CHARACTERIZATION OF SELECTED RADIONUCLIDES IN SEDIMENT AND SURFACE WATER IN STANDLEY LAKE, GREAT WESTERN RESERVOIR, AND MOWER RESERVOIR, JEFFERSON COUNTY, COLORADO, 1992

by David W. Clow and David A. Johncox

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BRUCE BABBITT, Secretary

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Gordon P. Eaton, Director

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For additional information write to:

District Chief
U.S. Geological Survey
Box 25046, MS 415
Denver Federal Center
Denver, CO 80225

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CONVERSION FACTORS AND ABBREVIATIONS

Multiply	By	To obtain
acre	0.004047	square kilometer
acre-foot (acre-ft)	1,233.49	cubic meter
centimeter (cm)	0.3937	inch
foot (ft)	0.3048	meter
inch (in.)	25.4	millimeter
liter (L)	0.2642	gallon (US)
micrometer (μm)	0.00003937	inch
milliliter (mL)	0.03381	ounce
mile (mi)	1.609	kilometer
square mile (mi^2)	2.590	square kilometer

Degree Celsius (°C) may be converted to degree Fahrenheit (°F) by using the following equation:

$$°F = 9/5\ (°C) + 32.$$

The following terms and abbreviations also are used in the report:

microgram per liter (μg/L)

microsiemens per centimeter at 25 degrees Celsius (μS/cm)

milligram per kilogram (mg/kg)

milligram per liter (mg/L)

nanocurie per square meter (nCi/m^2)

picocurie per gram (pCi/g)

picocurie per liter (pCi/L)

year (yr)

Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD 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 Sea Level Datum of 1929.

Characterization of Selected Radionuclides in Sediment and Surface Water in Standley Lake, Great Western Reservoir, and Mower Reservoir, Jefferson County, Colorado, 1992

By David W. Clow *and* David A. Johncox

Abstract

Sediment and surface water from Standley Lake, Great Western Reservoir, and Mower Reservoir, near Denver, Colorado, were sampled and analyzed for selected radionuclides during August through October 1992. These reservoirs are located about 1.5 to 3.3 miles east of the U.S. Department of Energy's Rocky Flats Environmental Technology Site, formerly the Rocky Flats Plant, which was a manufacturing site for nuclear bomb triggers. In the 1960's, drums containing oil contaminated with plutonium leaked onto the ground. Some of these contaminated soils were subsequently dispersed offsite by wind. In 1983–84, plant operators sampled reservoir sediment from Standley Lake and Great Western Reservoir and determined that some sediment was contaminated with plutonium-239,240 ($^{239,240}Pu$). However, the data from the 1983–84 study lacked the quality-assurance criteria currently (1992) required by the Rocky Flats Field Office. In 1992, the U.S. Geological Survey, in cooperation with the U.S. Department of Energy, undertook a study to: (1) Characterize concentrations of selected radionuclides in lake sediment and surface water at Standley Lake, Great Western Reservoir, and Mower Reservoir; and (2) compare $^{239,240}Pu$ lake-sediment data obtained in 1983–84 to results from co-located lake-sediment samples obtained in 1992 by the U.S. Geological Survey.

Median $^{239,240}Pu$ concentrations in lake-sediment grab samples from Standley Lake, Great Western Reservoir, and Mower Reservoir were 0.037, 0.105, and 0.351 picocuries per gram (pCi/g), and the differences between the reservoirs were statistically significant at $p<0.05$. The highest $^{239,240}Pu$ concentrations were measured in lake-sediment grab samples collected from reservoirs closest to Rocky Flats Environmental Technology Site, which is consistent with the spatial pattern of $^{239,240}Pu$ concentrations identified in soil surrounding the site in previous studies.

The maximum concentration of $^{239,240}Pu$ dissolved in lake water was 0.009 picocuries per liter, well below limits suggested by the Colorado Department of Public Health and Environment. Dissolved gross alpha and uranium isotope concentrations were below National Drinking Water Standards in all water samples.

There was no statistically significant difference between $^{239,240}Pu$ concentrations in lake-sediment grab samples collected from Standley Lake in 1983–84 and in 1992; however, there was a small, but statistically significant difference at Great Western Reservoir ($p<0.05$). Mean $^{239,240}Pu$ concentrations at Great Western Reservoir were 0.140 pCi/g lower in 1992, and median concentrations were 0.040 pCi/g lower. One possible explanation for the difference in concentrations in lake-bottom-sediment grab samples is that new sediments with relatively low $^{239,240}Pu$ concentrations may have buried older sediments containing higher concentrations of $^{239,240}Pu$; the grab-sampling technique collects only the top 2 to 4 inches of sediment from the lake bottom.

In lake-bottom-sediment cores, trends in $^{239,240}Pu$ concentrations with depth in 1992 were

similar to trends identified in the 1983–84 study. Maximum $^{239,240}Pu$ concentrations occurred at depths ranging from 13 to 31 inches below the sediment-water interface at most sites. There was a small, but statistically significant ($p<0.05$) difference in $^{239,240}Pu$ concentrations in co-located lake-bottom-sediment cores collected in 1983–84 and in 1992. Measured concentrations tended to be higher in 1983–84 than in 1992. The median difference between data sets was 0.050 pCi/g, and differences tended to increase with concentration; in samples with concentrations above 1.5 pCi/L, concentrations were 10 to 30 percent higher in 1983–84 than in 1992. The differences in concentrations could be attributable to spatial variations in sediment and $^{239,240}Pu$ deposition.

INTRODUCTION

Standley Lake, Great Western Reservoir, and Mower Reservoir are man-made water bodies used for domestic water supply and irrigation in northeastern Jefferson County, Colorado (fig. 1). These reservoirs (hereinafter referred to as lakes) are located 1.5 to 3.3 mi east of the Rocky Flats Environmental Technology Site (RFETS, formerly known as the Rocky Flats Plant), which is about 16 mi northwest of Denver, Colorado. The RFETS, which is owned by the U.S. Department of Energy (DOE) and operated by contractors, was built in 1951 and has been used for plutonium processing, purification, and machining in the manufacture of triggers for nuclear bombs. In the 1960's, drums containing oil contaminated with plutonium leaked onto the ground at the 903 pad (fig. 1), and contaminated soil was subsequently transported offsite by wind erosion (Krey and Hardy, 1970). Investigations in the 1970's, 80's, and 90's indicated that soil near the RFETS was contaminated with plutonium-239,240 ($^{239,240}Pu$, which is plutonium-239 + plutonium-240) and americium-241 (^{241}Am), which is a daughter product of plutonium-241(^{241}Pu) (Krey and Hardy, 1970; Hardy and others, 1980; Thomas and Robertson, 1981; Setlock, 1983; Setlock and Paricio, 1984; Litoar and others, 1994). In 1983–84, the RFETS contractor measured elevated levels of $^{239,240}Pu$ in bottom sediment from Standley Lake and Great Western Reservoir (Setlock, 1983; Setlock and Paricio, 1984). However, the data were not collected using the quality-assurance criteria currently required by the DOE-RFETS. Between August 27 and Oct. 14, 1992, the U.S. Geological Survey (USGS), in cooperation with the DOE, collected lake-sediment grab samples, lake-bottom sediment cores, and water samples from Standley Lake, Great Western Reservoir, and Mower Reservoir.

Purpose and Scope

This report summarizes concentrations of selected radionuclides in sediment and water samples collected in 1992 from Standley Lake, Great Western Reservoir, and Mower Reservoir. The report also describes the results of comparisons between $^{239,240}Pu$ concentrations in sediment collected from Standley Lake and Great Western Reservoir in 1983–84 and 1992. Analytical results for radionuclide, trace element, major-element composition, and other selected water-quality constituents in individual sediment and water samples are presented in the appendixes at the back of this report.

Description of the Study Area

Standley Lake is a reservoir in the city of Westminster, a suburb of Denver, in northeastern Jefferson County and is about 3.3 mi southeast of the RFETS (fig. 1). This lake is formed by an earthen dam on Big Dry Creek and originally was constructed in about 1910 to supply water for irrigation. Standley Lake supplies drinking water for the cities of Westminster, Thornton, and Northglenn, which are located 4 mi southeast, 8 mi east, and 7 mi northeast of Standley Lake. About two-thirds of the lake water is municipal water supply, and the other one-third is for irrigation. The full capacity of the lake is about 43,000 acre-ft; the mean depth is about 36 ft, and the maximum depth is 96 ft—based on the original land surface (Ruddy and others, 1992). Almost all the inflow to Standley Lake is delivered by canals flowing from the southeast which do not pass through the RFETS. Woman Creek, which drains the southern side of the RFETS, flows intermittently into Standley Lake. Standley Lake is owned and operated by the Farmers Reservoir and Irrigation Company of Brighton.

Great Western Reservoir is in northeastern Jefferson County about 1.5 mi east of the RFETS (fig. 1). Great Western Reservoir has an earthen dam that was built in 1904 and originally was designed to supply water for irrigation. The lake is owned and operated by the city of Broomfield, which is located 2 mi to the northeast of Great Western Reservoir and supplies drinking water to the city. The full capacity of the lake

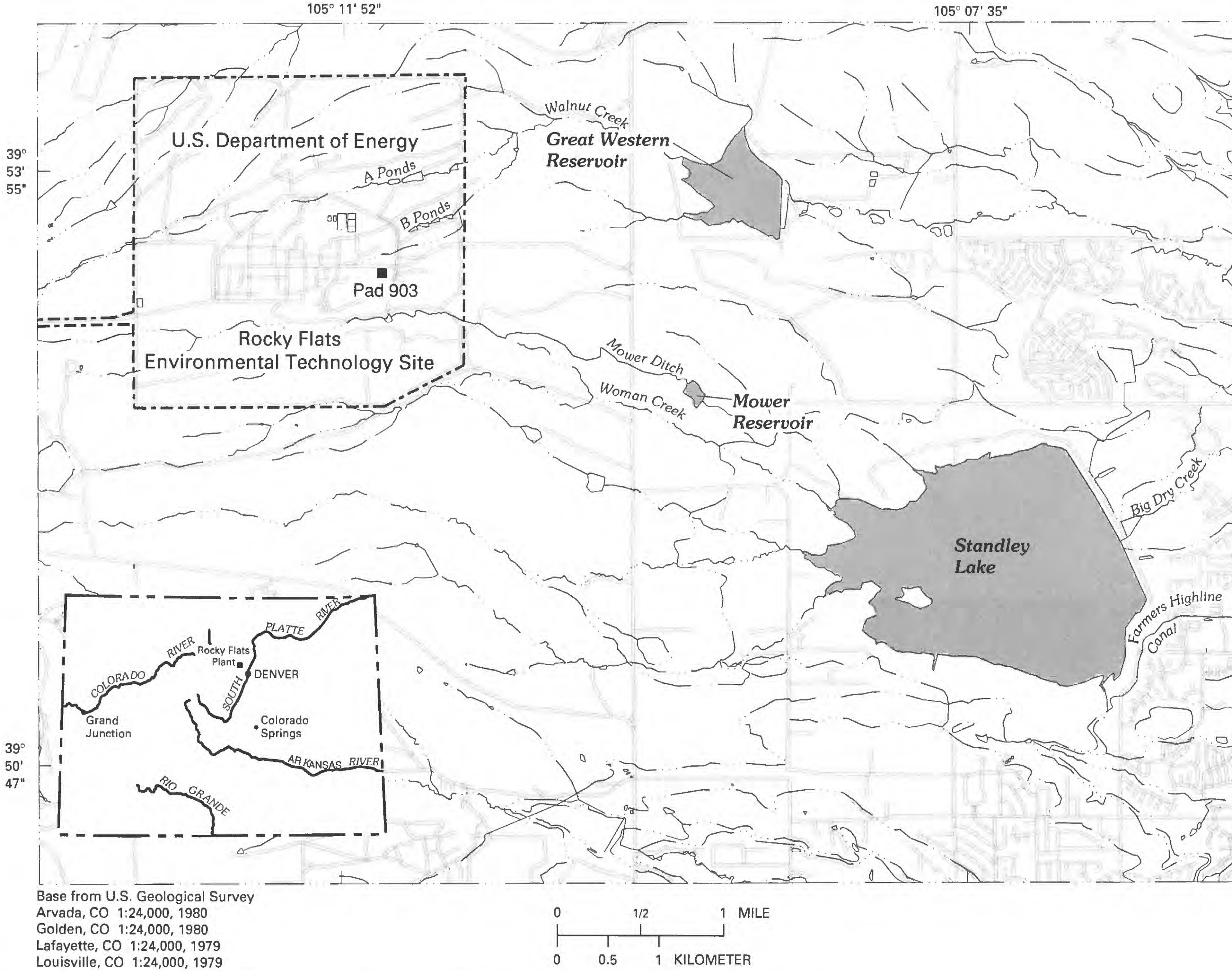

Figure 1. Location of Standley Lake, Great Western Reservoir, Mower Reservoir, and surrounding area.

is about 3,250 acre-ft. Most of the inflow to Great Western Reservoir comes from a canal flowing from the southeast, which does not pass through the RFETS. Walnut Creek, which flows from the RFETS, previously flowed into Great Western Reservoir but, in 1992, was diverted around Great Western Reservoir (U.S. Department of Energy, 1992). Outflow from Great Western Reservoir is into Walnut Creek, which joins Big Dry Creek several miles downstream.

Mower Reservoir is a small, privately owned lake about 1.5 mi southeast of the RFETS (fig. 1). Mower Reservoir water is used solely for agriculture. The lake covers an area of about 9 acres (U.S. Department of Energy, 1992). Inflow into Mower Reservoir is delivered from Mower Ditch, which diverts water from Woman Creek. Outflow discharges into Standley Lake southeast of Mower Reservoir. The lake had a maximum depth of about 5 ft during the sampling period. A dense mat of aquatic weeds covers most of the lake throughout the growing season.

Previous Investigations

^{239}Pu, ^{240}Pu, and ^{241}Pu are by-products of the nuclear processing activities that occurred at the RFETS. The half-life of ^{239}Pu is 24,100 years, the half-life of ^{240}Pu is 6,560 years, and the half-life of ^{241}Pu is 14.4 years (Walker and others, 1989). ^{241}Am is a decay product of ^{241}Pu and has a half-life of 432.7 years. ^{239}Pu, ^{240}Pu, and ^{241}Am primarily are alpha emitters and are the most prevalent transuranic contaminants in the soil at the RFETS (Litoar and others, 1994). A summary of the results of previous soil and lake-sediment investigations in the vicinity of the RFETS is provided in the following paragraphs.

A study conducted in 1970 characterized ^{239,240}Pu concentrations in soil surrounding the RFETS, and a contamination pattern converging on the drum storage site was identified (Krey and Hardy, 1970). Concentrations of ^{239,240}Pu in soil at the storage site were more than 2,000 nCi/m^2 and decreased in all directions away from the storage site (Krey and Hardy, 1970). These findings were confirmed by Litoar and others (1994), who measured ^{239,240}Pu and ^{241}Am concentrations as much as 4,440 pCi/g in soil near the drum storage site. It also was determined that 90 percent of ^{239,240}Pu and ^{241}Am concentrations were in the top 12 cm of soil, but earthworm burrowing probably was responsible for transporting some of the actinides to depths of 40 cm (Litoar and others, 1994).

In 1970 and 1973, the U.S. Environmental Protection Agency collected lake-bottom-sediment grab samples to determine ^{239,240}Pu levels in the sediment in Standley Lake. The concentrations were predominantly at background levels attributable to geologic and atmospheric testing sources of less than or equal to 0.10 pCi/g (U.S. Environmental Protection Agency, 1973, 1975). Maximum ^{239,240}Pu levels were 0.37 pCi/g in the 1970 study and 0.17 pCi/g in the 1973 study.

Lake-bottom-sediment cores were collected in 1974 in Standley Lake and Great Western Reservoir by a DOE contractor, Battelle Laboratory. One core from Standley Lake had a maximum ^{239,240}Pu concentration of 0.39 pCi/g, and a core from Great Western Reservoir had a maximum of 6.09 pCi/g (Thomas and Robertson, 1981).

In 1976, a lake-bottom-sediment core sample was collected from Standley Lake to determine the timing of plutonium releases (Hardy and others, 1980). Using a combination of actinides, the history of deposition of selected radionuclides was established, including fallout from nuclear bomb testing, nuclear-powered satellite failures, and releases at the RFETS. About 70 percent of the ^{239,240}Pu occurred in the uppermost 30 cm of the lake-bottom-sediment core, which Hardy and others (1980) attributed to drum leakage from the RFETS. The remaining 30 percent of the ^{239,240}Pu was attributed to atmospheric fallout during extensive nuclear testing in the 1950's and early 1960's (Hardy and others, 1980).

Additional studies were conducted in 1983 and 1984 by the DOE contractor, Rockwell International, to improve the existing knowledge of environmental radionuclide concentrations and relevant transport phenomena in Standley Lake and Great Western Reservoir (Setlock, 1983; Setlock and Paricio, 1984). In each of these studies, lake-sediment grab samples and lake-bottom-sediment cores were collected. Maximum ^{239,240}Pu concentrations in lake-bottom-sediment cores from Standley Lake were 0.61 pCi/g. Maximum ^{239,240}Pu concentrations in core samples from Great Western Reservoir were between 4.9 and 5.4 pCi/g. The 1983 and 1984 studies are the focus of the historical data comparison contained in this report.

METHODS OF DATA COLLECTION AND ANALYSIS

Sample-collection methods were designed to determine physical and chemical characteristics of sediment and water in the three lakes. Methods used for sample collection followed the RFETS environmental management standard operating procedures (EG&G, Rocky Flats, Inc., 1991) and are described or referenced in the following sections. The USGS boat was decontaminated at the RFETS decontamination pad according to standard procedures. Decontamination of the boat was done before and after the sampling of each lake. The samples were relinquished on the chain-of-custody to the DOE subcontractor for handling and shipping to the contract laboratories. The DOE subcontractor provided the sample bottles, which met the quality-assurance/quality-control requirements (U.S. Department of Energy, 1994), the sample bottle labels, and the chain-of-custody sheets. Sampling and decontamination methods specific to each type of sampling are described in the following sections.

Lake-Sediment Grab Sampling

Lake-sediment grab samples were collected from predetermined locations in the lakes. Sampling locations correspond to sites sampled during the 1983–84 studies at the RFETS. Sixteen lake-sediment grab samples were collected from Standley Lake on Sept. 3–4, 1992 (fig. 2), 15 samples were collected at Great Western Reservoir on Aug. 27–28 and Sept. 2, 1992 (fig. 3), and 3 samples were collected from Mower Reservoir on Sept. 10, 1992 (fig. 4). The lake-sediment grab samples were analyzed for selected radionuclides (table A-1 in Appendix A at the back of this report), trace elements, major ions, and cyanide (table A-2 in Appendix A). Analyses for total organic carbon were done for 10 percent of all grab samples at selected sampling sites.

Lake-sediment grab samples were collected using an Eckman dredge. The required volume of sediment sampled at most of the sites was 750 mL. Analyses for total organic carbon required an additional 1,250 mL of sediment for a total of about 2 L. The volume of sediment collected by the dredge was dependent on the physical consistency of the sediment. Where the sediment was soft, about 2 L was collected. Sandy or gravelly bottoms yielded only about 0.16 to 0.66 L of sediment, and several grabs had to be made at these sites to achieve the 750 mL. Once the dredge was retrieved, the sediment was emptied into a clean stainless-steel bowl and homogenized using a clean stainless-steel spoon. The sample then was containerized using the stainless-steel spoon to place the sediment in the sample bottle. Between samples, the decontamination of the dredge and the stainless-steel bowl and spoon consisted of a detergent wash, a deionized water rinse with a pressurized sprayer, and a drying with paper towels.

Lake-Bottom-Sediment Core Sampling

Lake-bottom-sediment core samples were collected from Standley Lake, Great Western Reservoir, and Mower Reservoir. Coring locations at Standley Lake and Great Western Reservoir in 1992 correspond to sites sampled during the 1983–84 studies. Lake-bottom-sediment core samples had not been previously collected at Mower Reservoir, and the coring locations there were determined by the USGS. A core was collected near the dam structure of each lake, near the center of each lake somewhere near the original stream channel, and in the deltas where the main tributaries flow into each lake. Two separate lake-bottom-sediment cores were collected at each sampling site: one core for chemical analyses, and the second for physical description.

Lake-bottom-sediment cores from the lakes were collected using a gravity-driven piston coring device (EG&G Rocky Flats Inc., 1991). The coring equipment consisted of a galvanized-steel weight stand that had fins, an attached galvanized-steel core barrel, driving weights, galvanized couplings, polyvinyl chloride (PVC) finger assembly, hose clamps, 2.6-in-diameter polybutyrate core liners, and a PVC piston valve. Once fully assembled, the coring device was attached to a steel cable and lowered into the water using a USGS E-reel (Buchanan and Somers, 1980). The coring device was lowered to about 20 ft from the lake bottom. At this point, the coring device was allowed to free-fall to the lake bottom to obtain a maximum core length. At the shallow sampling sites at Mower Reservoir, the coring device was allowed to free-fall from the water surface to get enough momentum to obtain an adequate core sample. The core sample was raised to the water surface using the E-reel. The core liner was removed from the core barrel, and end caps were secured on both ends of the liner. The liner was labeled and stored vertically in a cooled core-liner storage box.

The two core samples from each site were taken to a shore station for extrusion, description, and containerizing. Lake water above the sediment was siphoned from the core liner with a peristaltic pump, and an extrusion rod was placed in the bottom of the core liner. A clean 2-in.-long cutting sleeve was placed on top of the core liner, and a 2-in. section of core was pushed up into the cutting sleeve. A polyethylene cutter was inserted between the top of the core liner and the bottom of the cutting sleeve, and a 2-in. sample was cut from the core. The sample was put into a sample bottle and homogenized using a clean plastic spatula. A subsample was collected from this bottle and placed into a second sample bottle. One sample bottle was for analysis of radionuclides, and the other sample bottle

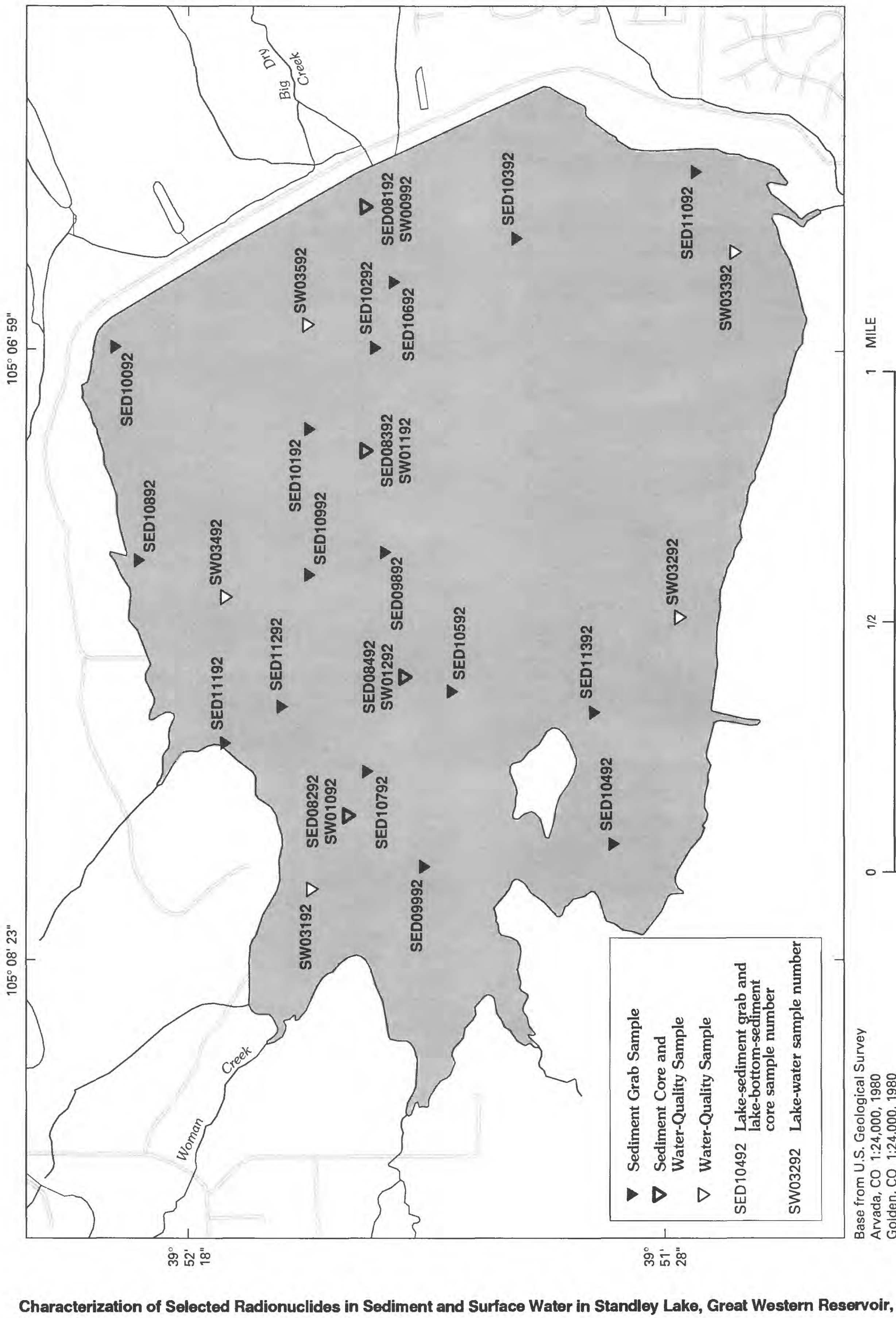

Figure 2. Location of sampling sites in Standley Lake.

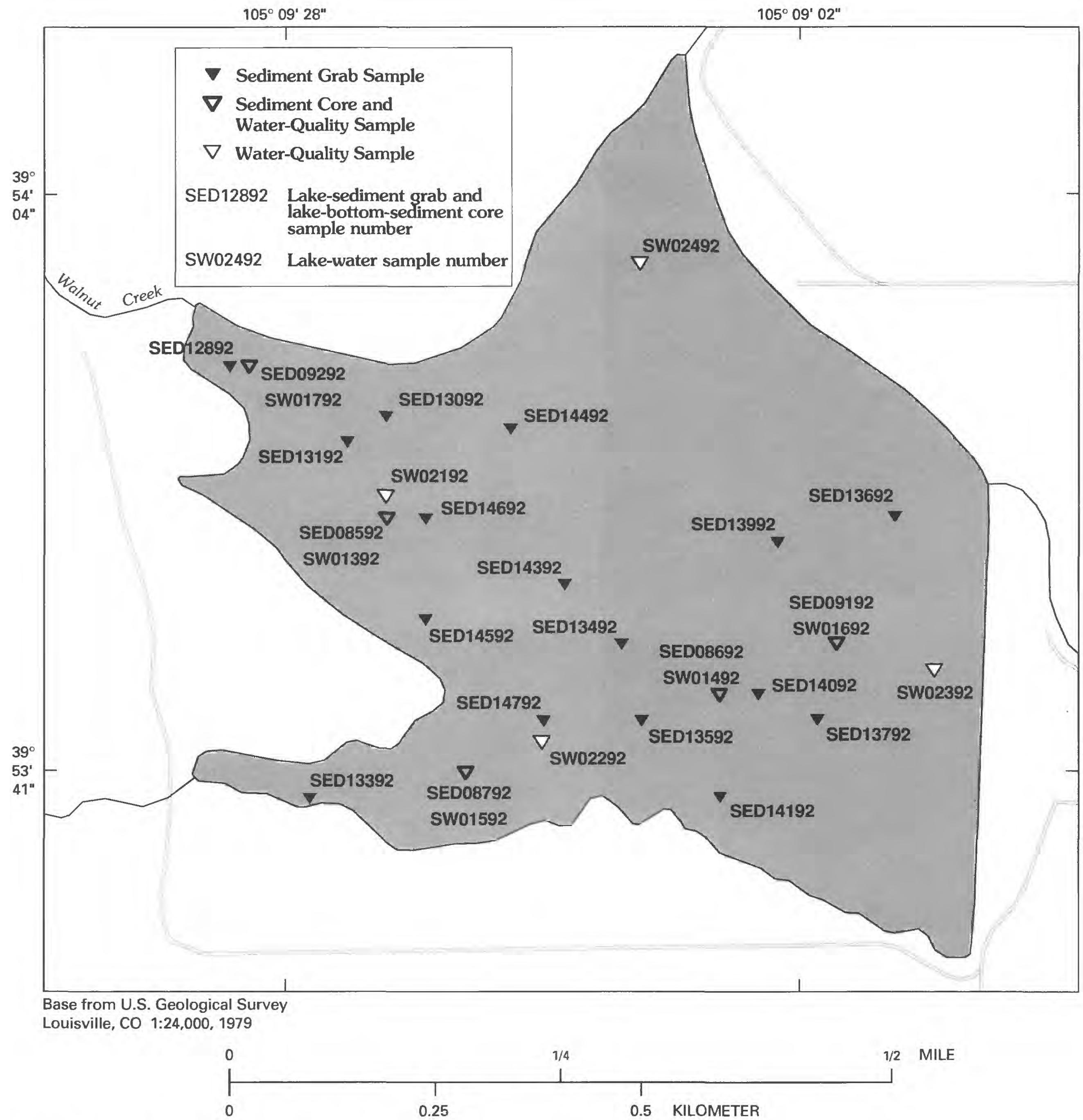

Figure 3. Location of sampling sites in Great Western Reservoir.

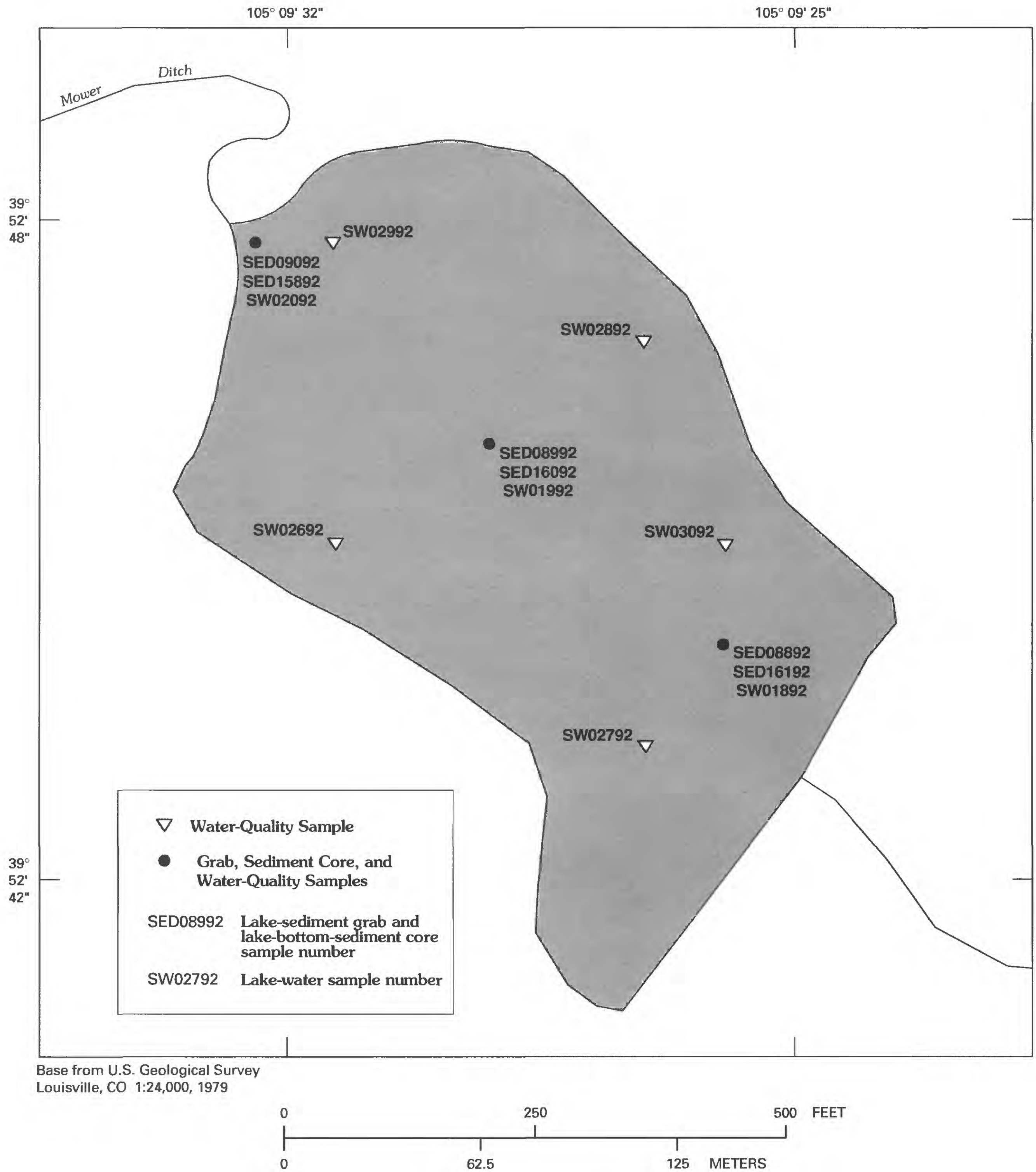

Figure 4. Location of sampling sites in Mower Reservoir.

was for analysis of trace elements, selected major ions, and cyanide. This procedure was repeated for the entire length of each core.

A physical description of the core material was done on one of the two cores collected from each lake-bottom sampling site (table B-1 in Appendix B). The core was extruded horizontally onto a table covered with white paper. The core was split in half longitudinally, using a spatula, to reveal the middle of the core. A yardstick was aligned along the side of the core for measuring purposes. The core material was photographed and qualitatively described in terms of color, texture, and other features. Core color was determined using the Munsell soil color chart standards.

Lake-bottom-sediment cores for chemical analyses were obtained from four sites at Standley Lake (fig. 2) on Sept. 8–9. Core lengths ranged from 8 in. at the Woman Creek bay site (SED08292) to 36 in. at the sampling site (SED08192) near the dam. Lake-bottom-sediment core samples were collected from five sites at Great Western Reservoir during 1992 (fig. 3) from Aug. 31–Sept. 2, and Sept. 15. Core lengths ranged from 9 in. at the Walnut Creek bay site (SED09292) to 31 in. at the site (SED09192) near the dam. Lake-bottom-sediment cores were obtained from three sites at Mower Reservoir (fig. 4) on Sept. 14. The cores ranged in length from 11 in. at the inlet of Mower Ditch site (SED09092) to 22 in. near the damsite (SED08992). The chemical analyses of the lake-bottom-sediment cores included radionuclides, selected major ions, trace elements, and cyanide. Attempts were made to obtain single core lengths of as much as 45 in.; however, some attempts were not successful. The low core recoveries could have been because of the physical characteristics of the sediment and limitations of the coring equipment.

Lake-Water Sampling

Water samples from the lakes were collected by using a horizontally suspended Van Dorn discrete-zone sampler. The Van Dorn sampler consists of a PVC cylinder with rigid polyurethane end seals, silicone gaskets, and a latex closing tube. The sampler is about 2 ft long and has a capacity of about 4 L. Samples obtained during the lake-bottom coring were collected about 1 to 1-1/2 ft from the bottom of the lake. During the Oct. aquatic sampling, water samples were collected at various depths based on the total depth at each sampling point. The water was decanted from the Van Dorn sampler into a clean 20-L carboy.

The water samples were taken to a shore station for preparation, containerizing, and preservation. All aliquots were taken from the 20-L carboy used to composite the samples on the boat. Samples for total concentrations were poured directly from the 20-L carboy, which was gently inverted several times to resuspend particulates, into the sample bottles. Samples for dissolved concentrations were pumped from the 20-L carboy through a 0.45-μm cellulose-membrane filter. The filter cartridge was flushed with 1 L of deionized water and about 500 mL of native water prior to filtration of samples from each site. The samples were relinquished on the chain-of-custody to the DOE subcontractor for handling and shipping to the laboratories. The DOE subcontractor provided the sample bottles, the sample bottle labeling, the 0.45-μm filter cartridges, and the chain-of-custody forms.

Water samples were collected in conjunction with the lake-bottom-sediment coring in Aug. and Sept. 1992 done by the USGS, and with the Oct. 1992 aquatic sampling done by the DOE subcontractor. Water samples were collected in July 1992 by the DOE subcontractor.

Field measurements were made at each water-sampling site at all three lakes (table C-1 in appendix C at the back of this report) using a multi-parameter measuring instrument. The parameters measured with the multi-parameter measuring instrument included water temperature, dissolved oxygen (DO), pH, and specific conductance. These field parameters were measured prior to the collection of water samples to develop a lake profile. By observing the water temperature and the DO, a determination of lake stratification could be made. No lake stratification was detected during the Oct. water sampling, so samples were composited from surface, middle, and bottom depths.

Four lake-bottom water samples were collected from Standley Lake during 1992 on Sept. 8–9 (fig. 2), five were collected from Great Western Reservoir from Aug. 31–Sept. 2 and on Sept. 15 (fig. 3), and three were collected from Mower Reservoir on Sept. 14 (fig. 4). The analyses of these water samples included radionuclides (table C-2 in Appendix C), trace elements, major ions, herbicides, nutrients, cyanide, and sulfide (table C-3 in Appendix C).

Water sampling, coinciding with the aquatic sampling performed by the DOE subcontractor at all three reservoirs, was done in Oct. 1992. Five water-quality samples were collected from Standley Lake on Oct. 13–14 (fig. 2), four were collected at Great Western Reservoir on Oct. 2 (fig. 3), and five were collected from Mower Reservoir on Oct. 8 (fig. 4). The analyses of these water samples included radionuclides (table C-2 in Appendix C), trace elements, major ions, nutrients, dissolved and suspended solids, oil and grease, pesticides, and volatile organic compounds (table C-3 in Appendix C).

Quality-Assurance Procedures and Analytical Methods

Quality-assurance procedures associated with sampling, sample preparation, and sample shipping were overseen by the DOE subcontractor. The quality-assurance activities were accomplished according to quality requirements (EG&G Rocky Flats Inc., 1991).

The types of quality-assurance samples collected at the sediment- and water-sampling sites consisted of duplicate samples and equipment rinsates. Duplicate samples were collected to provide an indication of overall sampling precision (U.S. Department of Energy, 1990). These duplicate samples were collected immediately after the regular samples were collected using the same sampling techniques. Equipment-rinsate samples were collected as a check on the potential for sample contamination by the sampling equipment. The equipment-rinsate samples were collected by containerizing deionized water that was used to rinse the various decontaminated sampling equipment. The frequency of the duplicate sample collection was 1 in every 10 regular sediment and water samples collected. Summary statistics for radionuclide concentrations in duplicate samples and differences in measured concentrations are in table 1. The frequency of the equipment-rinsate sample collection was 1 in every 20 regular sediment and water samples collected, and summary statistics for radionuclide concentrations in equipment rinsates are presented in table 2. Quality assurance for the field measurements consisted of

Table 1. Summary statistics for radionuclide concentrations in duplicate samples

[n, number of samples]

Grab	Total radionuclides (picocuries per gram)						
	Americium-241	Gross alpha	Gross beta	Plutonium-239,240	Uranium-233,234	Uranium-235	Uranium-238
Mean difference in concentrations	0.028	2.9	2.3	0.050	0.066	0.044	0.211
Mean concentration	.049	22.5	25.6	.129	1.310	.059	1.289
n	5	6	6	6	6	6	6

Core	Total radionuclides (picocuries per gram)					
	Americium-241	Plutonium-239,240	Polonium-210	Uranium-233,234	Uranium-235	Uranium-238
Mean difference in concentrations	.014	.153	.160	.166	.038	.144
Mean concentration	.117	.783	1.797	1.458	0.068	1.462
n	4	7	6	7	7	7

Water	Dissolved radionuclides (picocuries per liter)						
	Americium-241	Gross alpha	Gross beta	Plutonium-239,240	Uranium-233,234	Uranium-235	Uranium-238
Mean difference in concentrations	.002	.6	.3	.001	.185	.059	.129
Mean concentration	.003	.5	1.4	.001	.541	.034	.334
n	3	3	3	3	3	3	3

Water	Total radionuclides (picocuries per liter)						
	Americium-241	Gross alpha	Gross beta	Plutonium-239,240	Uranium-233,234	Uranium-235	Uranium-238
Mean difference in concentration	.007	1.9	.9	.002	.137	.042	.238
Mean concentration	.006	1.7	2.0	.003	.503	.018	.457
n	5	5	5	5	5	5	4

Table 2. Summary statistics for radionuclide concentrations in equipment rinsates

[n, number of samples]

Sediment cores	Total radionuclides (picocuries per gram)						
	Americium-241	**Gross alpha**	**Gross beta**	**Plutonium-239,240**	**Uranium-233,234**	**Uranium-235**	**Uranium-238**
Mean	0.001	-0.167	0.185	0.001	0.060	-0.003	0.065
Standard deviation	.001	.384	.654	.002	.075	.014	.088
n	8	7	7	8	8	8	8
Water	**Dissolved radionuclides (picocuries per liter)**						
	Americium-241	**Gross alpha**	**Gross beta**	**Plutonium-239,240**	**Uranium-233,234**	**Uranium-235**	**Uranium-238**
Mean	.005	.305	-.440	.002	.196	.003	.200
Standard deviation	.005	.204	.629	.002	.181	.018	.172
n	4	4	4	4	4	4	4
Water	**Total radionuclides (picocuries per liter)**						
	Americium-241	**Gross alpha**	**Gross beta**	**Plutonium-239,240**	**Uranium-233,234**	**Uranium-235**	**Uranium-238**
Mean	.671	.877	.447	.668	.814	.669	.832
Standard deviation	1.631	1.531	1.804	1.632	1.562	1.632	1.554
n	6	6	6	6	6	6	6

equipment inspection and calibration for each field-parameter measurement according to requirements (EG&G Rocky Flats, Inc., 1991).

Analytical methods for sediment and water-quality tests were provided by the U.S. Department of Energy (1990). Quality-assurance procedures for sample analyses and analytical data validation are outlined by the U.S. Department of Energy (1994). All analyses in this report met data-validation criteria.

Statistical Data-Analysis Techniques

To test for differences in analyte levels between the lakes, samples from each lake were grouped, and a Kruskal-Wallis test was applied to determine whether sample distributions were the same, or in some cases, whether medians of sample groups were the same. This test was used to identify differences in lake-sediment grab data and lake-water-quality results between lakes based on the 1992 data.

In the comparison of results for $^{239,240}Pu$ in lake-sediment grab samples and lake-bottom-sediment core samples collected in 1983–84 and in 1992, grab samples and core samples were evaluated independently. Results where concentrations were less than the reported detection limit were included in all statistical tests, and all data included in this report are uncensored. Uncensored data were used because removal or substitution of data below the detection limit can introduce bias into statistical analyses (Gilliom and others, 1984; Porter and others, 1988). Nonparametric statistical techniques were used because most data sets were not distributed normally.

Matched pairs of data were identified as samples that were collected in the same location in the 1983–84 and 1992 studies. Results for groups of matched pairs were compared using either a sign test or a Wilcoxon signed-rank test, depending on whether the differences between the data sets were symmetrically distributed. Although the signed-rank test provides more power when differences are symmetrical, the test is inappropriate where differences are asymmetric (Helsel and Hirsh, 1992; Ott, 1993). For matched pairs, the sign test determines whether x is generally larger or smaller than y, whereas the signed-rank test determines whether the median difference between paired observations is equal to zero (Helsel and Hirsh, 1992).

STATISTICAL ANALYSES OF RADIONUCLIDE CONCENTRATIONS

Lake-Sediment Grab Samples

1992 Data

Maximum concentrations of $^{239,240}Pu$ and ^{241}Am in sediment grab samples from all three study lakes were greater than the range of background concentrations, roughly ≤0.1 pCi/g, expected from natural processes and fallout (U.S. Environmental Protection Agency, 1973, 1975). The concentration of $^{239,240}Pu$ in lake-sediment grab samples for the three study lakes is shown in figure 5. Concentrations of $^{239,240}Pu$ were highest in Mower Reservoir sediment and lowest in sediment in Standley Lake. Boxplots of $^{239,240}Pu$ concentration are shown in figure 6. Summary statistics for radionuclide concentrations in all lake-sediment grab samples and groups of grab samples separated according to lake are listed in table 3. Median $^{239,240}Pu$ concentrations in Standley Lake, Great Western Reservoir, and Mower Reservoir were 0.037, 0.105, and 0.351 pCi/g, respectively, and the differences between the reservoirs were statistically significant at $p<0.05$.

The $^{239,240}Pu$ concentrations in Mower Reservoir were considerably higher than background levels measured in lake sediment in the Front Range of Colorado. For comparison, in a previous study (Cohen and others, 1990), mean $^{239,240}Pu$ concentrations in the top 4 in. of sediment from two unaffected Front Range lakes, Wellington Lake and Halligan Reservoir, were 0.094 and 0.027 pCi/g. Trends among the lakes used in this study were in agreement with the patterns of $^{239,240}Pu$ concentration reported for soil surrounding Rocky Flats (Hardy and others, 1980) and indicated that sediment in Mower Reservoir has the highest concentrations of $^{239,240}Pu$ of the three study lakes. These findings are consistent with the fact that Mower Reservoir is closest to the drum storage site at Rocky Flats.

The mean concentration of ^{241}Am in lake-sediment grab samples was highest in Great Western Reservoir and lowest in Standley Lake (fig. 7, table 3). However, ^{241}Am concentrations in sediment from Great Western Reservoir varied considerably and were substantially skewed; the median value was higher in Mower Reservoir than in Great Western Reservoir and Standley Lake (fig. 8, table 3). The difference in the median values of samples from Mower Reservoir and Standley Lake was significant at $p<0.05$.

Comparison Between 1983–84 and 1992 Data

When all lake-sediment grab sample data collected in 1983–84 were considered as one group, and all analogous data from 1992 were considered as another group, there was no statistically significant difference in the distributions of the data sets ($p>0.05$). However, when lake-sediment grab data from Standley Lake and Great Western Reservoir were considered separately, there was a statistically significant difference at Great Western Reservoir ($p<0.05$) and not at Standley Lake (no samples were taken from Mower Reservoir in 1983–84). Boxplots showing means, medians, and quartiles for the 1983–84 and 1992 data, as well as differences between the two data sets for co-located samples, are shown in figure 9. At Standley Lake, there seemed to be no consistent difference between the 1983–84 and the 1992 data (fig. 9a), but at Great Western Reservoir, the 1983–84 data had more spread than the 1992 data, and $^{239,240}Pu$ concentrations tended to be higher in 1983–84 (fig. 9b). The median difference between data sets at Great Western Reservoir was 0.040 pCi/g, and the mean difference was 0.140 pCi/g. The mean difference was substantially greater than the median difference because the distribution of differences was skewed; differences were greater at high concentration than at low concentration. Scatterplots of the matched pairs of $^{239,240}Pu$ concentration data for Standley Lake and Great Western Reservoir are shown in figures 10 and 11. A 1:1 line also is shown to indicate where samples would tend to plot if concentrations in co-located samples were the same in 1983–84 and 1992. Sites where samples had $^{239,240}Pu$ concentrations below 0.2 pCi/g in 1983–84 tended to have similar concentrations in 1992. However, sites where samples had $^{239,240}Pu$ concentrations above 0.2 pCi/g in 1983–84 tended to have much lower concentrations in 1992. The lower $^{239,240}Pu$ concentrations in 1992 compared to 1983–84 could be explained by recent deposition of sediments with relatively low $^{239,240}Pu$ concentrations; the new sediments may have buried the older sediments having somewhat higher concentrations of $^{239,240}Pu$. It is likely that the sediments with $^{239,240}Pu$ concentrations between 0.2 and 1.0 pCi/g still exist but were not sampled because the grab-sampling technique collects only the uppermost 2 to 4 in. of sediment.

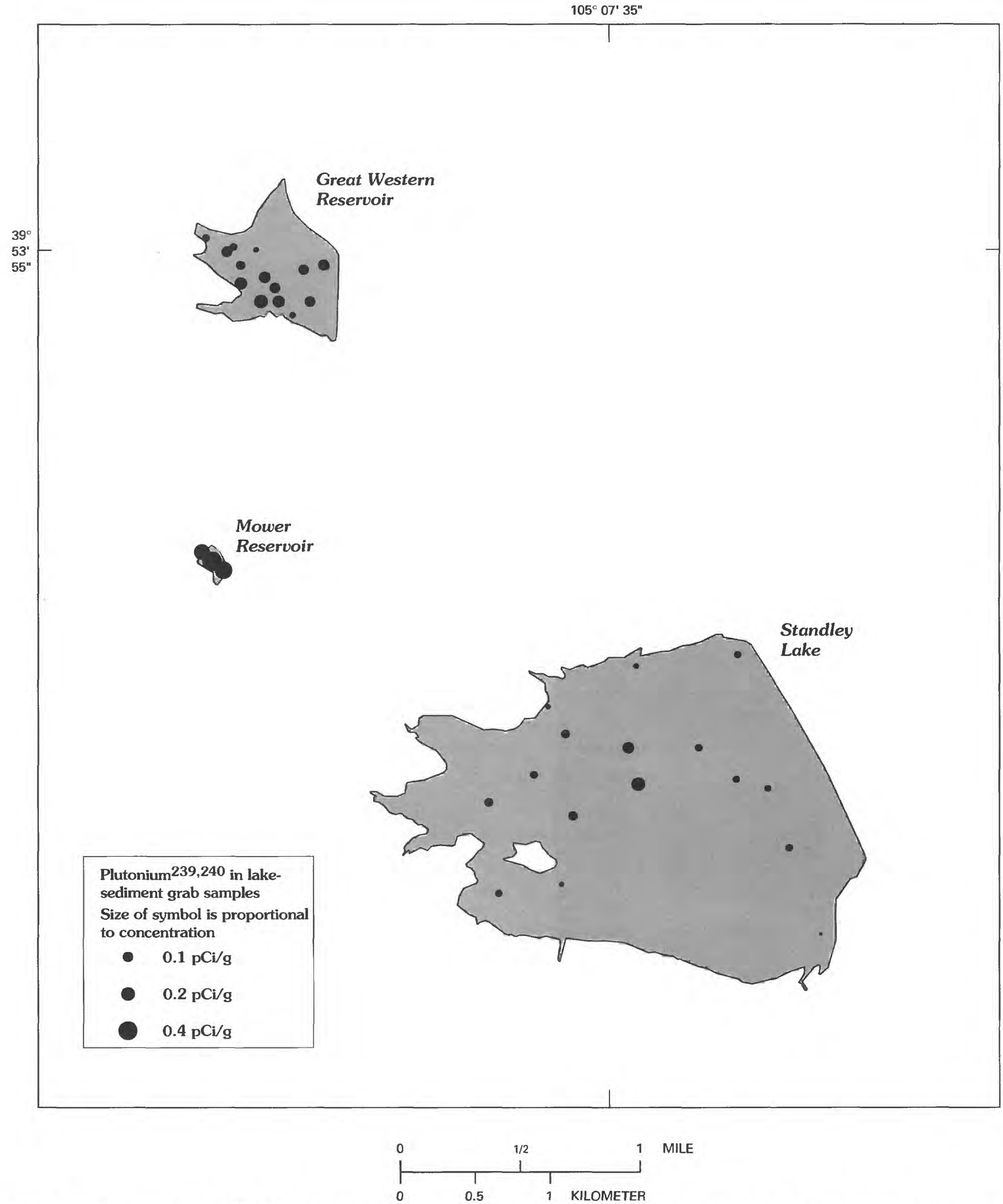

Figure 5. Concentrations of $^{239,240}Pu$ in lake-sediment grab samples collected from Standley Lake, Great Western Reservoir, and Mower Reservoir.

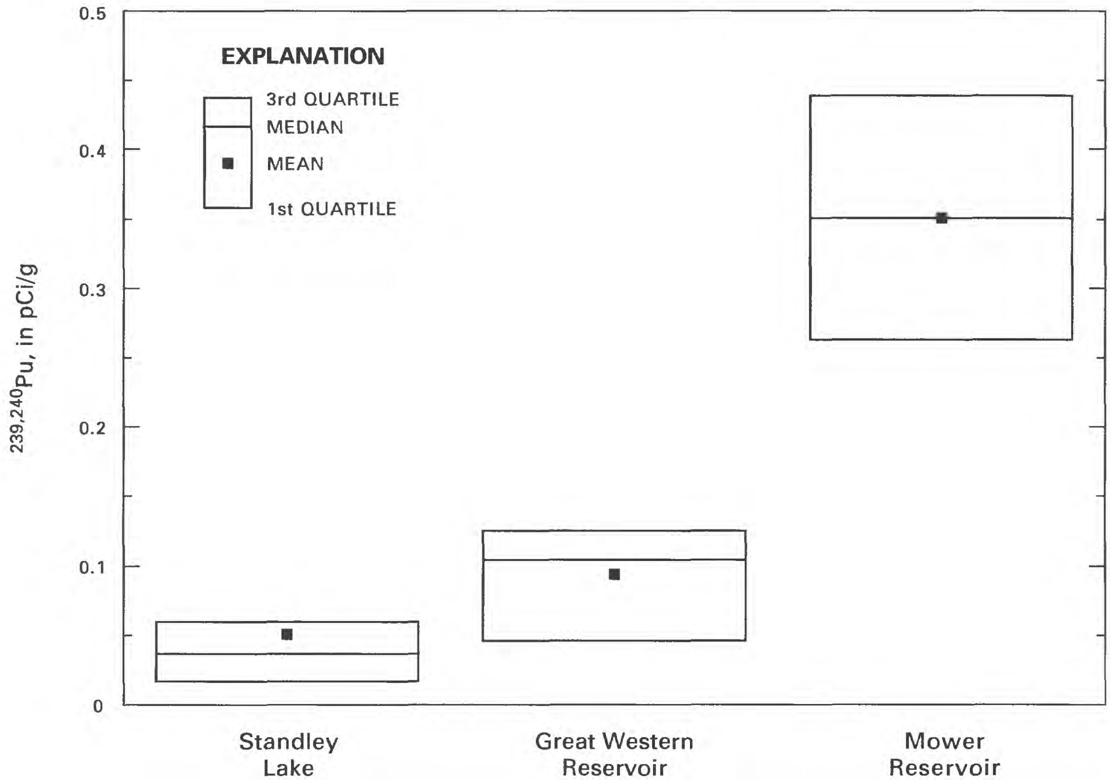

Figure 6. Distribution of $^{239,240}Pu$ concentrations in lake-sediment grab samples collected from Standley Lake, Great Western Reservoir, and Mower Reservoir.

Table 3. Summary statistics for radionuclide concentrations in lake-sediment grab samples

[Measurements in picocuries per gram; n, number of samples; --, not analyzed]

Grab sample	Statistic	Americium-241	Gross alpha	Gross beta	Plutonium-239,240	Tritium	Uranium		
							233,234	235	238
All samples	Mean	0.049	21.84	26.80	0.097	131.2	1.495	0.055	1.471
	Standard deviation	.052	5.60	4.38	.099	48.4	.551	.035	.524
	1st quartile	.013	18.43	24.11	.033	116.3	1.081	.026	1.110
	Median	.033	21.46	26.82	.060	157.2	1.497	.056	1.390
	3rd quartile	.050	24.15	29.10	.125	159.1	1.895	.088	1.940
	n	33	34	34	33	3	33	33	33
Standley Lake	Mean	.023	20.66	27.69	.051	--	1.623	.050	1.567
	Standard deviation	.026	4.57	4.12	.050	--	.685	.040	.627
	1st quartile	.009	18.18	26.10	.024	--	1.127	.009	.880
	Median	.013	21.61	27.81	.037	--	1.709	.053	1.862
	3rd quartile	.029	23.96	29.58	.060	--	2.161	.089	2.037
	n	15	16	16	16	0	16	16	16
Great Western Reservoir	Mean	.072	23.20	25.24	.095	131.2	1.387	.058	1.404
	Standard deviation	.065	6.91	4.61	.050	48.4	.390	.029	.445
	1st quartile	.034	18.67	23.35	.051	116.3	1.136	.041	1.142
	Median	.039	21.40	25.10	.105	157.2	1.391	.056	1.381
	3rd quartile	.093	27.55	26.33	.124	159.1	1.568	.084	1.558
	n	15	15	15	14	3	14	14	14
Mower Reservoir	Mean	.062	21.31	29.81	.351	--	1.322	.065	1.272
	Standard deviation	.013	1.01	1.37	.088	--	.302	.040	.029
	1st quartile	.055	20.86	29.03	.307	--	1.197	.047	1.260
	Median	.060	21.50	29.17	.351	--	1.406	.071	1.279
	3rd quartile	.068	21.86	30.28	.395	--	1.490	.086	1.288
	n	3	3	3	3	0	3	3	3

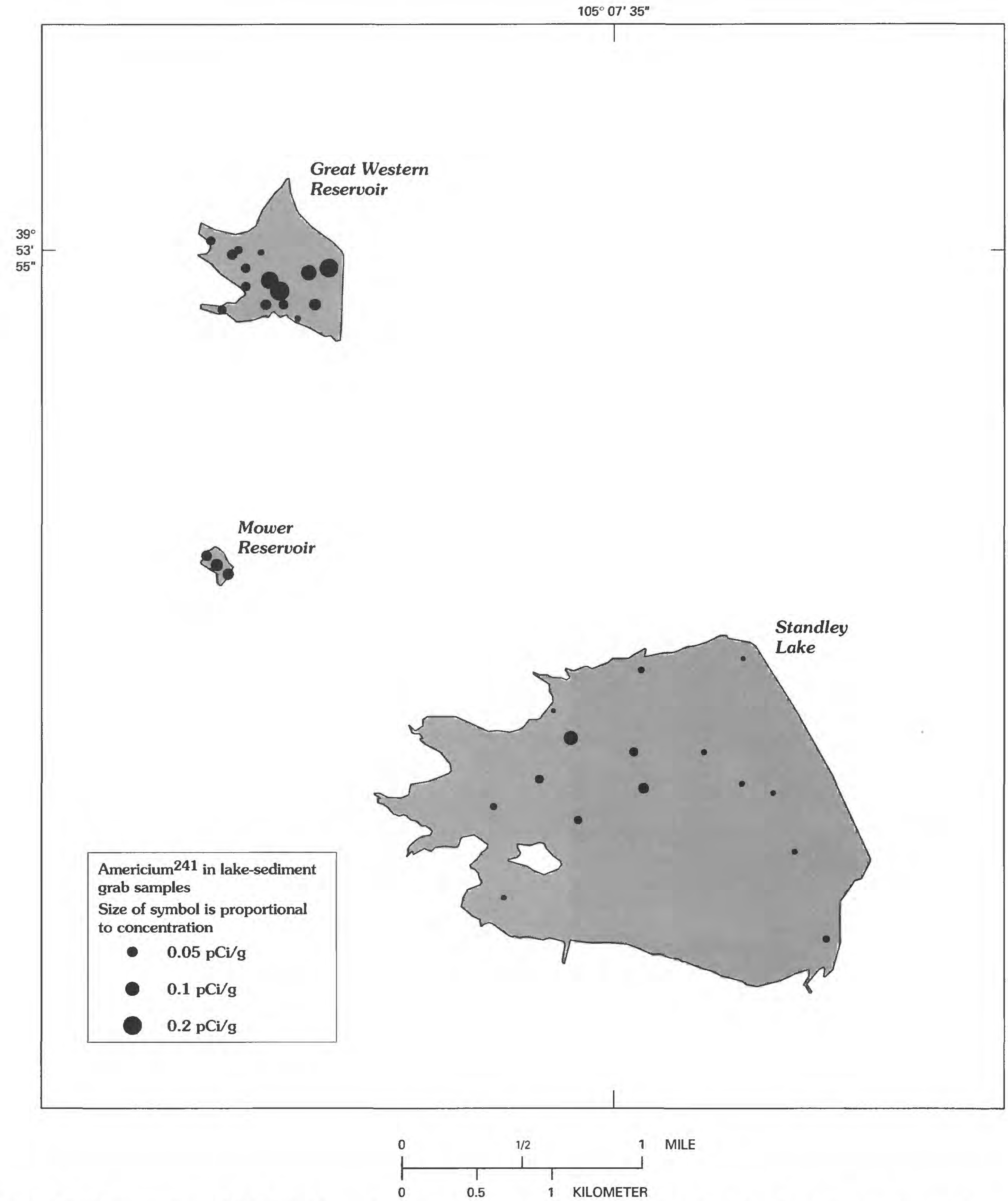

Figure 7. Concentrations of ^{241}Am in lake-sediment grab samples collected from Standley Lake, Great Western Reservoir, and Mower Reservoir.

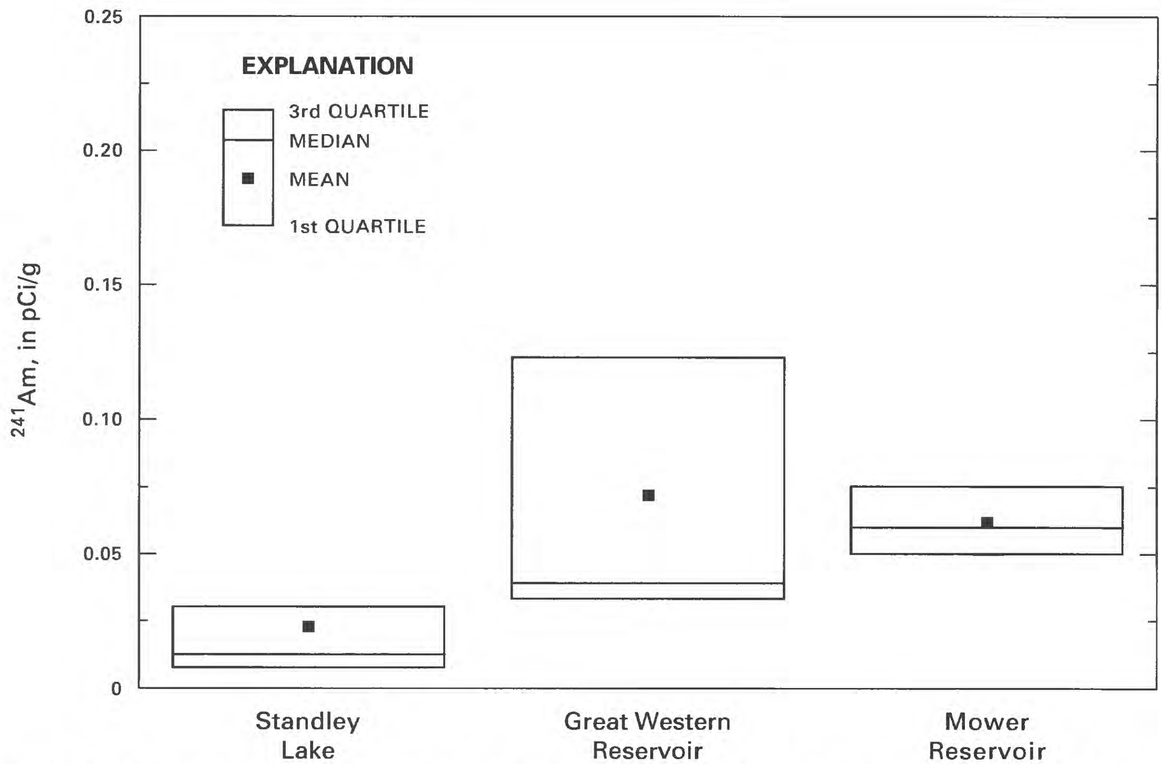

Figure 8. Distribution of ^{241}Am concentrations in lake-sediment grab samples collected from Standley Lake, Great Western Reservoir, and Mower Reservoir.

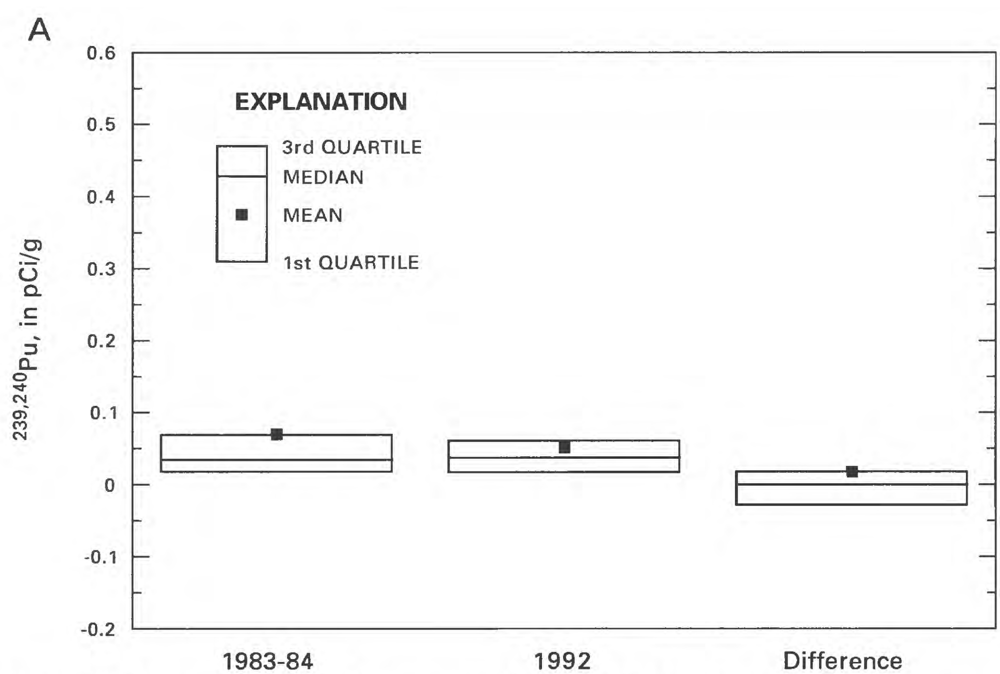

Figure 9A. Distribution of ^{239,240}Pu concentrations in 1983–84 and 1992 and differences between matched pairs of lake-sediment grab samples at Standley Lake.

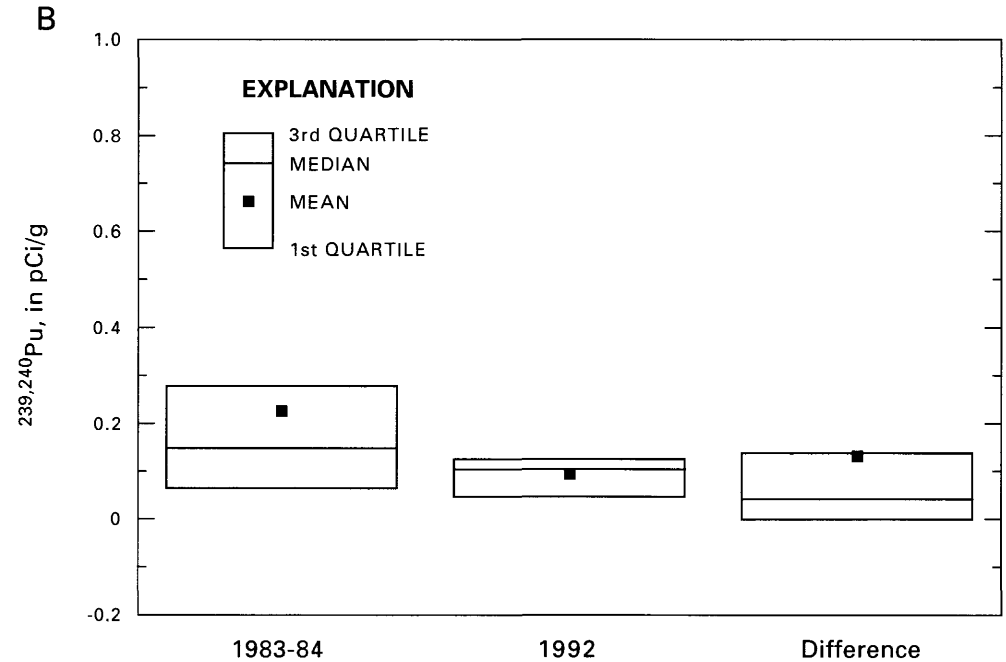

Figure 9B. Distribution of $^{239,240}Pu$ concentrations in 1983–84 and 1992 and differences between matched pairs of lake-sediment grab samples at Great Western Reservoir.

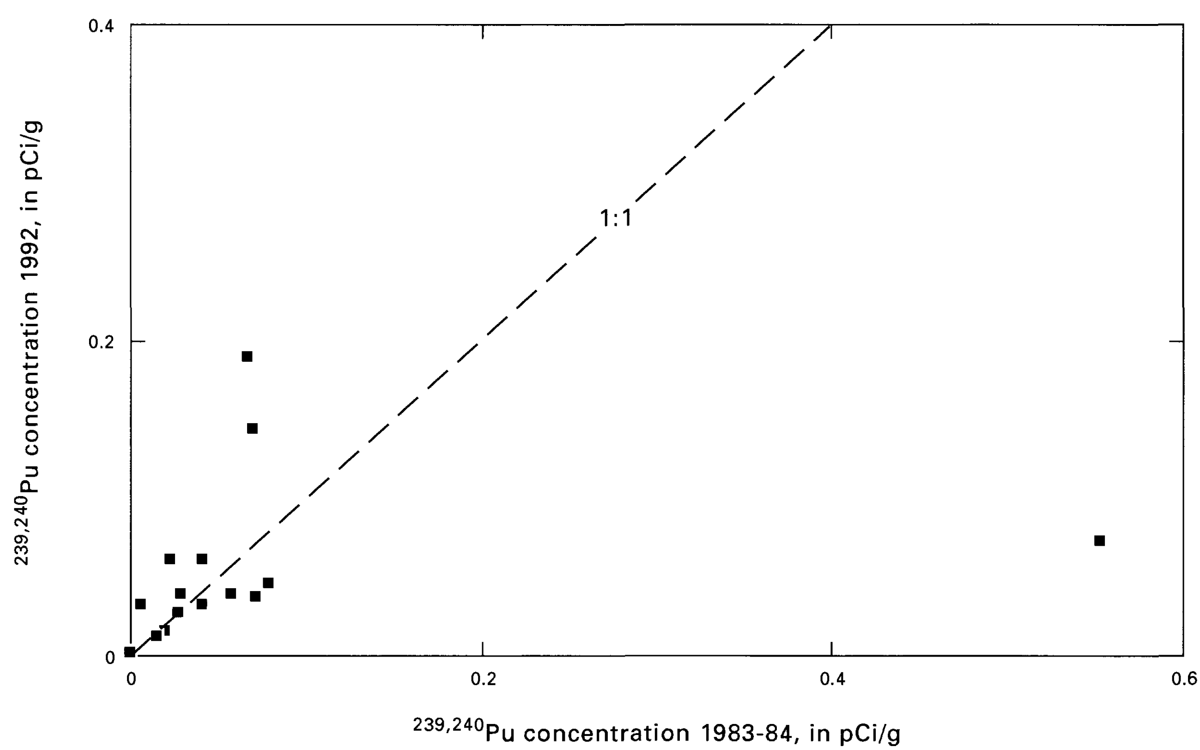

Figure 10. Relation between $^{239,240}Pu$ concentrations in lake-sediment grab samples collected at co-located sites in 1983–84 and in 1992 at Standley Lake.

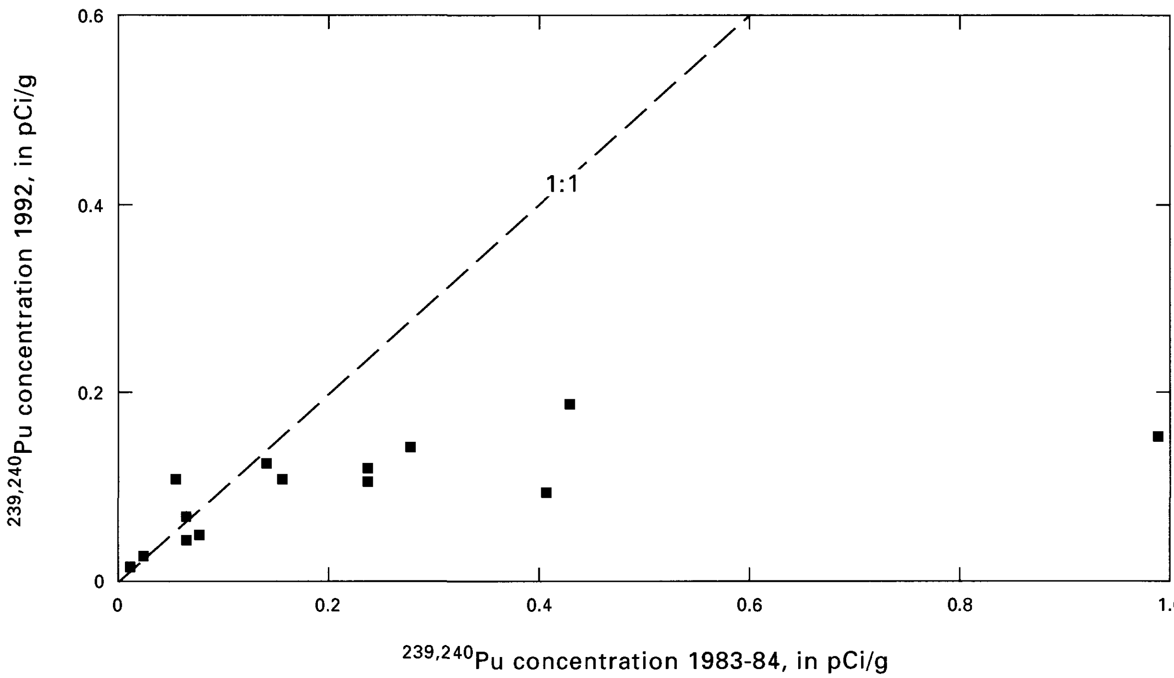

Figure 11. Relation between $^{239,240}Pu$ concentrations in lake-sediment grab samples collected at co-located sites in 1983–84 and in 1992 at Great Western Reservoir.

Lake-Bottom-Sediment Core Samples

1992 Data

As with the lake-sediment grab samples, concentrations of $^{239,240}Pu$ and ^{241}Am in many of the lake-bottom-sediment core samples were greater than the range of background concentrations expected from natural processes and fallout (U.S. Environmental Protection Agency, 1973, 1975). Concentrations of $^{239,240}Pu$ in lake-bottom-sediment cores ranged from about 0 pCi/g in Standley Lake and Mower Reservoir to 4.030 pCi/g in Great Western Reservoir (table 4) and had a median of 0.101 pCi/g. Concentrations of ^{241}Am ranged from 0 pCi/g in Standley Lake and Great Western Reservoir to 1.016 pCi/g in Great Western Reservoir (table 4) and had a median of 0.021 pCi/g. In most cores, $^{239,240}Pu$ and ^{241}Am concentrations exhibited a prominent peak at about the same depth, which occurred at depths ranging from 13 to 31 in. An example is shown in figure 12; $^{239,240}Pu$ and ^{241}Am concentrations both peak at a depth of 18 in. in core SED08392. Previous investigators have reported a prominent peak in the concentrations of these radionuclides at similar depths (Hardy and others, 1980; Setlock, 1983; Sackschewsky, 1985; Cohen and others, 1990).

Hardy and others (1980) used the ratio of ^{241}Am to $^{239,240}Pu$ to identify the predominant sources of $^{239,240}Pu$ in lake sediment. Krey and others (1976) reported that the ratio of ^{241}Am to $^{239,240}Pu$ in soil contaminated with Rocky Flats debris was 0.15. Livingston and Bowen (1976) noted that global fallout from 1961–62 nuclear testing averaged about 0.24. Hardy and others (1980) stated that the mean ratio of ^{241}Am to $^{239,240}Pu$ in lake sediment below the $^{239,240}Pu$ concentration peak matched that of fallout. The ^{241}Am to $^{239,240}Pu$ ratio above the $^{239,240}Pu$ concentration peak was equal to the ratios typical of contaminated Rocky Flats debris (Hardy and others, 1980). Hardy and others (1980) estimated that 74 to 90 percent of $^{239,240}Pu$ in sediment above the $^{239,240}Pu$ concentration peak was derived from Rocky Flats.

By following the method described in Hardy and others (1980), an attempt was made to identify the predominant sources of $^{239,240}Pu$ in lake-bottom-sediment cores collected in this study. It should be noted that the ratio of ^{241}Am to $^{239,240}Pu$ increases with time due to decay of ^{241}Pu (half-life = 14.4 yr) to ^{241}Am after deposition. The ratio of ^{241}Am to $^{239,240}Pu$ in the core from the middle of Standley Lake is plotted with depth in figure 13. In general, the lowest ratios (fig. 13) occurred near the same depth as the highest concentrations of $^{239,240}Pu$ and ^{241}Am (fig. 12) in this core, but the ratio had considerable scatter, and the data were inconclusive. Assignment of sources based on these results is not warranted. Furthermore, a plot of

Table 4. Radionuclide concentrations in lake-bottom-sediment core samples

[Measurements in picocuries per gram; in., inches; uncertainties are in parentheses; (nr), nr indicates uncertainty was not reported; --, not analyzed]

Site number[1]	Sampling depth from (in.)	Sampling depth to (in.)	Reservoir[2]	Sample number	Americium-241		Plutonium-239,240		Polonium-210		Uranium-233,234		Uranium-235		Uranium-238	
SED08192	0	2	SL	SD06400CH	0.004	(0.008)	0.016	(nr)	0.310	(0.010)	2.260	(0.016)	0.114	(0.016)	2.310	(0.016)
SED08192	2	4	SL	SD06401CH	.008	(nr)	.015	(nr)	.300	(.010)	2.130	(.016)	.063	(nr)	2.040	(nr)
SED08192	4	6	SL	SD06402CH	.012	(.007)	.022	(.014)	.330	(.010)	2.440	(.017)	.127	(nr)	2.380	(nr)
SED08192	6	8	SL	SD06403CH	.016	(nr)	.026	(nr)	.300	(.010)	2.540	(nr)	.084	(.022)	2.180	(.022)
SED08192	8	10	SL	SD06404CH	.000	(.006)	.026	(nr)	.300	(.010)	2.330	(.017)	.090	(nr)	1.950	(.017)
SED08192	10	12	SL	SD06405CH	.014	(.005)	.015	(.006)	.310	(.010)	1.570	(.015)	.059	(nr)	1.530	(.015)
SED08192	12	14	SL	SD06406CH	.024	(nr)	.039	(.008)	.350	(.020)	2.130	(.016)	.112	(nr)	2.120	(nr)
SED08192	14	16	SL	SD06407CH	.009	(.007)	.052	(nr)	.290	(nr)	1.890	(.014)	.055	(.014)	1.940	(.014)
SED08192	16	18	SL	SD06408CH	.011	(nr)	.041	(.009)	.340	(.020)	1.680	(.015)	.056	(.015)	1.470	(.015)
SED08192	18	20	SL	SD06409CH	.021	(nr)	.043	(nr)	.340	(.010)	1.700	(.014)	.067	(nr)	1.740	(.014)
SED08192	20	22	SL	SD06411CH	.011	(nr)	.049	(.013)	.280	(.010)	2.080	(.020)	.161	(.014)	2.040	(.014)
SED08192	22	24	SL	SD06412CH	.030	(.006)	.074	(.011)	.450	(.060)	2.090	(nr)	.040	(nr)	2.090	(.021)
SED08192	24	26	SL	SD06413CH	.040	(nr)	.141	(nr)	--	--	1.360	(.032)	.059	(.019)	1.180	(.019)
SED08192	26	28	SL	SD06414CH	.033	(nr)	.115	(.006)	1.110	(.050)	1.650	(nr)	.076	(nr)	1.910	(.016)
SED08192	28	30	SL	SD06415CH	.056	(nr)	.242	(nr)	1.990	(.030)	2.010	(.016)	.126	(.016)	1.790	(.016)
SED08192	30	32	SL	SD06416CH	.097	(.007)	.373	(nr)	1.330	(.020)	2.100	(.017)	.130	(.017)	1.850	(.017)
SED08192	32	34	SL	SD06417CH	.010	(nr)	.044	(nr)	1.480	(.030)	1.660	(.018)	.044	(nr)	1.480	(nr)
SED08292	0	2	SL	SD06429CH	.014	(.020)	.037	(.030)	1.850	(.020)	2.306	(.300)	.090	(.300)	2.323	(.300)
SED08292	2	4	SL	SD06430CH	.006	(.020)	.025	(.030)	1.980	(.020)	2.438	(.300)	.032	(.300)	2.320	(.300)
SED08292	4	6	SL	SD06431CH	.011	(.020)	.005	(.030)	1.620	(.030)	2.620	(.300)	.169	(.300)	2.310	(.300)
SED08292	6	8	SL	SD06432CH	.009	(.020)	.000	(.030)	1.620	(.020)	1.846	(.300)	.044	(.300)	1.876	(.300)
SED08392	0	2	SL	SD06458CH	.005	(.008)	.025	(nr)	--	--	2.660	(nr)	.056	(nr)	2.280	(.019)
SED08392	2	4	SL	SD06459CH	.011	(nr)	.028	(nr)	1.740	(.740)	2.460	(.016)	.135	(.016)	2.320	(.016)
SED08392	4	6	SL	SD06460CH	.015	(.006)	.041	(.005)	--	--	2.040	(.017)	.114	(.017)	1.850	(.017)
SED08392	6	8	SL	SD06461CH	.013	(nr)	.051	(.009)	.980	(.030)	1.560	(.016)	.063	(nr)	1.930	(nr)
SED08392	8	10	SL	SD06462CH	.015	(.005)	.071	(nr)	1.730	(.460)	1.730	(.017)	.056	(.017)	1.590	(.017)
SED08392	10	12	SL	SD06463CH	.020	(.005)	.080	(.006)	1.200	(.800)	1.620	(nr)	.103	(nr)	1.660	(.015)
SED08392	12	14	SL	SD06464CH	.022	(nr)	.139	(nr)	2.480	(.320)	2.000	(.020)	.066	(.020)	1.870	(nr)
SED08392	14	16	SL	SD06465CH	.068	(nr)	.265	(nr)	1.900	(.810)	1.850	(.015)	.051	(nr)	1.940	(.015)
SED08392	16	18	SL	SD06466CH	.081	(nr)	.380	(.011)	2.020	(.410)	2.200	(.016)	.055	(.016)	2.240	(.016)
SED08392	18	20	SL	SD06467CH	.016	(nr)	.101	(.006)	1.330	(.710)	2.220	(.015)	.110	(.015)	2.470	(nr)
SED08392	20	22	SL	SD06469CH	.020	(nr)	.041	(.006)	1.670	(.020)	3.150	(.028)	.133	(.020)	2.860	(.020)

Table 4. Radionuclide concentrations in lake-bottom-sediment core samples--Continued

Site number[1]	Sampling depth from (in.)	Sampling depth to (in.)	Reservoir[2]	Sample number	Americium-241		Plutonium-239,240		Polonium-210		Uranium-233,234		Uranium-235		Uranium-238	
SED08492	0	2	SL	SD06487CH	0.012	(0.020)	0.060	(0.030)	2.880	(0.020)	2.519	(0.300)	0.085	(0.300)	2.373	(0.300)
SED08492	2	4	SL	SD06488CH	.014	(.020)	.097	(.030)	2.130	(.010)	2.342	(.300)	.094	(.300)	2.370	(.300)
SED08492	4	6	SL	SD06489CH	.013	(.020)	.006	(.030)	1.700	(.020)	1.851	(.300)	.065	(.300)	1.674	(.300)
SED08492	6	8	SL	SD06490CH	.003	(.020)	.007	(.030)	1.700	(.030)	1.332	(.300)	.099	(.300)	1.224	(.300)
SED08592	0	2	GW	SD06516CH	.038	(.020)	.135	(.030)	1.350	(.010)	1.053	(.300)	.078	(.300)	.996	(.300)
SED08592	2	4	GW	SD06517CH	.000	(.020)	.116	(.030)	1.230	(.010)	1.064	(.300)	.042	(.300)	1.094	(.300)
SED08592	4	6	GW	SD06518CH	.020	(.020)	.060	(.030)	1.110	(.030)	1.249	(.300)	.028	(.300)	.802	(.300)
SED08592	6	8	GW	SD06519CH	.021	(.020)	.045	(.030)	1.060	(.020)	1.107	(.300)	.044	(.300)	1.243	(.300)
SED08592	8	10	GW	SD06520CH	.019	(.020)	.078	(.030)	1.150	(.030)	1.065	(.300)	.042	(.300)	1.044	(.300)
SED08592	10	12	GW	SD06522CH	--	--	.109	(.017)	1.120	(.010)	1.104	(.031)	.051	(.022)	1.244	(nr)
SED08592	12	14	GW	SD06523CH	--	--	1.556	(nr)	1.580	(.020)	.982	(.028)	.027	(.020)	1.069	(nr)
SED08692	0	2	GW	SD06545CH	--	--	.125	(nr)	2.890	(.020)	1.343	(.038)	.061	(.022)	1.737	(.022)
SED08692	2	4	GW	SD06546CH	--	--	.192	(.019)	2.640	(.020)	1.354	(.084)	.056	(.063)	1.380	(.089)
SED08692	4	6	GW	SD06547CH	--	--	.136	(.007)	2.410	(.020)	1.506	(.038)	.143	(.031)	1.561	(.022)
SED08692	6	8	GW	SD06549CH	--	--	.181	(nr)	2.390	(.010)	1.562	(.027)	.075	(nr)	1.372	(nr)
SED08692	8	10	GW	SD06550CH	--	--	--	--	1.770	(.010)	1.377	(.038)	.075	(.027)	1.271	(.038)
SED08692	10	12	GW	SD06551CH	--	--	--	--	1.630	(.010)	1.153	(.019)	.080	(nr)	1.315	(nr)
SED08692	12	14	GW	SD06552CH	--	--	.896	(nr)	2.230	(.020)	1.336	(.076)	.052	(nr)	1.362	(.076)
SED08692	14	16	GW	SD06553CH	--	--	1.437	(nr)	2.170	(.010)	1.328	(.036)	.098	(nr)	.997	(.026)
SED08692	16	18	GW	SD06554CH	--	--	2.313	(nr)	2.270	(.010)	1.329	(.036)	.045	(.036)	1.288	(.045)
SED08692	18	20	GW	SD06555CH	.619	(nr)	2.698	(nr)	2.320	(.020)	1.183	(.059)	.064	(.042)	1.721	(.066)
SED08692	20	22	GW	SD06556CH	.857	(.004)	3.263	(.008)	2.250	(.030)	1.354	(.057)	(.006)	(.047)	1.895	(.077)
SED08692	22	24	GW	SD06557CH	.798	(nr)	3.183	(.017)	1.890	(.040)	1.866	(.083)	(.007)	(.064)	1.872	(.052)
SED08692	24	26	GW	SD06558CH	.580	(.005)	1.266	(nr)	2.180	(.010)	1.393	(.032)	.033	(.022)	1.647	(.039)
SED08692	26	28	GW	SD06559CH	1.016	(.004)	2.413	(nr)	2.170	(.010)	1.398	(.037)	.063	(.045)	1.281	(.052)
SED08792	0	2	GW	SD06574CH	.125	(nr)	.376	(nr)	2.020	(.010)	1.153	(.072)	.041	(.042)	1.541	(.042)
SED08792	2	4	GW	SD06575CH	.392	(nr)	1.512	(nr)	1.970	(.010)	1.692	(.034)	.014	(.019)	1.531	(.028)
SED08792	4	6	GW	SD06576CH	.190	(.003)	.755	(.013)	1.880	(.020)	1.154	(.080)	.070	(.046)	1.455	(.065)
SED08792	6	8	GW	SD06577CH	.069	(nr)	.234	(.025)	1.860	(.010)	1.685	(.060)	.098	(.046)	1.329	(.032)
SED08792	8	10	GW	SD06578CH	.009	(nr)	.016	(.013)	2.010	(.010)	1.329	(.042)	.043	(.030)	1.535	(.030)

Table 4. Radionuclide concentrations in lake-bottom-sediment core samples--Continued

Site number[1]	Sampling depth from (in.)	Sampling depth to (in.)	Reservoir[2]	Sample number	Americium-241		Plutonium-239,240		Polonium-210		Uranium-233,234		Uranium-235		Uranium-238	
SED09192	0	2	GW	SD06603CH	0.026	(nr)	0.089	(0.013)	1.050	(0.060)	1.710	(0.032)	0.033	(0.023)	1.400	(0.023)
SED09192	2	4	GW	SD06604CH	.030	(nr)	.134	(nr)	2.110	(.030)	1.450	(nr)	.011	(nr)	1.410	(.022)
SED09192	4	6	GW	SD06605CH	.030	(nr)	.154	(nr)	1.840	(.050)	1.310	(.026)	.124	(.026)	1.370	(.026)
SED09192	6	8	GW	SD06606CH	.055	(nr)	.191	(nr)	2.750	(.040)	1.710	(nr)	.049	(nr)	1.550	(.020)
SED09192	8	10	GW	SD06607CH	.083	(nr)	.243	(.008)	1.350	(.030)	1.550	(.019)	.064	(.019)	1.620	(.019)
SED09192	10	12	GW	SD06608CH	.149	(0.006)	.519	(.019)	2.320	(.040)	1.180	(.019)	.084	(.019)	1.360	(.019)
SED09192	12	14	GW	SD06609CH	.388	(nr)	1.230	(.009)	3.140	(.080)	1.410	(.016)	.055	(nr)	1.310	(nr)
SED09192	14	16	GW	SD06610CH	.542	(.006)	1.740	(nr)	2.360	(.030)	1.380	(.020)	.019	(.020)	1.680	(.020)
SED09192	16	18	GW	SD06611CH	.663	(.006)	2.870	(.022)	2.100	(.030)	1.350	(nr)	.035	(nr)	1.260	(.018)
SED09192	18	20	GW	SD06612CH	--	--	4.030	(.013)	2.350	(.030)	1.210	(.020)	.058	(.020)	1.160	(nr)
SED09192	20	22	GW	SD06614CH	.586	(.006)	2.880	(.007)	2.490	(.060)	1.210	(.019)	.018	(.019)	1.270	(.019)
SED09192	22	24	GW	SD06615CH	.603	(.005)	1.930	(nr)	2.070	(.040)	1.340	(.019)	.037	(.019)	1.930	(nr)
SED09192	24	26	GW	SD06616CH	.609	(nr)	1.160	(nr)	2.810	(.030)	1.430	(.020)	.066	(.020)	1.490	(.020)
SED09192	26	28	GW	SD06617CH	.820	(nr)	2.610	(.009)	1.590	(.070)	1.550	(.031)	.064	(.022)	1.490	(.022)
SED09292	0	2	GW	SD06632CH	.044	(nr)	.090	(nr)	1.950	(.040)	.753	(nr)	.067	(nr)	1.000	(.020)
SED09292	2	4	GW	SD06633CH	.014	(.006)	.033	(.022)	--	--	.926	(.023)	.024	(.017)	1.050	(.017)
SED09292	4	6	GW	SD06634CH	.016	(nr)	.028	(nr)	--	--	.860	(nr)	.018	(nr)	.754	(.019)
SED09292	6	8	GW	SD06635CH	.024	(nr)	.040	(nr)	--	--	1.040	(.021)	.070	(.021)	1.100	(.021)
SED09292	8	10	GW	SD06636CH	.005	(nr)	.012	(nr)	--	--	.913	(nr)	.049	(nr)	1.290	(.025)
SED09292	10	12	GW	SD06637CH	.012	(nr)	.014	(.008)	--	--	.871	(.015)	.042	(.015)	1.050	(.015)
SED08892	0	2	M	SD06661CH	.062	(nr)	.292	(nr)	--	--	1.490	(.022)	.086	(.022)	1.480	(.022)
SED08892	2	4	M	SD06662CH	.075	(nr)	.502	(nr)	--	--	1.500	(.020)	.019	(nr)	1.360	(nr)
SED08892	4	6	M	SD06663CH	.100	(nr)	.462	(nr)	--	--	1.490	(.017)	.074	(.017)	1.390	(.017)
SED08892	6	8	M	SD06664CH	.024	(nr)	.054	(.011)	--	--	.993	(nr)	.050	(nr)	1.030	(.017)
SED08892	8	10	M	SD06665CH	.015	(nr)	.012	(.014)	--	--	1.190	(.024)	.023	(.024)	1.020	(nr)
SED08892	10	12	M	SD06666CH	.005	(nr)	.018	(.016)	--	--	.999	(.018)	.052	(nr)	.877	(.018)
SED08892	12	14	M	SD06667CH	.001	(.006)	.009	(.007)	--	--	1.070	(.018)	.052	(.018)	1.080	(.018)
SED08892	14	16	M	SD06668CH	.012	(nr)	.006	(nr)	--	--	1.110	(.030)	.051	(.021)	1.370	(nr)
SED08892	16	18	M	SD06669CH	.013	(.007)	.008	(nr)	--	--	1.170	(.038)	.021	(.022)	1.00	(.022)
SED08892	18	20	M	SD06670CH	.006	(nr)	.001	(.006)	--	--	1.030	(.021)	.051	(nr)	1.030	(.021)

Table 4. Radionuclide concentrations in lake-bottom-sediment core samples--Continued

Site number[1]	Sampling depth from (in.)	Sampling depth to (in.)	Reservoir[2]	Sample number	Americium-241		Plutonium-239,240		Polonium-210		Uranium-233,234		Uranium-235		Uranium-238	
SED08992	0	2	M	SD06690CH	0.076	(nr)	0.381	(nr)	3.810	(0.020)	1.426	(0.052)	0.031	(0.040)	1.179	(0.047)
SED08992	2	4	M	SD06691CH	.113	(nr)	.651	(0.018)	3.360	(.030)	1.725	(.025)	.039	(.017)	1.240	(nr)
SED08992	4	6	M	SD06692CH	.175	(nr)	1.112	(nr)	2.870	(.010)	1.371	(.045)	.028	(nr)	1.361	(.032)
SED08992	6	8	M	SD06693CH	--	--	.600	(nr)	2.630	(.010)	1.300	(nr)	.036	(nr)	1.236	(.017)
SED08992	8	10	M	SD06695CH	--	--	.128	(nr)	2.340	(.020)	1.328	(.035)	.051	(.025)	1.566	(.028)
SED08992	10	12	M	SD06696CH	--	--	.040	(nr)	1.860	(.010)	1.233	(.020)	.021	(nr)	1.151	(nr)
SED08992	12	14	M	SD06697CH	--	--	.012	(.018)	1.960	(.020)	1.359	(.084)	.026	(nr)	.926	(.059)
SED08992	14	16	M	SD06698CH	--	--	.014	(nr)	2.020	(.030)	1.331	(nr)	.042	(.035)	1.055	(.035)
SED08992	16	18	M	SD06699CH	--	--	--	--	1.740	(.020)	1.003	(.035)	.052	(.025)	1.012	(.043)
SED09092	0	2	M	SD06719CH	--	--	.254	(nr)	2.210	(.010)	.965	(.037)	.047	(.028)	.956	(.023)
SED09092	2	4	M	SD06720CH	--	--	.250	(nr)	2.190	(.020)	1.139	(.021)	.055	(.015)	1.138	(.026)
SED09092	4	6	M	SD06721CH	--	--	.123	(nr)	1.660	(.020)	1.115	(.023)	.056	(.033)	1.161	(.038)
SED09092	6	8	M	SD06722CH	--	--	.000	(nr)	1.710	(.010)	1.235	(.034)	.050	(.034)	1.091	(.020)
SED09092	8	10	M	SD06723CH	--	--	--	--	1.610	(.010)	1.036	(.024)	.041	(.014)	.923	(.019)
SED09092	10	12	M	SD06724CH	--	--	.010	(.016)	1.450	(.030)	1.009	(.035)	.030	(.020)	1.045	(.014)

[1]See figure 2 for location of sites on Standley Lake, figure 3 for sites on Great Western Reservoir, and figure 4 for sites on Mower Reservoir.

[2]Codes for lakes include: SL=Standley Lake, GW=Great Western Reservoir, and M=Mower Reservoir.

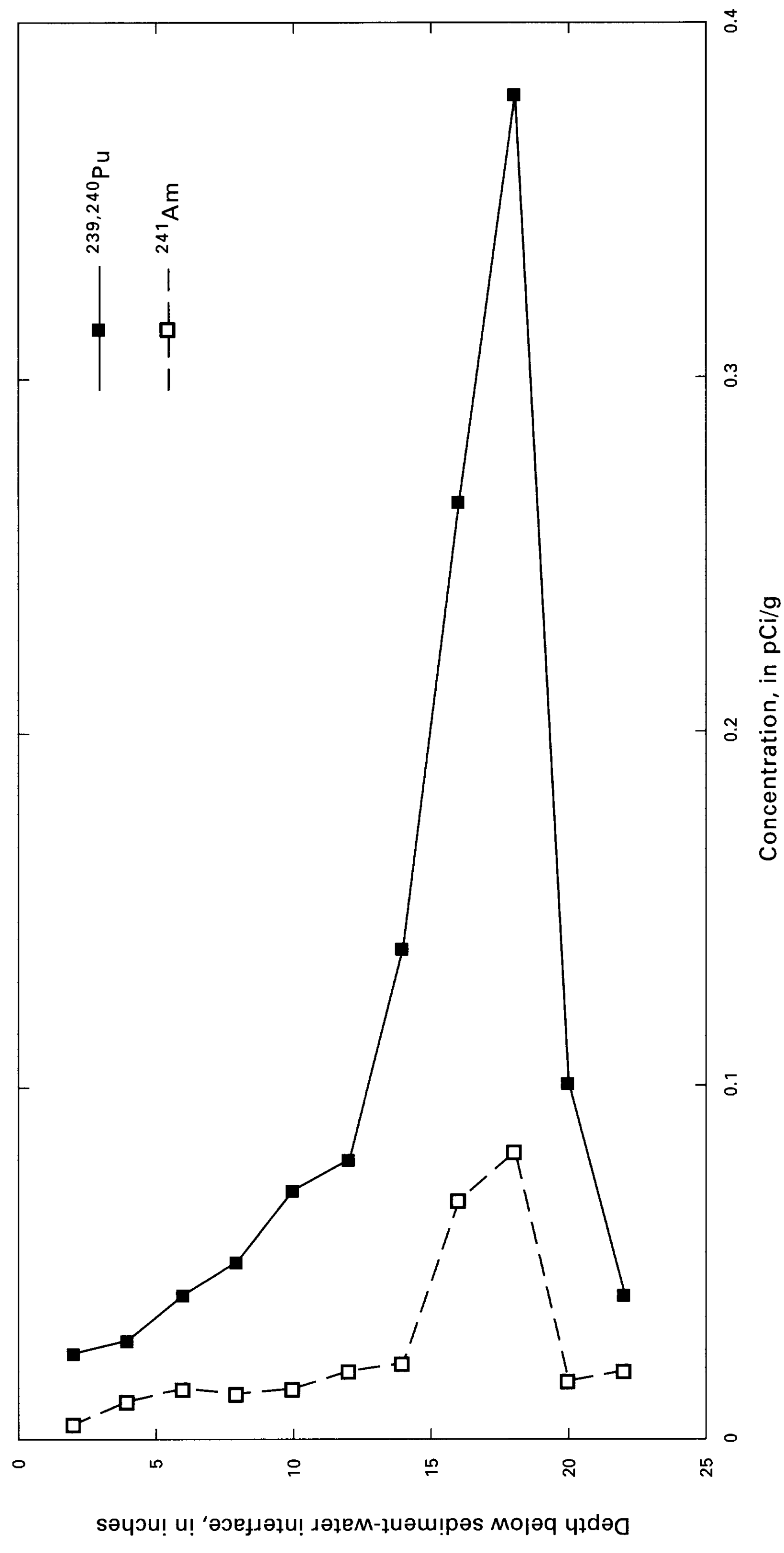

Figure 12. Concentrations of $^{239,240}Pu$ and ^{241}Am in lake-bottom-sediment core SED08392 collected from Standley Lake.

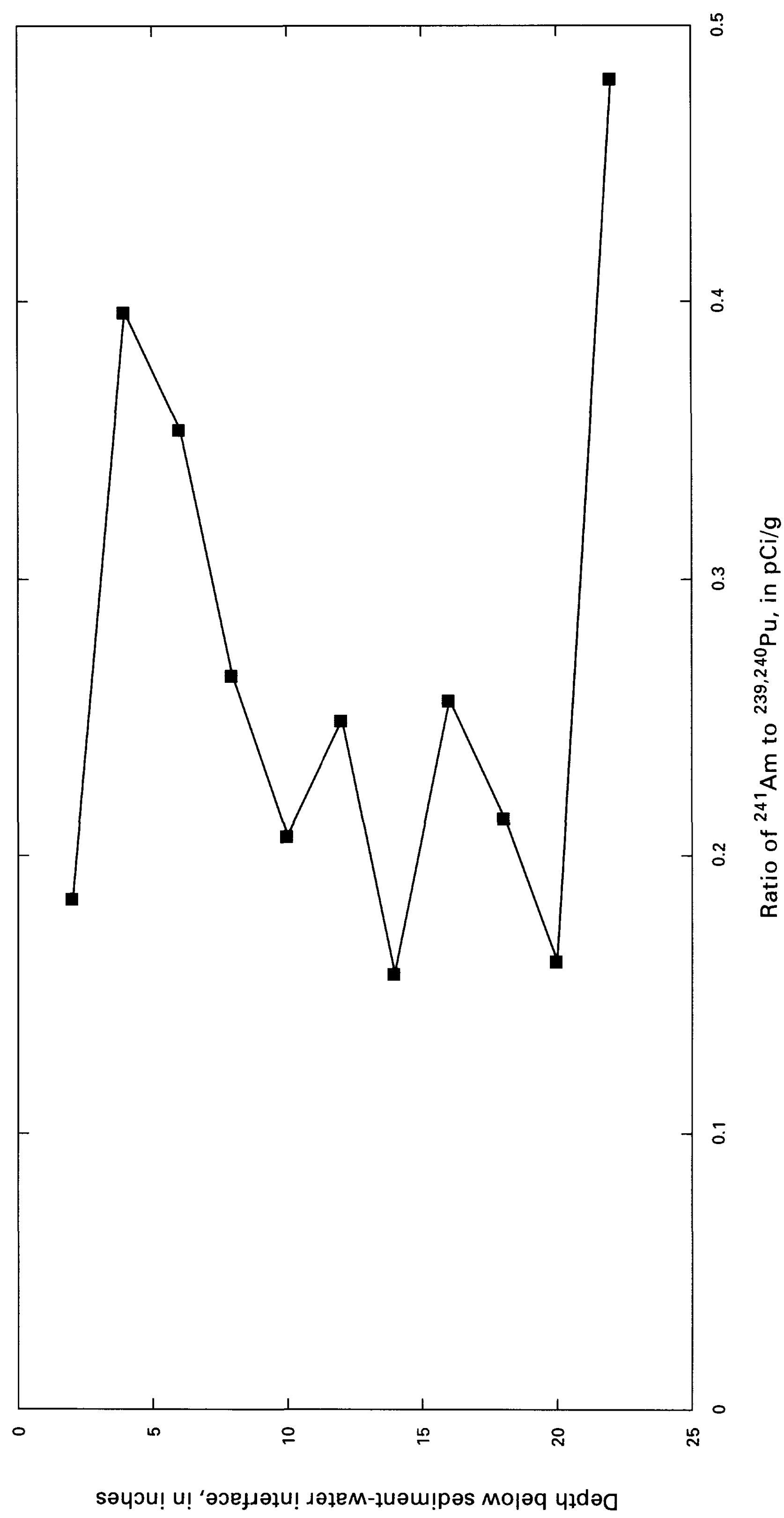

Figure 13. Ratio of concentrations of ^{241}Am to $^{239,240}Pu$ in lake-bottom-sediment core SED08392 collected from Standley Lake.

^{239,240}Pu concentration against ^{241}Am:^{239,240}Pu concentrations in lake-bottom-sediment cores collected from Standley Lake and Great Western Reservoir in 1992 indicates that there is no relation (fig. 14A). A relation was expected because the source of sediment that has high ^{239,240}Pu concentrations is likely to have been Rocky Flats debris, which has a relatively low ^{241}Am to ^{239,240}Pu ratio (Krey and others, 1976; Hardy and others, 1980). The reason for the lack of relation between ^{239,240}Pu concentration and ^{241}Am:^{239,240}Pu concentrations is unknown.

There is a linear relation (r^2=0.986, $p<0.02$) between concentrations of ^{239,240}Pu and ^{241}Am (figure 14B). This result was expected because ^{241}Am is a decay product of ^{241}Pu (half-life = 14.4 yrs) and is useful as an indication of the validity of the analytical results.

Comparison Between 1983–84 and 1992 Data

In 1992, lake-bottom-sediment core samples were collected at four of the sites sampled in 1983–84. Two of these sites were in Standley Lake, and two were in Great Western Reservoir. At each lake, one site was in the deep part of the lake, and the other was in the middle or shallow part. For each coring location, data from 1983–84 and 1992 were matched after taking recent sedimentation into account, assuming a sedimentation rate of 1.2 to 1.5 in./yr in Standley Lake and 0.9 to 1.2 in/yr in Great Western Reservoir. A range of rates was used for each lake because sedimentation rates generally were higher in the deeper parts of the reservoirs than in the shallow parts (Cohen and others, 1990). Sedimentation rates were estimated based on matching of peaks and inflection points in plots of ^{239,240}Pu concentration against depth using 1983–84 and 1992 lake-bottom-sediment core data. The sedimentation rates used were reasonable based on rates reported by Hardy and others (1980), who estimated an average sedimentation rate of 1.3 in/yr for Standley Lake; sedimentation rates were unavailable for Great Western Reservoir.

Concentration of ^{239,240}Pu in sediment cores collected in 1983–84 and in 1992 is plotted with depth for each of the four sites in figures 15A through 15D. In general, trends in concentration to depth were consistent between 1983–84 and 1992 at all of the sites. Boxplots of ^{239,240}Pu concentrations, and the differences between matched pairs of data, are shown in figure 16A. Measured concentrations tended to be somewhat higher in 1983–84 than in 1992. Although the median difference between the two data sets was statistically significant at $p<0.05$, most differences between the matched pairs were small. The median difference was 0.050 pCi/g, which is almost 100 times smaller (two orders of magnitude) than the peak ^{239,240}Pu concentrations measured in this study. The mean difference was 0.200 pCi/g. Differences in concentrations tended to increase at higher concentrations (fig. 16b). At ^{239,240}Pu concentrations between 1.5 and 5.5 pCi/g, values from the 1992 study are 10 to 30 percent less than values reported in the 1983–84 study. The differences in measured concentrations may be attributable to spatial variations in sediment and ^{239,240}Pu deposition.

Lake-Water Samples

Summary statistics of dissolved and total radionuclide concentrations in lake-water samples are presented in table 5. The median concentration of dissolved ^{239,240}Pu in lake water was 0.001, and the maximum concentration was 0.009 pCi/L (table 5). Total ^{239,240}Pu concentrations in lake water were somewhat higher; the median concentration was 0.003 pCi/L, and the maximum concentration was 0.030 pCi/L. There are no National Drinking Water Standards for ^{239,240}Pu, but the Colorado Department of Public Health and Environment has set a water-quality standard of 15 pCi/L and a site-specific water-quality standard of 0.030 pCi/L for Standley Lake and Great Western Reservoir (Colorado codes and regulations, 3.8.0, 5CCR102-8). ^{239,240}Pu and ^{241}Am are alpha emitters that contribute to the gross alpha concentrations in lake water in Standley Lake, Great Western Reservoir, and Mower Reservoir. The median dissolved gross alpha concentration was 0.52 pCi/L, and the maximum was 1.9 pCi/L (table 5). These concentrations are substantially below the National Drinking Water Standard for gross alpha concentration of 15 pCi/L (U.S. Environmental Protection Agency, 1995). Uranium concentrations also were well below the National Drinking Water Standard of 15 pCi/L (U.S. Environmental Protection Agency, 1995); the median dissolved concentrations for ^{233,234}U, ^{235}U, and ^{238}U were 0.500, 0.024, and 0.270 pCi/L, and maximum dissolved concentrations were 1.2, 0.71 and 0.73 pCi/L (table 5). The maximum dissolved ^{241}Am concentration was 0.116 pCi/L, and the maximum total ^{241}Am concentration was 0.026 pCi/L. The maximum total tritium concentration was 144.3 pCi/L (dissolved tritium was not measured). National Drinking Water Standards for ^{241}Am and tritium do not exist. In summary, concentrations of all radionuclides measured in lake water at Standley Lake, Great Western Reservoir, and Mower Reservoir were below National Drinking Water Standards for constituents where standards exist.

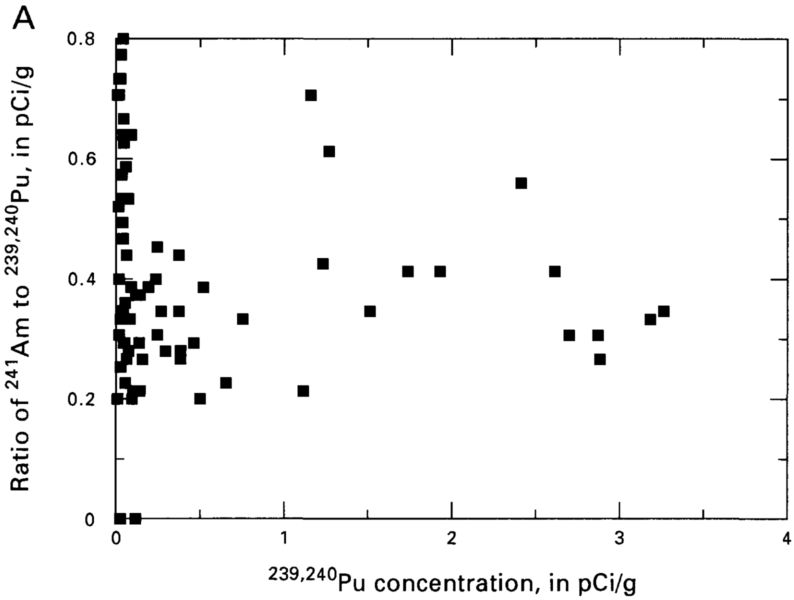

Figure 14A. Relation between ^{241}Am to $^{239,240}Pu$ concentration ratio and $^{239,240}Pu$ concentration in lake-bottom-sediment core samples collected from Standley Lake and Great Western Reservoir.

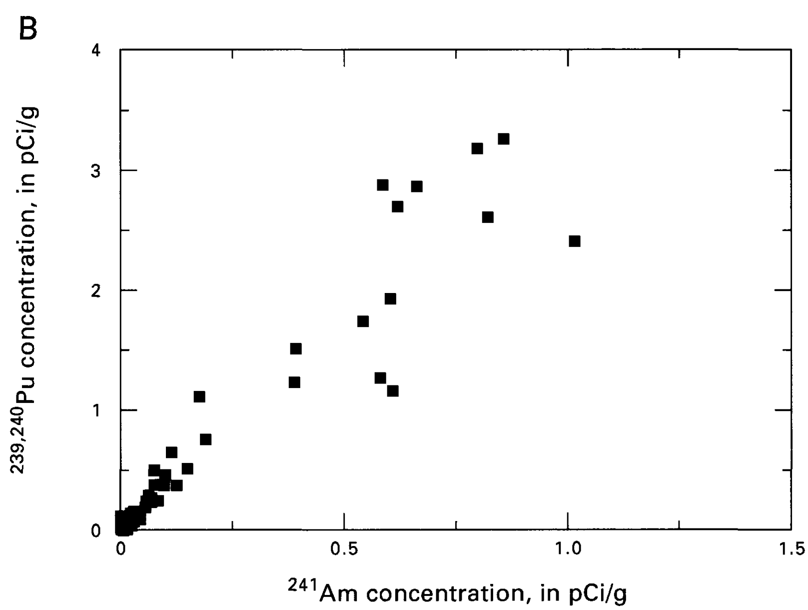

Figure 14B. Relation between concentrations of $^{239,240}Pu$ and ^{241}Am in lake-bottom-sediment core samples collected from Standley Lake and Great Western Reservoir.

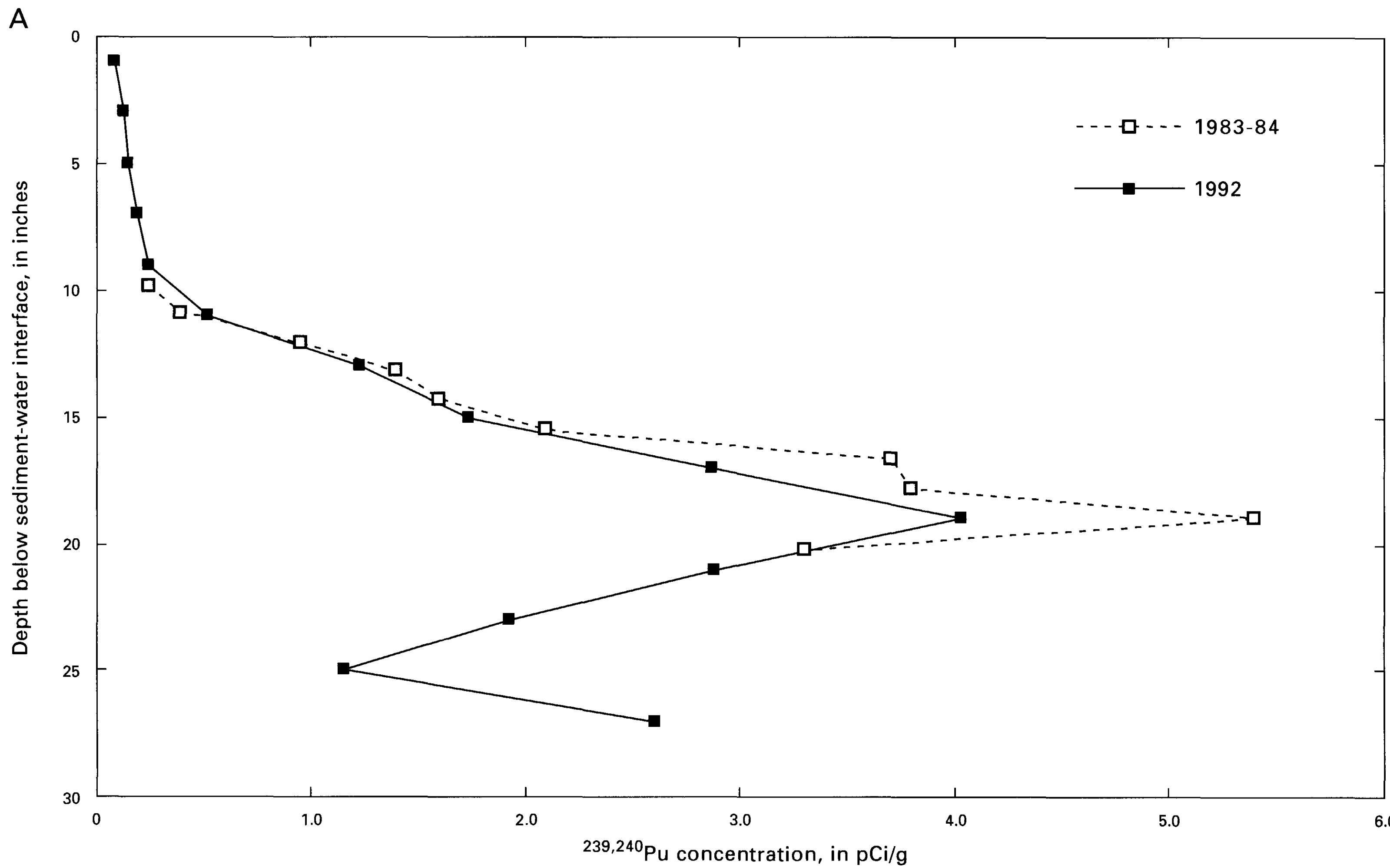

Figure 15A. Relation of concentrations of $^{239,240}Pu$ to depth at lake-bottom-sediment site SED08192 collected from Standley Lake in 1983–84 and 1992.

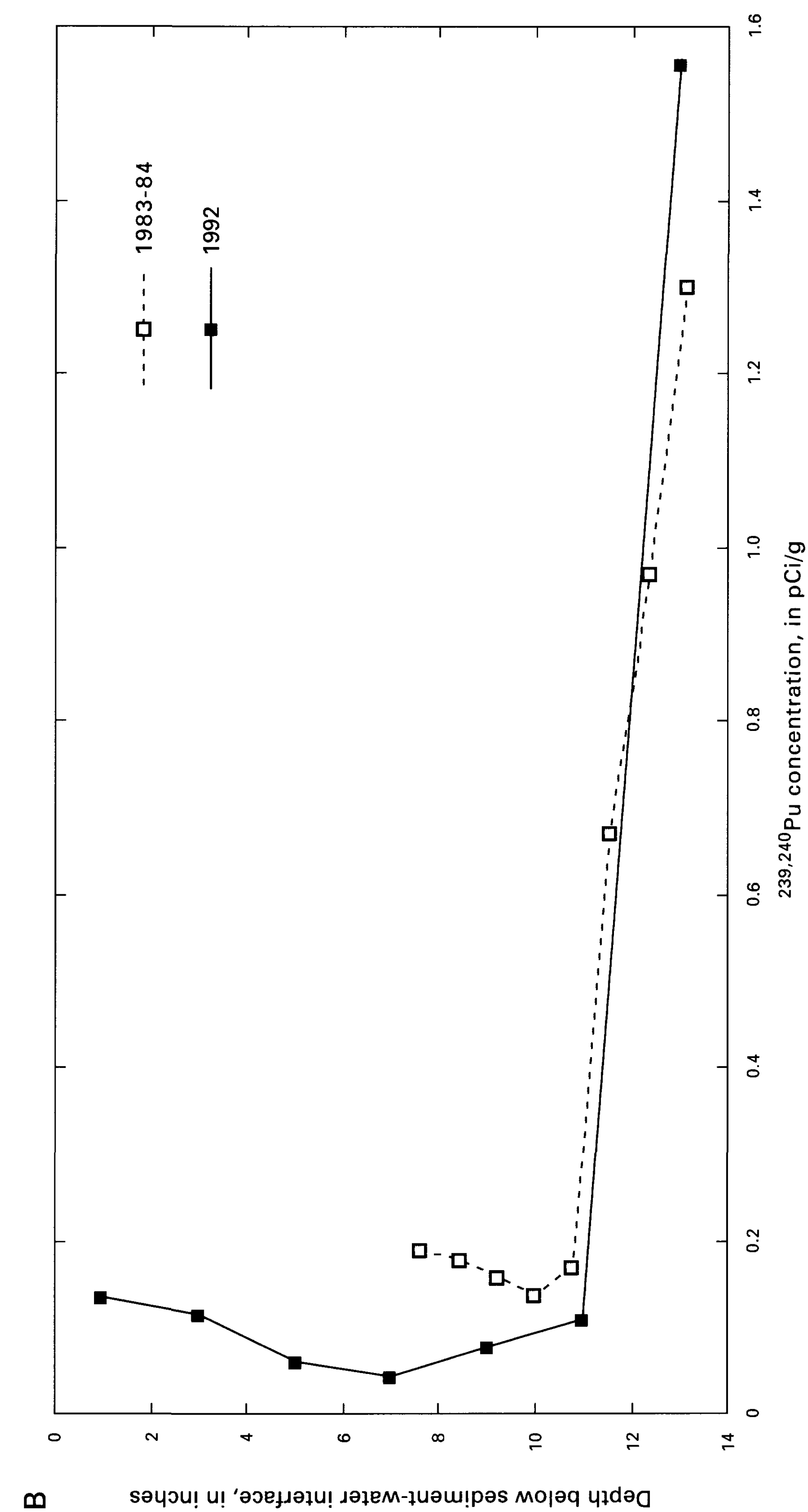

Figure 15B. Relation of concentrations of $^{239,240}Pu$ to depth at lake-bottom-sediment site SED08392 collected from Standley Lake in 1983–84 and 1992.

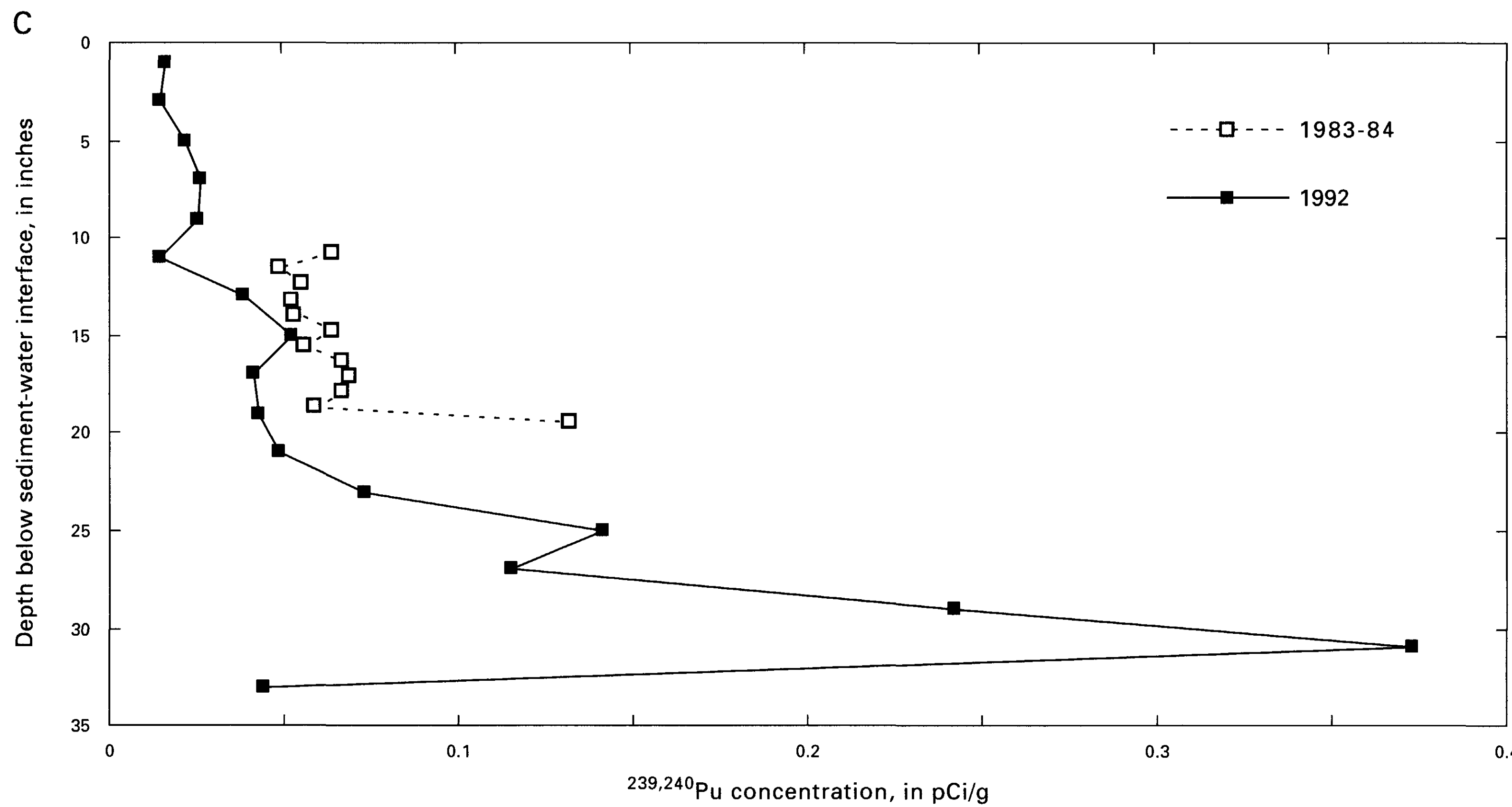

Figure 15C. Relation of concentrations of $^{239,240}Pu$ to depth at lake-bottom-sediment site SED09192 collected from Great Western Reservoir in 1983–84 and 1992.

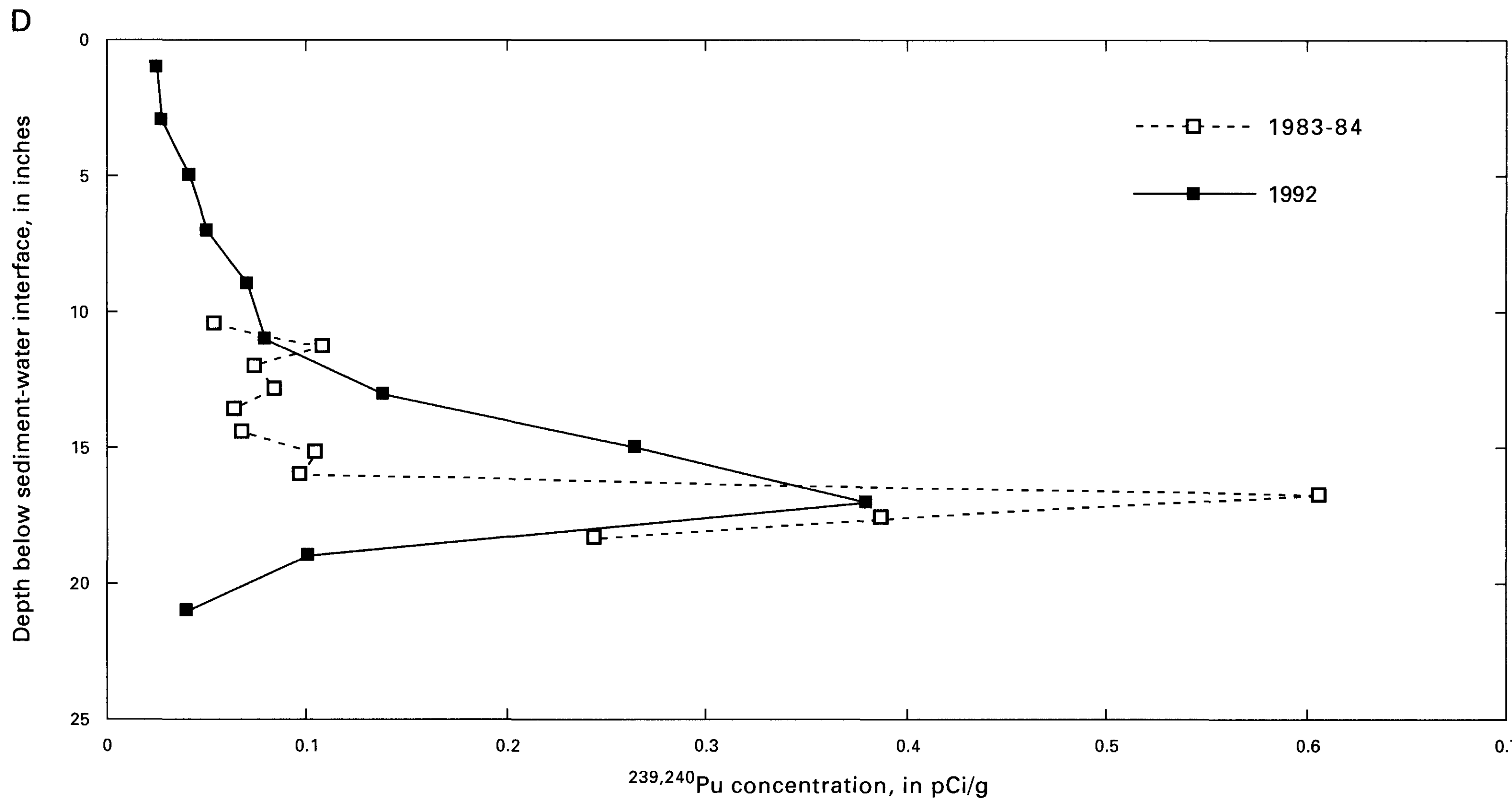

Figure 15D. Relation of concentrations of $^{239,240}Pu$ to depth at lake-bottom-sediment site SED08592 collected from Great Western Reservoir in 1983–84 and 1992.

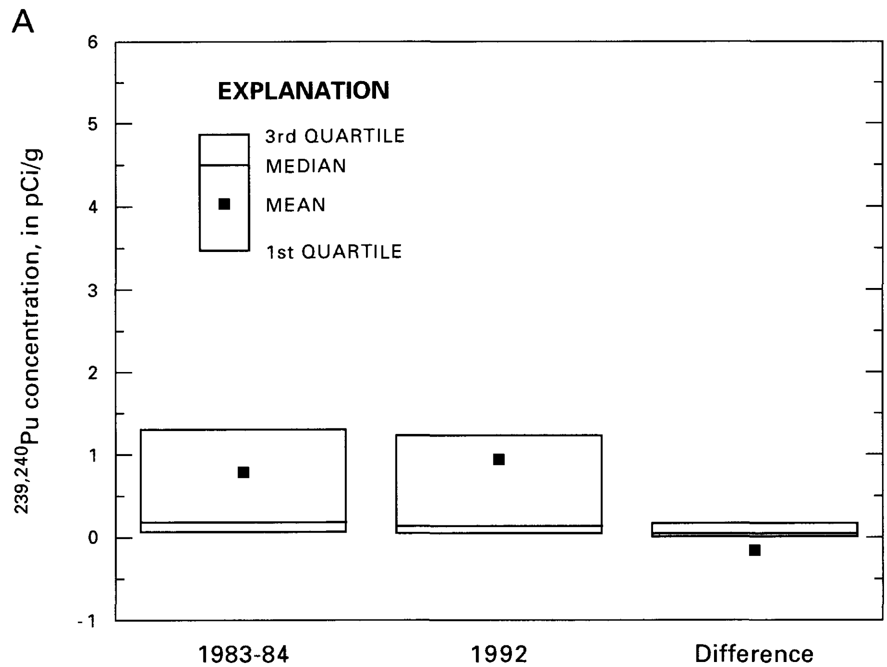

Figure 16A. Distribution of concentrations of $^{239,240}Pu$ in lake-bottom-sediment core samples collected from Standley Lake and Great Western Reservoir.

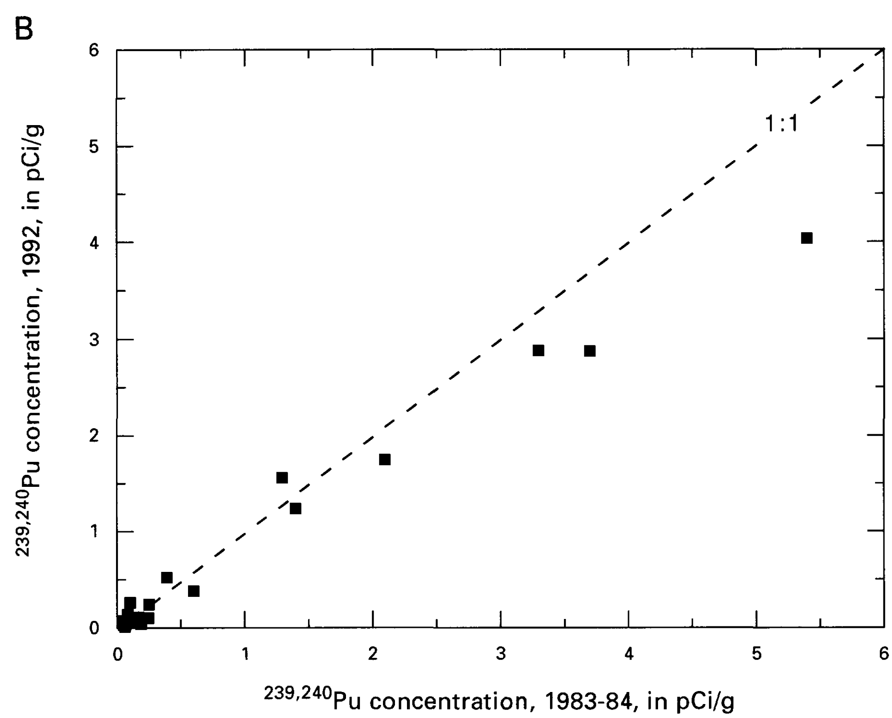

Figure 16B. Relation between $^{239,240}Pu$ concentrations in lake-bottom-sediment core samples collected from Standley Lake and Great Western Reservoir in 1983–84 and 1992.

Table 5. Summary statistics for radionuclide concentrations in lake-water samples

[Measurements in picocuries per liter; --, not analyzed]

Statistic	Dissolved radionuclides							Total radionuclides							
	Americium-241	Gross alpha	Gross beta	Plutonium-239,240	Uranium-233,234	Uranium-235	Uranium-238	Americium-241	Gross alpha	Gross beta	Plutonium-239,240	Tritium	Uranium-233,234	Uranium-235	Uranium-238
All samples															
Mean	0.007	0.52	1.42	0.001	0.530	0.092	0.277	0.006	0.88	1.97	0.004	28.07	0.600	0.058	0.470
Standard deviation	.020	.51	1.00	.002	.250	.202	.242	.006	.59	1.47	.006	81.53	.310	.091	.280
1st quartile	.000	.24	.79	.000	.380	-.003	.111	.002	.45	1.30	.001	-28.35	.400	-.004	.290
Median	.004	.52	1.50	.001	.500	.024	.270	.006	.79	2.07	.003	-1.46	.550	.037	.420
3rd quartile	.006	.87	2.07	.002	.670	.094	.453	.010	1.40	2.85	.004	54.96	.740	.091	.650
Maximum	.116	1.90	4.30	.009	1.20	.710	.730	.026	2.20	4.70	.030	144.3	1.300	.410	1.100
n	35	38	38	28	30	30	30	38	35	42	35	4	38	38	37
Standley Lake															
Mean	.004	.74	2.04	.002	.760	.157	.410	.007	1.10	2.22	.003	--	.780	.061	.670
Standard deviation	.005	.49	1.07	.003	.220	.267	.248	.007	.47	1.11	.002	--	.290	.073	.260
1st quartile	.000	.58	1.40	.000	.640	.008	.345	.002	.74	1.30	.001	--	.580	.008	.450
Median	.004	.86	2.10	.001	.760	.032	.434	.005	1.20	2.29	.002	--	.680	.042	.650
3rd quartile	.007	1.00	2.65	.002	.870	.122	.570	.010	1.40	2.75	.004	--	.960	.081	.860
Maximum	.013	1.40	4.30	.009	1.20	.710	.730	.026	1.90	4.30	.009	--	1.300	.270	1.100
n	12	13	13	11	11	11	11	15	13	16	15	0	16	16	16
Great Western Reservoir															
Mean	.003	.32	1.40	.000	.460	.091	.273	.006	.99	2.82	.003	28.07	.590	.092	.370
Standard deviation	.006	.44	.75	.002	.080	.192	.211	.006	.71	1.24	.002	81.53	.290	.142	.190
1st quartile	-.001	-.06	.96	-.002	.430	-.007	.210	.003	.45	2.05	.003	-28.35	.440	.000	.360
Median	.001	.39	1.66	.000	.470	.000	.250	.007	.83	2.60	.004	-1.46	.510	.040	.370
3rd quartile	.005	.69	1.85	.001	.510	.071	.460	.010	1.65	3.40	.004	54.96	.750	.160	.430
Maximum	.018	.88	2.60	.002	.560	.510	.580	.017	2.20	4.70	.005	144.30	1.100	.410	.680
n	11	13	13	7	9	9	9	11	11	13	8	4	9	9	9
Mower Reservoir															
Mean	.013	.50	.76	.001	.350	.020	.135	.006	.52	.82	.005	--	.390	.032	.290
Standard deviation	.034	.54	.73	.001	.180	.094	.193	.005	.45	1.42	.010	--	.240	.059	.170
1st quartile	.002	.13	.19	.000	.200	-.007	.104	.003	.24	.34	.001	--	.200	-.014	.160
Median	.005	.38	.74	.001	.300	.012	.143	.005	.63	1.30	.003	--	.360	.000	.260
3rd quartile	.009	.65	1.25	.002	.450	.087	.230	.009	.82	1.50	.005	--	.560	.084	.370
Maximum	.116	1.90	2.10	.002	.700	.140	.420	.017	1.20	3.00	.030	--	.820	.150	.650
n	12	12	12	10	10	10	10	12	11	13	12	0	13	13	12

There were no statistically significant differences in $^{239,240}Pu$ concentrations in surface water collected at the three study lakes in 1992. However, gross alpha and uranium isotope concentrations tended to be higher in Standley Lake than in the other reservoirs; gross alpha concentrations were higher in Standley Lake than in Great Western Reservoir ($p<0.05$) (figs. 17 and 18, table 5). Uranium-233,234 concentrations were higher in Standley Lake than in Mower Reservoir, and uranium-238 concentrations were higher in Standley Lake than in Great Western and Mower Reservoirs ($p<0.05$). The relatively high concentrations of ura-

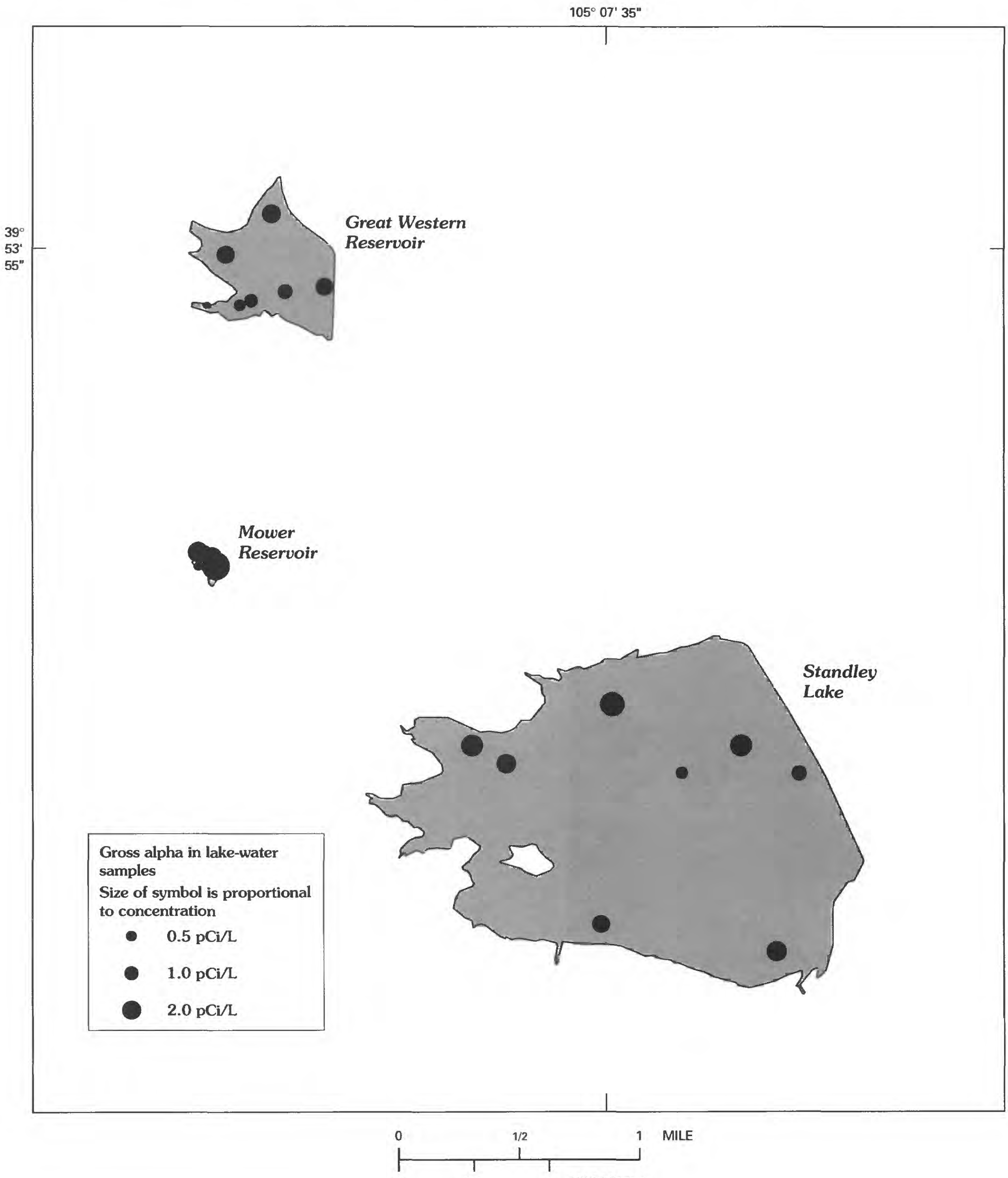

Figure 17. Gross alpha concentrations in water samples collected in 1992 from Standley Lake, Great Western Reservoir, and Mower Reservoir.

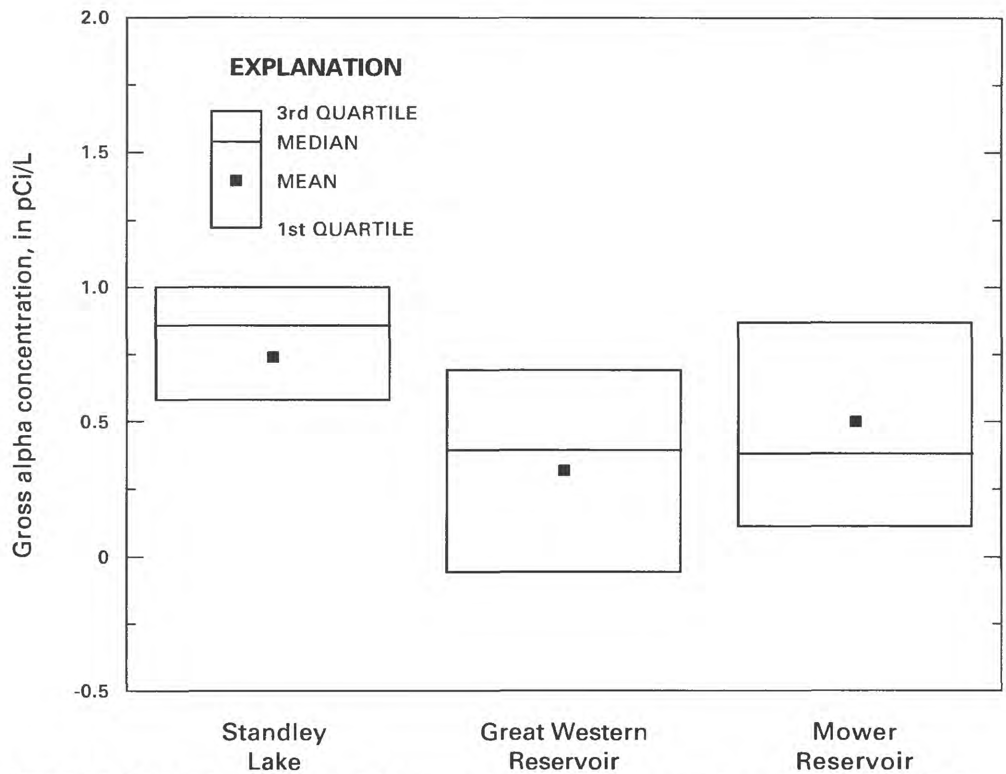

Figure 18. Distribution of gross alpha concentrations in water samples collected in 1992 at Standley Lake, Great Western Reservoir, and Mower Reservoir.

nium in Standley Lake may be due to weathering of marine shales that contain substantial amounts of uranium. In southeastern Colorado, uranium concentrations in the Arkansas River have been found to increase markedly where the river crosses from a predominantly igneous and metamorphic terrain into areas where marine shale and limestone are the dominant bedrock types (Zielinski and others, 1995). Shale bedrock that crops out to the west of Standley Lake contains substantial quantities of uranium and, thus, may provide a source of uranium to streams that flow into Standley Lake.

SUMMARY

Median $^{239,240}Pu$ concentrations in lake-sediment grab samples from Standley Lake, Great Western Reservoir, and Mower Reservoir were 0.037, 0.105, and 0.351 pCi/g, and the differences between the reservoirs were statistically significant at $p<0.05$. The spatial pattern of $^{239,240}Pu$ concentration identified in this study, i.e., sediment in lakes closest to Rocky Flats Environmental Technology Site having the highest $^{239,240}Pu$ concentrations, is consistent with $^{239,240}Pu$ concentration patterns previously measured in soil surrounding Rocky Flats.

Maximum concentrations of $^{239,240}Pu$ dissolved in lake water were 0.009 pCi/L, well below limits suggested by the Colorado Department of Public Health and Environment. Dissolved concentrations of gross alpha and $^{233,234}U$, ^{235}U, and ^{238}U were below National Drinking Water Standards in all water samples. There were no statistically significant differences in $^{239,240}Pu$ concentrations in surface water collected at the three study lakes in 1992.

A comparison of $^{239,240}Pu$ concentrations in lake-sediment grab samples collected from Standley Lake and Great Western Reservoir in 1983–84 to concentrations in 1992 revealed no statistically significant difference ($p<0.05$) in mean values when samples from the lakes were grouped. When samples from each lake were considered separately, and data from the two studies were compared, it was determined that there was a small, but statistically significant, difference in $^{239,240}Pu$ concentrations at Great Western Reservoir ($p<0.05$); concentrations were lower in 1992. The most likely reason for the difference is that sediments deposited in Great Western Reservoir in the 1960's and 70's have been buried beneath newer sediment with lower concentrations of $^{239,240}Pu$. The technique used to obtain grab sediment samples collects sediment from only the upper 2–4 in. of sediments; thus, it is possible that only newer, relatively uncontaminated, sediments were sampled in 1992.

Trends in $^{239,240}Pu$ concentrations with depth identified in the 1992 study were similar to trends observed in the 1983–84 study and other previous studies. In the 1992 investigation, maximum $^{239,240}Pu$ concentrations occurred at depths ranging from 13 to 31 in. below the sediment-water interface at most sites. There was a small, but statistically significant, difference ($p<0.05$) in median $^{239,240}Pu$ concentrations in co-located lake-bottom-sediment cores collected in 1983–84 and in 1992. The median difference between data sets was 0.050 pCi/g, and differences tended to increase with concentration; in samples with concentrations above 1.5 pCi/L, concentrations were 10 to 30 percent higher in 1983–84 than in 1992. The differences in concentrations could be attributable to spatial variations in sediment and $^{239,240}Pu$ deposition.

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APPENDIXES

APPENDIX A

Lake-sediment grab samples

Table A1. Radionuclide concentrations in lake-sediment grab samples

[Uncertainties are in parentheses; nr indicates uncertainty was not reported; measurements in picocuries per gram; --, not reported]

Site number[1]	Reser-voir[2]	Sample number	Sample date	Americium-241		Gross alpha		Gross beta		Plutonium-239,240		Tritium		Uranium 233,234		Uranium 235		Uranium 238	
SED09892	SL	SD06104CH	09-04-92	0.049	(0.006)	20.810	(2.200)	33.080	(2.400)	0.190	(0.008)	--	--	2.248	(0.031)	0.092	(0.022)	2.187	(0.022)
SED09992	SL	SD06105CH	09-03-92	.018	(nr)	21.800	(1.800)	22.600	(4.400)	.060	(nr)	--	--	0.781	(.010)	.038	(nr)	0.628	(nr)
SED10092	SL	SD06106CH	09-04-92	.005	(nr)	18.210	(2.600)	29.300	(2.600)	.033	(.020)	--	--	1.545	(.058)	(.002)	(nr)	1.528	(.041)
SED10192	SL	SD06107CH	09-04-92	.010	(nr)	23.890	(2.400)	32.660	(2.600)	.039	(nr)	--	--	2.671	(.069)	.088	(.049)	2.226	(.069)
SED10292	SL	SD06108CH	09-04-92	.010	(nr)	24.160	(2.300)	28.150	(2.500)	.032	(.011)	--	--	1.717	(.038)	.092	(nr)	2.010	(.038)
SED10392	SL	SD06109CH	09-04-92	.009	(nr)	23.770	(2.900)	27.970	(2.300)	.038	(.008)	--	--	2.135	(.052)	.098	(.030)	2.116	(.060)
SED10492	SL	SD06111CH	09-04-92	.008	(nr)	22.390	(3.000)	26.640	(2.400)	.037	(nr)	--	--	1.922	(.042)	.056	(nr)	1.824	(.030)
SED10592	SL	SD06112CH	09-03-92	.027	(nr)	28.100	(2.400)	26.300	(4.800)	.073	(nr)	--	--	2.620	(.021)	.061	(nr)	2.370	(nr)
SED10692	SL	SD06113CH	09-04-92	.007	(nr)	24.280	(2.600)	35.470	(2.500)	.027	(.008)	--	--	1.895	(.063)	.115	(.051)	1.972	(.036)
SED10792	SL	SD06114CH	09-03-92	.030	(nr)	12.800	(1.800)	25.500	(4.500)	.045	(.008)	--	--	1.700	(nr)	.065	(nr)	1.900	(nr)
SED10892	SL	SD06115CH	09-04-92	.013	(nr)	12.280	(3.200)	27.640	(2.500)	.017	(.015)	--	--	1.212	(nr)	.026	(nr)	1.209	(.027)
SED10992	SL	SD06116CH	09-04-92	.033	(nr)	21.410	(1.900)	27.470	(2.500)	.144	(.012)	--	--	2.240	(.057)	.050	(nr)	1.940	(.046)
SED11092	SL	SD06117CH	09-03-92	.017	(nr)	25.100	(2.000)	21.600	(4.600)	.001	(nr)	--	--	.731	(nr)	.000	(nr)	.890	(nr)
SED11192	SL	SD06118CH	09-03-92	.004	(nr)	14.300	(2.100)	3.400	(4.500)	.015	(nr)	--	--	.877	(nr)	.010	(nr)	.848	(nr)
SED11292	SL	SD06119CH	09-03-92	.103	(nr)	18.100	(4.200)	28.200	(4.700)	.060	(nr)	--	--	1.210	(nr)	.000	(nr)	.812	(nr)
SED11392	SL	SD06120CH	09-03-92	--	--	19.100	(1.900)	20.000	(4.600)	.012	(nr)	--	--	.467	(nr)	.008	(nr)	.617	(nr)
SED12892	GW	SD06132CH	08-27-92	.033	(nr)	20.000	(4.200)	23.000	(5.600)	.046	(nr)	--	--	--	--	--	--	--	--
SED13092	GW	SD06134CH	08-27-92	.027	(nr)	36.000	(1.800)	23.200	(5.800)	.042	(nr)	--	--	.929	(nr)	.034	(nr)	1.040	(nr)
SED13192	GW	SD06135CH	08-27-92	.047	(nr)	24.100	(2.200)	24.500	(5.500)	.106	(nr)	--	--	.749	(.016)	.016	(nr)	.733	(nr)
SED13392	GW	SD06137CH	08-27-92	.035	(nr)	34.000	(2.000)	27.000	(5.500)	--	--	--	--	1.330	(nr)	.041	(nr)	1.390	(nr)
SED13492	GW	SD06138CH	08-27-92	.206	(nr)	21.400	(2.400)	23.500	(5.900)	.103	(.009)	--	--	1.580	(nr)	.094	(nr)	1.550	(nr)
SED13592	GW	SD06140CH	08-28-92	.039	(nr)	19.700	(2.100)	25.100	(4.300)	.140	(nr)	--	--	1.360	(.022)	.085	(nr)	1.600	(nr)
SED13692	GW	SD06141CH	08-27-92	.192	(nr)	30.300	(1.800)	29.900	(5.100)	.119	(nr)	--	--	2.170	(nr)	.063	(nr)	2.270	(nr)
SED13792	GW	SD06142CH	08-27-92	.063	(nr)	24.800	(2.900)	25.400	(5.400)	.106	(.012)	--	--	1.950	(nr)	.100	(nr)	2.200	(nr)
SED13992	GW	SD06144CH	08-27-92	.123	(nr)	23.400	(1.100)	27.300	(5.300)	.094	(.011)	--	--	1.590	(nr)	.048	(nr)	1.560	(nr)
SED14192	GW	SD06146CH	08-27-92	.013	(nr)	17.800	(1.900)	21.200	(5.900)	.025	(nr)	--	--	1.530	(nr)	.043	(nr)	1.110	(nr)
SED14392	GW	SD06148CH	08-27-92	.164	(nr)	31.200	(2.400)	37.500	(5.600)	.125	(nr)	--	--	1.300	(nr)	.090	(nr)	1.480	(nr)
SED14492	GW	SD06149CH	08-28-92	.013	(nr)	12.500	(2.400)	15.900	(4.600)	.014	(nr)	--	--	.923	(nr)	.008	(nr)	.775	(nr)
SED14592	GW	SD06131CH	09-02-92	.038	(.005)	15.500	(2.900)	25.660	(2.300)	.153	(.008)	160.900	(680)	1.497	(.035)	.080	(.024)	1.336	(.024)
SED14692	GW	SD06129CH	09-02-92	.036	(nr)	18.210	(3.000)	25.500	(2.600)	.067	(nr)	157.200	(680)	1.081	(.046)	.062	(nr)	1.239	(.046)
SED14792	GW	SD06130CH	09-02-92	.050	(nr)	19.120	(2.800)	23.980	(2.600)	.187	(nr)	75.340	(680)	1.422	(.031)	.050	(.022)	1.372	(.022)
SED15892	M	SD06160CH	09-10-92	.050	(.005)	21.500	(2.600)	29.170	(2.500)	.263	(nr)	--	--	.987	(.044)	.102	(.031)	1.241	(.044)
SED16092	M	SD06162CH	09-10-92	.075	(nr)	22.210	(3.000)	28.880	(2.300)	.439	(nr)	--	--	1.574	(.036)	.071	(.025)	1.297	(.025)
SED16192	M	SD06154CH	09-10-92	.060	(nr)	20.220	(2.300)	31.390	(2.400)	.351	(.014)	--	--	1.406	(.034)	.023	(nr)	1.279	(.034)

[1]See figure 2for location of sites on Standley Lake, figure 3 for sites on Great Western Reservoir, and figure 4 for sites on Mower Reservoir.
[2]Codes for lakes include: SL=Standley Lake, GW=Great Western Reservoir, and M=Mower Reservoir.

Table A2. Chemical concentrations in lake-sediment grab samples

[Measurements in milligrams per kilogram except total organic carbon, which is in percent; --, not reported]

Site number[1]	Reservoir[2]	Sample number	Sample date	Aluminum	Arsenic	Barium	Beryllium	Cadmium	Calcium	Cesium	Chromium	Cobalt	Copper	Iron	Lead	Lithium	Magnesium
SED09892	SL	SD06104CH	09-04-92	21,000	11.3	171	1.3	2.8	5,810	--	19.3	10.7	176	23,700	126	12	4,770
SED09992	SL	SD06105CH	09-03-92	13,900	12.7	145	1.0	4.2	5,440	24.6	18.0	11.9	145	20,100	108	12	3,940
SED10092	SL	SD06106CH	09-04-92	6,470	5.3	94	0.6	0.5	6,860	14.9	6.0	6.0	15	11,900	22	5	1,640
SED10192	SL	SD06107CH	09-04-92	21,700	11.6	182	1.6	4.2	6,000	--	19.6	12.4	153	24,500	127	16	4,950
SED10292	SL	SD06108CH	09-04-92	23,500	10.9	195	1.6	2.3	6,600	--	18.9	11.5	163	27,000	129	14	5,340
SED10392	SL	SD06109CH	09-04-92	14,500	7.3	123	1.1	4.2	4,370	18.7	16.2	10.3	105	19,600	77	11	3,620
SED10492	SL	SD06111CH	09-04-92	13,400	5.5	97	0.8	1.7	3,750	18.1	13.0	7.5	82	14,400	51	10	2,860
SED10592	SL	SD06112CH	09-03-92	9,210	8.5	152	0.8	2.5	3,650	14.7	13.5	6.8	106	16,500	78	9	2,810
SED10692	SL	SD06113CH	09-04-92	17,700	12.9	167	1.3	--	5,670	--	17.0	10.3	157	23,200	148	11	4,490
SED10792	SL	SD06114CH	09-03-92	13,300	8.9	143	0.9	2.6	4,300	14.8	18.3	8.6	133	19,200	133	12	3,440
SED10892	SL	SD06115CH	09-04-92	5,380	3.4	78	0.4	0.4	13,300	14.2	5.1	3.5	14	7,690	12	6	1,730
SED10992	SL	SD06116CH	09-04-92	16,800	9.0	130	1.1	2.4	4,440	--	15.8	8.9	111	18,400	83	12	3,820
SED11092	SL	SD06117CH	09-03-92	12,400	11.4	120	1.1	4.6	4,570	19.8	16.0	9.9	110	21,000	90	10	3,470
SED11192	SL	SD06118CH	09-03-92	4,380	4.7	40	0.3	0.7	3,740	14.2	6.6	3.9	19	8,020	24	5	1,540
SED11292	SL	SD06119CH	09-03-92	3,690	5.7	36	0.3	0.5	2,010	16.7	6.2	3.4	21	8,690	19	4	1,060
SED11392	SL	SD06120CH	09-03-92	10,500	16.8	156	0.8	5.0	3,710	15.3	16.2	8.7	167	20,200	190	10	3,580
SED12892	GW	SD06132CH	08-27-92	5,720	3.6	146	0.6	0.4	6,530	14.1	6.7	6.7	18	9,220	16	5	1,980
SED13092	GW	SD06134CH	08-27-92	11,200	5.7	129	0.9	0.5	5,410	15.2	12.4	8.4	33	19,000	24	10	3,050
SED13192	GW	SD06135CH	08-27-92	5,320	3.6	80	0.6	0.4	3,510	15.8	6.5	7.5	26	12,100	19	4	1,510
SED13392	GW	SD06137CH	08-27-92	5,680	3.2	86	0.6	0.5	5,100	14.9	6.3	5.0	28	11,500	21	6	2,100
SED13492	GW	SD06138CH	08-27-92	13,400	7.1	156	1.2	1.2	5,690	25.8	13.6	9.6	109	17,900	54	10	3,550
SED13592	GW	SD06140CH	08-28-92	10,400	5.3	147	1.0	0.8	5,590	25.7	11.5	9.4	93	14,700	46	9	3,030
SED13692	GW	SD06141CH	08-27-92	11,600	5.7	152	1.0	1.3	5,760	29.5	12.0	9.8	111	17,000	64	9	3,350
SED13792	GW	SD06142CH	08-27-92	11,100	5.4	160	1.2	1.2	6,660	27.3	13.2	11.2	126	17,700	64	9	3,450
SED13992	GW	SD06144CH	08-27-92	14,400	5.8	168	1.1	0.9	5,970	29.7	14.9	10.3	115	18,500	61	11	3,720
SED14192	GW	SD06146CH	08-27-92	8,500	3.6	182	0.8	0.4	33,900	13.8	8.8	9.9	19	12,100	17	9	3,110
SED14392	GW	SD06148CH	08-27-92	8,810	4.6	125	0.9	0.7	5,360	22.5	10.3	8.7	74	13,600	43	8	2,790
SED14492	GW	SD06149CH	08-28-92	11,900	4.4	119	0.9	0.5	4,230	16.5	12.3	7.6	40	15,800	28	10	2,720
SED14592	GW	SD06131CH	09-02-92	11,500	6.2	117	1.0	1.4	4,540	20.8	13.8	8.9	77	14,500	35	10	2,890
SED14692	GW	SD06129CH	09-02-92	10,600	6.3	126	1.0	0.8	5,840	21.9	12.3	9.0	59	13,900	32	10	2,990
SED14792	GW	SD06130CH	09-02-92	8,960	6.6	119	1.0	1.3	4,770	22.1	10.6	9.3	73	13,300	36	9	2,550
SED15892	M	SD06160CH	09-10-92	9,070	3.6	133	0.8	0.7	18,800	24.3	10.5	5.5	12	10,800	23	7	2,480
SED16092	M	SD06162CH	09-10-92	18,300	10.4	250	1.0	--	42,000	69.8	22.1	8.1	22	22,300	37	10	4,690
SED16192	M	SD06154CH	09-10-92	16,300	2.7	213	1.5	--	13,300	--	17.6	9.7	25	21,300	34	12	4,620
	Detection limit			200	10	200	5	5	5,000	1,000	10	50	25	100	3	100	5,000

Table A2. Chemical concentrations for lake-sediment grab samples--Continued

Site number[1]	Reser-voir[2]	Sample number	Sample date	Man-ganese	Mer-cury	Molyb-denum	Nickel	Potas-sium	Selen-ium	Sil-ver	Sod-ium	Stron-tium	Thal-lium	Tin	Vana-dium	Zinc	Cya-nide	Total organic carbon
SED09892	SL	SD06104CH	09-04-92	1,250	0.60	--	19.4	3,410	--	--	271	62.3	--	--	41.2	894	--	--
SED09992	SL	SD06105CH	09-03-92	698	0.16	2.2	23.2	2,910	1.8	3.4	145	53.6	0.86	6.8	34.9	1,120	1.2	--
SED10092	SL	SD06106CH	09-04-92	519	0.12	0.5	8.2	756	1.1	--	92	37.1	1.10	2.0	16.8	148	0.8	--
SED10192	SL	SD06107CH	09-04-92	1,410	0.28	--	20.9	3,450	--	3.1	276	64.6	--	--	43.9	1,010	--	--
SED10292	SL	SD06108CH	09-04-92	1,880	0.31	--	20.6	3,630	--	--	285	69.1	--	--	45.2	918	--	--
SED10392	SL	SD06109CH	09-04-92	853	0.29	0.6	18.3	2,720	7.1	2.4	148	44.5	1.40	--	31.1	973	1.0	0.16
SED10492	SL	SD06111CH	09-04-92	405	0.14	0.6	14.5	2,150	1.5	1.3	122	41.1	1.50	2.5	27.0	534	0.9	0.50
SED10592	SL	SD06112CH	09-03-92	313	0.14	0.7	14.2	2,200	1.1	3.0	102	41.5	0.51	4.7	25.8	426	0.7	--
SED10692	SL	SD06113CH	09-04-92	2,010	0.37	--	19.4	3,040	--	--	280	57.1	3.90	--	38.9	859	--	--
SED10792	SL	SD06114CH	09-03-92	363	0.12	3.8	20.2	2,880	1.1	4.0	152	46.5	0.53	4.4	31.9	838	0.7	--
SED10892	SL	SD06115CH	09-04-92	182	0.11	0.5	7.6	861	1.0	--	74	59.7	1.00	2.2	12.8	72	0.8	--
SED10992	SL	SD06116CH	09-04-92	711	0.22	--	15.2	2,820	--	--	195	48.7	--	5.2	34.1	743	--	--
SED11092	SL	SD06117CH	09-03-92	930	0.17	0.7	17.7	2,480	1.4	2.4	135	44.9	0.65	5.4	33.1	1,000	1.0	--
SED11192	SL	SD06118CH	09-03-92	234	0.07	0.5	8.2	1,010	1.0	1.0	67	17.6	0.48	3.0	13.2	200	0.8	--
SED11292	SL	SD06119CH	09-03-92	292	0.08	0.6	7.5	846	1.2	1.3	64	15.1	0.55	4.6	15.8	170	0.8	--
SED11392	SL	SD06120CH	09-03-92	385	0.08	0.5	17.3	2,970	1.1	4.9	131	38.8	0.50	5.9	31.0	738	0.8	0.26
SED12892	GW	SD06132CH	08-27-92	164	0.06	0.5	11.5	937	--	1.3	138	40.2	0.48	1.7	18.2	55	0.7	--
SED13092	GW	SD06134CH	08-27-92	468	0.08	0.5	17.3	1,690	--	2.3	146	45.4	0.53	1.9	33.1	166	0.8	--
SED13192	GW	SD06135CH	08-27-92	255	0.06	0.6	11.5	964	--	1.6	73	26.7	0.46	1.6	20.5	101	0.7	--
SED13392	GW	SD06137CH	08-27-92	234	0.08	0.5	9.9	881	--	1.5	206	46.6	0.50	1.8	21.7	100	0.8	--
SED13492	GW	SD06138CH	08-27-92	648	0.14	2.5	17.7	2,220	--	2.2	172	54.6	0.85	3.2	36.8	434	1.4	--
SED13592	GW	SD06140CH	08-28-92	455	0.12	1.0	15.7	1,850	--	1.9	166	48.6	0.95	3.2	33.6	296	1.2	0.26
SED13692	GW	SD06141CH	08-27-92	813	0.12	1.8	16.7	2,010	--	2.5	142	51.2	1.00	3.7	35.0	440	1.4	--
SED13792	GW	SD06142CH	08-27-92	731	0.14	1.4	18.1	2,050	--	3.1	142	51.8	0.95	3.4	34.7	496	1.4	--
SED13992	GW	SD06144CH	08-27-92	751	0.13	1.7	18.0	2,360	--	2.8	218	56.1	1.00	3.7	37.9	449	1.4	--
SED14192	GW	SD06146CH	08-27-92	272	0.07	0.6	14.0	1,060	--	1.1	201	154.0	0.45	1.7	23.7	75	0.7	--
SED14392	GW	SD06148CH	08-27-92	544	0.11	1.0	15.6	1,530	--	1.6	138	46.7	0.85	4.4	27.7	304	1.2	--
SED14492	GW	SD06149CH	08-28-92	495	0.08	0.6	15.0	1,750	--	1.2	130	41.8	0.56	2.6	32.7	143	0.8	--
SED14592	GW	SD06131CH	09-02-92	416	0.10	0.7	16.1	1,840	2.0	2.0	136	47.0	1.60	4.8	30.3	334	1.0	--
SED14692	GW	SD06129CH	09-02-92	337	0.10	0.8	16.9	1,690	4.0	1.6	148	52.8	1.60	6.1	29.6	247	1.2	0.33
SED14792	GW	SD06130CH	09-02-92	501	0.15	0.8	16.7	1,480	1.6	1.6	156	45.3	1.60	3.2	27.9	326	1.1	--
SED15892	M	SD06160CH	09-10-92	169	0.11	0.8	10.5	1,980	1.9	1.7	171	69.5	0.62	16.4	22.5	46	1.2	--
SED16092	M	SD06162CH	09-10-92	485	--	--	15.3	3,450	5.7	--	430	190.0	--	51.4	42.3	100	--	--
SED16192	M	SD06154CH	09-10-92	241	--	--	18.6	3,240	--	--	373	78.4	--	33.3	45.4	87	--	--
	Detection limit			15	0.2	200	40	5,000	5	10	5,000	200	10	200	50	20	10	0.5

[1]See figure 2 for location of sites on Standley Lake, figure 3 for sites on Great Western Reservoir, and figure 4 for sites on Mower Reservoir.

[2]Codes for lakes include: SL=Standley Lake, GW=Great Western Reservoir, and M=Mower Reservoir.

APPENDIX B

Lake-bottom-sediment core samples

Table B1. Lake-bottom-sediment core descriptions

[in., inches]

Depth from top (in.)	Color	Texture	Other features/observations
			Standley Lake (Site ID: SED08192) September 8, 1992
0-0.50	Olive	Silt	Abundant fine-grained organic particles, wet
0.50-3.5	Olive gray	Clayey silt	Very wet, fine-grained organic particles
3.5-6.0	Dark olive gray	Clayey silt	Roots, stems, slight H_2S odor, wet
6.0-8.0	Olive gray	Clayey silt	Less organics, no roots/stems, wet
8.0-9.0	Dark gray	Silty clay	Wet, some stems
9.0-14.0	Olive gray	Silty clay	Abundant root hairs, stems, organic particles, wet
14.0-17.0	Olive gray	Silty clay	Root hairs, stems, fine-grained organic, wet
17.0-19.0	Black	Clay	Drier, root hairs
19.0-22.5	Olive gray	Clay	Mottled, H_2S odor, root hairs
22.5-25.0	Dark olive gray	Clay	Stems, root hairs (long strands)
25.0-26.5	Olive gray	Sand (silty)	Very coarse, stem and bark pieces
26.5-28.5	Dark olive gray	Silty clay	Coarse root, stems, root hairs
28.5-30.5	Olive gray	Silty clay	Finer root hairs, no stems, drier
30.5-35.0	Dark olive gray	Clay	Drier, few root hairs, some grass
35.0-36.0	Black	Clay	Very few organics, slight H_2S odor
			Standley Lake (Site ID: SED08392) September 8, 1992
0-0.75	Olive gray	Silt	Very wet, fine-grained organics
0.75-3.0	Dark olive gray	Silt	Strong H_2S odor, very wet
3.0-4.0	Olive	Silt	Strong H_2S, more fine-grained organics
4.0-9.0	Very dark gray	Clayey silt	Strong H_2S odor, some root hairs, wet
9.0-12.0	Dark olive gray	Clayey silt	Strong H_2S odor
12.0-15.5	Black	Clayey silt	Strong H_2S odor, slightly drier
15.5-22.0	Olive gray	Clay	Very dry, root hairs and stems, abrupt contact at 15.5 in.
22.0-22.5	Olive gray	Clay	Drier, compacted, coarser vegetative material
			Standley Lake (Site ID: SED08292) September 9, 1992
0-0.50	Olive brown	Sand	Quartz grains, muscovite, pyrite, slight H_2S odor large bark and stem
0.50-1.5	Olive gray	Silty sand	Mineral grains, coarse vegetation, some roots
1.5-2.5	Dark olive gray	Silty sand	Smaller grain minerals, root and root hairs
2.5-4.0	Very dark gray	Silty sand	Abundant root hairs and stems
4.0-5.0	Olive gray	Sand	Mostly quartz, very coarse stem and root material
5.0-6.0	Very dark gray	Clayey silt	Drier, coarse roots
6.0-8.0	Dark gray	Clayey silt	Dry, very fine-grained minerals, finer roots and root hairs
			Standley Lake (Site ID: SED08492) September 9, 1992
0-1.0	Olive	Silty sand	Very wet, very fine-grained organics
1.0-4.0	Olive gray	Sandy silt	Coarse quartz grains, very fine-grained organics
4.0-5.0	Very dark gray	Sand	Coarse organics fragments, detrital stems, some roots, slight H_2S odor
5.0-6.0	Dark gray	Silty sand	Coarse pebbles, roots and stems, moist
6.0-9.0	Olive gray	Clayey sand	Abundant root hairs and roots, quartz grains

Table B1. Lake-bottom-sediment core descriptions--Continued

Depth from top (in.)	Color	Texture	Other features/observations
		Great Western Reservoir (Site ID: SED08592 **August 31, 1992**	
0-0.25	Dark yellowish	Sandy silt	Very wet
0.25-4. 0	Very dark gray	Silty clay	Wet, minor roots
4.0-8.0	Black	Clay	Lots of fine root hairs
8.0-9.5	Dark gray	Clayey silt	Some root hairs
9.5-11.0	Black	Clay	Some lighter clay bands
11.0-13.5	Grayish brown	Clay	Very wet
13.5-14.5	Black	Sandy clay	Some organic materials
14.5-15.5	Very dark grayish brown	Clay	Lots of fibers and some iron oxide
		Great Western Reservoir (Site ID: SED08792 **September 1, 1992**	
0-0.50	Dark yellow brown	Sandy silt	Very wet
0.50-3.0	Very dark gray	Clayey silt	H_2S odor, no roots, wet
3.0-4.5	Very dark gray	Silty clay	Pebbles, H_2S odor, wet
4.5-5.5	Very dark gray	Silty clay	Black crumbs (carbonaceous)
5.5-10	Very dark gray	Clay	Lots of roots, root hairs, stems, (possibly original land surface)
		Great Western Reservoir (Site ID: SED08692) **September 1, 1992**	
0-0.50	Light olive brown	Silt	Oxidized, small worms present, very wet
0.50-2.0	Very dark gray	Silt/clayey	H_2S odor, black area, organics
2.0-8.0	Dark olive gray	Clayey silt	Fine-grained organic material, moderately wet
8.0-10.5	Olive gray with black streaks	Clayey silt	Strong H_2S odor, moderately wet
10.5-12.5	Olive	Clayey silt	Slight H_2S Odor
12.5-17.0	Dark olive gray	Silt with some	Moderately wet
17.0-19.5	Very dark gray	clay	Strong H_2S, slightly moist
19.5-27.0	Very dark gray	Silty clay	More organic thin roots/fibers
27.0-27.5	Black	Silty clay	Less fibers, moderately H_2S odor
27.5-28.5	Dark olive gray	Silty clay	Very slight H_2S odor
		Silty clay	
		Great Western Reservoir (Site ID: SED09192) **September 2, 1992**	
0-1.0	Light olive brown	Silty	Oxidized, some organics, very wet
1.0-4.5	Olive gray (some black)	Clayey silt	Fine-grained organics, very wet
4.5-6.5	Dark olive gray	Clayey silt	Strong H_2s odor, some black streaks, wet
6.5-9.0	Olive gray	Clayey silt	Less wet, less streaky
9.0-9.75	Black	Clayey silt	Some root hairs, stronger H_2S odor
9.75-11.0	Olive gray	Silty clay	Fine-grained organic particles, wet
11.0-18.5	Olive gray	Silty clay	Few root hairs, wet
18.5-21.0	Dark olive gray	Silty clay	Drier, few root hairs
21.0-24.0	Black	Silty clay	Stem fragment, root hairs, drier still
24.0-31.25	Black	Clay	Pods of organic material, drier
31.25-31.5	Black	Clay	Mineralization

Table B1. Lake-bottom-sediment core descriptions--Continued

Depth from top (in.)	Color	Texture	Other features/observations
		Great Western Reservoir (Site ID: SED09292) September 15, 1992	
0-0.5	Light olive brown	Silty sand	Very wet, fine grained, few organics
0.5-2.0	Light olive brown	Sandy silt	Wet, few organics, mottled
2.0-2.5	Olive brown	Silty clay	Wet, very fine-grained, abundant organics, roots, iron stains
2.5-4.0	Dark grayish brown	Clay	Some roots and root hairs
4.0-6.0	Light olive brown	Silty clay	Drier, pods of oxidized organics, roots, root hairs
6.0-6.5	Light yellowish brown	Clay	Abundant organics, oxidized and reduced areas
6.5-8.5	Light yellowish brown	Clay	Crumbly root hairs, many small oxidized organics
8.5-9.0	Pale yellow	Clay	Relatively homogeneous, few organics
9.0-9.5	Light gray	Clay	Few organics, distinct oxidized bands
		Mower Reservoir (Site ID: SED08892) September 14, 1992	
0-1.0	Very dark gray with black	Silt	Very reduced, abundant organic matter, aquatic vegetation, very wet
1.0-3.5	Dark olive gray	Sandy silt	Very wet, abundant fine-grained organics
3.5-6.5	Very dark gray	Sandy silt	Very fine-grained sand, slight H_2S odor, less organic, very wet
6.5-8.5	Very dark gray	Sandy silt	Drier, root hairs and roots, stronger H_2S odor
8.5-11.5	Olive gray	Clayey silt	Slight H_2S odor, some root hairs
11.5-13.0	Very dark gray	Sandy silt	H_2S odor, root hairs, roots, stems
13.0-14.5	Dark gray	Clayey silt	Very fine-grained organics, wet
14.5-15.5	Very dark gray	Sandy clay	Drier, fine root hairs
15.5-16.5	Dark gray	Clayey silt	Abundant roots and root hairs, wet, very slight H_2S odor
16.5-18.0	Dark grayish brown	Sandy clay	Dry, abundant stems and roots
18.0-19.0	Very dark grayish brown	Sandy clay	Drier, dense layer of coarse organic stems, roots and root hairs
19.0-20.5	Gray	Clay	Very little organics, root hairs, dry
		Mower Reservoir (Site ID: SED08992) September 14, 1992	
0-1.5	Black	Sandy silt	Very wet, abundant aquatic plants and fine-grained organics
1.5-3.5	Very dark gray	Silt	Abundant fine-grained organics, very wet
3.5-5.0	Dark gray	Clayey silt	Wet, slight H_2S odor
5.0-10.0	Very dark gray	Silt	Wet, H_2S odor
10.0-11.0	Olive gray	Clayey silt	Drier
11.0-13.5	Dark gray	Clayey sand	Wetter, H_2S odor
13.5-17.0	Olive gray	Sandy clay	Wet
17.0-17.5	Dark gray	Sandy clay	Coarser grain
17.5-20.5	Very dark gray	Sandy clay	Finer grain
20.5-22.0	Gray	Clay	Drier
		Mower Reservoir (Site ID: SED09092) September 14, 1992	
0-0.5	Dark olive gray	Silty sand	Abundant fine-grained organics, some aquatic plants, very wet
0.5-1.5	Dark gray	Sandy silt	Wet
1.5-2.0	Black	Silty sand	Wet, H_2S odor, coarse organics
2.0-2.5	Olive	Clayey silt with sand	Some pebbles, stems, roots, and root hairs
2.5-3.0	Dark olive gray	Silty sand with gravel	Wet, pebbles, roots and root hairs
3.0-4.5	Dark grayish brown	Sandy clay	Lots of roots and root hairs, gravels
4.5-7.0	Grayish brown	Very sandy clay	Abundant root and root hairs, gravelly with iron stain
7.0-10.25	Very dark grayish brown	Sandy clay	Finer grained, drier, root hairs
10.25-10.75	Very dark gray	Silty clay	Some root hairs

Table B2. Chemical concentrations in lake-bottom-sediment core samples

[in., inches; --, not reported; measurements in milligrams per kilogram]

Site number[1]	Sampling depth from (in.)	Sampling depth to (in.)	Reservoir[2]	Sample number	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Cesium	Chromium	Cobalt	Copper	Iron	Lead	Lithium	Magnesium
SED08192	0	2	SL	SD06400CH	10,700	5.3	6.6	115	0.9	2.4	4,260	17.8	11.0	7.2	103	14,600	64	8	2,940
SED08192	2	4	SL	SD06401CH	15,000	9.2	11.4	188	1.4	3.4	6,520	31.0	16.2	11.7	166	23,700	110	13	4,390
SED08192	4	6	SL	SD06402CH	18,900	9.4	12.2	191	1.6	3.6	7,230	31.9	19.4	11.8	171	25,900	109	14	4,970
SED08192	6	8	SL	SD06403CH	14,300	8.3	12.5	173	1.4	2.8	6,560	28.1	15.8	10.2	140	21,000	156	13	4,120
SED08192	8	10	SL	SD06404CH	16,200	7.5	13.2	181	1.5	3.3	6,950	25.2	17.7	11.6	138	21,700	137	14	4,190
SED08192	10	12	SL	SD06405CH	15,800	6.4	9.4	181	1.3	2.5	6,800	21.7	16.9	11.0	117	21,900	87	13	3,970
SED08192	12	14	SL	SD06406CH	13,700	7.7	15.3	178	1.3	3.7	6,660	26.1	16.7	11.3	143	19,100	118	12	3,840
SED08192	14	16	SL	SD06407CH	13,100	6.7	10.0	162	1.2	3.7	7,480	31.7	15.0	10.8	130	17,900	135	10	3,730
SED08192	16	18	SL	SD06408CH	16,700	5.9	8.7	178	1.2	3.7	7,140	31.8	19.2	10.2	125	22,300	110	13	4,120
SED08192	18	20	SL	SD06409CH	15,700	7.1	9.9	199	1.4	4.2	10,100	29.0	19.7	12.2	148	20,500	120	13	4,370
SED08192	20	22	SL	SD06411CH	12,900	6.7	9.9	196	1.3	4.0	7,780	31.7	18.2	10.5	148	20,500	148	11	3,830
SED08192	22	24	SL	SD06412CH	14,100	6.5	11.1	194	1.4	4.1	7,510	22.1	20.1	10.7	165	22,000	151	13	3,960
SED08192	24	26	SL	SD06413CH	15,500	6.7	12.4	198	1.5	4.4	10,300	31.6	23.5	12.4	174	21,300	269	14	4,370
SED08192	26	28	SL	SD06414CH	13,900	8.2	10.9	198	1.4	3.7	10,200	21.1	22.8	12.2	155	20,400	106	13	3,950
SED08192	28	30	SL	SD06415CH	18,500	7.0	13.8	212	1.5	4.3	9,180	23.8	31.6	12.2	179	24,600	166	16	4,590
SED08192	30	32	SL	SD06416CH	10,800	--	8.5	92	0.9	2.5	3,960	19.7	12.0	8.2	88	13,800	63	9	2,680
SED08192	32	34	SL	SD06417CH	3,020	--	6.1	26	0.3	0.4	1,240	20.1	5.8	4.1	17	17,200	19	3	761
SED08292	0	2	SL	SD06429CH	12,900	--	15.2	144	0.8	4.1	3,040	17.0	18.4	8.5	165	21,000	328	11	3,790
SED08292	2	4	SL	SD06430CH	13,600	--	9.0	151	0.8	2.7	3,350	14.5	17.8	8.6	147	22,100	188	11	3,730
SED08292	4	6	SL	SD06431CH	17,900	--	8.4	181	1.2	2.3	4,100	14.3	22.7	11.0	166	25,800	131	15	4,710
SED08292	6	8	SL	SD06432CH	13,600	--	6.8	161	0.9	2.1	3,520	15.5	16.2	6.5	104	18,600	84	11	3,170
SED08392	0	2	SL	SD06458CH	17,000	--	12.7	188	1.4	2.9	6,300	--	17.7	10.6	161	25,800	103	13	4,560
SED08392	2	4	SL	SD06459CH	20,200	--	13.6	197	1.6	3.0	6,510	40.6	20.2	11.1	166	26,900	131	15	4,990
SED08392	4	6	SL	SD06460CH	16,700	9.9	11.5	192	1.4	3.2	7,820	33.3	19.2	12.2	142	21,800	105	14	4,370
SED08392	6	8	SL	SD06461CH	14,600	--	10.9	174	1.3	2.8	7,430	39.9	17.2	10.7	129	19,300	110	13	3,990
SED08392	8	10	SL	SD06462CH	20,700	--	14.4	221	1.3	3.7	9,090	30.2	23.9	11.5	152	25,700	129	17	5,020
SED08392	10	12	SL	SD06463CH	16,200	--	11.3	216	1.3	3.6	8,690	30.2	19.9	9.6	160	24,900	127	15	4,260
SED08392	12	14	SL	SD06464CH	17,200	--	14.8	211	1.4	3.5	7,570	26.3	24.5	10.2	166	25,600	154	15	4,360
SED08392	14	16	SL	SD06465CH	16,900	--	14.9	231	1.4	3.8	9,700	31.2	31.0	13.3	192	24,500	150	16	4,630
SED08392	16	18	SL	SD06466CH	18,400	--	16.6	250	1.5	4.7	7,420	25.8	33.7	12.0	186	31,400	180	15	4,780
SED08392	18	20	SL	SD06467CH	18,900	--	33.8	214	1.3	7.0	6,660	26.0	31.4	16.7	225	27,600	246	16	4,700
SED08392	20	22	SL	SD06469CH	15,600	--	36.2	234	1.2	4.3	4,140	18.1	22.4	10.9	254	25,200	241	13	3,970

Table B2. Chemical concentrations in lake-bottom-sediment core samples--Continued

Site number[1]	Sampling depth from (in.)	Sampling depth to (in.)	Reservoir[2]	Sample number	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Cesium	Chromium	Cobalt	Copper	Iron	Lead	Lithium	Magnesium
SED08492	0	2	SL	SD06487CH	19,500	--	10.8	151	1.2	3.6	5,230	24.0	21.2	14.5	133	22,000	102	15	4,410
SED08492	2	4	SL	SD06488CH	12,700	--	8.5	135	1.1	2.7	4,320	14.4	17.8	9.6	131	17,300	143	12	3,340
SED08492	4	6	SL	SD06489CH	12,600	--	7.1	121	0.9	1.4	3,240	12.8	14.7	7.2	54	17,500	65	10	2,830
SED08492	6	8	SL	SD06490CH	10,900	--	5.7	121	0.8	0.4	3,280	13.0	12.3	7.6	27	16,200	30	9	2,690
SED08592	0	2	GW	SD06516CH	7,390	--	4.6	106	0.7	0.4	5,910	16.7	8.3	8.5	28	13,600	19	6	1,960
SED08592	2	4	GW	SD06517CH	8,910	--	4.1	124	0.7	0.4	5,590	32.5	9.7	8.4	29	12,700	18	7	2,330
SED08592	4	6	GW	SD06518CH	6,710	--	4.1	113	0.7	0.4	5,360	20.5	7.6	8.2	28	11,300	17	5	2,090
SED08592	6	8	GW	SD06519CH	6,670	--	5.2	133	0.5	0.4	7,620	23.1	6.8	7.9	16	11,500	16	6	1,990
SED08592	8	10	GW	SD06520CH	9,780	--	4.4	179	0.8	0.5	7,820	15.6	10.2	9.5	22	13,000	20	8	2,850
SED08592	10	12	GW	SD06522CH	10,500	--	5.1	134	0.8	0.5	7,670	15.3	10.5	7.5	24	12,400	19	8	2,710
SED08592	12	14	GW	SD06523CH	10,700	--	7.0	129	0.8	0.4	4,350	13.8	12.8	8.7	68	13,400	26	10	2,710
SED08692	0	2	GW	SD06545CH	14,400	--	6.8	160	1.4	2.1	5,880	26.9	15.7	9.9	126	19,100	59	12	3,710
SED08692	2	4	GW	SD06546CH	15,300	--	7.5	179	1.4	1.0	6,830	39.2	15.8	9.5	97	18,800	51	13	3,780
SED08692	4	6	GW	SD06547CH	12,200	--	9.9	153	1.3	0.8	6,430	21.7	13.1	10.0	57	15,500	47	11	3,310
SED08692	6	8	GW	SD06549CH	11,900	--	6.1	152	1.1	0.8	6,690	19.7	13.0	8.5	45	16,800	34	10	3,240
SED08692	8	10	GW	SD06550CH	12,300	--	6.5	162	1.4	0.7	7,570	23.6	13.4	9.4	45	16,400	40	10	3,350
SED08692	10	12	GW	SD06551CH	10,700	--	5.5	146	1.2	0.6	7,970	20.5	10.9	8.5	41	14,700	33	9	2,970
SED08692	12	14	GW	SD06552CH	14,400	--	6.7	166	1.2	1.0	6,220	19.6	15.7	9.6	89	18,500	47	12	3,480
SED08692	14	16	GW	SD06553CH	16,200	--	6.9	171	1.3	1.0	6,860	33.4	17.2	10.2	114	18,700	60	13	3,840
SED08692	16	18	GW	SD06554CH	14,400	--	7.3	189	1.2	0.9	8,260	24.8	16.1	9.1	181	19,500	54	12	3,590
SED08692	18	20	GW	SD06555CH	14,100	--	5.9	155	1.2	1.0	15,400	18.0	15.6	8.8	129	15,800	50	13	3,440
SED08692	20	22	GW	SD06556CH	12,600	--	9.7	177	1.4	1.3	11,200	19.4	14.7	9.0	207	18,100	75	12	3,320
SED08692	22	24	GW	SD06557CH	13,000	--	8.3	179	1.3	1.7	7,210	22.8	15.7	10.7	224	21,000	95	11	3,640
SED08692	24	26	GW	SD06558CH	13,400	--	7.6	173	1.1	1.7	7,990	18.2	15.9	10.1	287	19,400	89	12	3,530
SED08692	26	28	GW	SD06559CH	16,400	--	9.0	189	1.4	2.6	10,900	20.2	19.0	11.4	216	21,500	98	14	4,060
SED08792	0	2	GW	SD06574CH	9,370	--	5.5	116	0.9	1.0	4,370	16.4	10.6	8.1	68	13,100	33	9	2,480
SED08792	2	4	GW	SD06575CH	10,100	--	10.4	133	1.0	0.6	4,790	17.6	11.7	9.9	98	18,300	38	9	2,480
SED08792	4	6	GW	SD06576CH	10,800	--	6.5	115	0.8	0.4	5,400	14.4	12.1	8.5	38	15,700	42	10	2,460
SED08792	6	8	GW	SD06577CH	8,990	--	8.3	123	0.9	0.4	5,580	12.7	10.5	7.5	28	16,800	36	9	2,350
SED08792	8	10	GW	SD06578CH	9,260	--	3.6	175	0.8	0.6	5,180	21.1	10.6	7.4	20	11,200	33	9	2,520

Table B2. Chemical concentrations in lake-bottom-sediment core samples--Continued

Site number[1]	Sampling depth from (in.)	Sampling depth to (in.)	Reservoir[2]	Sample number	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Cesium	Chromium	Cobalt	Copper	Iron	Lead	Lithium	Magnesium
SED09192	0	2	GW	SD06603CH	14,300	--	7.2	142	1.1	1.0	5,160	27.4	14.9	9.8	105	16,700	59	12	3,340
SED09192	2	4	GW	SD06604CH	23,800	--	6.2	200	1.4	0.8	6,510	31.9	24.0	11.2	123	23,000	51	18	4,620
SED09192	4	6	GW	SD06605CH	23,900	--	6.1	192	1.4	0.8	6,880	26.9	24.6	10.2	67	22,700	47	18	4,560
SED09192	6	8	GW	SD06606CH	21,500	--	5.7	176	1.2	0.8	6,150	25.9	21.9	9.8	53	20,100	47	16	4,170
SED09192	8	10	GW	SD06607CH	15,800	--	5.3	173	1.3	0.7	7,480	24.4	15.5	10.6	54	16,800	37	14	3,760
SED09192	10	12	GW	SD06608CH	22,800	--	6.3	173	1.7	0.7	7,780	24.5	23.0	10.6	60	19,800	47	17	4,460
SED09192	12	14	GW	SD06609CH	24,000	--	7.1	186	2.3	1.8	6,700	25.2	25.2	11.0	106	23,400	65	18	5,080
SED09192	14	16	GW	SD06610CH	24,000	--	6.1	199	1.5	0.8	65,10	26.6	25.2	11.3	139	23,000	72	19	4,630
SED09192	16	18	GW	SD06611CH	15,900	--	7.5	183	1.2	0.7	7,120	24.5	17.2	10.8	194	19,600	74	15	3,620
SED09192	18	20	GW	SD06612CH	25,300	--	5.5	196	1.5	1.0	15,300	20.7	26.0	10.9	161	21,300	55	19	4,750
SED09192	20	22	GW	SD06614CH	14,900	--	6.2	205	1.4	0.7	10,700	22.4	17.0	10.4	197	21,900	67	13	3610
SED09192	22	24	GW	SD06615CH	14,600	--	6.6	172	1.1	1.3	9,350	21.4	15.8	10.3	229	18,700	75	13	3,560
SED09192	24	26	GW	SD06616CH	18,100	--	7.7	184	1.2	1.8	9,930	21.0	20.2	11.3	311	20,600	105	16	4,110
SED09192	26	28	GW	SD06617CH	26,100	--	9.7	201	1.4	2.0	9,430	23.1	28.1	12.2	122	25,600	126	20	5,050
SED09292	0	2	GW	SD06632CH	6,340	--	4.0	82	0.6	0.4	3,900	14.8	7.5	5.9	20	9,330	15	6	1,850
SED09292	2	4	GW	SD06633CH	8,830	--	4.7	172	0.8	0.4	7,630	12.9	10.5	7.7	20	13,600	15	10	2,820
SED09292	4	6	GW	SD06634CH	9,260	--	5.1	183	0.8	0.4	7,910	12.7	10.4	7.7	18	13,100	18	9	2,900
SED09292	6	8	GW	SD06635CH	10,800	--	5.1	147	0.9	0.4	8,640	14.4	11.5	7.6	19	12,000	17	9	3,040
SED09292	8	10	GW	SD06636CH	9,530	--	8.8	168	1.0	0.5	12,100	15.9	10.2	8.5	19	14,200	18	8	3,060
SED09292	10	12	GW	SD06637CH	8,870	--	5.1	169	0.8	0.4	7,930	13.8	9.3	7.6	16	11,100	15	7	2,470
SED08892	0	2	M	SD06661CH	17,900	--	5.1	230	1.1	--	21,900	--	18.3	9.5	58	22,200	36	14	4,940
SED08892	2	4	M	SD06662CH	13,800	--	3.9	175	1.1	0.9	6,880	30.4	15.6	7.4	32	16,600	31	11	3,680
SED08892	4	6	M	SD06663CH	17,700	--	4.2	205	1.4	0.8	9,320	25.5	19.5	9.8	32	19,800	28	16	4,440
SED08892	6	8	M	SD06664CH	14,600	--	3.7	161	1.2	0.7	9,350	21.8	17.2	7.4	25	16,500	28	11	3,580
SED08892	8	10	M	SD06665CH	11,300	--	3.6	169	1.0	0.6	9,090	18.3	13.3	7.9	22	15,000	24	9	3,130
SED08892	10	12	M	SD06666CH	14,500	--	4.7	176	1.1	0.5	11,400	16.7	16.1	8.5	22	16,200	26	12	3,630
SED08892	12	14	M	SD06667CH	14,500	--	4.4	188	1.2	0.5	11,800	17.9	16.6	9.0	23	16,700	26	12	3,770
SED08892	14	16	M	SD06668CH	13,100	--	5.7	186	1.1	0.5	6,010	17.6	15.3	9.5	24	15,500	38	11	3,460
SED08892	16	18	M	SD06669CH	16,000	--	7.4	212	1.4	0.5	6,020	17.5	18.9	9.2	26	17,500	50	13	3,870
SED08892	18	20	M	SD06670CH	14,100	--	4.8	198	1.2	0.4	5,230	13.5	16.1	8.3	22	16,300	31	12	3,670

Table B2. Chemical concentrations in lake-bottom-sediment core samples--Continued

Site number[1]	Sampling depth from (in.)	Sampling depth to (in.)	Reservoir[2]	Sample number	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Cesium	Chromium	Cobalt	Copper	Iron	Lead	Lithium	Magnesium
SED08992	0	2	M	SD06690CH	13,100	--	8.9	227	1.4	--	29,100	--	14.7	5.2	41	18,500	25	14	4,050
SED08992	2	4	M	SD06691CH	18,700	--	6.2	246	1.5	--	10,100	--	18.8	10.0	37	21,100	41	17	4,870
SED08992	4	6	M	SD06692CH	18,800	--	5.6	222	1.3	1.0	8,260	32.6	19.5	9.1	32	19,000	44	17	4,560
SED08992	6	8	M	SD06693CH	19,500	--	6.6	217	1.3	0.8	15,300	27.3	20.6	9.2	29	19,800	36	19	4,560
SED08992	8	10	M	SD06695CH	12,700	--	6.2	192	1.1	0.6	14,300	21.2	14.6	9.2	26	15,100	46	13	3,630
SED08992	10	12	M	SD06696CH	13,100	--	4.4	176	1.0	0.5	12,500	15.9	14.6	8.5	21	15,200	32	13	3,450
SED08992	12	14	M	SD06697CH	13,100	--	4.7	160	1.0	0.4	9,110	13.1	14.3	7.7	18	14,800	20	13	3,320
SED08992	14	16	M	SD06698CH	13,900	--	4.9	193	1.2	0.4	6,630	13.9	15.8	8.7	23	15,700	31	14	3,680
SED08992	16	18	M	SD06699CH	13,700	--	5.1	218	1.2	0.5	5,780	15.1	15.6	9.0	24	15,000	31	15	3,690
SED09092	0	2	M	SD06719CH	9,370	--	2.8	115	0.6	0.6	17,000	19.0	10.6	5.1	12	10,900	17	7	2,470
SED09092	2	4	M	SD06720CH	7,340	--	4.5	95	0.7	0.5	13,700	15.3	9.5	5.0	12	11,400	18	6	2,030
SED09092	4	6	M	SD06721CH	6,430	--	2.6	72	0.7	0.3	33,30	11.3	8.7	4.4	10	14,700	11	5	1,530
SED09092	6	8	M	SD06722CH	6,650	3.3	3.0	84	0.8	0.3	2340	11.1	9.8	6.7	25	23,200	10	6	1,650
SED09092	8	10	M	SD06723CH	11,000	3.8	2.6	134	0.8	0.4	3,730	13.0	14.5	9.9	24	14,600	14	10	2,640
SED09092	10	12	M	SD06724CH	9,600	3.4	2.8	142	0.8	0.4	3,930	11.6	13.3	9.6	22	12,400	16	8	2,710
Detection limit					200	60	10	200	5	5	5,000	1,000	10	50	25	100	3	100	5,000

Site number[1]	Sampling depth from (in.)	Sampling depth to (in.)	Reservoir[2]	Sample number	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Strontium	Thallium	Tin	Vanadium	Zinc	Cyanide
SED08192	0	2	SL	SD06400CH	1,070	0.15	0.6	14.4	1,960	--	1.3	125	40.0	1.40	2.8	24.1	626	1.0
SED08192	2	4	SL	SD06401CH	1,730	0.27	1.1	20.0	2,803	2.1	2.2	174	63.7	2.20	3.8	37.0	872	1.6
SED08192	4	6	SL	SD06402CH	1,580	0.29	1.1	20.7	3,290	2.2	2.6	190	69.1	2.30	6.9	41.7	901	1.7
SED08192	6	8	SL	SD06403CH	1,210	0.24	1.0	19.2	2,770	--	2.0	163	58.5	2.30	3.8	33.9	700	1.5
SED08192	8	10	SL	SD06404CH	1,130	0.25	0.9	20.2	2,920	1.9	1.8	144	61.6	2.00	3.8	36.7	759	1.3
SED08192	10	12	SL	SD06405CH	1,880	0.18	0.7	18.4	2,640	1.5	2.3	137	61.8	1.60	2.7	35.5	651	1.1
SED08192	12	14	SL	SD06406CH	965	0.18	1.7	20.2	2,670	3.2	2.3	149	58.5	1.90	3.2	34.7	808	1.4
SED08192	14	16	SL	SD06407CH	811	0.22	1.4	19.8	2,610	1.7	1.6	133	58.3	1.80	2.8	32.7	812	1.2
SED08192	16	18	SL	SD06408CH	1,460	0.25	1.0	19.7	2,970	1.4	1.9	143	64.8	1.50	2.5	37.0	757	1.0
SED08192	18	20	SL	SD06409CH	642	0.26	12.1	24.0	3,280	1.7	2.9	160	71.1	1.70	3.0	37.9	915	1.1
SED08192	20	22	SL	SD06411CH	1,340	0.26	13.3	20.3	2,670	1.6	2.4	139	64.9	1.70	2.8	33.8	870	1.1

Table B2. Chemical concentrations for lake-bottom sediment core samples--Continued

Site number[1]	Sampling depth from (in.)	Sampling depth to (in.)	Reservoir[2]	Sample number	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Strontium	Thallium	Tin	Vanadium	Zinc	Cyanide
SED08192	22	24	SL	SD06412CH	1,200	0.21	18.4	21.9	2,880	1.5	2.1	133	65.4	1.60	3.6	34.0	943	1.1
SED08192	24	26	SL	SD06413CH	784	0.21	12.6	24.9	3,330	1.6	2.6	170	70.1	1.60	2.8	37.8	1,020	1.1
SED08192	26	28	SL	SD06414CH	959	0.26	23.7	22.5	2,890	1.6	2.9	154	67.9	1.60	3.5	35.7	859	1.1
SED08192	28	30	SL	SD06415CH	917	0.24	22.8	23.9	3,550	1.5	2.3	151	71.1	1.60	3.0	41.2	1,070	1.1
SED08192	30	32	SL	SD06416CH	424	0.24	0.7	15.5	1,920	1.3	1.9	130	40.7	0.63	5.0	26.4	585	0.9
SED08192	32	34	SL	SD06417CH	310	0.17	0.4	8.8	712	0.9	2.2	59	11.3	0.43	3.0	32.7	168	0.6
SED08292	0	2	SL	SD06429CH	429	0.48	0.6	15.2	3,550	1.3	6.8	144	37.3	1.30	3.1	30.4	708	0.9
SED08292	2	4	SL	SD06430CH	346	0.39	0.5	16.2	3,200	1.2	4.9	137	39.1	1.20	2.5	32.0	621	0.7
SED08292	4	6	SL	SD06431CH	396	0.36	0.5	19.4	3,790	1.2	4.6	187	49.6	1.20	3.1	40.3	627	0.8
SED08292	6	8	SL	SD06432CH	293	0.21	0.5	13.7	2,660	1.1	1.8	129	44.4	1.10	3.5	29.5	428	0.8
SED08392	0	2	SL	SD06458CH	1,630	0.22	--	18.6	3,070	--	--	215	63.9		5.9	40.5	837	--
SED08392	2	4	SL	SD06459CH	1,140	0.24	--	21.2	3,590	--	255	67.6	--	--	--	46.3	802	--
SED08392	4	6	SL	SD06460CH	973	0.22	1.1	22.8	3,150	2.2	2.4	235	65.0	2.30	4.1	41.9	802	1.7
SED08392	6	8	SL	SD06461CH	654	0.40	2.8	22.0	2,910	--	--	256	60.9	--	--	37.4	785	--
SED08392	8	10	SL	SD06462CH	1,010	0.28	8.8	24.2	3,660	2.1	2.8	355	78.4	0.99	11.9	45.7	961	1.6
SED08392	10	12	SL	SD06463CH	842	0.30	13.4	21.6	3,120	2.0	3.8	334	71.1	0.93	7.2	36.8	931	1.4
SED08392	12	14	SL	SD06464CH	941	0.31	15.7	22.0	3,240	1.9	4.3	352	68.7	0.89	9.9	40.4	939	1.5
SED08392	14	16	SL	SD06465CH	888	0.33	23.3	25.2	3,310	2.2	3.2	449	71.8	1.00	7.5	42.6	1,140	1.5
SED08392	16	18	SL	SD06466CH	848	0.40	11.4	22.8	3,540	1.9	5.0	439	73.4	0.88	11.4	42.9	1,200	1.4
SED08392	18	20	SL	SD06467CH	877	0.41	2.6	28.7	3,700	1.7	5.0	416	63.6	0.81	10.9	45.8	1,660	1.3
SED08392	20	22	SL	SD06469CH	605	0.55	0.7	18.3	3,180	1.2	4.9	323	54.8	0.59	6.7	39.4	940	0.9
SED08492	0	2	SL	SD06487CH	625	0.25	0.8	23.6	3,580	1.7	2.8	189	55.1	1.70	--	41.6	990	1.2
SED08492	2	4	SL	SD06488CH	357	0.27	1.8	21.4	2,790	1.2	3.5	146	44.3	1.20	3.8	29.5	844	0.8
SED08492	4	6	SL	SD06489CH	332	0.15	0.4	16.1	2,860	1.0	1.8	123	38.3	0.98	2.0	33.7	413	0.7
SED08492	6	8	SL	SD06490CH	264	0.10	0.4	15.4	2,660	0.9	1.4	149	36.9	0.87	--	31.2	121	0.6
SED08592	0	2	GW	SD06516CH	316	0.07	1.2	13.6	1,130	1.0	1.9	84	38.7	1.00	1.7	23.1	78	0.7
SED08592	2	4	GW	SD06517CH	196	0.08	0.8	13.5	1,360	1.1	2.1	121	43.4	1.10	1.8	25.4	77	0.8
SED08592	4	6	GW	SD06518CH	190	0.07	1.2	12.7	1,060	1.1	1.8	107	39.2	1.00	1.8	21.2	74	0.8
SED08592	6	8	GW	SD06519CH	200	0.07	0.5	12.3	973	1.1	2.2	112	42.6	1.00	1.8	21.5	46	0.7
SED08592	8	10	GW	SD06520CH	205	0.07	1.1	15.5	1,350	1.2	2.3	170	58.5	1.20	1.9	25.3	66	0.8
SED08592	10	12	GW	SD06522CH	154	0.07	1.3	13.7	1,330	1.2	2.2	178	55.0	1.10	1.9	25.2	65	0.8
SED08592	12	14	GW	SD06523CH	157	0.07	3.2	15.3	1,650	1.1	3.6	165	46.4	1.10	1.7	24.9	115	0.7

Table B2. Chemical concentrations for lake-bottom sediment core samples--Continued

Site number[1]	Sampling depth from (in.)	Sampling depth to (in.)	Reservoir[2]	Sample number	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Strontium	Thallium	Tin	Vanadium	Zinc	Cyanide
SED08692	0	2	GW	SD06545CH	772	0.18	0.9	18.5	2,410	1.8	1.9	125	56.2	0.65	3.3	37.7	480	1.4
SED08692	2	4	GW	SD06546CH	514	0.22	0.8	19.2	2,430	1.9	1.8	122	61.9	0.68	3.0	41.2	294	1.3
SED08692	4	6	GW	SD06547CH	342	0.26	0.7	18.3	2,000	1.6	1.6	127	57.4	0.58	2.7	35.1	258	1.1
SED08692	6	8	GW	SD06549CH	423	0.17	0.7	16.8	1,830	1.5	1.4	107	60.5	0.55	2.4	34.7	154	1.0
SED08692	8	10	GW	SD06550CH	370	0.16	0.8	17.8	1,850	1.6	1.7	122	65.6	0.60	2.9	35.6	137	1.1
SED08692	10	12	GW	SD06551CH	343	0.16	0.7	15.8	1,530	1.4	1.5	117	64.0	0.52	2.5	31.0	116	1.0
SED08692	12	14	GW	SD06552CH	427	0.15	0.7	17.7	2,270	1.5	2.1	118	58.9	0.53	2.4	37.8	197	1.1
SED08692	14	16	GW	SD06553CH	331	0.26	0.7	19.9	2,580	1.5	2.2	131	61.5	0.56	2.6	42.0	216	1.1
SED08692	16	18	GW	SD06554CH	518	0.21	5.0	17.6	2,370	1.4	3.3	118	64.5	0.49	2.6	38.5	225	1.0
SED08692	18	20	GW	SD06555CH	273	0.22	1.2	18.5	2,380	1.4	2.7	123	72.3	0.50	2.2	35.3	168	0.9
SED08692	20	22	GW	SD06556CH	469	0.22	3.0	17.2	2,220	1.4	4.2	130	63.5	0.50	2.7	34.8	211	1.0
SED08692	22	24	GW	SD06557CH	549	0.29	0.7	20.1	2,340	1.4	8.2	128	59.8	0.50	2.5	37.3	342	1.0
SED08692	24	26	GW	SD06558CH	573	0.27	0.6	18.1	2,330	1.3	14.1	113	58.8	0.48	2.3	36.9	284	0.9
SED08692	26	28	GW	SD06559CH	510	0.30	0.7	21.4	2,730	1.4	16.4	134	70.4	0.51	2.5	44.1	273	1.0
SED08792	0	2	GW	SD06574CH	326	0.16	0.6	14.6	1,590	1.2	1.2	93	42.2	0.45	2.0	28.9	201	0.8
SED08792	2	4	GW	SD06575CH	290	0.10	3.1	16.7	1,710	1.1	1.7	98	45.2	0.39	1.8	35.0	129	0.7
SED08792	4	6	GW	SD06576CH	184	0.12	0.5	16.3	1,810	1.0	1.0	107	47.8	0.36	1.8	33.8	89	0.7
SED08792	6	8	GW	SD06577CH	272	0.11	0.4	15.3	1,630	1.0	0.9	112	48.0	0.36	1.6	30.8	78	0.7
SED08792	8	10	GW	SD06578CH	164	0.10	0.5	14.7	1,810	1.0	1.0	118	49.6	0.36	1.6	27.7	63	0.7
SED09192	0	2	GW	SD06603CH	633	0.17	0.9	16.1	2,280	1.7	3.2	119	53.6	0.76	5.4	34.6	390	1.5
SED09192	2	4	GW	SD06604CH	657	0.17	0.9	19.5	3,360	1.5	2.8	170	72.7	0.67	3.6	55.9	293	1.3
SED09192	4	6	GW	SD06605CH	500	0.12	0.9	18.8	3,390	1.6	2.8	154	73.9	0.70	5.1	56.8	264	1.3
SED09192	6	8	GW	SD06606CH	389	0.17	0.9	18.3	3,030	1.5	2.7	147	71.1	0.69	4.2	50.6	226	1.3
SED09192	8	10	GW	SD06607CH	389	0.15	0.8	19.6	2,420	1.5	1.8	141	70.8	0.66	3.0	37.5	200	1.2
SED09192	10	12	GW	SD06608CH	337	0.21	0.8	20.8	3,200	1.5	3.4	150	79.7	0.67	3.0	54.8	203	1.3
SED09192	12	14	GW	SD06609CH	461	0.22	0.9	21.6	3,420	1.4	5.6	161	70.8	0.64	4.4	55.2	241	1.3
SED09192	14	16	GW	SD06610CH	445	0.26	2.4	20.1	3,680	1.4	3.7	155	71.9	0.65	3.3	56.6	263	1.3
SED09192	16	18	GW	SD06611CH	570	0.21	4.2	17.5	2,510	1.4	4.1	151	65.0	0.63	3.5	38.5	239	1.2
SED09192	18	20	GW	SD06612CH	329	0.19	1.1	21.2	3,720	1.3	4.9	154	88.4	0.58	3.5	58.0	201	1.1
SED09192	20	22	GW	SD06614CH	590	0.20	0.8	19.4	2,470	1.3	5.4	146	72.9	0.58	2.8	38.2	214	1.1
SED09192	22	24	GW	SD06615CH	456	0.25	0.7	19.0	2,490	1.3	7.9	148	64.2	0.57	2.7	35.1	347	1.0
SED09192	24	26	GW	SD06616CH	414	0.10	0.7	20.9	3,000	1.2	16.5	153	71.2	0.55	2.6	43.3	338	1.1
SED09192	26	28	GW	SD06617CH	404	0.28	0.8	23.6	4,000	1.4	9.4	173	81.6	0.61	4.2	60.4	358	1.1

Table B2. Chemical concentrations for lake-bottom sediment core samples--Continued

Site number[1]	Sampling depth from (in.)	Sampling depth to (in.)	Reservoir[2]	Sample number	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Strontium	Thallium	Tin	Vanadium	Zinc	Cyanide
SED09292	0	2	GW	SD06632CH	174	0.06	0.5	11.2	1,040	1.0	1.1	75	35.0	1.00	3.8	17.2	74	0.7
SED09292	2	4	GW	SD06633CH	184	0.06	0.4	15.5	1,420	1.7	1.8	129	59.6	1.00	3.3	25.5	67	0.7
SED09292	4	6	GW	SD06634CH	162	0.07	0.4	15.5	1,380	0.8	1.7	148	61.4	1.10	2.2	25.5	59	0.7
SED09292	6	8	GW	SD06635CH	156	0.07	0.5	14.7	1,370	1.0	1.3	192	70.5	1.10	4.2	26.3	62	0.7
SED09292	8	10	GW	SD06636CH	264	0.09	0.5	14.9	1,180	0.9	1.5	224	82.7	1.10	4.6	24.1	61	0.8
SED09292	10	12	GW	SD06637CH	153	0.08	0.5	13.6	1,100	2.5	1.0	189	59.5	1.00	6.0	22.3	52	0.8
SED08892	0	2	M	SD06661CH	248	--	--	17.8	3,540	--	--	364	109.0	--	49.7	43.8	96	--
SED08892	2	4	M	SD06662CH	239	0.13	1.0	15.7	2,750	2.4	2.2	216	54.9	0.79	27.3	38.0	69	1.5
SED08892	4	6	M	SD06663CH	207	0.11	0.9	19.2	3,520	2.7	1.8	224	63.2	0.68	26.9	46.2	79	1.3
SED08892	6	8	M	SD06664CH	179	0.10	0.7	15.2	2,900	1.7	1.6	225	53.0	0.56	18.3	39.3	70	1.1
SED08892	8	10	M	SD06665CH	215	0.09	0.6	14.7	2,290	1.4	1.3	167	51.3	0.47	14.6	34.9	58	1.0
SED08892	10	12	M	SD06666CH	213	0.08	0.6	16.0	2,910	1.4	1.2	175	57.9	0.47	14.5	38.6	64	0.9
SED08892	12	14	M	SD06667CH	246	0.08	0.6	17.1	2,960	1.3	1.3	170	59.1	0.45	15.4	39.2	67	0.9
SED08892	14	16	M	SD06668CH	258	0.09	0.6	16.7	2,760	1.4	1.3	166	47.2	0.47	14.5	39.9	73	0.9
SED08892	16	18	M	SD06669CH	233	0.09	0.6	18.3	3,420	1.6	1.3	185	52.4	0.46	13.0	42.0	88	0.9
SED08892	18	20	M	SD06670CH	234	0.07	0.5	17.0	2,950	1.1	1.0	165	45.8	0.38	14.6	34.6	66	0.7
SED08992	0	2	M	SD06690CH	442	--	--	12.7	2,900	6.7	--	441	151.0	10.3	36.4	74.0	--	--
SED08992	2	4	M	SD06691CH	265	--	--	17.9	3,860	3.5	--	258	80.2	--	6.9	48.9	92	--
SED08992	4	6	M	SD06692CH	227	0.16	1.1	19.1	3,800	2.7	2.3	263	64.8	2.30	5.0	46.5	84	1.6
SED08992	6	8	M	SD06693CH	195	0.14	0.9	20.4	3,950	4.3	2.0	260	80.4	2.30	8.4	47.2	85	1.5
SED08992	8	10	M	SD06695CH	191	0.12	0.7	17.7	2,850	2.2	1.5	203	68.9	1.60	3.9	39.7	67	1.1
SED08992	10	12	M	SD06696CH	250	0.08	0.5	15.8	2,630	0.8	1.3	166	60.9	1.10	2.9	35.3	58	0.8
SED08992	12	14	M	SD06697CH	219	0.07	0.5	14.3	2,560	1.4	1.5	141	50.9	1.00	2.2	32.6	54	0.7
SED08992	14	16	M	SD06698CH	219	0.06	0.5	16.2	3,030	1.4	1.7	194	54.8	1.00	3.2	32.8	69	0.7
SED08992	16	18	M	SD06699CH	252	0.07	0.5	16.7	3,020	1.4	1.7	181	57.2	1.10	4.7	31.1	63	0.7
SED09092	0	2	M	SD06719CH	157	0.10	0.6	9.2	1,990	1.4	1.4	228	63.6	0.47	18.3	22.6	50	1.0
SED09092	2	4	M	SD06720CH	179	0.07	0.5	9.3	1,720	1.1	1.1	148	50.2	0.36	12.0	24.3	44	0.7
SED09092	4	6	M	SD06721CH	210	0.06	0.4	8.8	1,480	0.9	0.8	63	21.2	0.30	12.2	31.2	31	0.6
SED09092	6	8	M	SD06722CH	448	0.06	0.4	12.6	1,550	0.9	1.1	71	20.7	0.86	6.8	50.2	40	0.6
SED09092	8	10	M	SD06723CH	389	0.06	0.4	14.8	2,650	0.9	0.9	126	36.5	0.92	5.2	31.8	54	0.6
SED09092	10	12	M	SD06724CH	401	0.06	0.4	14.6	2,360	0.9	0.8	119	37.8	0.92	3.2	27.1	46	0.6
	Detection limit				15	0.2	200	40	5,000	5	10	5,000	200	10	200	50	20	10

[1]See figure 2 for location of sites on Standley Lake, figure 3 for sites on Great Western Reservoir, and figure 4 for sites on Mower Reservoir.
[2]Codes for lakes include: SL=Standley Lake, GW=Great Western Reservoir, and M=Mower Reservoir.

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APPENDIX C

Lake-water samples

Table C1. Field measurements at lake-water-sampling sites

[ft, feet; °C, degrees Celsius; mg/L, milligrams per liter; µS/cm, microsiemens per centimeter at 25 degrees Celsius]

Site number[1]	Reservoir[2]	Sample date	Sample time	Depth (ft)	Temperature (°C)	Dissolved oxygen (mg/L)	pH	Specific conductance (µS/cm)
SW00992	SL	09/08/92	9:02	1	18.1	8.2	8.2	224
			9:02	5	18.1	8.1	8.1	224
			9:03	10	18.1	8.0	8.1	224
			9:04	15	18.1	7.9	8.1	224
			9:05	20	18.1	7.9	8.1	223
			9:06	25	18.1	7.9	8.1	224
			9:07	30	18.1	7.8	8.1	224
			9:08	35	18.1	7.8	8.1	224
			9:09	40	18.0	7.7	8.1	223
			9:10	45	18.0	7.3	8.0	223
			9:11	50	17.9	6.5	8.0	223
			9:11	55	17.0	5.6	7.9	224
			9:12	60	17.3	3.1	7.9	228
			9:13	65	17.1	2.4	7.8	228
			9:14	70	17.0	1.9	7.7	229
			9:15	72.5	16.4	0.4	7.6	234
			9:16	75	15.1	0.3	7.5	246
			9:17	80	14.8	0.3	7.5	249
SW01092	SL	09/09/92	9:52	1	17.7	7.2	8.0	226
			9:52	5	17.7	7.2	8.0	226
			9:53	10	17.7	7.2	8.0	226
			9:54	15	17.6	7.1	8.0	226
			9:55	20	17.6	7.1	8.0	226
			9:56	21	17.5	7.0	8.0	226
SW01192	SL	09/08/92	11:00	1	18.4	8.0	7.8	226
			11:01	5	18.3	8.0	7.8	226
			11:01	10	18.1	7.9	7.8	228
			11:02	15	18.0	7.9	7.8	227
			11:03	20	18.0	7.8	7.8	227
			11:03	25	18.0	7.8	7.8	227
			11:04	30	18.0	7.6	7.8	226
			11:04	35	18.0	7.2	7.8	226
			11:05	40	17.9	6.7	7.7	227
			11:06	45	17.9	6.0	7.7	225
			11:07	50	17.8	5.7	7.6	224
			11:08	55	17.7	5.4	7.6	224
			11:09	60	17.7	5.1	7.6	224
			11:09	65	17.4	4.0	7.6	225

Table C1. Field measurements at lake-water-sampling sites--Continued

Site number[1]	Reservoir[2]	Sample date	Sample time	Depth (ft)	Temperature (°C)	Dissolved oxygen (mg/L)	pH	Specific conductance (μS/cm)
SW01292	SL	09/09/92	11:24	1	18.3	7.2	7.9	223
			11:24	5	18.2	7.2	7.9	224
			11:25	10	18.1	7.1	7.9	224
			11:25	15	18.0	7.1	7.9	224
			11:26	20	18.0	7.1	7.9	225
			11:27	25	17.9	7.1	7.9	225
			11:28	30	17.9	7.0	7.9	225
			11:29	35	17.8	7.0	7.9	224
			11:30	40	17.7	7.0	7.8	224
			11:31	42	17.7	6.9	7.9	224
SW03192	SL	10/13/92	10:14	1	13.9	8.8	8.1	229
			10:15	5	13.9	8.6	8.1	229
			10:16	10	13.7	8.3	8.1	229
			10:19	15	13.4	7.8	8.0	229
			10:20	16	13.2	7.7	8.0	229
SW03292	SL	10/14/92	9:54	1	14.4	7.9	8.3	226
			9:54	5	14.4	7.9	8.3	227
			9:55	10	14.4	7.9	8.3	230
			9:55	15	14.3	7.9	8.3	232
SW03392	SL	10/13/92	8:56	1	14.0	8.5	8.1	229
			8:58	5	14.0	8.4	8.1	229
			9:00	10	13.9	8.4	8.2	229
			9:01	13.5	13.7	8.3	8.2	229
SW03492	SL	10/13/92	11:12	1	14.3	8.7	8	229
			11:13	5	14.2	8.6	8	229
			11:14	10	14.2	8.6	8.1	229
			11:15	15	14.1	8.4	8.1	228
			11:16	20	14.1	8.3	8.1	229
			11:17	22.5	14.0	7.9	8	228
SW03592	SL	10/14/92	8:55	1	14.7	8	8.2	229
			8:57	5	14.7	7.9	8.2	231
			8:58	10	14.7	7.9	8.2	233
			8:58	15	14.7	7.8	8.2	236
			8:59	20	14.7	7.8	8.2	236
			9:00	25	14.7	7.8	8.1	237
			9:00	30	14.7	7.8	8.1	241
			9:01	40	14.7	7.7	8.1	240
			9:02	50	14.7	7.5	8.0	238
			9:03	60	14.5	6.8	7.8	249
			9:05	70	14.5	6.5	7.7	244

Table C1. Field measurements at lake-water-sampling sites--Continued

Site number[1]	Reservoir[2]	Sample date	Sample time	Depth (ft)	Temperature (°C)	Dissolved oxygen (mg/L)	pH	Specific conductance (μS/cm)
SW01392	GW	08/31/92	9:00	1	18.5	7.6	8.3	184
			9:01	5	18.4	7.5	8.3	183
			9:02	10	18.3	7.5	8.3	184
			9:03	14.5	17.5	7.6	8.3	185
SW01492	GW	09/01/92	11:50	1	18.3	7.6	8.3	182
			11:51	5	18.3	7.6	8.3	183
			11:52	10	18.3	7.5	8.3	185
			11:53	15	18.3	7.5	8.3	189
			11:54	20	18.2	7.5	8.2	190
			11:55	25	18.2	7.4	8.2	192
			11:56	30	18.2	7.4	8.2	195
			11:57	35	18.1	7.1	8.1	197
SW01692	GW	09/02/92	8:35	1	17.8	7.7	8.3	184
			8:35	5	17.8	7.7	8.3	184
			8:36	10	17.8	7.6	8.3	185
			8:37	15	17.8	7.6	8.2	191
			8:38	20	17.8	7.5	8.2	193
			8:39	25	17.8	7.5	8.2	194
			8:40	30	17.7	7.5	8.2	196
			8:41	35	17.6	7.5	8.2	199
			8:42	38	17.4	7.4	8.1	204
SW01592	GW	09/01/92	9:16	1	18.0	7.6	8.3	183
			9:17	5	18.0	7.6	8.3	183
			9:18	10	18.0	7.6	8.3	183
			9:20	15	18.0	7.6	8.3	185
			9:21	18	17.7	7.4	8.2	191
SW01792	GW	09/15/92	9:17	1	18.3	8.4	8.3	187
SW02192	GW	10/02/92	12:18	1	17.0	8.2	8.3	181
			12:19	5	16.7	8.2	8.3	183
			12:20	8	16.4	8.2	8.3	187
SW02292	GW	10/02/92	11:11	1	16.2	8.1	8.3	183
			11:12	5	15.8	8.1	8.3	184
			11:13	10	15.6	8.0	8.2	189
			11:14	15	15.5	8.1	8.3	191
			11:15	17	15.4	8.2	8.3	191

Table C1. Field measurements at lake-water-sampling sites--Continued

Site number[1]	Reservoir[2]	Sample date	Sample time	Depth (ft)	Temperature (°C)	Dissolved oxygen (mg/L)	pH	Specific conductance (μS/cm)
SW02392	GW	10/02/92	8:37	1	15.6	7.8	8.0	183
			8:39	5	15.6	7.8	8.0	185
			8:40	10	15.6	7.8	8.0	189
			8:40	15	15.6	7.7	8.0	191
			8:41	20	15.6	7.7	8.0	194
			8:42	25	15.6	7.6	7.9	196
			8:43	30	15.5	7.5	7.9	196
			8:45	33	15.5	7.3	7.8	198
SW02492	GW	10/02/92	10:30	1	16.1	7.9	8.2	179
			10:31	2.5	16.1	7.9	8.2	181
SW01892	M	09/14/92	10:05	1	17.3	7	10.3	276
			10:09	3	16.9	4.8	10.1	271
			10:10	5	16.6	2.0	9.7	268
			10:11	6	16.4	0.6	9.6	270
			10:52	1	17.3	9.7	10.4	282
			10:53	3	16.9	8.3	10.2	276
			10:55	5	16.3	2.0	9.8	269
SW02092	M	09/14/92	13:02	0.5	22.0	12.5	9.9	272
SW02692	M	10/08/92		1	8.4	9.6	10.1	270
				3	8.1	8.8	10.1	271
SW02792	M	10/08/92	12:04	1	9.5	9.6	10.2	269
			12:05	3	8.7	9.2	10.2	268
SW02892	M	10/08/92	11:20	1	9.6	8.2	10.1	268
			11:22	3	9.4	7.6	10.1	269
SW02992	M	10/08/92	8:56	1	7.7	5.9	10.0	267
SW03092	M	10/08/92	10:30	1	9.3	7.6	10.1	268
			10:31	4	9.1	6.6	10.1	268

[1]See figure 2 for location of sites on Standley Lake, figure 3 for sites on Great Western Reservoir, and figure 4 for sites on Mower Reservoir.
[2]Codes for lakes include: SL=Standley Lake, GW=Great Western Reservoir, and M=Mower Reservoir.

Table C2. Radionuclide concentrations in lake-water samples

[Measurements are in picocuries per liter; ft, feet; --, measurement not reported; * indicates maximum depth of composite sample; uncertainties are in parentheses; nr indicates uncertainty was not reported]

Site number[1]	Sampling depth (ft)		Reservoir[2]	Sample number	Sample date	Dissolved radionuclides														Total radionuclides	
						Americium-241		Gross alpha		Gross beta		Plutonium-239,240		Uranium-233,234		Uranium-235		Uranium-238		Americium-241	
	From	To																			
SW00992	80	80	SL	SW07100CH	09-08-92	-0.004	-0.01	0.47	-2	2.3	-2	-0.002	-0.01	0.43	-0.2	0.03	-0.2	0.35	-0.2	0.002	-0.005
SW01092	20	21	SL	SW07101CH	09-09-92	0	-0.008	0.84	-2	2.1	-2	0.006	-0.01	0.63	-0.2	0.03	-0.2	0.42	-0.2	0.001	-0.01
SW01192	65	65	SL	SW07102CH	09-08-92	-0.001	-0.006	0.29	-2	2.3	-2	0.001	-0.01	0.5	-0.3	0.66	-0.2	-0.04	-0.2	-0.001	-0.006
SW01292	41	42	SL	SW07103CH	09-09-92	0.009	-0.01	-0.58	-2	1.2	-2	0.002	-0.01	0.65	-0.1	0.04	-0.2	0.51	-0.1	0	-0.01
SW03192	--	--	SL	SW07022CH	07-27-92	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.005	-0.006
SW03192	--	16	SL	SW07219CH	10-13-92	0.005	(nr)	1.08	-0.46	2.82	-1.6	0.001	(nr)	0.67	(nr)	0	(nr)	0.34	-0.15	0.013	(nr)
SW03292	--	--	SL	SW07023CH	07-30-92	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.011	-0.004
SW03292	15.5*	17	SL	SW07221CH	10-14-92	0	-0.047	0.68	-2.12	2	-2.74	0	-0.003	0.87	-0.26	0	-0.2	0	-0.26	0.026	-0.038
SW03392	--	--	SL	SW07024CH	07-27-92	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.005	-0.002
SW03392	--	13.5	SL	SW07222CH	10-13-92	0.007	(nr)	0.92	-0.85	2.65	-1.6	0	(nr)	0.84	(nr)	0	(nr)	0.43	-0.12	0.004	(nr)
SW03492	--	--	SL	SW07025CH	07-28-92	0.004	-0.006	1	-0.46	-0.14	-2.8	--	--	1.2	-0.2	0.71	-0.07	0.47	-0.07	0.006	-0.002
SW03492	21*	22.5	SL	SW07224CH	10-13-92	0.006	-0.005	1.4	-2.26	2.8	-2.86	0.009	-0.009	1	-0.15	0.2	-0.13	0.63	-0.12	0.009	-0.008
SW03592	--	--	SL	SW07026CH	07-28-92	0.013	-0.003	1	-0.29	4.3	-2.6	--	--	0.76	-0.09	0.04	-0.04	0.73	-0.04	0.002	-0.004
SW03592	--	--	SL	SW07028CH	07-28-92	0.003	-0.003	0.58	-0.44	1.4	-3	0.002	-0.002	--	--	--	--	--	--	0.004	-0.006
SW03592	--	--	SL	SW07029CH	07-28-92	--	--	0.86	-0.47	1.8	-2.6	0	-0.011	--	--	--	--	--	--	--	--
SW03592	73.5*	75	SL	SW07225CH	10-14-92	0.007	-0.004	1.1	-2.08	1	-2.9	0.001	-0.004	0.86	-0.13	0.02	-0.13	0.67	-0.12	0.012	-0.006
SW01392	14.5	14.5	GW	SW07104CH	08-31-92	-0.003	-0.009	-0.42	-2	1.7	-2	0	-0.007	0.43	-0.3	0.31	-0.2	0	-0.2	-0.005	-0.02
SW01492	35	36	GW	SW07105CH	09-01-92	-0.001	-0.006	0.43	-2	0.96	-2	-0.002	-0.02	0.5	-0.3	0	-0.3	0.29	-0.3	0.002	-0.01
SW01592	18.5	19	GW	SW07106CH	09-01-92	0.001	-0.01	0.25	-2	1.6	-2	0.002	-0.007	0.47	-0.3	-0.08	-0.4	0.23	-0.3	0.01	-0.004
SW01692	39	40	GW	SW07107CH	09-02-92	0.004	-0.01	-0.06	-2	1.8	-2	-0.001	-0.01	0.56	-0.2	0.07	-0.3	0.21	-0.2	0.011	-0.01
SW01792	--	--	GW	SW07108CH	09-15-92	-0.001	-0.01	-0.39	-2	1	-2	0	-0.007	0.53	-0.3	0.51	-0.2	-0.05	-0.2	0.003	-0.009
SW02192	--	--	GW	SW07007CH	07-15-92	0.006	-0.007	0.7	-0.41	0.08	-3	--	--	0.38	-0.03	0.04	-0.03	0.48	-0.05	0.007	-0.004
SW02192	8*	9	GW	SW07205CH	10-02-92	--	--	0.65	-0.55	1.92	-1.5	--	--	--	--	--	--	--	--	--	--
SW02292	--	--	GW	SW07008CH	07-15-92	0.001	-0.005	0.35	-0.41	0.81	-3	--	--	0.29	-0.04	-0.01	-0.06	0.46	-0.04	-0.002	-0.004
SW02292	17*	19	GW	SW07206CH	10-02-92	0.002	(nr)	-0.09	-0.54	1.85	-1.7	--	--	--	--	--	--	--	--	0.017	(nr)
SW02392	--	--	GW	SW07009CH	07-16-92	0.018	-0.009	0.69	-0.58	0.17	-2.9	-0.003	-0.015	0.44	-0.04	-0.01	-0.07	-0.58	-0.07	--	--
SW02392	30*	34	GW	SW07207CH	10-02-92	-0.001	(nr)	0.39	-0.41	1.66	-1.6	--	--	--	--	--	--	--	--	0.007	(nr)
SW02492	--	--	GW	SW07010CH	07-16-92	0.005	-0.001	0.78	-0.43	2.6	-2.8	0.001	-0.002	0.51	-0.11	-0.01	-0.11	0.25	-0.11	0.009	-0.002
SW02492	1.75	3.5	GW	SW07208CH	10-02-92	--	--	0.88	-0.48	2.09	-1.6	--	--	--	--	--	--	--	--	0.004	(nr)

Table C2. Radionuclide concentrations in lake-water samples--Continued

Site number[1]	Sampling depth (ft)		Reser-voir[2]	Sample number	Sample date	Dissolved radionuclides														Total radionuclides	
						Americium-241		Gross alpha		Gross beta		Plutonium-239,240		Uranium-233,234		Uranium-235		Uranium-238		Americium-241	
	From	To																			
SW01892	1	6	M	SW07109CH	09-14-92	0.013	-0.01	0.11	-2	1.4	-2	0	-0.009	0.17	-0.1	0.02	-0.2	0.17	-0.1	0.002	-0.01
SW01992	4.5	5	M	SW07110CH	09-14-92	-0.001	-0.01	-0.13	-2	0.7	-2	0.002	-0.009	- -	- -	- -	- -	- -	- -	0	-0.009
SW02092	1	1	M	SW07111CH	09-14-92	0.002	-0.01	0.95	-2	1.2	-1	-0.001	-0.01	0.18	-0.2	0.11	-0.2	0.2	-0.1	0	-0.01
SW02692	- -	- -	M	SW07012CH	07-20-92	0.005	-0.003	0.47	-0.45	0.46	-2.4	0.003	-0.002	0.32	-0.09	-0.01	-0.09	0.33	-0.06	- -	- -
SW02692	- -	- -	M	SW07210CH	10-08-92	0.004	-0.003	0.14	-2.6	1.7	-2.8	0.002	-0.003	0.2	-0.5	-0.2	-0.46	-0.26	-0.52	-0.01	-0.01
SW02792	- -	- -	M	SW07013CH	07-20-92	0.008	-0.005	0.4	-0.46	-0.02	-2.5	- -	- -	0.28	-0.03	0.04	-0.03	0.24	-0.06	--	-0.004
SW02792	2	4	M	SW07214CH	10-08-92	0.005	-0.007	0.07	-2.3	-0.06	-2.77	0.001	-0.003	0.58	-0.31	-0.01	-0.19	0.11	-0.25	0.003	-0.008
SW02892	- -	- -	M	SW07014CH	07-20-92	0.001	-0.002	0.57	-0.42	-0.25	-2.7	-0.001	-0.01	- -	- -	- -	- -	- -	- -	0.007	-0.004
SW02892	2	4	M	SW07216CH	10-08-92	-0.019	-0.172	0.87	-1.9	0.87	-2.85	0.001	-0.009	0.21	-0.23	0.14	-0.23	0.12	-0.26	0.013	-0.007
SW02992	- -	- -	M	SW07015CH	07-20-92	0.017	-0.02	0.24	-0.46	0.26	-2.4	- -	- -	0.47	-0.04	0	-0.04	0.42	-0.04	0.003	-0.006
SW02992	1	1	M	SW07217CH	10-08-92	0.116	-0.158	0.36	-2.7	2.1	-2.81	0	-0.01	0.39	-0.33	0.1	-0.28	0.1	-0.28	0.008	-0.003
SW03092	- -	- -	M	SW07016CH	07-21-92	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.005	-0.001
SW03092	2	4	M	SW07218CH	10-08-92	0.002	-0.013	1.9	-2.3	0.78	-2.94	0	-0.005	0.7	-3.15	0	-2.53	-0.08	-2.89	0.017	-0.017

Site number[1]	Sampling depth (ft)		Reser-voir[2]	Sample number	Sample date	Total radionuclides													
						Gross alpha		Gross beta		Plutonium-239,240		Tritium		Uranium-233,234		Uranium-235		Uranium-238	
	From	To																	
SW00992	80	80	SL	SW07100CH	09-08-92	0.44	-2	2.7	-2	0	-0.01	- -	- -	0.82	-0.3	0.09	-0.30	-0.37	-0.30
SW01092	20	21	SL	SW07101CH	09-09-92	0.45	-2	4.3	-2	0.004	-0.01	- -	- -	0.39	-0.2	0.13	-0.3	0.45	-0.2
SW01192	65	65	SL	SW07102CH	09-08-92	0.91	-1	2.7	-2	- -	- -	- -	- -	0.59	-0.2	0.02	-0.2	0.39	-0.1
SW01292	41	42	SL	SW07103CH	09-09-92	1.2	-2	2.9	-2	0.005	-0.01	- -	- -	0.68	-0.2	0.06	-0.2	0.73	-0.2
SW03192	- -	- -	SL	SW07022CH	07-27-92	-1.57	-0.69	-1.30	-2.40	0.002	-0.009	- -	- -	0.68	-0.04	0.04	-0.07	0.77	-0.07
SW03192	- -	16	SL	SW07219CH	10-13-92	0.62	-0.68	2.49	-1.6	0.002	(nr)	- -	- -	0.55	-0.11	0.03	-0.15	0.44	-0.15
SW03292	- -	- -	SL	SW07023CH	07-30-92	1.9	-0.32	2.1	-2.5	0.004	-0.002	- -	- -	0.7	-0.03	0.08	-0.03	0.85	-0.05
SW03292	15.5*	17	SL	SW07221CH	10-14-92	1.5	-1.93	2.1	-2.86	0.001	-0.004	- -	- -	0.68	-0.26	0.08	-0.21	0.54	-0.24
SW03392	- -	- -	SL	SW07024CH	07-27-92	1.4	-0.53	2.5	-2.6	0	-0.005	- -	- -	0.95	-0.16	0.14	-0.14	0.62	-0.16
SW03392	- -	13.5	SL	SW07222CH	10-13-92	1.57	-0.69	-3.34	-1.60	-0.001	(nr)	- -	- -	-0.97	-0.13	-0.00	(nr)	-0.67	(nr)
SW03492	- -	- -	SL	SW07025CH	07-28-92	1.4	-0.5	1.2	-2.7	0.002	-0.004	- -	- -	0.52	-0.18	0	-0.04	1.1	-0.07
SW03492	21*	22.5	SL	SW07224CH	10-13-92	0.77	-2.43	0.87	-2.77	0.009	-0.009	- -	- -	1.2	-0.2	0.27	-0.12	0.89	-0.20
SW03592	- -	- -	SL	SW07026CH	07-28-92	- -	- -	-0.01	-3	0	-0.004	- -	- -	1.3	-0.03	0.04	-0.03	1.1	0.06
SW03592	- -	- -	SL	SW07028CH	07-28-92	- -	- -	1.3	-2.6	0.003	-0.001	- -	- -	0.61	-0.18	-0.02	-0.14	0.29	-0.15
SW03592	- -	- -	SL	SW07029CH	07-28-92	- -	- -	2	-2.4	0.003	-0.004	- -	- -	0.52	-0.34	0	-0.1	0.52	0.34
SW03592	73.5*	75	SL	SW07225CH	10-14-92	0.74	-2.31	3.7	-2.69	0.002	-0.008	- -	- -	1.3	-0.14	0.01	-0.12	1	0.12

Table C-2. Radionuclide concentrations in surface water samples--Continued

Site number[1]	Sampling depth (ft)		Reser-voir[2]	Sample number	Sample date	Total radionuclides													
	From	To				Gross alpha		Gross beta		Plutonium-239,240		Tritium		Uranium-233,234		Uranium-235		Uranium-238	
SW01392	14.5	14.5	GW	SW07104CH	08-31-92		0.07		-2		2.6		-2		0.002		-0.02		- -
SW01492	35	36	GW	SW07105CH	09-01-92		1.8		-2		4.7		-2		0		-0.008		- -
SW01592	18.5	19	GW	SW07106CH	09-01-92	0.83	-2	2.4	-2	- -	- -	- -	- -	0.5	-0.2	0.11	-0.3	0.44	-0.2
SW01692	39	40	GW	SW07107CH	09-02-92	1.7	-2	3.3	-2	0.003	-0.008	- -	- -	0.51	-0.3	0.41	-0.2	-0.02	0.20
SW01792	- -	- -	GW	SW07108CH	09-15-92	0.67	-2	3.4	-1	0.004	-0.007	- -	- -	0.44	-0.3	0	-0.2	0.37	0.20
SW02192	- -	- -	GW	SW07007CH	07-15-92	1.6	-0.57	3.3	-2.2	0.004	-0.001	- -	- -	0.91	-0.05	0.16	-0.05	0.43	0.05
SW02192	8*	9	GW	SW07205CH	10-02-92	0.87	-0.66	1.56	-1.7	- -	- -	-28.1	-530	- -	- -	- -	- -	- -	- -
SW02292	- -	- -	GW	SW07008CH	07-15-92	2.2	-0.45	4.4	-2.5	0.003	-0.001	- -	- -	0.75	-0.15	0.17	-0.08	0.36	-0.05
SW02292	17*	19	GW	SW07206CH	10-02-92	0.25	-0.41	2.41	-1.5	- -	- -	144.3	-540	- -	- -	- -	- -	- -	- -
SW02392	- -	- -	GW	SW07009CH	07-16-92	- -	- -	2	-2.4	0.005	-0.002	- -	- -	0.53	-0.13	-0.02	-0.2	0.25	-0.2
SW02392	30*	34	GW	SW07207CH	10-02-92	0.48	-0.45	2.05	-1.6	- -	- -	-29.1	-540	- -	- -	- -	- -	- -	- -
SW02492	- -	- -	GW	SW07010CH	07-16-92	- -	- -	0.27	-2.7	0.005	-0.003	- -	- -	1.1	-0.16	0.04	-0.12	0.68	0.14
SW02492	1.75	3.5	GW	SW07208CH	10-02-92	0.42	-0.48	4.24	-1.6	- -	- -	25.2	-540	- -	- -	- -	- -	- -	- -
SW01892	1	6	M	SW07109CH	09-14-92	0.95	-2	1.3	-2	- -	- -	- -	- -	0.2	-0.2	-0.03	-0.3	0.09	-0.2
SW01992	4.5	5	M	SW07110CH	09-14-92	-0.25	-2	0.34	-2	0.004	-0.01	- -	- -	0.08	-0.2	0	-0.2	0.16	-0.2
SW02092	1	1	M	SW07111CH	09-14-92	-0.04	-2	1.3	-2	0.005	-0.02	- -	- -	0.19	-0.2	0.03	-0.2	0.14	0.20
SW02692	- -	- -	M	SW07012CH	07-20-92	- -	- -	-1.3	-2.9	0.001	-0.006	- -	- -	0.08	-0.36	0.08	-0.36	0.22	0.36
SW02692	- -	- -	M	SW07210CH	10-08-92	0.35	-2.52	1.7	-2.9	0.03	-0.016	- -	- -	0.56	-0.39	-0.03	-0.35	0.65	-0.4
SW02792	- -	- -	M	SW07013CH	07-20-92	0.85	-0.45	0.59	-2.4	-0.005	-0.016	- -	- -	0.68	-0.04	0.1	-0.04	0.39	-0.04
SW02792	2	4	M	SW07214CH	10-08-92	0.71	-2.09	3	-2.89	0.006	-0.003	- -	- -	0.24	-0.27	-0.01	-0.27	0.5	0.23
SW02892	- -	- -	M	SW07014CH	07-20-92	- -	- -	-2.1	-2.9	0.004	-0.004	- -	- -	0.82	-0.08	0.09	-0.08	0.17	-0.13
SW02892	2	4	M	SW07216CH	10-08-92	0.12	-1.97	1.4	-2.78	0.001	-0.004	- -	- -	0.46	-0.21	0.08	-0.21	0.29	0.26
SW02992	- -	- -	M	SW07015CH	07-20-92	0.41	-0.43	-0.33	-3	-0.002	-0.008	- -	- -	0.36	-0.05	-0.02	-0.16	0.36	0.05
SW02992	1	1	M	SW07217CH	10-08-92	0.63	-2.5	0.77	-2.91	0	-0.01	- -	- -	0.25	-0.27	0.15	-0.2	0.13	0.24
SW03092	- -	- -	M	SW07016CH	07-21-92	1.2	-0.48	1.5	-2.5	0.001	-0.001	- -	- -	0.49	-0.05	-0.01	-0.05	- -	- -
SW03092	2	4	M	SW07218CH	10-08-92	0.79	-2.49	2.5	-2.72	0.017	-0.012	- -	- -	0.63	-0.3	-0.01	-0.26	0.32	0.27

[1]See figure 2 for location of sites on Standley Lake, figure 3 for sites on Great Western Reservoir, and figure 4 for sites on Mower Reservoir.

[2]Codes for lakes include: SL=Standley Lake, GW=Great Western Reservoir, and M=Mower Reservoir.

Table C3. Chemical concentrations in lake-water samples

[Unless otherwise shown, measurements are in micrograms per liter; ft, feet; mg/L, milligrams per liter; --, not reported; *, indicates maximum depth of composite sample]

Site number[1]	Sampling depth[3] (ft)	Total depth (ft)	Reservoir[2]	Sample number	Sample date	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Cesium	Chromium	Cobalt	Copper	Iron	Lead	Lithium	Manganese	Mercury
								Dissolved												
SW00992	80.0	80.0	SL	SW07100CH	09-08-92	14.7	14.8	3.2	37.6	0.3	1.5	50	2.6	1.3	1.9	--	2.0	8.1	1570.0	0.2
SW01092	20.0	21.0	SL	SW07101CH	09-09-92	20.2	14.8	3.2	35.9	0.3	1.5	50	2.6	1.3	1.9	--	2.0	8.4	2.6	0.2
SW01192	65.0	65.0	SL	SW07102CH	09-08-92	45.0	14.8	3.2	37.4	0.3	1.5	50	2.6	1.3	2.2	20.3	2.0	6.3	68.4	0.2
SW01292	41.0	42.0	SL	SW07103CH	09-09-92	--	14.8	3.2	33.2	0.3	1.5	50	2.6	1.3	1.9	--	2.0	7.1	8.3	0.2
SW03192	--	--	SL	SW07022CH	07-27-92	17.3	16.5	2.9	33.3	0.4	1.4	80	3.7	2.3	2.6	16.3	3.5	7.1	2.4	0.2
SW03192	--	16.0	SL	SW07219CH	10-13-92	19.2	14.8	1.9	36.8	0.3	1.5	50	3.8	1.3	2.0	39.5	2.3	8.2	0.9	0.1
SW03292	15.5*	17.0	SL	SW07221CH	10-14-92	31.6	14.8	1.9	36.0	0.3	1.5	50	2.6	1.3	1.9	24.5	2.0	9.0	0.9	0.1
SW03292	--	--	SL	SW07023CH	07-30-92	431.0	16.5	2.9	37.2	0.4	1.4	50	3.7	2.3	2.4	28.6	2.1	6.4	26.5	0.2
SW03392	--	--	SL	SW07024CH	07-27-92	30.4	16.5	2.2	32.5	0.4	1.4	60	3.7	2.3	2.4	16.3	1.0	7.5	6.0	0.2
SW03392	--	13.5	SL	SW07222CH	10-13-92	25.2	14.8	1.9	36.2	0.3	1.5	50	2.6	1.3	1.9	12.1	2.0	8.1	0.9	0.1
SW03492	21.0*	22.5	SL	SW07224CH	10-13-92	16.4	14.8	1.9	35.8	0.3	1.5	50	2.6	1.3	1.9	28.6	2.5	7.8	0.9	0.1
SW03492	--	--	SL	SW07025CH	07-28-92	26.7	16.5	2.6	33.8	0.4	1.4	50	3.7	2.3	2.4	27.0	3.9	6.5	1.6	0.2
SW03592	73.5*	75.0	SL	SW07225CH	10-14-92	14.7	14.8	1.9	36.3	0.3	1.5	60	2.6	1.3	1.9	11.0	2.5	7.0	13.3	0.1
SW03592	--	--	SL	SW07026CH	07-28-92	17.3	16.5	2.6	33.3	0.4	1.4	50	3.7	2.3	2.4	16.3	2.2	6.7	1.8	0.2
SW03592	--	--	SL	SW07028CH	07-28-92	28.2	16.5	2.6	35.3	0.4	2.5	50	3.7	2.3	2.4	37.3	8.0	8.8	2.3	0.2
SW03592	--	--	SL	SW07029CH	07-28-92	23.1	16.5	2.6	36.9	0.4	1.4	50	3.7	2.3	2.4	40.3	2.2	6.8	372.0	0.2
SW01392	14.5	14.5	GW	SW07104CH	08-31-92	30.4	16.5	2.9	33.2	0.4	1.4	50	3.7	2.3	6.4	43.0	2.2	5.9	2.2	0.2
SW01492	35.0	36.0	GW	SW07105CH	09-01-92	2,250.0	14.8	1.9	45.7	0.3	1.5	50	2.6	1.3	7.4	141.0	1.5	3.9	79.0	0.2
SW01592	18.5	19.0	GW	SW07106CH	09-01-92	3,230.0	14.8	1.9	48.9	0.3	1.5	60	2.6	1.9	9.4	199.0	1.6	6.6	94.2	0.2
SW01692	39.0	40.0	GW	SW07107CH	09-02-92	14.7	14.8	1.9	32.9	0.3	1.5	50	2.6	1.3	1.9	4.0	1.2	5.4	1.8	0.2
SW01792	--	--	GW	SW07108CH	09-15-92	15.8	14.8	1.9	37.5	0.3	1.5	50	2.6	1.3	2.8	--	1.9	8.2	0.9	0.2
SW02192	8.0*	9.0	GW	SW07205CH	10-02-92	19.9	14.8	2.9	40.8	0.3	1.5	50	2.6	1.3	1.9	28.1	3.8	6.8	1.8	0.1
SW02192	--	--	GW	SW07007CH	07-15-92	17.3	16.5	2.4	33.3	0.4	1.4	50	3.7	2.3	2.4	16.3	4.7	3.7	2.3	0.2
SW02292	17.0*	19.0	GW	SW07206CH	10-02-92	14.7	14.8	2.9	39.2	0.3	1.5	50	2.6	1.3	1.9	23.5	3.4	6.2	1.2	0.1
SW02292	--	--	GW	SW07008CH	07-15-92	17.3	16.5	2.4	32.5	0.4	1.4	50	3.7	2.3	2.4	16.3	5.8	3.8	2.4	0.2
SW02392	30.0*	34.0	GW	SW07207CH	10-02-92	15.2	14.8	2.9	39.7	0.3	1.5	50	2.6	1.3	1.9	6.6	2.8	6.7	3.0	0.1
SW02392	--	--	GW	SW07009CH	07-16-92	78.4	16.5	2.4	37.6	0.4	1.4	50	3.7	2.3	3.2	73.2	2.8	4.4	5.0	0.2
SW02492	1.8	3.5	GW	SW07208CH	10-02-92	20.2	14.8	2.9	40.0	0.3	1.5	50	2.6	1.3	1.9	17.8	3.5	6.7	1.8	0.1
SW02492	--	--	GW	SW07010CH	07-16-92	50.0	16.5	2.4	33.5	0.4	1.4	50	3.7	2.3	3.5	47.8	3.6	5.1	2.8	0.2
SW01892	1.0	6.0	M	SW07109CH	09-14-92	20.2	14.8	3.6	29.6	0.3	1.5	50	2.6	1.3	3.6	13.5	2.9	10.6	6.4	0.2
SW01992	4.5	5.0	M	SW07110CH	09-14-92	14.7	14.8	3.5	28.1	0.3	1.5	50	2.6	1.3	2.1	15.2	2.3	10.6	5.7	0.2
SW02092	1.0	1.0	M	SW07111CH	09-14-92	18.5	14.8	4.0	31.4	0.3	1.5	50	2.6	1.8	4.5	9.3	3.8	7.4	3.0	0.2
SW02692	--	--	M	SW07012CH	07-20-92	47.8	16.5	4.1	24.3	0.4	1.4	80	3.7	2.3	2.4	60.2	2.7	6.5	7.3	0.2

Table C3. Chemical concentrations in lake-water samples--Continued

Site number[1]	Sampling depth[3] (ft)	Total depth (ft)	Reservoir[2]	Sample number	Sample date	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Cesium	Chromium	Cobalt	Copper	Iron	Lead	Lithium	Manganese	Mercury
								Dissolved--Continued												
SW02692	--	--	M	SW07210CH	10-08-92	14.7	14.8	5.5	25.6	0.3	1.5	50	2.6	1.3	1.9	23.8	2.1	9.7	5.4	0.1
SW02792	2.0	4.0	M	SW07214CH	10-08-92	14.7	14.8	4.3	23.7	0.3	1.5	50	2.6	1.3	1.9	7.0	5.6	8.7	2.7	0.1
SW02792	--	--	M	SW07013CH	07-20-92	17.3	16.5	5.1	20.9	0.4	1.4	70	3.7	2.3	--	58.0	3.4	7.9	4.5	0.2
SW02892	2.0	4.0	M	SW07216CH	10-08-92	14.7	14.8	2.9	23.0	0.3	1.5	50	2.6	1.3	2.7	25.4	7.3	7.8	2.7	0.1
SW02892	--	--	M	SW07014CH	07-20-92	47.1	16.5	3.6	23.1	0.4	1.4	50	3.7	2.3	2.4	62.3	4.7	7.2	7.9	0.2
SW02992	1.0	1.0	M	SW07217CH	10-08-92	14.7	14.8	3.7	24.2	0.3	1.5	50	2.6	1.3	1.9	30.9	1.9	7.8	3.4	0.1
SW02992	--	--	M	SW07015CH	07-20-92	17.5	16.5	2.9	20.3	0.4	1.4	50	3.7	2.3	2.4	44.1	4.6	8.1	5.9	0.2
SW03092	2.0	4.0	M	SW07218CH	10-08-92	14.7	14.8	6.3	25.2	0.3	1.5	50	3.4	1.3	2.7	40.2	2.9	8.0	3.8	0.1
SW03092	--	--	M	SW07016CH	07-21-92	17.3	16.5	4.3	21.6	0.4	1.8	50	3.7	2.3	2.4	71.1	11.4	6.6	4.4	0.2
		Detection limits				200	60	10	200	5	5	1,000	10	50	25	100	3	100	15	0.2

Site number[1]	Sampling depth[3] (ft)	Total depth (ft)	Reservoir[2]	Sample number	Sample date	Molybdenum	Nickel	Selenium	Silver	Strontium	Thallium	Tin	Vanadium	Zinc	Calcium	Magnesium	Potassium	Silicon	Sodium
								Dissolved--Continued											
SW00992	80.0	80.0	SL	SW07100CH	09-08-92	6.7	3	3.9	--	171	1.3	--	2.5	9.3	24,400	5,650	1,880	2,440	12,300
SW01092	20.0	21.0	SL	SW07101CH	09-09-92	4.3	3	3.9	--	161	1.3	6.2	2.5	5.7	22,900	5,300	1,820	1,470	11,800
SW01192	65.0	65.0	SL	SW07102CH	09-08-92	4.8	3	3.9	--	164	1.3	13.7	2.5	14.6	23,300	5,430	1,890	1,690	12,000
SW01292	41.0	42.0	SL	SW07103CH	09-09-92	4.0	3	3.9	--	153	1.3	6.2	2.5	7.0	21,900	5,080	1,710	1,550	11,200
SW03192	--	--	SL	SW07022CH	07-27-92	3.7	6	3.8	2.3	156	0.9	12.5	3.3	10.1	23,200	5,300	1,840	1,570	11,800
SW03192	--	16.0	SL	SW07219CH	10-13-92	8.8	3	3.0	3.6	162	1.3	12.2	2.5	12.2	23,000	5,360	1,890	920	11,900
SW03292	15.5*	17.0	SL	SW07221CH	10-14-92	6.1	3	2.9	3.6	159	1.3	11.7	2.5	10.8	22,700	5,270	1,870	870	11,700
SW03292	--	--	SL	SW07023CH	07-30-92	2.7	6	3.8	2.3	157	1.3	12.5	3.3	12.8	23,200	5,270	1,870	1,270	11,800
SW03392	--	--	SL	SW07024CH	07-27-92	5.5	6	2.8	2.3	152	0.9	12.5	3.3	10.1	22,700	5,180	1,780	1,320	11,400
SW03392	--	13.5	SL	SW07222CH	10-13-92	4.4	3	2.9	3.6	163	1.3	9.7	2.5	9.4	23,200	5,420	1,890	865	12,100
SW03492	21.0*	22.5	SL	SW07224CH	10-13-92	4.9	3	2.9	3.6	162	1.3	6.3	2.5	16.1	23,100	5,380	1,900	935	12,000
SW03492	--	--	SL	SW07025CH	07-28-92	4.9	6	3.7	2.3	155	1.6	12.5	3.3	10.1	23,300	5,270	1,800	1,280	11,500
SW03592	73.5*	75.0	SL	SW07225CH	10-14-92	4.3	3	2.9	3.6	162	1.3	6.2	2.5	13.4	23,200	5,390	1,890	968	12,000
SW03592	--	--	SL	SW07026CH	07-28-92	4.2	6	3.7	2.3	157	1.6	12.5	3.3	10.1	23,600	5,330	1,790	1,250	11,700
SW03592	--	--	SL	SW07028CH	07-28-92	6.6	6	3.7	2.3	158	1.6	12.5	3.3	19.5	23,900	5,390	1,830	1,500	11,800
SW03592	--	--	SL	SW07029CH	07-28-92	6.2	6	3.7	2.3	179	1.6	12.5	3.3	10.1	26,900	6,110	2,050	1,740	13,400

Table C3. Chemical concentrations in lake-water samples--Continued

Site number[1]	Sampling depth[3] (ft)	Total depth (ft)	Reservoir[2]	Sample number	Sample date	Molybdenum	Nickel	Selenium	Silver	Strontium	Thallium	Tin	Vanadium	Zinc	Calcium	Magnesium	Potassium	Silicon	Sodium
								Dissolved–Continued											
SW01392	14.5	14.5	GW	SW07104CH	08-31-92	4.3	6	3.8	2.5	122	1.7	12.5	3.3	10.1	18,700	3,870	1,550	1,460	8,120
SW01492	35.0	36.0	GW	SW07105CH	09-01-92	3.7	3	2.9	3.6	133	3.8	6.2	2.5	19.6	20,900	4,110	2,030	1,270	8,370
SW01592	18.5	19.0	GW	SW07106CH	09-01-92	2.0	3	2.9	3.6	137	3.8	6.2	3.4	25.7	22,000	4,320	1,790	1,260	8,610
SW01692	39.0	40.0	GW	SW07107CH	09-02-92	3.1	3	2.9	3.6	126	3.8	6.2	2.5	5.8	18,500	3,870	1,500	1,230	7,850
SW01792	- -	- -	GW	SW07108CH	09-15-92	4.8	3	2.9	3.6	135	3.8	6.2	2.5	5.7	19,400	4,030	1,520	1,040	8,280
SW02192	8.0*	9.0	GW	SW07205CH	10-02-92	6.9	3	3.8	3.6	147	3.8	6.2	2.5	11.8	20,700	4,180	1,590	469	8,520
SW02192	- -	- -	GW	SW07007CH	07-15-92	4.4	6	3.6	2.6	126	4.3	12.5	3.3	10.1	18,400	3,830	1,480	2,050	7,930
SW02292	17.0*	19.0	GW	SW07206CH	10-02-92	6.0	3	3.8	3.6	142	3.8	6.2	2.5	5.7	20,000	4,030	1,540	498	8,250
SW02292	- -	- -	GW	SW07008CH	07-15-92	3.2	6	3.6	2.5	125	4.3	12.5	3.3	10.1	18,200	3,820	1,480	2,080	7,890
SW02392	30.0*	34.0	GW	SW07207CH	10-02-92	6.4	3	3.8	3.6	144	3.8	6.2	2.5	5.7	20,300	4,080	1,560	514	8,310
SW02392	- -	- -	GW	SW07009CH	07-16-92	5.0	6	3.1	2.3	129	4.3	12.5	3.3	11.1	19,100	4,030	1,620	2,200	8,220
SW02492	1.8	3.5	GW	SW07208CH	10-02-92	6.0	4	3.8	3.6	145	3.8	6.2	2.5	6.1	20,400	4,100	1,550	475	8,370
SW02492	- -	- -	GW	SW07010CH	07-16-92	3.3	6	3.1	2.7	115	4.3	12.5	3.3	10.1	17,600	3,750	1,460	2,040	7,590
SW01892	1.0	6.0	M	SW07109CH	09-14-92	1.7	3	2.9	3.6	136	3.8	8.1	3.5	6.9	13,600	6,600	640	1,090	30,600
SW01992	4.5	5.0	M	SW07110CH	09-14-92	1.7	3	2.9	3.6	135	3.8	6.2	3.5	143.0	13,600	6,770	483	570	30,400
SW02092	1.0	1.0	M	SW07111CH	09-14-92	1.7	7	2.9	3.6	137	3.8	6.2	6.1	10.8	14,200	6,780	626	669	30,600
SW02692	- -	- -	M	SW07012CH	07-20-92	2.7	6	3.1	2.3	123	0.9	12.5	3.3	10.1	12,500	7,140	141	3,330	27,100
SW02692	- -	- -	M	SW07210CH	10-08-92	3.1	3	3.0	3.6	126	1.7	6.2	2.9	5.7	14,100	6,180	518	530	31,300
SW02792	2.0	4.0	M	SW07214CH	10-08-92	1.7	3	2.9	3.6	123	1.7	6.2	5.2	5.7	12,700	6,090	507	515	31,200
SW02792	- -	- -	M	SW07013CH	07-20-92	2.7	6	3.1	2.3	117	0.9	12.5	3.3	10.8	11,200	6,910	175	3,160	27,900
SW02892	2.0	4.0	M	SW07216CH	10-08-92	1.7	3	2.9	3.6	121	1.7	6.2	3.9	5.7	12,900	5,930	616	659	31,000
SW02892	- -	- -	M	SW07014CH	07-20-92	2.7	6	3.1	2.3	122	0.9	12.5	3.3	22.5	12,100	7,100	194	2,440	27,400
SW02992	1.0	1.0	M	SW07217CH	10-08-92	1.7	3	2.9	3.6	125	1.7	6.2	2.5	5.7	13,600	6,200	568	410	31,400
SW02992	- -	- -	M	SW07015CH	07-20-92	2.7	6	3.1	2.3	115	0.9	12.5	3.3	11.1	11,400	7,160	171	2,560	27,800
SW03092	2.0	4.0	M	SW07218CH	10-08-92	2.7	3	3.8	3.6	126	3.8	6.2	2.5	10.5	13,000	6,200	543	554	32,500
SW03092	- -	- -	M	SW07016CH	07-21-92	2.7	6	3.1	2.3	114	4.5	12.5	3.3	10.1	11,400	7,100	184	2,710	27,700
		Detection limits				200	40	5	10	200	10	200	50	20	5,000	5,000	5,000	100	5,000

Table C3. Chemical concentrations in lake-water samples--Continued

Site number[1]	Sampling depth[3] (ft)	Total depth (ft)	Reser-voir[2]	Sample number	Sample date	Bicarbonate as CO_3 (mg/L)	Carbonate as CO_3 (mg/L)	Chlo-ride (mg/L)	Fluoride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Nitrate/ nitrite as N (mg/L)	Nitrite (mg/L)
							Dissolved–Continued								
SW00992	80.0	80.0	SL	SW07100CH	09-08-92	62.2	10	9.0	0.58	39.4	1	150	6	0.1	0.1
SW01092	20.0	21.0	SL	SW07101CH	09-09-92	51.4	10	8.0	0.56	39.1	1	128	5	0.1	0.1
SW01192	65.0	65.0	SL	SW07102CH	09-08-92	46.9	10	8.4	0.57	45.1	1	126	9	0.1	0.1
SW01292	41.0	42.0	SL	SW07103CH	09-09-92	50.1	10	8.1	0.57	39.7	1	119	17	0.1	0.1
SW03192	- -	- -	SL	SW07022CH	07-27-92	49.5	10	8.3	0.59	39.1	1	145	6	0.1	- -
SW03192	- -	16.0	SL	SW07219CH	10-13-92	52.8	10	7.8	0.56	41.0	1	109	5	0.1	- -
SW03292	15.5*	17.0	SL	SW07221CH	10-14-92	52.2	10	8.4	0.58	41.2	1	131	10	0.1	- -
SW03292	- -	- -	SL	SW07023CH	07-30-92	50.1	10	8.2	0.57	38.9	1	140	5	0.1	- -
SW03392	- -	- -	SL	SW07024CH	07-27-92	49.4	10	8.1	0.55	38.3	1	150	5	0.1	- -
SW03392	- -	13.5	SL	SW07222CH	10-13-92	52.0	10	7.8	0.58	41.2	1	106	11	0.1	- -
SW03492	21.0*	22.5	SL	SW07224CH	10-13-92	52.3	10	8.0	0.57	41.2	1	49	5	0.1	- -
SW03492	- -	- -	SL	SW07025CH	07-28-92	49.3	10	8.3	0.58	39.1	1	143	5	0.1	- -
SW03592	73.5*	75.0	SL	SW07225CH	10-14-92	45.8	10	7.7	0.57	47.5	1	137	14	0.1	- -
SW03592	- -	- -	SL	SW07026CH	07-28-92	49.6	10	8.2	0.55	39.2	1	136	5	0.1	- -
SW03592	- -	- -	SL	SW07028CH	07-28-92	50.6	10	8.4	0.56	39.2	1	141	5	0.1	- -
SW03592	- -	- -	SL	SW07029CH	07-28-92	56.2	10	9.5	0.62	43.3	1	154	25	0.2	- -
SW01392	14.5	14.5	GW	SW07104CH	08-31-92	43.0	10	5.1	0.51	27.7	1	90	20	0.1	0.1
SW01492	35.0	36.0	GW	SW07105CH	09-01-92	45.7	10	5.1	0.51	27.7	1	68	44	0.1	0.1
SW01592	18.5	19.0	GW	SW07106CH	09-01-92	46.0	10	5.2	0.51	27.5	1	78	26	0.1	0.1
SW01692	39.0	40.0	GW	SW07107CH	09-02-92	45.7	10	5.3	0.52	27.7	1	83	31	0.3	0.1
SW01792	- -	- -	GW	SW07108CH	09-15-92	46.9	10	5.3	0.50	27.6	1	113	22	0.1	0.1
SW02192	8.0*	9.0	GW	SW07205CH	10-02-92	48.5	10	5.4	0.50	29.1	1	110	8	0.1	- -
SW02192	- -	- -	GW	SW07007CH	07-15-92	44.2	10	5.4	0.53	27.6	1	145	13	0.1	- -
SW02292	17.0*	19.0	GW	SW07206CH	10-02-92	49.0	10	5.4	0.55	29.1	1	110	10	0.1	- -
SW02292	- -	- -	GW	SW07008CH	07-15-92	43.6	10	5.5	0.53	27.5	1	138	15	0.1	- -
SW02392	30.0*	34.0	GW	SW07207CH	10-02-92	48.9	10	5.6	0.54	29.1	1	113	11	0.1	- -
SW02392	- -	- -	GW	SW07009CH	07-16-92	43.6	10	5.3	0.51	27.2	1	146	16	0.1	- -
SW02492	1.8	3.5	GW	SW07208CH	10-02-92	49.0	10	5.4	0.50	29.1	1	114	6	0.1	- -
SW02492	- -	- -	GW	SW07010CH	07-16-92	42.4	10	5.1	0.51	26.3	1	134	14	0.1	- -
SW01892	1.0	6.0	M	SW07109CH	09-14-92	31.8	45	21.8	0.59	16.9	- -	134	- -	0.1	- -
SW01992	4.5	5.0	M	SW07110CH	09-14-92	22.2	56	21.3	0.60	16.6	- -	127	- -	0.1	- -
SW02092	1.0	1.0	M	SW07111CH	09-14-92	39.1	43	22.1	0.59	16.1	- -	152	10	0.1	- -
SW02692	- -	- -	M	SW07012CH	07-20-92	29.1	46	20.0	0.58	17.2	1	132	6	0.1	- -

Table C3. Chemical concentrations in lake-water samples--Continued

Site number[1]	Sampling depth[3] (ft)	Total depth (ft)	Reservoir[2]	Sample number	Sample date	Bicarbonate as CO_3 (mg/L)	Carbonate as CO_3 (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Nitrate/nitrite as N (mg/L)	Nitrite (mg/L)
							Dissolved–Continued								
SW02692	- -	- -	M	SW07210CH	10-08-92	42.8	38	24.2	0.63	14.9	1	176	7	0.1	- -
SW02792	2.0	4.0	M	SW07214CH	10-08-92	33.9	43	23.9	0.68	15.6	1	174	5	0.1	- -
SW02792	- -	- -	M	SW07013CH	07-20-92	10.0	65	18.8	0.61	18.6	1	129	5	0.1	- -
SW02892	2.0	4.0	M	SW07216CH	10-08-92	39.4	37	24.3	0.67	16.0	1	172	7	0.1	- -
SW02892	- -	- -	M	SW07014CH	07-20-92	33.4	43	19.2	0.51	16.8	1	124	5	0.1	- -
SW02992	1.0	1.0	M	SW07217CH	10-08-92	41.9	38	24.1	0.62	15.3	1	170	6	0.1	- -
SW02992	- -	- -	M	SW07015CH	07-20-92	14.8	55	18.9	0.63	18.7	1	123	5	0.1	- -
SW03092	2.0	4.0	M	SW07218CH	10-08-92	41.1	38	25.0	0.66	15.7	1	170	12	0.1	- -
SW03092	- -	- -	M	SW07016CH	07-21-92	18.5	52	18.4	0.61	18.6	1	175	5	0.1	- -
		Detection limits				10	10	5	0.10	0.1	1	10	5	0.1	0.1

Site number[1]	Sampling depth[3] (ft)	Total depth (ft)	Reservoir[2]	Sample number	Sample date	Ammonia (mg/L)	Orthophosphate as P (mg/L)	Phosphorus as P (mg/L)	Oil and grease (mg/L)	Cyanide	Total xylenes	trans-1,3-Dichloropropene	Trichloroethene	Vinyl acetate	Vinyl chloride
							Dissolved–Continued								
SW00992	80.0	80.0	SL	SW07100CH	09-08-92	0.28	0.07	0.05	- -	10	- -	- -	- -	- -	- -
SW01092	20.0	21.0	SL	SW07101CH	09-09-92	0.12	0.05	0.05	- -	10	- -	- -	- -	- -	- -
SW01192	65.0	65.0	SL	SW07102CH	09-08-92	0.12	0.08	0.05	- -	10	- -	- -	- -	- -	- -
SW01292	41.0	42.0	SL	SW07103CH	09-09-92	0.12	0.05	0.05	- -	10	- -	- -	- -	- -	- -
SW03192	- -	- -	SL	SW07022CH	07-27-92	0.05	0.05	0.05	8.9	10	- -	- -	- -	- -	- -
SW03192	- -	16.0	SL	SW07219CH	10-13-92	0.05	0.05	0.05	5.0	- -	- -	- -	- -	- -	- -
SW03292	15.5*	17.0	SL	SW07221CH	10-14-92	0.05	0.05	0.05	8.4	- -	- -	- -	- -	- -	- -
SW03292	- -	- -	SL	SW07023CH	07-30-92	0.05	0.05	0.05	5.0	10	- -	- -	- -	- -	- -
SW03392	- -	- -	SL	SW07024CH	07-27-92	0.05	0.05	0.05	11.3	10	- -	- -	- -	- -	- -
SW03392	- -	13.5	SL	SW07222CH	10-13-92	0.05	0.05	0.05	5.0	- -	- -	- -	- -	- -	- -
SW03492	21.0*	22.5	SL	SW07224CH	10-13-92	0.05	0.05	0.05	5.0	- -	- -	- -	- -	- -	- -
SW03492	- -	- -	SL	SW07025CH	07-28-92	0.05	0.05	0.05	11.5	10	- -	- -	- -	- -	- -
SW03592	73.5*	75.0	SL	SW07225CH	10-14-92	0.05	0.05	0.05	5.0	- -	- -	- -	- -	- -	- -
SW03592	- -	- -	SL	SW07026CH	07-28-92	0.05	0.05	0.05	11.2	10	- -	- -	- -	- -	- -
SW03592	- -	- -	SL	SW07028CH	07-28-92	0.05	0.05	0.05	8.8	10	- -	- -	- -	- -	- -
SW03592	- -	- -	SL	SW07029CH	07-28-92	0.05	0.05	0.06	5.0	10	- -	- -	- -	- -	- -

Table C3. Chemical concentrations in lake-water samples--Continued

Site number[1]	Sampling depth[3] (ft)	Total depth (ft)	Reser-voir[2]	Sample number	Sample date	Ammonia (mg/L)	Ortho-phosphate as P (mg/L)	Phosphorus as P (mg/L)	Oil and grease (mg/L)	Cya-nide	Total xylenes	trans-1,3-Dichloro-propene	Tri-chloro-ethene	Vinyl acetate	Vinyl chloride
							Dissolved–Continued								
SW01392	14.5	14.5	GW	SW07104CH	08-31-92	0.12	0.05	0.05	- -	10	- -	- -	- -	- -	- -
SW01492	35.0	36.0	GW	SW07105CH	09-01-92	0.12	0.06	0.11	- -	10	- -	- -	- -	- -	- -
SW01592	18.5	19.0	GW	SW07106CH	09-01-92	0.12	0.05	0.05	- -	10	- -	- -	- -	- -	- -
SW01692	39.0	40.0	GW	SW07107CH	09-02-92	0.12	0.05	0.05	- -	10	- -	- -	- -	- -	- -
SW01792	- -	- -	GW	SW07108CH	09-15-92	0.05	0.09	0.05	- -	10	- -	- -	- -	- -	- -
SW02192	8.0*	9.0	GW	SW07205CH	10-02-92	0.05	0.05	0.05	5.0	- -	- -	- -	- -	- -	- -
SW02192	- -	- -	GW	SW07007CH	07-15-92	0.05	0.06	0.05	5.0	10	- -	- -	- -	- -	- -
SW02292	17.0*	19.0	GW	SW07206CH	10-02-92	0.05	0.05	0.05	5.0	- -	- -	- -	- -	- -	- -
SW02292	- -	- -	GW	SW07008CH	07-15-92	0.05	0.05	0.08	5.0	10	- -	- -	- -	- -	- -
SW02392	30.0*	34.0	GW	SW07207CH	10-02-92	0.05	0.07	0.05	17.0	- -	- -	- -	- -	- -	- -
SW02392	- -	- -	GW	SW07009CH	07-16-92	0.05	0.07	0.05	5.0	10	- -	- -	- -	- -	- -
SW02492	1.8	3.5	GW	SW07208CH	10-02-92	0.06	0.05	0.05	5.1	- -	- -	- -	- -	- -	- -
SW02492	- -	- -	GW	SW07010CH	07-16-92	0.05	0.05	0.09	5.3	10	- -	- -	- -	- -	- -
SW01892	1.0	6.0	M	SW07109CH	09-14-92	0.07	0.07	0.06	- -	10	- -	- -	- -	- -	- -
SW01992	4.5	5.0	M	SW07110CH	09-14-92	0.05	0.05	0.05	- -	10	- -	- -	- -	- -	- -
SW02092	1.0	1.0	M	SW07111CH	09-14-92	0.05	0.05	0.05	- -	10	- -	- -	- -	- -	- -
SW02692	- -	- -	M	SW07012CH	07-20-92	0.11	0.13	0.08	5.0	10	5	5	5	10	10
SW02692	- -	- -	M	SW07210CH	10-08-92	0.05	0.05	0.05	5.0	- -	5	5	5	10	10
SW02792	2.0	4.0	M	SW07214CH	10-08-92	0.05	0.05	0.05	6.3	- -	5	5	5	10	10
SW02792	- -	- -	M	SW07013CH	07-20-92	0.05	0.11	0.06	5.0	10	5	5	5	10	10
SW02892	2.0	4.0	M	SW07216CH	10-08-92	0.05	0.05	0.05	5.5	- -	5	5	5	10	10
SW02892	- -	- -	M	SW07014CH	07-20-92	0.05	0.08	0.07	11.2	10	5	5	5	10	10
SW02992	1.0	1.0	M	SW07217CH	10-08-92	0.05	0.05	0.05	8.2	- -	5	5	5	10	10
SW02992	- -	- -	M	SW07015CH	07-20-92	0.05	0.10	0.06	20.2	10	5	5	5	10	10
SW03092	2.0	4.0	M	SW07218CH	10-08-92	0.05	0.05	0.05	5.0	10	5	5	5	10	10
SW03092	- -	- -	M	SW07016CH	07-21-92	0.05	0.19	0.07	19.5	10	5	5	5	10	10
		Detection limits				0.5	0.05	0.05	5	10	5	5	5	10	10

Table C3. Chemical concentrations in lake-water samples--Continued

Site number[1]	Sampling depth[3] (ft)	Total depth (ft)	Reservoir[2]	Sample number	Sample date	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Cesium	Chromium	Cobalt	Copper	Iron	Lithium	Lead	Manganese	Mercury
								Total												
SW00992	80.0	80.0	SL	SW07100CH	09-08-92	388	14.8	3.2	39.8	0.3	1.5	50	2.6	1.3	3.0	382	4.9	3.8	1580.0	0.2
SW01092	20.0	21.0	SL	SW07101CH	09-09-92	187	14.8	3.2	34.6	0.3	1.5	50	2.6	1.3	4.8	174	5.5	2.5	18.1	0.2
SW01192	65.0	65.0	SL	SW07102CH	09-08-92	566	14.8	3.2	38.7	0.3	1.5	50	2.6	1.3	5.8	511	6.2	4.3	127.0	0.2
SW01292	41.0	42.0	SL	SW07103CH	09-09-92	764	14.8	3.2	38.5	0.3	1.5	50	2.6	1.9	7.1	666	8.1	3.5	44.6	0.2
SW03192	- -	- -	SL	SW07022CH	07-27-92	160	16.5	2.2	34.9	0.4	1.4	50	3.7	2.3	4.1	150	6.8	9.9	12.3	0.2
SW03192	- -	16.0	SL	SW07219CH	10-13-92	238	14.8	3.2	35.7	0.3	1.5	50	2.6	1.3	- -	204	8.9	2.7	12.7	0.1
SW03292	15.5*	17.0	SL	SW07221CH	10-14-92	354	14.8	3.2	37.0	0.3	1.5	50	2.8	1.3	2.8	285	7.0	2.7	17.4	0.1
SW03292	- -	- -	SL	SW07023CH	07-30-92	165	16.5	2.9	34.5	0.4	1.4	50	3.7	2.3	2.8	128	9.0	3.3	11.2	0.2
SW03392	- -	- -	SL	SW07024CH	07-27-92	66	16.5	2.2	33.6	0.4	1.4	50	3.7	2.3	4.1	88	8.3	3.4	11.0	0.2
SW03392	- -	13.5	SL	SW07222CH	10-13-92	249	14.8	3.2	37.1	0.3	1.5	50	2.6	1.3	- -	249	6.9	2.0	19.2	0.1
SW03492	21.0*	22.5	SL	SW07224CH	10-13-92	184	14.8	3.2	35.7	0.3	1.5	50	2.6	1.3	1.9	187	6.0	2.5	12.5	0.1
SW03492	- -	- -	SL	SW07025CH	07-28-92	80	16.5	2.6	33.9	0.4	1.4	50	3.7	2.3	3.2	88	6.9	2.7	5.5	0.2
SW03592	73.5*	75.0	SL	SW07225CH	10-14-92	434	14.8	3.2	31.0	0.3	1.5	50	2.6	1.3	- -	411	8.7	3.9	49.0	0.8
SW03592	- -	- -	SL	SW07026CH	07-28-92	65	16.5	2.6	34.3	0.4	1.4	50	3.7	2.3	3.5	38	9.5	2.2	5.6	0.2
SW03592	- -	- -	SL	SW07028CH	07-28-92	160	16.5	2.6	35.0	0.4	1.4	50	3.7	2.3	4.7	142	8.9	2.9	14.7	0.2
SW03592	- -	- -	SL	SW07029CH	07-28-92	1,540	16.5	2.6	44.5	0.4	1.4	50	3.7	2.3	7.0	1,150	8.4	8.1	511.0	0.2
SW01392	14.5	14.5	GW	SW07104CH	08-31-92	1,690	16.5	2.9	45.9	0.4	1.4	50	3.7	2.3	6.3	948	5.6	7.4	35.1	0.2
SW01492	35.0	36.0	GW	SW07105CH	09-01-92	1,360	14.8	1.9	38.7	0.3	1.5	50	2.6	1.3	8.5	1,180	6.2	8.8	62.5	0.2
SW01592	18.5	19.0	GW	SW07106CH	09-01-92	895	14.8	1.9	38.6	0.3	1.5	50	2.6	1.3	6.3	723	6.3	6.5	31.2	0.2
SW01692	39.0	40.0	GW	SW07107CH	09-02-92	1,160	14.8	1.9	38.9	0.3	1.5	50	2.6	1.5	7.3	938	4.3	4.4	47.5	0.2
SW01792	- -	- -	GW	SW07108CH	09-15-92	773	14.8	1.9	43.0	0.3	1.5	50	2.6	1.3	5.9	671	7.3	5.3	38.8	0.2
SW02192	8.0*	9.0	GW	SW07205CH	10-02-92	546	14.8	2.9	41.7	0.3	1.5	90	2.6	1.3	- -	436	8.0	3.1	21.2	0.1
SW02192	- -	- -	GW	SW07007CH	07-15-92	1,200	16.5	2.4	41.8	0.4	1.4	50	3.7	2.3	5.9	1,150	5.7	18.5	40.5	0.2
SW02292	17.0*	19.0	GW	SW07206CH	10-02-92	516	14.8	2.2	45.0	0.3	1.5	50	2.6	1.3	- -	457	8.3	3.8	21.5	0.1
SW02292	- -	- -	GW	SW07008CH	07-15-92	1,740	16.5	2.4	43.7	0.4	1.4	50	3.7	2.3	4.3	1,360	4.3	14.4	41.3	0.2
SW02392	30.0*	34.0	GW	SW07207CH	10-02-92	653	14.8	2.2	45.9	0.3	1.5	50	2.6	1.6	- -	584	7.7	3.8	30.9	0.1
SW02392	- -	- -	GW	SW07009CH	07-16-92	2,300	16.5	2.4	46.4	0.4	1.9	50	3.7	2.3	11.8	1,640	6.7	5.2	49.9	0.2
SW02492	1.8	3.5	GW	SW07208CH	10-02-92	529	14.8	2.2	41.8	0.3	1.5	50	2.6	2.6	- -	455	8.7	3.4	25.6	0.1
SW02492	- -	- -	GW	SW07010CH	07-16-92	3,140	16.5	2.4	46.7	0.4	1.4	50	4.4	2.3	7.6	2,280	5.3	8.3	46.9	0.2
SW01892	1.0	6.0	M	SW07109CH	09-14-92	92	14.8	4.6	29.9	0.3	1.5	50	2.6	1.3	1.9	139	7.9	2.4	29.5	0.2
SW01992	4.5	5.0	M	SW07110CH	09-14-92	26	14.8	4.5	28.3	0.3	1.5	50	2.6	1.3	4.5	57	9.4	2.6	24.8	0.2
SW02092	1.0	1.0	M	SW07111CH	09-14-92	196	14.8	4.3	34.7	0.3	1.5	50	2.6	1.3	1.9	246	8.9	3.1	27.8	0.2
SW02692	- -	- -	M	SW07012CH	07-20-92	88	16.5	5.1	25.2	0.4	1.4	80	3.7	2.3	3.3	220	8.6	4.6	37.0	0.2
SW02692	- -	- -	M	SW07210CH	10-08-92	73	14.8	5.0	26.4	0.3	1.5	50	2.6	1.3	1.9	99	5.8	2.9	11.8	0.1
SW02792	2.0	4.0	M	SW07214CH	10-08-92	166	14.8	6.0	26.0	0.3	1.5	50	2.6	1.3	1.9	133	6.9	37.2	15.0	0.1

Table C3. Chemical concentrations in lake-water samples--Continued

Site number[1]	Sampling depth[3] (ft)	Total depth (ft)	Reservoir[2]	Sample number	Sample date	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Cesium	Chromium	Cobalt	Copper	Iron	Lithium	Lead	Manganese	Mercury
										Total--Continued										
SW02792	- -	- -	M	SW07013CH	07-20-92	48	16.5	4.1	22.2	0.4	1.4	50	3.7	2.3	2.4	110	6.8	4.8	20.4	0.2
SW02892	2.0	4.0	M	SW07216CH	10-08-92	72	14.8	5.5	24.9	0.3	9.0	50	65.8	1.3	1.9	328	5.9	3.8	15.2	0.1
SW02892	- -	- -	M	SW07014CH	07-20-92	76	16.5	5.7	24.8	0.4	4.0	60	3.7	2.3	2.4	163	5.2	3.4	32.6	0.3
SW02992	1.0	1.0	M	SW07217CH	10-08-92	62	14.8	5.4	25.1	0.3	1.5	50	2.6	1.3	1.9	129	6.4	3.6	12.1	0.1
SW02992	- -	- -	M	SW07015CH	07-20-92	36	16.5	3.1	20.4	0.4	1.4	50	3.7	2.3	2.4	82	6.4	3.2	18.0	0.2
SW03092	2.0	4.0	M	SW07218CH	10-08-92	189	14.8	6.6	26.8	0.3	1.5	50	2.6	1.3	2.2	206	8.0	17.0	14.8	0.1
SW03092	- -	- -	M	SW07016CH	07-21-92	79	16.5	4.0	23.0	0.4	1.4	50	3.7	2.3	2.4	126	8.6	5.3	26.5	0.2
		Detection limits				200	60	10	200	5	5	1,000	10	50	25	100	100	3	15	0

Site number[1]	Sampling depth[3] (ft)	Total depth (ft)	Reservoir[2]	Sample number	Sample date	Molybdenum	Nickel	Selenium	Silver	Strontium	Thallium	Tin	Vanadium	Zinc	Calcium	Magnesium	Potassium	Silicon	Sodium	Cyanide
									Total--Continued											
SW00992	80.0	80.0	SL	SW07100CH	09-08-92	7.7	3	3.9	- -	168	1.3	6.2	2.5	26.8	24,000	5,580	1,970	2,620	12,100	- -
SW01092	20.0	21.0	SL	SW07101CH	09-09-92	3.3	3	3.9	- -	152	1.3	6.2	2.5	20.8	21,700	5,040	1,750	1,430	11,200	- -
SW01192	65.0	65.0	SL	SW07102CH	09-08-92	4.5	3	3.9	- -	155	1.3	6.2	2.5	22.0	22,000	5,200	1,850	1,940	11,400	- -
SW01292	41.0	42.0	SL	SW07103CH	09-09-92	5.9	3	3.9	- -	154	1.3	6.2	2.5	28.0	21,900	5,190	1,890	1,710	11,300	- -
SW03192	- -	- -	SL	SW07022CH	07-27-92	5.8	6	5.3	2.3	151	0.9	12.5	3.3	10.1	22,400	5,130	1,780	1,210	11,400	- -
SW03192	- -	16.0	SL	SW07219CH	10-13-92	6.6	3	3.9	3.6	158	1.3	6.2	2.5	16.8	22,200	5,160	1,900	1,010	11,400	10
SW03292	15.5*	17.0	SL	SW07221CH	10-14-92	3.4	5	3.9	3.6	161	1.3	6.2	2.5	184.0	22,500	5,240	1,940	957	11,500	10
SW03292	- -	- -	SL	SW07023CH	07-30-92	5.5	6	3.8	2.3	152	1.3	12.5	3.3	16.2	22,000	5,160	1,800	1,280	11,600	- -
SW03392	- -	- -	SL	SW07024CH	07-27-92	4.4	6	2.8	2.3	151	0.9	12.5	3.3	12.8	22,600	5,170	1,800	1,230	11,400	- -
SW03392	- -	13.5	SL	SW07222CH	10-13-92	4.4	33	3.9	3.6	163	1.3	6.2	2.5	51.5	22,800	5,320	1,920	970	11,700	10
SW03492	21.0*	22.5	SL	SW07224CH	10-13-92	3.8	3	3.9	3.6	160	1.3	6.2	2.5	15.1	22,300	5,180	1,870	974	11,500	10
SW03492	- -	- -	SL	SW07025CH	07-28-92	5.2	6	3.7	2.3	150	1.6	12.5	3.3	10.1	22,900	5,220	1,780	1,180	11,800	- -
SW03592	73.5*	75.0	SL	SW07225CH	10-14-92	5.3	5	3.9	3.6	146	1.3	6.2	2.5	18.1	12,600	5,520	2,180	1,140	415,000	22
SW03592	- -	- -	SL	SW07026CH	07-28-92	4.7	6	3.7	2.3	156	1.6	12.5	3.3	10.1	23,400	5,310	1,820	1,190	11,600	- -
SW03592	- -	- -	SL	SW07028CH	07-28-92	5.7	6	3.7	2.3	156	1.6	12.5	3.3	14.6	23,600	5,310	1,830	1,430	11,700	- -
SW03592	- -	- -	SL	SW07029CH	07-28-92	7.4	6	3.7	2.3	174	1.6	12.5	3.3	37.5	26,100	6,110	2,250	2,240	13,100	- -
SW01392	14.5	14.5	GW	SW07104CH	08-31-92	4.5	6	3.8	2.3	133	1.7	12.5	3.3	27.0	20,300	4,340	1,850	1,590	8,580	- -
SW01492	35.0	36.0	GW	SW07105CH	09-01-92	4.6	3	2.9	3.6	128	3.8	6.2	3.4	37.1	18,700	4,130	1,810	1,560	7,850	- -
SW01592	18.5	19.0	GW	SW07106CH	09-01-92	4.8	3	2.9	3.6	129	3.8	6.2	3.1	23.4	19,000	4,100	1,700	1,450	8,030	- -
SW01692	39.0	40.0	GW	SW07107CH	09-02-92	3.6	3	2.9	3.6	123	3.8	6.2	2.8	27.0	18,000	3,950	1,650	1,440	7,590	- -
SW01792	- -	- -	GW	SW07108CH	09-15-92	4.7	3	2.9	3.6	140	3.8	6.2	2.5	16.2	18,700	3,980	1,610	1,250	8,030	- -

Table C3. Chemical concentrations in lake-water samples--Continued

Site number[1]	Sampling depth[3] (ft)	Total depth (ft)	Reser-voir[2]	Sample number	Sample date	Molyb-denum	Nickel	Selen-ium	Sil-ver	Stron-tium	Thal-lium	Tin	Vana-dium	Zinc	Cal-cium	Magne-sium	Potas-sium	Sili-con	Sodi-um	Cya-nide
								Total--Continued												
SW02192	8.0*	9.0	GW	SW07205CH	10-02-92	8.2	3	3.6	3.6	139	3.8	6.2	2.5	27.1	19,600	3,980	1,620	675	8,100	10
SW02192	- -	- -	GW	SW07007CH	07-15-92	4.0	6	3.6	2.3	125	4.3	12.5	4.7	50.2	17,900	3,930	1,580	3,520	7,750	- -
SW02292	17.0*	19.0	GW	SW07206CH	10-02-92	6.0	3	3.6	3.6	146	3.8	9.7	2.5	15.2	20,300	4,160	1,620	673	8,620	10
SW02292	- -	- -	GW	SW07008CH	07-15-92	5.9	6	3.6	2.3	128	4.3	12.5	6.7	40.7	18,200	4,040	1,730	2,440	7,800	- -
SW02392	30.0*	34.0	GW	SW07207CH	10-02-92	5.2	3	3.6	3.6	145	3.8	7.0	3.0	22.3	20,300	4,150	1,670	776	8,720	10
SW02392	- -	- -	GW	SW07009CH	07-16-92	7.5	7	3.1	2.3	125	4.3	12.5	4.2	44.0	18,200	4,160	2,030	2,620	7,930	- -
SW02492	1.8	3.5	GW	SW07208CH	10-02-92	5.5	3	3.6	3.6	146	3.8	6.2	2.5	13.8	20,100	4,130	1,610	700	8,470	10
SW02492	- -	- -	GW	SW07010CH	07-16-92	5.8	6	3.1	2.3	123	4.3	12.5	6.1	44.4	17,700	4,170	1,960	2,600	7,710	- -
SW01892	1.0	6.0	M	SW07109CH	09-14-92	1.7	3	2.9	3.6	132	3.8	6.2	2.5	13.9	13,100	6,350	587	968	29,400	- -
SW01992	4.5	5.0	M	SW07110CH	09-14-92	1.9	10	2.9	3.6	131	3.8	6.5	2.6	7.8	13,300	6,610	536	460	29,600	- -
SW02092	1.0	1.0	M	SW07111CH	09-14-92	1.7	3	2.9	3.6	131	3.8	6.2	6.4	9.4	13,900	6,550	640	560	29,200	- -
SW02692	- -	- -	M	SW07012CH	07-20-92	2.7	6	3.1	2.3	123	0.9	12.5	3.3	18.0	12,600	7,250	217	3,250	27,000	- -
SW02692	- -	- -	M	SW07210CH	10-08-92	2.8	3	3.8	3.6	124	1.3	6.2	2.5	5.7	13,500	6,000	377	501	30,800	10
SW02792	2.0	4.0	M	SW07214CH	10-08-92	1.7	3	3.8	3.6	120	1.3	6.2	4.8	5.7	12,600	5,870	740	372	29,800	10
SW02792	- -	- -	M	SW07013CH	07-20-92	2.7	6	3.1	2.3	115	4.5	12.5	3.3	10.1	11,200	7,130	180	2,850	27,400	- -
SW02892	2.0	4.0	M	SW07216CH	10-08-92	4.4	23	3.8	3.6	121	1.3	6.2	3.8	5.7	12,900	5,820	540	592	30,500	10
SW02892	- -	- -	M	SW07014CH	07-20-92	2.7	6	3.1	2.3	122	4.5	12.5	3.3	17.2	12,300	7,340	147	2,050	27,300	- -
SW02992	1.0	1.0	M	SW07217CH	10-08-92	2.4	3	3.8	3.6	123	1.3	6.2	3.0	5.7	13,400	5,970	540	348	30,500	10
SW02992	- -	- -	M	SW07015CH	07-20-92	2.7	6	3.1	2.3	115	0.9	12.5	3.3	10.1	11,100	7,150	164	2,390	27,600	- -
SW03092	2.0	4.0	M	SW07218CH	10-08-92	2.3	3	3.8	3.6	124	3.8	6.2	2.5	6.6	12,800	6,120	592	487	31,200	- -
SW03092	- -	- -	M	SW07016CH	07-21-92	2.7	6	3.1	2.3	114	0.9	12.5	3.3	11.9	12,100	7,230	204	2,660	27,700	- -
		Detection limits				200	40	5	10	200	10	200	50	20	5,000	5,000	5,000	100	5,000	10

Table C3. Chemical concentrations in lake-water samples--Continued

Site number[1]	Sampling depth[3] (ft)	Total depth (ft)	Reser-voir[2]	Sample number	Sample date	Pesticide		Volatile organic					
						Atrazine	Simazine	1,1,1-Trichloro-ethane	1,1,2,2-Tetrachloro-ethane	1,1,2-Trichloro-ethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,2-Dichloro-ethane
SW00992	80.0	80.0	SL	SW07100CH	09-08-92	0.5	0.5	--	--	--	--	--	--
SW01092	20.0	21.0	SL	SW07101CH	09-09-92	0.5	0.5	--	--	--	--	--	--
SW01192	65.0	65.0	SL	SW07102CH	09-08-92	0.5	0.5	--	--	--	--	--	--
SW01292	41.0	42.0	SL	SW07103CH	09-09-92	0.5	0.5	--	--	--	--	--	--
SW03192	--	--	SL	SW07022CH	07-27-92	0.5	0.5	--	--	--	--	--	--
SW03192	--	16.0	SL	SW07219CH	10-13-92	0.5	0.5	--	--	--	--	--	--
SW03292	15.5*	17.0	SL	SW07221CH	10-14-92	0.5	0.5	--	--	--	--	--	--
SW03292	--	--	SL	SW07023CH	07-30-92	0.5	0.5	--	--	--	--	--	--
SW03392	--	--	SL	SW07024CH	07-27-92	0.5	0.5	--	--	--	--	--	--
SW03392	--	13.5	SL	SW07222CH	10-13-92	0.5	0.5	--	--	--	--	--	--
SW03492	21.0*	22.5	SL	SW07224CH	10-13-92	0.5	0.5	--	--	--	--	--	--
SW03492	--	--	SL	SW07025CH	07-28-92	0.5	0.5	--	--	--	--	--	--
SW03592	73.5*	75.0	SL	SW07225CH	10-14-92	0.5	0.5	--	--	--	--	--	--
SW03592	--	--	SL	SW07026CH	07-28-92	0.5	0.5	--	--	--	--	--	--
SW03592	--	--	SL	SW07028CH	07-28-92	0.5	0.5	--	--	--	--	--	--
SW03592	--	--	SL	SW07029CH	07-28-92	0.5	0.5	--	--	--	--	--	--
SW01392	14.5	14.5	GW	SW07104CH	08-31-92	0.5	0.5	--	--	--	--	--	--
SW01492	35.0	36.0	GW	SW07105CH	09-01-92	0.5	0.5	--	--	--	--	--	--
SW01592	18.5	19.0	GW	SW07106CH	09-01-92	0.5	0.5	--	--	--	--	--	--
SW01692	39.0	40.0	GW	SW07107CH	09-02-92	--	--	0.5	0.5	--	--	--	--
SW01792	--	--	GW	SW07108CH	09-15-92	0.5	0.5	--	--	--	--	--	--
SW02192	8.0*	9.0	GW	SW07205CH	10-02-92	0.5	0.5	--	--	--	--	--	--
SW02192	--	--	GW	SW07007CH	07-15-92	0.5	0.5	--	--	--	--	--	--
SW02292	17.0*	19.0	GW	SW07206CH	10-02-92	0.5	0.5	--	--	--	--	--	--
SW02292	--	--	GW	SW07008CH	07-15-92	0.5	0.5	--	--	--	--	--	--
SW02392	30.0*	34.0	GW	SW07207CH	10-02-92	0.5	0.5	--	--	--	--	--	--
SW02392	--	--	GW	SW07009CH	07-16-92	0.5	0.5	--	--	--	--	--	--
SW02492	1.8	3.5	GW	SW07208CH	10-02-92	0.5	0.5	--	--	--	--	--	--
SW02492	--	--	GW	SW07010CH	07-16-92	0.5	0.5	--	--	--	--	--	--
SW01892	1.0	6.0	M	SW07109CH	09-14-92	0.5	0.5	--	--	--	--	--	--
SW01992	4.5	5.0	M	SW07110CH	09-14-92	0.5	0.5	--	--	--	--	--	--
SW02092	1.0	1.0	M	SW07111CH	09-14-92	0.5	0.5	--	--	--	--	--	--
SW02692	--	--	M	SW07012CH	07-20-92	0.5	0.5	5	5	5	5	5	5
SW02692	--	--	M	SW07210CH	10-08-92	0.5	0.5	5	5	5	5	5	5
SW02792	2.0	4.0	M	SW07214CH	10-08-92	0.5	0.5	5	5	5	5	5	5
SW02792	--	--	M	SW07013CH	07-20-92	0.5	0.5	5	5	5	5	5	5

Table C3. Chemical concentrations in lake-water samples--Continued

Site number[1]	Sampling depth[3] (ft)	Total depth (ft)	Reser-voir[2]	Sample number	Sample date	Pesticide		Volatile organic					
						Atrazine	Simazine	1,1,1-Trichloro-ethane	1,1,2,2-Tetrachloro-ethane	1,1,2-Trichloro-ethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,2-Dichloro-ethane
SW02892	2.0	4.0	M	SW07216CH	10-08-92	0.5	0.5	5	5	5	5	5	5
SW02892	--	--	M	SW07014CH	07-20-92	0.5	0.5	5	5	5	5	5	5
SW02992	1.0	1.0	M	SW07217CH	10-08-92	0.5	0.5	5	5	5	5	5	5
SW02992	--	--	M	SW07015CH	07-20-92	0.5	0.5	5	5	5	5	5	5
SW03092	2.0	4.0	M	SW07218CH	10-08-92	0.5	0.5	5	5	5	5	5	5
SW03092	--	--	M	SW07016CH	07-21-92	0.5	0.5	5	5	5	5	5	5
Detection limits						0.5	0.5	5	5	5	5	5	5

Site number[1]	Sampling depth[3] (ft)	Total depth (ft)	Reser-voir[2]	Sample number	Sample date	Volatile organic							
						1,2-Dichloro-ethene	1,2-Dichloro-propane	2-Butanone	2-Hexanone	4-Methyl-2-pentanone	Acetone	Benzene	Bromo-dichloromethane
SW00992	80.0	80.0	SL	SW07100CH	09-08-92	--	--	--	--	--	--	--	--
SW01092	20.0	21.0	SL	SW07101CH	09-09-92	--	--	--	--	--	--	--	--
SW01192	65.0	65.0	SL	SW07102CH	09-08-92	--	--	--	--	--	--	--	--
SW01292	41.0	42.0	SL	SW07103CH	09-09-92	--	--	--	--	--	--	--	--
SW03192	--	--	SL	SW07022CH	07-27-92	--	--	--	--	--	--	--	--
SW03192	--	16.0	SL	SW07219CH	10-13-92	--	--	--	--	--	--	--	--
SW03292	15.5*	17.0	SL	SW07221CH	10-14-92	--	--	--	--	--	--	--	--
SW03292	--	--	SL	SW07023CH	07-30-92	--	--	--	--	--	--	--	--
SW03392	--	--	SL	SW07024CH	07-27-92	--	--	--	--	--	--	--	--
SW03392	--	13.5	SL	SW07222CH	10-13-92	--	--	--	--	--	--	--	--
SW03492	21.0*	22.5	SL	SW07224CH	10-13-92	--	--	--	--	--	--	--	--
SW03492	--	--	SL	SW07025CH	07-28-92	--	--	--	--	--	--	--	--
SW03592	73.5*	75.0	SL	SW07225CH	10-14-92	--	--	--	--	--	--	--	--
SW03592	--	--	SL	SW07026CH	07-28-92	--	--	--	--	--	--	--	--
SW03592	--	--	SL	SW07028CH	07-28-92	--	--	--	--	--	--	--	--
SW03592	--	--	SL	SW07029CH	07-28-92	--	--	--	--	--	--	--	--
SW01392	14.5	14.5	GW	SW07104CH	08-31-92	--	--	--	--	--	--	--	--
SW01492	35.0	36.0	GW	SW07105CH	09-01-92	--	--	--	--	--	--	--	--
SW01592	18.5	19.0	GW	SW07106CH	09-01-92	--	--	--	--	--	--	--	--
SW01692	39.0	40.0	GW	SW07107CH	09-02-92	--	--	--	--	--	--	--	--
SW01792	--	--	GW	SW07108CH	09-15-92	--	--	--	--	--	--	--	--

Table C3. Chemical concentrations in lake-water samples--Continued

Site number[1]	Sampling depth[3] (ft)	Total depth (ft)	Reser-voir[2]	Sample number	Sample date	Volatile organic							
						1,2-Dichloro-ethene	1,2-Dichloro-propane	2-Butanone	2-Hexanone	4-Methyl-2-pentanone	Acetone	Benzene	Bromo-dichloromethane
SW02192	8.0*	9.0	GW	SW07205CH	10-02-92	--	--	--	--	--	--	--	--
SW02192	--	--	GW	SW07007CH	07-15-92	--	--	--	--	--	--	--	--
SW02292	17.0*	19.0	GW	SW07206CH	10-02-92	--	--	--	--	--	--	--	--
SW02292	--	--	GW	SW07008CH	07-15-92	--	--	--	--	--	--	--	--
SW02392	30.0*	34.0	GW	SW07207CH	10-02-92	--	--	--	--	--	--	--	--
SW02392	--	--	GW	SW07009CH	07-16-92	--	--	--	--	--	--	--	--
SW02492	1.8	3.5	GW	SW07208CH	10-02-92	--	--	--	--	--	--	--	--
SW02492	--	--	GW	SW07010CH	07-16-92	--	--	--	--	--	--	--	--
SW01892	1.0	6.0	M	SW07109CH	09-14-92	--	--	--	--	--	--	--	--
SW01992	4.5	5.0	M	SW07110CH	09-14-92	--	--	--	--	--	--	--	--
SW02092	1.0	1.0	M	SW07111CH	09-14-92	--	--	--	--	--	--	--	--
SW02692	--	--	M	SW07012CH	07-20-92	5	5	--	10	10	--	5	5
SW02692	--	--	M	SW07210CH	10-08-92	5	5	10	10	10	10	5	5
SW02792	2.0	4.0	M	SW07214CH	10-08-92	5	5	10	10	10	10	5	5
SW02792	--	--	M	SW07013CH	07-20-92	5	5	--	10	10	--	5	5
SW02892	2.0	4.0	M	SW07216CH	10-08-92	5	5	10	10	10	10	5	5
SW02892	--	--	M	SW07014CH	07-20-92	5	5	--	10	10	--	5	5
SW02992	1.0	1.0	M	SW07217CH	10-08-92	5	5	10	10	10	10	5	5
SW02992	--	--	M	SW07015CH	07-20-92	5	5	--	10	10	--	5	5
SW03092	2.0	4.0	M	SW07218CH	10-08-92	5	5	10	10	10	10	5	5
SW03092	--	--	M	SW07016CH	07-21-92	5	5	--	10	10	--	5	5
Detection limits						5	5	10	10	10	10	5	5

Site number[1]	Sampling depth[3] (ft)	Total depth (ft)	Reser-voir[2]	Sample number	Sample date	Volatile organic							
						Bromoform	Bromo-methane	Carbon disulfide	Carbon tetra-chloride	Chloro-benzene	Chloro-ethane	Chloroform	Chloro-methane
SW00992	80.0	80.0	SL	SW07100CH	09-08-92	--	--	--	--	--	--	--	--
SW01092	20.0	21.0	SL	SW07101CH	09-09-92	--	--	--	--	--	--	--	--
SW01192	65.0	65.0	SL	SW07102CH	09-08-92	--	--	--	--	--	--	--	--
SW01292	41.0	42.0	SL	SW07103CH	09-09-92	--	--	--	--	--	--	--	--
SW03192	--	--	SL	SW07022CH	07-27-92	--	--	--	--	--	--	--	--
SW03192	--	16.0	SL	SW07219CH	10-13-92	--	--	--	--	--	--	--	--

Table C3. Chemical concentrations in lake-water samples--Continued

Site number[1]	Sampling depth[3] (ft)	Total depth (ft)	Reser-voir[2]	Sample number	Sample date	Volatile organic							
						Bromoform	Bromo-methane	Carbon disulfide	Carbon tetra-chloride	Chloro-benzene	Chloro-ethane	Chloroform	Chloro-methane
SW03292	15.5*	17.0	SL	SW07221CH	10-14-92	--	--	--	--	--	--	--	--
SW03292	--	--	SL	SW07023CH	07-30-92	--	--	--	--	--	--	--	--
SW03392	--	--	SL	SW07024CH	07-27-92	--	--	--	--	--	--	--	--
SW03392	--	13.5	SL	SW07222CH	10-13-92	--	--	--	--	--	--	--	--
SW03492	21.0*	22.5	SL	SW07224CH	10-13-92	--	--	--	--	--	--	--	--
SW03492	--	--	SL	SW07025CH	07-28-92	--	--	--	--	--	--	--	--
SW03592	73.5*	75.0	SL	SW07225CH	10-14-92	--	--	--	--	--	--	--	--
SW03592	--	--	SL	SW07026CH	07-28-92	--	--	--	--	--	--	--	--
SW03592	--	--	SL	SW07028CH	07-28-92	--	--	--	--	--	--	--	--
SW03592	--	--	SL	SW07029CH	07-28-92	--	--	--	--	--	--	--	--
SW01392	14.5	14.5	GW	SW07104CH	08-31-92	--	--	--	--	--	--	--	--
SW01492	35.0	36.0	GW	SW07105CH	09-01-92	--	--	--	--	--	--	--	--
SW01592	18.5	19.0	GW	SW07106CH	09-10-92	--	--	--	--	--	--	--	--
SW01692	39.0	40.0	GW	SW07107CH	09-02-92	--	--	--	--	--	--	--	--
SW01792	--	--	GW	SW07108CH	09-15-92	--	--	--	--	--	--	--	--
SW02192	8.0*	9.0	GW	SW07205CH	10-02-92	--	--	--	--	--	--	--	--
SW02192	--	--	GW	SW07007CH	07-15-92	--	--	--	--	--	--	--	--
SW02292	17.0*	19.0	GW	SW07206CH	10-02-92	--	--	--	--	--	--	--	--
SW02292	--	--	GW	SW07008CH	07-15-92	--	--	--	--	--	--	--	--
SW02392	30.0*	34.0	GW	SW07207CH	10-02-92	--	--	--	--	--	--	--	--
SW02392	--	--	GW	SW07009CH	07-16-92	--	--	--	--	--	--	--	--
SW02492	1.8	3.5	GW	SW07208CH	10-02-92	--	--	--	--	--	--	--	--
SW02492	--	--	GW	SW07010CH	07-16-92	--	--	--	--	--	--	--	--
SW01892	1.0	6.0	M	SW07109CH	09-14-92	--	--	--	--	--	--	--	--
SW01992	4.5	5.0	M	SW07110CH	09-14-92	--	--	--	--	--	--	--	--
SW02092	1.0	1.0	M	SW07111CH	09-14-92	--	--	--	--	--	--	--	--
SW02692	--	--	M	SW07012CH	07-20-92	5	10	5	5	5	10	5	10
SW02692	--	--	M	SW07210CH	10-08-92	5	10	5	5	5	10	5	10
SW02792	2.0	4.0	M	SW07214CH	10-08-92	5	10	5	5	5	10	5	10
SW02792	--	--	M	SW07013CH	07-20-92	5	10	5	5	5	10	5	10
SW02892	2.0	4.0	M	SW07216CH	10-08-92	5	10	5	5	5	10	5	10
SW02892	--	--	M	SW07014CH	07-20-92	5	10	5	5	5	10	5	10
SW02992	1.0	1.0	M	SW07217CH	10-08-92	5	10	5	5	5	10	5	10
SW02992	--	--	M	SW07015CH	07-20-92	5	10	5	5	5	10	5	10
SW03092	2.0	4.0	M	SW07218CH	10-08-92	5	10	5	5	5	10	5	10
SW03092	--	--	M	SW07016CH	07-21-92	5	10	5	5	5	10	5	10
		Detection limits				5	10	5	5	5	10	5	10

Table C3. Chemical concentrations in lake-water samples--Continued

Site number[1]	Sampling depth[3] (ft)	Total depth (ft)	Reser-voir[2]	Sample number	Sample date	Volatile organic						
						cis-1,3-Dichloropropene	Dibromo-chloromethane	Ethyl-benzene	Methylene-chloride	Styrene	Tetra-chloroethane	Toluene
SW00992	80.0	80.0	SL	SW07100CH	09-08-92	--	--	--	--	--	--	--
SW01092	20.0	21.0	SL	SW07101CH	09-09-92	--	--	--	--	--	--	--
SW01192	65.0	65.0	SL	SW07102CH	09-08-92	--	--	--	--	--	--	--
SW01292	41.0	42.0	SL	SW07103CH	09-09-92	--	--	--	--	--	--	--
SW03192	--	--	SL	SW07022CH	07-27-92	--	--	--	--	--	--	--
SW03192	--	16.0	SL	SW07219CH	10-13-92	--	--	--	--	--	--	--
SW03292	15.5*	17.0	SL	SW07221CH	10-14-92	--	--	--	--	--	--	--
SW03292	--	--	SL	SW07023CH	07-30-92	--	--	--	--	--	--	--
SW03392	--	--	SL	SW07024CH	07-27-92	--	--	--	--	--	--	--
SW03392	--	13.5	SL	SW07222CH	10-13-92	--	--	--	--	--	--	--
SW03492	21.0*	22.5	SL	SW07224CH	10-13-92	--	--	--	--	--	--	--
SW03492	--	--	SL	SW07025CH	07-28-92	--	--	--	--	--	--	--
SW03592	73.5*	75.0	SL	SW07225CH	10-14-92	--	--	--	--	--	--	--
SW03592	--	--	SL	SW07026CH	07-28-92	--	--	--	--	--	--	--
SW03592	--	--	SL	SW07028CH	07-28-92	--	--	--	--	--	--	--
SW03592	--	--	SL	SW07029CH	07-28-92	--	--	--	--	--	--	--
SW01392	14.5	14.5	GW	SW07104CH	08-31-92	--	--	--	--	--	--	--
SW01492	35.0	36.0	GW	SW07105CH	09-91-92	--	--	--	--	--	--	--
SW01592	18.5	19.0	GW	SW07106CH	09-91-92	--	--	--	--	--	--	--
SW01692	39.0	40.0	GW	SW07107CH	09-02-92	--	--	--	--	--	--	--
SW01792	--	--	GW	SW07108CH	09-15-92	--	--	--	--	--	--	--
SW02192	8.0*	9.0	GW	SW07205CH	10-02-92	--	--	--	--	--	--	--
SW02192	--	--	GW	SW07007CH	07-15-92	--	--	--	--	--	--	--
SW02292	17.0*	19.0	GW	SW07206CH	10-02-92	--	--	--	--	--	--	--
SW02292	--	--	GW	SW07008CH	07-15-92	--	--	--	--	--	--	--
SW02392	30.0*	34.0	GW	SW07207CH	10-02-92	--	--	--	--	--	--	--
SW02392	--	--	GW	SW07009CH	07-16-92	--	--	--	--	--	--	--
SW02492	1.8	3.5	GW	SW07208CH	10-02-92	--	--	--	--	--	--	--
SW02492	--	--	GW	SW07010CH	07-16-92	--	--	--	--	--	--	--
SW01892	1.0	6.0	M	SW07109CH	09-14-92	--	--	--	--	--	--	--
SW01992	4.5	5.0	M	SW07110CH	09-14-92	--	--	--	--	--	--	--
SW02092	1.0	1.0	M	SW07111CH	09-14-92	--	--	--	--	--	--	--
SW02692	--	--	M	SW07012CH	07-20-92	5	5	5	5	5	5	5
SW02692	--	--	M	SW07210CH	10-08-92	5	5	5	5	5	5	5
SW02792	2.0	4.0	M	SW07214CH	10-08-92	5	5	5	5	5	5	5

Table C3. Chemical concentrations in lake-water samples--Continued

Site number[1]	Sampling depth[3] (ft)	Total depth (ft)	Reser-voir[2]	Sample number	Sample date	Volatile organic						
						cis-1,3-Dichloropropene	Dibromo-chloromethane	Ethyl-benzene	Methylene-chloride	Styrene	Tetra-chloroethane	Toluene
SW02792	--	--	M	SW07013CH	07-20-92	5	5	5	5	5	5	5
SW02892	2.0	4.0	M	SW07216CH	10-08-92	5	5	5	5	5	5	5
SW02892	--	--	M	SW07014CH	07-20-92	5	5	5	5	5	5	5
SW02992	1.0	1.0	M	SW07217CH	10-08-92	5	5	5	5	5	5	5
SW02992	--	--	M	SW07015CH	07-20-92	5	5	5	5	5	5	5
SW03092	2.0	4.0	M	SW07218CH	10-08-92	5	5	5	5	5	5	5
SW03092	--	--	M	SW07016CH	07-21-92	5	5	5	5	5	5	5
		Detection limits				5	5	5	5	5	5	5

[1]See figure 2 for location of sites on Standley Lake, figure 3 for sites on Great Western Reservoir, and figure 4 for sites on Mower Reservoir.
[2]Codes for lakes include: SL=Standley Lake, GW=Great Western Reservoir, and M=Mower Reservoir.

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