DESCRIPTION AND HYDROGEOLOGIC EVALUATION OF NINE HAZARDOUS-WASTE SITES IN KANSAS, 1984-86

By R. J. Hart and T. B. Spruill

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CONVERSION FACTORS

For interested readers, the factors for converting the inch-pound units used in this report to metric units (International System) are given below:

Multiply inch-pound unit	By	To obtain metric unit
inch	25.4	millimeter
foot	0.3048	meter
mile	1.609	kilometer
square foot (ft^2)	0.09290	square meter
square mile (mi^2)	2.590	square kilometer
acre	4,047	square meter
gallon	3.785	liter
gallon per minute (gal/min)	0.06309	liter per second
ounce	28.35	gram
pound	0.4536	kilogram
pound per square inch (lb/in^2)	6.895	kilopascal
degree Fahrenheit (°F)	°C = 5/9 x (°F -32)	degree Celsius (°C)

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

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ABSTRACT

Nine hazardous-waste sites in Kansas have been investigated by the U.S. Geological Survey, in cooperation with the Kansas Department of Health and Environment, to determine if the sites pose significant environmental problems and to determine the extent of possible contamination. Wastes generated on these sites either were disposed of in open pits or stored in surface or underground tanks. These disposal methods have the potential of being sources of contamination to ground water, soils, and surface-water bodies at or near the sites.

Activities on the nine sites included: production of diborane for rocket fuel (site 1), oil waste-dump (site 2), manufacturing of farm implements (site 3), production of soda ash (site 4), reclamation of solvents (site 5), oil-refinery activities (sites 6 and 7), meat packaging (site 8), and manufacturing and cleaning of tanker-truck tanks (site 9).

Wells to monitor the quality of ground water were installed, based on ground-water flow, upgradient and downgradient of the suspected contaminant source on each site. Wells were screened at or near the water table to enhance detection of light molecular-weight compounds. Ambient air-quality surveys were made on several sites to detect ionizable vapors that could pose health risks.

Principal findings were:

Site 1.--Elevated concentrations of boron (1,400 and 590 micrograms per liter) were detected in water from wells downgradient from the site. The concentration of boron in the upgradient well was 30 micrograms per liter. However, boron is not considered a hazard to human health. No concentrations of priority pollutants were found in ground water that exceeded State or Federal drinking-water standards.

Site 2.--Concentrations of polychlorinated biphenyls, PCB, (50,000 micrograms per gram) were found in soil samples collected from a pit where transformer oil was burned. Results from this investigation indicated PCB contamination (3.2 micrograms per gram) in a drainage located adjacent to the burn pits. In addition, a concentration of 0.5 micrograms per liter of PCB was found in water from a well located downgradient and adjacent to the burn area, indicating localized ground-water contamination. However, PCB was not detected in a downgradient supply well located on the site.

Site 3.--Waste piles located on the site of a former soda-ash plant are contaminating ground water beneath the site. Concentrations of 620 and 940 milligrams per liter of calcium, 1,400 and 1,500 milligrams per liter of chloride, and more than 0.1 milligram per liter of ammonia in wells downgradient of the former plant site indicate contamination by leachate from the wastes. No concentrations of any priority pollutant compounds or constituents were detected in samples from these wells.

Site 4.--Ground-water samples collected downgradient from the former waste-disposal pit on this site had concentrations of methylene chloride and 1,1,1 trichloroethane that did not exceed existing State and Federal drinking-water standards.

Site 5.--Concentrations of trichloroethylene, TCE, (1,935 micrograms per liter) methylene chloride (187 and 73 micrograms per liter), and some other halogenated organic compounds were detected in water samples from monitor wells on the site. These compounds probably are associated with the solvent-reclamation facility (site 6) or other industrial activities in the vicinity. Polynuclear aromatic (PNA) compounds detected in ground-water samples on the site probably are associated with wastes from a former oil refinery. Concentrations of antimony, lead, and PNA in soil samples collected onsite were larger than in offsite soil samples.

Site 6.--Concentrations of several priority pollutants, such as benzene, vinyl chloride, and other volatile organic compounds (VOC) were detected in water from monitor wells onsite that exceeded both State and Federal drinking-water standards. Ionizable vapors ranging from 4 to 130 parts per million detected from boreholes onsite. Concentrations of PNA compounds also were found in wells onsite and probably are associated with a former oil refinery. Trace elements, such as antimony, chromium, and lead, were detected in soils onsite; concentrations exceeded those in background soil samples.

Site 7.--Concentrations of both volatile organic and PNA compounds were detected in water samples from monitor wells on the site. The occurrence of halogenated volatile organic compounds probably are associated with industrial activities not related to a former oil refinery. PNA compounds in water samples probably are derived from wastes or activities associated with a former oil refinery. Antimony and lead concentrations in soil samples collected onsite were larger than background concentrations.

Site 8.--Carbon tetrachloride, TCE, and various benzene compounds were found in samples collected from wells located on the site. However, because concentrations of these compounds were larger in water from monitor and supply wells located upgradient, the principal sources of these contaminants probably is not onsite.

Site 9.--Concentrations of 130 and 280 micrograms per liter of TCE were found in water from monitoring wells onsite. However, although sampling of a storage tank located onsite indicated the presence of concentrations of TCE and other organic compounds, larger concentrations of TCE (greater than 900 milligrams per liter) were found in water from monitor and supply wells located upgradient from the site. The source of volatile organic compounds in ground water flowing under the site cannot be determined with the available data.

INTRODUCTION

A hazardous-waste site is defined for the purpose of this report as an area where a hazardous substance has been deposited, stored, disposed of, placed, or otherwise come to be located. These sites can pose significant problems to the public health and quality of the environment. Several hazardous-waste sites in Kansas have been identified by the State and more are being discovered. The U.S. Geological Survey in cooperation with the Kansas Department of Health and Environment investigated nine hazardous-waste sites in Kansas from 1984 through 1986. Most of these sites are located in river valleys, which are underlain by alluvium, in eastern and south-central Kansas (fig. 1). Data collected at these sites indicated the presence of several contaminants in the ground water, soil, and bed material of drainages near and on these sites. Work performed during these investigations provided sufficient data to identify hazardous wastes associated with past or present activities on the sites.

Purpose and Scope

This report describes the results of site investigations to (1) identify principal sources of ground-water contamination, (2) identify principal organic and inorganic chemical contaminants in the atmosphere, soil, and ground water, (3) define hydrogeologic characteristics of the sites, and (4) where appropriate, determine if contaminants have affected local water supplies.

The report describes the methodology used for studying potential hazardous-waste sites,

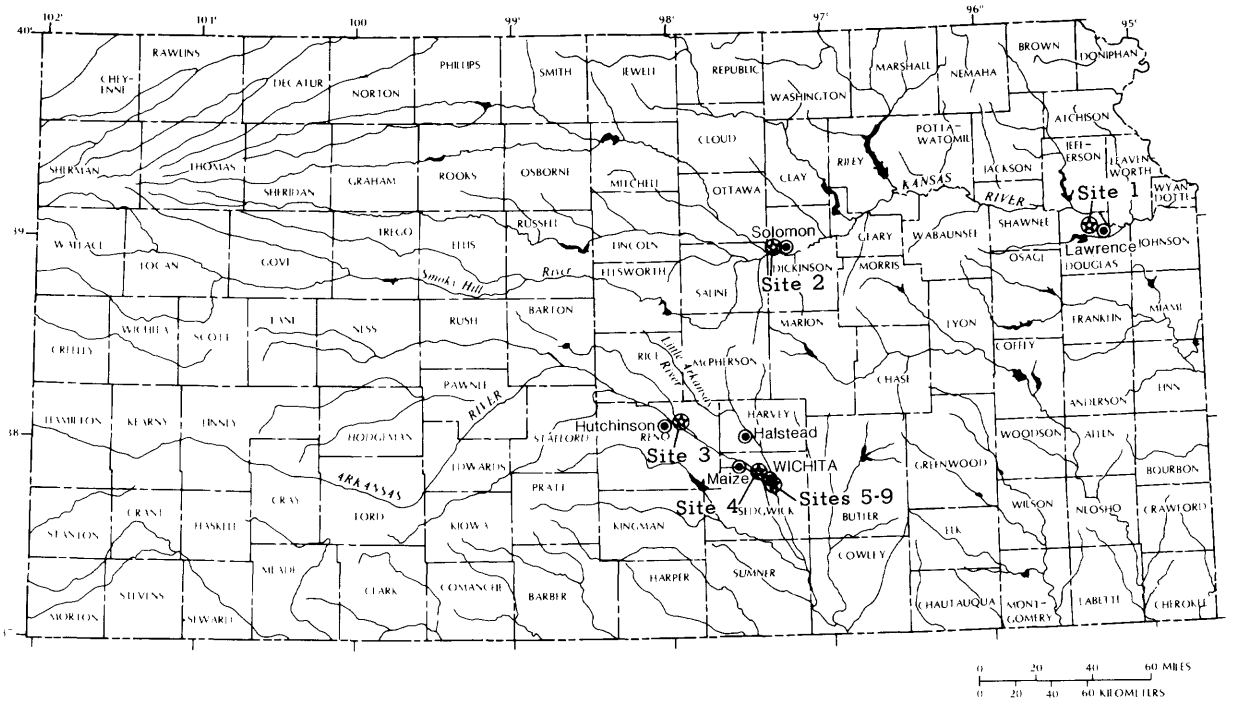

Figure 1. Location of nine hazardous-waste sites in Kansas.

describes site characteristics and general hydrogeology, presents information about site activities, discusses study results, and provides a compilation of data.

Well-Numbering System

The system for numbering wells and test holes in this report is based on the U.S. Bureau of Land Management's system of land subdivision. The first number indicates the township south (S) of the 40th parallel; the second number indicates the range east (E) or west (W) of the Sixth Principal Meridian; and the third number indicates the section in which the well is located. The first letter following the section number denotes the quarter section or 160-acre tract; the second, the quarter-quarter section or 40-acre tract; and the third, the quarter-quarter-quarter section or 10-acre tract. The letters are designated A, B, C, or D in a counterclockwise direction beginning in the northeast quarter of the section. Where there is more than one well in a 10-acre tract, consecutive numbers are added in the order in which the wells are inventoried. As shown in figure 2, 26S-2W-13DAD2 indicates the second well inventoried in the southeast quarter of the northeast quarter of the southeast quarter of section 13, T. 26 S., R. 2 W. When specific wells are discussed in this report, only the section number, letter designations of the quarter sections, and consecutive numbers (when necessary) will be used to identify these wells.

METHOD OF STUDY

Air-Quality Surveys

Various volatile chemicals had been used at several of the nine sites. Before monitor-well installation and other data-collection activities onsite, the ambient air was surveyed for ionizable or explosive vapors from the ground surface to about 8 feet above ground surface. Air-quality survey instruments used included a combustible gas indicator (CGI) and photoionization detector (PID). Meter readings of more than 4 parts per million on the PID (which was calibrated to 55 parts per million of toluene) were interpreted to indicate the presence of possible hazardous air contaminants. Meter readings on the CGI of 25 percent or more of the lower explosive limit were interpreted as indicating the presence of explosive vapors.

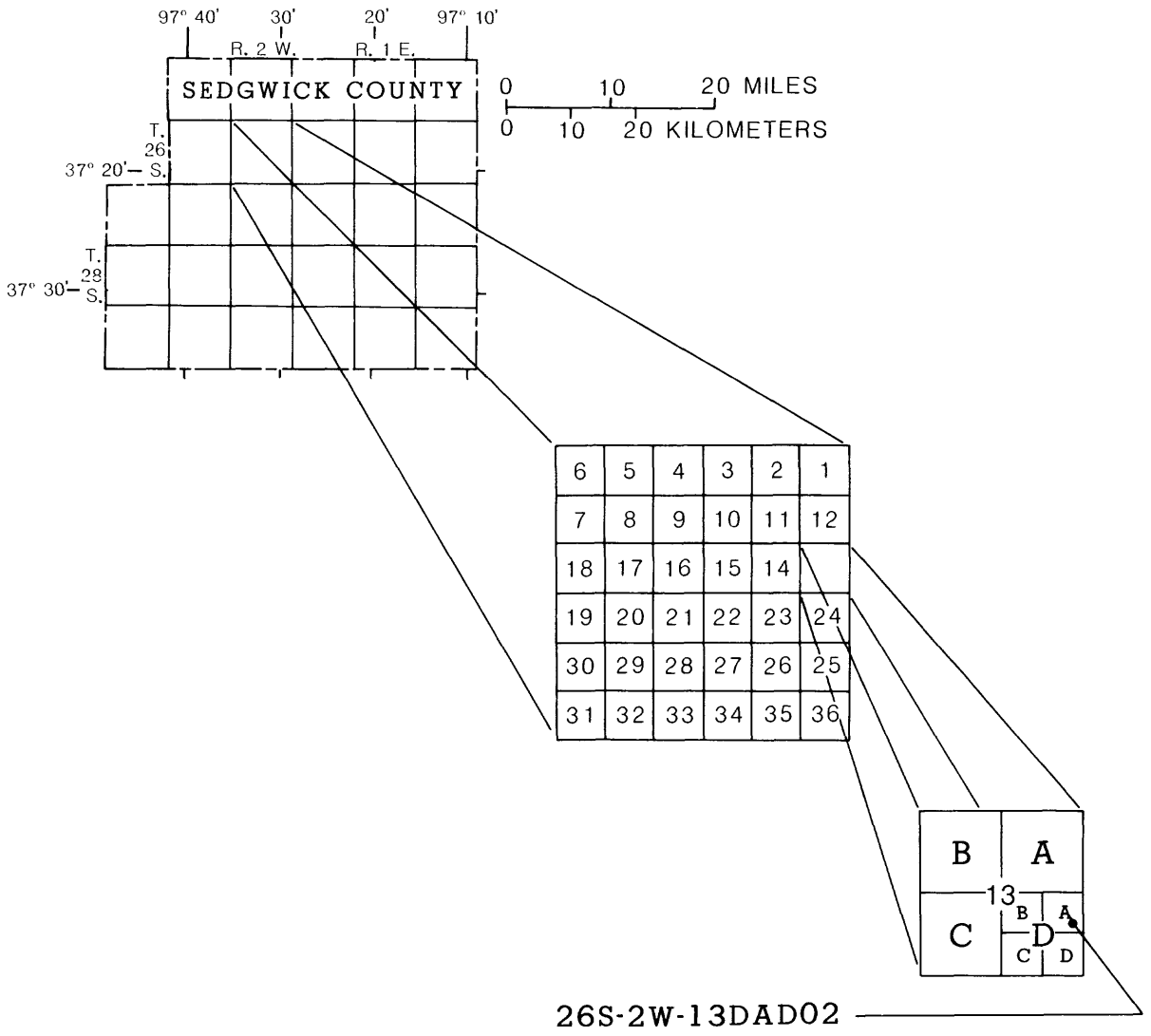

Figure 2. Well-numbering system used in this report.

Formation material and the annular space of the borehole also were monitored for possible release of vapors during augering.

Monitor-Well Installation

As part of the hazardous-waste site evaluations, monitor wells were installed on and adjacent to the study sites to obtain water samples and water-level measurements. Noncontaminating methods of well installation were used to ensure collection of representative water samples.

Monitor wells were installed by augering with a hollow-stem auger. Once the desired depth was reached, the hollow-stem auger bit plate was removed with a screened-well swab. As shown in figure 3, the swab prevented a sand plug from forming and allowed formation water to enter the auger. The swab also eliminated the introduction of outside water to the formation material. The swab was removed after water pressure in the hollow-stem auger equalized with that of the aquifer. The reader is referred to Perry and Hart (1985) for a detailed

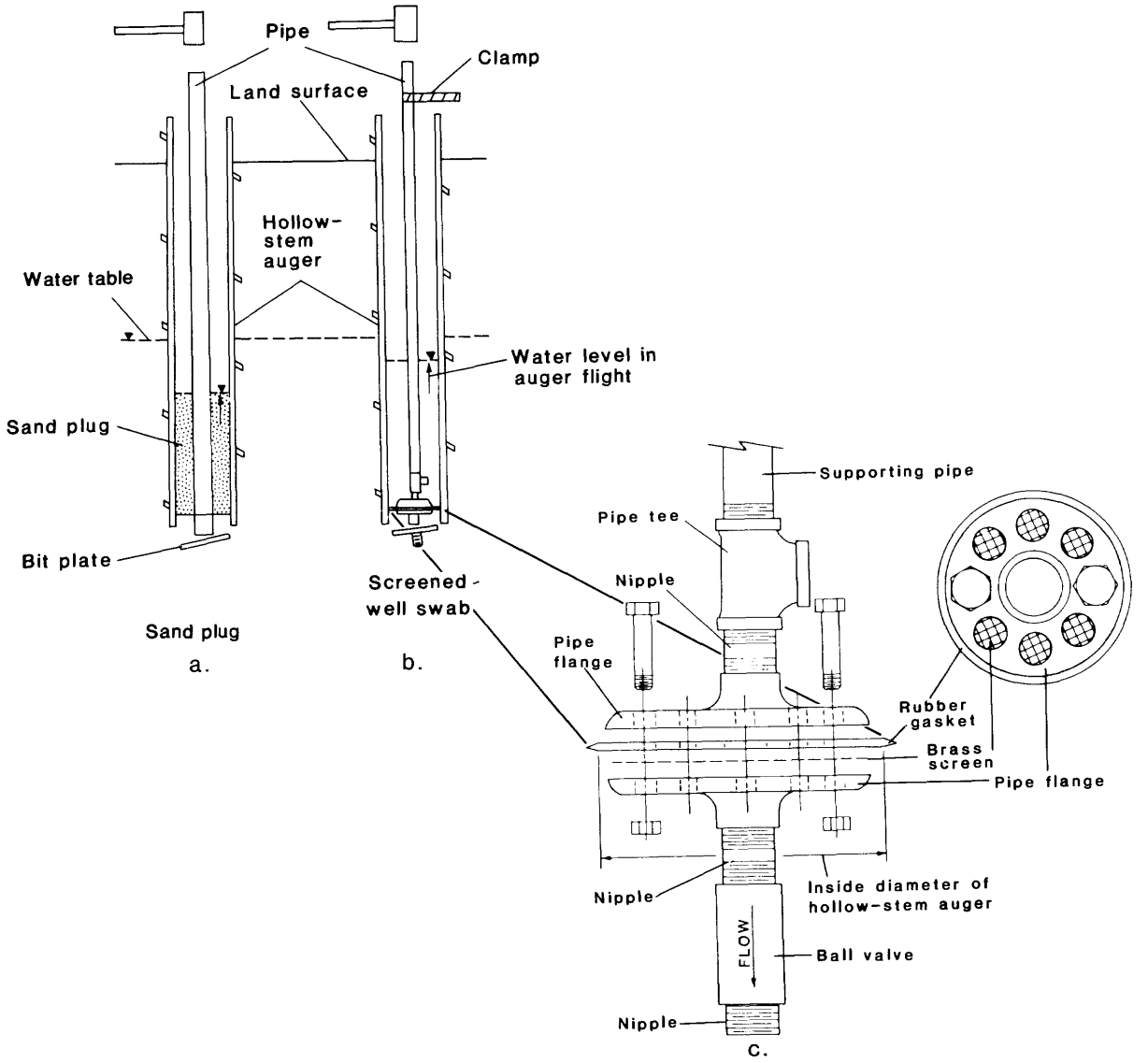

Figure 3. Diagram showing (a) sand plug, (b) use of screened-well swab, and (c) schematic of screened-well swab.

description of the swab. The well casing and screen were installed in the hollow-stem auger. The auger flights were removed after placement of the casing and screen. The annular space for each well was sealed using the techniques shown in figure 4.

To prevent contamination of ground water with material from other sites, auger flights were decontaminated after the completion of each test hole. The augers were washed with potable water using a high-pressure nozzle (about 150 lb/in^2) and then scrubbed with bristle brush and a detergent solution. The auger flights then were sprayed with commercial-grade acetone. Potable water was stored in a 500-gallon stainless-steel tank mounted on a support truck. Auger flights were placed on sawhorses covered with plastic sheeting during decontamination. The plastic was disposed after the completion of each hole. An effort was made to install wells first on sites suspected of having the least contamination.

Monitor wells were constructed with a 5-foot stainless-steel slotted screen (0.02-inch slots) and polyvinyl-chloride schedule-40 casing, 2 inches in diameter. Wells were screened at or

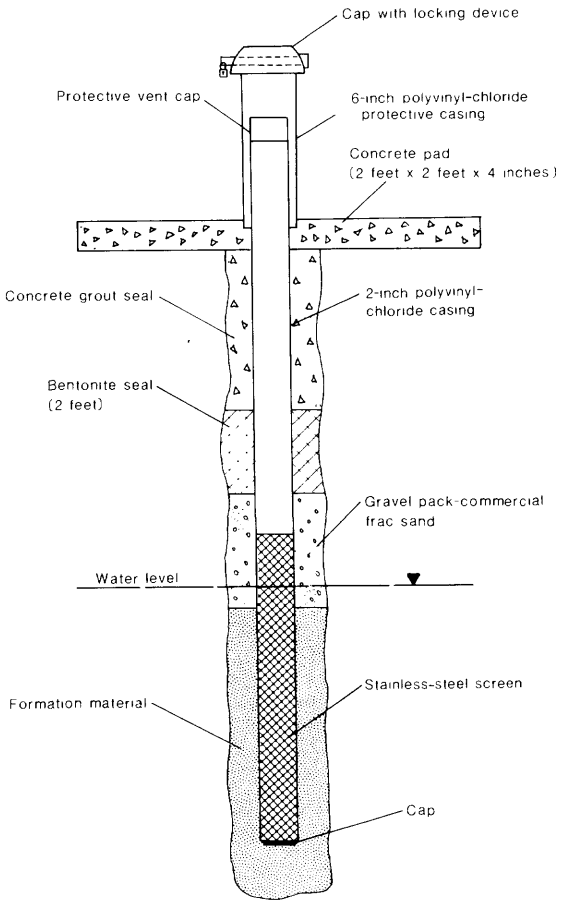

Figure 4. Construction techniques for monitor wells.

near the water table to enhance detection of light molecular-weight compounds like benzene and toluene. Some compounds like carbon tetrachloride are heavier than water and may be present at greater concentrations with increasing depths. All well-construction materials were decontaminated before installation by the same procedure used on the auger flights. After the wells were installed, a 3-foot high protective casing (6-inch diameter, polyvinyl-chloride, schedule-40) was placed around the well casing. The altitude of each completed well was surveyed to sea level or estimated from topographic maps. Records of wells measured and sampled during the investigations are listed in table 1.

Surface Geophysical Surveys

An electromagnetic (EM) survey (a surface geophysical technique) was conducted to detect the possible presence of anomalies that could indicate the remnants of buried hazardous substances. Components of the EM instrument used for the survey consist of a transmitter and receiver coil, an energizer, and a receiver set which includes integrated electronic systems to allow direct reading of ground conductivity, in millimhos per meter. Background readings were made for a site isolated from the suspected contaminant source or remnant. Meter readings less than background values indicated the presence of a substance or object that was less conductive. Meter readings greater than background indicated the presence of a substance or object that was more conductive.

Results from the EM surveys conducted at most of the sites did not indicate obvious conductivity anomalies. This may be because cultural features, such as metal fences, buildings, and power lines, as well as natural conductive clays, were present at most of the sites investigated. Because of the many possible interfaces at most of the sites and because no boreholes were installed to aid in interpretation and verification of conductivity measurements, the results of these surveys were inconclusive. EM data from these surveys are on file in the U.S. Geological Survey office in Lawrence, Kansas.

Natural Gamma-Ray Logs

Test holes were augered at various locations at each study site. Natural gamma-ray logs were made of the test holes to gain lithologic information about the aquifer(s) of concern. An increase in gamma-ray activity indicates more clay-bearing sediments in the aquifer material, whereas a decrease in activity indicates less clay-bearing sediments.

Permeameter Tests

Soil cores were collected at various depths in selected areas at several of the study sites. Core tubes were fabricated from 1 1/4-inch steel pipe cut into approximately 9-inch lengths. The core tubes were driven directly into the soil for shallow samples (surface samples) or driven into a split-spoon sampler that was used to collect deeper samples (more than 9 inches below land surface).

Table 1. *Records of water wells sampled during 1984-86 at or near the nine study sites*

Well number and legal description (township, range, section)	Type of well[1]	Depth of well (feet)	Diameter of well (inches)	Geologic source[2]	Depth to water (feet below land surface)	Date of measurement	Altitude of land surface (feet above sea level)
			Site 1 (Douglas County)				
12S-19E-13CCA	Obs	41	2	Gf	36.2	10-23-84	857.9
12S-19E-13CDC1	Obs	25	2	Gf	19.7	10-23-84	857.9
12S-19E-13CDC2	Obs	50	2	Gf	33.7	10-23-84	857.0
			Site 2 (Dickinson County)				
13S-1E-5DCD	D	--	--	--	--	--	--
13S-1E-5DC1	Obs	55	2	Ds	27.0	9-26-84	1,272(topo)[3]
13S-1E-5DC2	Obs	35	2	Ds	19.5	9-26-84	1,262(topo)
13S-1E-5DC3	Obs	35	2	Ds	13.0	9-26-84	1,263(topo)
			Site 3 (Reno County)				
23S-5W-DBA	Obs	37	2	Al	21.6	10-18-84	1,525(topo)
23S-5W-8DA1	Obs	33	2	Al	21.6	10-18-84	1,525(topo)
23S-5W-8DA2	Obs	38	2	Al	21.6	10-18-84	1,525(topo)
			Site 4 (Sedgwick County)				
26S-2W-13DAD1	Obs	25	2	Al	14.1	11-8-84	1,353.6
26S-2W-13DAD2	Obs	20	2	Al	15.2	11-7-84	1,354.7
26S-2W-13DAD3	Obs	28	2	Al	15.6	11-7-84	1,355.1
			Sites 5-9 (Sedgwick County)				
26S-1E-33BCD	Obs	25	2	Al	11.8	11-15-84	--
26S-1E-33CCC1	Obs	25	2	Al	13.6	11-16-84	1,316.3
26S-1E-33CCC2	Obs	25	2	Al	14.1	11-16-84	1,316.4
26S-1E-33CCC3	Obs	15	2	Al	11.6	10-30-85	1,315.7
26S-1E-33CCC4	Obs	25	2	Al	13.4	11-16-84	--
26S-1E-33CCD	Obs	25	2	Al	13.2	11-16-84	1,315.2
26S-1E-33CCC5	Obs	20	2	Al	12.1	10-30-85	1,316.4
26S-1E-33CCC6	Obs	20	2	Al	12.1	10-30-85	1,316.4
26S-1E-33CCB	Obs	17	2	Al	9.5	10-30-85	1,314.2
26S-1E-333CCA	Obs	18	2	Al	13.1	10-30-85	1,315.8
26S-1E-33CAB	Ind	44	12	Al	-		-
27S-1E-4BBB	Obs	17	2	Al	10.6	10-30-85	1,314.3

Table 1. *Records of water wells sampled during 1984-86 at or near the nine study sites*--Continued

Well number and legal description (township, range, section)	Type of well[1]	Depth of well (feet)	Diameter of well (inches)	Geologic source[2]	Depth to water (feet below land surface)	Date of measurement	Altitude of land surface (feet above sea level)
			Site 5-9 (Sedgwick County)--Continued				
27S-1E-4BBC	Obs	18		Al	10.1	10-30-85	1,312.5
27S-1E-4BCA	Obs	13	2	Al	9.2	10-30-85	1,312.1
27S-1E-5DAA	Obs	27	2	Al	11.3	10-30-85	1,312.5
27S-1E-4BAB1	Nu	44	-	Al	-		-
26S-1E-33BCC	Ind	-	-	Al	-		-
27S-1E-4BAA	Ind	40	10	Al	-	-	-
27S-1E-4DBB	Nu	27	1.25	Al	11.4	10-30-85	1,312.2
27S-1E-29DCC	D	-	-	Al	-	-	-
27S-1E-5AC	Og	32	5	Al	12.3	10-30-85	1,314.3
27S-1E-4AAB	Obs	13.5	2	Al	9.2	10-30-85	1,314.0
27S-1E-4BAB2	Obs	17.5	2	Al	12.5	4-29-86	1,316.3
27S-1E-4BAC	Obs	27.5	2	Al	11.9	4-29-86	1,314.2
27S-1E-4ABC	Obs	27.6	2	Al	14.1	4-29-86	1,316.2
27S-1E-4ACB	Obs	26.8	2	Al	14.9	4-29-86	1,315.9

[1] Obs, observation or monitor; Ind, industrial; D, domestic; Lg, lawn and garden; Nu, not used.

[2] Al, alluvium; Ds, dune sand; Gf, glaciofluvial.

[3] (topo), estimated from U.S. Geological Survey topographic quadrangle.

A constant-head permeameter (Todd, 1980, p. 73) was used to measure the hydraulic conductivity of the soil cores. The hydraulic conductivity was calculated from Darcy's law as follows:

$$K = \frac{VL}{Ath} \quad (1)$$

where V is the flow volume, in time(t);

A is the cross-sectional area of the core sample;

L is the length of the sample; and

h is the hydraulic head during the test.

Several tests using different hydraulic heads were made to provide a measurement of known precision. Core samples with hydraulic-conductivity values less than 0.3 foot per day are considered to be small. Values ranging from 30 feet per day to 0.3 foot per day are considered to be moderate. Values greater than 30 feet per day are considered to be large (Todd, 1980, p. 72). No soils having large hydraulic-conductivity values were sampled. Hydraulic-conductivity values determined from the cores were considered to be representative of the sites. Results of these tests are listed in table 2.

Sample Collection

Ground Water

After each monitor well was installed, it was developed by bailing five to eight well volumes of water and then allowed to remain undisturbed for a few hours before a sample was withdrawn. Teflon bailers were used to develop the wells. Before a water sample was collected, the well was bailed again until the water temperature and specific conductance stabilized. To minimize cross contamination, wells were sampled in order of suspected increasing contamination. The Teflon bailers were decontaminated after sampling each well. In some instances, where the ground water was suspected of being greatly contaminated, the bailer was dedicated to the well.

Water from industrial- and domestic-supply wells was sampled to provide information on the possible migration of contaminants in the ground water from the sites. Before collecting a water sample from these wells, it was determined if a pressure tank was connected. Samples were collected after the water temperature and specific conductance stabilized. Samples were collected as close to the well head as possible.

Specific conductance, pH, water temperature, and dissolved oxygen were measured onsite using methods described in Fishman and Friedman (1985).

Soil and Streambed Material

Random samples of the top 2 to 3 inches of the soil were collected at several of the sites. Composite samples were composited in a glass container. The glass containers were baked in the laboratory prior to collecting a sample to remove any trace organic compounds. A stainless-steel trowel was used to collected the samples. The trowel was decontaminated after use at each site. Samples were chilled to about 4°Celsius during storage and shipment prior to laboratory analysis.

Streambed material was collected from surface-water bodies near sites 5-9 in northeast Wichita. Samples were collected from the center of the water body using a glass bottle.

Laboratory Analysis

Table 2. *Hydraulic conductivity of soil cores at sites 2-9*

Site	Well number	Depth of soil sample (feet below land surface)	Hydraulic conductivity (feet per day)
2	5DC1	2	0.067
2	5DC1	10	2.392
2	5DC2	1.5	1.043
2	5DC3	1.5	.214
3	8DA1	2	.022
3	8DA1	10	.145
4	13DAD1	2	.059
4	13DAD2	.5	.007
4	13DAD2	10	.326
Near sites 5-9	33BCD	2	.046
Near sites 5-9	33BCD	10	.709
5	33CCD	10	.816
Sites 5 and 6	33CCC1	2	11.083
8	4BAB2	.5	1.049
9	4ABC	.5	.320

Analyses for inorganic and organic constituents in ground-water, surface-water, soil, and streambed samples collected from all sites (except sites 5 and 6) were performed by the U.S. Geological Survey's water-quality laboratory in Denver, Colorado. Analyses for inorganic constituents (including several priority pollutant trace elements shown in table 3) were performed according to techniques described in Fishman and Friedman (1985). Analyses for priority pollutant organic compounds, shown in table 3, were performed according to techniques described in Wershaw and others (1983). Analyses for organic priority pollutants in water samples from sites 5 and 6 were performed by the Division of Laboratories, Kansas Department of Health and Environment, Topeka, Kansas, according to U.S.

Environmental Protection Agency Methods 608, 624, and 625 (U.S. Environmental Protection Agency, 1982). Results of analyses performed according to these methods are presented in tables 5 and 6 located in the "Supplemental Information" section of this report. Tentative identification by gas-chromatography/mass spectrometry of additional organic compounds that are not priority pollutants listed in table 3 (non-target compounds) were performed using the National Bureau of Standards library-reference spectra. These identifications were not verified by comparison with standard reference compounds. Organic compounds identified by this method are listed in tables 7 and 8 located in the "Supplemental Information" section of this report.

DESCRIPTION AND HYDROGEOLOGIC EVALUATION OF STUDY SITES

This section of the report briefly describes the physical characteristics, historical background, hydrogeologic characteristics, and evaluation of data for each of the nine study sites. State and Federal drinking-water standards shown in table 4 are referred to frequently in this discussion.

Introduction to Sites 1-4

Sites 1-4 were investigated during the fall of 1984. These sites are located in Douglas, Dickinson, Reno, and Sedgwick Counties (fig. 1). Past activities on these sites include: site 1, production of diborane for rocket fuel; site 2, oil-waste dump; site 3, production of soda ash; and site 4, the manufacture of farm implements. Sites 1, 2, and 4 are located in predominately rural settings. Site 3 is located within the city of Hutchinson. The following sections describe these sites and results of the data analyses.

Site 1-Former Diborane Plant

Site 1 is located near Lawrence in Douglas County and is about 0.25 mile south of the Kansas River. The site facilities occupied about 15 acres in the SW1/4 sec. 13, T. 12 S., R. 19 E. A detailed map of the site is shown in figure 5.

The former plant produced diborane, which was used as a rocket propellant. The plant existed between 1958 and 1960, but the actual production of diborane only lasted about 3 months. The processing plant has been disassembled with only abandoned buildings, underground water lines, and drains remaining onsite.

On the basis of historical records, all products were reported to have been sold. Spillage in the plant facility was controlled by drains throughout the facility. Liquid spillage (including boron) was piped to a lagoon at the southeast end of the site property (fig. 5). Boric acid would have been the principal chemical contaminant, resulting from the decomposition of diborane. Therefore, it was suspected that the soil and ground water might be contaminated by boron. Boron is not considered a hazard to human health but can be toxic to plants.

The site is situated on glaciofluvial deposits and tills of Pleistocene age. Gamma-ray logs (figs. 6 and 7) and well drillers' logs indicate that the site is underlain by about 25 to 30 feet of silt and clay. A transmissive sand layer was penetrated between about 12 and 18 feet below land surface during the augering of monitor well 13CDC2 (fig. 7). Bedrock was not penetrated after augering to a depth of 50 feet; however O'Connor (1960) indicates that bedrock occurs at a depth of about 50 to 55 feet in the area and consists of shale of Pennsylvanian age. The water table was about 35 feet below land surface during well installation.

On the basis of ground-water flow gradients inferred from topographic characteristics, well 13CCA was installed upgradient and wells 13CDC1 and 13CDC2 were installed downgradient from suspected areas of waste disposal (fig. 5). Ground-water samples collected from downgradient wells 13CDC1 and 13CDC2 contained larger concentrations of boron [1,400 and 590µg/L (micrograms per liter), respectively] than samples from the upgradient

Table 3. *Selected chemicals from the U.S. Environmental Protection Agency's list of priority pollutants (as mandated by the Federal Water Pollution Control Act Amendments of 1972) that were analyzed for during this study*

Acidic Compounds	
Phenol	Para-Chloro-meta-cresol
2-Nitrophenol	2-Chlorophenol
4-Nitrophenol	2,4-Dichlorophenol
2,4-Dinitrophenol	2,4,6-Trichlorophenol
4,6-Dinitro-ortho-cresol	2,4-Dimethylphenol
Pentachlorophenol	
Neutral Compounds	
1,2-Dichlorobenzene	Acenaphthylene
1,3-Dichlorobenzene	Acenaphthene
1,4-Dichlorobenzene	N-Butyl benzyl phthalate
Hexachloroethane	Fluorene
Hexachlorobutadiene	Fluoranthene
Hexachlorobenzene	Chrysene
1,2,4-Trichlorobenzene	Pyrene
bis(2-Chloroethoxy)methane	Phenanthrene
Naphthalene	Anthracene
2-Chloronaphthalene	Benzo(a)anthracene 1, 2-Benzanthracene
Isophorone	Benzo(b)fluoranthene
Nitrobenzene	Benzo(k)fluoranthene
2,4-Dinitrotoluene	Benzo(a)pyrene
2,6-Dinitrotoluene	Indeno(1,2,3-c,d)pyrene
4-Bromophenyl phenyl ether	1,2,5,6-Dibenzanthracene
bis(2-Ethylhexyl)phthalate	Benzo(g,h,i)perylene, 12-Benzoperylene
Di-n-octyl phthalate	4-Chlorophenyl phenyl ether
Dimethyl phthalate	bis(2-chloroethyl)ether
Diethyl phthalate	Hexachlorocyclopentadiene
Di-n-butyl phthalate	bis(2-Chlorisopropl)ether
Basic Compounds	
Benzidine	N-Nitrosodimethylamine
N-Nitrosodiphenylamine	N-Nitrosodi-n-propylamine
Purgeable Compounds	
Benzene	2-Chloroethyl vinyl ether
Toluene	Chloroform
Ethylbenzene	1,2-Dichloropropane
Carbon tetrachloride	1,3-Dichloropropane
Chlorobenzene	Methylene chloride
1,2-Dichloroethane	Dichlorobromomethane
1,1,1-Trichloroethane	Chlorodibromomethane

Table 3. *Selected chemicals from the U.S. Environmental Protection Agency's list of priority pollutants (as mandated by the Federal Water Pollution Control Act Amendments of 1972) that were analyzed for during this study*--Continued

Purgeable Compounds--Continued

1,1-Dichloroethane	Tetrachloroethylene
1,1-Dichloroethylene	Trichlorethylene
1,1,1-Trichloroethane	Vinyl chloride
1,1,2,2-Tetrachloroethane	1,2-trans-Dichloroethylene
Chloroethane	Bromoform

Pesticides and related compounds

Endosulfan	Toxaphene
Aldrin	Arochlor 1016
Dieldrin	Arochlor 1221
DDE	Arochlor 1232
DDD	Arochlor 1242 (polychlorinated biphenyls (PCB))
Endrin	Arochlor 1248
Heptachlor	Arochlor 1254
Heptachlor epoxide	Arochlor 1260
Chlordane	2,3,7,8-Tetrachlorodibenzo

Trace elements

Antimony	Lead
Arsenic	Mercury
Barium	Nickel
Beryllium	Selenium
Cadmium	Silver
Chromium	Zinc
Copper	

Table 4. *Selected chemical constituents found in water samples collected from sites 1-9 and State and Federal drinking-water standards*

Chemical compound or constituent	Unit of measurement	Kansas Notification Level [1]	Kansas Action Level [2]	Maximum contaminant level goal [3]	Primary maximum contaminant level [4]	Secondary maximum contaminant level [5]
Nitrogen, as NO_2	milligrams per liter	--	10	--	--	
Cyanide	do.	--	154	154	--	--
Chloride	do.	--	--	--	--	250
Sulfate	do.	--	250	--	--	250
Fluoride	do.	--	4	4	4	--
Arsenic	micrograms per liter	--	50	50	50	--

Table 4. *Selected chemical constituents found in water samples collected from sites 1-9 and State and Federal drinking-water standards*--Continued

Chemical compound or constituent	Unit of measurement	Kansas Notification Level [1]	Kansas Action Level[2]	Maximum contaminant level goal[3]	Primary maximum contaminant level [4]	Secondary maximum contaminant level [5]
Barium	micrograms per liter	--	1,000	1,000	1,000	--
Beryllium	do.	--	.13	.13	--	--
Cadmium	do.	--	5	5	10	--
Chromium	do.	--	50	50	50	--
Iron	do.	--	300	--	--	300
Lead	do.	--	50	50	50	--
Manganese	do.	--	50	50	--	50
Zinc	do.	--	5,000	5,000	5,000	--
Antimony	do.	--	143	143	--	--
Selenium	do.	--	45	--	45	--
Carbon tetrachloride	do.	0.5	5	5	5	--
1,2 dichloroethane	do.	.5	5	5	5	--
Bromoform	do.	1.5	100	100	100	--
Chloroform	do.	.5	5	100	100	--
Toluene	do.	200	2,000	2,000	--	--
Benzene	do.	0.5	5	5	5	--
Anthracene	do.	(6)	(7)	(6)	--	--
Butylbenzylpthalate	do.	1	10	10	--	--
Ethylbenzene	do.	68	680	680	--	--
Fluoranthene	do.	(6)	(7)	(6)	--	--
Methylene chloride	do.	5	50	4.8	--	--
Phenanthrene	do.	(6)	(7)	(6)	--	--
Pyrene	do.	(6)	(7)	(6)	--	--
1,1 Dichloroethane	do.	.5	5	--	--	--
1,1 Dichloroethane	do.	.7	7	7	7	--
1,1 Dichloroethylene	do.	.7	7	7	7	--
1,2 Dichloroethylene	do.	7	70	70	--	
1,1,1 Trichloroethane	do.	20	200	200	200	--
Benzo (a) anthracene	do.	(6)	(7)	(6)	--	--
Di-N octylpthalate	do.	1	10	--	--	--
Phenol	do.	30	300	300	--	--
Bis(2-ethylhexyl-pthalate)	do.	420	4,200	420	--	--
Vinyl chloride	do.	.2	2	2	2	--

Table 4. *Selected chemical constituents found in water samples collected from sites 1-9 and State and Federal drinking-water standards*--Continued

Chemical compound or constituent	Unit of measure-ment	Kansas Notification Level[1]	Kansas Action Level[2]	Maximum contaminant level goal[3]	Primary maximum contaminant level[4]	Secondary maximum contaminant level[5]
Napthalene	do.	14.3	143	143	--	--
Phenol	do.	30	300	300	--	--
Benzo (a) anthracene	do.	(6)	(7)	(6)	--	--
Di-N octylpthalate	do.	1	10	--	--	--
Napthalene	do.	14.3	143	143	--	--
Bis(2-ethylhexyl-pthalate)	do.	420	4,200	420	--	--
Vinyl chloride	do.	.2	2	2	2	--
Trichloroethylene (TCE)	do.	.5	5	5	5	--
Polychlorinated biphenyls (PCB)	do.	(8)	(9)	(8)	--	--

[1]Kansas Notification Level--the concentration of a compound or chemical constituent that constitutes an administrative c onfirmation by the State that ground-water contamination exists (Kansas Department of Health and Environment, written commun., 1987).

[2]Kansas Action Level--the concentration of a compound or chemical constituent that could produce human health risks. Where Kansas Action Level concentrations occur in public-water supplies, consumer notification is mandatory (Kansas Department of Health and Environment, written commun., 1987).

[3]Maximum contaminant level goal or U.S. Environmental Protection Agency Drinking Water Health Advisory--the concentration of a chemical compound or constitute at which no known or anticipated adverse effects of the health of persons occur and which allows an adequate margin of safety. These are not enforceable standards (U.S. Environmental Protection Agency, 1987).

[4]Primary contaminant level--concentration of a chemical compound or constituent that cannot be exceeded in public-water supplies. These are enforceable standards (U.S. Environmental Protection Agency, 1987).

[5]Secondary maximum contamination level--concentration of chemical compound or constituent that can affect the aesthetic quality of public drinking-water supplies. These standards are not Federally enforceable and are intended as guidelines for the states (Code of Federal Regulations, Part 143).

[6]0.0029 micrograms per liter.

[7]0.029 micrograms per liter.

[8]0.000079 micrograms per liter.

[9]0.0079 micrograms per liter.

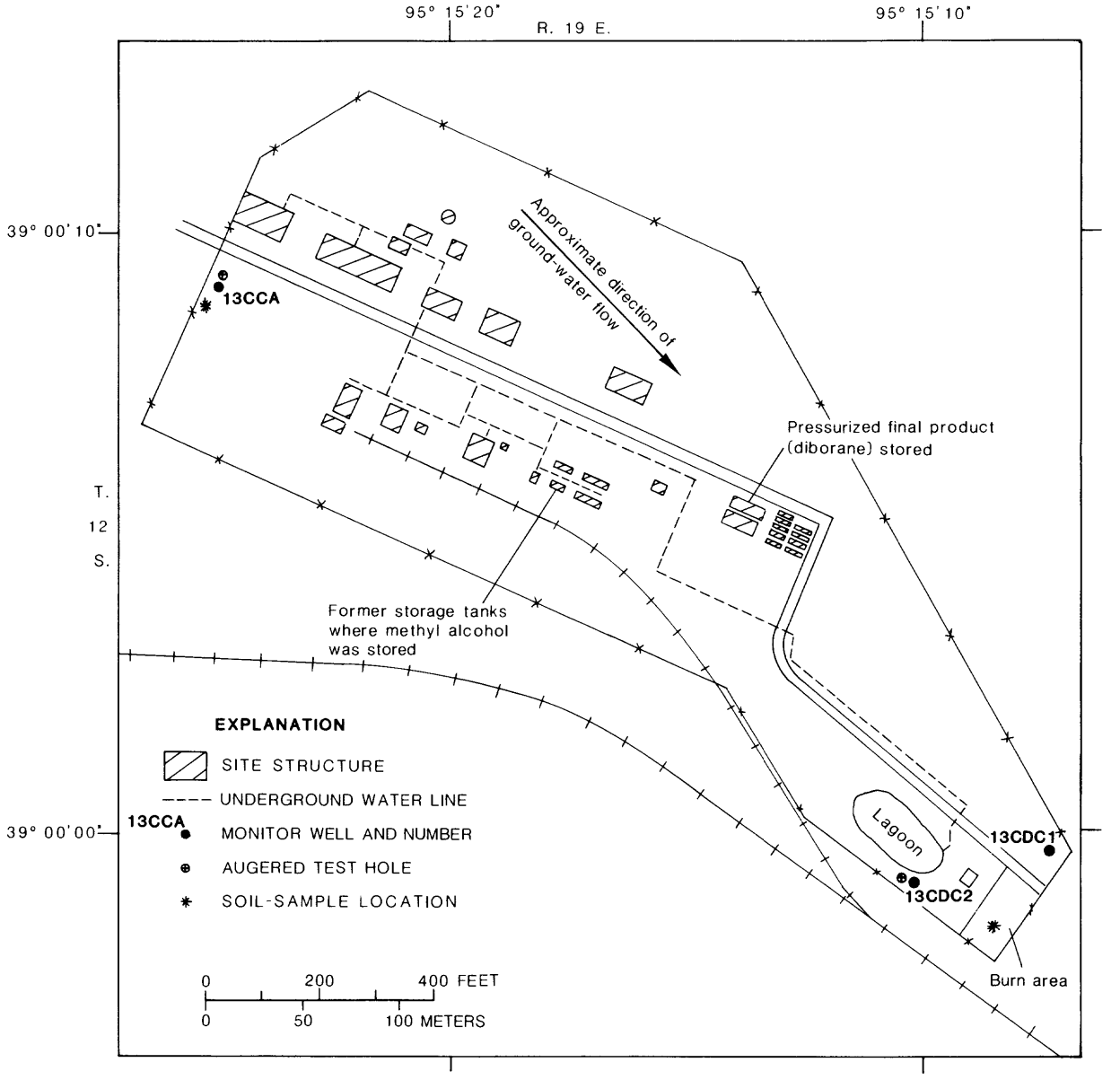

Figure 5. Site 1 showing site structures and characteristics, potential waste sources, monitor wells, test holes, soil-sampling locations, and direction of ground-water flow based on topographic characteristics.

well 13CCA (30µg/L), as shown in table 5 in the "Supplemental Information" section at the end of this report. The larger concentrations in samples from the downgradient wells were a result of contaminated ground water flowing from waste-disposal areas on the site. No offsite supply wells were samples. There are no State or Federal drinking-water standards established for boron. The only priority pollutant detected in the ground water was bis(2-ethylhexyl)-phthalate at a concentration of 10 µg/L in well 13CCA, which is substantially less than the Kansas Notification Level of 420 µg/L (table 4).

Soil samples were collected from two areas onsite; a sample near well 13CCA provided background information, and a sample near well 13CDC2 was collected because of past waste-disposal activities in that area. Boron concentrations of 10 µg/g (micrograms per gram) were detected in the background sample, whereas a concentration of 330 µg/g was detected near well 13CDC2 as listed in table 6 in

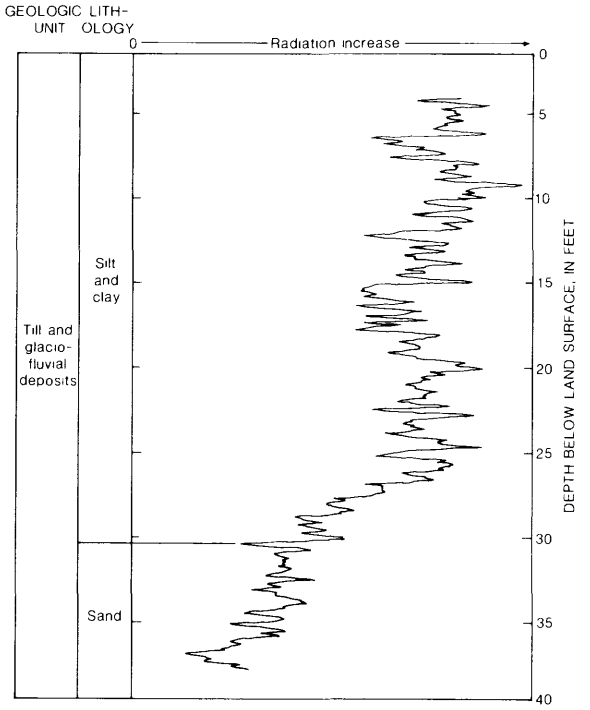

Figure 6. Gamma-ray log of test hole near monitor well 13CCA on site 1.

the "Supplemental Information" section, indicating soil contamination with boron. No concentrations of any chemical constituent or organic compound were found that were greater than existing drinking-water standards.

Site 2--Oil Waste Dump

Site 2 is located north of Solomon in Dickinson County and is about 3 miles north of the Smoky Hill River. The site consists of about 4 acres in the SW1/4 sec. 5, T. 13 S., R. 1 E. A detailed map is shown in figure 8.

The site is situated in a rural setting and was leased from 1971 to 1973 to dispose of old electrical transformers and capacitors. The oil from these materials was dumped and burned in three open pits that were about 4 feet deep with a combined area of about 600 ft^2, as shown in figure 8. Besides the disposal of waste oil, site served as an auto salvage yard. Polychlorinated biphenyls (PCB) were detected by the Kansas Department of Health and Environment during 1980 in soil samples collected near the old capacitors. Concentrations exceeded 50,000 µg/g (V.Kamath, Kansas Department of Health and Environment, written commun., 1981).

The dump site is situated on Pleistocene deposits consisting of terrace deposits overlain by dune sand. The terrace deposits consist of unconsolidated gravel, sand, silt, and clay (Gillespie and Hargadine, 1981). The dune sand consists of fine-to-medium quartz grains and locally contains considerable silt. Thickness of the dune sand ranges from 3 to 40 feet (Latta, 1949, p. 31). Well drillers' logs of monitor wells installed onsite suggested that a shallow unconsolidated aquifer system, consisting of clay stringers, exists under the site. A test hole was augered to 85 feet below land surface, and a gamma log of the hole (fig. 9) indicated a large

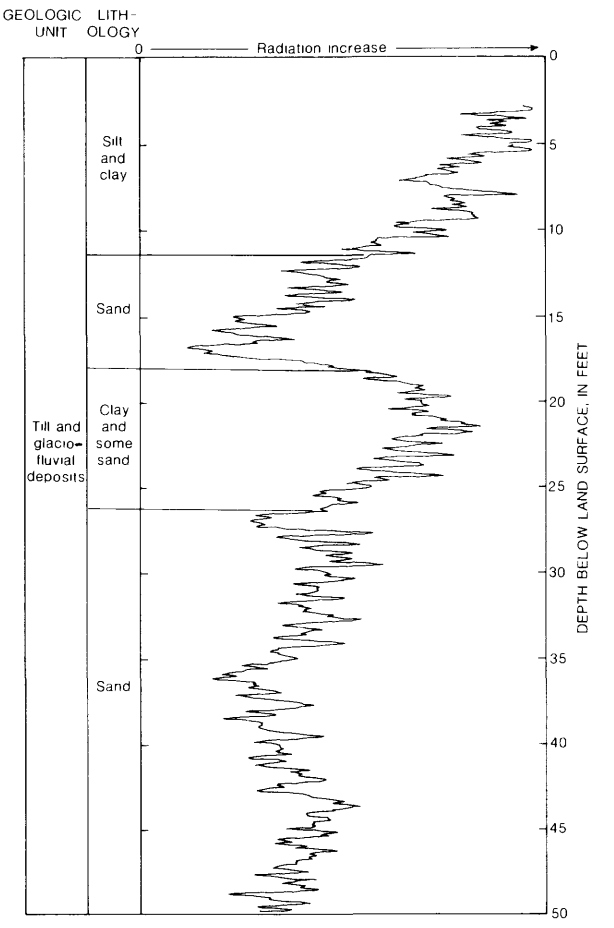

Figure 7. Gamma-ray log of test hole near monitor well 13CDC2 on site 1.

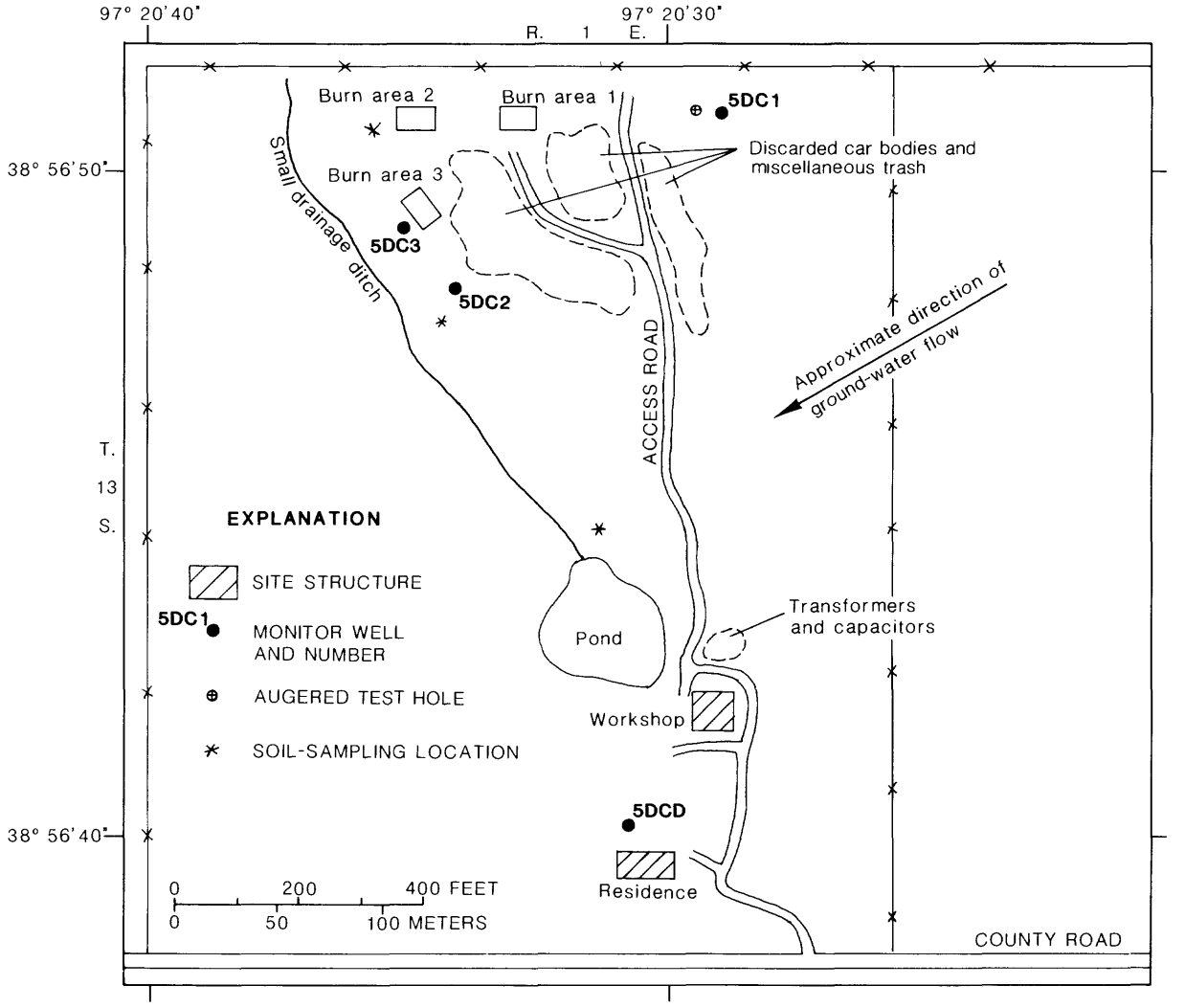

Figure 8. Site 2 showing site structures and characteristics, potential waste sources, monitor wells, test hole, soil-sampling locations, and direction of ground-water flow based on topographic characteristics.

percentage of sand to a depth of 85 feet. The approximate depth to water onsite was 20 feet below land surface. During augering of boreholes onsite, soil cores were collected at depths of 1.5, 2, and 10 feet. Permeameter tests made on these cores indicated the soil to have small to moderate hydraulic conductivity. Values ranged from 0.067 foot per day at 1.5 feet to 2.39 feet per day at 10 feet, as listed in table 2.

Well 5DC1 was installed upgradient of the waste pits, and wells 5DC2 and 5DC3 were installed downgradient. Water samples collected from well 5DC2 contained 0.5 µg/L of PCB, considerably more than existing State and Federal drinking-water standards (table 4). PCB was detected in water from supply well 5DCD located downgradient from the area where transformers and capacitors were stored. The occurrence of PCB in monitor well 5DC2 indicates localized contamination in the shallow aquifer in the vicinity of the burn pits.

Soil samples were collected from the drainage upgradient of the pond and then composited into one sample. The composited soil sample had a concentration of 3,200 µg/kg of PCB (table 6 at the end of this report). This concentration indicated the probable movement of PCB by overland runoff from the area of the burn pits.

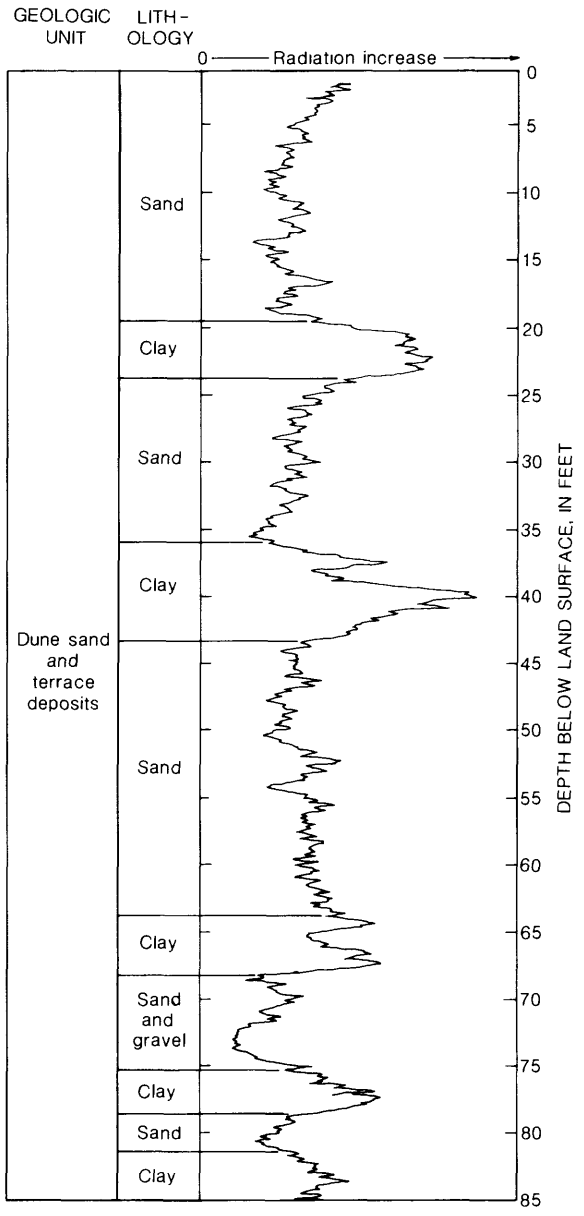

Figure 9. Gamma-ray log of test hole near monitor well 5DC1 on site 2.

Site 3--Former Soda-Ash Plant

Site 3 is located on the east side of Hutchinson, Reno County, and is about 4.5 miles north of the Arkansas River. The site occupies about 20 acres in the SE1/4 sec. 8, T. 23 S., R. 5 W. A detailed map is shown in figure 10.

The site was the location of a soda-ash plant that operated from about 1907 to 1943. The plant created both liquid and solid wastes, including calcium and sodium chloride, calcium sulfate, ammonia, magnesium hydroxide, calcium carbonate, and silica. Wastes were disposed in two separate piles onsite. The largest pile covers a 15- to 18-acre area and is about 20-feet high. This waste pile is composed of fine, partially cemented material that is powdery in texture. A smaller waste pile covered about 1 acre and was about 5-feet high. This pile consists of material that is white in color.

The geology of the site consists of alluvium and terrace deposits of Pleistocene age. The alluvium consists predominately of coarse sand and gravel, and the terrace deposits consist of gravel, sand, and silt, and small quantities of clay (Bayne, 1956). Gamma-ray logs of test holes augered onsite (figs. 11 and 12) and well-drillers' logs indicated that the formation feet, with sand content increased with depth. Water-yielding material was penetrating about 20 feet below land surface. Laboratory permeameter tests of soil cores that were collected during monitor-well installation indicated hydraulic-conductivity values of 0.02 foot per day at a 2-foot depth and 0.145 foot per day at a 10-foot depth (table 2).

Well 8DBA was installed upgradient from both waste piles; well 8DA1 and 8DA2 were installed downgradient. The ground water had larger concentrations of ammonia (0.29 to 0.36 mg/L), calcium (620 and 940 mg/L), and chloride (1,400 and 1,500 mg/L) in the downgradient wells as compared to the upgradient well where concentrations were: ammonia (0.29 to 0.36 mg/L) calcium, 140 mg/L; and chloride, 190 mg/L. These data suggest that leachate derived from the piles has contaminated ground-water flowing beneath the waste piles. Concentrations of chloride exceeded the recommended concentration of 250 mg/L for drinking water; concentrations of calcium and ammonia exceeded suggested limits of 75 to 200 mg/L for calcium and 0.1 mg/L for ammonia (Kansas Department of Health and Environment, written commun., 1986). No priority pollutants listed in table 3 were detected in ground water.

Site 4--Former Farm-Implement Assembly Plant

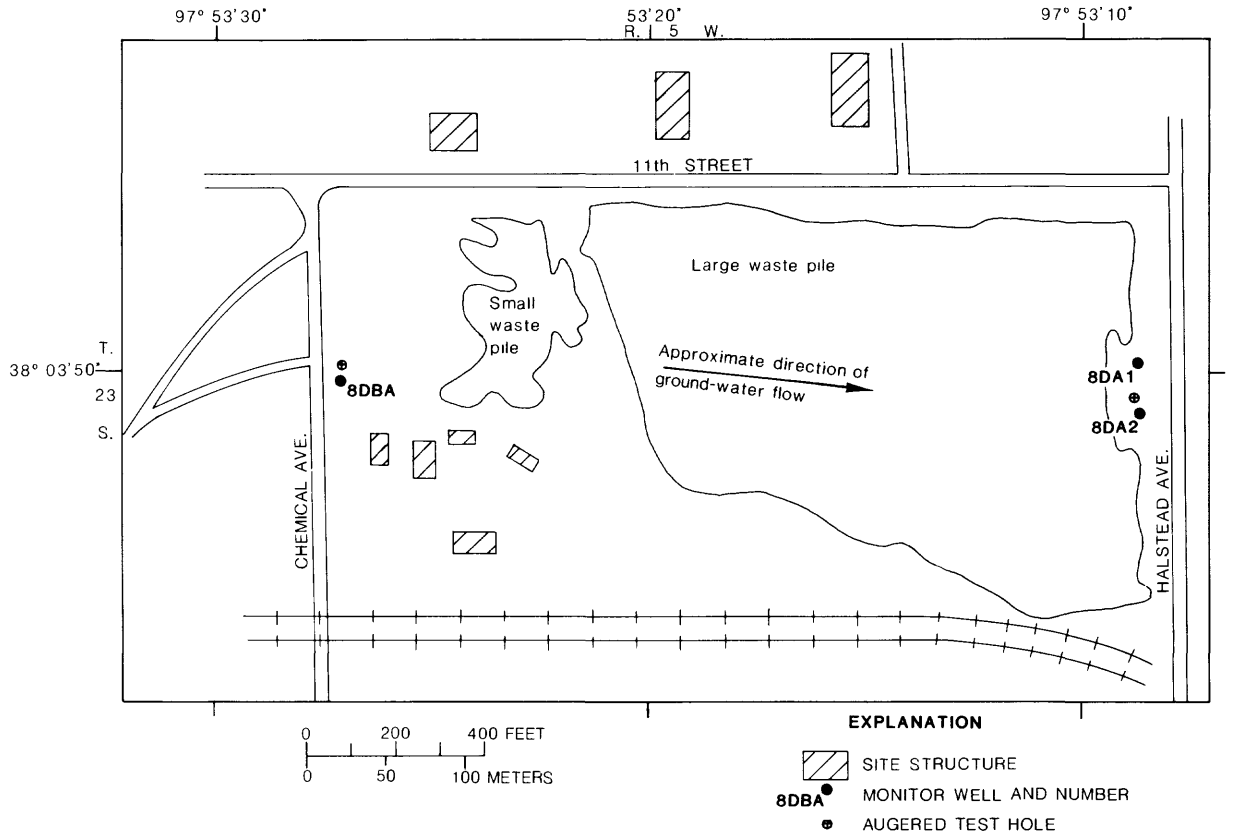

Figure 10. Site 3 showing site structures and characteristics, potential waste sources, monitor wells, test holes, and direction of ground-water flow based on topographic characteristics.

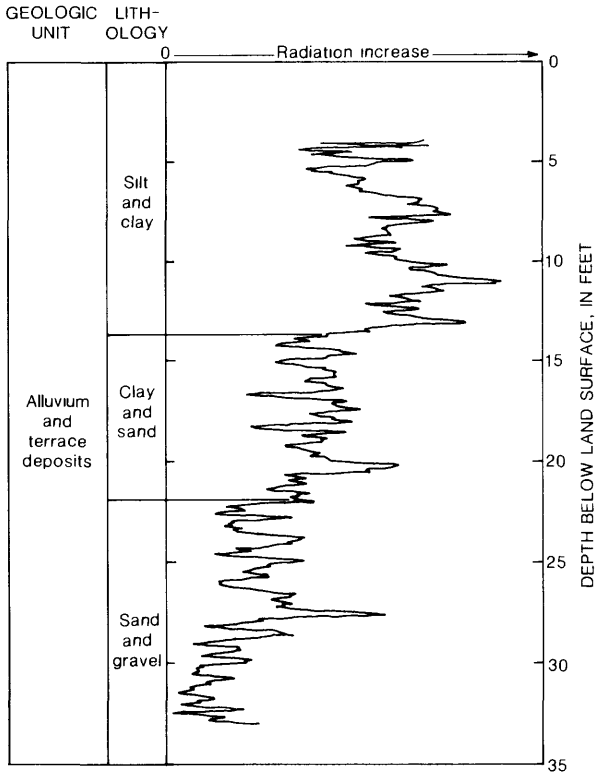

Figure 11. Gamma-ray log of test hole near monitor 8DBA on site 3.

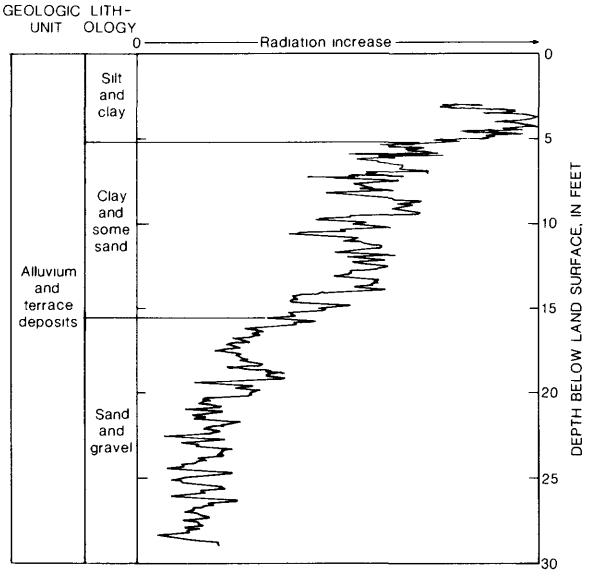

Figure 12. Gamma-ray log of test hole near monitor well 8DA2 on site 3.

Site 4 is located northwest of the town of Maize, in Sedgwick County, and is approximately 2.5 miles south of the Arkansas River. The site consists of about 15 to 20 acres in SE1/4 sec. 13, T. 26S., R. 2 W. A detailed map of the site is shown in figure 13.

The site was occupied by a plant that assembled plastic products and manufactured farm implements during 1977-81. The primary waste associated with the plant activities was organic solvents that were used as degreasing agents. The solvents were reportedly disposed of through a 4-inch pipe leading from the plant to a gravel pit with dimensions of 15 x 20 x 8 feet. An estimated 300 gallons per month of solvents were discharged to the pit.

The site is situated on terrace deposits of Pleistocene age consisting of fine-to-coarse sand and fine-to-coarse gravel that grade into sandy silt in the upper part (Lane and Miller, 1965). Gamma-ray logs (figs. 14 and 15) of test holes augered onsite indicated a thin silty clay layer in the upper 9 feet. Below 8 feet the formation material consists of clay and sand. The water

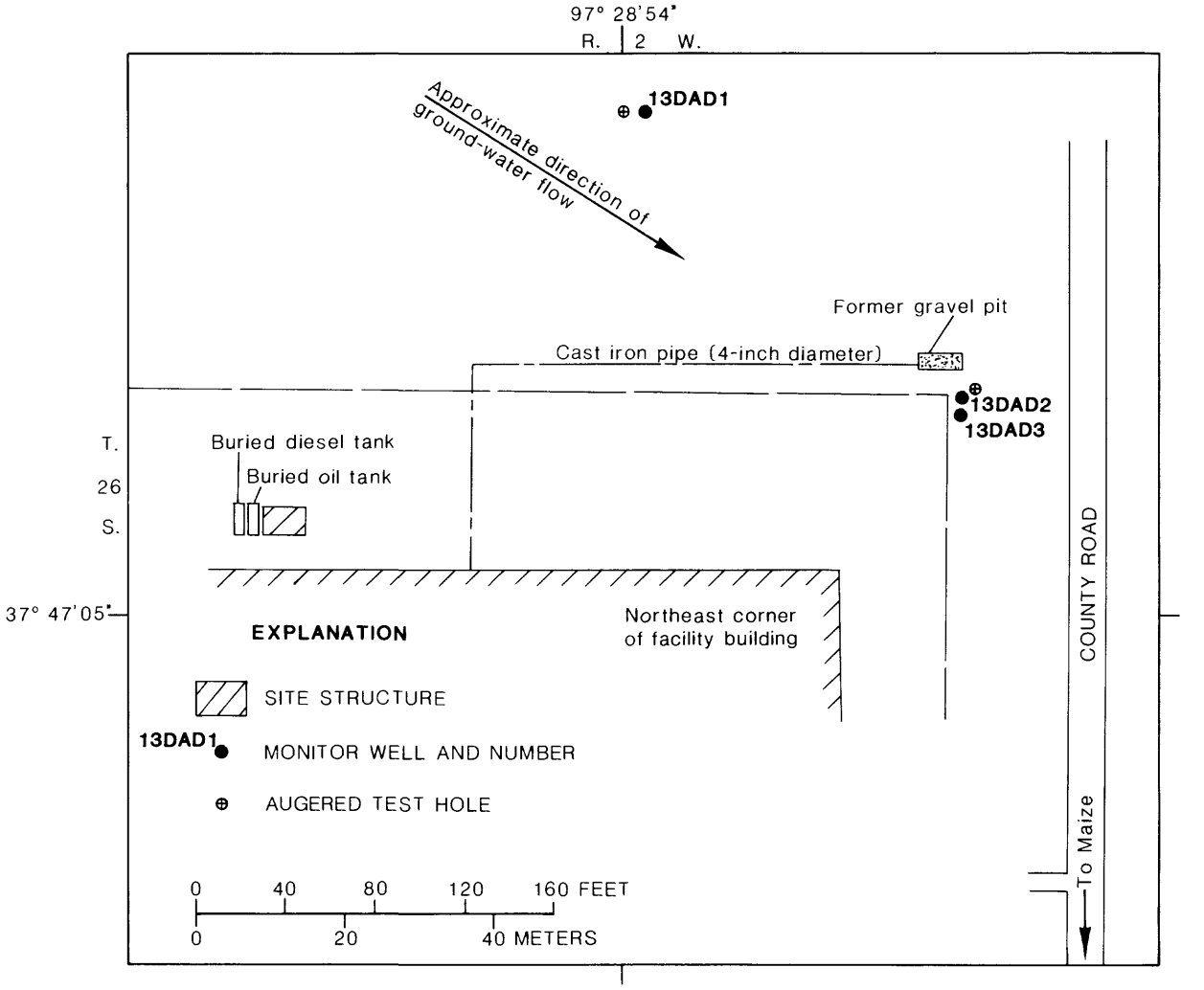

Figure 13. Site 4 showing site structures and characteristics, potential waste sources, monitor wells, test holes, and direction of ground-water flow based on topographic characteristics.

table was encountered about 15 feet below land surface during augering operations. Laboratory permeameter tests of soil cores that were collected during monitor-well installation at depths of 0.5, 2, and 10 feet indicated that the top 10 feet had small to moderate hydraulic conductivity, with values ranging from 0.007 foot per day to 0.326 foot per day (table 2).

Monitor wells were installed onsite, upgradient and downgradient from the former gravel pit. Analytical results of water samples collected from monitor wells 13DAD1 and 13DAD3 did not indicate the presence of any priority pollutants listed in table 3. Concentrations of methyl chloride (2.7 µg/L) and 1,1,1 trichloroethane (9.7 µg/L) were detected in water from monitor well 13DAD2 but did not exceed drinking-water standards listed in table 4. A surface geophysical survey was made in the vicinity of the gravel pit. However, no anomalies were detected using this technique.

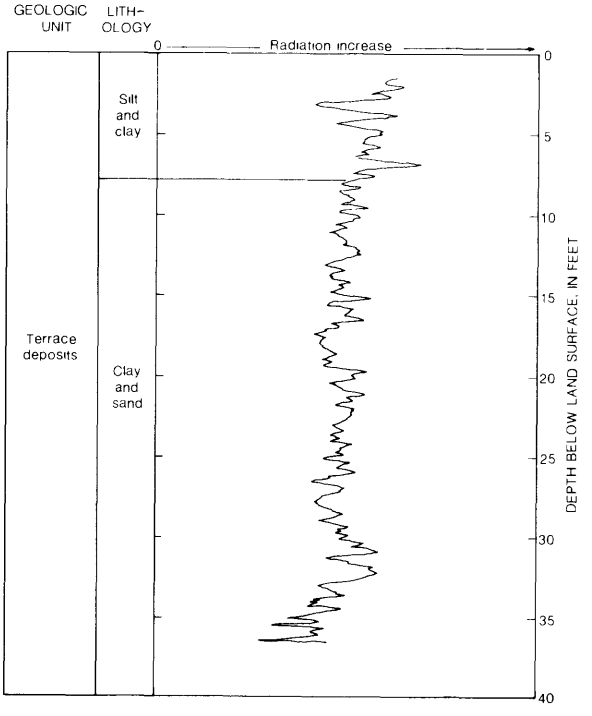

Figure 14. Gamma-ray log of test hole near monitor well 13DAD1 on site 4.

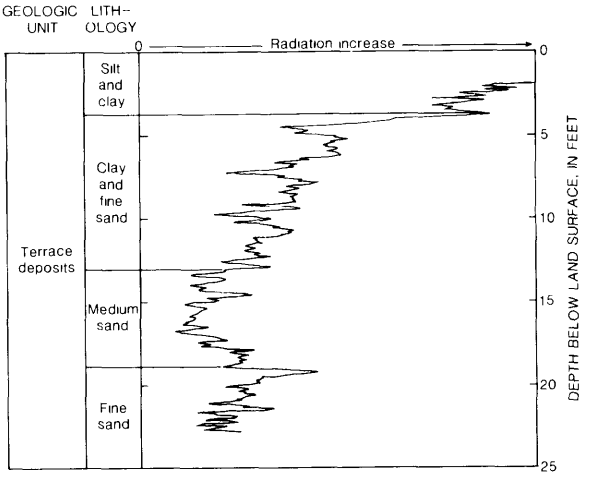

Figure 15. Gamma-ray log of test hole near monitor well 13DAD2 on site 4.

Introduction to Sites 5-9, Northeast Wichita

From 1984 through 1986, five sites were investigated in northeast Wichita, Sedgwick County. These sites are contiguous and cover an area of about 1 mi^2 north of 25th Street and between Ohio and Broadway Streets (fig. 16). This area of Wichita is industrialized, and land use consists of oil refineries, meat-processing facilities, truck-trailer manufacturing, grain-elevator storage silos, foundries, and metal-recycling facilities. To the west of the sites, the area is primarily residential with some commercial business. Industrial activities occur in the areas to the north, south, and east of the sites. Trucking and railroad transportations is used extensively in the area.

Sites 5 to 7 were investigated during the fall of 1984 and during 1985. Because of past activities on these sites, the sites are a potential source of ground-water contamination in this area; however, current (1985) activities on these

sites also may be contributing to ground-water contamination. The effects of current activities on sites 8 and 9 were investigated during the spring of 1986 to determine if these sites were contributing contamination to ground water in the area.

The hydrogeologic characteristics and ground- and surface-water uses of northeast Wichita will be discussed in the following paragraphs. This discussion includes the results of offsite hydrologic data collection, including ground-water-level measurements and chemical analyses of surface water, streambed material, soil, and water from supply wells adjacent to the sites.

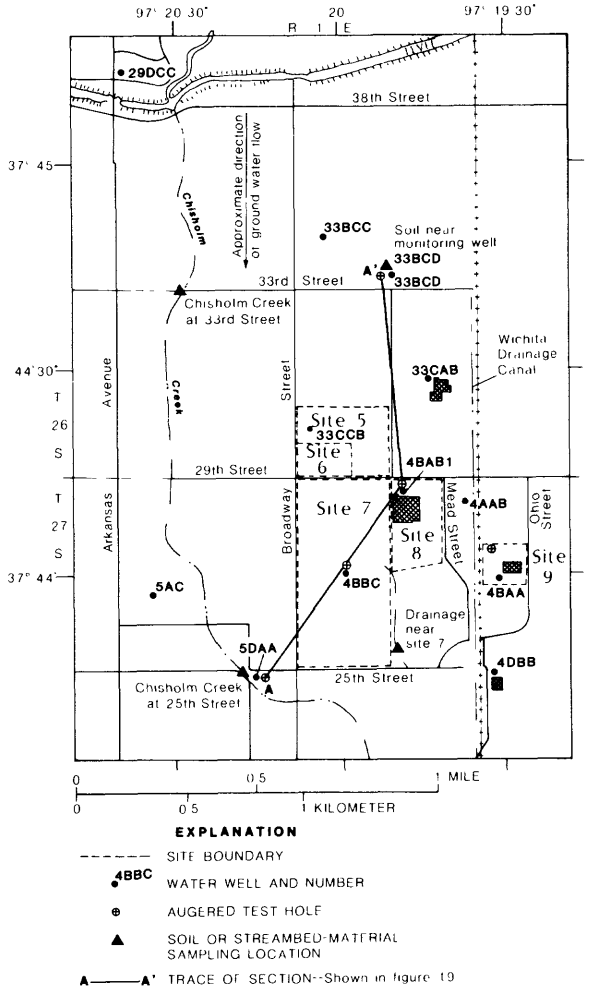

Figure 16. Part of northeast Wichita showing ground-water, soil, and streambed-material sampling locations near sites 5-9, and direction of ground-water flow based on water-level measurements, October 30, 1985.

Hydrogeology of Northeast Wichita

Northeast Wichita is situated in the valley of the Arkansas River. The geology consists of unconsolidated Pleistocene deposits, containing fine- to very coarse gravel, fine- to-coarse sand, and some silt and clay. The alluvial deposits average 45 feet in thickness. The Wellington Formation of Permian Age underlies the unconsolidated alluvial deposits (Lane and Miller, 1965).

Test holes were augered near monitor wells 33BCD and 5DAA (fig. 16), and gamma-ray logs of the test holes (figs. 17 and 18) indicate a large clay content in the upper 10 feet. Well-drillers' logs indicated a silty-clay material in the upper 10 feet and a sandy material in the depth interval between 10 and 40 feet. A geologic section from near monitor well 5DAA to near monitor well 33BCD is shown in figure 19. Tests conducted on soil cores from the test hole near monitor well 33BCD indicated that the formation material had small values of hydraulic conductivity. Values ranged from 0.046 to 0.709 foot per day from cores collected at 2 and 10 feet (table 2). Other soil cores were collected onsite and are discussed in the appropriate sections of this report.

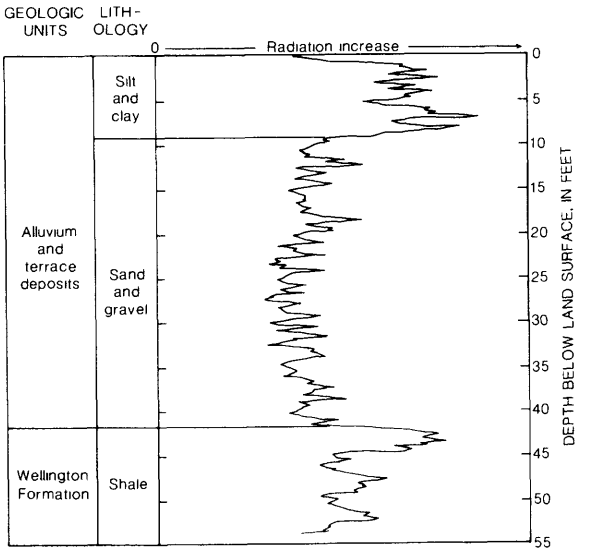

Figure 17. Gamma-ray log of test hole near monitor well 33BCD near sites 5-9.

The alluvial aquifer underlying the Arkansas River valley is the most extensively used source of water for domestic and stock purposes in the area. Wells penetrating the aquifer are capable of yielding large quantities of water (more than 500 gal/min) (Lane and Miller, 1965). Depth to the water table in the vicinity of the sites ranges from 9 to 12 feet below land surface. As shown in figure 20, the water in the alluvial aquifer in the area of the five sites tends to be a calcium bicarbonate type. The majority of the population within a 3-mile radius of the sites are served by public-water supplies. Lawn and garden wells are used extensively in residential areas of northeast Wichita.

Water-level measurements were made in about 20 wells screened in the alluvial aquifer within a 10-mi^2 area of northeast Wichita to determine the direction of ground-water flow. The potentiometric surface of the alluvial aquifer on October 30, 1985, is shown in figure 21; ground-water flow was towards the south.

The closest major surface-water body is the Little Arkansas River, which is about 2 miles west of sites 5-9.

Chemical Quality of Water and Soil Offsite From Sites 5-9

Ground Water

Two monitor wells were installed near sites 5-9. Monitor well 33BCD served as a background well, and monitor well 5DAA was installed downgradient from the sites. Monitor well 33BCD was destroyed after sampling during 1985 due to land development.

Results of chemical analysis of water sampled from various types of wells in the area indicated the presence of volatile organic compounds (VOC). Water from monitor well 33BCD (located upgradient from the five sites but still in an industrial area) had concentrations of several VOC, such as TCE (5.3 and 8.8 µg/L), 1,1-dichloroethane (2.6 µg/L), and 1,1,1-trichloroethane (0.7 µg/L). TCE also was detected in water from supply well 4DBB (470 µg/L) located in an industrial area to the south of the five sites and in water from supply well 5AC (20 µg/L) located in a residential area to the

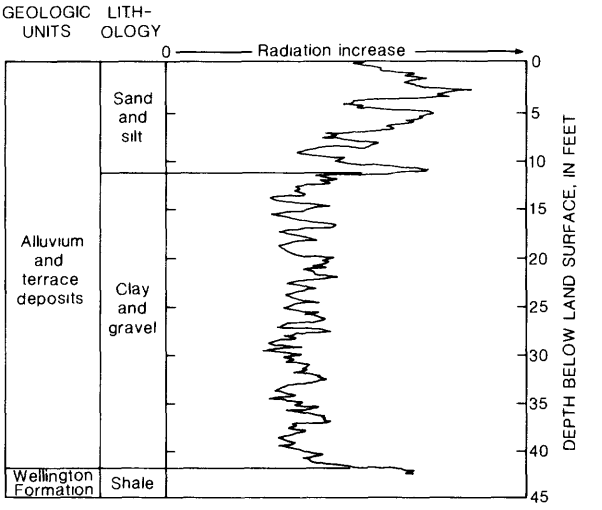

Figure 18. Gamma-ray log of test hole near monitor well 5DAA near sites 5-9.

west. These detected concentrations of TCE also exceeded the State and Federal drinking-water standard of 5 µg/L (table 4). In water from supply wells 4DBB and 5AC, the concentration of TCE also exceeded the State and Federal standard (table 4). Water from supply well 29DCC located in a residential area upgradient from monitor well 33BCD did not contain any VOC.

TCE was the most frequently detected contaminant in water from supply wells sampled in the area. Water from supply well 4BAB1 had a concentration of 1,400 µg/L, and water from supply well 33CAB had a concentration of 940 µg/L, which exceeded State and Federal drinking-water standards (table 4). Carbon tetrachloride, one of the more toxic and persistent compounds, was detected in water from supply wells 33CAB and 4BAB1 at concentrations of 64 and 110 µg/L and exceeded the 5 µg/L State and Federal drinking-water standards (table 4).

Streambed Material and Soil

Chemical analyses of streambed-material samples collected from Chisholm Creek (fig. 16) contained concentrations of trace elements and polynuclear aromatic hydrocarbons (PNA) (table 6 at the end of this report). Concentrations of antimony decreased from 8,100 µg/g at an

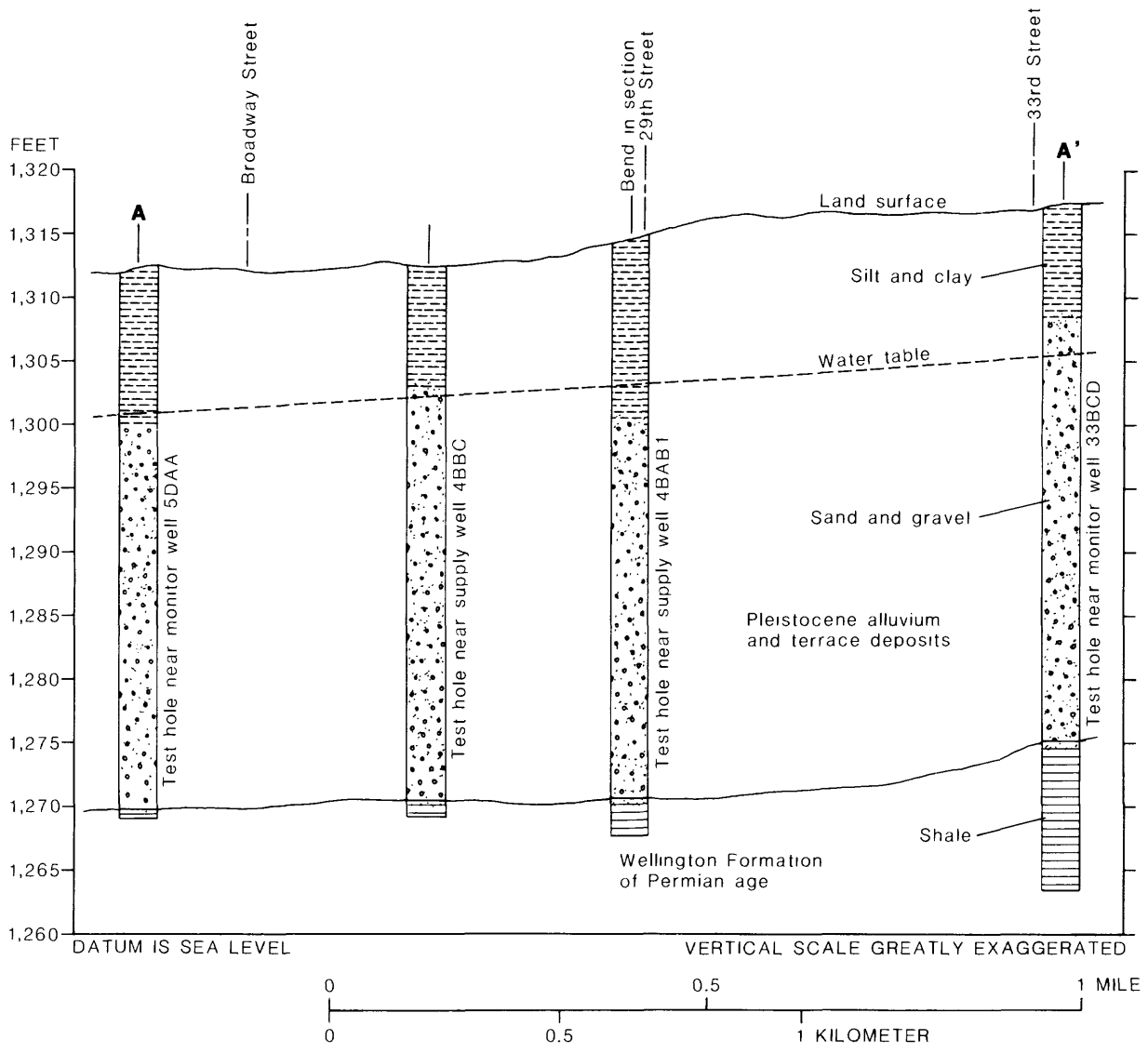

Figure 19. Geological section from test holes near monitor well 5DAA to near monitor well 33BCD. Trace of section is shown in figure 16.

upstream point at 33rd Street to 3,400 µg/g at a downstream point at 25th Street. Chrysene was detected at a concentration of 28 µg/kg at the upstream sampling point but was not detected at the downstream point. Fluoranthene and phenanthrene were detected upstream at concentrations of 55 to 140 µg/kg and downstream at concentrations of 27 to 110 µg/kg. Other trace elements and PNA were detected with concentrations usually larger at the downstream sampling point, as listed in table 6.

Analysis of streambed-material samples from a small drainage ditch (unnamed) located east of site 7 and south of site 9 (fig. 16) indicated concentrations of PNA greater than 2,000 µg/kg. As shown in table 6, benzo(a)anthracene

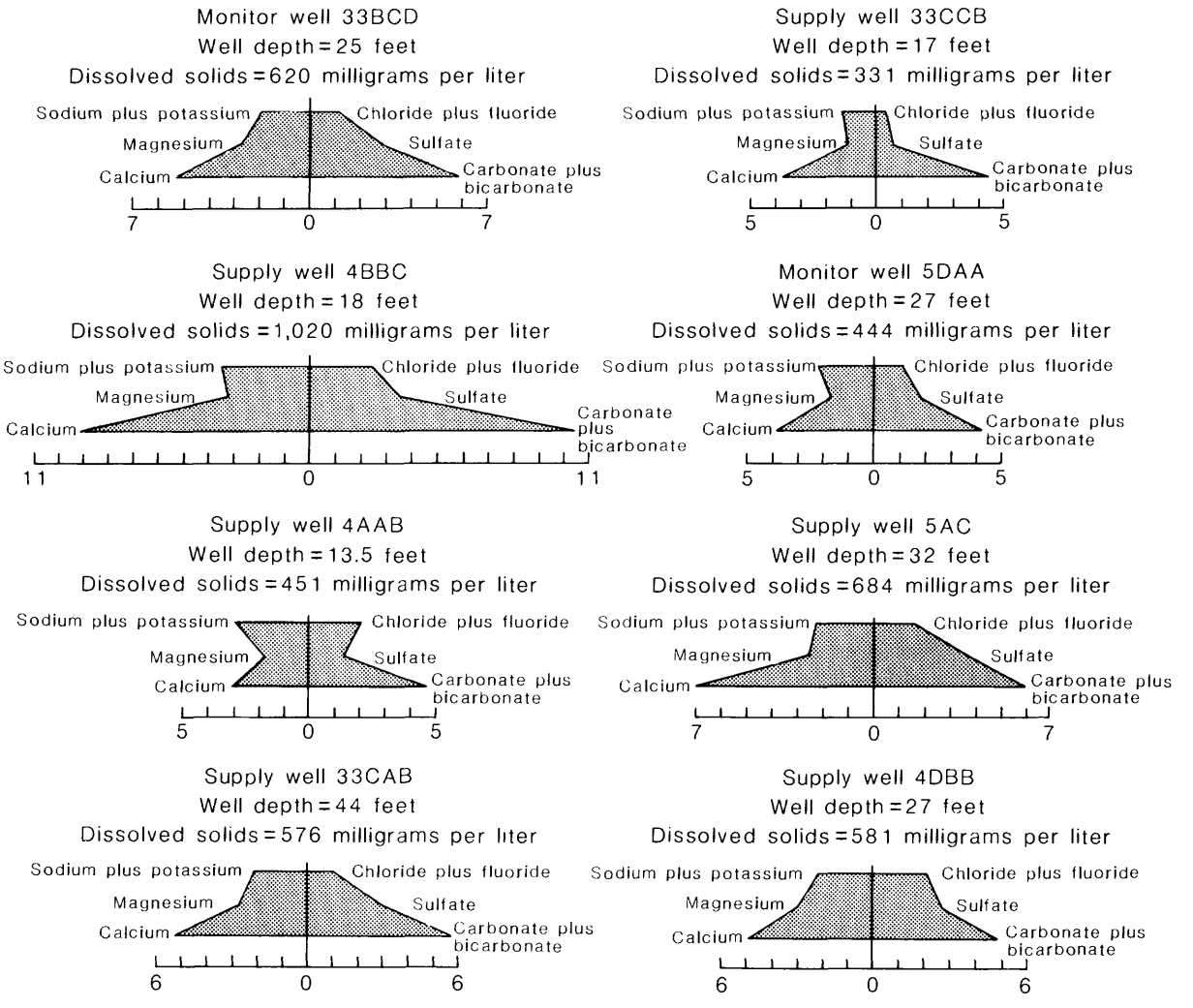

Figure 20. Chemical characteristics of water from eight wells in northeast Wichita, September-October 1985. Location of wells is shown in figure 16.

was detected at a concentration of 2,000 µg/kg, chrysene at 4,600 µg/kg, and phenanthrene at 3,800 µg/kg. These concentrations indicate that bed sediment in the drainage has been contaminated with PNA compounds.

Composite soil samples were collected near monitor well 33BCD to provide background information. Concentrations of trace elements and PNA were detected at this site; however, concentrations generally were smaller than in samples collected at sites 5-7, as listed in table 6 and discussed in the following sections of the report.

Site 5--Former Oil Refinery

Site 5 consists of about 30 acres in the vicinity of 29th and Broadway in the SW1/4sec.33, T. 20 S., R. 1 E. A detailed site map shown in figure 22.

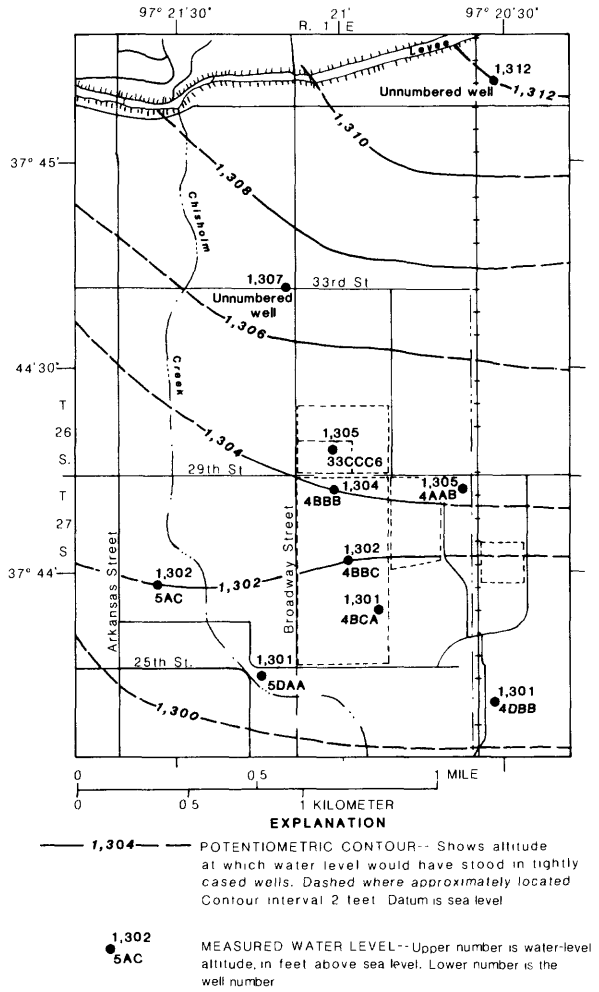

Figure 21. Potentiometric surface of the alluvial aquifer, northeast Wichita, October 30, 1985. (Unnumbered wells were not sampled for water-quality analysis.)

Activities on the site included a former oil refinery that operated from the early 1900's to about 1940. The refinery created acid-sludge, consisting of sulfuric acid and oil byproducts, that was disposed in open pits. Four disposal pits were identified from aerial photographs; these pits had estimated area of 102,000 ft^2. Information obtained from the Kansas Department of Health and Environment indicated that the contents of the pits either (Unnumbered wells were not sampled for water-quality analysis) were burned or removed from the site after the refinery ceased operations. From 1940 to 1950, activities on the site were not known. Starting about 1950, a solvent-reclamation facility began operation within site 5 and is discussed separately as site 6 in this report. Waste created by the oil refinery and solvent-reclamation facility complicated the task of defining contaminant sources.

Several monitor wells were installed onsite during 1984 and 1985. As shown in figure 22, monitor wells 33CCC1, 33CCC2, 33CCC3, 33CCC4, AND 33CCCB were installed downgradient from former acid-sludge pits, and monitor wells 33CCD and 33CCA were installed downgradient from areas where former petroleum storage tanks existed. The wells were screened from 3 to 10 feet below the water table. During installation of monitor wells 33CCC1 and 33CCD, soil cores were collected at depths of 2 and 10 feet. Permeameter tests (table 2) on the cores indicated a moderate hydraulic conductivity at depths of 2 feet in monitor well 33CCC1 (11.083 feet per day) and 10 feet in monitor well 33CCD (0.816 foot per day).

Analysis of ground-water samples detected several priority pollutants--VOC, such as methylene chloride and TCE, were detected in water from monitor wells 33CCD and 33CCA. Concentrations of methylene chloride (187 and 73 µg/L) and TCE (1,935 and 13 µg/L) and other detected VOC exceeded the water-quality standards listed in table 4. Water from monitor wells 33CCC1-33CCC4 also contained VOC, including benzene, toluene, and vinyl chloride. Samples from monitor well 33CCB did not indicate any evidence of contamination. PNA compounds, and possibly toluene and xylene, detected in the monitor wells probably are associated with activities of the oil refinery. Occurrence of most VOC, particularly halogenated compounds such as TCE or vinyl chloride, probably were derived from the former solvent-reclamation facility (site 6) or other industrial activities in the vicinity. All contaminants detected in water from the monitor wells are listed in table 5 in the "Supplemental Information" section of this report.

Soil samples were collected onsite near the former sludge pits as shown in figure 22. Concentrations of trace elements (lead, 420 µg/g; antimony, 1,200 µg/g; phenanthrene, 9,800 µg/g; pyrene, 1,200 µg/g) were detected in the vicinity of monitor well 33CCC2 that exceeded concentrations detected offsite near monitor well

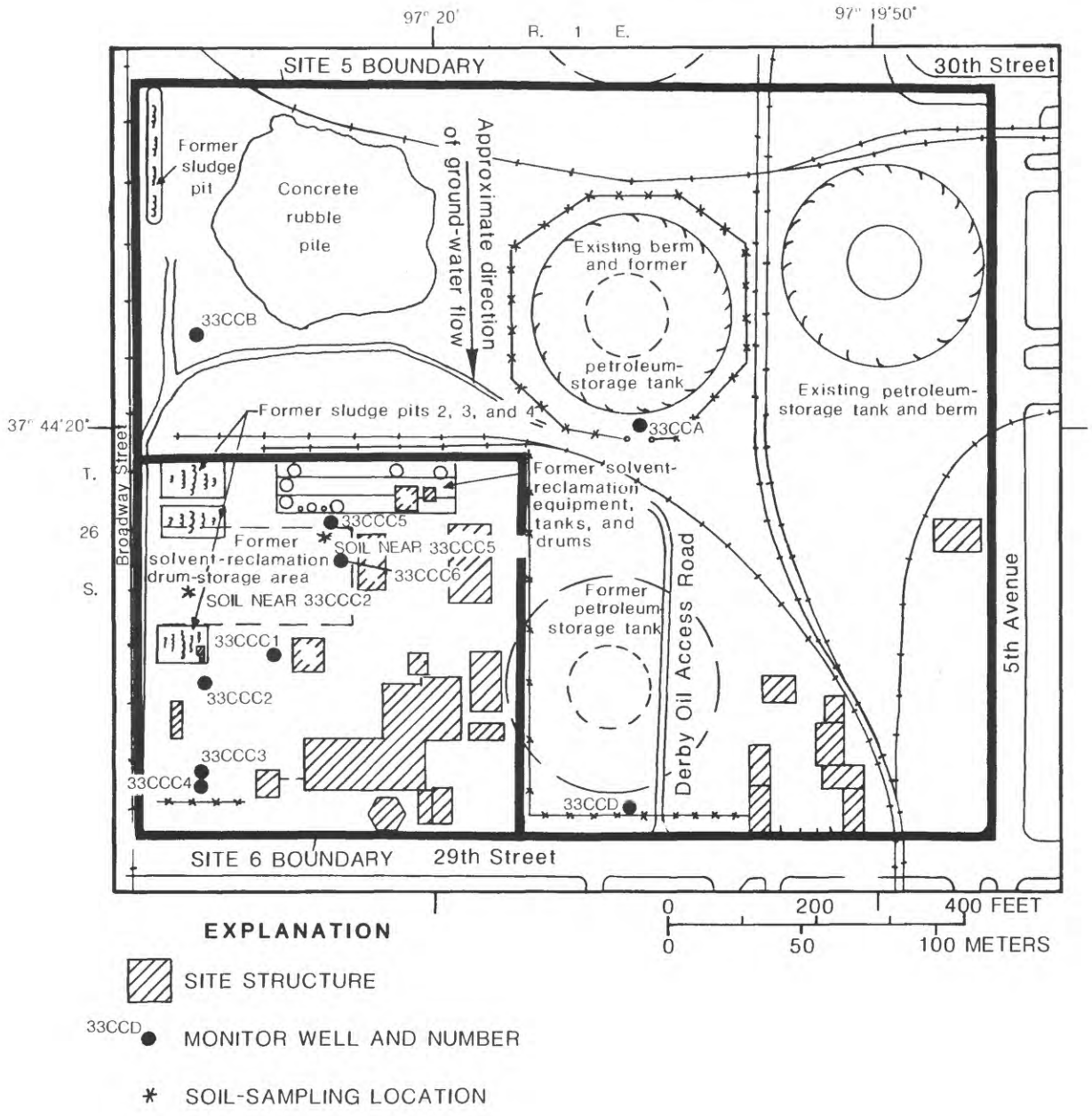

Figure 22. Sites 5 and 6 showing site structures and characteristics, potential waste sources, monitor wells, soil-sampling locations, and direction of ground-water flow based on water-level measurements, October 30, 1985.

33BCE (fig. 16). Sources of these contaminants are thought to be numerous due to past and current activities on the site. Results of all soil analyses are listed in table 6 in the "Supplemental Information" section of this report.

Site 6--Former Solvent-Reclamation Facility

Site 6 is situated within the boundaries of site 5 and consists of about 6 acres in the SW1/4 sec. 33, T. 26 S., R. 1 E. The location of the site and its orientation to site 5 are shown in figure 22.

As mentioned in the discussion of site 5, site 6 consisted of a solvent-reclamation facility that recycled unprocessed paint and solvents. These

materials were stored onsite in 55-gallon drums on the west edge of the site. The Kansas Department of Health and Environment estimated that 1,300 drums were stored before their removal to an approved disposal site. The drums were reported to have been corroded and leaking onto the ground surface. Sixteen drums still remained onsite during this investigation, some of which appeared to contain some type of substance. Several facility structures remain onsite, including large-capacity tanks that probably were used to store solvents. The State had not determined whether these tanks were empty or still contained product at the time of this investigation.

Prior to data-collection activities onsite, an extensive ambient air-quality survey was made of the site due to the volatile nature of the hazardous waste substance. Background readings of ionizable vapors in the ambient air were less than 3 ppm (parts per million). Vapor readings at about 2 to 3 feet above the ground surface in the vicinity where 55-gallon drums remained indicated concentrations of 4 to 60 ppm. Readings made at a valve located on one of the large storage tanks indicated ionizable vapor concentrations ranging from 4 to 14 ppm. Ionizable-vapor concentrations ranging from 4 to 130 ppm also were detected in the boreholes during augering of monitoring wells (fig. 23).

Monitor wells 33CCC5 and 33CCC6 were installed onsite immediately downgradient from the existing storage tanks. Monitor wells 33CCC1-33CCC4 were installed downgradient from the area where the majority of the 55-gallon drums were stored; however, these wells also are downgradient from former sludge pits created by oil-refinery activities on site 5. Monitor wells 33CCC5 and 33CCC6 were screened about 3 to 8 feet below the water table.

Analyses of ground-water samples collected from monitor wells 33CCC5 and 33CCC6 indicated the presence of several priority pollutants, including benzene (35 and 17 µg/L), vinyl chloride (44 and 25 µg/L), toluene (4.2 and less than 3.0 µg/L), and ethylbenzene (32 and 19 µg/L). Concentrations of VOC exceeded established water-quality standards listed in tables 4 and 5. With the exception of vinyl chloride, VOC can be associated with either the oil refinery or solvent-reclamation facility. Besides the detection of VOC, PNA compounds, including phenanthrene (3 and 7 µg/L) and naphthalene (99 and 110 µg/L), were detected in water from monitor wells 33CCC5 and 33CCC6. These PNA hydrocarbons probably are associated with refinery activities that took place on this site. All contaminants were detected in the ground water onsite are listed in table 5.

Soil samples were collected onsite near monitor well 33CCC5 (also near monitor well 33CCC2, which was discussed in the site-5 section of this report). Trace elements and PNA were detected at concentrations greater than offsite background concentrations. Concentrations of a few of the more toxic trace elements detected were antimony (4,100 µg/g), chromium (3,100 µg/g), and lead (540 µg/g). Background concentrations for these trace elements near monitor well 33BCD were: antimony, 3,100 µg/g; chromium, 100 µg/g; and

Figure 23. Measuring volatile vapors using a photoionization detector during monitor-well installation at sites 5 and 6.

lead, 60 µg/g. Even though these background concentrations were larger than expected, they were not too surprising due to the industrial activities near the sampling site. The concentrations detected at the background sampling site were still less than those detected onsite. Analytical results for all soil samples collected are listed in table 6.

Site 7--Former Oil Refinery

Site 7 is located directly south of sites 5 and

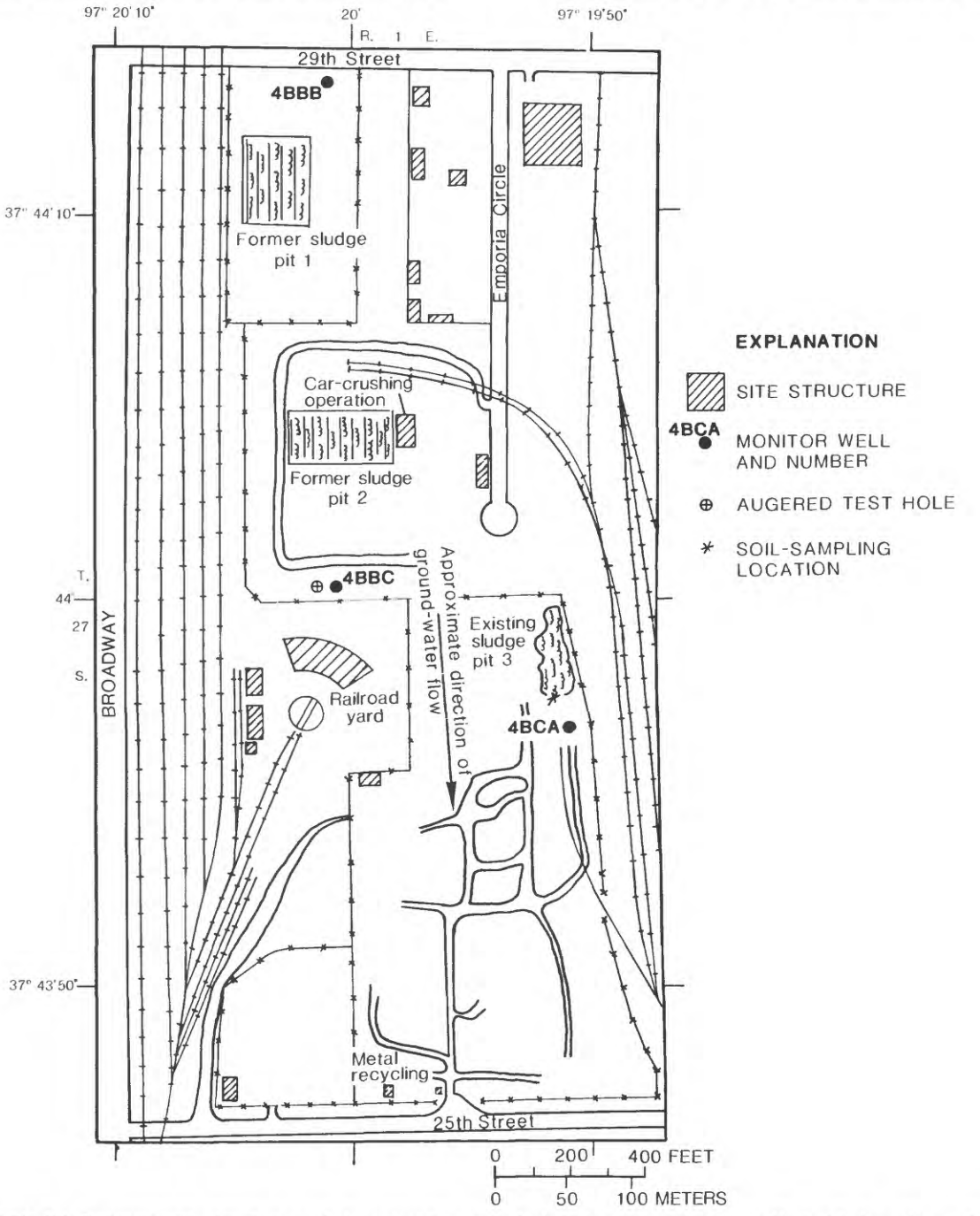

Figure 24. Site 7 showing site structures and characteristics, potential waste sources, monitor wells, test hole, soil-sampling locations, and direction of ground-water flow based on water-level measurements, October 30, 1985.

6 and consists of about 80 acres in the NW1/4sec. 4, T. 27 S., R. 1 E. A detailed site map is shown in figure 24.

Past activities on site 7 included the operation of an oil refinery from 1930 to 1950, which created three acid-sludge disposal pits. Contents of two of the three pits reportedly were removed. The third pit, shown in figure 25, still contains the tar-like substance assumed to be acid sludge. The area of this existing pit was estimated to be about 42,168 ft^2 (168 by 251 feet). The site property currently consists of two metal recycling facilities and small industrial-related businesses on its perimeter.

Prior to any data-collection activities onsite, the immediate area around the existing sludge pit was surveyed for ionizable vapors using a PID and for combustible gases using a CGI. No evidence of ionizable vapors was detected even after stirring up the tar-like sludge. During well installation, no vapors were detected in the boreholes.

During the installation of three monitor wells onsite, a test hole was augered to bedrock near monitor well 4BBC. A natural gamma-ray log of the borehole, as shown in figure 26, indicates a silty-clay layer in the top 8 feet, with the sand content increasing below a depth of 10 feet. Based on the direction of ground-water flow, monitor well 4BBB was installed upgradient from the former and existing sludge

Figure 25. Existing acid-sludge pit located on site 7.

pits. Monitor well 4BBC was installed downgradient from the two former sludge pits, and monitor well 4BCA was installed downgradient from the existing sludge pit (fig. 24).

Analysis of water samples collected from monitor wells 4BBC and 4BCA detected several VOC listed on the priority pollutant list (table 3). Methylene chloride was detected in water from monitor well 4BBC. Benzene and 1,1-dichloroethane were detected in water from monitor well 4BCA. TCE and 1,2 dichloroethylene were detected in water from monitor wells 4BCA and 4BBC. Water from the upgradient well 4BBB did not contain any of the contaminants. Halogenated compounds, such as TCE, methylene chloride, and 1,2 dischloroethylene, probably are derived from industrial activities not associated with the former refinery. PNA compounds (napthalene,anthracene, and indene) found in monitor wells 4BCA and 4 BBC probably are derived from the former oil refinery. All contaminants detected are listed in table 5.

Soil samples were collected onsite near the existing sludge pit (fig. 24). Trace elements were detected, including antimony (6,200 µg/g), and lead (270 µg/g), which were larger than concentrations in background samples near offsite monitor well 33BCD. All soil-sample analyses for the site are listed in table 6.

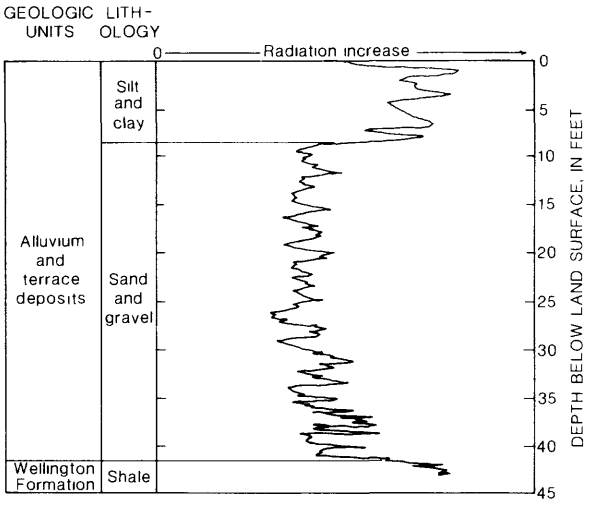

Figure 26. Gamma-ray log of test hole near monitor well 4BBC on site 7.

Site 8--Meat-Packing Plant

Site 8 is located adjacent to site 7 and consists of about 25 acres in the NW1/4 sec. 4, T. 27 S., R. 1 E. A detailed map of the site is shown in figure 27.

A plant that processes beef carcasses for distribution and renders beef tallow is located on the site. This site and site 9 differ from the previous sites in that current activities (1985) are believed to be the cause of contaminated ground water beneath the sites. The plant uses various chemicals in the operation and cleaning of equipment, but according to plant personnel no wastes are disposed on or offsite. The plant has been in operation since about 1980. Activities on the site prior to 1980 are unknown.

In 1985, the water supply well for the plant (well 4BAB1, fig. 27) was sampled by the Kansas Department of Health and Environment and by the U.S. Geological Survey during the investigation of sites 5 to 7. Analysis of the water indicated large concentrations of TCE (1,400 µg/L), carbon tetrachloride (110 µg/L), and other VOC. The pump to supply well 4BAB1 was disassembled by plant personnel to prevent further use because of contaminants in the water.

During the spring of 1986, a test hole was augered to bedrock, and two monitor wells were installed onsite (fig. 27). A gamma-ray log was made of the test hole and indicated increasing clay content in the upper 17 feet of formation material (fig. 28). The aquifer contains sand and gravel from about 17 to 45 feet below land surface. Observation of augered material verified the presence of silt and clay in the upper 17 feet and sand and gravel deeper than 17 feet. Monitor well 4BAB2 was located upgradient of the facility's supply well 4BAB1, and monitor well 4BAC was located downgradient from the facility (fig. 27). Monitor wells 4BAB2 and 4BAC were screened near the water table (about 15 to 20 feet below land surface), whereas supply well 4BAB1 was screened from 35 to 45 feet. Laboratory permeameter tests of a soil core collected at a depth of 0.5 foot near monitor well 4BAB2 indicated that this layer of soil had a moderate hydraulic conductivity, with a value of 1.049 feet per day.

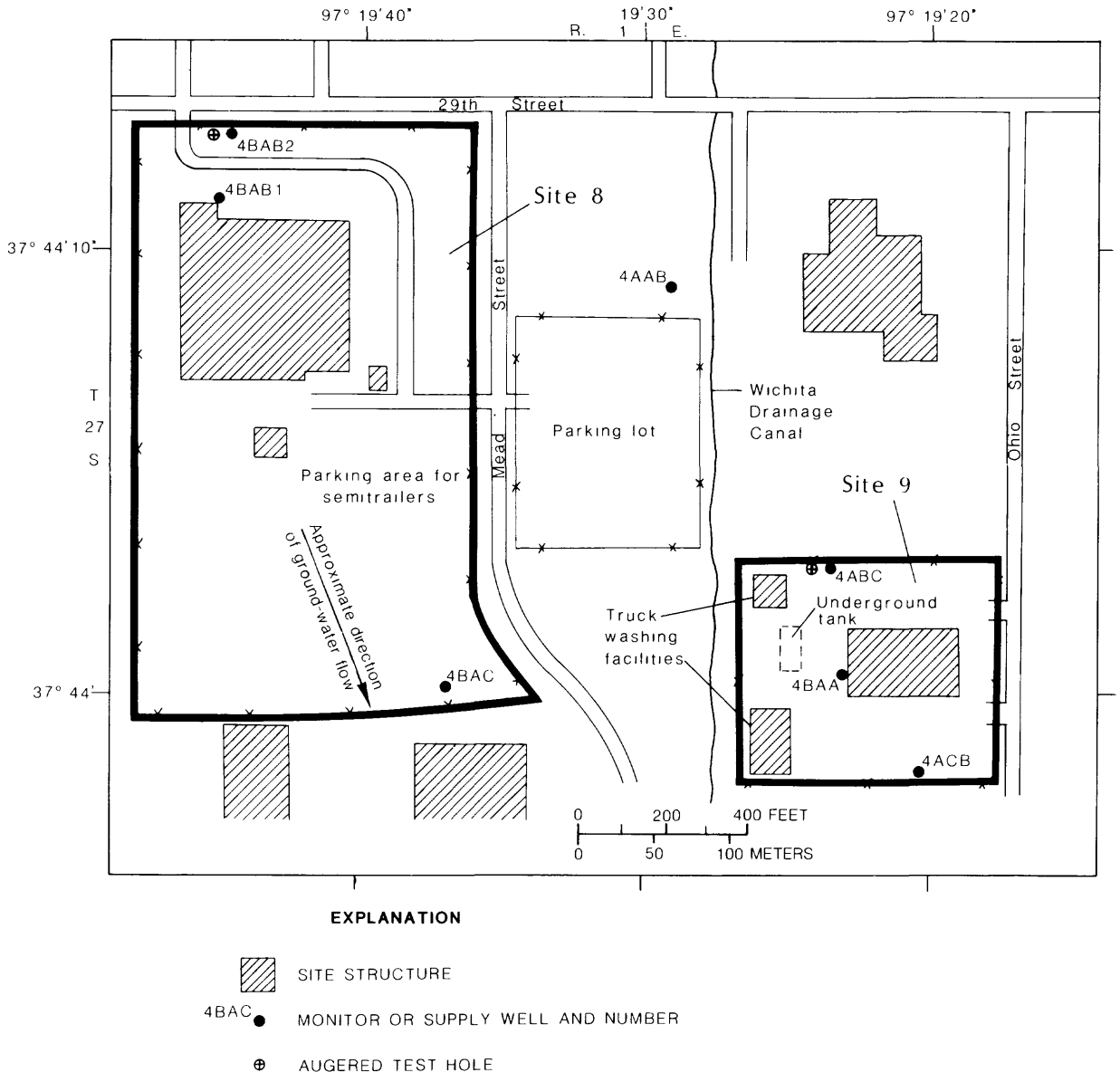

Figure 27. Sites 8 and 9 showing site structures and characteristics, potential waste sources, monitor wells, test holes, and direction of ground-water flow based on water-level measurements, October 30, 1985.

TCE was detected in water from monitor wells 4BAB2 (250 µg/L) and 4BAC (390 µg/L). However, larger concentrations of TCE occurred in water from monitor wells located upgradient and offsite (monitor well 33CCD, 1,935 µg/L, and supply well 33CAB, 940 µg/L), suggesting migration from upgradient sources. Also, concentrations of benzene isomers in water from wells 4BAB2 (2.5 to 3.9 µg/L) and 4ABC (2 to 27.1 µg/L) were smaller than concentrations in water from monitor wells 33CCC5 (1.2 to 63 µg/L) and 33CCC6 (5.1 to 217 µg/L), indicating that site 6 is the probable source of these contaminants. Several isomers of benzene with concentrations ranging from 2.5 to 3.9 µg/L were tentatively identified in water from monitor well 4BAB2 (table 7 at the end of this report). Carbon tetrachloride was not detected in water from in the onsite monitor wells, although it was detected in water from supply

well 4BAB1 and offsite supply well 33CAB during 1985. A possible reason that carbon tetrachloride was detected in water from supply wells 4BAB1 and 33CAB and not in water from the monitor onsite wells may be due to the depth to which the supply wells are screened. Both supply wells are screened deeper in the aquifer than are the monitor wells. Denser-than-water compounds, such as carbon tetrachloride, may be present at greater concentrations with increasing depth. Grain elevators exist in the area and may use carbon tetrachloride as an insecticide. The meat-packing plant reportedly does not use carbon tetrachloride.

During augering of monitor well 4BAB2, ionizable vapors ranging in concentration from 5 to 30 ppm were detected in the borehole with a PID. Ambient-air readings ranged from 0.3 to 5 ppm. PID readings from the borehole of monitor well 4BAC did not exceed ambient concentrations.

Site 9--Tanker-Truck Manufacturing and Cleaning Facility

Site 9 is located to the east of sites 5 through 8 and consists of about 5 acres in the NE1/4 sec. 4, T. 27 S., R. 1 E. A detailed site map is shown in figure 27.

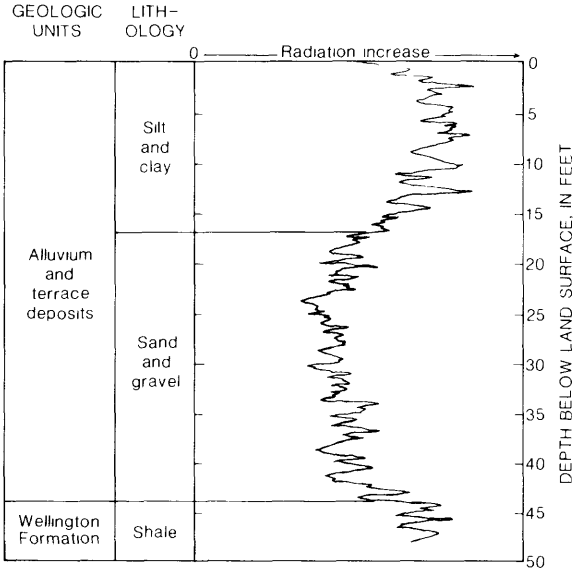

Figure 28. Gamma-ray log of test hole near monitor well 4BAB2 on site 8.

Current activities on the site include the manufacture and cleaning of tanker trucks that are used to transport asphalt, liquid propane gas, crude oil, ammonia, gasoline, or fertilizer. The company has been in operation since 1936 but has been located in other areas. It is not known how long the company has been operating at the present site, but it is estimated that it has been there for the past 15 years. On the basis of information obtained from the Kansas Department of Health and Environment, about 165 pounds of paint filters and 4,000 gallons of waste water that contain solvents are generated by the facility each month. These wastes are disposed at an approved dump site near Wichita. A 12,000-gallon underground storage tank is located onsite and is used to store waste water used in the steam cleaning of tanker trucks. Contents in the tank are pumped periodically and disposed offsite. The cleaning process involves two different methods, depending on the materials that are in the tankers. The first method uses 1,1,1-trichloroethane vapor to clean tankers that contained asphalt or crude oil. The second method uses steam to clean tankers that contained petroleum products. Residue from both cleaning processes are stored in the 12,000-gallon underground tank.

In 1985, the facility's supply well 4BAA (fig. 27) was sampled, and analysis detected concentrations of TCE (290 µg/L) and other VOC (table 5). The Kansas Department of Health and Environment sampled the contents of the underground storage tank in the same year, and analysis detected 10,700 µg/L of TCE plus other VOC. 1,1,1 trichloroethane was not detected in the ground water or underground storage tank even though the compound supposedly is used in the cleaning process. These results led to further investigation of the site.

In 1986, a test hole was augered to bedrock, and gamma activity indicated a greater clay content to about 10 feet below land surface and less clay from 10 to 45 feet below land surface (fig. 29). A layer with slight permeability was penetrated at a depth of about 50 feet. Laboratory permeameter tests on a soil core collected within the top 6 inches indicated that

the near-surface material has a hydraulic-conductivity value of 0.320 foot per day. After the test hole was augered, two monitor wells were installed onsite. One was installed upgradient (monitor well 4ABC) from the underground storage tank and one downgradient (monitor well 4ACB) (fig. 27). Analysis of the water from these wells detected 130 µg/L of TCE in the upgradient well and 280 µg/L in the downgradient well. These concentrations exceeded the water-quality standards listed in tables 4. Because larger concentrations of TCE occurred in ground water from nearby sites located upgradient from site 9, the source of TCE cannot be determined with the available data.

Ionizable vapors in the boreholes of monitor wells 4ABC and 4ACB, which were measured using a PID, had concentrations ranging from 3 to 15 ppm. Background concentrations of the ambient air ranged from 0 to 3 ppm.

SUMMARY

Nine hazardous-waste sites were investigated in Kansas during 1984 to 1986, to determine if the sites posed significant environmental problems and to determine the extent of possible contamination. Various sampling methods were used on each site to determine the extent and degree of contamination. Air-monitoring instruments were used to detect ionizable organic vapors. Monitoring wells were installed upgradient and downgradient from the suspected contaminant source on each site for the purpose of collecting water samples and measuring water levels. Surface geophysical surveys performed on several of the sites to aid in delineating possible contaminant plumes below land surface did not provide useful results. Natural gamma-ray logs and permeameter tests were used to define lithologic characteristics.

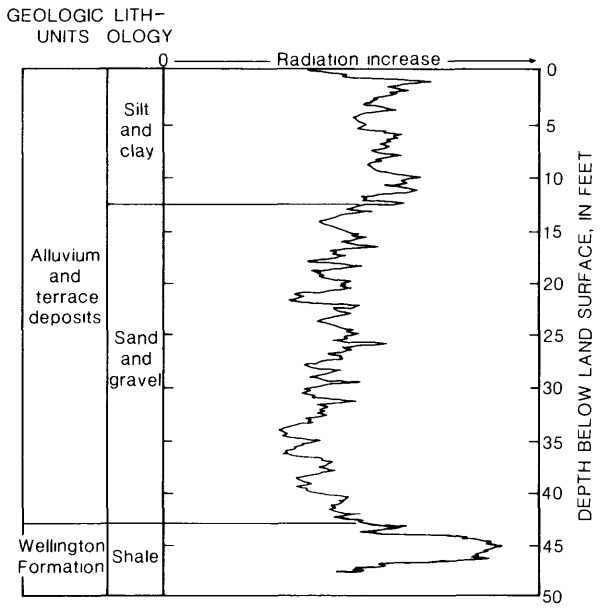

Figure 29. Gamma-ray log of test hole near monitor well 4ABC on site 9.

Significant results of each site investigated were as follows:

Site 1: Past activities onsite involved the production of diborane for use as a rocket fuel. Liquid spillage of product was piped to a lagoon and latter burned. Concentrations of boron (1,400 and (590 µg/L) were detected in the ground water downgradient from the site. Boron (330 µg/g) also was detected in the soil onsite. Boron is not considered a hazard to human health but can be toxic to plants. No concentrations of any priority pollutant were found in ground water that exceeded State or Federal drinking-water standards.

Site 2: This site was a waste dump where electrical transformers and capacitors were disposed. Oil from these electrical materials, containing polychlorinated biphenyls (PCB), were disposed into open pits and burned. PCB were detected in the soil by the Kansas Department of Health and Environment (50,000 µg/g), in ground water (0.5 µg/L), and in streambed material of a nearby drainage (3,200 µg/kg) onsite. A supply well downgradient from the pits did not contain any PCB. The occurrence of PCB in monitor well 5DC2 indicates localized contamination of the aquifer in the vicinity of the burn pits.

Site 3: Past activities on this site included the production of soda ash. Liquid and solid waste consisting of calcium and sodium chloride, calcium sulfate, ammonia, magnesium hydroxide, calcium carbonate, and silica were disposed onsite. Concentrations of ammonia (0.29 and 0.36 mg/L), calcium (620 and 940 mg/L), and chloride (1,400 and 1,500 mg/L) were

detected in the ground water downgradient from the disposed waste. Although no priority pollutants were detected, the elevated concentrations of calcium, ammonia, and chloride in wells downgradient from the site indicate ground-water contamination by leachate from wastes on the site.

Site 4: Farm implements were once manufactured on this site. Past activities involved the use of solvents as degreasing agents. These solvents were disposed in a gravel pit onsite. Concentrations of organic solvents (methylene chloride and 1,1,1 trichloroethane) were detected in the ground water downgradient from the pit, but the concentrations did not exceed existing State and Federal drinking-water standards.

Site 5: This site consisted of a former oil refinery where oil byproducts (acid sludge) were disposed into open pits. The acid sludge had been removed, and no indication of the pits was visible. Several priority pollutants were detected in the ground water. TCE (1,935 µg/L), methylene chloride (187 and 73 µg/L), and other halogenated organic compounds probably were derived from the solvent-reclamation facility (site 6) or other industrial activities in the vicinity. PNA compounds detected in ground-water samples probably are associated with wastes or activities of the former oil refinery. Antimony, lead, chrysene, phenanthrene, and pyrene were detected in the soil onsite in larger concentrations than in offsite soil samples.

Site 6: Past activities onsite included the recycling of solvents and paints supplied by nearby industries. These materials once were stored onsite in 55-gallon drums. The drums reportedly were corroded and leaking. Ionizable organic vapors (4 to 130 ppm) were detected in the boreholes during augering of wells. Vapor readings near drums remaining onsite indicated concentrations of 4 to 60 ppm. Concentrations of benzene (17 and 35 µg/L) and other VOC were detected in the ground water onsite. Concentrations of PNA (3 and 110 µg/L) also were detected in the ground water. Trace elements, such as antimony, chromium, and lead, were detected in the soil onsite; concentrations exceeded those in background samples.

Site 7: This site consisted of a former oil refinery similar to site 5. Acid-sludge pits had once existed onsite. One pit was still present during this investigation that contained tar-like acid sludge. Similar contamination was detected in the ground water and in the soil as detected on site 5. Vapor releases from the existing acid-sludge pit were not detected.

Site 8: Present activities (1985) on this site involved the processing of beef. No known hazardous substances were reported to have been used onsite; however, several organic solvents were detected in the ground water under the site. Concentrations of carbon tetrachloride (110 µg/L) and TCE (1,400 µg/L) were the two predominate contaminants detected in the ground water. Larger concentrations of TCE and benzene isomers in monitor wells located upgradient from site 8 indicate that contaminant sources for these compounds are located upgradient. Ionizable organic vapors (5 to 30 ppm) were detected in the boreholes during installation of wells onsite; however, ambient air concentrations ranged from 0.3 to 5 ppm.

Site 9: Present activities (1985) on this site involve the cleaning and manufacture of tanks for semitrailer trucks. The cleaning process involves the use of solvents to clean the truck tanks. The tanker trucks are used to transport a variety of potentially hazardous materials. Residue pumped from the tanks are disposed in a 12,000-gallon underground storage tank. Concentrations of TCE (130 and 280 µg/L) were detected in the ground water near the underground storage tank. However, because this compound occurred at other sites in the vicinity and at larger concentrations, the source of this contaminant cannot be determined with the available data. TCE also was detected in the storage tank by the Kansas Department of Health and Environment at a concentration of 10,700 µg/L. Other organic compounds also were detected in the ground water onsite.

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SUPPLEMENTAL INFORMATION

Table 5.--Chemical analyses of water from wells

[Values are given in degrees Celsius (°C), microsiemens per centimeter at 25 °C (µS/cm), milligrams per liter (mg/L), or micrograms per liter (µg/L), except as noted. < means less than]

Well number	Date (month-day-year)	Water temperature (°C)	Specific conductance (µS/cm)	Specific conductance, laboratory (µS/cm)	Oxygen, dissolved (mg/L)	pH (standard units)	pH, laboratory (standard units)	Alkalinity, laboratory (mg/L as $CaCO_3$)	Nitrogen, monia dissolved (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)
				Site 1 (Douglas County)						
13CCA	09-25-84	13	630	685	—	7.1	7.5	305	0.06	7.60
13CDC1	09-25-84	16	640	645	—	7.1	7.5	154	.18	16.0
13CDC2	09-25-84	16	635	547	—	7.2	7.9	287	.16	2.20
				Site 2 (Dickinson County)						
5DCD	10-10-84	16.5	1,220	1,100	—	7.3	7.5	—	.05	.59
5DC1	10-10-84	16.5	775	744	—	7.5	7.9	—	.02	6.60
5DC2	10-10-84	16.5	700	627	—	7.6	7.8	—	.05	.55
5DC3	10-10-84	17.5	840	803	—	7.5	7.7	—	.03	.65
				Site 3 (Reno County)						
8DBA	10-18-84	18	1,750	5,260	—	7.1	7.3	—	.03	5.00
8DA1	11-07-84	10.5	4,300	4,800	—	6.4	7.3	—	.36	1.60
8DA2	10-19-84	—	4,200	5,260	—	7.0	7.3	—	.29	5.40
				Site 4 (Sedgwick County)						
13DAD1	11-08-84	11	1,060	899	—	6.8	8.0	—	.04	18.0
13DAD2	11-08-84	11	732	701	—	6.6	—	—	.04	—
13DAD3	11-08-84	12	584	600	—	6.4	8.4	—	.10	8.20
				Sites 5-9 (Sedgwick County)						
33BCD	11-15-84	—	1,000	937	—	6.8	7.3	—	.09	2.50
33BCD	09-24-85	15.5	900	967	3.1	6.8	7.1	304	.07	3.10
33CCC1	11-15-84	—	1,220	1,080	—	6.4	7.8	—	.58	.51
33CCC2	11-15-84	—	1,230	1,120	—	6.3	7.2	—	.84	<.10
33CCC3	11-16-84	—	1,430	1,360	—	6.1	7.0	—	1.40	3.80
33CCC3	10-02-85	15	1,180	1,170	2.1	6.7	6.8	408	.76	1.50
33CCC4	11-16-84	—	1,200	1,110	—	6.1	7.0	—	.56	.67
33CCD	11-16-84	14	1,220	—	—	6.5	7.9	—	.07	—
33CCC5	09-25-85	17.5	2,000	1,910	2.2	6.5	6.8	628	1.60	<0.10
33CCC6	09-25-85	17.5	1,210	1,150	1.4	6.8	7.0	568	.85	< .10
33CCB	09-25-85	17.0	518	550	6.2	6.3	7.2	221	.04	1.60
33CCA	09-25-85	13	1,900	2,010	2.6	6.8	7.0	788	.14	3.20
33CAB	09-24-85	16	830	947	—	7.0	7.2	291	.03	2.50
4BBB	10-02-85	18	1,490	1,530	.7	7.0	7.2	708	1.70	<.10
4BBC	09-20-85	19	1,240	1,530	2.7	6.8	7.6	538	.62	.33
4BCA	10-02-85	17.5	1,800	1,070	1.0	6.5	6.7	428	1.60	<.10
5DAA	10-02-85	18	721	753	1.3	6.7	7.1	225	.04	<.10
4BAB1	09-25-85	15.5	696	947	—	6.9	7.3	307	.10	1.60
33BCC	09-25-85	16	1,020	962	—	6.8	7.4	287	.04	.12
4BAA	10-03-85	17	1,040	1,080	7.3	7.2	7.4	290	.04	5.70
4DBB	09-25-85	15.5	888	970	—	7.0	7.4	255	.06	1.60
29DCC	10-03-85	18	800	805	4.9	7.2	7.6	189	.01	<.10
5AC	09-25-85	15.5	1,100	1,070	—	6.7	7.1	311	.07	<.10
4AAB	09-25-85	17	790	826	2.7	6.3	7.1	240	.09	.23
4BAB2	04-29-86	17	1,420	1,230	6.6	7.6	7.5	254	.18	10.0
4BAC	04-29-86	16	849	803	.3	6.8	7.0	280	.05	4.30
4ABC	04-29-86	15.5	852	990	.4	7.1	7.3	289	.17	2.00
4ACB	04-29-86	15.5	1,050	1,030	.2	7.0	7.2	288	.31	4.00

Table 5.--Chemical analyses of water from wells--Continued

Well number	Date (month-day-year)	Cyanide, total (mg/L as CN)	Sulfide, total (mg/L as S)	Hardness, (mg/L as $CaCO_3$)	Calcium dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)
				Site 1 (Douglas County)						
13CCA	09-25-84	--1/	--	290	92	15	37	2.2	11	28
13CDC1	09-25-84	--	--	210	69	10	37	3.0	38	46
13CDC2	09-25-84	--	--	290	90	15	27	5.8	11	25
				Site 2 (Dickinson County)						
5DCD	10-10-84	--	--	560	140	51	29	2.0	26	280
5DC1	10-10-84	--	--	270	66	25	55	3.4	20	36
5DC2	10-10-84	--	--	310	77	28	24	2.2	9	22
5DC3	10-10-84	--	--	300	72	29	64	1.9	22	25
				Site 3 (Reno County)						
8DBA	10-18-84	--	--		140	33	210	4.8	190	330
8DA1	11-07-84	--	--	1,	620	29	410	6.7	1,400	410
8DA2	10-19-84	--	--	2,500	940	26	460	7.3	1,500	260
				Site 4 (Sedgwick County)						
13DAD1	11-08-84	--	--	340	98	22	79	3.1	140	75
13DAD2	11-08-84	--	--	260	76	18	45	4.9	--	--
13DAD3	11-08-84	--	--	260	76	16	33	1.8	16	36
				Sites 5-9 (Sedgwick County)						
33BCD	11-15-84	--	--	440	120	34	46	3.7	45	130
33BCD	09-24-85	--	--	420	110	34	45	3.3	43	140
33CCC1	11-15-84	--	--	480	140	31	55	4.0	51	100
33CCC2	11-15-84	--	--	490	140	33	58	6.7	64	26
33CCC3	11-16-84	--	--	550	160	37	74	28	65	200
33CCC3	10-02-85	--	--	510	150	32	47	33	12	200
33CCC4	11-16-84	--	--	510	150	32	53	23	43	130
33CCD	11-16-84	--	--	480	140	32	66	3.8	--	--
33CCC5	09-25-85	--	3.2	610	160	50	140	6.5	240	12
33CCC6	09-25-85	--	< .5	420	110	35	96	3.6	43	7.4
33CCB	09-25-85	--	< .5	250	75	14	29	2.5	12	30
33CCA	09-25-85	--	--	740	180	70	160	3.6	92	220
33CAB	09-24-85	--	--	420	110	34	51	2.5	39	140
4BBB	10-02-85	--	--	570	140	52	100	5.2	80	17
4BBC	09-20-85	<.01	3.2	640	190	40	78	5.7	88	180
4BCA	10-02-85	<.01	< .5	840	120	130	56	5.0	68	12
5DAA	10-02-85	--	--	270	76	20	48	3.4	41	90
4BAB1	09-25-85	--	--	410	110	33	41	2.5	43	130
33BCC	09-25-85	--	--	420	110	35	40	3.0	41	170
4BAA	10-03-85	--	--	440	110	41	57	2.9	70	160
4DBB	09-25-85	--	--	390	97	35	49	2.9	77	130
29DCC	10-03-85	--	--	310	87	23	50	4.2	85	82
5AC	09-25-85	--	--	480	140	31	51	3.9	57	180
4AAB	09-25-85	--	--	250	62	22	65	4.8	69	65
4BAB2	04-29-86	<.01	<1.0	500	140	36	62	6.1	85	240
4BAC	04-29-86	<.03	<1.0	270	72	22	65	2.6	51	130
4ABC	04-29-86	<.04	1.1	420	100	36	56	5.8	71	140
4ACB	04-29-86	<.04	<5.0	400	100	41	61	4.7	73	160

Table 5.--Chemical analyses of water from wells--Continued

Well number	Date (month-day-year)	Fluoride, dissolved (mg/L as F)	Silica, dissolved (mg/L as SiO_2)	Aluminum, dissolved (µg/L as Al)	Antimony, total (µg/L as Sb)	Arsenic, dissolved (µg/L as As)	Barium, dissolved (µg/L as Ba)	Beryllium, dissolved (µg/L as Be)	Boron, dissolved (µg/L as B)	Cadmium, dissolved (µg/L as Cd)
				Site 1 (Douglas County)						
13CCA	09-25-84	0.3	32	--	--	--	370	<0.5	30	1
13CDC1	09-25-84	.2	34	--	--	--	180	2	1,400	2
13CDC2	09-25-84	.3	25	--	--	--	120	2	590	1
				Site 2 (Dickinson County)						
5DCD	10-10-84	.3	18	--	--	--	120	< .5	--	<1
5DC1	10-10-84	.4	16	--	--	--	210	< .5	--	2
5DC2	10-10-84	.4	16	--	--	--	300	< .5	--	<1
5DC3	10-10-84	.4	16	--	--	--	300	< .5	--	1
				Site 3 (Reno County)						
8DBA	10-18-84	.7	21	--	--	<1	100	2	--	2
8DA1	11-07-84	.7	25	--	--	--	140	<3	--	<5
8DA2	10-19-84	.7	20	--	--	<1	110	2	--	4
				Site 4 (Sedgwick County)						
13DAD1	11-08-84	.4	19	--	--	<1	100	< .5	--	<1
13DAD2	11-08-84	--	18	--	--	<1	100	< .5	--	<1
13DAD3	11-08-84	.5	21	--	--	<1	<2	< .5	--	1
				Sites 5-9 (Sedgwick County)						
33BCD	11-15-84	.4	52	--	--	<1	140	1	--	2
33BCD	09-24-85	.4	19	2,300	--	<1	110	< .5	--	9
33CCC1	11-15-84	.4	21	--	--	2	550	< .5	--	2
33CCC2	11-15-84	.4	33	--	--	<1	1,000	< .5	--	<1
33CCC3	11-16-84	.4	16	--	--	3	260	< .5	--	<1
33CCC3	10-02-85	.3	12	10	--	9	100	< .5	--	<1
33CCC4	11-16-84	.3	15	--	--	6	370	< .5	--	<1
33CCD	11-16-84	--	16	--	--	--	--	--	--	--
33CCC5	09-25-85	.6	27	20	--	27	1,500	< .5	--	<1
33CCC6	09-25-85	.7	23	20	--	4	1,300	< .5	--	<1
33CCB	09-25-85	.4	13	20	--	<1	110	.9	--	<1
33CCA	09-25-85	.8	26	20	--	1	130	.7	--	<1
33CAB	09-24-85	.4	20	90	--	1	65	< .5	--	<1
4BBB	10-02-85	.9	19	20	--	8	770	< .5	--	<1
4BBC	09-20-85	.6	19	510	--	4	300	< .5	--	<1
4BCA	10-02-85	.6	24	20		10	440	< .5	--	1
5DAA	10-02-85	.5	14	<10	--	3	140	< .5	--	<1
4BAB1	09-25-85	.4	18	<10	--	<1	68	< .5	--	<1
33BCC	09-25-85	.4	13	<10	--	<1	83	< .5	--	1
4BAA	10-03-85	.3	23	<10	--	1	64	< .5	--	1
4DBB	09-25-85	.3	22	20	--	1	56	.7	--	<1
29DCC	10-03-85	.5	12	<10	--	<1	120	< .5	--	<1
5AC	09-25-85	.3	16	20	--	<1	160	< .5	--	<1
4AAB	09-25-85	.6	14	280	--	<1	100	< .5	--	<1
4BAB2	04-29-86	.5	15	130	1	<1	79	< .5	--	<1
4BAC	04-29-86	.3	21	140	1	<1	68	< .5	--	<1
4ABC	04-29-86	.5	23	220	6	1	72	< .5	--	<1
4ACB	04-29-86	.4	21	90	7	<1	71	< .5	--	<1

Table 5.--Chemical analyses of water from wells--Continued

Well number	Date (month-day-year)	Chromium, dissolved (µg/L as Cr)	Cobalt, dissolved (µg/L as Co)	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Lithium, dissolved (µg/L as Li)	Manganese, dissolved (µg/L as Mn)	Molybdenum, dissolved (µg/L as Mo)
			Site 1 (Douglas County)						
13CCA	09-25-84	--	<3	20	1,200	<10	15	170	<10
13CDC1	09-25-84	--	3	10	1,000	<10	16	540	<10
13CDC2	09-25-84	--	<3	60	3,700	<10	34	1,400	<10
			Site 2 (Dickinson County)						
5DCD	10-10-84	--	<3	20	35	<10	51	35	<10
5DC1	10-10-84	--	<3	20	23	<10	30	9	<10
5DC2	10-10-84	--	4	30	530	<10	35	170	<10
5DC3	10-10-84	--	<3	<10	48	<10	36	9	<10
			Site 3 (Reno County)						
8DBA	10-18-84	--	<3	<10	690	10	48	26	<10
8DA1	11-07-84	--	<20	120	49	<50	100	21	<50
8DA2	10-19-84	--	<3	10	23	10	77	100	<10
			Site 4 (Sedgwick County)						
13DAD1	11-08-84	<10	<3	<10	15	<10	21	130	<10
13DAD2	11-08-84	<10	<3	<10	22	<10	18	36	10
13DAD3	11-08-84	<10	<3	<10	45	<10	15	220	<10
			Sites 5-9 (Sedgwick County)						
33BCD	11-15-84	20	5	40	4,600	<10	29	130	<10
33BCD	09-24-85	3	5	20	290	1	22	170	<10
33CCC1	11-15-84	10	<3	<10	12,000	10	15	3,100	<10
33CCC2	11-15-84	10	<3	50	10,000	10	16	3,500	<10
33CCC3	11-16-84	<10	<3	<10	2,900	<10	15	2,400	<10
33CCC3	10-02-85	<1	120	14	17,000	<1	6	3,000	<10
33CCC4	11-16-84	<10	<3	<10	11,000	20	15	1,800	<10
33CCD	11-16-84	--	<3	30	190	<10	24	200	<10
33CCC5	09-25-85	<1	300	33	33,000	<1	16	2,100	<10
33CCC6	09-25-85	<1	110	11	12,000	<1	9	1,200	<10
33CCB	09-25-85	<1	<3	23	21	1	9	55	<10
33CCA	09-25-85	1	10	200	24	13	49	5,200	10
33CAB	09-24-85	<1	<3	11	110	1	24	6	<10
4BBB	10-02-85	<1	9	6	210	<1	17	11,000	20
4BBC	09-20-85	<1	20	12	61	2	23	10,000	10
4BCA	10-02-85	<1	90	6	12,000	<1	9	5,300	10
5DAA	10-02-85	<1	10	9	1,200	<1	8	2,300	<10
4BAB1	09-25-85	<1	7	3	590	<1	23	100	<10
33BCC	09-25-85	<1	20	3	2,500	1	23	43	<10
4BAA	10-03-85	<1	<3	3	5	3	25	9	<10
4DBB	09-25-85	<1	<3	8	270	2	25	33	<10
29DCC	10-03-85	<1	<3	10	8	2	21	88	10
5AC	09-25-85	<1	3	2	370	<1	25	150	<10
4AAB	09-25-85	<1	3	21	91	2	15	2,500	30
4BAB2	04-29-86	<1	4	6	3	1	26	1,300	20
4BAC	04-29-86	<1	<3	3	30	1	19	80	<10
4ABC	04-29-86	<1	6	4	470	1	27	1,100	<10
4ACB	04-29-86	<1	<3	10	560	3	27	2,200	10

Table 5.—Chemical analyses of water from wells—Continued

Well number	Date (month-day-year)	Nickel, dissolved (µg/L as Ni)	Selenium, dissolved (µg/L as Se	Silver, dissolved (µg/L as Ag)	Strontium, dissolved (µg/L as Sr)	Vanadium, dissolved (µg/L as V)	Zinc, dissolved (µg/L as Zn)	Carbon, organic total (mg/L as C)	Dichlorobromomethane, total (µg/L)
			Site 1 (Douglas County)						
13CCA	09-25-84	—	—	—	530	<6	59	2.7	—
13CDC1	09-25-84	—	—	—	260	<6	55	5.0	—
13CDC2	09-25-84	—	—	—	360	<6	65	61	—
			Site 2 (Dickinson County)						
5DCD	10-10-84	—	—	—	3,200	<6	28	.6	—
5DC1	10-10-84	—	—	—	320	<6	78	.8	—
5DC2	10-10-84	—	—	—	290	<6	190	10	—
5DC3	10-10-84	—	—	—	320	<6	22	5.5	—
			Site 3 (Reno County)						
8DBA	10-18-84	—	—	—	1,200	<6	58	1.6	—
8DA1	11-07-84	—	—	—	5,200	<30	130	2.2	—
8DA2	10-19-84	—	—	—	4,000	<6	74	2.6	—
			Site 4 (Sedgwick County)						
13DAD1	11-08-84	—	<1	—	710	<6	45	2.1	—
13DAD2	11-08-84	—	2	—	540	<6	58	—	—
13DAD3	11-08-84	—	2	—	530	<6	47	18	—
			Sites 5-9 (Sedgwick County)						
33BCD	11-15-84	—	1	—	860	15	100	32	—
33BCD	09-24-85	24	2	<1	890	<6	39	—	<3.0
33CCC1	11-15-84	—	<1	—	1,100	<6	110	10	—
33CCC2	11-15-84	—	<1	—	1,000	8	110	94	—
33CCC3	11-16-84	—	<1	—	1,200	<6	48	410	—
33CCC3	10-02-85	4	<1	<1	980	<6	110	—	<3.0
33CCC4	11-16-84	—	<1	—	1,000	<6	87	64	—
33CCD	11-16-84	—	1	—	910	<6	61	—	—
33CCC5	09-25-85	22	<1	<1	1,500	8	29	—	<10
33CCC6	09-25-85	18	<1	<1	1,000	<6	13	—	<3.0
33CCB	09-25-85	3	1	<1	450	<6	31	—	<3.0
33CCA	09-25-85	43	1	1	1,900	<6	320	—	<3.0
33CAB	09-24-85	4	2	<1	960	<6	32	—	<3.0
4BBB	10-02-85	29	<1	<1	1,300	<6	12	—	<3.0
4BBC	09-20-85	43	<1	<1	1,500	<6	51	—	<3.0
4BCA	10-02-85	60	<1	<1	820	<6	24	—	<3.0
5DAA	10-02-85	6	<1	<1	450	<6	20	—	<3.0
4BAB1	09-25-85	60	<1	<1	1,000	<6	41	—	<3.0
33BCC	09-25-85	2	<1	<1	770	<6	1,600	—	<3.0
4BAA	10-03-85	1	2	<1	1,200	<6	6	—	<3.0
4DBB	09-25-85	3	<1	<1	1,000	<6	690	—	<3.0
29DCC	10-03-85	2	<1	<1	620	<6	14	—	<3.0
5AC	09-25-85	<1	<1	<1	1,000	<6	48	—	<3.0
4AAB	09-25-85	9	<1	<1	490	<6	34	—	<3.0
4BAB2	04-29-86	25	2	<1	1,200	<6	26	—	<3.0
4BAC	04-29-86	10	1	<1	610	<6	49	—	<3.0
4ABC	04-29-86	25	1	<1	1,100	<6	21	—	<3.0
4ACB	04-29-86	48	<1	<1	960	<6	23	—	<3.0

Table 5.--Chemical analyses of water from wells--Continued

Well number	Date (month-day-year)	Carbon-tetra-chloride, total (µg/L)	1,2-Di-chloro-ethane, total (µg/L)	Bromo-form, total (µg/L)	Chloro-di-bromo-methane, total (µg/L)	Chloro-form, total (µg/L)	Toluene, total (µg/L)	Benzene, total (µg/L)	Ace-naphth-ylene, total (µg/L)
				Site 1 (Douglas County)					
13CCA	09-25-84	--	--	--	--	--	--	--	<5.0
13CDC1	09-25-84	--	--	--	--	--	--	--	<5.0
13CDC2	09-25-84	--	--	--	--	--	--	--	<5.0
				Site 2 (Dickinson County)					
5DCD	10-10-84	--	--	--	--	--	--	--	<5.0
5DC1	10-10-84	--	--	--	--	--	--	--	<5.0
5DC2	10-10-84	--	--	--	--	--	--	--	<5.0
5DC3	10-10-84	--	--	--	--	--	--	--	<5.0
				Site 3 (Reno County)					
8DBA	10-18-84	--	--	--	--	--	--	--	<5.0
8DA1	11-07-84	--	--	--	--	--	--	--	<5.0
8DA2	10-19-84	--	--	--	--	--	--	--	<5.0
				Site 4 (Sedgwick County)					
13DAD1	11-08-84	--	--	--	--	--	--	--	<5.0
13DAD2	11-08-84	--	--	--	--	--	--	--	<5.0
13DAD3	11-08-84	--	--	--	--	--	--	--	<5.0
				Sites 5-9 (Sedgwick County)					
33BCD	11-15-84	--	--	--	--	0.7	--	--	--
33BCD	09-24-85	<3	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<5.0
33CCC1	11-15-84	--	--	.9	--	--	--	7.5	--
33CCC2	11-15-84	--	--	--	--	--	--	1.7	--
33CCC3	11-16-84	--	--	--	--	--	--	--	--
33CCC3	10-02-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<5.0
33CCC4	11-16-84	--	--	--	--	--	3.7	1.3	--
33CCD	11-16-84	--	--	--	--	--	0.4	1.6	--
33CCC5	09-25-85	<10	<10	<10	<10	<10	4.2	35	<5.0
33CCC6	09-25-85	<3.0	3.9	<3.0	<3.0	<3.0	<3.0	17	<5.0
33CCB	09-25-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<5.0
33CCA	09-25-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<5.0
33CAB	09-24-85	64	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<5.0
4BBB	10-02-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<5.0
4BBC	09-20-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<5.0
4BCA	10-02-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	3.0	<5.0
5DAA	10-02-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<5.0
4BAB1	09-25-85	110	4.8	<3.0	<3.0	<3.0	<3.0	11	<5.0
33BCC	09-25-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<5.0
4BAA	10-03-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<5.0
4DBB	09-25-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<5.0
29DCC	10-03-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<5.0
5AC	09-25-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<5.0
4AAB	09-25-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<5.0
4BAB2	04-29-86	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<5.0
4BAC	04-29-86	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<5.0
4ABC	04-29-86	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<5.0
4ACB	04-29-86	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<5.0

Table 5.—Chemical analyses of water from wells—Continued

Well number	Day (month-day-year)	Acenaphthene, total (µg/L)	Anthracene, total (µg/L)	Benzo(b)fluoranthene, total (µg/L)	Benzo(k)fluoranthene, total (µg/L)	Benzo(a)pyrene total (µg/L)	Bis(2-chloroethyl) ether, total (µg/L)	Bis(2-chloroethoxy) methane, total (µg/L)	Bis(2-chloroisoprophy) ether, total (µg/L)
				Site 1 (Douglas County)					
13CCA	09-25-84	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
13CDC1	09-25-84	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
13CDC2	09-25-84	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
				Site 2 (Dickinson County)					
5DCD	10-10-84	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
5DC1	10-10-84	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
5DC2	10-10-84	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
5DC3	10-10-84	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
				Site 3 (Reno County)					
8DBA	10-18-84	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
8DA1	11-07-84	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
8DA2	10-19-84	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
				Site 4 (Sedgwick County)					
13DAD1	11-08-84	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
13DAD2	11-08-84	—	<5.0	—	<10.0	—	<5.0	<5.0	<5.0
13DAD3	11-08-84	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
				Sites 5-9 (Sedgwick County)					
33BCD	11-15-84	—	—	—	—	—	—	—	—
33BCD	09-24-85	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
33CCC1	11-15-84	—	—	—	—	—	—	—	—
33CCC2	11-15-84	—	—	—	—	—	—	—	—
33CCC3	11-16-84	—	—	—	—	—	—	—	—
33CCC3	10-02-85	<5.0	2.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
33CCC4	11-16-84	—	—	—	—	—	—	—	—
33CCD	11-16-84	—	—	—	—	—	—	—	—
33CCC5	09-25-85	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
33CCC6	09-25-85	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
33CCB	09-25-85	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
33CCA	09-25-85	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
33CAB	09-24-85	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
4BBB	10-02-85	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
4BBC	09-20-85	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
4BCA	10-02-85	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
5DAA	10-02-85	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
4BAB1	09-25-85	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
33BCC	09-25-85	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
4BAA	10-03-85	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
4DBB	09-25-85	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
29DCC	10-03-85	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
5AC	09-25-85	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
4AAB	09-25-85	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
4BAB2	04-29-86	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
4BAC	04-29-86	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
4ABC	04-29-86	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0
4ACB	04-29-86	<5.0	<5.0	<10.0	<10.0	<10.0	<5.0	<5.0	<5.0

Table 5.--Chemical analyses of water from wells--Continued

Well number	Date (month-day-year)	N-butyl-benzyl-phthal-ate, total (µg/L)	Chloro-benzene, total (µg/L)	Chloro-ethane, total (µg/L)	Chry-sene, total (µg/L)	Diethyl-phthal-ate, total (µg/L)	Di-methyl-phthal-ate, total (µg/L)	Ethyl-benzene, total (µg/L)
			Site 1 (Douglas County)					
13CCA	09-25-84	<5.0	---	---	<10.0	<5.0	<5.0	---
13CDC1	09-25-84	<5.0	---	---	<10.0	<5.0	<5.0	---
13CDC2	09-25-84	<5.0	---	---	<10.0	<5.0	<5.0	---
			Site 2 (Dickinson County)					
5DCD	10-10-84	<5.0	---	---	<10.0	<5.0	<5.0	---
5DC1	10-10-84	<5.0	---	---	<10.0	<5.0	<5.0	---
5DC2	10-10-84	<5.0	---	---	<10.0	<5.0	<5.0	---
5DC3	10-10-84	<5.0	---	---	<10.0	<5.0	<5.0	---
			Site 3 (Reno County)					
8DBA	10-18-84	<5.0	---	---	<10.0	<5.0	<5.0	---
8DA1	11-07-84	<5.0	---	---	<10.0	<5.0	<5.0	---
8DA2	10-19-84	<5.0	---	---	<10.0	<5.0	<5.0	---
			Site 4 (Sedgwick County)					
13DAD1	11-08-84	<5.0	---	---	<10.0	<5.0	<5.0	---
13DAD2	11-08-84	<5.0	---	---	<10.0	<5.0	<5.0	---
13DAD3	11-08-84	<5.0	---	---	<10.0	<5.0	<5.0	---
			Sites 5-9 (Sedgwick County)					
33BCD	11-15-84	---	---	---	---	---	---	---
33BCD	09-24-85	<5.0	<3.0	<3.0	<10.0	<5.0	<5.0	<3.0
33CCC1	11-15-84	---	---	---	---	---	---	---
33CCC2	11-15-84	23.0	---	---	---	---	---	---
33CCC3	11-16-84	---	---	---	---	---	---	1.9
33CCC3	10-02-85	<5.0	<3.0	<3.0	<10.0	<5.0	<5.0	<3.0
33CCC4	11-16-84	---	---	---	---	---	---	---
33CCD	11-16-84	---	---	---	---	---	---	---
33CCC5	09-25-85	<5.0	<22	<10	<10.0	<5.0	<5.0	19
33CCC6	09-25-85	<5.0	<140	<3.0	<10.0	<5.0	<5.0	32
33CCB	09-25-85	<5.0	<3.0	<3.0	<10.0	<5.0	<5.0	<3.0
33CCA	09-25-85	<5.0	<3.0	<3.0	<10.0	<5.0	<5.0	<3.0
33CAB	09-24-85	<5.0	<3.0	<3.0	<10.0	<5.0	<5.0	<3.0
4BBB	10-02-85	<5.0	<3.0	<3.0	<10.0	<5.0	<5.0	<3.0
4BBC	09-20-85	<5.0	<3.0	<3.0	<1.0	<5.0	<5.0	<3.0
4BCA	10-02-85	<5.0	<3.0	<3.0	<10.0	<5.0	<5.0	<3.0
5DAA	10-02-85	<5.0	<3.0	<3.0	<10.0	<5.0	<5.0	<3.0
4BAB1	09-25-85	<5.0	<3.0	<3.0	<10.0	<5.0	<5.0	<3.0
33BCC	09-25-85	<5.0	<3.0	<3.0	<10.0	<5.0	<5.0	<3.0
4BAA	10-03-85	<5.0	<3.0	<3.0	<10.0	<5.0	<5.0	<3.0
4DBB	09-25-85	<5.0	<3.0	<3.0	<10.0	<5.0	<5.0	<3.0
29DCC	10-03-85	<5.0	<3.0	<3.0	<10.0	<5.0	<5.0	<3.0
5AC	09-25-85	<5.0	<3.0	<3.0	<10.0	<5.0	<5.0	<3.0
4AAB	09-25-85	<5.0	<3.0	<3.0	<10.0	<5.0	<5.0	<3.0
4BAB2	04-29-86	<5.0	<3.0	<3.0	<10.0	<5.0	<5.0	<3.0
4BAC	04-29-86	<5.0	<3.0	<3.0	<10.0	<5.0	<5.0	<3.0
4ABC	04-29-86	<5.0	<3.0	<3.0	<10.0	<5.0	<5.0	<3.0
4ACB	04-29-86	<5.0	<3.0	<3.0	<10.0	<5.0	<5.0	<3.0

Table 5.--Chemical analyses of water from wells--Continued

Well number	Date (month-day-year)	Fluoranthene, total (µg/L)	Fluorene, total (µg/L)	Hexachlorocyclopentadiene, total (µg/L)	Hexachloroethane, total (µg/L)	Indeno(1,2,3-cd)pyrene, total (µg/L)	Isophorone, total (µg/L)	Methyl bromide, total (µg/L)	Methylene chloride, total (µg/L)
				Site 1 (Douglas County)					
13CCA	09-25-84	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	---	---
13CDC1	09-25-84	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	---	---
13CDC2	09-25-84	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	---	---
				Site 2 (Dickinson County)					
5DCD	10-10-84	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	---	---
5DC1	10-10-84	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	---	---
5DC2	10-10-84	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	---	---
5DC3	10-10-84	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	---	---
				Site 3 (Reno County)					
8DBA	10-18-84	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	---	---
8DA1	11-07-84	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	---	---
8DA2	10-19-84	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	---	---
				Site 4 (Sedgwick County)					
13DAD1	11-08-84	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	---	---
13DAD2	11-08-84	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	---	2.7
13DAD3	11-08-84	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	---	<0.9
				Sites 5-9 (Sedgwick County)					
33BCD	11-15-84	---	---	---	---	---	---	---	<0.9
33BCD	09-24-85	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<3.0	<3.0
33CCC1	11-15-84	---	---	---	---	---	---	---	<0.9
33CCC2	11-15-84	---	---	---	---	---	---	---	<0.9
33CCC3	11-16-84	---	---	---	---	---	---	---	<0.9
33CCC3	10-02-85	2.0	<1.0	<5.0	<5.0	<10.0	<5.0	<3.0	<3.0
33CCC4	11-16-84	---	---	---	---	---	---	---	<0.9
33CCD	11-16-84	---	---	---	---	---	---	---	187
33CCC5	09-25-85	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<10	<10.0
33CCC6	09-25-85	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<3.0	<3.0
33CCB	09-25-85	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<3.0	<3.0
33CCA	09-25-85	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<3.0	73
33CAB	09-24-85	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<3.0	<3.0
4BBB	10-02-85	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<3.0	<3.0
4BBC	09-20-85	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<3.0	27
4BCA	10-02-85	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<3.0	<3.0
5DAA	10-02-85	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<3.0	<3.0
4BAB1	09-25-85	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<3.0	<3.0
33BCC	09-25-85	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<3.0	<3.0
4BAA	10-03-85	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<3.0	<3.0
4DBB	09-25-85	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<3.0	10
29DCC	10-03-85	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<3.0	<3.0
5AC	09-25-85	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<3.0	<3.0
4AAB	09-25-85	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<3.0	<3.0
4BAB2	04-29-86	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<3.0	26
4BAC	04-29-86	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<3.0	<3.0
4ABC	04-29-86	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<3.0	86
4ACB	04-29-86	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<3.0	<3.0

Table 5.--Chemical analyses of water from wells--Continued

Well number	Date (month-day-year)	n-Nitrosodi-n-propylamine, total (µg/L)	n-Nitrosodiphenylamine, total (µg/L)	n-Nitrosodimethylamine, total (µg/L)	Nitrobenzene, total (µg/L)	Parachlorometacresol, total (µg/L)	Phenanthrene, total (µg/L)	Pyrene, total (µg/L)	Tetrachloroethylene, total (µg/L)
				Site 1 (Douglas County)					
13CCA	09-25-84	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	--
13CDC1	09-25-84	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	--
13CDC2	09-25-84	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	--
				Site 2 (Dickinson County)					
5DCD	10-10-84	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	--
5DC1	10-10-84	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	--
5DC2	10-10-84	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	--
5DC3	10-10-84	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	--
				Site 3 (Reno County)					
8DBA	10-18-84	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	--
8DA1	11-07-84	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	--
8DA2	10-19-84	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	--
				Site 4 (Sedgwick County)					
13DAD1	11-08-84	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	--
13DAD2	11-08-84	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	--
13DAD3	11-08-84	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	--
				Sites 5-9 (Sedgwick County)					
33BCD	11-15-84	--	--	--	--	--	--	--	--
33BCD	09-24-85	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	<3.0
33CCC1	11-15-84	--	--	--	--	--	--	--	--
33CCC2	11-15-84	--	--	--	--	--	--	--	--
33CCC3	11-16-84	--	--	--	--	--	12.3	--	--
33CCC3	10-02-85	<5.0	<5.0	<5.0	<5.0	<30.0	5.0	8.0	<3.0
33CCC4	11-16-84	--	--	--	--	--	--	--	--
33CCD	11-16-84	--	--	--	--	--	--	--	--
33CCC5	09-25-85	<5.0	<5.0	<5.0	<5.0	<30.0	3.0	<5.0	<10
33CCC6	09-25-85	<5.0	<5.0	<5.0	<5.0	<30.0	7.0	<5.0	<3.0
33CCB	09-25-85	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	<3.0
33CCA	09-25-85	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	<3.0
33CAB	09-24-85	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	<3.0
4BBB	10-02-85	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	<3.0
4BBC	09-20-85	<5.0	<5.0	<5.0	<5.0	<5.0	<1.0	<1.0	<3.0
4BCA	10-02-85	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	<3.0
5DAA	10-02-85	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	<3.0
4BAB1	09-25-85	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	4.8
33BCC	09-25-85	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	<3.0
4BAA	10-03-85	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	3.6
4DBB	09-25-85	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	<3.0
29DCC	10-03-85	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	<3.0
5AC	09-25-85	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	<3.0
4AAB	09-25-85	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	<3.0
4BAB2	04-29-86	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	<3.0
4BAC	04-29-86	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	<3.0
4ABC	04-29-86	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	<3.0
4ACB	04-29-86	<5.0	<5.0	<5.0	<5.0	<30.0	<5.0	<5.0	<3.0

Table 5.--Chemical analyses of water from wells--Continued

Well number	Date (month-day-year)	Trichlorofluoromethane, total (µg/L)	1,1-Dichloroethane, total (µg/L)	1,1-Dichloroethylene, total (µg/L)	1,1,1-Trichloroethane, total (µg/L)	1,1,2-Trichloroethane, total (µg/L)	1,1,2,2 Tetrachloroethane, total (µg/L)	Benzo(g,h,i)-perylene 1,12-benzoperylene, total (µg/L)
			Site 1 (Douglas County)					
13CCA	09-25-84	--	--	--	--	--	--	<10.0
13CDC1	09-25-84	--	--	--	--	--	--	<10.0
13CDC2	09-25-84	--	--	--	--	--	--	<10.0
			Site 2 (Dickinson County)					
5DCD	10-10-84	--	--	--	--	--	--	<10.0
5DC1	10-10-84	--	--	--	--	--	--	<10.0
5DC2	10-10-84	--	--	--	--	--	--	<10.0
5DC3	10-10-84	--	--	--	--	--	--	<10.0
			Site 3 (Reno County)					
8DBA	10-18-84	--	--	--	--	--	--	<10.0
8DA1	11-07-84	--	--	--	--	--	--	<10.0
8DA2	10-19-84	--	--	--	--	--	--	<10.0
			Site 4 (Sedgwick County)					
13DAD1	11-08-84	--	--	--	--	--	--	<10.0
13DAD2	11-08-84	--	--	--	9.7	--	--	<10.0
13DAD3	11-08-84	--	--	--	--	--	--	<10.0
			Sites 5-9 (Sedgwick County)					
33BCD	11-15-84	--	2.6	--	0.7	--	--	--
33BCD	09-24-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<10.0
33CCC1	11-15-84	--	--	--	--	--	--	--
33CCC2	11-15-84	--	--	--	--	--	--	--
33CCC3	11-16-84	--	--	--	--	--	--	--
33CCC3	10-02-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<10.0
33CCC4	11-16-84	--	--	--	--	--	--	--
33CCD	11-16-84	--	3.1	40.3	216	--	--	--
33CCC5	09-25-85	<10	<10	<10	<10	<10	<10	<10.0
33CCC6	09-25-85	<3.0	3.0	<3.0	<3.0	<3.0	<46	<10.0
33CCB	09-25-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<10.0
33CCA	09-25-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<10.0
33CAB	09-24-85	<3.0	13	140	250	<3.0	<3.0	<10.0
4BBB	10-02-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<10.0
4BBC	09-20-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<10.0
4BCA	10-02-85	<3.0	3.2	<3.0	<3.0	<3.0	<3.0	<10.0
5DAA	10-02-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<10.0
4BAB1	09-25-85	<3.0	6.6	190	450	<3.0	<3.0	<10.0
33BCC	09-25-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<10.0
4BAA	10-03-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<10.0
4DBB	09-25-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<10.0
29DCC	10-03-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<10.0
5AC	09-25-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<10.0
4AAB	09-25-85	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<10.0
4BAB2	04-29-86	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<10.0
4BAC	04-29-86	<3.0	3.6	3.5	9.1	<3.0	<3.0	<10.0
4ABC	04-29-86	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<10.0
4ACB	04-29-86	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<10.0

Table 5.--Chemical analyses of water from wells--Continued

Well number	Date (month-day-year)	Benzo(a) anthracene 1,2-benzanthracene, total (µg/L)	1,2-Dichlorobenzene, total (µg/L)	1,2-Dichloropropane, total (µg/L)	Chloroethylene, total (µg/L)	1,2,4-Trichlorobenzene, total (µg/L)	1,2,5,6-Dibenzanthracene, total (µg/L)	1,3-Dichloropropane, total (µg/L)
			Site 1 (Douglas County)					
13CCA	09-25-84	<5.0	<5.0	--	--	<5.0	<10.0	--
13CDC1	09-25-84	<5.0	<5.0	--	--	<5.0	<10.0	--
13CDC2	09-25-84	<5.0	<5.0	--	--	<5.0	<10.0	--
			Site 2 (Dickinson County)					
5DCD	10-10-84	<5.0	<5.0	--	--	<5.0	<10.0	--
5DC1	10-10-84	<5.0	<5.0	--	--	<5.0	<10.0	--
5DC2	10-10-84	<5.0	<5.0	--	--	<5.0	<10.0	--
5DC3	10-10-84	<5.0	<5.0	--	--	<5.0	<10.0	--
			Site 3 (Reno County)					
8DBA	10-18-84	<5.0	<5.0	--	--	<5.0	<10.0	--
8DA1	11-07-84	<5.0	<5.0	--	--	<5.0	<10.0	--
8DA2	10-19-84	<5.0	<5.0	--	--	<5.0	<10.0	--
			Site 4 (Sedgwick County)					
13DAD1	11-08-84	<5.0	<5.0	--	--	<5.0	<10.0	--
13DAD2	11-08-84	<5.0	<5.0	--	--	<5.0	<10.0	--
13DAD3	11-08-84	<5.0	<5.0	--	--	<5.0	<10.0	--
			Sites 5-9 (Sedgwick County)					
33BCD	11-15-84	--	--	--	--	--	--	--
33BCD	09-24-85	<5.0	<5.0	<3.0	<3.0	<5.0	<10.0	<3.0
33CCC1	11-15-84	--	--	--	1.6	--	--	--
33CCC2	11-15-84	--	--	--	--	--	--	--
33CCC3	11-16-84	--	--	--	--	--	--	--
33CCC3	10-02-85	4.0	<5.0	<3.0	<3.0	<5.0	<10.0	<3.0
33CCC4	11-16-84	--	--	--	--	--	--	--
33CCD	11-16-84	--	--	--	38.3	--	--	--
33CCC5	09-25-85	<5.0	<5.0	<10	23	<5.0	<10.0	<10
33CCC6	09-25-85	<5.0	<5.0	<3.0	16	<5.0	<10.0	<3.0
33CCB	09-25-85	<5.0	<5.0	<3.0	<3.0	<5.0	<10.0	<3.0
33CCA	09-25-85	<5.0	<5.0	<3.0	<3.0	<5.0	<10.0	<3.0
33CAB	09-24-85	<5.0	<5.0	<3.0	220	<5.0	<10.0	<3.0
4BBB	10-02-85	<5.0	<5.0	<3.0	<3.0	<5.0	<10.0	<3.0
4BBC	09-20-85	<5.0	<5.0	<3.0	20	<5.0	<10.0	<3.0
4BCA	10-02-85	<5.0	<5.0	<3.0	410	<5.0	<10.0	<3.0
5DAA	10-02-85	<5.0	<5.0	<3.0	<3.0	<5.0	<10.0	<3.0
4BAB1	09-25-85	<5.0	<5.0	<3.0	300	<5.0	<10.0	<3.0
33BCC	09-25-85	<5.0	<5.0	<3.0	<3.0	<5.0	<10.0	<3.0
4BAA	10-03-85	<5.0	<5.0	<3.0	11	<5.0	<10.0	<3.0
4DBB	09-25-85	<5.0	<5.0	<3.0	<7.1	<5.0	<10.0	<3.0
29DCC	10-03-85	<5.0	<5.0	<3.0	<3.0	<5.0	<10.0	<3.0
5AC	09-25-85	<5.0	<5.0	<3.0	4.6	<5.0	<10.0	<3.0
4AAB	09-25-85	<5.0	<5.0	<3.0	<3.0	<5.0	<10.0	<3.0
4BAB2	04-29-86	<5.0	<5.0	<3.0	7.8	<5.0	<10.0	<3.0
4BAC	04-29-86	<5.0	<5.0	<3.0	33	<5.0	<10.0	<3.0
4ABC	04-29-86	<5.0	<5.0	<3.0	<3.0	<5.0	<10.0	<3.0
4ACB	04-29-86	<5.0	<5.0	<3.0	9.9	<5.0	<10.0	<3.0

Table 5.--Chemical analyses of water from wells--Continued

Well number	Date (month-day-year)	1,3-Dichlorobenzene, total (µg/L)	1,4-Dichlorobenzene, total (µg/L)	2-Chloroethyl vinyl ether, total (µg/L)	2-Chloronaphthalene, total (µg/L)	2-Chlorophenol, total (µg/L)	2-Nitrophenol, total (µg/L)	Di-n-octylphthalate, total (µg/L)	2,4-Dichlorophenol, total (µg/L)
				Site 1 (Douglas County)					
13CCA	09-25-84	<5.0	<5.0	--	<5.0	<5.0	<5.0	<10.0	<5.0
13CDC1	09-25-84	<5.0	<5.0	--	<5.0	<5.0	<5.0	<10.0	<5.0
13CDC2	09-25-84	<5.0	<5.0	--	<5.0	<5.0	<5.0	<10.0	<5.0
				Site 2 (Dickinson County)					
5DCD	10-10-84	<5.0	<5.0	--	<5.0	<5.0	<5.0	<10.0	<5.0
5DC1	10-10-84	<5.0	<5.0	--	<5.0	<5.0	<5.0	<10.0	<5.0
5DC2	10-10-84	<5.0	<5.0	--	<5.0	<5.0	<5.0	<10.0	<5.0
5DC3	10-10-84	<5.0	<5.0	--	<5.0	<5.0	<5.0	<10.0	<5.0
				Site 3 (Reno County)					
8DBA	10-18-84	<5.0	<5.0	--	<5.0	<5.0	<5.0	<10.0	<5.0
8DA1	11-07-84	<5.0	<5.0	--	<5.0	<5.0	<5.0	<10.0	<5.0
8DA2	10-19-84	<5.0	<5.0	--	<5.0	<5.0	<5.0	<10.0	<5.0
				Site 4 (Sedgwick County)					
13DAD1	11-08-84	<5.0	<5.0	--	<5.0	<5.0	<5.0	<10.0	<5.0
13DAD2	11-08-84	<5.0	<5.0	--	<5.0	<5.0	<5.0	<10.0	<5.0
13DAD3	11-08-84	<5.0	<5.0	--	<5.0	<5.0	<5.0	<10.0	<5.0
				Sites 5-9 (Sedgwick County)					
33BCD	11-15-84	--	--	--	--	--	--	25.7	--
33BCD	09-24-85	<5.0	<5.0	<3.0	<5.0	<5.0	<5.0	<10.0	<5.0
33CCC1	11-15-84	--	--	--	--	--	--	67.1	--
33CCC2	11-15-84	--	--	--	--	--	--	268	--
33CCC3	11-16-84	--	--	--	--	--	--	--	--
33CCC3	10-02-85	<5.0	<5.0	<3.0	<5.0	<5.0	<5.0	<10.0	<5.0
33CCC4	11-16-84	--	--	--	--	--	--	14.4	--
33CCD	11-16-84	--	--	--	--	--	--	32.4	--
33CCC5	09-25-85	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<10.0	<5.0
33CCC6	09-25-85	<5.0	<5.0	<3.0	<5.0	<5.0	<5.0	<10.0	<5.0
33CCB	09-25-85	<5.0	<5.0	<3.0	<5.0	<5.0	<5.0	<10.0	<5.0
33CCA	09-25-85	<5.0	<5.0	<3.0	<5.0	<5.0	<5.0	<10.0	<5.0
33CAB	09-24-85	<5.0	<5.0	<3.0	<5.0	<5.0	<5.0	<10.0	<5.0
4BBB	10-02-85	<5.0	<5.0	<3.0	<5.0	<5.0	<5.0	<10.0	<5.0
4BBC	09-20-85	<5.0	<5.0	<3.0	<5.0	<5.0	<5.0	<10.0	<5.0
4BCA	10-02-85	<5.0	<5.0	<3.0	<5.0	<5.0	<5.0	<10.0	<5.0
5DAA	10-02-85	<5.0	<5.0	<3.0	<5.0	<5.0	<5.0	<10.0	<5.0
4BAB1	09-25-85	<5.0	<5.0	<3.0	<5.0	<5.0	<5.0	<10.0	<5.0
33BCC	09-25-85	<5.0	<5.0	<3.0	<5.0	<5.0	<5.0	<10.0	<5.0
4BAA	10-03-85	<5.0	<5.0	<3.0	<5.0	<5.0	<5.0	<10.0	<5.0
4DBB	09-25-85	<5.0	<5.0	<3.0	<5.0	<5.0	<5.0	<10.0	<5.0
29DCC	10-03-85	<5.0	<5.0	<3.0	<5.0	<5.0	<5.0	<10.0	<5.0
5AC	09-25-85	<5.0	<5.0	<3.0	<5.0	<5.0	<5.0	<10.0	<5.0
4AAB	09-25-85	<5.0	<5.0	<3.0	<5.0	<5.0	<5.0	<10.0	<5.0
4BAB2	04-29-86	<5.0	<5.0	<3.0	<5.0	<5.0	<5.0	<10.0	<5.0
4BAC	04-29-86	<5.0	<5.0	<3.0	<5.0	<5.0	<5.0	<10.0	<5.0
4ABC	04-29-86	<5.0	<5.0	<3.0	<5.0	<5.0	<5.0	<10.0	<5.0
4ACB	04-29-86	<5.0	<5.0	<3.0	<5.0	<5.0	<5.0	<10.0	<5.0

Table 5.--Chemical analyses of water from wells--Continued

Well number	Date (month-day-year)	2,4-Dimethylphenol, total (µg/L)	2,4-Dinitrotoluene, total (µg/L)	2,4,-Dinitrophenol, total (µg/L)	2,4,6-Trichlorophenol, total (µg/L)	2,6-Dinitrotoluene, total (µg/L)	4-Bromophenyl phenyl ether, total (µg/L)	4-Chlorophenyl phenyl ether, total (µg/L)	4-Nitrophenol, total (µg/L)
				Site 1 (Douglas County)					
13CCA	09-25-84	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
13CDC1	09-25-84	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
13CDC2	09-25-84	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
				Site 2 (Dickinson County)					
5DCD	10-10-84	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
5DC1	10-10-84	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
5DC2	10-10-84	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
5DC3	10-10-84	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
				Site 3 (Reno County)					
8DBA	10-18-84	<5.0	<5.0	<20.0	<20.0	<5.0	--	--	--
8DA1	11-07-84	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
8DA2	10-19-84	<5.0	<5.0	<20.0	<20.0	<5.0	--	--	--
				Site 4 (Sedgwick County)					
13DAD1	11-08-84	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
13DAD2	11-08-84	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
13DAD3	11-08-84	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
				Sites 5-9 (Sedgwick County)					
33BCD	11-15-84	--	--	--	--	--	--	--	--
33BCD	09-24-85	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
33CCC1	11-15-84	--	--	--	--	--	--	--	--
33CCC2	11-15-84	--	--	--	--	--	--	--	--
33CCC3	11-16-84	--	--	--	--	--	--	--	--
33CCC3	10-02-85	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<5.0
33CCC4	11-16-84	--	--	--	--	--	--	--	--
33CCD	11-16-84	--	--	--	--	--	--	--	--
33CCC5	09-25-85	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
33CCC6	09-25-85	<16.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
33CCB	09-25-85	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
33CCA	09-25-85	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
33CAB	09-24-85	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
4BBB	10-02-85	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
4BBC	09-20-85	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
4BCA	10-02-85	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
5DAA	10-02-85	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
4BAB1	09-25-85	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
33BCC	09-25-85	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
4BAA	10-03-85	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
4DBB	09-25-85	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
29DCC	10-03-85	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
5AC	09-25-85	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
4AAB	09-25-85	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
4BAB2	04-29-86	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
4BAC	04-29-86	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
4ABC	04-29-86	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0
4ACB	04-29-86	<5.0	<5.0	<20.0	<20.0	<5.0	<5.0	<5.0	<30.0

Table 5.--Chemical analyses of water from wells--Continued

Well number	Date (month-day-year)	4,6-Dinitro-o-cresol, total (µg/L)	Dichlorodifluoromethane, total (µg/L)	2,3,7,8 Tetrachlorodibenzo-p-dioxin, total (µg/L)	Naphthalene, total (µg/L)	Trans-1,3-Dichloropropene, total (µg/L)	Cis-1,3-Dichloropropene, total (µg/L)	Phenol, total (µg/L)	Pentachlorophenol, total (µg/L)
				Site 1 (Douglas County)					
13CCA	09-25-84	<30.0	--	--	<5.0	--	--	--	<30.0
13CDC1	09-25-84	<30.0	--	--	<5.0	--	--	--	<30.0
13CDC2	09-25-84	<30.0	--	--	<5.0	--	--	--	<30.0
				Site 2 (Dickinson County)					
5DCD	10-10-84	<30.0	--	--	--	--	--	--	--
5DC1	10-10-84	<30.0	--	--	--	--	--	--	--
5DC2	10-10-84	<30.0	--	--	--	--	--	--	--
5DC3	10-10-84	<30.0	--	--	--	--	--	--	--
				Site 3 (Reno County)					
8DBA	10-18-84	<30.0	--	--	--	--	--	--	--
8DA1	11-07-84	<30.0	--	--	--	--	--	--	--
8DA2	10-19-84	<30.0	--	--	--	--	--	--	--
				Site 4 (Sedgwick County)					
13DAD1	11-08-84	<30.0	--	--	<5.0	--	--	--	<30.0
13DAD2	11-08-84	<30.0	--	--	<5.0	--	--	--	<30.0
13DAD3	11-08-84	<30.0	--	--	--	--	--	--	--
				Sites 5-9 (Sedgwick County)					
33BCD	11-15-84	--	--	--	--	--	--	4.1	--
33BCD	09-24-85	<30.0	<3.0	<0.01	<5.0	--	--	--	<30.0
33CCC1	11-15-84	--	--	--	--	--	--	--	--
33CCC2	11-15-84	--	--	--	--	--	--	--	--
33CCC3	11-16-84	--	--	--	--	--	--	--	--
33CCC3	10-02-85	<30.0	<3.0	< .01	<5.0	--	--	14.1	<30.0
33CCC4	11-16-84	--	--	--	--	--	--	--	--
33CCD	11-16-84	--	--	--	--	--	--	5.1	--
33CCC5	09-25-85	<30.0	<10	< .01	99.0	--	--	--	<30.0
33CCC6	09-25-85	<30.0	<3.0	< .01	110	--	--	--	<30.0
33CCB	09-25-85	<30.0	<3.0	< .01	<5.0	--	--	--	<30.0
33CCA	09-25-85	<30.0	<3.0	< .01	<5.0	--	--	--	<30.0
33CAB	09-24-85	<30.0	<3.0	< .01	<5.0	--	--	--	<30.0
4BBB	10-02-85	<30.0	<3.0	< .01	<5.0	--	--	--	<30.0
4BBC	09-20-85	<30.0	<3.0	< .01	<5.0	--	--	--	<30.0
4BCA	10-02-85	<30.0	<3.0	< .01	<5.0	--	--	--	<30.0
5DAA	10-02-85	<30.0	<3.0	< .01	<5.0	--	--	--	<30.0
4BAB1	09-25-85	<30.0	<3.0	< .01	<5.0	--	--	--	<30.0
33BCC	09-25-85	<30.0	<3.0	< .01	<5.0	--	--	--	<30.0
4BAA	10-03-85	<30.0	<3.0	< .01	<5.0	--	--	--	<30.0
4DBB	09-25-85	<30.0	<10	< .01	<5.0	--	--	--	<30.0
29DCC	10-03-85	<30.0	<3.0	< .01	<5.0	--	--	--	<30.0
5AC	09-25-85	<30.0	<3.0	< .01	<5.0	--	--	--	<30.0
4AAB	09-25-85	<30.0	<3.0	< .01	<5.0	--	--	--	<30.0
4BAB2	04-29-86	<30.0	<3.0	< .01	<5.0	<3.0	<3.0	--	<30.0
4BAC	04-29-86	<30.0	<3.0	< .01	<5.0	<3.0	<3.0	--	<30.0
4ABC	04-29-86	<30.0	<3.0	< .01	<5.0	<3.0	<3.0	--	<30.0
4ACB	04-29-86	<30.0	<3.0	< .01	<5.0	<3.0	<3.0	--	<30.0

Table 5.--Chemical analyses of water from wells--Continued

Well number	Date (month-day-year)	Bis(2-ethylhexyl)-phthalate, total (µg/L)	Di-n-butyl phthalate, total (µg/L)	Benzidine, total (µg/L)	Vinyl chloride, total (µg/L)	Trichloroethylene, total (µg/L)	Gross polychlorinated biphenyls, total (µg/L)	Hexachlorobenzene, total (µg/L)	Hexachlorobutadiene, total (µg/L)
			Site 1 (Douglas County)						
13CCA	09-25-84	10.0	<5.0	--	--	--	--	--	--
13CDC1	09-25-84	<5.0	<5.0	--	--	--	--	--	--
13CDC2	09-25-84	<5.0	<5.0	--	--	--	--	--	--
			Site 2 (Dickinson County)						
5DCD	10-10-84	--	--	--	--	--	--	--	--
5DC1	10-10-84	--	--	--	--	--	--	--	--
5DC2	12-12-84	<5.0	<5.0	--	--	--	0.5	--	--
5DC3	12-12-84	<5.0	<5.0	--	--	--	<.1	--	--
			Site 3 (Reno County)						
8DBA	10-18-84	--	--	--	--	--	--	--	--
8DA1	11-07-84	--	--	--	--	--	--	--	--
8DA2	10-19-84	--	--	--	--	--	--	--	--
			Site 4 (Sedgwick County)						
13DAD1	11-08-84	<5.0	<5.0	--	--	--	--	--	--
13DAD2	11-08-84	<5.0	--	--	--	--	--	--	--
13DAD3	11-08-84	--	<5.0	--	--	--	--	--	--
			Sites 5-9 (Sedgwick County)						
33BCD	11-15-84	--	--	--	--	5.3	--	--	--
33BCD	09-24-85	<10.0	6.0	--	<3.0	8.8	--	<5.0	<5.0
33CCC1	11-15-84	--	--	--	12.6	--	--	--	--
33CCC2	11-15-84	--	--	--	--	--	--	--	--
33CCC3	11-16-84	--	--	--	4.1	--	--	--	--
33CCC3	10-02-85	<5.0	<5.0	--	<3.0	--	--	<5.0	<5.0
33CCC4	11-16-84	--	--	--	4.8	--	--	--	--
33CCD	11-16-84	--	--	--	6.9	1,935	--	--	--
33CCC5	09-25-85	<5.0	<5.0	--	44	<3.0	--	<5.0	<5.0
33CCC6	09-25-85	<7.0	<5.0	--	25	<3.0	--	<5.0	<5.0
33CCB	09-25-85	<8.0	<5.0	--	<3.0	<3.0	--	<5.0	<5.0
33CCA	09-25-85	<10.0	<5.0	--	<3.0	13	--	<5.0	<5.0
33CAB	09-24-85	<10.0	<5.0	--	4.6	940	--	<5.0	<5.0
4BBB	10-02-85	<5.0	<5.0	--	<3.0	<3.0	--	<5.0	<5.0
4BBC	09-20-85	<7.0	<5.0	--	<3.0	91	--	<5.0	<5.0
4BCA	10-02-85	<5.0	<5.0	--	<3.0	3.0	--	--	<5.0
5DAA	10-02-85	<5.0	<5.0	--	<3.0	<3.0	--	<5.0	<5.0
4BAB1	09-25-85	<5.0	<5.0	--	8.4	1,400	--	<5.0	<5.0
33BCC	09-25-85	<5.0	<5.0	--	<3.0	<3.0	--	<5.0	<5.0
4BAA	10-03-85	<5.0	<5.0	--	<3.0	290	--	<5.0	<5.0
4DBB	09-25-85	<6.0	<5.0	--	<3.0	470	--	<5.0	<5.0
29DCC	10-03-85	<5.0	<5.0	--	<3.0	<3.0	--	<5.0	<5.0
5AC	09-25-85	<5.0	<5.0	--	<3.0	20.0	--	<5.0	<5.0
4AAB	09-25-85	<10.0	<5.0	--	<3.0	<3.0	--	<5.0	<5.0
4BAB2	04-29-86	<5.0	<5.0	--	<3.0	250	--	--	<5.0
4BAC	04-29-86	<5.0	<5.0	--	<3.0	390	--	<5.0	<5.0
4ABC	04-29-86	<5.0	<5.0	--	<3.0	130	--	--	<5.0
4ACB	04-29-86	<5.0	<5.0	--	<3.0	280	--	--	<5.0

Table 5.--Chemical analyses of water from wells--Continued

Well number	Date (month-day-year)	Solids, residue at 180 deg. C, dissolved (mg/L)	Mercury, dissolved (µg/L as Hg)
	Site 1 (Douglas County)		
13CCA	09-25-84	--	--
13CDC1	09-25-84	--	--
13CDC2	09-25-84	--	--
	Site 2 (Dickinson County)		
5DCD	10-10-84	--	--
5DC1	10-10-84	--	--
5DC2	10-10-84	--	--
5DC3	10-10-84	--	--
	Site 3 (Reno County)		
8DBA	10-18-84	--	--
8DA1	11-07-84	--	--
8DA2	10-19-84	--	--
	Site 4 (Sedgwick County)		
13DAD1	11-08-84	--	--
13DAD2	11-08-84	--	--
13DAD3	11-08-84	--	--
	Sites 5-9 (Sedgwick County)		
33BCD	11-15-84	--	--
33BCD	09-24-85	620	0.5
33CCC1	11-15-84	--	--
33CCC2	11-15-84	--	--
33CCC3	11-16-84	--	--
33CCC3	10-02-85	795	< .1
33CCC4	11-16-84	--	--
33CCD	11-16-84	--	--
33CCC5	09-25-85	1,200	.2
33CCC6	09-25-85	729	< .1
33CCB	09-25-85	331	< .1
33CCA	09-25-85	1,350	< .1
33CAB	09-24-85	576	< .1
4BBB	10-02-85	897	< .1
4BBC	09-20-85	1020	--
4BCA	10-02-85	656	< .1
5DAA	10-02-85	444	< .1
4BAB1	09-25-85	589	< .1
33BCC	09-25-85	611	< .1
4BAA	10-03-85	662	.1
4DBB	09-25-85	581	< .1
29DCC	10-03-85	450	< .1
5AC	09-25-85	684	< .1
4AAB	09-25-85	451	< .1
4BAB2	04-29-86	826	.3
4BAC	04-29-86	502	< .1
4ABC	04-29-86	671	< .1
4ACB	04-29-86	779	< .1

[1] "--" not detected.

Table 6.--Chemical analyses of samples from soil and streambed material

[Values are given in micrograms per gram (µg/g), and micrograms per kilogram (µg/kg). < means less than]

Soil or bed sample	Date	Arsenic, total in bottom material (µg/g as As)	Barium, recovered from bottom material (µg/g as Ba)	Beryllium, recovered from bottom material (µg/g as Be)	Boron, recovered from bottom material (µg/g as B)	Cadmium, recovered from bottom material (µg/g as Cd)	Chromium, recovered from bottom material (µg/g as Cr)	Copper, recovered from bottom material (µg/g as Cu)	Lead, recovered from bottom material (µg/g as Pb)	Manganese, recovered from bottom material (µg/g as Mn)	Zinc, recovered from bottom material (µg/g as Zn)
					Site 1 (Douglas County)						
Soil near 13CCA	10-23-84	--[1]	--	--	10	--	--	--	--	--	--
Soil near 13CDC2	10-23-84	--	--	--	330	--	--	--	--	--	--
					Site 2 (Dickinson County)						
Soil near drainage ditch	12-12-84	--	--	--	--	--	--	--	--	--	--
					Near sites 5-9 (Sedgwick County)						
Soil near 33BCD	09-26-85	8	130	1	--	<1	100	70	60	320	
Soil near 33CCC5	10-01-85	3	330	<1	--	40	3,100	170	540	140	
Soil near 33CCC2	10-03-85	7	120	<1	--	2	90	90	480	190	
Soil near 4BCA	10-02-85	7	80	1	--	1	210	360	270	270	
Streambed material in Chisholm Creek at 33rd	10-09-85	7	100	<1	--	<1	60	20	--	220	
Streambed material in Chisholm Creek at 25th	10-09-85	7	90	1	--	2	150	50	--	220	
Streambed material in drainage near site 7	10-09-85	8	170	1	--	1	110	70	130	340	

Table 6.--Chemical analyses of samples from soil and streambed material--Continued

Soil or bed sample	Date	Antimony, total in bottom material (µg/g as Sb)	Selenium, total in bottom material (µg/g as Se)	Iron, recovered from bottom material (µg/g as Fe)	Acenaphthylene, bottom material (µg/kg)	Acenaphthene, bottom material (µg/kg)	Anthracene, bottom material (µg/kg)	Benzo(b)fluoranthene, bottom material (µg/kg)	Benzo(k)fluoranthene, bottom material (µg/kg)
				Site 1 (Douglas County)					
Soil near 13CCA	10-23-84	--	--	--	--	--	--	--	--
Soil near 13CDC2	10-23-84	--	--	--	--	--	--	--	--
				Site 2 (Dickinson County)					
Soil near drainage ditch	12-12-84	--	--	--	--	--	--	--	--
				Near sites 5-9 (Sedgwick County)					
Soil near 33BCD	09-26-85	3,100	<1	8,800	<200	<200	<200	<200	<200
Soil near 33CCC5	10-01-85	4,100	7	4,900	<2,000	<2,000	<2,000	<4,000	<4,000
Soil near 33CCC2	10-03-85	4,300	<1	17,000	<20,000	<20,000	<20,000	<40,000	<40,000
Soil near 4BCA	10-02-85	6,200	<1	14,000	<20,000	2,700	4,900	<40,000	<40,000
Streambed material in Chisholm Creek at 33rd	10-09-85	8,100	<1	5,400	<200	<200	<200	<200	<200
Streambed material in Chisholm Creek at 25th	10-09-85	3,400	<1	7,200	<200	<200	<200	170	150
Streambed material in drainage near site 7	10-09-85	<1	<1	10,000	<200	23.0	1,900	800	270

Table 6.--Chemical analyses of samples from soil and streambed material--Continued

Soil or bed sample	Date	Benzo(a)-a-pyrene, bottom material (µg/kg)	Bis (2-Chloroethyl) ether, bottom material (µg/kg)	Bis (2-Chloroethoxy) methane, bottom material (µg/kg)	Bis(2-) Chloro-iso-propyl) ether, bottom material (µg/kg)	N-butyl-benzyl-phthalate, bottom material (µg/kg)	Chloroethane, total (µg/L)	Chrysene, bottom material (µg/kg)	Diethyl phthalate, bottom material (µg/kg)
				Site 1 (Douglas County)					
Soil near 13CCA	10-23-84	--	--	--	--	--	<3.0	--	--
Soil near 13CDC2	10-23-84	--	--	--	--	--	<3.0	--	--
				Site 2 (Dickinson County)					
Soil near drainage ditch	12-12-84	--	--	--	--	--	--	--	--
				Near sites 5-9 (Sedgwick County)					
Soil near 33BCD	09-26-85	<200	<200	<200	<200	<200	--	75.0	<200
Soil near 33CCC5	10-01-85	<4,000	<2,000	<2,000	<2.000	30,000	--	<4,000	<2,000
Soil near 33CCC2	10-03-85	<40,000	<20,000	<20,000	<20,000	<20,000	--	8,200	<20,000
Soil near 4BCA	10-02-85	<40,000	<20,000	<20,000	<20,000	<20,000	--	12,000	<20,000
Streambed material in Chisholm Creek at 33rd	10-09-85	<200	<200	<200	<200	<200	--	28.0	<200
Streambed material in Chisholm Creek at 25th	10-09-85	140	<200	<200	<200	<200	--	<200	<200
Streambed material in drainage near site 7	10-09-85	1,100	<200	<200	<200	<200	<3.0	4,600	<200

Table 6.--Chemical analyses of samples from soil and streambed material--Continued

Soil or bed sample	Date	Dimethyl phthalate, bottom material (µg/kg)	Ethyl benzene, total (µg/L)	Fluoranthene, bottom material (µg/kg)	Fluorene, bottom material (µg/kg)	Hexachlorocyclopentadiene, bottom material (µg/kg)	Hexachloroethane, bottom material (µg/kg)	Indeno(1,2,3-c,d)pyrene, bottom material (µg/kg)	Isophorone, bottom material (µg/kg)
				Site 1 (Douglas County)					
Soil near 13CCA	10-23-84	--	<3.0	--	--	--	--	--	--
Soil near 13CDC2	10-23-84	--	<3.0	--	--	--	--	--	--
				Site 2 (Dickinson County)					
Soil near drainage ditch	12-12-84	--	--	--	--	--	--	--	--
				Near sites 5-9 (Sedgwick County)					
Soil near 33BCD	09-26-85	<200	--	76.0	<200	<200	<200	<200	<200
Soil near 33CCC5	10-01-85	<2,000	--	<2,000	<2,000	<2,000	<2,000	<2,000	28,000
Soil near 33CCC2	10-03-85	<20,000	--	<20,000	<20,000	<20,000	<20,000	<20,000	<20,000
Soil near 4BCA	10-02-85	<20,000	--	3,300	4,300	<20,000	<20,000	<20,000	<20,000
Streambed material in Chisholm Creek at 33rd	10-09-85	<200	--	55.0	<200	<200	<200	<200	<200
Streambed material in Chisholm Creek at 25th	10-09-85	<200	--	140	<200	<200	<200	<200	<200
Streambed material in drainage near site 7	10-09-85	<200	<3.0	560	67.0	<200	<200	250	<200

Table 6.--Chemical analyses of samples from soil and streambed material--Continued

Soil or bed sample	Date	n-Nitrosodi-n-propylamine, bottom material (µg/kg)	n-Nitrosodiphenylamine, bottom material (µg/kg)	n-Nitrosodimethylamine, bottom material (µg/kg)	Naphthalene, bottom material (µg/kg)	Nitrobenzene, bottom material (µg/kg)	Parachlorometacresol, bottom material (µg/kg)	Phenanthrene, bottom material (µg/kg)	Pyrene, bottom material (µg/kg)
				Site 1 (Douglas County)					
Soil near 13CCA	10-23-84	--	--	--	--	--	--	--	--
Soil near 13CDC2	10-23-84	--	--	--	--	--	--	--	--
				Site 2 (Dickinson County)					
Soil near drainage ditch	12-12-84	--	--	--	--	--	--	--	--
				Near sites 5-9 (Sedgwick County)					
Soil near 33BCD	09-26-85	<200	<200	<200	14.0	<200	<600	76.0	65.0
Soil near 33CCC5	10-01-85	<2,000	<2,000	<2,000	870	<2,000	<6,000	2,000	<2,000
Soil near 33CCC2	10-03-85	<20,000	<20,000	<20,000	<20,000	<20,000	<60,000	9,800	10,000
Soil near 4BCA	10-02-85	<20,000	<20,000	<20,000	1,700	<20,000	<60,000	28,000	26,000
Streambed material in Chisholm Creek at 33rd	10-09-85	<200	<200	<200	<200	<200	<600	27.0	43.0
Streambed material in Chisholm Creek at 25th	10-09-85	<200	<200	<200	<10.0	<200	<600	110	150
Streambed material in drainage near site 7	10-09-85	<200	<200	<200	93.0	<200	<600	3,800	1,500

Table 6.--Chemical analyses of samples from soil and streambed material--Continued

Soil or bed sample	Date	Benzo-(g,h,i) perylene 1, 12- benzo-perylene, bottom material (µg/kg)	Benzo(a) anthra-cene 1,2-benzan-thracene, bottom material (µg/kg)	1,2-Di-chloro-benzene, bottom material (µg/kg)	1,2,4-Tri-chloro-benzene, bottom material (µg/kg)	1,2,5,6-Dibenz-anthra-cene, bottom material (µg/kg)	1,3-Di-chloro-benzene, bottom material (µg/kg)	1,4-Di-chloro-benzene, bottom material (µg/kg)	2-Chloro-naph-thalene, bottom material (µg/kg)
				Site 1 (Douglas County)					
Soil near 13CCA	10-23-84	--	--	--	--	--	--	--	--
Soil near 13CDC2	10-23-84	--	--	--	--	--	--	--	--
				Site 2 (Dickinson County)					
Soil near drain-age ditch	12-12-84	--	--	--	--	--	--	--	--
				Near sites 5-9 (Sedgwick County)					
Soil near 33BCD	09-26-85	<200	47.0	<200	<200	<400	<200	<200	<200
Soil near 33CCC5	10-01-85	<4,000	<2,000	<2,000	<2,000	<4,000	<2,000	<2,000	<2,000
Soil near 33CCC2	10-03-85	<40,000	<20,000	<2,000	<20,000	<40,000	<20,000	<20,000	<20,000
Soil near 4BCA	10-02-85	<40,000	1,700	<20,000	<20,000	<40,000	<20,000	<20,000	<20,000
Streambed material in Chisholm Creek at 33rd	10-09-85	<400	<200	<200	<200	<400	<200	<200	<200
Streambed material in Chisholm Creek at 25th	10-09-85	<200	72.0	<200	<200	<200	<200	<200	<200
Streambed material in drainage near site 7	10-09-85	390	2,000	<200	<200	370	<200	<200	<200

Table 6.--Chemical analyses of samples from soil and streambed material--Continued

Soil or bed sample	Date	2-Chlorophenol, bottom material (µg/kg)	2-Nitrophenol, bottom material (µg/kg)	Di-n-octylphthalate, bottom material (µg/kg)	2,4-Dichlorophenol, bottom material (µg/kg)	2,4-DP, bottom material (µg/kg)	2,4-Dinitrotoluene, bottom material (µg/kg)	2,4-Dinitrophenol, bottom material (µg/kg)	2,4,6-Trichlorophenol, bottom material (µg/kg)
				Site 1 (Douglas County)					
Soil near 13CCA	10-23-84	--	--	--	--	--	--	--	--
Soil near 13CDC2	10-23-84	--	--	--	--	--	--	--	--
				Site 2 (Dickinson County)					
Soil near drainage ditch	12-12-84	--	--	--	--	--	--	--	--
				Near sites 5-9 (Sedgwick County)					
Soil near 33BCD	09-26-85	<200	<200	<200	<200	<200	<200	<600	<600
Soil near 33CCC5	10-01-85	<2,000	<2,000	<4,000	<2,000	<2,000	<2,000	<6,000	<6,000
Soil near 33CCC2	10-03-85	<20,000	<20,000	<40,000	<20,000	<20,000	<20,000	<60,000	<60,000
Soil near 4BCA	10-02-85	<20,000	<20,000	<40,000	<20,000	<20,000	<20,000	<60,000	<60,000
Streambed material in Chisholm Creek at 33rd	10-09-85	<200	<200	<400	<200	<200	<200	<600	<600
Streambed material in Chisholm Creek at 25th	10-09-85	<200	<200	<400	<200	<200	<200	<600	<600
Streambed material in drainage near site 7	10-09-85	<200	<200	<400	<200	<200	<200	<600	<600

Table 6.--Chemical analyses of samples from soil and streambed material--Continued

Soil or bed sample	Date	2,6-Dinitrotoluene, bottom material (µg/kg)	4-Bromophenyl phenyl ether, bottom material (µg/kg)	4-Nitrophenol, bottom material (µg/kg)	4,6-Dinitro-o-cresol, bottom material (µg/kg)	2,3,7,8 Tetrachlorodibenzo-p-dioxin, bottom material (µg/kg)	Pentachlorophenol, bottom material (µg/kg)	Bis(2-ethylhexyl)phthalate, bottom material (µg/kg)	Di-n-butyl phthalate, bottom material (µg/kg)
				Site 1 (Douglas County)					
Soil near 13CCA	10-23-84	--	--	--	--	--	--	--	--
Soil near 13CDC2	10-23-84	--	--	--	--	--	--	--	--
				Site 2 (Dickinson County)					
Soil near drainage ditch	12-12-84	--	--	--	--	--	--	--	--
				Near sites 5-9 (Sedgwick County)					
Soil near 33BCD	09-26-85	<200	<200	<200	<600	--	<600	<200	<200
Soil near 33CCC5	10-01-85	<2,000	<2,000	<6,000	<2,000	--	<6,000	200,000	1,400
Soil near 33CCC2	10-03-85	<20,000	<20,000	<60,000	<60,000	--	<60,000	<20,000	<20,000
Soil near 4BCA	10-02-85	<20,000	<20,000	<60,000	<60,000	--	<60,000	<20,000	<20,000
Streambed material in Chisholm Creek at 33rd	10-09-85	<200	<200	<600	<600	--	<600	<200	<200
Streambed material in Chisholm Creek at 25th	10-09-85	<200	<200	<600	<600	--	<600	<200	<200
Streambed material in drainage near site 7	10-09-85	<200	<200	<200	<600	--	<600	<200	<200

Table 6.--Chemical analyses of samples from soil and streambed material--Continued

Soil or bed sample	Date	Benzidine, bottom material (µg/kg)	PCN, total in bottom material (µg/kg)	Lindane, 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)
				Site 1 (Douglas County)					
Soil near 13CCA	10-23-84	--	--	--	--	--	--	--	--
Soil near 13CDC2	10-23-84	--	--	--	--	--	--	--	--
				Site 2 (Dickinson County)					
Soil near drainage ditch	12-12-84	--	--	--	--	--	--	--	--
				Near sites 5-9 (Sedgwick County)					
Soil near 33BCD	09-26-85	<0.01	--	--	--	--	--	--	--
Soil near 33CCC5	10-01-85	< .01	<200	<20	240	<200	230	<20	<10
Soil near 33CCC2	10-03-85	< .01	--	--	--	--	--	--	--
Soil near 4BCA	10-02-85	< .01	--	--	--	--	--	--	--
Streambed material in Chisholm Creek at 33rd	10-09-85	< .01	--	--	--	--	--	--	--
Streambed material in Chisholm Creek at 25th	10-09-85	< .01	--	--	--	--	--	--	--
Streambed material in drainage near site 7	10-09-85	< .01	--	--	--	--	--	--	--

Table 6.--Chemical analyses of samples from soil and streambed material--Continued

Soil or bed sample	Date	Endosulfan, total in bottom material (µg/kg)	Endrin, total in bottom material (µg/kg)	Ethion, total in bottom material (µg/kg)	Toxaphene, total in bottom material (µg/kg)	Heptachlor, total in bottom material (µg/kg)	Heptachlor expoxide, total in bottom material (µg/kg)	Methoxychlor, total in bottom material (µg/kg)	PCB, total in bottom material (µg/kg)
				Site 1 (Douglas County)					
Soil near 13CCA	10-23-84	--	--	--	--	--	--	--	--
Soil near 13CDC2	10-23-84	--	--	--	--	--	--	--	--
				Site 2 (Dickinson County)					
Soil near drainage ditch	12-12-84	--	--	--	--	--	--	--	3,200
				Near sites 5-9 (Sedgwick County)					
Soil near 33BCD	09-26-85	--	--	--	--	--	--	--	--
Soil near 33CCC5	10-01-85	<20	<10	<0.1	<2,000	<10	<20	<5.0	>50,000
Soil near 33CCC2	10-03-85	--	--	--	--	--	--	--	--
Soil near 4BCA	10-02-85	--	--	--	--	--	--	--	--
Streambed material in Chisholm Creek at 33rd	10-09-85	--	--	--	--	--	--	--	--
Streambed material in Chisholm Creek at 25th	10-09-85	--	--	--	--	--	--	--	--
Streambed material in drainage near site 7	10-09-85	--	--	--	--	--	--	--	--

Table 6.--Chemical analyses of samples from soil and streambed material--Continued

Soil or bed sample	Date	Malathion, total in bottom material (µg/kg)	Parathion, total in bottom material (µg/kg)	Diazinon, total in bottom material (µg/kg)	Methyl parathion, total in bottom material (µg/kg)	Hexachlorobenzene total in bottom material (µg/kg)	Hexachlorobutadiene, bottom material (µg/kg)	Mirex, total in bottom material (µg/kg)
				Site 1 (Douglas County)				
Soil near 13CCA	10-23-84	--	--	--	--	--	--	--
Soil near 13CDC2	10-23-84	--	--	--	--	--	--	--
				Site 2 (Dickinson County)				
Soil near drainage ditch	12-12-84	--	--	--	--	--	--	--
				Near sites 5-9 (Sedgwick County)				
Soil near 33BCD	09-26-85	--	--	--	--	<200	--	--
Soil near 33CCC5	10-01-85	<0.1	<0.1	<0.1	<0.1	450	<2,000	<20
Soil near 33CCC2	10-03-85	--	--	--	--	<20,000	--	--
Soil near 4BCA	10-02-85	--	--	--	--	<20,000	--	--
Streambed material in Chisholm Creek at 33rd	10-09-85	--	--	--	--	<200	--	--
Streambed material in Chisholm Creek at 25th	10-09-85	--	--	--	--	<200	--	--
Streambed material in drainage near site 7	10-09-85	--	--	--	--	<200	<200	--

Table 6.--Chemical analyses of samples from soil and streambed material--

Continued

Soil or bed sample	Date	Trithion, total in bottom material (µg/kg)	Methyl trithion, total in bottom material (µg/kg)	Mercury, recovered from bottom material (µg/kg as Hg)	Perthane, in bottom material (µg/kg)
		Site 1 (Douglas County)			
Soil near 13CCA	10-23-84	--	--	--	--
Soil near 13CDC2	10-23-84	--	--	--	--
		Site 2 (Dickinson County)			
Soil near drainage ditch	12-12-84	--	--	--	--
		Sites 5-9 (Sedgwick County)			
Soil near 33BCD	09-26-85	--	--	0.1	--
Soil near 33CCC5	10-01-85	<0.1	<0.1	.2	<200.0
Soil near 33CCC2	10-03-85	--	--	.2	--
Soil near 4BCA	10-02-85	--	--	.1	--
Streambed material in Chisholm Creek at 33rd	10-09-85	--	--	.1	--
Streambed material in Chisholm Creek at 25th	10-09-85	--	--	.1	--
Streambed material in drainage near site 7	10-09-85	--	--	.2	--

1 "--" Not detected.

Table 7.--Nontarget compounds tentatively identified by computerized library search in water from wells on or near sites 5 to 9

[Upper numbers are base-neutral fractions; lower numbers are acid fractions; all values are in micrograms per liter (µg/L)]

Well number	Alkane (µg/L)	Naphthalene (µg/L)	2-Methyl-9H-fluorene (µg/L)	Anthracene[1] (µg/L)	Molecular sulfur (µg/L)	Cyclohexane (µg/L)	N,N-Di-methylformamide (µg/L)
33CCC	0.8 - 11.2	0.8 - 3.6	4.6	1.5 - 2.7	-- [2]	--	--
	0.9 - 10.4	0.7 - 1.8	--	0.8 - 2.0	6.4	--	--
33CCC5	4.2 - 42.9	5.5 - 54.0	--	--	--	2.6 - 11.0	4.4
	8.2 - 165	14.8 - 112	--	--	--	--	--
33CCC6	1.9 - 318	22.2 - 327	--	--	--	1.3 - 73.8	--
	1.9 - 341	14.9 - 290	--	--	--	2.7 - 30.2	--
33CCA	--	--	--	--	--	--	--
	--	--	--	--	--	--	--
4BBB	--	--	--	--	--	--	--
	--	--	--	--	1.2	--	--
4BBC	--	--	--	0.2 - 0.5	--	--	--
				0.3	9.1	--	--
4BCA	--	0.5	--	--	--	--	--
	--	--	--	--	--	--	--
4BAB1	0.2 - 0.4	--	--	--	--	--	--
	--	--	--	--	--	--	--
4DBB	--	--	--	--	--	--	--
	--	--	--	--	1.7	--	--
4BAB2	--	--	--	--	--	--	--
	--	--	--	--	--	--	--
4ABC	--	--	--	--	--	1.1 - 2.6	--
	--	--	--	--	--	--	--

Table 7.--Nontarget compounds tentatively identified by computerized library search in water from wells on or near sites 5 to 9--Continued

Well number	Benzene (µg/L)	4,4,5,5-Tetra-methyl-1,3-Di-oxolane (µg/L)	Benzo-(b)thio-phene (µg/L)	4-Methyl-benzo(b)-thio-phene (µg/L)	2,4,6-Tri-methyl-benzoic acid (µg/L)	2,3-Di-hydro-1,1-Di-methyl-1H-Indene (µg/L)	Triethyl-ester phos-phoric acid (µg/L)	2,3-Di-hydro-1,2-Di-methyl-1H-Indene (µg/L)
33CCC3	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--
33CCC5	1.2 - 63.0	10.6	--	--	--	--	--	--
	--	--	--	--	--	--	--	--
33CCC6	5.1 - 217	--	--	--	--	--	--	--
	5.3 - 160	--	--	--	--	--	--	--
33CCA	--	--	2.0	1.3	--	--	--	--
	--	--	.7	--	1.4	--	--	--
4BBB	--	--	--	--	--	0.6	0.6	0.7
	--	--	--	--	2.1	--	--	--
4BBC	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--
4BCA	--	--	--	--	--	1.1	--	--
	--	--	--	--	--	--	--	--
4BAB1	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--
4DBB	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--
4BAB2	2.5 - 3.9	--	--	--	--	--	--	--
	3.8	--	--	--	--	--	--	--
4ABC	2.0 - 27.1	--	--	--	--	--	--	--
	0.6 - 1.8	--	--	--	--	--	--	--

Table 7.--Nontarget compounds tentatively identified by computerized library search in water from wells on or near sites 5 to 9--Continued

Well number	2,3-Dihydro-1H-Indene (µg/L)	2,3-Dihydro-1,6-Di-methyl-1H-Indene (µg/L)	Butyl-ester Octadecanoic acid (µg/L)	Decanoic acid (µg/L)	4-Hydroxy-, methyl ester benzoic acid (µg/L)	4-Hydroxy-propyl ester benzoic acid (µg/L)	2,2'-Methylene-bis-phenol (µg/L)
33CCC3	--	--	--	--	--	--	--
	--	--	--	--	--	--	--
33CCC5	--	--	--	--	--	--	--
	--	--	--	--	--	--	--
33CCC6	--	--	--	--	--	--	--
	--	--	--	--	--	--	--
33CCA	--	--	--	--	--	--	--
	--	--	--	--	--	--	--
4BBB	--	--	--	--	--	--	--
	--	--	--	--	--	--	--
4BBC	--	--	--	--	--	--	--
	--	--	--	--	--	--	--
4BCA	2.3	0.4	1.4	--	--	--	--
	--	--	--	--	--	--	--
4DBB	--	--	--	--	--	--	--
	--	--	--	0.2	1.5	0.3	0.3
4BAB2	--	--	--	--	--	--	--
	--	--	--	--	--	--	--
4ABC	--	--	--	--	--	--	--
	--	--	--	--	--	--	--

[1] Other possible isomers include the phenanthrenes.

[2] "--" Not detected.

Table 8.--Nontarget compounds tentatively identified by computerized library search in samples from soil and streambed material on or near sites 5 to 9

[All values in micrograms per kilogram (µg/kg)]

Soil or bed sample	Alkane (µg/kg)	Naphthalene (µg/kg)	Anthracene[1] (µg/kg)	1,3-Isobenzofurandione[2] (µg/kg)	4-Hydroxy-3-methoxybenzaldehyde (µg/kg)	Dibenzofuran (µg/kg)	Hexadecanoic acid (µg/kg)	Perylene[3] (µg/kg)
Soil near 33BCD	8.9-213	12.3-38.3	10.7	8.6	15.9	9.3	--[4]	--
Soil near 33CCC5	329-5,338	2,440	--	5,756	--	--	--	--
Soil near 33CCC2	5,851-88,943	6,670-15,162	7,185	4,265	--	--	--	--
Soil near 4BCA	1,798-16,465	1,760-25,711	2,536-17,256	--	--	--	--	--
Streambed material in Chisholm Creek at 33rd	21.3	--	--	20.2	--	--	--	--
Streambed material in Chisholm Creek at 25th	--	20.2	--	--	--	--	4,212	--
Streambed material from drainage near site 7	11.4-85.0	11.6-324	45.0-725	--	--	11.7	--	446

Table 8.--Nontarget compounds tentatively identified by computerized library search in samples from soil and streambed material on or near sites 5 to 9--Continued

Soil or bed sample	4,4'-(1-Methyl-ethylidene)bis-phenol (µg/kg)	Benzene (µg/kg)	Tetra-chloro-ethane (µg/kg)	Styrene (µg/kg)	Tributyl ester phos-phoric acid (µg/kg)	PCBs (µg/kg)	1,2,4,5-Tetra-methyl-benzene (µg/kg)	1,2,4-Trithio-lane D (µg/kg)	Indene (µg/kg)	4-Methyl-dibenzo-furan (µg/kg)
Soil near 33BCD	108	21.8	--	--	--	--	--	--	--	--
Soil near 33CCC5	2,869	350-7,445	2,183	176	8,759	507-1,572	--	--	--	--
Soil near 33CCC2	--	--	--	--	--	--	7,624	--	--	--
Soil near 4BCA	--	3,108-3,699	--	--	--	--	--	10,368	2,352-6,401	--
Streambed material in Chisholm Creek at 33rd	56.9	--	--	--	--	--	--	--	--	--
Streambed material in Chisholm Creek at 25th	--	--	--	--	--	--	--	--	--	--
Streambed material from drainage near site 7	--	11.8-21.3								29.6

Table 8.--Nontarget compounds tentatively identified by computerized library search in samples from soil and streambed material on or near sites 5 to 9--Continued

Soil or bed sample	2-Methyl-1,1'-Biphenyl (µg/kg)	Fluorene (µg/kg)	Dibenzothiophene (µg/kg)	Pyrene (µg/kg)	Phenol (µg/kg)	1-Phenylethanone (µg/kg)	Dodecanoic acid (µg/kg)	Methyl ester tetradecanoic acid (µg/kg)	Tetradecanoic acid (µg/kg)	Methyl ester hexadecanoic acid (µg/kg)
Soil near 33BCD	--	--	--	--	--	--	--	--	--	--
Soil near 33CCC5	--	--	--	--	--	--	--	--	--	--
Soil near 33CCC2	--	--	--	--	--	--	--	--	--	--
Soil near 4BCA	2,105 2,105	11,230 11,230	5,392 5,392	2,354-7,464	--	--	--	--	--	--
Streambed material in Chisholm Creek at 33rd	--	--	--	--	26.7	--	--	--	--	--
Streambed material in Chisholm Creek at 25th	--	--	--	--	--	34.6	24.0	26.0	744	199
Streambed material from drainage near site 7	11.2-36.6	18.7-183	169-265	94.4-401	36.1					

Table 8.--Nontarget compounds tentatively identified by computerized library search in samples from soil and and streambed material on or near sites 5 to 9--Continued

Soil or bed sample	2-Ethyl-1,1-biphenyl (µg/kg)	9H-Carbazole (µg/kg)	4,9-Dimethylnaphtho(2,3-b)thiophene (µg/kg)	1,1':2',1''-Terphenyl (µg/kg)	Benzo(b)naphtho(1,2-d)thiophene (µg/kg)	Benzo(b)naphtho(2,1-d)thiophene (µg/kg)	7-Methylbenzo(b)naphtho(2,3-d)thiophene (µg/kg)	2-Methyltripheny-lene[5] (µg/kg)
Soil near 33BCD	--	--	--	--	--	--	--	--
Soil near 33CCC5	--	--	--	--	--	--	--	--
Soil near 33CCC2	--	--	--	--	--	--	--	--
Soil near 4BCA	--	--	--	--	--	--	--	--
Streambed material in Chisholm Creek at 33rd	--	--	--	--	--	--	--	--
Streambed material in Chisholm Creek at 25th	--	--	--	--	--	--	--	--
Streambed material from drainage near site 7	21.2	51.9	53.7-125	72.0	402	106	274	631-1,228

[1] Another possible isomer is phenanthrenes.
[2] Another possible isomer is 1,2-benzenedicarboxylic acid.
[3] Other possible isomers include benzo(e)pyrene and benzo(j)fluoranthene.
[4] "--" Not detected.
[5] Other possible isomers include 1-methyl-benz(a)anthracene and 5-methyl-chrysene.