Ammonium, total as N	9	3.0	3.8	4.8	7.8	13
	48	1.8	8.4	18	49	120
	24	1.8	7.0	9.9	25	110
	24	8.0	17	36	56	120
Ammonium plus organic nitrogen, as N	9	430	765	900	1250	2,000
	48	<20	82	545	792	1,300
	24	<20	20	160	715	1,300
	24	40	388	645	988	1,200
Nitrite plus nitrate, as N	9	<2.0	4.5	9.0	18	37
	48	<2.0	<2.0	<2.0	3.0	35
	24	<2.0	<2.0	<2.0	3.0	4.0
	24	<2.0	<2.0	<2.0	3.0	35
Phosphorus	9	360	425	600	830	2,200
	46	52	130	325	442	3,100
	23	52	100	150	400	570
	23	120	260	390	470	3,100
Carbon, organic plus inorganic	9	9.5	11	12	20	33
	38	0.3	3.5	8.4	11	28
	19	0.3	1.7	3.6	10	28
	19	4.1	6.5	9.6	11	21

Table 8. Statistical summary of trace elements in overbank and streambed sediment from selected sites in eastern Nebraska, 1994–95

[All concentrations are in micrograms per gram; top statistic, overbank stream sediment samples; second statistic, all streambed sediment samples; third statistic, composite streambed sediment samples; bottom statistic, discrete streambed sediment samples; <, less than]

Constituent	Number of samples	Minimum	25th percentile	Median	75th percentile	Maximum
Aluminum	9	6,300	8,300	9,400	13,500	17,000
	48	610	2,300	4,200	7,300	14,000
	24	610	1,800	2,600	7,900	13,000
	24	810	3,700	5,800	7,300	14,000
Arsenic	9	2	2	3	5	6
	48	<1	1	2	4	6
	24	<1	<1	1	4	6
	24	<1	1	2	4	6
Boron	9	230	270	300	440	490
	48	<10	<10	<10	<10	280
	24	<10	<10	<10	<10	280
	24	<10	<10	<10	<10	280
Cadmium	9	<1	<1	<1	<1	1
	48	<1	<1	<1	<1	<1
	24	<1	<1	<1	<1	<1
	24	<1	<1	<1	<1	<1
Chromium	9	9	10	10	20	20
	48	<1	3	7	9	20
	24	<1	2	4	10	10
	24	1	5	8	9	20
Cobalt	9	<5	<5	<5	10	20
	48	<5	<5	<5	10	10
	24	<5	<5	<5	10	10
	24	<5	<5	<5	10	10
Copper	9	9	10	14	20	27
	48	1	2	7	10	17
	24	1	2	2	10	15
	24	2	6	8	11	17
Iron	9	8,700	9,200	11,000	20,000	98,000
	48	600	3,400	7,900	11,000	17,000
	24	1,300	2,400	4,400	11,000	14,000
	24	600	5,500	8,400	11,000	17,000
Lead	9	<10	10	10	20	40

Table 8. Statistical summary of trace elements in overbank and streambed sediment from selected sites in eastern Nebraska, 1994–95—Continued

Constituent	Number of samples	Minimum	25th percentile	Median	75th percentile	Maximum
	48	<10	<10	<10	10	210
	24	<10	<10	<10	10	10
	24	<10	<10	<10	10	210
Manganese	9	320	360	460	670	860
	48	3	110	265	510	880
	24	3	98	145	450	880
	24	5	150	365	550	670
Mercury	9	.02	.02	.03	.04	.05
	48	<.01	<.01	.01	.02	.03
	24	<.01	<.01	<.01	<.01	.03
	24	<.01	<.01	.02	.02	.02
Selenium	9	<1	<1	<1	<1	<1
	48	<1	<1	<1	<1	<1
	24	<1	<1	<1	<1	<1
	24	<1	<1	<1	<1	<1
Strontium	9	24	26	30	45	70
	48	3	16	24	32	600
	24	3	10	16	30	250
	24	17	21	28	41	600
Zinc	9	37	42	61	152	440
	48	1	10	28	40	58
	24	1	6	13	40	56
	24	7	24	30	42	58

Table 9. Statistical summary of acid and base/neutral extractable organic compounds and total recoverable petroleum hydrocarbons in overbank and streambed sediment from selected sites in eastern Nebraska, 1994–95

[All concentrations are in micrograms per gram except as noted; top statistic, overbank stream sediment samples; second statistic, all streambed sediment samples; third statistic, composite streambed sediment samples; bottom statistic, discrete streambed sediment samples; <, less than; compounds analyzed for, but not detected, are listed in table 2]

Constituent	Number of samples	Number of detections	Minimum	25th percentile	Median	75th percentile	Maximum
Benzo[b]fluoranthene	9	1	<400	<400	<400	<400	550
	27	0	<400	<400	<400	<400	<400
	12	0	<400	<400	<400	<400	<400
	16	0	<400	<400	<400	<400	<400
Benzo[k]fluoranthene	9	1	<400	<400	<400	<400	420
	28	0	<400	<400	<400	<400	<400
	12	0	<400	<400	<400	<400	<400
	16	0	<400	<400	<400	<400	<400
Bis(2-Ethyl-hexyl)phthalate	9	1	<200	<200	<200	<200	<230
	28	1	<200	<200	<200	<200	<200
	12	0	<200	<200	<200	<200	<200
	16	0	<200	<200	<200	<200	<200
Fluoranthene	9	1	<200	<200	<200	<200	220
	28	0	<200	<200	<200	<200	<200
	12	0	<200	<200	<200	<200	<200
	16	0	<200	<200	<200	<200	<200
Pyrene	9	1	<200	<200	<200	<200	220
	28	0	<200	<200	<200	<200	<200
	12	0	<200	<200	<200	<200	<200
	16	0	<200	<200	<200	<200	<200
Total recoverable petroleum hydrocarbons, in milligrams per kilogram	9	1	<200	<200	<200	<200	525
	48	8	<200	<200	<200	<200	98
	24	3	<200	<200	<200	<200	79
	24	5	<200	<200	<200	<200	98

Note that not all semivolatile data are in. Also note that Miss type 2, 95-4-24 at 1335 H is not included in the st.data file, but has been included in the statistics above.

Table 10. Statistical summary of organochlorine pesticides and polychlorinated organic compounds in overbank and streambed sediment from selected sites in eastern Nebraska, 1994–95

[All concentrations are in micrograms per kilogram; top statistic, overbank stream sediment samples; second statistic, all streambed sediment samples; third statistic, composite streambed sediment samples; bottom statistic, discrete streambed sediment samples; <, less than; other compounds analyzed for, but not detected, are listed in table 2]

Constituent	Number of samples	Number of detections	Minimum	25th percentile	Median	75th percentile	Maximum
Aldrin	9	2	<0.1	<0.1	<0.1	<0.1	0.8
	48	12	<.1	<.1	<.1	<.1	0.2
	24	4	<.1	<.1	<.1	<.1	0.2
	24	8	<.1	<.1	<.1	<.1	0.2
Chlordane	9	4	<1	<1	<1	1.5	120
	48	5	<1	<1	<1	<1	1
	24	1	<1	<1	<1	<1	1
	24	4	<1	<1	<1	<1	1
DDD	9	8	<1	.2	.2	.4	5.3
	48	19	<.1	<.1	<.1	.2	.3
	24	7	<.1	<.1	<.1	.1	.3
	24	12	<.1	<.1	<.1	.2	.3
DDE	9	8	<.1	.1	.2	.4	.6
	48	28	<.1	<.1	.1	.2	.3
	24	11	<.1	<.1	<.1	.2	.3
	24	17	<.1	<.1	.1	.3	.3
DDT	9	9	.1	.2	.2	.3	2.8
	48	10	<.1	<.1	<.1	<.1	.9
	24	2	<.1	<.1	<.1	<.1	.6
	24	8	<.1	<.1	<.1	<.1	.9
Dieldrin	9	8	<.4	.4	1	2	38
	48	13	<.8	<.8	<.8	<.8	1
	24	5	<.8	<.8	<.8	<.8	1
	24	8	<.8	<.8	<.8	<.8	.9
Heptachlor	9	0	<.1	<.1	<.1	<.1	<.1
	48	1	<.1	<.1	<.1	<.1	.2
	24	0	<.1	<.1	<.1	<.1	<.1
	24	1	<.1	<.1	<.1	<.1	.2
Heptachlor epoxide	9	2	<.1	<.1	<.1	<.1	.8
	48	5	<.1	<.1	<.1	<.1	.1
	24	2	<.1	<.1	<.1	<.1	.1
	24	3	<.1	<.1	<.1	<.1	.1
Polychlorinated biphenyls	9	7	<1	<1	1	1	3
	48	5	<1	<1	<1	<1	3
	24	3	<1	<1	<1	<1	1
	24	2	<1	<1	<1	<1	3

Table 11. Statistical summary of triazine and related herbicides and selected metabolites in overbank and streambed sediment from selected sites in eastern Nebraska, 1994–95

[All concentrations are in micrograms per kilogram; top statistic, overbank stream sediment samples; second statistic, all streambed sediment samples; third statistic, composite streambed sediment samples; bottom statistic, discrete streambed sediment samples; <, less than; compounds analyzed for, but not detected, are listed in table 2]

Constituent	Number of samples	Number of detections	Minimum	25th percentile	Median	75th percentile	Maximum
Acetochlor	9	0	<0.5	<0.5	<0.5	<0.5	<0.5
	47	2	<.5	<.5	<.5	<.5	1.1
	23	0	<.5	<.5	<.5	<.5	<.5
	24	2	<.5	<.5	<.5	<.5	1.1
Alachlor	9	8	<.5	1.2	5.8	16	820
	47	25	<.5	<.5	1.0	5.4	38
	23	8	<.5	<.5	<.5	5.1	33
	24	17	<.5	<.5	1.5	7.9	38
Ametryn	9	1	<.5	<.5	<.5	<.5	1.2
	47	17	<.5	<.5	<.5	1.4	4.4
	23	6	<.5	<.5	<.5	0.9	4.2
	24	11	<.5	<.5	<.5	1.7	4.4
Atrazine	9	9	1.9	3.0	3.9	24	271
	47	30	<.5	<.5	1.2	5.6	26
	23	12	<.5	<.5	.5	5.0	26
	24	18	<.5	<.5	1.8	6.5	22
Cyanazine	9	1	<.5	<.5	<.5	<.5	576
	47	4	<.5	<.5	<.5	<.5	9.5
	23	1	<.5	<.5	<.5	<.5	9.5
	24	3	<.5	<.5	<.5	<.5	7.0
Cyanazine amide	9	1	<.5	<.5	<.5	<.5	250
	47	0	<.5	<.5	<.5	<.5	<.5
	23	0	<.5	<.5	<.5	<.5	<.5
	24	0	<.5	<.5	<.5	<.5	<.5
Deethylatrazine	9	2	<.5	<.5	<.5	1.0	6.1
	47	4	<.5	<.5	<.5	<.5	1.9
	23	1	<.5	<.5	<.5	<.5	1.8
	24	3	<.5	<.5	<.5	<.5	1.9
Deisopropylatrazine	9	2	<.5	<.5	<.5	<.5	11.5
	47	0	<.5	<.5	<.5	<.5	<.5
	23	0	<.5	<.5	<.5	<.5	<.5
	24	0	<.5	<.5	<.5	<.5	<.5

Table 11. Statistical summary of triazine and related herbicides and selected metabolites in overbank and streambed sediment from selected sites in eastern Nebraska, 1994–95—Continued

Constituent	Number of samples	Number of detections	Minimum	25th percentile	Median	75th percentile	Meximum
Metolachlor	9	7	<0.5	0.2	2.6	4.0	180
	47	27	<.5	<.5	1.2	2.3	19
	23	8	<.5	<.5	<.5	2.1	19
	24	19	<.5	.6	1.7	3.8	16
Prometon	9	1	<.5	<.5	<.5	<.5	23
	47	0	<.5	<.5	<.5	<.5	<.5
	23	0	<.5	<.5	<.5	<.5	<.5
	24	0	<.5	<.5	<.5	<.5	<.5
Propachlor	9	1	<.5	<.5	<.5	<.5	9.0
	28	0	<.5	<.5	<.5	<.5	<.5
	12	0	<.5	<.5	<.5	<.5	<.5
	16	0	<.5	<.5	<.5	<.5	<.5
Propazine	9	1	<.5	<.5	<.5	<.5	8.3
	47	0	<.5	<.5	<.5	<.5	<.5
	23	0	<.5	<.5	<.5	<.5	<.5
	24	0	<.5	<.5	<.5	<.5	<.5
Simazine	9	1	<.5	<.5	<.5	<.5	2.5
	47	0	<.5	<.5	<.5	<.5	<.5
	23	0	<.5	<.5	<.5	<.5	<.5
	24	0	<.5	<.5	<.5	<.5	<.5

Table 12. Summary of results of duplicate analyses for overbank and streambed sediment samples, 1994–95

[mg/kg, milligrams per kilogram; µg/g, micrograms per gram]

Constituent	Nutrients, in mg/kg			Constituent	Nutrients, in mg/kg		
	Number of duplicate pairs	Average percent difference	Mean difference in paired samples		Number of duplicate pairs	Average percent difference	Mean difference in paired samples
Nitrogen, ammonium, as N	6	24	12	Nitrogen, nitrite plus nitrate, as N	6	30	1.3
Nitrogen, ammonium, plus organic nitrogen as N	6	30	262	Phosphorus	6	21	70
				Carbon, inorganic	6	10	1.2

Constituent	Trace elements, in µg/g			Constituent	Trace elements, in µg/g		
	Number of duplicate pairs	Average percent difference	Mean difference in paired samples		Number of duplicate pairs	Average percent difference	Mean difference in paired samples
Aluminum	5	17	1,360	Iron	5	11	1,000
Arsenic	5	33	1.6	Lead	5	$^{1}0$	$^{1}0$
Boron	5	1	4	Manganese	5	7	30
Cadmium	5	$^{1}0$	$^{1}0$	Mercury	5	$^{1}0$	$^{1}0$
Chromium	5	21	1	Selenium	5	$^{1}0$	$^{1}0$
Cobalt	5	10	1	Strontium	5	25	4
Copper	5	12	2.2	Zinc	5	24	5

Table 12. Summary of results of duplicate analyses for overbank and streambed sediment samples, 1994–95—Continued

Constituent	Semivolatile organic compounds, in µg/g, and total recoverable petroleum hydrocarbons, in mg/kg			Semivolatile organic compounds, in µg/g, and total recoverable petroleum hydrocarbons, in mg/kg			
	Number of duplicate pairs	Average percent difference	Mean difference in paired samples	Constituent	Number of duplicate pairs	Average percent difference	Mean difference in paired samples
4-Chloro-3-methylphenol	6	10	10	1,2-Dichlorobenzene	6	10	10
2-Chlorophenol	6	10	10	1,3-Dichlorobenzene	6	10	10
2,4-Dichlorophenol	6	10	10	1,4-Dichlorobenzene	6	10	10
2,4-Demethylphenol	6	10	10	Diethylphthalate	6	10	10
2-Methyl-4,6-dinitrophenol	6	10	10	Dimethylphthalate	6	10	10
2,4-Dinitrophenol	6	10	10	2,4-Dinitrotoluene	6	10	10
2-Nitrophenol	6	10	10	2,6-Dinitrotoluene	6	10	10
4-Nitrophenol	6	10	10	Di-n-octylphthalate	6	10	10
Pentachlorophenol	6	10	10	Bis(2-Ethylhexyl)phthalate	6	10	10
Phenol	6	10	10	Fluorene	6	10	10
2,4,6-Trichlorophenol	6	10	10	Fluoranthene	6	10	10
Acenaphthene	6	10	10	Hexachlorobenzene	6	10	10
Acenaphthylene	6	10	10	Hexachlorobutadiene	6	10	10
Anthracene	6	10	10	Hexachlorocyclopentadiene	6	10	10
Bena[a]anthracene	6	10	10	Hexachloroethane	6	10	10
Benzo[b]fluoranthene	6	10	10	Indeno[1,2,3-cd]pyrene	6	10	10
Benzo[k]fluoranthene	6	10	10	Isophorone	6	10	10
Benzo[a]pyrene	6	10	10	Naphthalene	6	10	10
Benzo[g,h,i]perylene	6	10	10	Nitrobenzene	6	10	10
Butylbenzylphthalate	6	10	10	N-Nitrosodimethylamine	6	10	10
Bis(2-chloroetyoxy)methane	6	10	10	N-Nitrosodiphenylamine	6	10	10
Bis(2-chloroethyl)ether	6	10	10	N-Nitrosodi-n-propylamine	6	10	10
Bis(2-chloroisopropyl)ether	6	10	10	Phenanthrene	6	10	10
4-Bromophenyl-phenylether	6	10	10	Pyrene	6	10	10
2-Chloronaphthalene	6	10	10	1,2,4-Trichlorobenzene	6	10	10
4-Chlorophenyl-phenylether	6	10	10	Total recoverable petroleum hydrocarbons	4	10	10
Chrysene	6	10	10				
Dibenz[a,h]anthracene	6	10	10				
Di-n-butylphthalate	6	10	10				

Table 12. Summary of results of duplicate analyses for overbank and streambed sediment samples, 1994–95—Continued

Constituent	Organochlorine pesticides, gross polychlorinated biphenyls, and polychlorinated naphthalenes, in µg/kg			Organochlorine pesticides, gross polychlorinated biphenyls, and polychlorinated naphthalenes, in µg/kg			
	Number of duplicate pairs	Average percent difference	Mean difference in paired samples	Constituent	Number of duplicate pairs	Average percent difference	Mean difference in paired samples
Perthane	6	[1]0	[1]0	Heptachlor	6	[1]0	[1]0
Endosulfan	6	[1]0	[1]0	Heptachlor epoxide	6	[1]0	[1]0
Aldrin	6	[1]0	[1]0	Lindane	6	[1]0	[1]0
Chlordane	6	[1]0	[1]0	Methoxychlor	6	[1]0	[1]0
DDD	6	6	<0.1	Mirex	6	[1]0	[1]0
DDE	6	12	<.1	Toxaphene	6	[1]0	[1]0
DDT	6	14	<.1	PCBs, gross	6	[1]0	[1]0
Dieldrin	6	[1]0	[1]0	PCNs, gross	6	8	<1
Endrin	6	[1]0	[1]0				

Constituent	Triazine and related herbicides and atrazine metabolites, in µg/kg			Triazine and related herbicides and atrazine metabolites, in µg/kg			
	Number of duplicate pairs	Average percent difference	Mean difference in paired samples	Constituent	Number of duplicate pairs	Average percent difference	Mean difference in paired samples
Acetochlor	11	6	0.1	Metolachlor	11	17	0.2
Alachlor	11	15	.8	Metribuzin	11	[1]0	[1]0
Ametryn	11	4	.2	Propazine	11	[1]0	[1]0
Atrazine	11	25	.9	Prometon	11	[1]0	[1]0
Cyanazine	11	7	.1	Prometryn	11	[1]0	[1]0
Deethylatrazine	11	8	.2	Terbutryn	11	[1]0	[1]0
Deisopropylatrazine	11	1	<.5	Simazine	11	[1]0	[1]0

[1]Concentrations for all sample pairs were below the method detection limit.