PHYSICAL, CHEMICAL, AND BIOLOGICAL DATA FOR DETAILED STUDY OF IRRIGATION DRAINAGE IN THE KLAMATH BASIN, CALIFORNIA AND OREGON, 1990-92

By Dorene E. MacCoy

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Conversion Factors and Abbreviations

Multiply	By	To obtain
centimeter (cm)	0.3937	inch
gram (g)	0.03527	ounce avoirdupois
kilometer (km)	0.6214	mile
millimeter (m)	0.03937	inch

Temperature is given in degrees Celsius (°C), which can be converted to degrees Fahrenheit (°F) by the following equation:

$$°F=1.8(°C)+32$$

Abbreviations

μm - micrometer
mg - milligram
mL - milliliter

PHYSICAL, CHEMICAL, AND BIOLOGICAL DATA FOR DETAILED STUDY OF IRRIGATION DRAINAGE IN THE KLAMATH BASIN, CALIFORNIA AND OREGON, 1990-92

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Abstract

Physical, chemical, and biological data were collected between 1990 and 1992 as part of a detailed study by the U.S. Department of the Interior of the effects of irrigation drainage on aquatic resources in the Klamath Basin of California and Oregon. Most of the sites for data collection were in and around the upper and lower sump of Tule Lake, in Tule Lake National Wildlife Refuge, and along major drains in Lower Klamath National Wildlife Refuge.

The physical and chemical data consist of particle-size determinations and concentrations of carbon, arsenic, mercury, and chlorophenoxy acid, organochlorine, organophosphate, and carbamate pesticides in bottom sediment; and concentrations of organophosphate, carbamate, and pyrethroid pesticides, major and trace inorganic constituents, nitrogen, phosphorus, and organic carbon in water. Continuous dissolved oxygen, pH, specific conductance, and temperature data from selected sites in 1991 and 1992 are presented in graphical form to summarize the diel water-quality conditions. The biological data consist of concentrations of inorganic constituents and organochlorine pesticides in tissue, invertebrate and fish surveys, fish health surveys, frog call surveys, eggshell thickness of avian eggs, and *in situ* and laboratory toxicity bioassay data collected in 1991 and 1992 using aquatic bacteria, plants, invertebrates, fish, frog, and bird species as test organisms.

INTRODUCTION

BACKGROUND

In response to increasing concern about the effects of contaminated irrigation drainwater on human health, fish, and wildlife, the U.S. Department of the Interior established the Irrigation Water Quality Program to investigate irrigation-related water-quality problems at National Wildlife Refuges (NWR) and migratory bird use areas potentially affected by irrigation projects constructed or managed by the Department of the Interior. The Klamath Basin (fig. 1) was one of the areas chosen for investigation. A reconnaissance-level study completed in 1988 identified elevated trace-element concentrations in local areas and potential problems related to pesticide contamination and water-quality degradation in highly eutrophic waters (Sorenson and Schwarzbach, 1991).

A more detailed follow-up study was begun in 1990. The objective of the detailed study was to determine the extent, severity, and magnitude of irrigation-induced water-quality problems caused by pesticide contamination, eutrophic conditions, and trace-element contamination in the irrigation system. The study was also designed to determine sources and environmental fate of identified contaminants.

Three basic approaches were used to evaluate the existence and effect of water-quality problems: (1) Measurements were made to determine water-quality characteristics and the presence of chemical contaminants in the environment and biota that could cause adverse effects to living organisms; (2) toxicity of

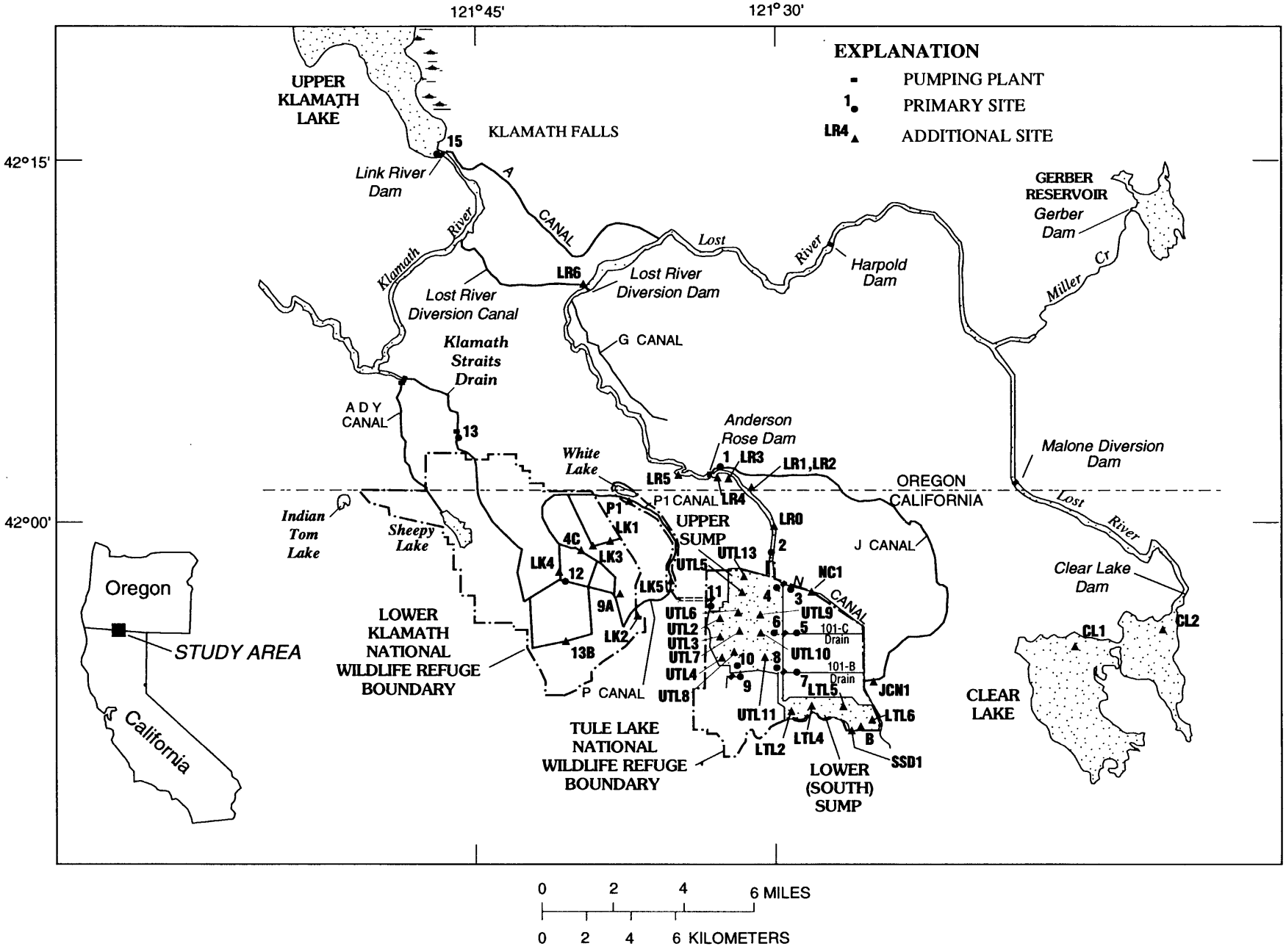


Figure 1. Location of Klamath Basin study area.

water and sediment were measured using bioassay techniques on a variety of test organisms; and (3) assessments of resident biological communities were made to evaluate the health of the ecosystem exposed to drainwater. Data from each of these approaches complement one another and contribute to a comprehensive evaluation of water-quality problems in the Klamath Basin.

The study was done by research teams from the U.S. Geological Survey (USGS) and the U.S. Fish and Wildlife Service (USFWS) with support from the U.S. Bureau of Reclamation and the U.S. Bureau of Indian Affairs.

PURPOSE AND SCOPE

The purpose of this report is to present, in tabular and graphical form, the data that were collected during the 1990-92 study of irrigation drainwater in the Klamath Basin. This report contains physical, chemical, and biological data from water-quality and biological monitoring sites in the Tule Lake and Lower Klamath National Wildlife Refuges (fig. 1), as well as the major tributaries supplying water to the area.

The method detection limits for chemical analysis are given in the tables using the "less than" (<) sign. These limits vary according to the date, type of analysis, and sensitivity of the instrumentation. The determination of the method detection limit by the USGS National Water Quality Laboratory (NWQL) can be found in the Code of Federal Regulations (1990).

The method validation for the analysis of pesticides and related compounds in surface water has been completed and is in the process of being approved by the NWQL. All other analytical methods used by the NWQL have been validated and approved (Fishman and Friedman, 1985; Wershaw and others, 1987).

ACKNOWLEDGMENTS

The author would like to acknowledge the following individuals for their contributions to the collection and preparation of data during the 3 years of study in the Klamath Basin: Staci Kawaguchi, Darian LaBrie, Deblyn Mead, and Stephen Sorenson, of the USGS; John Henderson, Elizabeth Materna, Thomas Maurer, Steven Schwarzbach, and Judy Sefchick of the USFWS; Jewel Bennett, Robin Boyer, Therese Littleton, and Meri Moore of the Washington Cooperative Fish and Wildlife Research Unit; and volunteers Chetna Acharya, Stephanie Ciccarello, Robin McWilliams, Karin Podlesch, and Nina Woodgate from the Student Conservation Association.

STUDY AREA

The Klamath Basin study area (fig. 1) is located on the border between California and Oregon and includes part of the Klamath River Basin and all of the Lost River Basin. This study was done in two key wildlife areas—the Tule Lake and Lower Klamath National Wildlife Refuges (figs. 2 and 3). Also included in the study area is the outlet for Upper Klamath Lake at the A Canal and sites in Clear Lake and the Lost River (fig. 1). Upper Klamath Lake and Clear Lake provide the majority of irrigation water to the Klamath Basin. These lakes and waterways are important for migratory waterfowl that use the Pacific flyway and provide habitat for two endangered fish, the shortnose sucker and Lost River sucker.

Within the Klamath Basin is the Klamath Basin Irrigation Project administered by the U.S. Bureau of Reclamation. This project was started in 1905 to drain and reclaim the lake bottoms of Tule and Lower Klamath Lakes for agricultural use. This was accomplished through the construction of a series of canals and drains that provided flood control and irrigation water to the newly reclaimed land. In 1964, homesteading of reclaimed land was discontinued and the remaining wetland areas of Tule and Lower Klamath Lakes were preserved as USFWS National Wildlife Refuges. Part of the land now included in the refuges continues to be farmed under a lease agreement with the Bureau of Reclamation, a situation unique in the national wildlife refuge system.

SAMPLING SITES

The principal data-collection sites for the detailed study are given in table 1. Site locations are shown in figures 1, 4, and 5. Sampling locations and sample numbers for biological tissue collected in 1990-92 are given in table 2; these locations have no corresponding site numbers but they can be located in figures 1, 2, and 3. Sites where frog call surveys were done are shown in figures 2 and 3.

In 1990-91, bottom-sediment and benthic invertebrate samples were collected in and around Tule Lake

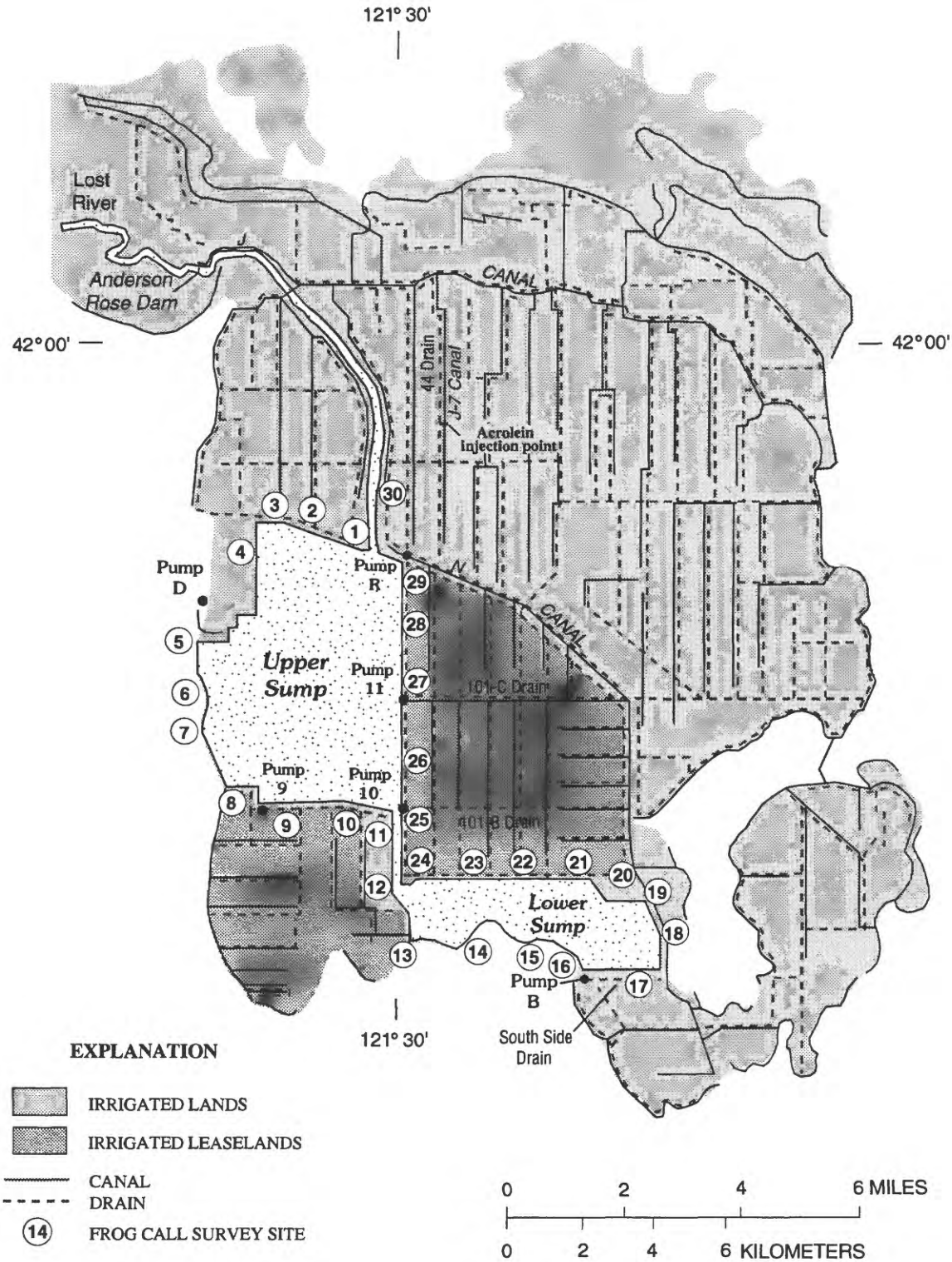


Figure 2. Tule Lake National Wildlife Refuge, agricultural area, and frog call survey sites.

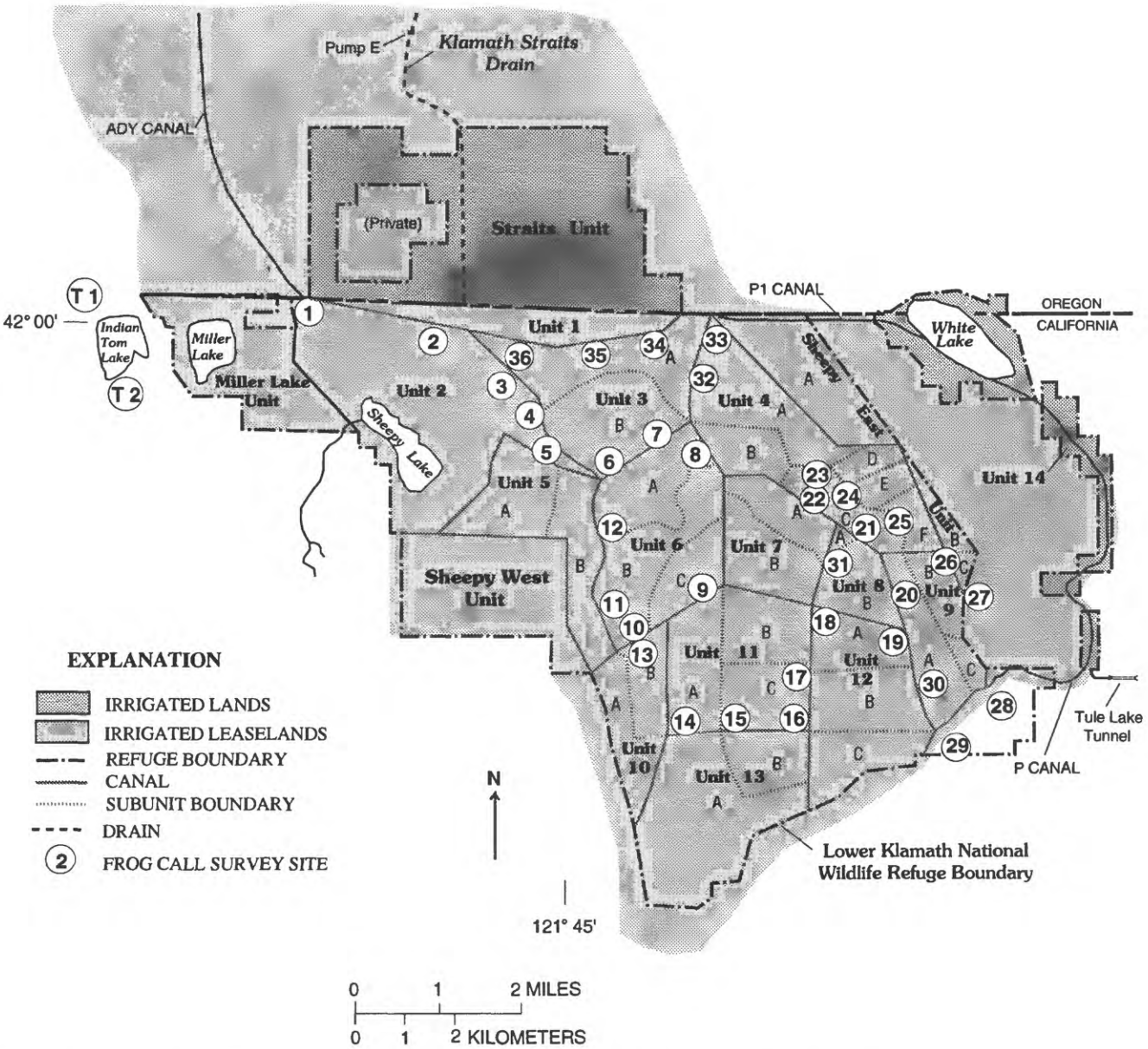


Figure 3. Lower Klamath National Wildlife Refuge, agricultural area, and frog call survey sites.

and Lower Klamath Refuges; a more intense monitoring of surface water and bioassays began in June 1991. The water was sampled weekly during June, July, and August (13 weeks) in 1991 and 1992. These months represent the peak agricultural irrigation season and the period of greatest eutrophic water conditions.

Water and sediment were sampled at strategic locations along the irrigation system to identify potential gradients in water quality and toxicity. There were three categories of sampling sites: (1) Above most agricultural inputs (sites 1, 2, and, in 1992, 15); (2) where irrigation return flow from agricultural fields enters Tule Lake upper sump (sites 3, 4, 5, 6, 7, 8, 9, and 10); and (3) at outflows from Tule Lake and Lower Klamath Refuges (sites 11, 12, and 13). Of these sites, nine were sampled in 1991 and ten in 1992 on a weekly basis (sites 1, 2, 3, 5, 7, 9, 11, 12, 13, and, in 1992, site 15). Also in 1992, water-quality data were collected in the irrigated leaselands of Tule Lake NWR in waterways adjacent to fields; the general area of these collection sites is shown in figure 2 and the individual sites are shown in figures 4 and 5.

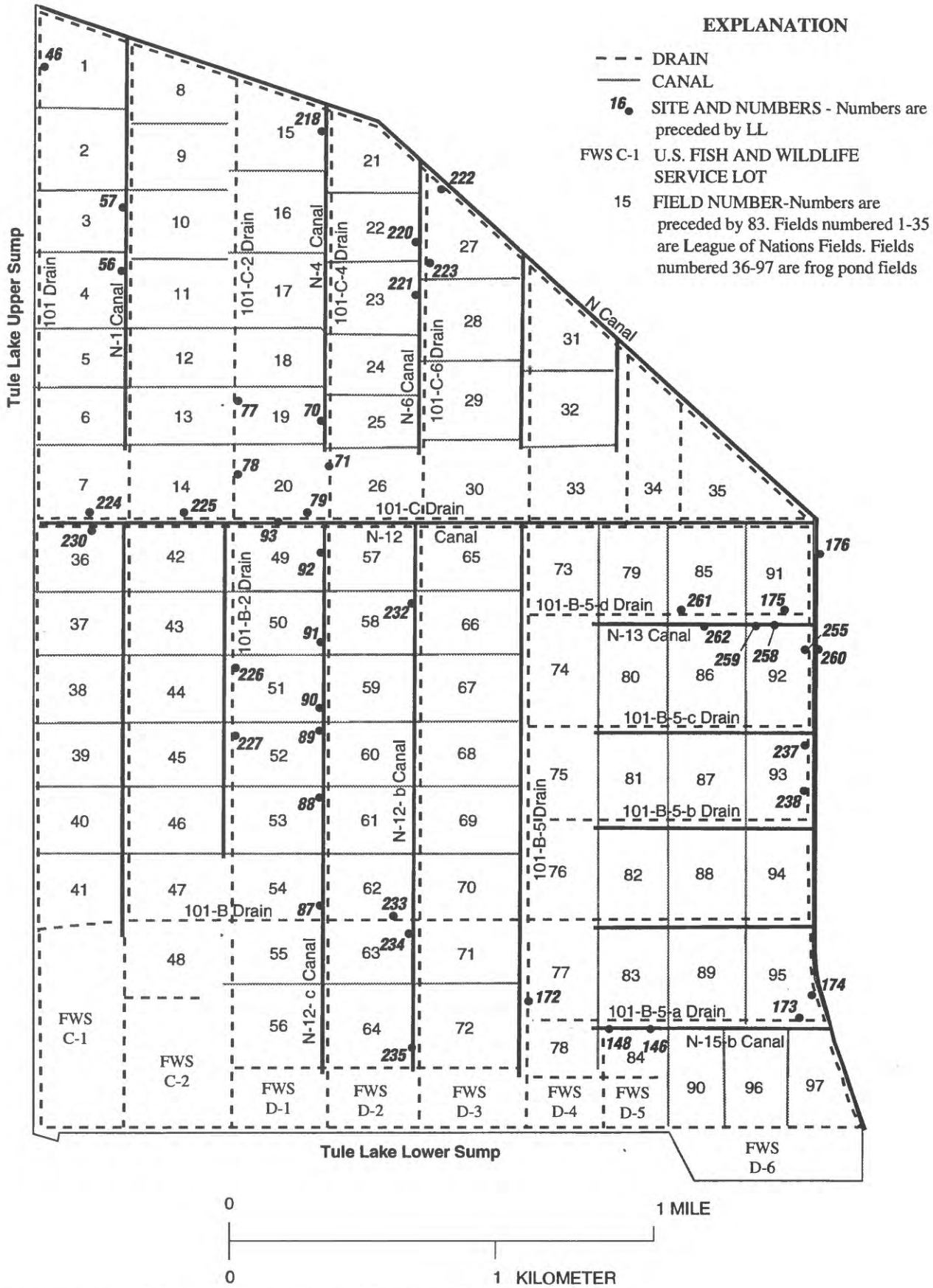


Figure 4. Tule Lake upper sump leaseland waterway sampling sites.

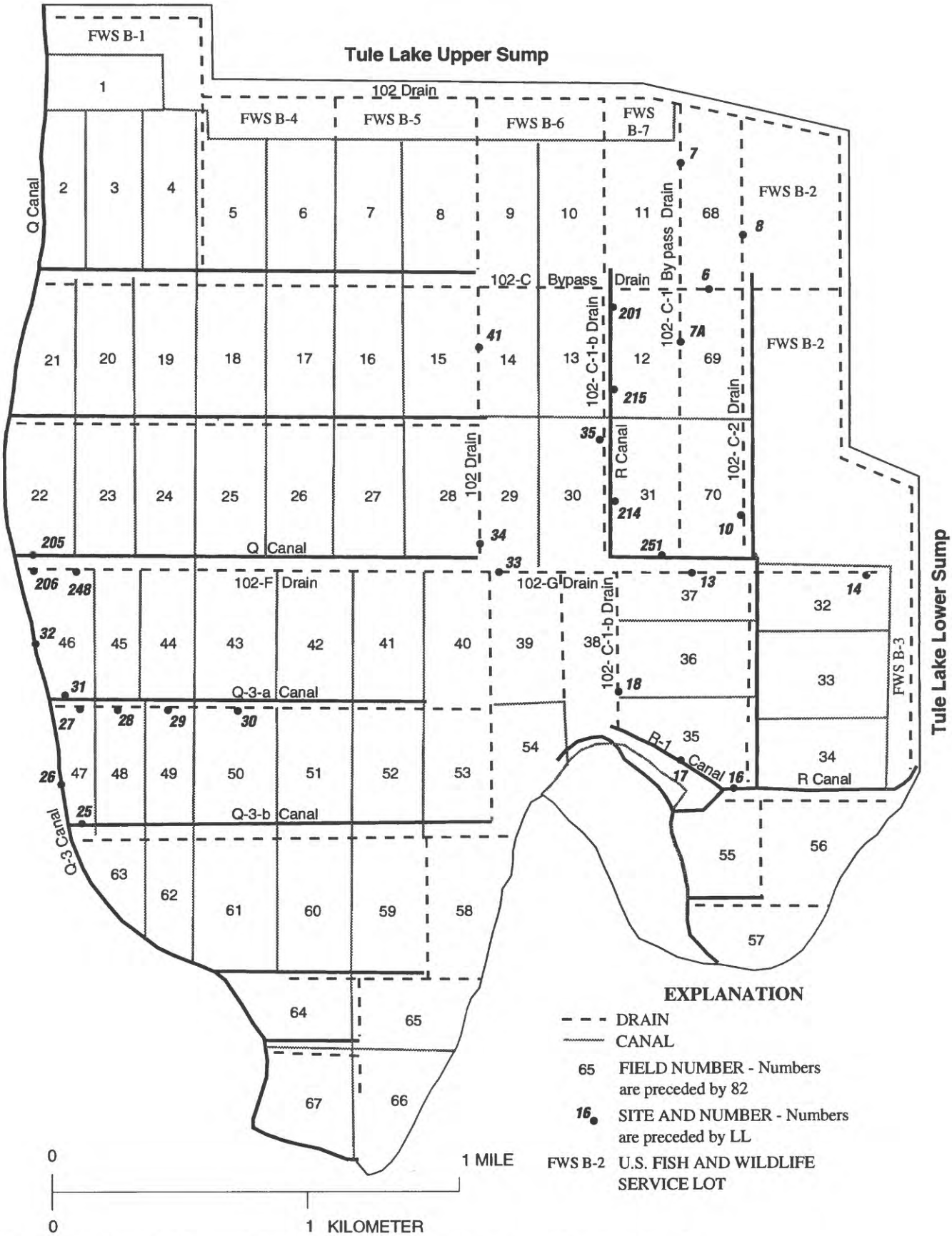


Figure 5. Tule Lake lower (south) sump leaseland waterway sampling sites.

SAMPLE COLLECTION, PRESERVATION, AND ANALYSIS

The field and laboratory procedures used for measurement of water quality (specific conductance, pH, water temperature, and dissolved oxygen) and collection, preservation, and analysis of samples of surface water, bottom sediment, and biota were similar to those used during the 1988-89 reconnaissance investigation (Sorenson and Schwarzbach, 1991). USGS quality-assurance practices were followed for all surface-water and sediment samples sent to the USGS NWQL (Friedman and Erdman, 1982). Additions to those procedures and sampling frequency are indicated below.

SEDIMENT

Bottom sediment was collected using a stainless steel Ekman grab sampler and bucket. Three grabs at each site were composited. Four subsamples for Microtox® bioassay (Microbics Corporation, 1988a), chironomid bioassay, organic analyses, and inorganic analyses were placed in 125-mL jars or whirlpak bags (inorganics). Porewater was removed from sediment for the Microtox® bioassay by centrifuge (in 1991 and 1992) or vacuum filtration through an air stone (in 1991).

Bottom-sediment samples were analyzed for organic and inorganic compounds using analytical procedures based on U.S. Environmental Protection Agency (1986 and 1991), U.S. Fish and Wildlife Service (1989a), Hazelton Laboratories America, Inc. (1991a,b), and other internal laboratory procedures approved and monitored by U.S. Fish and Wildlife Service Patuxent Analytical Control Facility.

WATER

Water-quality measurements (specific conductance, pH, water temperature, and dissolved oxygen) were made with handheld instruments up to three times a week, and more frequently during special studies, at each sampling site. Diel fluctuations in specific conductance, pH, water temperature, and dissolved oxygen at the primary sampling sites were monitored continuously during select *in situ* bioassays done in 1991 and 1992. Four monitors were rotated systematically to different sampling sites each week. Recorded data were recovered and the monitoring instruments calibrated prior to redeployment. The procedures used for set-up, calibration, and data recovery of the monitors can be found in the equipment operating manuals (Hydrolab Corporation, 1988 and 1991).

In 1991, water samples were analyzed for total and dissolved arsenic and mercury. Water samples for analysis of concentrations of nitrogen, phosphorus, organic carbon, and major dissolved constituents were taken at three separate times throughout the 1992 sampling season, using USGS sampling and preservation techniques (Ward and Harr, 1990) and analyzed at the NWQL. Samples were analyzed in the field for total ammonia in 1991 and 1992 using an ion-selective electrode (method described by Fishman and Friedman, 1985).

Water was sampled in 1991 and 1992 to determine concentrations of pesticides and related compounds using the solid-phase extraction method (Sandstrom and others, 1992). Only a few selected samples were chosen for analysis in 1991. Each week in 1992, three samples were randomly selected and up to three more samples were also analyzed if there was high bioassay mortality. Water was filtered through pre-ashed 0.7-µm, glass fiber filters, then pumped through cartridges packed with 500 mg of silica with an octadecylsilane (C-18) phase covalently bonded to the silica surface. Most compounds of interest bond with the silica particles. The cartridges were eluted at the NWQL and samples analyzed using a gas chromatographic/mass spectrophotometric method (Steven D. Zaugg, U.S. Geological Survey, written commun., 1993).

A one-time fate study on the herbicide acrolein (Magnicide-H®) was done in July 1992 along the 44 Drain and the J-7 and N Canals at the north end of Tule Lake Refuge (fig. 2). The purpose of this study was to determine if the herbicide persists in drainwater and whether it is transported to the refuge boundaries. The Endangered Species Consultation on use of acrolein in the Klamath Basin (U.S. Fish and Wildlife Service, 1989b) resulted in prohibiting the use of this herbicide on refuge land, but it is used extensively to clear vegetation from the drains and canals surrounding the refuge. Sites were selected downstream of the injection point of the herbicide (fig. 2) and sampled at regular intervals to determine the time and concentration of dispersement. Thirteen 40-mL water samples were collected and preserved with hydrochloric acid to a pH of 4. The samples were packed in ice and shipped to the NWQL and analyzed using the NWQL volatiles method. In this method, volatile organic compounds are purged from the sample matrix by bubbling helium through a 25-mL aqueous

sample. The analytes are trapped in a tube containing suitable sorbent materials and then thermally desorbed onto a megabore capillary column. The gas chromatograph is temperature-programmed to separate the analytes, which then are detected by the mass spectrometer. Target compound identifications are confirmed by analyzing standard reference materials under the same conditions as the samples, comparing retention times and mass spectra (Donna L. Rose, U.S. Geological Survey, written commun., 1993).

In 1992, deposition samplers (drift cards) were placed in and around leaseland waterway sampling sites (figs. 4 and 5). The drift cards were chemically clean, 7.0-cm-diameter cellulose filter paper. Water samples and drift cards were sent to the USFWS Patuxent Analytical Control Facility for analysis of methamidophos, EPN, acephate, aldicarb, azinphos-methyl, carbaryl, carbofuran, chlorpyrifos, coumaphos, and demeton. Methamidophos was the only compound detected in samples from leaseland waterway sampling sites. Methamidophos was detected at three sites on drift cards but not in sample water.

Daphnia magna and mallard duckling *in situ* bioassays also were done in these waterways using methods described below. These tests were done to determine if drift from aerial pesticide applications entered drainwater and was hazardous to nontarget aquatic organisms. *Daphnia magna*, mallard ducklings, and drift cards were placed in irrigation drains and canals adjacent to selected agricultural fields prior to aerial sprays. Water-quality measurements were taken at the time of deployment and retrieval of the *in situ* bioassays. This monitoring effort served to describe drainwater conditions and organism survival at sites adjacent to potato and grain fields.

BIOTA

Samples of the biota were collected for analysis of trace elements and pesticides. Blue-green algae, invertebrate composite samples (at least 10 g), and fish composite samples (at least 20 g) were collected and placed in clean containers. Bird eggs were hand collected, chilled prior to harvesting, and placed in clean glass jars. All samples were frozen prior to shipment.

Biological samples were analyzed for trace elements by one of the following laboratories under contract with the USFWS Patuxent Analytical Control Facility: Hazelton Laboratories America, Inc., Madison, Wisconsin; Environmental Trace Substances Research Center, Columbia, Missouri; and Research Triangle Institute, Research Triangle Park, North Carolina. The analytical procedures were similar to those used in the reconnaissance study (Sorenson and Schwarzbach, 1991). The laboratories analyzed the samples for arsenic and selenium using hydride-generation or graphite-furnace atomic absorption spectroscopy, and for mercury by cold vapor reduction. Other trace elements were analyzed by inductively coupled plasma atomic spectroscopy. Organochlorine pesticides and polychlorinated biphenyls were analyzed in invertebrate, fish, and avian-egg tissue using packed, capillary, or megabore column, electron-capture gas chromatography. Laboratory quality control was assured through the Patuxent Analytical Control Facility. The precision and accuracy of the laboratory analyses were confirmed with procedural blanks, duplicate analyses, test recoveries of spiked materials, and reference material analyses. Differences in significant figures in some tables result from use of different laboratories, analysis completed at different times, variation in tissue type and quantity, and sensitivity of instruments used.

Waterfowl carcasses were collected and brains extracted and analyzed for cholinesterase (ChE) activity using spectrophotometric methods developed by Hill and Fleming (1982).

Eggshell thickness was determined by taking measurements at three locations around the equator of each half shell using a micrometer with rounded contacts. The reported thickness is the average of the six measurements of the whole egg (U.S. Fish and Wildlife Service, 1990).

During 1992, water-column invertebrate communities were surveyed biweekly at primary sampling sites 1, 2, 3, 5, 7, 9, 11, 12, 13, and 15. Collection, handling, and subsampling procedures were based on methods described by Plafkin and others (1989) for rapid bioassessment of macroinvertebrates. Collections were made by duplicate draws of a student plankton net through the entire water column. The net was made of 80-µm mesh equipped with a stainless steel Clarke-Bumpus plankton bucket with an 86-µm mesh sieve. All organisms were preserved in 10-percent ethanol in the field and then subsampled and identified in the laboratory. Subsampling entailed distributing the entire sample evenly over the surface of a gridded pan. Grids were randomly selected and all organisms within those grids removed until approximately 100 organisms were removed for identification. In cases in which a sample did not

contain 100 organisms, all organisms were retained for identification. Invertebrates were identified to the family level using taxonomy recommended by Pennak (1978) and Merritt and Cummins (1984).

A benthic invertebrate survey was done in 1990 at sites in the Lost River, Tule Lake upper and lower (south) sumps, Lower Klamath Refuge, Clear Lake, J and N Canals, and the South Side Drain (figs. 1 and 2). In 1991, the inventory was limited to selected primary monitoring sites plus three sites in Tule Lake upper sump.

General methods for collection of benthic invertebrates were those described by Britton and Greeson (1987). Benthic invertebrates were collected using a petite Ponar grab sampler. A 533-µm mesh sieve was used to screen the samples. Samples were placed in wide-mouth containers with a 4-percent formalin solution containing Rose Bengal biological stain to aid in sorting the invertebrates from the other organic matter. Several days to several weeks later, samples were rinsed with tap water using a 250-µm mesh sieve and then preserved in 70-percent ethanol. Three replicates (grabs) were taken at each site. Samples were sorted by hand using a binocular dissecting scope at 7× to 10× power.

Due to the large volume of benthic invertebrate samples and time constraints, identification of invertebrates to species level was not practical for this study. Larger samples were subsampled using techniques described by Britton and Greeson (1987). Taxa are reported to the family level where practical (Hirudinea, Gastropoda, and Insecta) using keys by Mason (1968), Merritt and Cummins (1984), and Pennak (1978).

Frog call surveys were done during the breeding season (May-July) in 1991 and 1992 at selected sites throughout Tule Lake and Lower Klamath Lake Refuges and at Indian Tom Lake (figs. 2 and 3). These surveys assessed the calling male-frog distribution and abundance. Methods described by Karns (1986) were used as the basis for the frog call surveys. Two-person teams would travel to the frog call survey sites on a weekly basis beginning at dusk. Each site was surveyed one night a week. The species calling and number of male frogs heard were recorded. Water-quality measurements were made at most survey sites where water was accessible.

Fish were surveyed from the G Canal, sites 11 and 12, and the Lost River in October 1991 during the Bureau of Reclamation's sucker salvage operation (when the irrigation system is drained for the winter months). Fish were surveyed again in June and September 1992 at the Lost River below Clear Lake Dam, Anderson Rose Dam, and selected primary sampling sites. These surveys were done to determine the biological condition of fish assemblages along the drainwater system. The Lost River site below Clear Lake Dam was selected to serve as a reference site because it is located above drainwater inputs. Surveys were based on methods for rapid bioassessment of fish communities (Plafkin and others, 1989). Collections were made with beach seines, dip nets, traps, and electroshock. Fish were sorted by species and size class, counted, and examined for external abnormalities.

Fish health surveys were done on fathead minnows (*Pimephales promelas*) collected in the 1991 and 1992 fish surveys to provide information on fish health. The fish health surveys consisted of an autopsy-based assessment on fathead minnows and use of an assessment index (Goede and Barton, 1990).

Bioassays were done weekly from June through August 1991 and 1992. Both static laboratory and *in situ* bioassays were run using standard test species relevant to the Klamath aquatic community. The static laboratory bioassays were done to determine if acutely hazardous chemical concentrations were present in drainwater. Static tests were done using Microtox® (which uses bioluminescent marine bacteria, *Photobacterium phosphoreum*), green algae (*Selenastrum capricornutum*), duckweed (*Lemna minor*), water flea (*Daphnia magna*), amphipod (*Hyalella azteca*), midge larva (*Chironomus tentans*), fathead minnow (*Pimephales promelas*), and African clawed frog embryo (*Xenopus laevis*). Test organisms were exposed to water or sediment from selected primary sampling sites for 48 or 96 hours (depending upon species protocol). Static-test endpoints were percent luminescence (Microtox®), percent growth (plants), or percent survival or percent malformations (animals). Bioassays were done using procedures described by Microbics Corporation (1988a,b; 1992), Nebeker and others (1984), Peltier and Weber (1985), Wang (1986), and Bantle and Sabourin (1990).

The *in situ* bioassays were used to determine if continuous field exposure to drainwater was hazardous to aquatic organisms. The species tested *in situ* were *Daphnia magna, Hyalella azteca, Pimephales promelas,* and mallard ducklings (*Anas platyrynchos*). Test organisms were placed in the drainwater at each sampling site weekly (mallards less frequently) for either 48 or 96 hours. The endpoint of the *in situ*

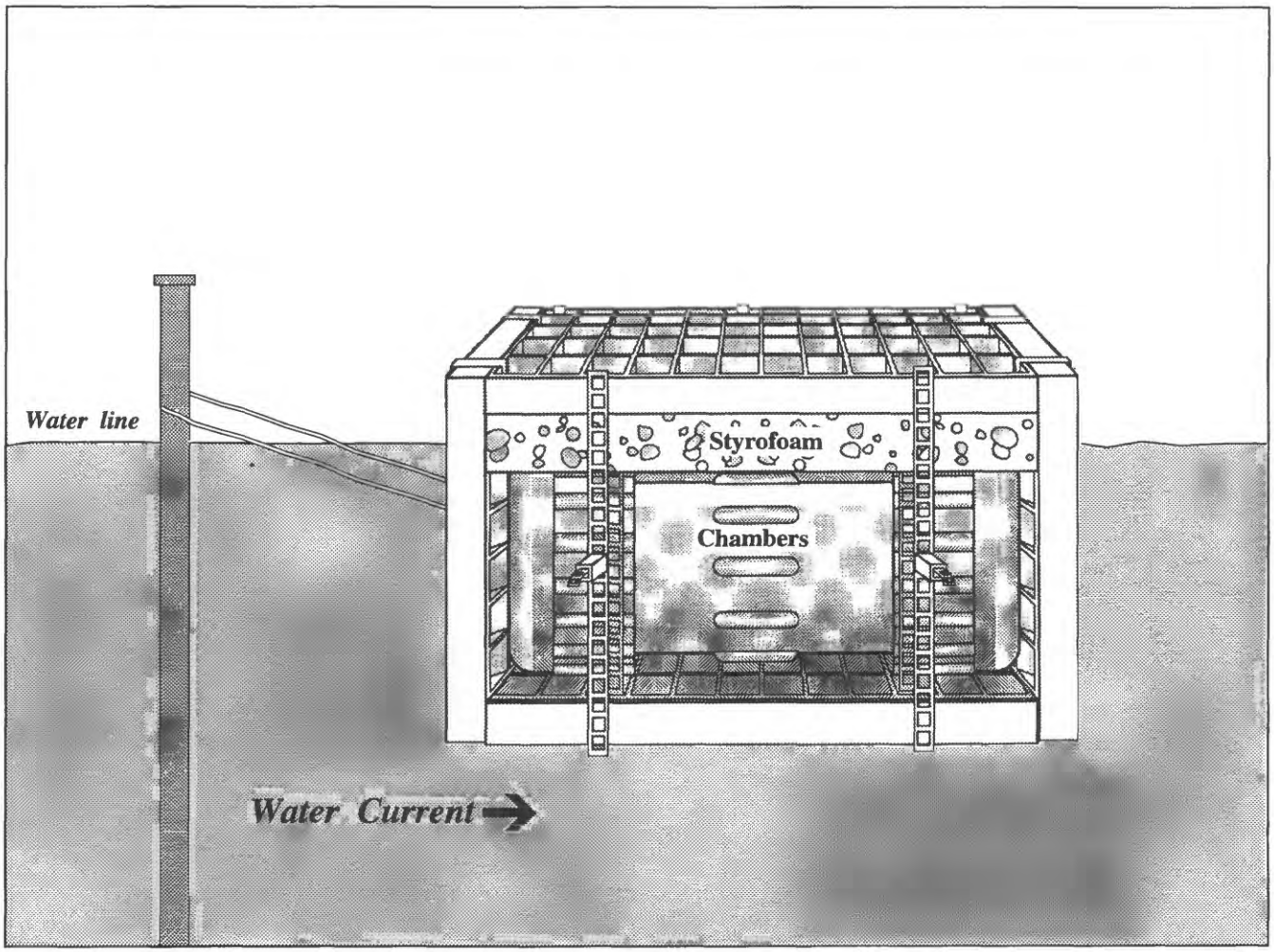


Figure 6. Diagram of *in situ* test chamber.

bioassays was percent survival. *In situ* test chambers, developed for this study to hold *Daphnia magna*, *Hyalella azteca,* and *Pimephales promelas*, were 5.7-cm-diameter polyvinyl-chloride compression couplers equipped with open screw-on endcaps. The endcap openings were covered with 500-µm screening to contain the animals but permit waterflow through the chamber. The screens were glued into the endcap with nontoxic aquarium sealer to prevent gaps around the screen. Ten animals were placed in each test chamber and duplicate chambers were prepared for each species. Chambers were prepared the evening before deployment and were held overnight in plastic bags filled with culture water and placed in insulated coolers. After being transported to the field sites early the next morning, the test chambers were transferred under water to plastic mesh cages with a 2.6-mm layer of styrofoam on top to ensure that the chambers would remain suspended in the water column. Cages were tethered in place at each sampling site (fig. 6) (Jewel Bennett, U.S. Fish and Wildlife Service, written commun., 1993).

COMPILATIONS OF PHYSICAL, CHEMICAL, AND BIOLOGICAL DATA

Sites listed in table 1 with a USGS identification number correspond to numbers in WATSTORE (the USGS National WATer data STOrage and REtrieval system). Sites with no USGS identification number and those in table 2 are biological-tissue and biosurvey sampling sites. Bottom-sediment physical and chemical data are found in tables 3-5; surface-water chemical data are in tables 6-14; biological tissue data are in tables 15-18; eggshell thickness data are in table 19; biological survey data are in tables 20-24; and bioassay data are in tables 25-36. Diel data from the continuous monitors are shown as graphs in figures 7 and 8.

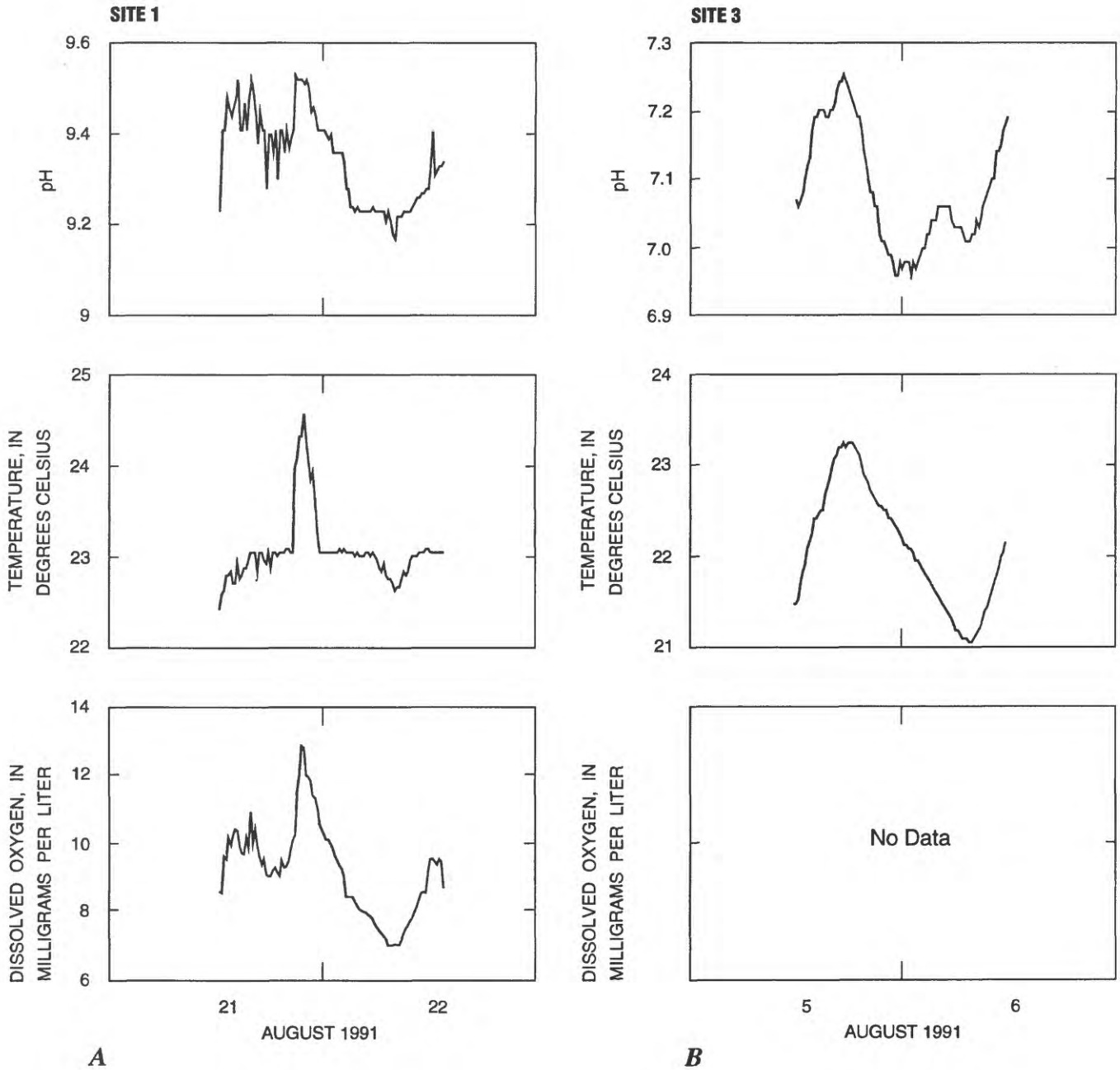
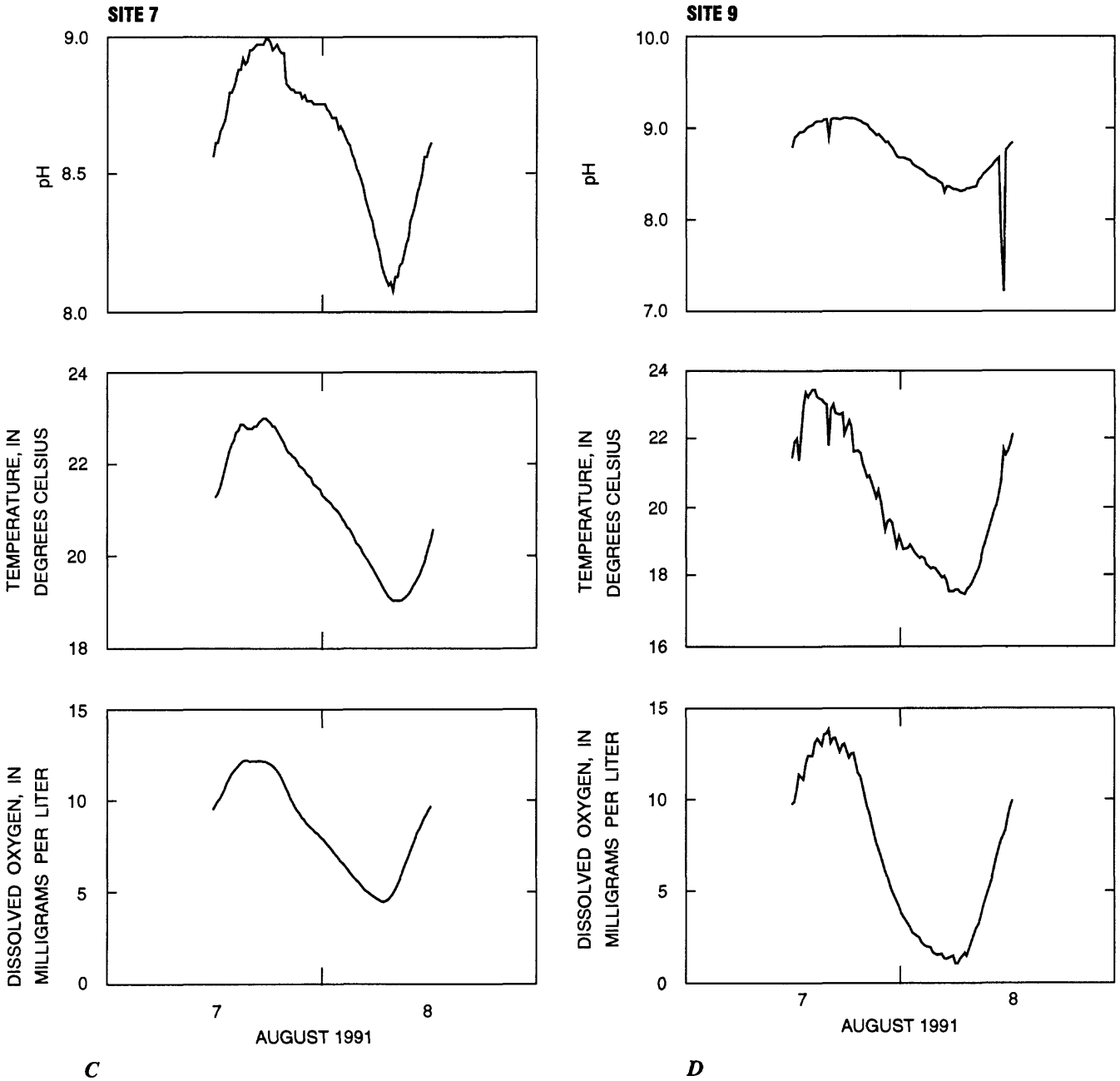


Figure 7. Diel pH, temperature, and dissolved-oxygen data from selected sites in Klamath Basin, 1991. Scales vary by site for each property or constituent. Location of sites in figure 1.



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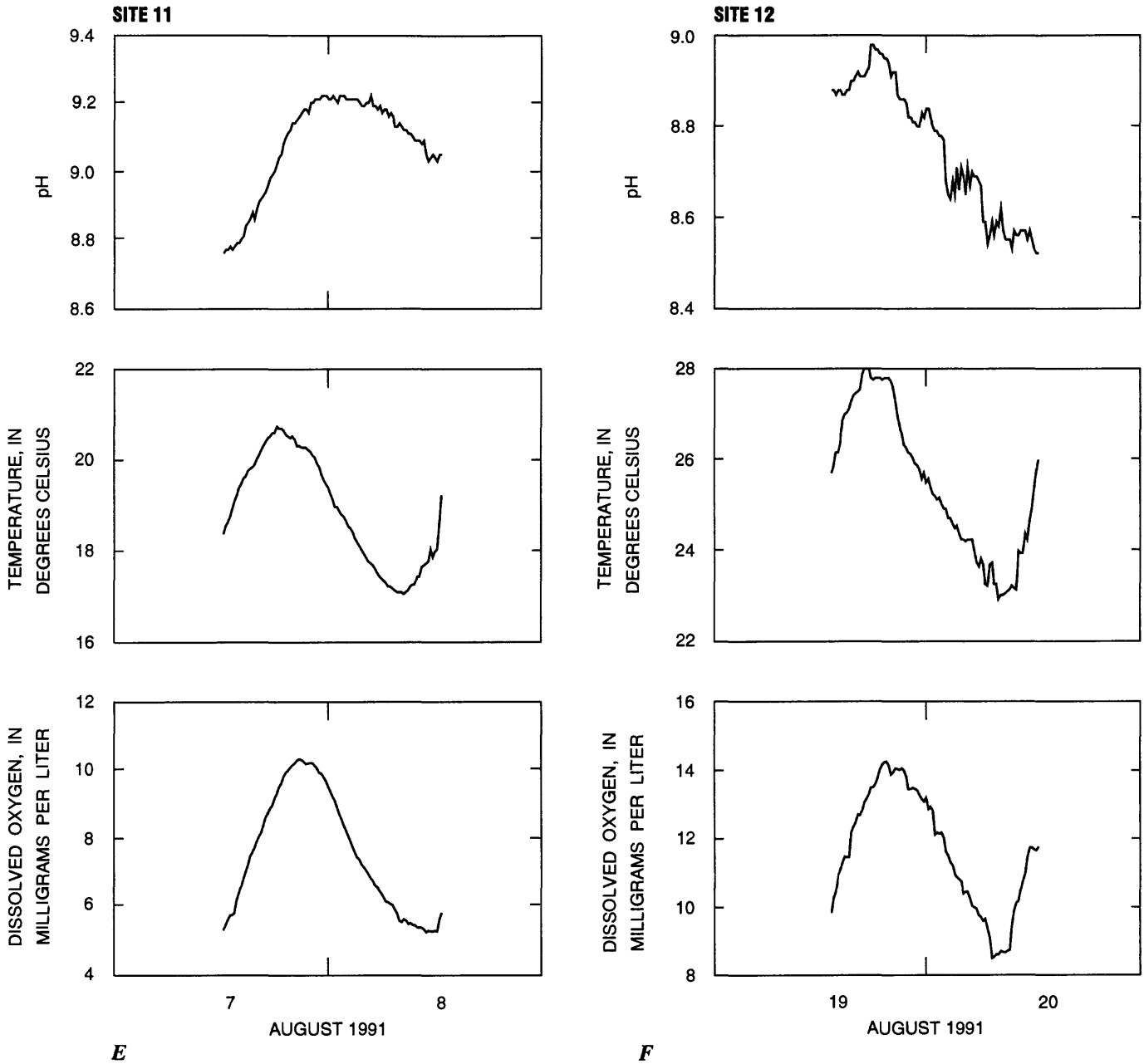

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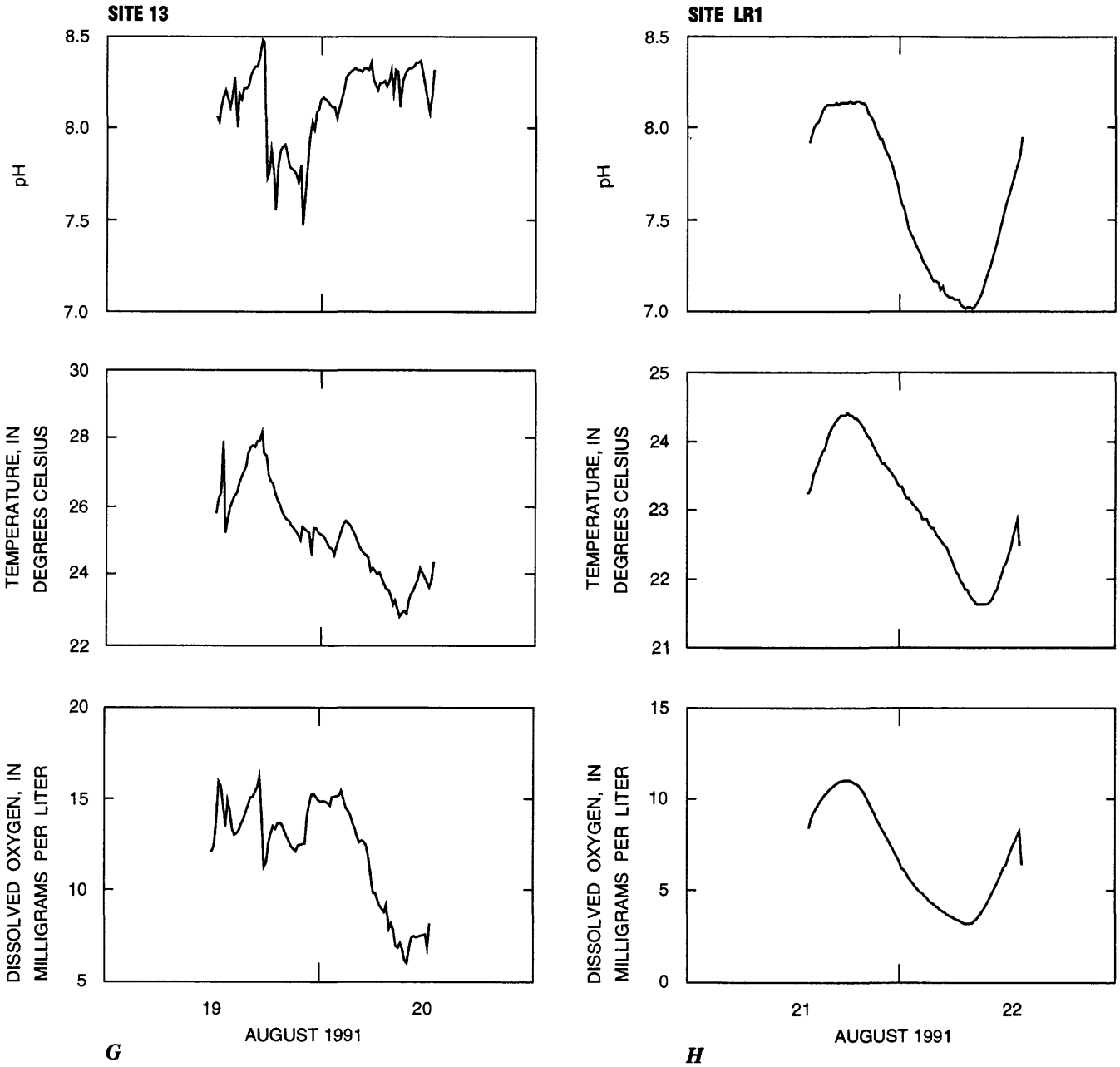

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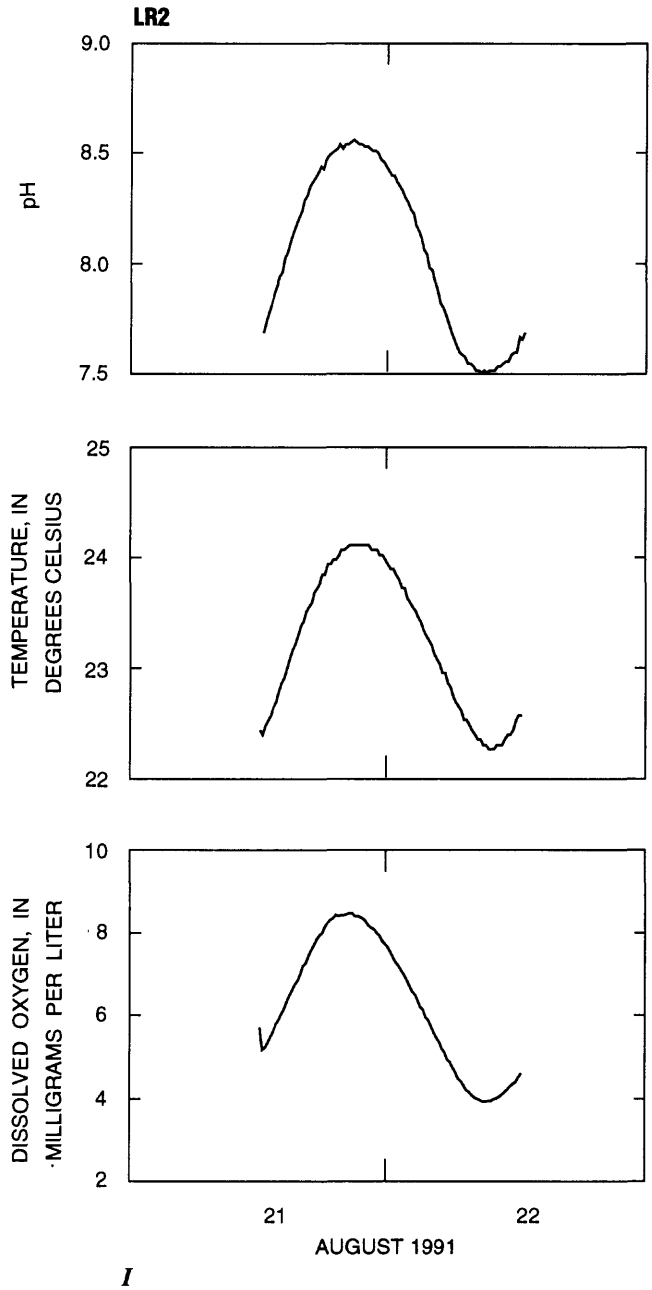

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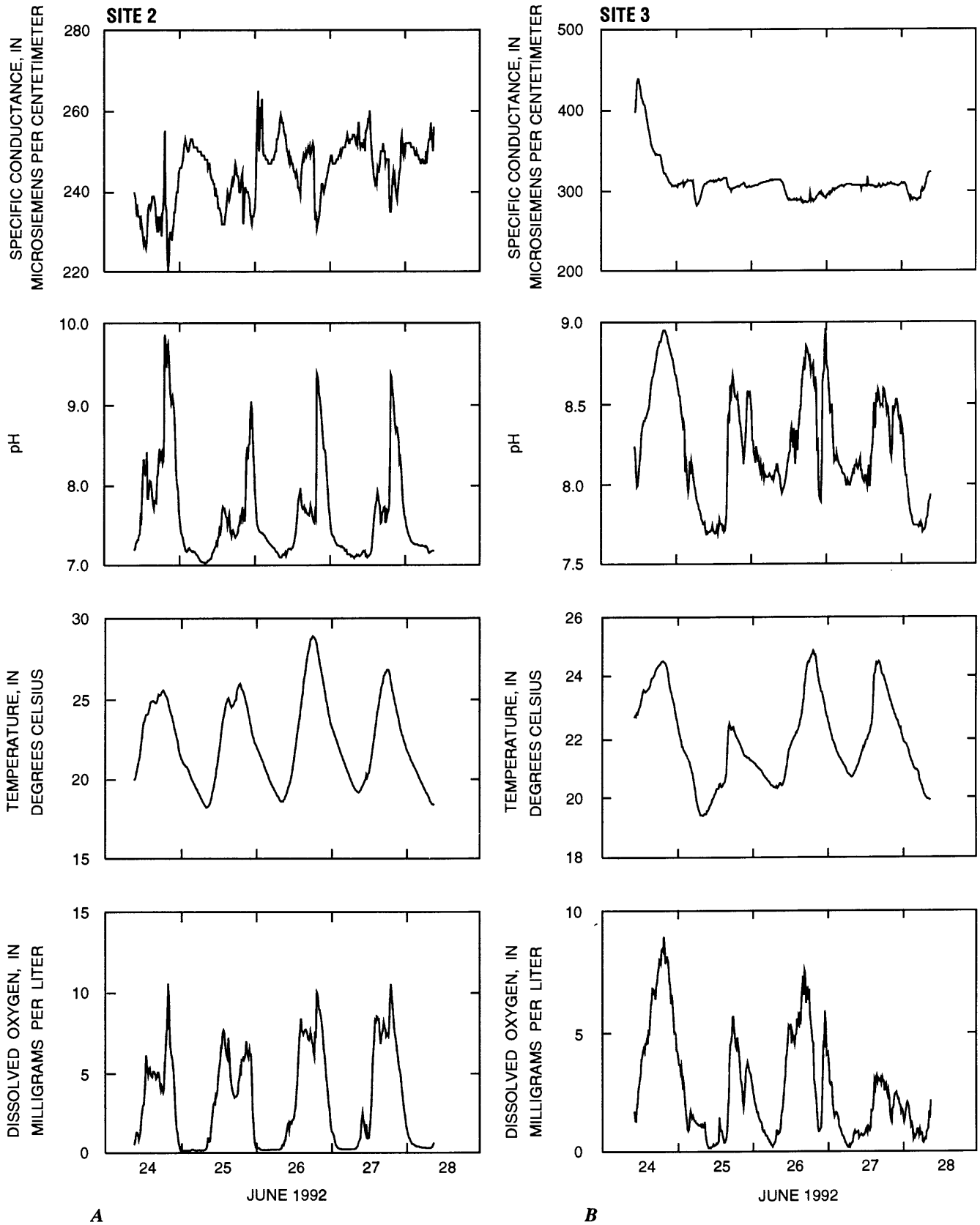
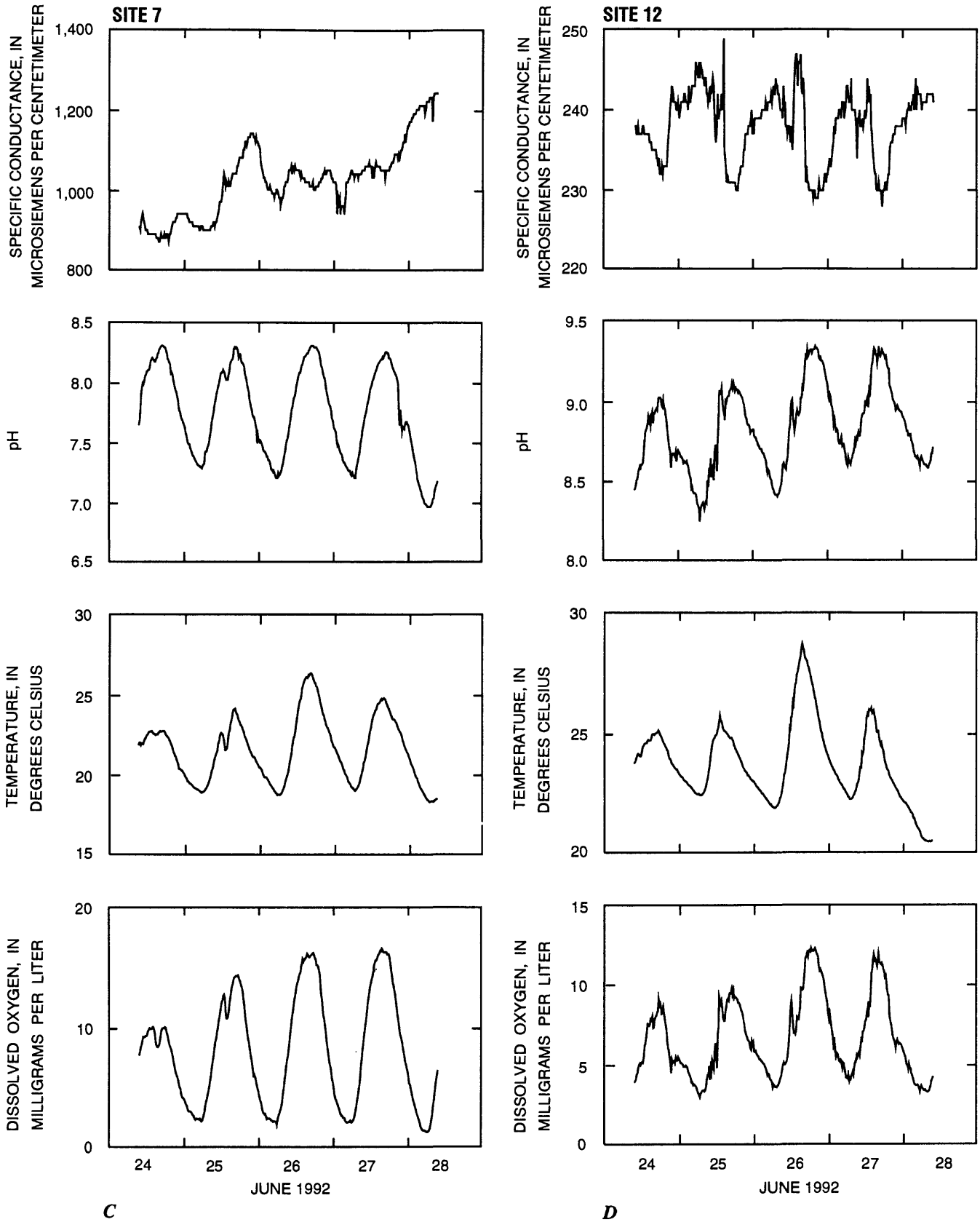


Figure 8. Diel specific conductance, pH, temperature, and dissolved-oxygen data from selected sites in Klamath Basin, 1992. Scales vary by site for each property or constituent. Location of sites in figure 1.



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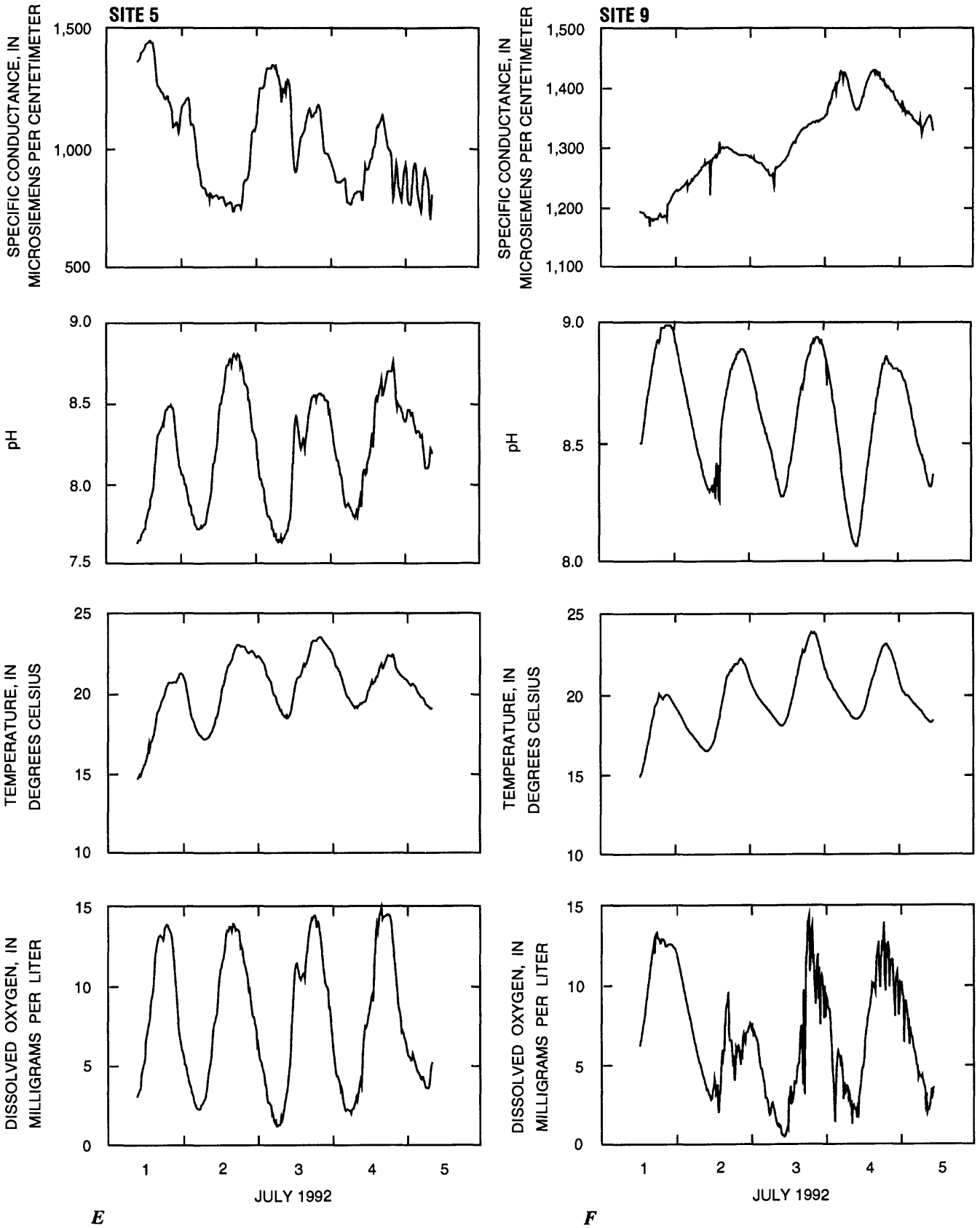

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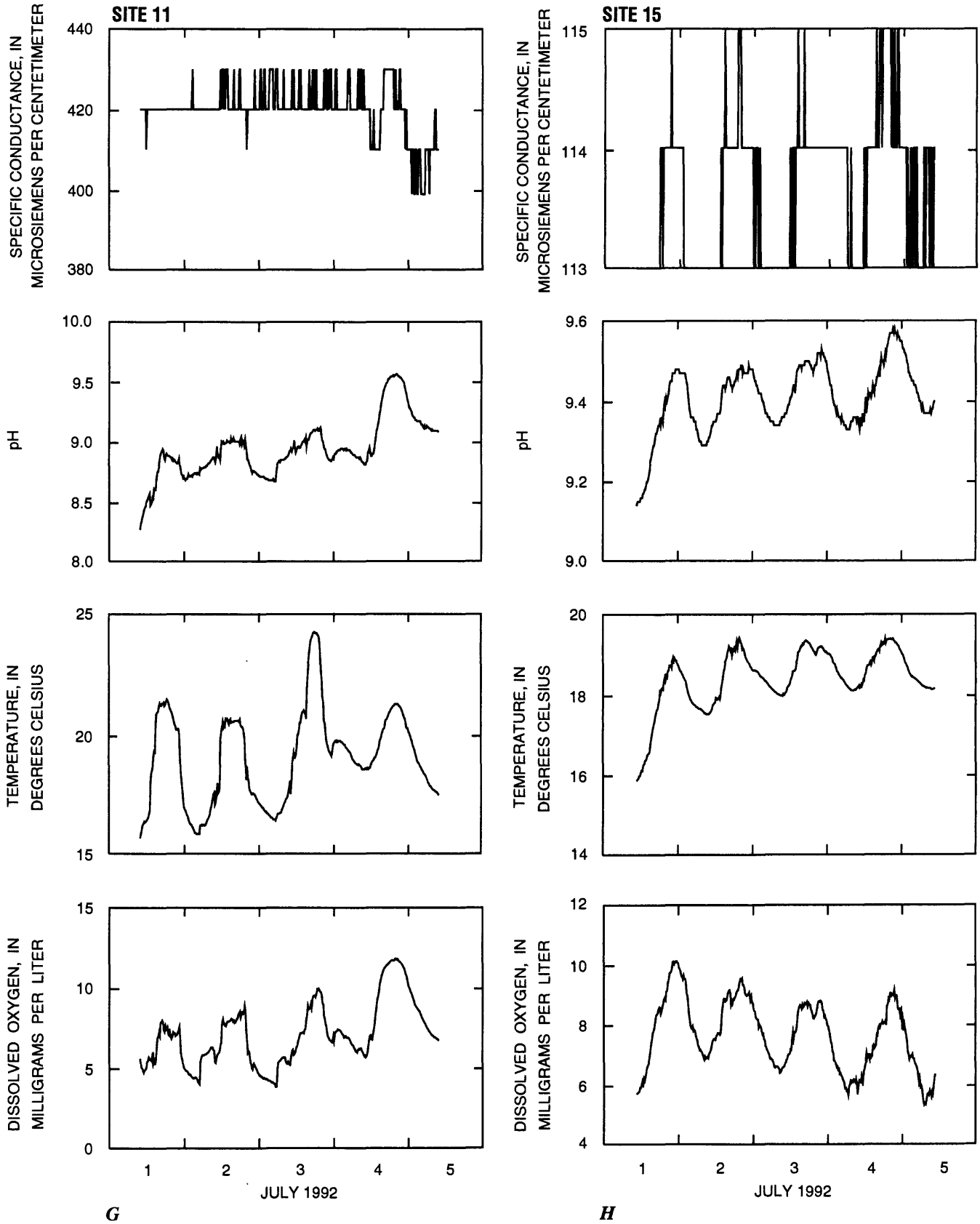

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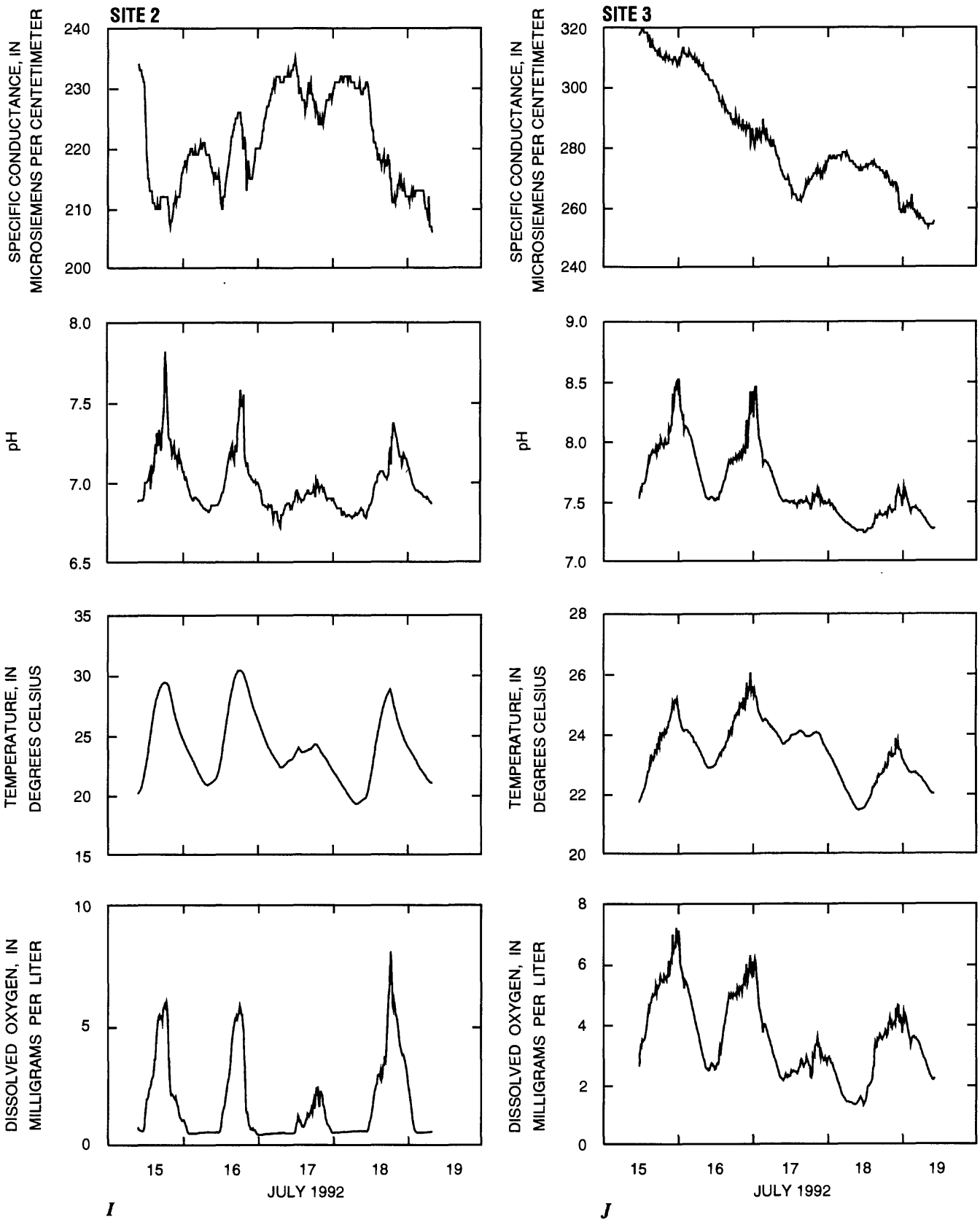

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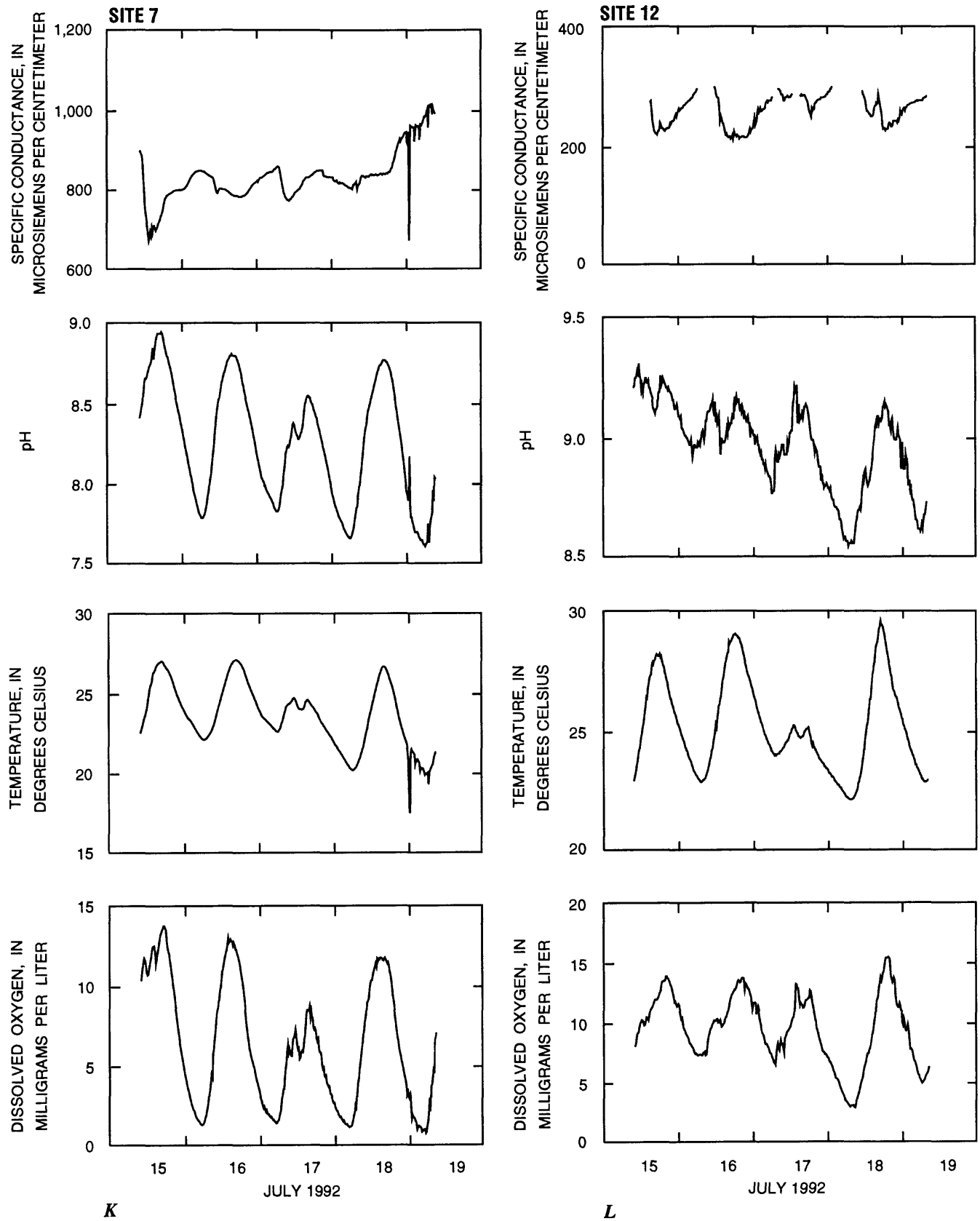

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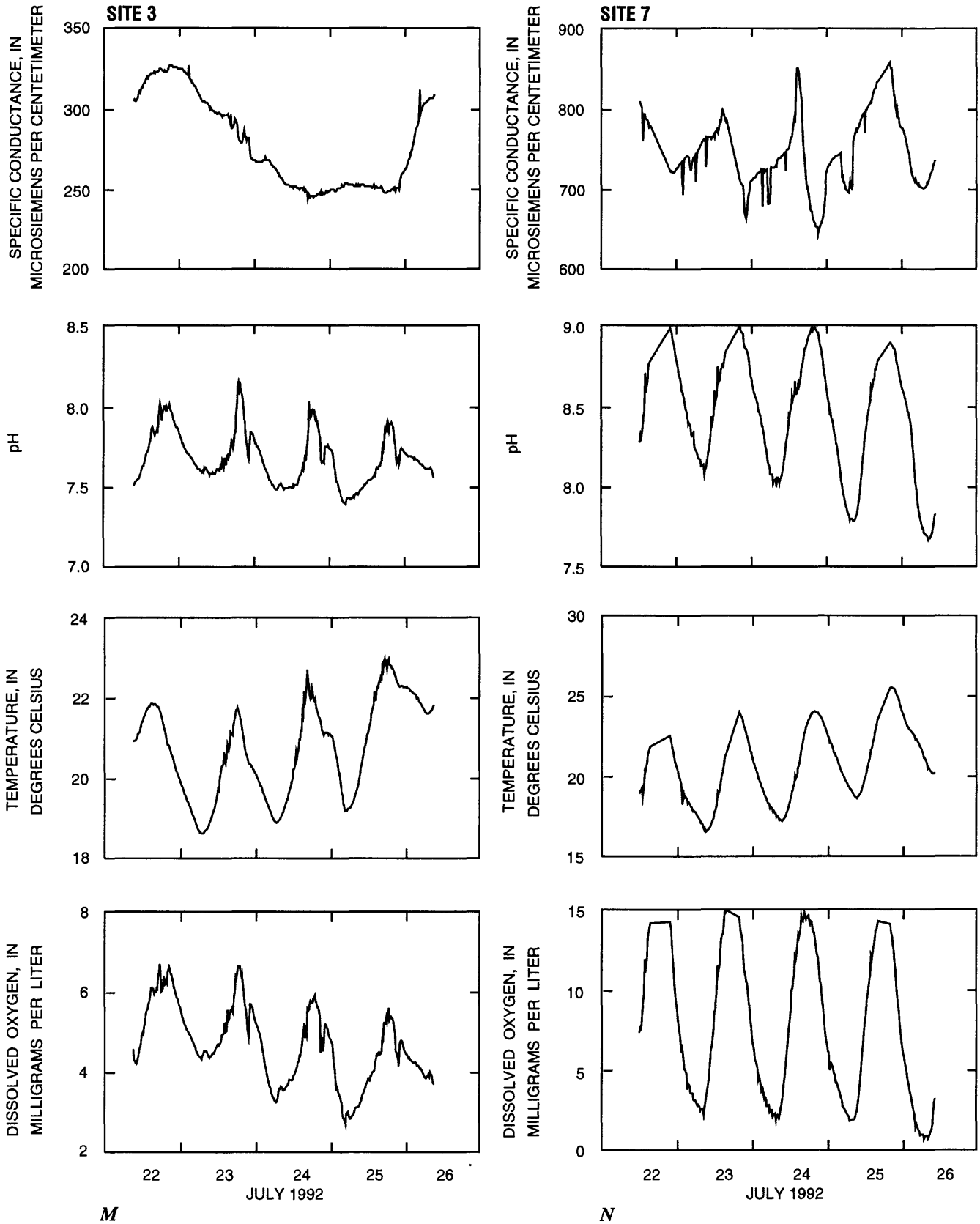

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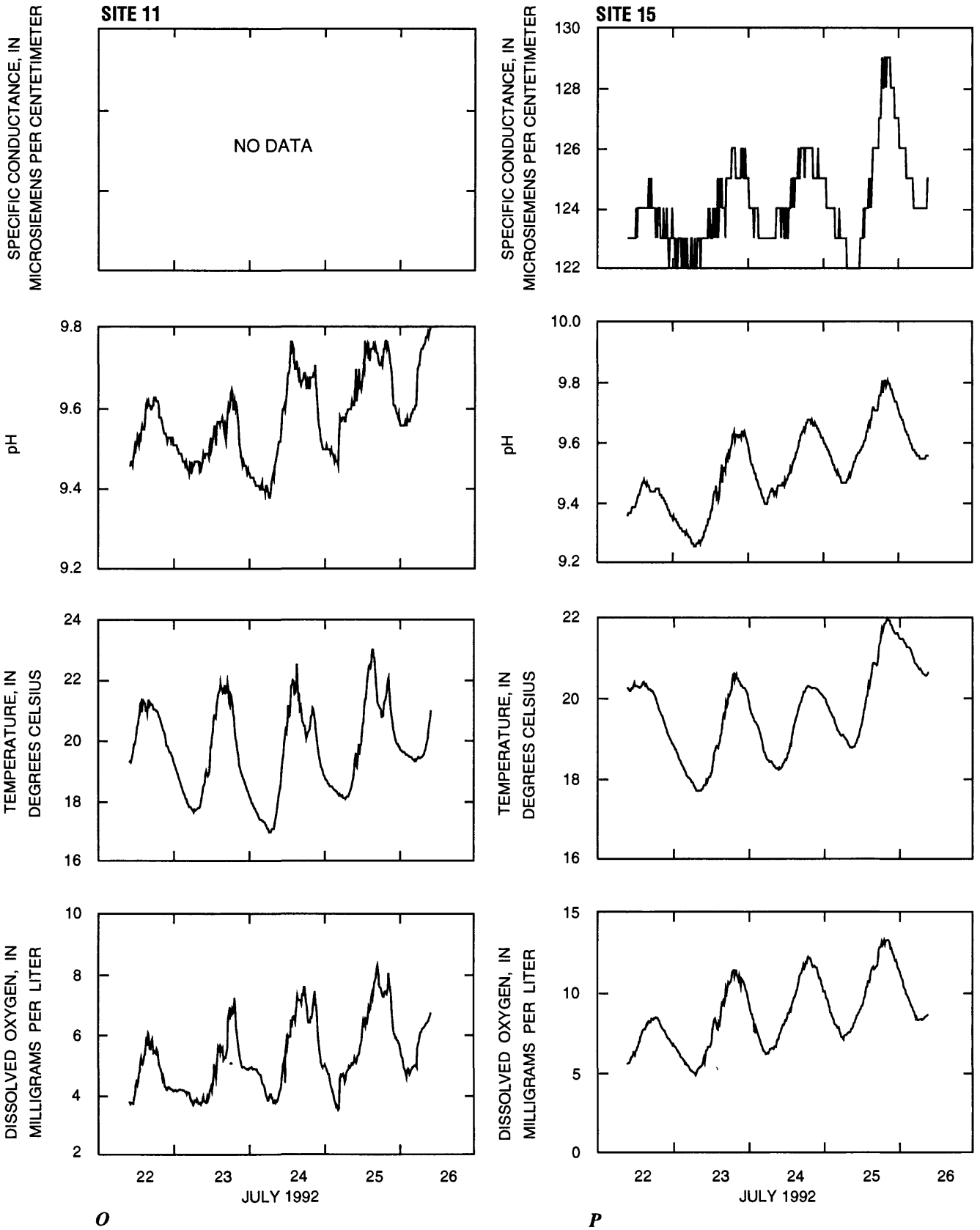

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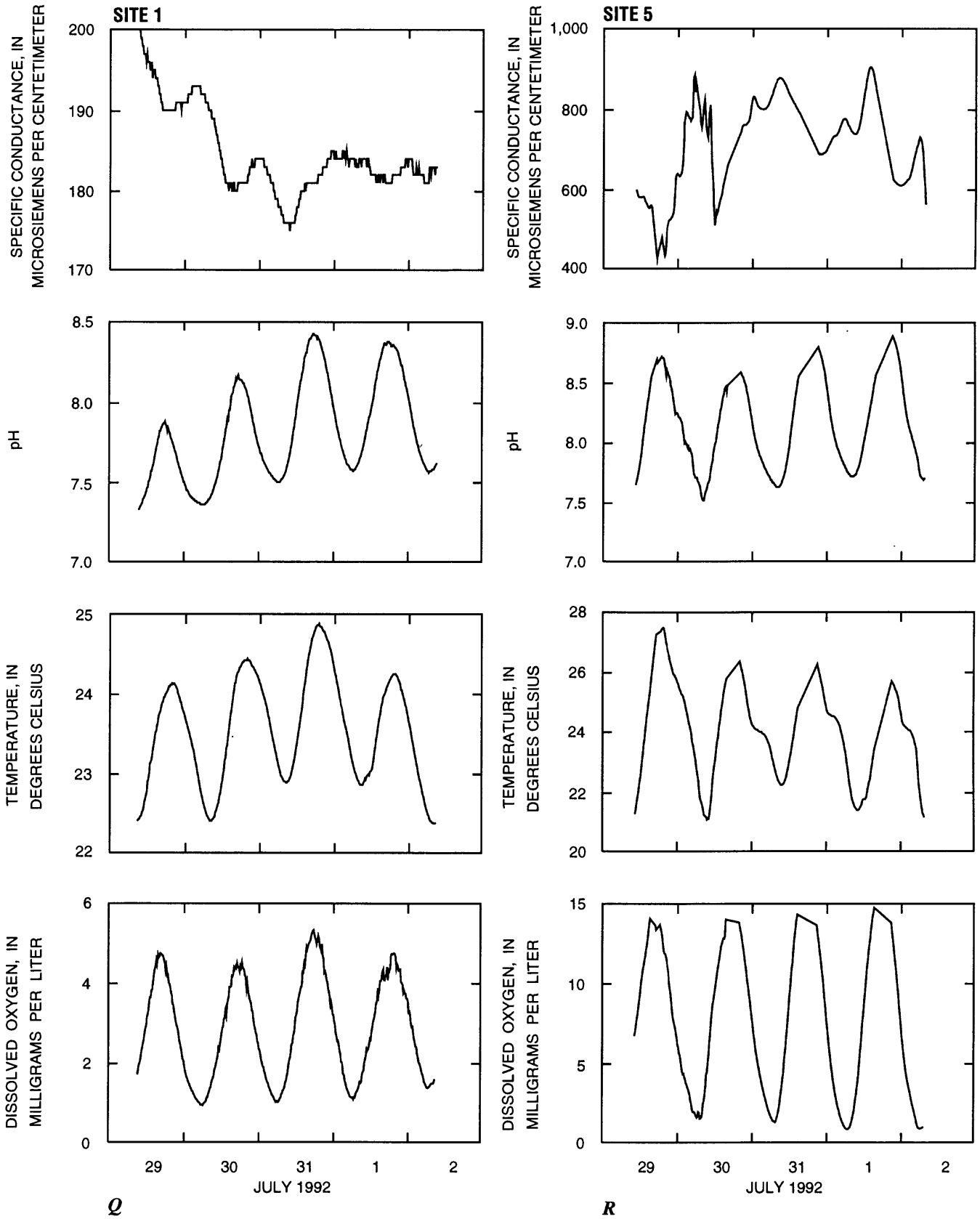

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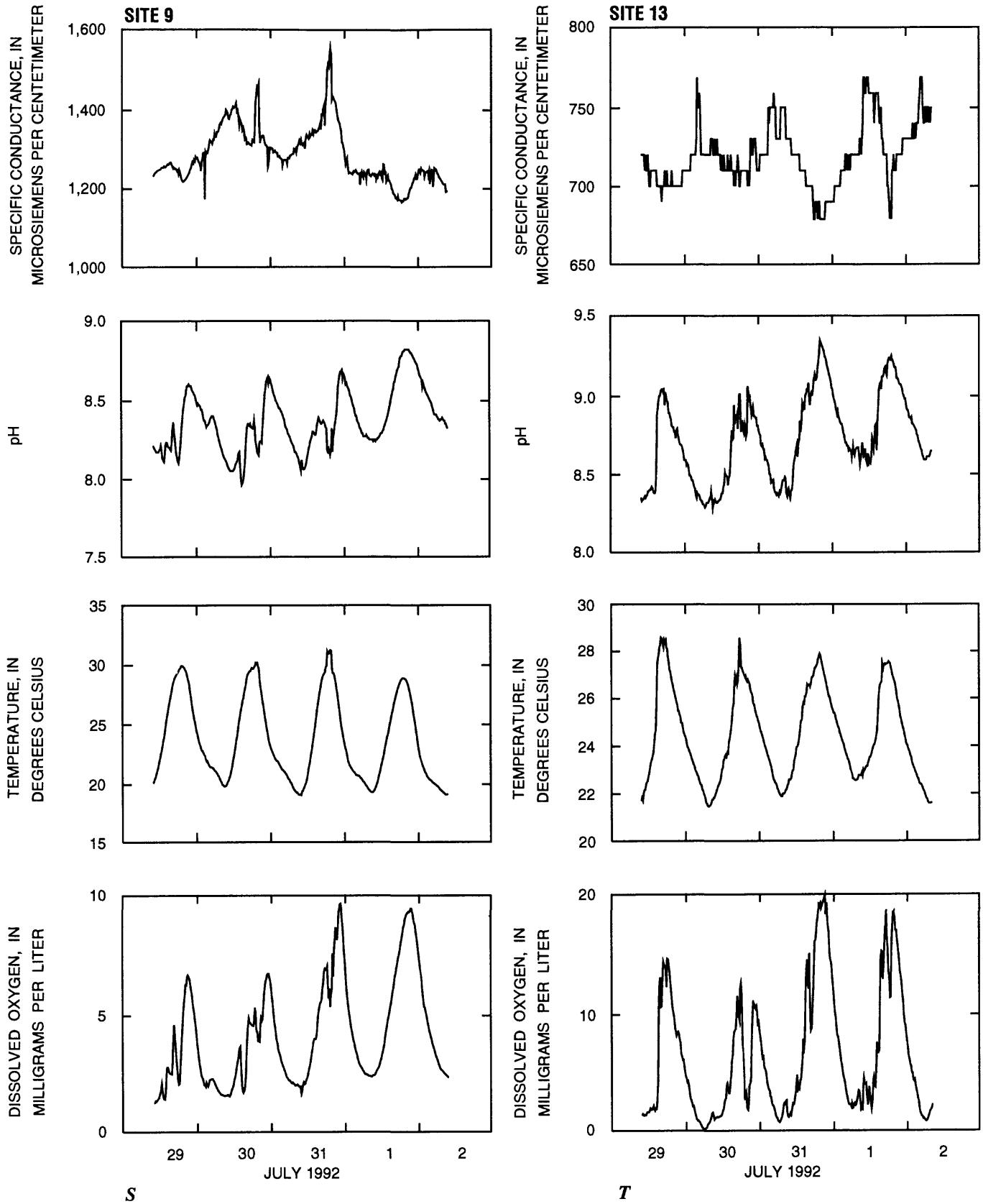

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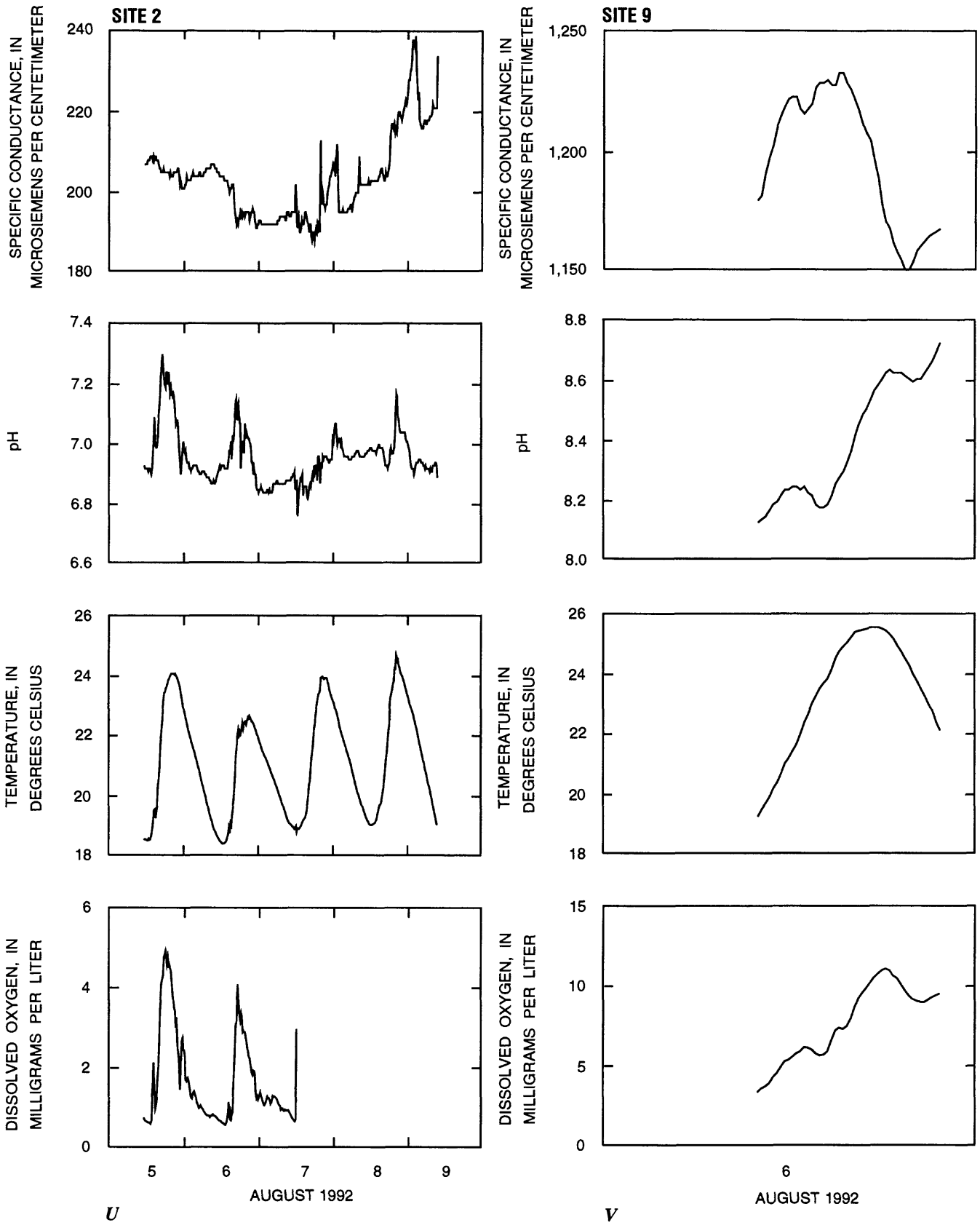

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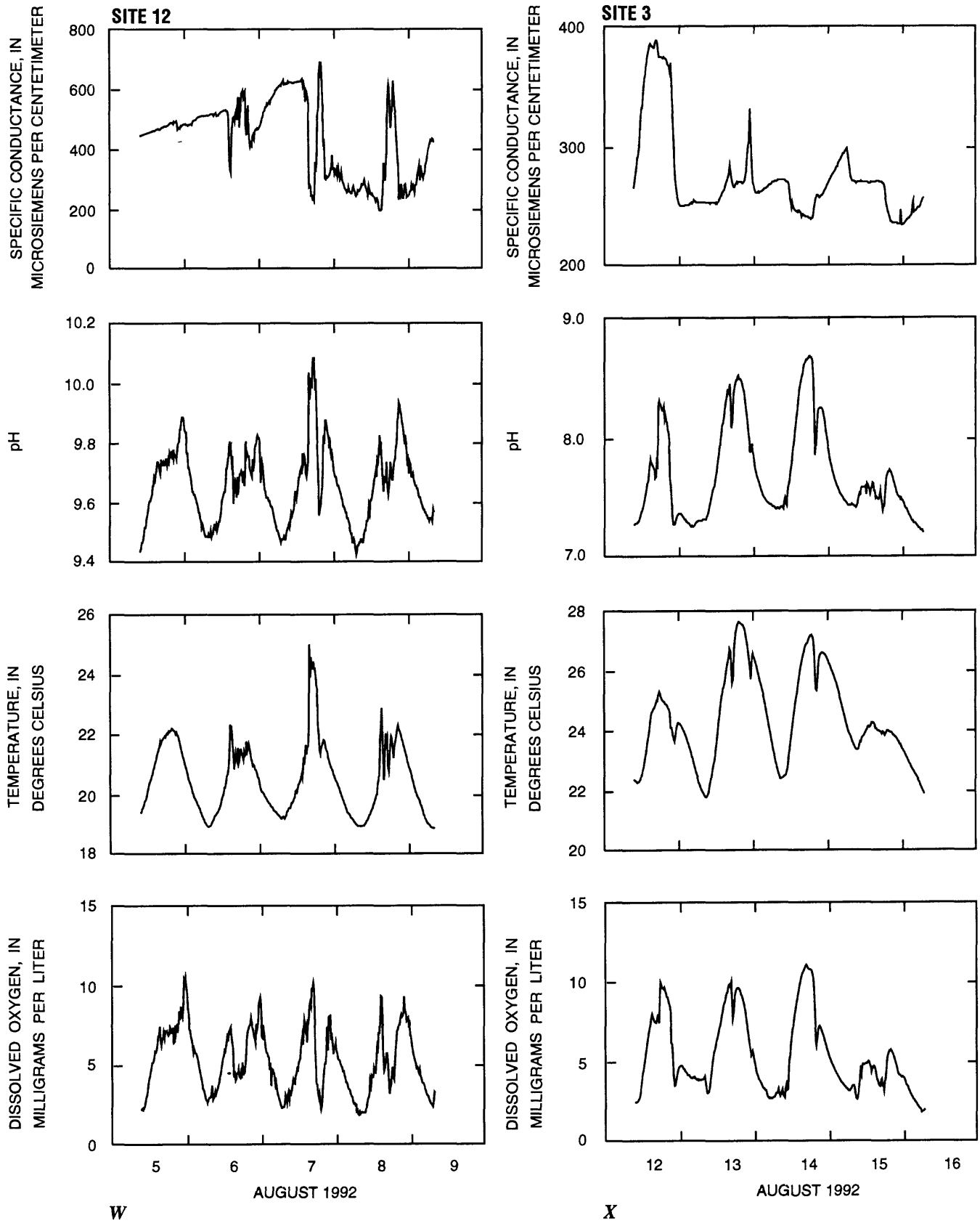

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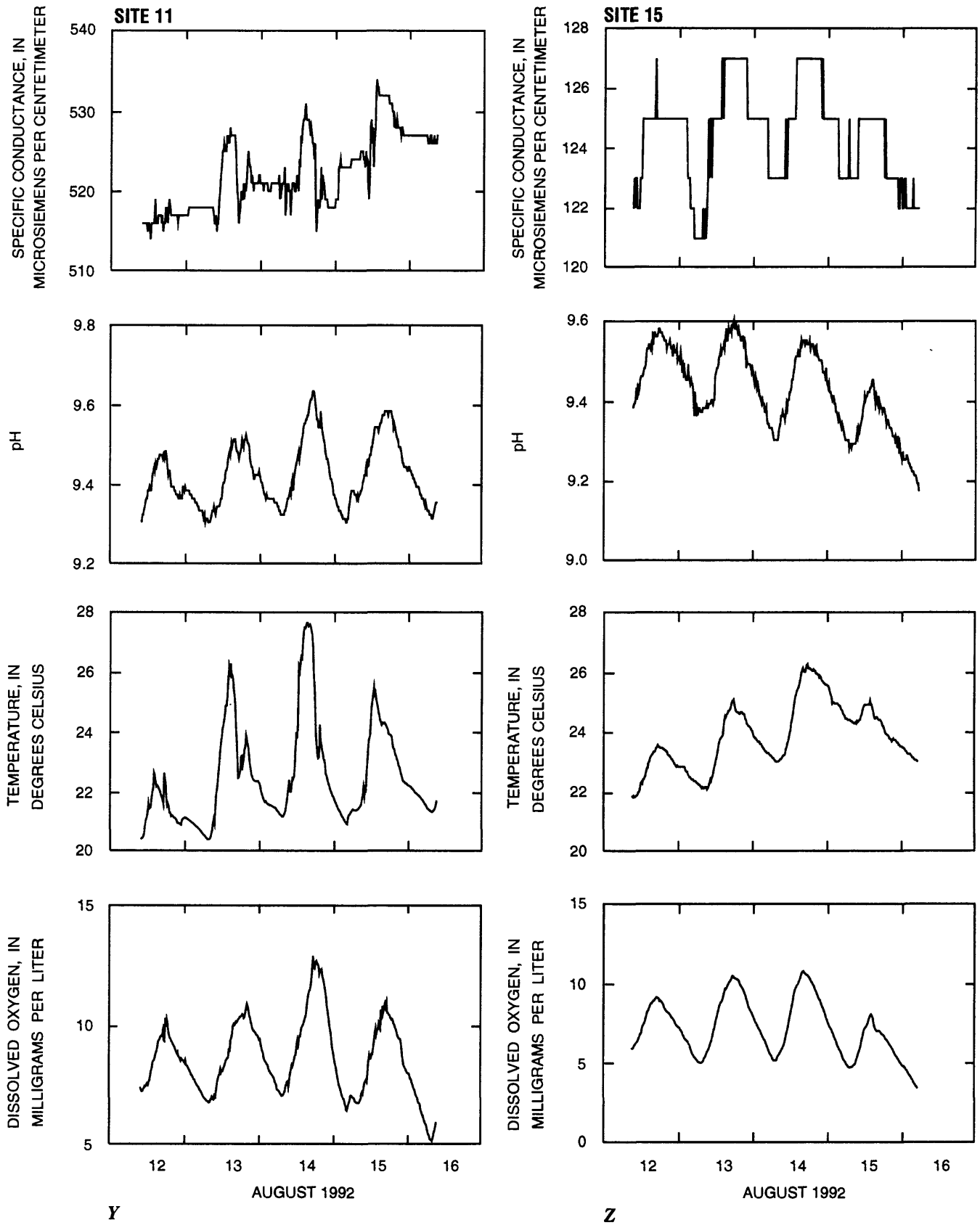

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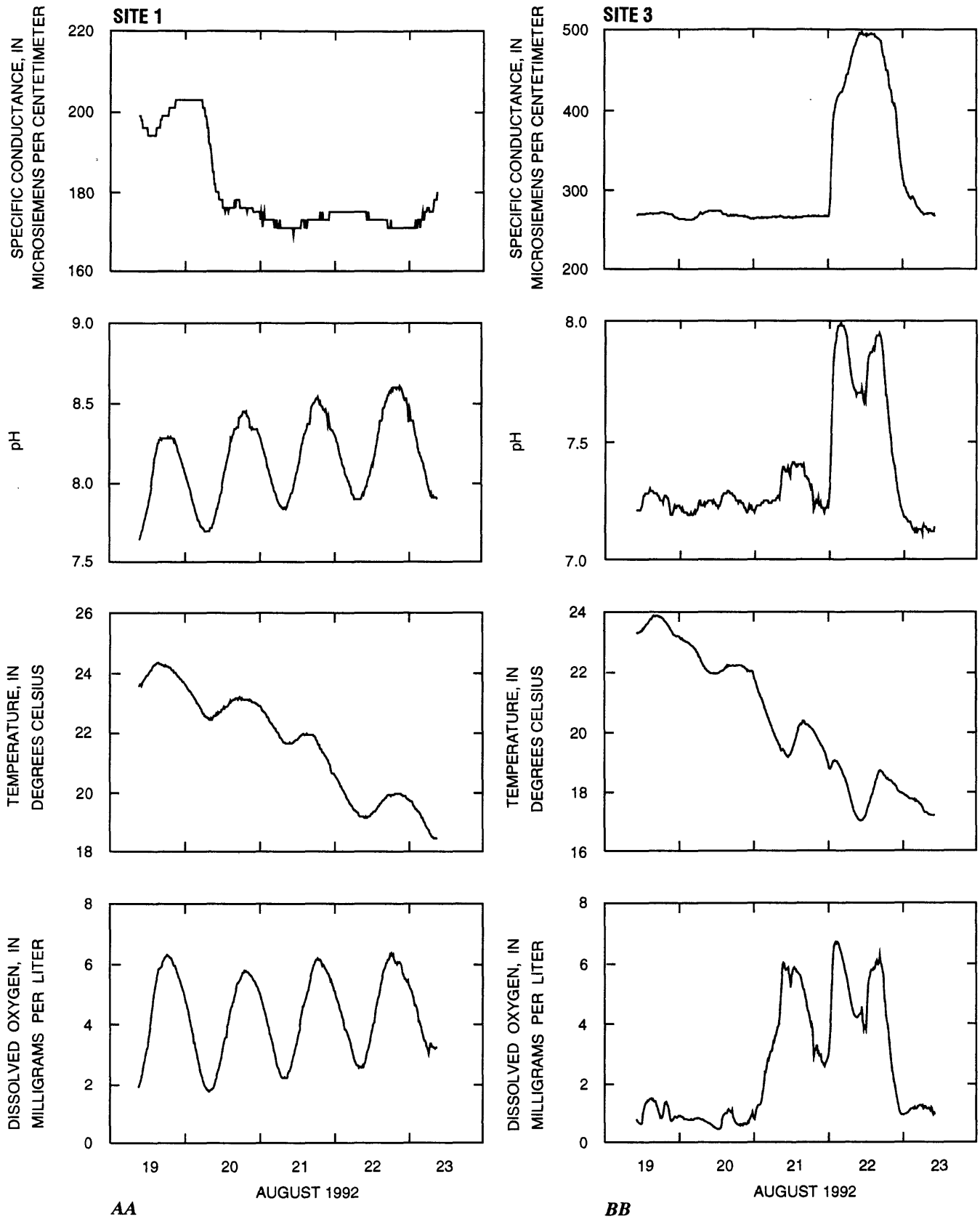

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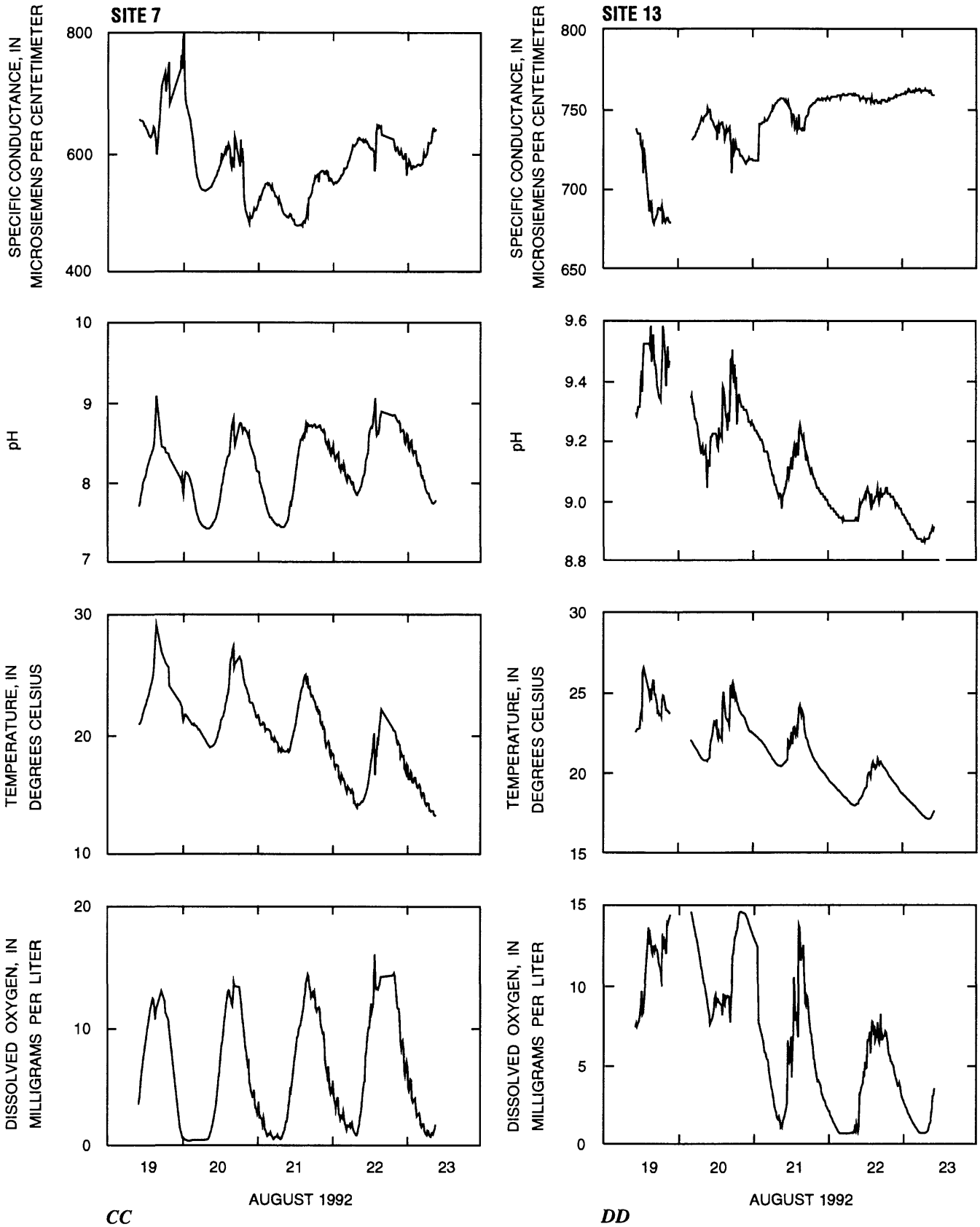

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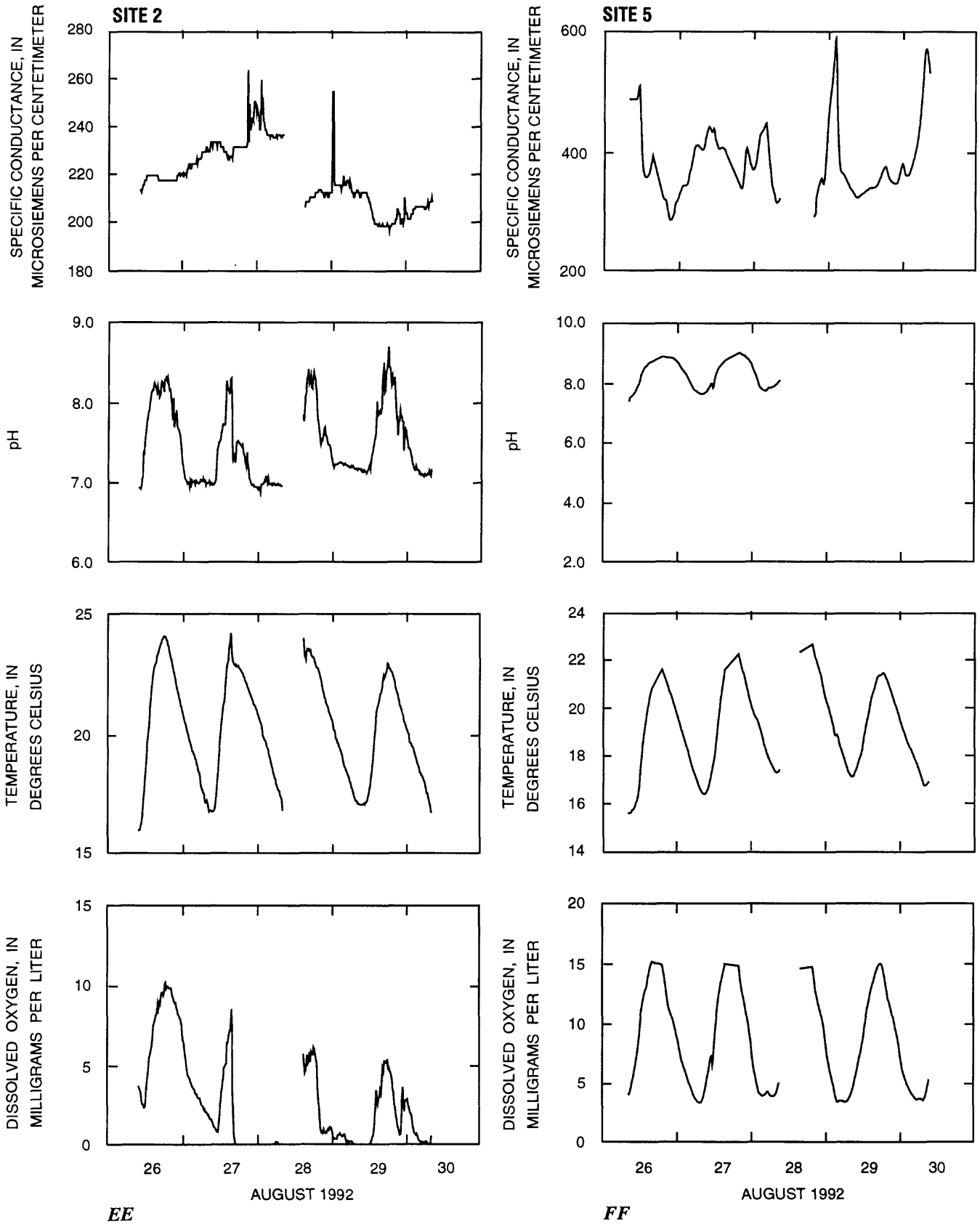

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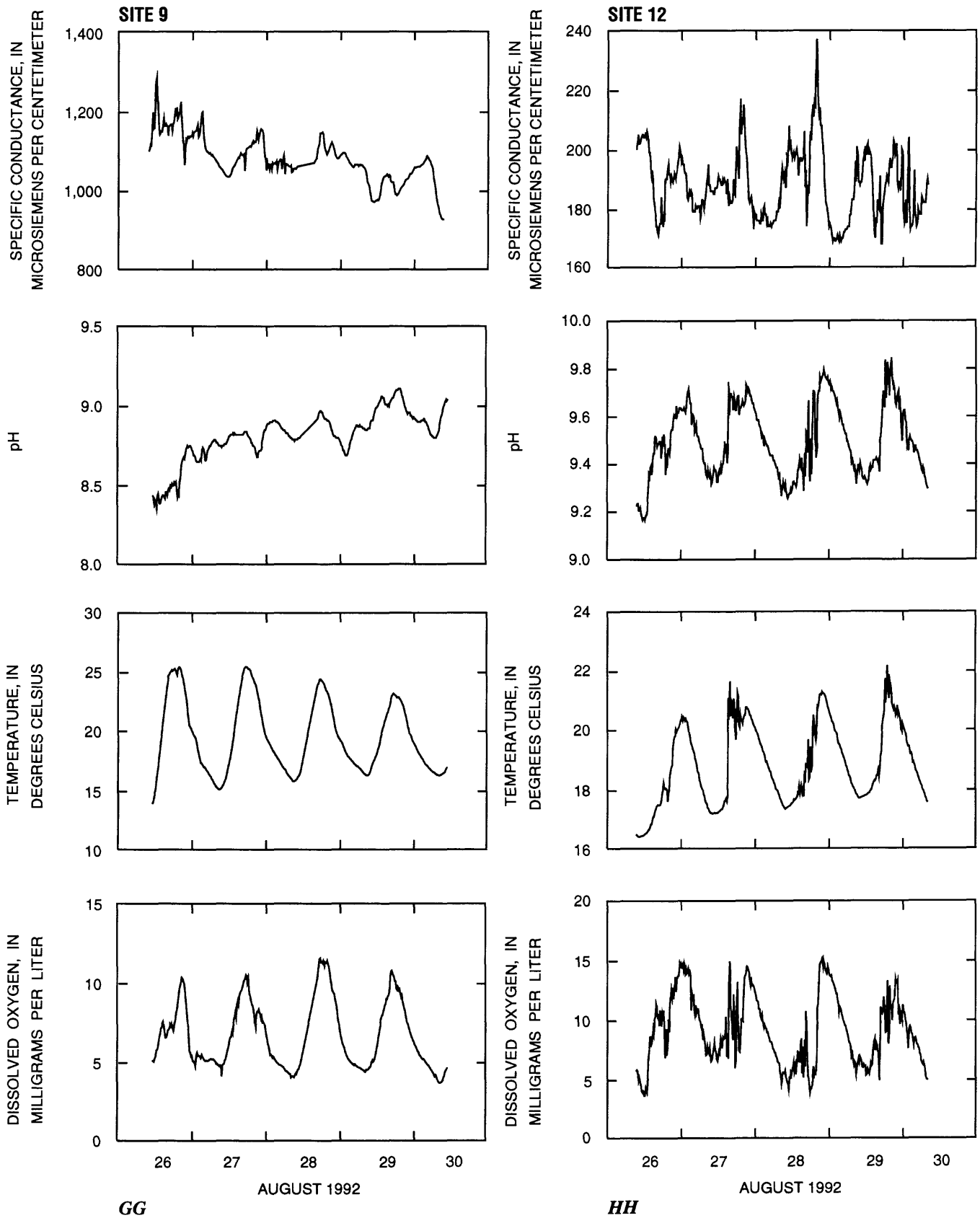

Figure 8. *Continued.*

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TABLES

Table 1. Surface-water sampling sites and types of samples collected at each site, 1990-92

[See figures 1, 4, and 5 for site locations. Data from U.S. Geological Survey. Abbreviations: USGS, U.S. Geological Survey; NWR, National Wildlife Refuge. USGS identification No.: Unique number for each site based on the latitude and longitude of the site. First six digits are latitude, next seven digits are longitude, and final two digits are a sequence number to uniquely identify each site]

Site No.	USGS site identification No.	Location	Types of samples collected
		Primary sampling sites	
1	420037121333001	J Canal below Anderson Rose Dam	Bioassay, biological tissue, invertebrates, water
2	415635121301401	Lost River at Tule Lake	Bioassay, invertebrates, water
3	415614121294201	N Canal at pump R	Bioassay, biological tissue, fish, invertebrates, water
4	415615121294901	Tule Lake at pump R	Bioassay, fish, water
5	415400121294201	101-C Drain at pump 11	Bioassay, invertebrates, water
6	415400121294801	Tule Lake at pump 11	Bioassay, water
7	415217121294001	101-B Drain at pump 10	Bioassay, fish, invertebrates, water
8	415217121294901	Tule Lake at pump 10	Bioassay, sediment, water
9	415223121323501	102 Drain at pump 9	Bioassay, invertebrates, sediment, water
10	415227121323501	Tule Lake at pump 9	Bioassay, sediment, water
11	415526121335101	Channel from upper sump Tule Lake to pump D	Bioassay, fish, invertebrates, water
12	415633121420601	Klamath Straits drain at Lower Klamath NWR	Bioassay, fish, invertebrates, sediment, water
13	420232121474501	Klamath Straits drain at pump E	Bioassay, biological tissue, invertebrates, sediment, water
15	421404121480101	A Canal at Upper Klamath Lake	Bioassay, sediment, water
		Additional sites at Tule Lake NWR	
UTL2	415426121330401	Upper sump	Invertebrates, sediment
UTL3	415335121330301	Upper sump	Invertebrates, sediment, water
UTL4	415051121280901	Upper sump	Invertebrates, sediment
UTL5	415519121314701	Upper sump	Invertebrates, sediment, water
UTL6	415426121314601	Upper sump	Invertebrates, sediment
UTL7	415334121314501	Upper sump	Invertebrates, sediment, water
UTL8	415242121314501	Upper sump	Invertebrates, sediment
UTL9	415427121300901	Upper sump	Invertebrates, sediment
UTL10	415334121300801	Upper sump	Invertebrates, sediment
UTL11	415242121300701	Upper sump	Invertebrates, sediment
UTL13	415611121314601	Upper sump	Invertebrates, sediment
LTL2	415054121291101	Lower sump	Invertebrates, sediment
LTL4	415051121280901	Lower sump	Invertebrates, sediment
LTL5	415051121265801	Lower sump	Invertebrates, sediment
LTL6	415021121251501	Lower sump	Invertebrates, sediment
SSD1	414949121255001	South Side drain below lower sump	Bioassay, invertebrates, sediment
JCN1	415257121235101	J Canal above lower sump	Invertebrates, sediment
NC1	415609121291301	N Canal above Tule Lake	Invertebrates, sediment
B		Southwest corner of lower sump	Sediment
		Additional sites at Lower Klamath NWR	
4C	415732121401101	Unit 4	Sediment, water
9A	415603121384801	Unit 9	Sediment, water
13B		Unit 13B	Sediment
LK1	415821121390701	Unit 4A inflow	Water
LK2	415518121373401	P Canal near unit 9C	Water

Table 1. Surface-water sampling sites and types of samples collected at each site, 1990-92--*Continued*

Site No.	USGS site identification No.	Location	Types of samples collected
		Additional sites at Lower Klamath NWR--*Continued*	
LK3	415820121390301	Pump E inflow to unit 4A	Water
LK4	415635121420801	Unit 7B outflow	Sediment, water
LK5	415552121361001	P Canal at P1 Canal	Water
P1	415907121370101	P1 Canal at White Lake	Water
		Additional sites on Lost River	
LR0	415714121301401	Lost River above Tule Lake	Sediment, water
LR1		Lost River at California/Oregon State line	Sediment
LR2		Drain outfall into Lost River at California/Oregon State line	Sediment
LR3		Lost River below Anderson Rose Dam	Fish, sediment
LR4		Lost River below Anderson Rose Dam	Sediment
LR5	420122121355701	Lost River at Merrill, Oregon	Sediment, water
LR6	420225121372501	Lost River near Lost River diversion canal	Fish, water
		Additional sites on Clear Lake	
Cl1	415348121101501	Clear Lake	Invertebrates, sediment
Cl2	415501121045501	Clear Lake	Invertebrates, sediment
		Sites on Tule Lake NWR leaselands	
LL6		102-C bypass drain at field 69, lower sump fields	Bioassay, water
LL7		102-C-1 bypass drain at field 68, lower sump fields	Bioassay, water
LL7A		102-C-1 bypass drain at field 69, lower sump fields	Bioassay, water
LL8		102-C-2 drain at field 68, lower sump fields	Bioassay, water
LL10	415101121303701	102-C-2 drain near SE corner of field 70, lower sump fields	Bioassay, water
LL13		102-C-1 drain at field 37, lower sump fields	Bioassay, water
LL14		102-C-1 drain at field 32, lower sump fields	Bioassay, water
LL16	415016121302901	R canal near SE corner of field 35, lower sump fields	Bioassay, water
LL17		R-1 canal at field 35, lower sump fields	Bioassay, water
LL18		102-C-1-b drain at field 36, lower sump fields	Bioassay, water
LL25		Q-3-b canal at field 47, lower sump fields	Bioassay, water
LL26	415010121325701	Q-3 canal near SW corner of field 47, lower sump fields	Bioassay, water
LL27		102-H drain at field 47, lower sump fields	Bioassay, water
LL28		102-H drain at field 48, lower sump fields	Bioassay, water
LL29		102-H drain at field 49, lower sump fields	Bioassay, water
LL30		102-H drain at field 50, lower sump fields	Bioassay, water
LL31	415028121330301	Q-3-a canal near SW corner of field 46, lower sump fields	Bioassay, water
LL32		Q-3 canal near SW corner of field 46, lower sump fields	Bioassay, water
LL33		102-G drain at field 39, lower sump fields	Bioassay, water
LL34	415059121312201	102 drain near SW corner of field 29, lower sump fields	Bioassay, water
LL35		102-C-1-b drain at field 30, lower sump fields	Bioassay, water
LL41		102 drain at field 15, lower sump fields	Bioassay, water
LL46	415550121291301	101 drain near SW corner of field 1, League of Nations fields	Bioassay, water
LL56		N-1 canal at field 4, League of Nations fields	Bioassay, water
LL57	415512121291201	N-1 canal at field 3, League of Nations fields	Bioassay, water
LL70		N-4 canal at field 19, League of Nations fields	Bioassay, water

Table 1. Surface-water sampling sites and types of samples collected at each site, 1990-92--*Continued*

Site No.	USGS site identification No.	Location	Types of samples collected
		Sites on Tule Lake NWR leaselands--*Continued*	
LL71		101-C-4 drain at field 26, League of Nations fields	Bioassay, water
LL77		101-C-2 drain at field 19, League of Nations fields	Bioassay, water
LL78		101-C-2 drain at field 20, League of Nations fields	Bioassay, water
LL79	415401121280001	101-C drain near SE corner of field 20, League of Nations fields	Bioassay, water
LL87		N-12-c canal at field 54, Frog Pond fields	Bioassay, water
LL88		N-12-c canal at field 53, Frog Pond fields	Bioassay, water
LL89		N-12-c canal at field 52, Frog Pond fields	Bioassay, water
LL90	415309121280001	N-12-c canal near SE corner of field 51, Frog Pond fields	Bioassay, water
LL91		N-12-c canal at field 50, Frog Pond fields	Bioassay, water
LL92		N-12-c canal at field 49, Frog Pond fields	Bioassay, water
LL93		N-12 canal at field 49, Frog Pond fields	Bioassay, water
LL146	415135121255401	N-15-b canal near NE corner of field 84, Frog Pond fields	Bioassay, water
LL148		N-15-b canal at field 84, Frog Pond fields	Bioassay, water
LL172	415142121264601	101-B-5 drain near NE corner of field 72, Frog Pond fields	Bioassay, water
LL173	415152121250101	101-B-5-a drain near SE corner of field 95, Frog Pond fields	Bioassay, water
LL174		101-B-5-a drain at field 95, Frog Pond fields	Bioassay, water
LL175		101-B-5-d drain at field 91, Frog Pond fields	Bioassay, water
LL176	415338121250502	N canal near NE corner of field 91, Frog Pond fields	Bioassay, water
LL201	415126121305001	R canal near NW corner of field 12, lower sump fields	Bioassay, water
LL205	415056121330801	Q canal near SW corner of field 22, lower sump fields	Bioassay, water
LL206	415028121330303	102-F drain near NW corner of field 46, lower sump fields	Bioassay, water
LL214	415102121304802	R canal near SW corner of field 31, lower sump fields	Bioassay, water
LL215	415126121305002	R canal near SW corner of field 12, lower sump fields	Bioassay, water
LL218	415553121280201	N-4 canal near SE corner of field 15, League of Nations fields	Bioassay, water
LL220	415507121272601	N-6 canal near SE corner of field 22, League of Nations fields	Bioassay, water
LL221	415451121272601	N-6 canal near SE corner of field 23, League of Nations fields	Bioassay, water
LL222	415500121264902	101-C-6 drain near NW corner of field 27, League of Nations fields	Bioassay, water
LL223	415500121264901	101-C-6 drain near SW corner of field 27, League of Nations fields	Bioassay, water
LL224	415400121291101	101-C drain near SW corner of field 7, League of Nations fields	Bioassay, water
LL225	415401121283801	101-C drain near SE corner of field 14, League of Nations fields	Bioassay, water
LL226	415309121280002	101-B-2 drain near NW corner of field 51, Frog Pond fields	Bioassay, water
LL227	415253121280001	101-B-2 drain near NW corner of field 52, at Frog Pond fields	Bioassay, water
LL230	415342121291101	N-12 canal near NW corner of field 36, Frog Pond fields	Bioassay, water
LL232	415327121272501	N-12-b canal near NE corner of field 58, Frog Pond fields	Bioassay, water
LL233	415200121272401	N-12-b canal near NE corner of field 63, Frog Pond fields	Bioassay, water
LL234	415200121272402	N-12-b canal near NE corner of field 63, Frog Pond fields	Bioassay, water
LL235	415142121272401	N-12-b canal near SE corner of field 64, Frog Pond fields	Bioassay, water
LL237		101-B-5-b drain at field 93, Frog Pond fields	Bioassay, water
LL238		101-B-5-b drain at field 93, Frog Pond fields	Bioassay, water
LL248	415028121330304	102-F drain near NE corner of field 46, lower sump fields	Bioassay, water
LL251	415102121304801	R canal near SE corner of field 31, lower sump fields	Bioassay, water
LL255	415313121250403	101-B-5-c drain near NE corner of field 92, Frog Pond fields	Bioassay, water
LL258	415313121250404	N-13 canal near NW corner of field 92, Frog Pond fields	Bioassay, water
LL259	415313121250401	N-13 canal near NW corner of field 92, Frog Pond fields	Bioassay, water
LL260	415313121250402	N canal near NE corner of field 92, Frog Pond fields	Bioassay, water
LL261		101-B-5-d drain at field 85, Frog Pond fields	Bioassay, water
LL262	415314121252802	N-13 canal near NE corner of field 86, Frog Pond fields	Bioassay, water

Table 2. Principal biological tissue sampling locations, 1990-92

[Sample locations shown in figures 1, 2, and 3. NWR, National Wildlife Refuge]

Sample Type	Sample No.	Location
	Aquatic invertebrates	
Backswimmer	LK6BS	Lower Klamath NWR, near site 12
Chironomid larvae	TLCH07A	Upper sump, Tule Lake, near site UTL7
	TLCH08A	Upper sump, Tule Lake, near site UTL8
Leeches	TLL07A	Upper sump, Tule Lake, near site UTL7
Waterboatman	LK6WB	Lower Klamath NWR, near site 12
	Fish	
Fathead minnow	12FH01J	Klamath Straits drain near site 12, Lower Klamath NWR
	12FH02J	Klamath Straits drain near site 12, Lower Klamath NWR
	12FH03J	Klamath Straits drain near site 12, Lower Klamath NWR
Tui chub	CLTC01A	Lost River below Clear Lake Dam
	CLTC01J	Lost River below Clear Lake Dam
	CLTC02A	Lost River below Clear Lake Dam
	CLTC02J	Lost River below Clear Lake Dam
	CLTC03A	Lost River below Clear Lake Dam
	CLTC03J	Lost River below Clear Lake Dam
	2TC01A	Lost River below Anderson Rose Dam
	2TC01J	Lost River below Anderson Rose Dam
	2TC02A	Lost River below Anderson Rose Dam
	2TC02J	Lost River below Anderson Rose Dam
	2TC03A	Lost River below Anderson Rose Dam
	2TC03J	Lost River below Anderson Rose Dam
	3TC01J	N Canal near site 3
	3TC02J	N Canal near site 3
	3TC03J	N Canal near site 3
	7TC01J	101-B drain near site 7
	7TC02J	101-B drain near site 7
	7TC03J	101-B drain near site 7
	11TC01J	Channel to pump D near site 11
	11TC02J	Channel to pump D near site 11
	11TC03J	Channel to pump D near site 11
	Birds	
American avocet egg	4BA1	Lower Klamath NWR, unit 4B
	4BA2	Lower Klamath NWR, unit 4B
	4BA3	Lower Klamath NWR, unit 4B
	4BA4	Lower Klamath NWR, unit 4B
	4BA5	Lower Klamath NWR, unit 4B
	4BA6	Lower Klamath NWR, unit 4B
	4BA7	Lower Klamath NWR, unit 4B
	4BA8	Lower Klamath NWR, unit 4B
	4BA9	Lower Klamath NWR, unit 4B
	4BA10	Lower Klamath NWR, unit 4B
	4BA11	Lower Klamath NWR, unit 4B
	4BA12	Lower Klamath NWR, unit 4B

Table 2. Principal biological tissue sampling locations, 1990-92--*Continued*

Sample Type	Sample No.	Location
	Birds--*Continued*	
American coot egg	7AC1	Lower Klamath NWR, unit 7A
	7AC2	Lower Klamath NWR, unit 7A
	7AC3	Lower Klamath NWR, unit 7A
	7AC4	Lower Klamath NWR, unit 7A
	7AC5	Lower Klamath NWR, unit 7A
	LK12CC1	Lower Klamath NWR, unit 12C
	LK12CC2	Lower Klamath NWR, unit 12C
	LK12CC3	Lower Klamath NWR, unit 12C
	LK12CC4	Lower Klamath NWR, unit 12C
	LK12CC5	Lower Klamath NWR, unit 12C
Eared grebe egg	92TLEG4A	Upper sump, Tule Lake
	92TLEG4B	Upper sump, Tule Lake
	92TLEG9A	Upper sump, Tule Lake
	92TLEG9B	Upper sump, Tule Lake
Egret egg	E1	Upper sump, Tule Lake
Mallard egg	M441	Lower Klamath NWR, unit 8A
	M447	Lower Klamath NWR, unit 12A
	M459A	Lower Klamath NWR, unit 7B
	M459B	Lower Klamath NWR, unit 7B
	M499A	Lower Klamath NWR, unit 6B
	M499B	Lower Klamath NWR, unit 6B
	M516A	Lower Klamath NWR, unit 6B
	M516B	Lower Klamath NWR, unit 6B
	M563	Lower Klamath NWR, unit 6B
	M574	Lower Klamath NWR, unit 6B
	92M2	Lower Klamath NWR, unit 13A
Western grebe egg	3AG1	Lower Klamath NWR, unit 3A
	3AG2	Lower Klamath NWR, unit 3A
	3AG3	Lower Klamath NWR, unit 3A
	3AG4	Lower Klamath NWR, unit 3A
	3AG5	Lower Klamath NWR, unit 3A
	3AG6	Lower Klamath NWR, unit 3A
	3AG7	Lower Klamath NWR, unit 3A
	TLG1	Upper sump, Tule Lake
	TLG2	Upper sump, Tule Lake
	TLG3	Upper sump, Tule Lake
	TLG4	Upper sump, Tule Lake
	TLG5	Upper sump, Tule Lake
	TLG6	Upper sump, Tule Lake
	TLG7	Upper sump, Tule Lake
	TLG8	Upper sump, Tule Lake
	TLG9	Upper sump, Tule Lake
	TLG10	Upper sump, Tule Lake
	92TLWG1	Upper sump, Tule Lake
	92TLWG2A	Upper sump, Tule Lake
	92TLWG2B	Upper sump, Tule Lake
	92TLWG3A	Upper sump, Tule Lake
	92TLWG3B	Upper sump, Tule Lake
	92TLWG5A	Upper sump, Tule Lake

Table 2. Principal biological tissue sampling locations, 1990-92--*Continued*

Sample Type	Sample No.	Location
	Birds--*Continued*	
Western grebe egg--*Continued*	92TLWG6A	Upper sump, Tule Lake
	92TLWG7A	Upper sump, Tule Lake
	92TLWG8	Upper sump, Tule Lake
White-faced ibis egg	I1	Lower Klamath NWR, unit 12A
	I2	Lower Klamath NWR, unit 12A
	I3	Lower Klamath NWR, unit 12A
	I4	Lower Klamath NWR, unit 12A
	I5	Lower Klamath NWR, unit 12A
	LK12AI1	Lower Klamath NWR, unit 12A
	LK12AI2	Lower Klamath NWR, unit 12A
	LK12AI3	Lower Klamath NWR, unit 12A
	LK12AI4	Lower Klamath NWR, unit 12A
	LK12AI5	Lower Klamath NWR, unit 12A
	LK12AI7	Lower Klamath NWR, unit 12A
	LK12AI8	Lower Klamath NWR, unit 12A
	LK12AI9	Lower Klamath NWR, unit 12A
	LK12AI10	Lower Klamath NWR, unit 12A
	LK12AI11	Lower Klamath NWR, unit 12A
	LK12AI12	Lower Klamath NWR, unit 12A
	92LKI1	Lower Klamath NWR, unit 13B
	92LKI2	Lower Klamath NWR, unit 13B
	92LKI3	Lower Klamath NWR, unit 12B
	92LKI4	Lower Klamath NWR, unit 13B
	92LKI5	Lower Klamath NWR, unit 13B
	92LKI6	Lower Klamath NWR, unit 13B
	92LKI7	Lower Klamath NWR, unit 13B
	92LKI8	Lower Klamath NWR, unit 13B
	92LKI9	Lower Klamath NWR, unit 13B
	92LKI10	Lower Klamath NWR, unit 13B
White-faced ibis nestling	I6Y	Lower Klamath NWR, unit 12A

Table 3. Concentrations of carbon and organochlorine compounds in bottom sediment, 1990

[See figure 1 for site locations. Carbon in grams per kilogram. Organochlorine compounds in micrograms per kilogram, wet weight. PCN, Polychlorinated naphthalene. PCB, Polychlorinated biphenyls. **Detections** are in bold print. <, actual value is less than value shown]

Site	Date	Carbon, inorganic	Carbon, inorganic plus organic	PCN	PCB	Aldrin	Chlordane	DDD	DDE
UTL2	Aug. 22	19	100	<1.0	<1.0	<0.1	**1.0**	**0.9**	**0.8**
UTL3	Aug. 22	16	100	<1.0	<1.0	<.1	**1.0**	**.7**	**.7**
UTL4	Aug. 22	27	110	<1.0	<1.0	<.1	**1.0**	**.6**	**.9**
UTL5	Aug. 22	8	97	<1.0	<1.0	<.1	**1.0**	**.6**	**1.0**
UTL6	Aug. 22	19	100	<1.0	<1.0	<.1	**1.0**	**.7**	**.9**
UTL7	Aug. 22	12	65	<1.0	<1.0	<.1	**1.0**	**.5**	**.5**
UTL8	Aug. 22	23	110	<1.0	<1.0	<.1	**1.0**	**1.1**	**1.2**
UTL9	Aug. 22	11	120	<1.0	<1.0	<.1	<1.0	**.2**	**.3**
UTL10	Aug. 22	15	120	<1.0	<1.0	<.1	**1.0**	**1.2**	**1.3**
UTL11	Aug. 22	25	95	<1.0	<1.0	<.1	**1.0**	**1.2**	**1.8**
UTL13	Aug. 22	11	110	<1.0	<1.0	<.1	**1.0**	**.8**	**1.5**
LTL2	Aug. 23	--	--	<1.0	<1.0	<.1	**1.0**	**.4**	**.6**
	Aug. 23	23	100	<1.0	<1.0	<.1	**1.0**	**.6**	**.9**
LTL4	Aug. 23	19	95	<1.0	<1.0	<.1	**1.0**	**.6**	**.8**
LTL5	Aug. 23	20	100	<1.0	<1.0	<.1	<1.0	**1.1**	**1.4**
LTL6	Aug. 23	15	73	<1.0	<1.0	<.1	<1.0	**1.0**	**.9**
LR0	Aug. 21	1	42	<1.0	<1.0	<.1	**4.0**	**1.6**	**2.7**
LR5	Aug. 28	<1	25	<1.0	<1.0	<.1	**3.0**	**1.5**	**1.6**
SSD1	Aug. 27	8	58	<1.0	<1.0	<.1	**6.0**	**2.4**	**2.1**
JCN1	Aug. 27	<1	37	<1.0	<1.0	<.1	**4.0**	**1.7**	**2.1**
1	Aug. 23	<1	14	<1.0	<1.0	<.1	**2.0**	**.5**	**.9**
12	Aug. 24	14	100	<1.0	<1.0	<.1	**1.0**	**.2**	**.6**
NC1	Aug. 27	<1	62	<1.0	<1.0	<.1	**6.0**	**4.4**	**4.5**
4C	Aug. 24	25	140	<1.0	<1.0	<.1	**1.0**	**.2**	**.4**
9A	Aug. 24	18	160	<1.0	<1.0	<.1	**1.0**	**.3**	**1.0**
CL1	Aug. 21	<1	7	<1.0	<1.0	<.1	<1.0	**.3**	**.4**

Table 3. Concentrations of carbon and organichlorine compounds in bottom sediment, 1990--*Continued*

Site	DDT	Dieldrin	Endo-sulfan	Endrin	Hepta-chlor	Hepta-chlor epoxide	Lindane	Meth-oxy-chlor	Mirex	Toxa-phene
UTL2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<10.0
UTL3	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<10.0
UTL4	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<10.0
UTL5	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<10.0
UTL6	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<10.0
UTL7	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<10.0
UTL8	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<10.0
UTL9	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<10.0
UTL10	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<10.0
UTL11	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<10.0
UTL13	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<10.0
LTL2	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<10.0
	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<10.0
LTL4	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<10.0
LTL5	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<10.0
LTL6	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<10.0
LR0	**.5**	.1	<.1	<.1	<.1	<.1	<.1	<10	<.1	<10.0
LR5	**.2**	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<10.0
SSD1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<10.0
JCN1	**.2**	.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<10.0
1	**.3**	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<10.0
12	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<10.0
NC1	**.2**	.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<10.0
4C	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<10.0
9A	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<10.0
CL1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<1.0	<.1	<10.0

Table 4. Particle-size distribution in bottom sediment, 1990

[See figure 1 for site locations. --, all sediment is finer than indicated particle size]

Site	Date	Percent finer than particle size, in millimeters, indicated											
		16.0	8.00	4.00	2.00	1.00	0.500	0.250	0.125	0.062	0.031	0.016	0.004
UTL2	Aug. 22	--	--	--	100	90	63	45	38	35	34	31	23
UTL3	Aug. 22	--	--	--	--	100	99	94	82	67	67	63	48
UTL4	Aug. 22	--	--	--	--	--	--	100	92	84	83	80	65
UTL5	Aug. 22	--	--	100	98	86	66	52	42	37	36	34	25
UTL7	Aug. 22	--	--	--	--	100	83	68	58	53	53	49	36
UTL8	Aug. 22	--	--	--	--	100	97	91	86	81	79	74	53
UTL9	Aug. 22	--	--	--	--	--	--	100	99	95	94	86	57
UTL13	Aug. 22	--	--	--	--	--	--	100	99	97	97	94	68
LTL2	Aug. 23	--	--	--	--	--	100	98	95	93	91	88	71
LTL4	Aug. 23	--	--	--	100	94	76	64	57	54	53	50	38
LTL5	Aug. 23	--	--	--	--	100	99	95	91	88	88	82	57
LR0	Aug. 21	100	72	72	64	59	56	52	46	28	25	22	13
LR5	Aug. 28	--	--	100	99	97	89	68	46	38	33	27	18
SSD1	Aug. 27	--	--	100	97	93	89	84	79	74	73	71	50
JCN1	Aug. 27	100	96	95	93	91	85	55	46	43	40	35	27
1	Aug. 23	--	--	--	100	94	88	62	25	14	13	12	8
NC1	Aug. 27	--	--	100	99	98	92	78	70	68	66	63	44
4C	Aug. 24	--	--	--	--	100	99	96	96	90	67	54	30
CL1	Aug. 21	100	95	85	62	50	46	40	31	18	16	14	11

Table 5. Moisture content, arsenic, mercury, and chlorophenoxy acid, organochlorine, organophosphate, and carbamate pesticides in bottom sediment, 1992

[See figure 1 for site locations. Values (except moisture) in micrograms per gram (µg/g), wet weight; <, actual value is less than value shown; --, not analyzed]

Site	Date	Moisture content (percent)	Arsenic	Mercury	Dicamba	Dichloro-prop	2,4-D	2,4,5-T	2,4-DB	PCP
LR3	July 27	61.2	1.36	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
LR4	July 27	45.7	1.53	.05	--	--	--	--	--	--
8	July 27	72.3	.89	.01	--	--	--	--	--	--
B	July 28	72.0	--	--	<.01	<.01	<.01	<.01	<.01	<.01
9	June 1	72.6	--	--	<.01	<.01	<.01	<.01	<.01	<.01
9	June 16	71.8	--	--	<.01	<.01	<.01	<.01	<.01	<.01
10	June 16	77.4	--	--	<.01	<.01	<.01	<.01	<.01	<.01
10	July 28	83.0	--	--	<.01	<.01	<.01	<.01	<.01	<.01
12	June 28	78.8	--	--	<.01	<.01	<.01	<.01	<.01	<.01
13	June 15	38.8	2.65	.06	<.01	<.01	<.01	<.01	<.01	<.01
15	June 28	57.7	1.07	.09	--	--	--	--	--	--
4C	June 28	86.8	3.18	.01	<.01	<.01	<.01	<.01	<.01	<.01
9A	May 31	70.6	4.25	.04	<.01	<.01	<.01	<.01	<.01	<.01
9A	June 28	83.6	3.12	.02	<.01	<.01	<.01	<.01	<.01	<.01
9A	July 27	85.0	5.95	.03	<.01	<.01	<.01	<.01	<.01	<.01
13B	May 31	91.6	2.13	<.01	<.01	<.01	<.01	<.01	<.01	<.01
13B	June 28	94.2	1.23	.03	<.01	<.01	<.01	<.01	<.01	<.01

Samples analyzed for listed chemicals but none detected:

10	July 28	Gamma BHC, gamma chlordane, heptachlor epoxide, mirex, o,p-DDD, o,p-DDE, o,p-DDT, oxychlordane,p,p-DDD, p,p-DDE, p,p-DDT, toxaphene, trans-nonachlor, HCB, total PCBs, alpha BHC, alpha chlordane, beta BHC, dieldrin, endrin. Detection limit = 0.01 µg/g wet weight.
9	June 16	EPN, acephate, azinphos-methyl, chlorpyrifos, coumaphos, demeton, diazinon, dichlorvos,
LR2	July 27	dichrotophos, dimethoate, disulfoton, ethoprop, famphur, fensulfothion, fenthion, malathion, methamidophos, methyl parathion, mevinphos, monocrotophos, parathion, phorate, terbufos, trichlorfon. Detection limit = 0.5 µg/g wet weight.

Table 6. Field measurements of pH and dissolved oxygen in surface water from sediment-collection sites, 1990

[See figure 1 for site locations. mg/L, milligram per liter; >, actual value is greater than value shown; --, no data]

Site	Date	Time	pH, water, whole, field (standard units)	Oxygen, dis-solved (mg/L)
UTL2	July 12	1100	9.8	11.6
	Aug. 22	0915	10.0	9.4
UTL3	July 12	1150	9.5	8.8
	Aug. 22	0945	10.0	10.1
UTL4	July 12	1320	9.2	9.9
	Aug. 22	1015	9.8	7.1
UTL5	July 19	1615	9.4	10.0
	Aug. 22	1230	9.1	11.2
UTL6	July 19	1530	9.1	8.9
	Aug. 22	1155	10.3	15.6
UTL7	July 19	1440	8.8	7.4
	Aug. 22	1130	10.2	16.8
	Sept. 18	0945	9.9	12.2
	Sept. 18	1600	--	17.8
UTL8	July 12	1320	9.9	11.9
	Aug. 22	1050	9.8	13.2
	Aug. 28	1015	9.7	12.9
	Sept. 19	0915	9.5	8.3
	Sept. 19	1345	--	17.0
UTL9	July 19	1715	8.8	17.4
	Aug. 22	1340	8.2	12.2
UTL10	Aug. 14	1130	9.1	9.6
	Aug. 22	1415	9.3	13.8
UTL11	Aug. 14	1215	9.5	18.2
	Aug. 22	1450	9.7	>20.0
UTL13	Aug. 14	1300	8.4	8.6
	Aug. 22	1305	8.6	11.0
LTL2	Aug. 13	1630	--	14.4
LTL4	Aug. 13	1530	9.6	13.4
	Aug. 23	1100	10.1	12.9
LTL5	Aug. 13	1430	9.6	14.8
	Aug. 23	1030	10.2	13.8
LTL6	Aug. 13	1330	8.9	8.8
	Aug. 23	1015	9.3	11.4
LR0	Aug. 14	1200	7.3	5.1
LR3	Aug. 28	0730	7.6	3.9
SSD1	Aug. 27	1445	8.4	12.2
	Aug. 27	1715	8.9	11.9
1	Aug. 28	0730	7.6	3.8
12	Aug. 24	1200	9.3	2.9
NC1	Aug. 27	1115	7.8	5.9
JCN1	Aug. 27	1715	8.9	11.9
4C	Aug. 24	0945	10.0	10.3
9A	Aug. 24	1100	9.2	7.9
CL1	Aug. 21	1100	8.6	8.5
CL2	Aug. 21	1155	8.6	7.8

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92

[See figures 1, 4, and 5 for site locations. µS/cm, microsiemen per centimeter at 25°C; °C, degree Celsius; mg/L, milligram per liter; mm of Hg, millimeter of mercury; mg/L as N, data obtained from National Water Quality Laboratory; mg/L as NH_3, data obtained from ion selective electrode; <, actual value is less than value shown; --, no data]

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temperature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
1	6-05-91	0950	242	8.4	15.0	6.4	74	660	--	--
	6-07-91	1135	--	8.6	17.0	7.8	--	660	--	--
	6-09-91	0940	219	8.0	18.0	6.2	76	660	--	--
	6-12-91	1040	210	7.9	19.0	4.3	55	650	--	--
	6-14-91	0850	180	8.1	17.0	5.9	71	660	--	--
	6-16-91	0735	197	7.7	17.0	8.1	97	660	--	--
	6-19-91	0950	187	7.9	18.0	4.8	60	650	--	--
	6-20-91	1045	--	7.8	16.0	5.7	--	650	--	--
	6-21-91	0900	220	7.2	16.5	6.2	75	650	--	--
	6-23-91	1128	240	8.0	17.5	5.8	70	660	--	--
	6-26-91	0930	224	7.9	17.0	6.2	74	660	--	--
	6-28-91	1000	231	8.2	17.0	6.1	74	650	--	--
	6-30-91	0920	275	7.7	16.5	5.7	69	650	--	--
	7-03-91	0910	315	7.9	22.0	3.5	46	660	--	--
	7-05-91	0925	220	7.5	23.0	3.8	51	660	--	--
	7-07-91	1010	208	8.8	23.0	3.3	45	660	--	--
	7-10-91	0947	180	8.7	20.5	3.2	41	660	--	--
	7-12-91	0929	187	8.5	22.0	2.5	34	650	--	--
	7-14-91	1115	190	8.5	22.0	2.7	36	660	--	--
	7-17-91	0954	224	8.0	19.5	2.3	28	660	--	0.37
	7-19-91	0915	263	7.0	20.5	2.1	27	660	--	--
	7-21-91	0830	219	7.9	20.5	2.3	30	650	--	--
	7-23-91	1345	228	8.1	22.5	2.8	38	660	--	--
	7-24-91	1005	234	7.6	22.0	1.9	25	660	--	.31
	7-26-91	0830	250	7.7	21.5	1.7	22	660	--	--
	7-28-91	0820	192	7.7	22.0	--	--	660	--	--
	7-31-91	0900	255	7.3	22.0	1.4	19	660	--	.36
	8-02-91	0755	230	6.7	20.5	2.2	28	660	--	--
	8-04-91	0800	239	6.8	22.0	2.5	34	650	--	--
	8-07-91	0950	268	7.4	20.0	2.9	38	650	--	.20
	8-09-91	1034	246	7.3	20.0	3.1	40	650	--	--
	8-11-91	0800	233	6.8	19.5	4.2	53	660	--	--
	8-12-91	1540	260	7.5	21.5	4.9	64	660	--	--
	8-14-91	0900	226	7.2	20.0	3.3	42	660	--	.13
	8-16-91	0805	230	7.5	20.0	3.6	46	660	--	--
	8-18-91	0755	234	7.5	22.0	4.3	57	660	--	--
	8-21-91	0715	238	7.8	20.5	3.9	50	660	--	<.1
	8-21-91	1240	224	7.9	22.5	4.3	58	660	--	--
	8-21-91	1420	205	8.1	23.0	5.1	69	660	--	--
	8-21-91	1515	225	8.4	23.0	6.0	81	660	--	--
	8-21-91	1600	204	8.5	23.5	6.2	85	660	--	--
	8-21-91	1720	204	8.5	24.0	6.2	86	660	--	--
	8-21-91	2030	167	8.5	24.0	8.2	113	660	--	--
	8-21-91	2200	178	8.8	23.0	8.1	110	660	--	--
	8-21-91	2400	199	8.7	23.0	7.4	100	660	--	--
	8-22-91	0158	173	8.4	22.5	6.2	83	660	--	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temper-ature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
1	8-22-91	0615	198	7.7	22.5	3.8	51	660	--	--
	8-22-91	0825	203	7.7	22.0	3.2	42	660	--	--
	8-22-91	0940	208	7.7	21.5	3.2	42	660	--	--
	8-22-91	1201	237	7.8	22.0	3.9	52	660	--	--
	8-22-91	1345	174	8.3	22.5	5.4	72	660	--	--
	8-23-91	1445	226	8.2	27.0	4.8	70	660	--	--
	8-25-91	0745	290	7.0	20.0	3.8	48	660	--	--
	8-28-91	0928	224	8.1	18.5	3.8	47	660	--	<0.1
	8-30-91	1015	237	7.7	18.5	4.5	56	660	--	--
	9-01-91	0714	228	7.3	19.0	4.4	55	660	--	--
	6-03-92	0930	195	8.0	21.0	4.8	63	655	0.10	.22
	6-05-92	0730	174	8.7	20.0	4.8	61	660	--	--
	6-07-92	0719	169	8.5	20.0	5.0	64	655	--	--
	6-10-92	0700	168	8.5	19.5	4.7	60	650	.10	<.1
	6-12-92	0728	153	8.6	16.0	4.8	57	655	--	--
	6-14-92	0848	174	9.4	15.0	.7	8	657	--	--
	6-15-92	1350	190	9.3	14.5	8.0	91	656	--	--
	6-17-92	0715	207	8.7	16.0	6.2	73	655	.11	<.1
	6-19-92	1215	220	8.7	19.0	4.5	56	659	--	--
	6-21-92	0855	225	8.7	20.0	3.6	46	658	--	--
	6-24-92	0915	183	8.2	21.0	.9	12	656	.51	.64
	6-26-92	0754	202	7.4	20.0	.8	10	657	--	--
	6-28-92	0845	204	7.4	21.0	--	--	652	--	--
	7-01-92	0715	228	7.1	16.0	2.7	32	650	.63	.66
	7-03-92	0830	244	7.5	19.5	1.7	22	655	--	--
	7-05-92	0840	308	--	20.0	--	--	654	--	--
	7-08-92	0707	219	8.0	20.0	4.4	56	660	.20	--
	7-10-92	0805	239	7.7	21.0	3.7	48	660	--	--
	7-10-92	1725	233	8.0	23.0	6.2	84	657	--	--
	7-12-92	0750	200	7.4	19.0	2.7	34	659	--	--
	7-15-92	0700	177	8.1	22.0	2.4	32	655	.21	--
	7-17-92	1015	153	8.1	23.0	2.0	27	660	--	--
	7-19-92	0743	206	7.4	22.5	1.0	13	660	--	--
	7-22-92	0650	166	6.8	21.0	1.3	17	659	.41	--
	7-24-92	1055	190	6.8	20.0	2.4	31	660	--	--
	7-24-92	1300	190	6.9	20.0	2.5	32	660	--	--
	7-26-92	0814	199	7.0	21.5	1.4	18	662	--	--
	7-27-92	1205	220	7.2	22.0	2.1	28	660	--	--
	7-28-92	1550	210	7.3	24.0	4.2	58	662	.41	--
	7-28-92	1555	--	--	--	--	--	--	.41	--
	7-29-92	0640	196	6.9	23.0	.7	9	660	.46	--
	7-31-92	0955	181	6.9	23.0	1.5	20	655	--	--
	8-02-92	1130	182	7.5	22.0	3.2	42	665	--	--
	8-05-92	0650	--	7.4	23.0	1.9	26	659	.18	--
	8-07-92	0820	195	7.6	21.5	2.7	36	659	--	--
	8-09-92	0930	188	7.1	20.5	3.7	47	665	--	--
	8-12-92	0657	229	7.4	23.0	2.2	30	660	.23	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temperature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
1	8-14-92	0923	220	7.4	23.0	2.4	32	660	--	--
	8-16-92	0730	181	7.2	23.0	4.0	54	659	--	--
	8-19-92	0650	221	6.7	24.0	3.1	43	655	0.21	--
	8-21-92	1000	186	7.7	21.0	5.1	66	660	--	--
	8-21-92	1535	210	8.2	22.0	4.9	65	660	--	--
	8-23-92	0725	165	7.8	18.5	3.4	42	660	--	--
	8-24-92	1445	231	7.2	18.0	5.0	61	660	.18	--
	8-26-92	0655	235	7.5	18.0	3.9	47	664	.19	--
	8-28-92	0830	194	7.6	18.5	3.4	42	660	--	--
	8-30-92	0945	247	7.3	18.0	2.7	33	660	--	--
2	6-05-91	0810	232	9.3	11.0	6.6	70	650	--	--
	6-07-91	1055	--	8.8	16.5	8.7	--	660	--	--
	6-09-91	1105	216	8.7	20.0	8.4	107	660	--	--
	6-12-91	0854	221	8.4	15.0	6.3	73	650	--	--
	6-13-91	1115	222	8.7	12.0	9.4	102	653	--	--
	6-14-91	0815	237	7.6	12.5	5.8	63	660	--	--
	6-16-91	1009	191	7.9	14.5	6.3	72	660	--	--
	6-19-91	0730	209	7.6	12.0	3.8	41	650	--	--
	6-21-91	0915	209	7.3	14.0	6.4	73	650	--	--
	6-23-91	0919	216	7.5	15.0	5.5	64	650	--	--
	6-26-91	0735	207	6.6	14.0	2.3	26	655	--	--
	6-28-91	1115	216	8.1	19.0	5.8	74	650	--	--
	6-30-91	0855	218	7.7	15.0	1.5	17	662	--	--
	7-03-91	0733	263	6.3	20.0	.5	6	650	--	--
	7-05-91	0845	276	7.5	22.0	1.8	24	660	--	--
	7-07-91	1110	279	8.4	22.5	6.2	83	660	--	--
	7-10-91	0755	249	6.8	17.0	1.5	18	660	--	--
	7-12-91	0922	226	7.6	20.0	3.8	49	650	--	--
	7-14-91	1115	255	9.6	23.0	12.6	173	650	--	--
	7-17-91	0730	243	6.0	16.0	.6	7	660	--	<0.10
	7-19-91	1035	251	8.2	18.5	1.6	20	660	--	--
	7-21-91	0820	220	6.8	18.0	.7	9	650	--	--
	7-24-91	0735	233	6.6	18.5	.5	6	655	--	<.10
	7-26-91	0900	208	7.3	18.0	.4	5	660	--	--
	7-28-91	0810	230	6.6	18.0	.3	4	660	--	--
	7-30-91	0955	210	6.9	19.0	.5	6	661	--	--
	7-31-91	0720	234	6.9	19.5	.3	4	660	--	<.10
	8-02-91	0800	223	6.9	18.0	.4	5	660	--	--
	8-04-91	0945	184	7.1	20.0	1.8	23	650	--	--
	8-05-91	1340	228	7.7	26.0	4.0	57	660	--	--
	8-05-91	1600	228	8.5	25.5	6.7	95	660	--	--
	8-05-91	1820	225	8.1	26.5	6.5	94	660	--	--
	8-05-91	2000	205	8.5	25.0	9.2	129	660	--	--
	8-05-91	2200	211	8.5	22.5	7.2	97	660	--	--
	8-06-91	0004	214	7.6	21.5	4.0	53	660	--	--
	8-06-91	0203	209	7.0	20.0	1.4	18	660	--	--
	8-06-91	0400	205	7.0	19.0	.4	5	660	--	--
	8-06-91	0545	216	6.4	18.5	.1	1	660	--	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temperature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
2	8-06-91	0745	219	6.8	18.0	.5	6	660	--	--
	8-06-91	1020	221	6.8	18.5	1.2	15	660	--	--
	8-06-91	1145	222	6.9	20.5	4.6	59	660	--	--
	8-07-91	0724	204	6.2	16.5	.6	7	650	--	<0.10
	8-09-91	1130	221	7.6	18.5	1.7	21	650	--	--
	8-11-91	1020	236	7.3	18.0	1.6	20	650	--	--
	8-13-91	1030	231	7.0	17.5	1.1	13	660	--	--
	8-14-91	0725	213	6.6	17.5	.4	5	658	--	<.10
	8-16-91	0820	217	6.9	18.0	0.3	4	660	--	--
	8-18-91	0800	224	6.7	18.0	.3	4	660	--	--
	8-21-91	0720	223	7.2	19.0	.2	2	660	--	<.10
	8-23-91	1510	223	8.8	26.0	9.2	132	660	--	--
	8-23-91	1723	230	9.0	26.0	8.3	119	660	--	--
	8-25-91	0750	207	7.3	17.0	.4	5	660	--	--
	8-28-91	0750	216	7.2	17.0	.3	4	660	--	.17
	8-30-91	0840	273	7.2	16.0	.7	8	663	--	--
	9-01-91	0737	240	7.5	15.5	.4	5	660	--	--
	6-03-92	0655	250	7.3	15.5	--	--	655	0.33	.34
	6-05-92	0914	226	7.7	14.0	4.2	47	660	--	--
	6-07-92	0735	226	7.9	13.0	1.0	11	651	--	--
	6-10-92	0700	228	6.9	13.5	1.2	14	650	.08	<.12
	6-12-92	0935	229	8.2	12.0	5.2	57	650	--	--
	6-14-92	0900	224	7.5	11.0	4.5	48	655	--	--
	6-15-92	1300	219	8.9	16.0	8.2	97	657	--	--
	6-17-92	0707	203	7.1	12.0	1.4	15	655	.07	<.1
	6-21-92	0802	243	6.5	15.5	.6	7	660	--	--
	6-24-92	0710	244	7.1	19.0	.4	5	655	.70	.88
	6-26-92	0755	244	7.1	19.0	.6	7	660	--	--
	6-26-92	1600	240	8.5	28.0	10.5	157	655	--	--
	6-28-92	0800	265	7.0	18.0	.5	6	655	--	--
	7-01-92	0741	217	6.7	15.0	.7	8	660	.91	.86
	7-03-92	0755	238	6.9	18.0	1.1	14	656	--	--
	7-05-92	0810	237	7.0	17.5	.9	11	650	--	--
	7-08-92	0722	220	6.6	16.0	.4	5	660	.18	--
	7-10-92	0805	228	6.7	18.5	.2	2	660	--	--
	7-12-92	0805	238	6.4	17.5	.2	2	655	--	--
	7-15-92	0720	294	6.5	19.5	.1	1	662	.36	--
	7-17-92	0815	245	7.0	21.5	1.0	13	665	--	--
	7-17-92	1643	244	6.6	24.0	.4	6	660	--	--
	7-19-92	0755	201	6.7	20.5	1.1	14	664	--	--
	7-22-92	0705	236	6.4	19.0	.2	3	655	.37	--
	7-24-92	0800	210	6.6	17.0	.7	8	663	--	--
	7-24-92	1200	209	6.4	19.0	.4	5	660	--	--
	7-26-92	0800	211	6.6	20.0	2.0	25	665	--	--
	7-27-92	1330	226	6.6	26.0	2.6	37	660	--	--
	7-28-92	1520	230	6.9	26.0	4.0	57	662	.28	--
	7-29-92	0703	228	7.0	21.0	.5	7	655	.47	--
	7-31-92	0605	210	6.6	23.0	.7	9	661	--	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temperature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
2	8-02-92	0545	232	6.8	21.5	0.5	7	660	--	--
	8-05-92	0835	203	6.3	19.0	.4	5	660	0.40	--
	8-07-92	0935	206	6.5	19.0	1.0	12	660	--	--
	8-07-92	1738	191	7.2	25.0	5.4	76	660	--	--
	8-09-92	0709	205	6.9	19.0	.7	9	662	--	--
	8-12-92	0700	255	6.6	23.0	.9	12	655	.46	--
	8-14-92	0755	238	6.8	22.5	.5	7	665	--	--
	8-16-92	0653	262	6.1	21.0	1.2	16	660	--	--
	8-19-92	0700	231	6.5	22.5	.8	11	660	1.40	--
	8-19-92	0705	--	--	--	--	--	--	1.40	--
	8-21-92	0808	238	6.7	19.0	1.7	21	656	--	--
	8-23-92	0950	208	7.0	14.0	1.8	20	660	--	--
	8-24-92	1250	206	6.9	18.0	4.6	56	660	.18	--
	8-26-92	0708	225	6.8	15.0	2.5	28	665	.37	--
	8-28-92	0820	252	6.6	16.5	1.7	20	665	--	--
	8-30-92	0805	214	6.5	15.0	1.7	20	660	--	--
	9-08-92	1055	216	7.5	16.5	7.1	84	661	.15	--
3	6-05-91	0832	367	9.2	15.0	8.4	98	650	--	--
	6-07-91	1255	343	9.2	18.0	11.8	145	660	--	--
	6-09-91	0800	314	9.0	20.0	11.6	148	660	--	--
	6-12-91	0917	321	8.9	18.5	6.8	86	650	--	--
	6-13-91	1125	307	8.9	17.0	8.2	99	653	--	--
	6-14-91	0855	239	9.1	13.0	5.8	64	660	--	--
	6-19-91	0800	212	9.1	16.5	6.7	81	650	--	--
	6-19-91	0951	245	9.0	17.0	8.9	107	660	--	--
	6-21-91	1009	207	8.5	--	8.1	--	650	--	--
	6-23-91	0944	214	8.3	16.0	7.3	87	650	--	--
	6-26-91	0800	328	8.3	18.0	8.3	102	655	--	--
	6-28-91	1100	317	8.7	18.0	8.3	103	650	--	--
	6-30-91	0925	334	8.9	17.0	8.0	96	662	--	--
	7-03-91	0805	368	8.7	24.0	6.0	83	660	--	--
	7-05-91	0815	380	8.5	24.0	5.1	70	660	--	--
	7-07-91	1000	369	8.3	25.0	5.3	75	660	--	--
	7-10-91	0816	329	8.5	20.0	3.3	42	660	--	--
	7-12-91	0930	290	7.9	22.0	3.3	45	650	--	--
	7-14-91	1035	650	8.5	24.0	4.6	65	650	--	--
	7-17-91	0750	333	6.6	18.5	1.8	22	660	--	0.37
	7-19-91	1020	334	8.5	22.0	6.9	92	660	--	--
	7-21-91	0845	290	7.8	21.0	4.1	54	650	--	--
	7-24-91	0805	345	7.6	21.5	2.7	36	655	--	.30
	7-26-91	0635	335	7.4	20.0	1.6	20	660	--	--
	7-28-91	0830	244	7.0	21.0	2.0	26	660	--	--
	7-30-91	1050	317	7.9	23.5	4.7	64	661	--	--
	7-31-91	0745	276	7.4	22.0	2.3	31	660	--	.16
	8-02-91	0820	--	7.2	18.0	1.9	--	660	--	--
	8-04-91	0930	258	7.9	21.0	4.1	54	650	--	--
	8-05-91	1220	322	7.4	21.0	4.7	61	660	--	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temper-ature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
3	8-05-91	1410	319	7.7	22.0	5.3	70	660	--	--
	8-05-91	1630	326	7.8	23.0	5.9	80	660	--	--
	8-05-91	1820	327	7.8	26.5	5.7	82	660	--	--
	8-05-91	2011	306	7.6	22.5	4.9	66	660	--	--
	8-05-91	2220	307	7.4	22.5	4.2	56	660	--	--
	8-06-91	0020	303	7.6	22.0	3.8	50	660	--	--
	8-06-91	0212	306	7.5	22.0	4.0	53	660	--	--
	8-06-91	0408	304	7.6	22.0	4.0	53	660	--	--
	8-06-91	0600	312	7.2	21.0	3.9	51	660	--	--
	8-06-91	0755	309	7.3	21.0	3.7	48	660	--	--
	8-06-91	1038	310	7.6	21.5	5.2	68	660	--	--
	8-06-91	1200	314	7.7	22.0	5.8	77	660	--	--
	8-07-91	0740	392	7.0	19.5	4.2	53	660	--	<0.1
	8-09-91	1110	327	8.2	20.5	5.2	68	650	--	--
	8-11-91	1005	314	8.0	20.0	5.8	75	650	--	--
	8-13-91	1125	336	8.4	21.5	7.6	100	660	--	--
	8-14-91	0740	325	7.1	20.0	3.5	45	660	--	<.1
	8-16-91	0845	327	7.4	20.0	5.2	66	660	--	--
	8-18-91	0815	458	7.8	20.0	2.7	34	660	--	--
	8-21-91	0740	294	7.3	21.5	1.5	20	660	--	<.1
	8-21-91	1710	310	8.8	25.0	9.5	134	660	--	--
	8-23-91	1525	291	8.4	25.0	8.6	121	660	--	--
	8-25-91	0810	300	7.4	20.0	1.7	22	660	--	--
	8-28-91	0810	292	7.6	18.0	2.9	36	660	--	.11
	8-30-91	0900	293	7.5	17.5	3.2	39	660	--	--
	9-01-91	0750	272	7.8	17.5	2.0	24	660	--	--
	6-03-92	0745	252	8.6	21.0	--	--	655	0.11	.26
	6-05-92	0948	247	8.9	21.0	7.9	103	660	--	--
	6-07-92	0812	238	9.2	19.5	7.6	97	651	--	--
	6-10-92	0740	238	8.3	14.0	3.1	35	650	.23	.38
	6-12-92	1005	241	9.3	--	--	--	--	--	--
	6-14-92	0929	246	9.0	14.0	7.4	84	656	--	--
	6-16-92	1330	257	9.3	17.0	11.8	141	660	--	--
	6-17-92	0749	259	8.8	16.0	5.8	69	655	.19	.30
	6-19-92	0904	255	8.7	19.5	5.3	67	660	--	--
	6-21-92	0832	295	8.8	21.0	6.5	84	660	--	--
	6-24-92	0753	--	7.9	22.0	1.1	--	656	.72	.96
	6-26-92	0842	313	7.9	20.5	2.6	34	660	--	--
	6-26-92	1630	267	8.8	28.0	12.5	187	655	--	--
	6-28-92	0834	350	7.8	18.5	4.6	57	655	--	--
	7-01-92	0820	329	7.6	16.5	5.8	70	650	.76	.79
	7-03-92	0835	342	7.6	20.0	--	--	--	--	--
	7-05-92	0830	360	7.3	20.0	5.6	72	655	--	--
	7-08-92	0817	282	7.4	17.5	3.1	38	660	--	--
	7-10-92	0844	323	7.6	21.0	4.5	59	660	--	--
	7-10-92	1800	334	8.2	24.0	9.5	132	657	--	--
	7-12-92	0845	294	7.2	20.0	4.3	55	660	--	--
	7-15-92	0825	341	6.9	21.5	2.2	29	662	--	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temperature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
3	7-17-92	0848	276	7.3	23.5	4.8	65	665	--	--
	7-17-92	1702	276	7.3	24.0	2.4	32	660	--	--
	7-19-92	0830	246	7.1	21.5	3.0	39	664	--	--
	7-22-92	0740	329	7.0	20.0	2.9	37	655	--	--
	7-23-92	1000	287	6.8	18.5	4.2	52	664	--	--
	7-24-92	0835	249	7.2	18.5	3.7	46	663	--	--
	7-26-92	0830	276	7.0	21.0	4.2	54	665	--	--
	7-28-92	1500	230	7.3	--	--	--	--	--	--
	7-29-92	0745	251	6.7	22.0	1.6	21	655	--	--
	7-30-92	0530	280	7.1	22.0	1.5	20	659	0.17	--
	7-31-92	0640	272	7.0	22.0	1.8	24	663	--	--
	8-02-92	0614	247	7.0	22.5	2.1	28	660	--	--
	8-05-92	0815	256	6.6	19.5	.1	1	660	.12	--
	8-07-92	0910	239	6.8	20.0	2.6	33	665	--	--
	8-09-92	0740	267	7.2	20.0	2.0	25	662	--	--
	8-12-92	0733	225	7.0	23.0	2.0	27	655	.38	--
	8-12-92	0738	--	--	--	--	--	--	.38	--
	8-14-92	0835	267	6.9	22.5	5.2	69	665	--	--
	8-14-92	1635	252	8.3	31.0	6.6	103	660	--	--
	8-16-92	0714	274	6.1	21.5	1.7	22	660	--	--
	8-19-92	0726	260	7.1	23.0	.7	9	660	.36	--
	8-21-92	0815	240	6.9	19.0	4.1	52	655	--	--
	8-21-92	1606	272	7.3	20.0	3.3	42	660	--	--
	8-23-92	0930	270	7.0	17.0	.8	10	660	--	--
	8-24-92	1335	268	6.5	18.0	.4	5	660	.16	--
	8-26-92	0735	264	6.9	17.0	4.6	55	665	.96	--
	8-30-92	0835	248	7.3	19.5	3.8	48	660	--	--
	9-08-92	1150	276	7.3	16.0	6.6	77	661	.07	--
4	6-12-91	0900	321	9.3	19.0	6.9	88	650	--	--
	7-03-91	0740	367	8.8	23.0	6.0	81	660	--	--
	7-24-91	0800	350	6.2	21.0	2.4	32	650	--	--
	8-19-91	1540	303	8.2	23.5	7.8	107	660	--	--
	7-20-92	1320	312	7.3	24.0	2.5	35	659	.25	--
	7-28-92	1430	225	7.1	--	--	--	--	--	--
	7-31-92	1105	282	7.5	23.0	3.6	49	660	.17	--
	8-20-92	0900	274	6.6	22.0	1.2	16	660	.26	--
	9-09-92	0940	253	7.9	17.0	7.7	92	661	.05	--
5	6-05-91	0900	539	9.0	15.0	9.0	103	660	--	--
	6-07-91	1215	755	9.2	23.0	12.8	174	660	--	--
	6-09-91	1140	503	9.1	23.0	9.3	126	660	--	--
	6-12-91	0945	986	8.9	19.0	11.9	151	650	--	--
	6-13-91	1225	452	8.9	18.0	10.4	129	653	--	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temper-ature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
5	6-14-91	0925	442	9.0	15.0	7.6	87	660	--	--
	6-16-91	0924	454	8.8	15.5	7.1	82	660	--	--
	6-19-91	0830	435	8.8	16.5	4.7	57	650	--	--
	6-21-91	1230	466	8.9	--	11.0	--	650	--	--
	6-23-91	0959	526	8.4	17.5	6.3	78	650	--	--
	6-26-91	0828	758	7.8	15.5	5.5	64	655	--	--
	6-28-91	1020	736	8.2	17.0	7.9	96	650	--	--
	6-30-91	0800	811	8.4	17.0	7.5	90	662	--	--
	7-03-91	0825	632	8.3	22.5	4.5	60	660	--	--
	7-05-91	0935	684	8.1	24.0	6.0	83	660	--	--
	7-07-91	1030	574	8.1	23.0	6.8	92	660	--	--
	7-10-91	0844	952	8.3	18.5	6.1	76	660	--	--
	7-12-91	1005	515	8.5	25.0	7.0	100	650	--	--
	7-14-91	1015	763	8.7	23.0	8.4	116	650	--	--
	7-17-91	0810	843	7.7	18.0	4.2	52	660	--	0.20
	7-19-91	0955	528	8.4	21.5	7.6	100	660	--	--
	7-21-91	0910	755	7.9	21.0	6.3	83	650	--	--
	7-24-91	0830	386	7.7	21.0	5.0	66	655	--	<.1
	7-26-91	0715	528	8.2	20.0	3.1	40	660	--	--
	7-28-91	0853	552	7.9	21.0	5.2	68	660	--	--
	7-30-91	1135	365	8.2	23.0	6.7	91	661	--	--
	7-31-91	0805	496	7.6	21.5	3.9	51	660	--	.19
	8-02-91	0845	424	7.8	21.0	4.4	57	660	--	--
	8-04-91	0905	420	7.7	20.0	4.2	54	650	--	--
	8-05-91	1300	490	8.6	23.5	10.4	142	660	--	--
	8-05-91	1420	445	8.4	24.0	11.0	152	660	--	--
	8-05-91	1655	489	8.5	25.0	10.2	144	660	--	--
	8-05-91	1800	538	8.5	24.0	10.1	139	660	--	--
	8-05-91	2028	490	7.9	23.0	5.8	79	660	--	--
	8-05-91	2240	458	7.6	22.0	4.0	53	660	--	--
	8-06-91	0040	460	7.7	22.0	3.7	49	660	--	--
	8-06-91	0230	464	7.6	22.0	2.9	39	660	--	--
	8-06-91	0420	482	7.5	21.0	2.6	34	660	--	--
	8-06-91	0615	512	7.4	20.0	3.0	38	660	--	--
	8-06-91	0810	515	7.3	20.0	4.6	59	660	--	--
	8-06-91	1050	559	7.8	21.5	8.3	109	660	--	--
	8-06-91	1230	575	8.0	23.0	10.1	137	660	--	--
	8-07-91	0805	402	6.8	19.0	3.8	48	650	--	<.1
	8-09-91	1045	348	8.1	20.5	7.8	102	650	--	--
	8-11-91	0945	440	7.9	19.0	6.4	81	650	--	--
	8-12-91	1020	502	7.8	20.5	8.2	105	662	--	--
	8-14-91	0755	423	7.3	19.5	3.7	47	660	--	<.1
	8-16-91	0915	461	7.9	20.0	6.8	87	660	--	--
	8-18-91	0835	478	7.5	20.0	3.7	47	660	--	--
	8-21-91	0750	381	7.5	20.0	4.1	52	660	--	<.1
	8-21-91	1648	520	8.2	25.5	11.2	159	660	--	--
	8-23-91	1540	292	8.3	25.0	4.2	59	660	--	--
	8-25-91	0825	544	7.5	18.0	3.2	39	660	--	--
	8-28-91	0825	357	7.7	17.0	5.6	67	660	--	.11

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temperature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
5	8-30-91	0925	392	7.7	17.0	5.3	64	660	--	--
	9-01-91	0803	420	8.0	17.0	4.4	53	660	--	--
	6-03-92	0833	1,040	8.3	20.5	--	--	655	0.26	0.80
	6-05-92	1030	308	8.3	20.5	3.6	46	660	--	--
	6-07-92	0855	409	9.0	18.0	5.0	62	651	--	--
	6-10-92	0825	552	8.2	18.0	5.0	61	660	.09	<.1
	6-12-92	1040	643	8.9	--	--	--	--	--	--
	6-14-92	1000	617	8.5	14.0	6.8	77	655	--	--
	6-16-92	1220	520	--	15.5	9.6	111	661	--	--
	6-17-92	0824	686	8.7	16.0	6.8	81	655	.08	<.1
	6-19-92	0930	--	8.3	19.0	7.6	--	660	--	--
	6-21-92	0904	566	7.8	21.0	7.2	94	660	--	--
	6-24-92	0826	679	8.0	22.0	4.2	56	656	.35	.51
	6-26-92	0920	932	7.8	20.0	4.9	63	660	--	--
	6-28-92	0922	887	7.6	20.0	1.7	22	655	--	--
	7-01-92	0857	1,120	7.3	15.0	2.3	27	650	.36	.38
	7-03-92	0905	1,130	7.5	19.0	--	--	--	--	--
	7-05-92	0850	786	7.7	19.0	2.3	29	655	--	--
	7-08-92	0850	776	7.2	18.5	3.6	45	660	.19	--
	7-10-92	0923	973	7.9	20.5	4.8	61	660	--	--
	7-10-92	1823	992	8.4	24.0	16.0	222	657	--	--
	7-12-92	0938	786	7.4	19.0	5.9	74	660	--	--
	7-15-92	0920	665	7.2	20.5	2.8	36	664	.37	--
	7-17-92	0920	629	7.6	22.5	4.7	63	665	--	--
	7-19-92	0900	672	7.1	21.0	5.8	75	664	--	--
	7-22-92	0818	547	7.4	20.0	2.2	28	655	.12	--
	7-23-92	1105	452	7.6	17.5	9.3	112	664	--	--
	7-24-92	0905	--	7.5	17.5	.5	--	664	--	--
	7-26-92	0925	456	7.8	21.0	6.5	84	665	--	--
	7-28-92	1400	485	8.0	25.5	11.1	157	661	--	--
	7-29-92	0820	710	7.3	20.0	3.5	45	655	.10	--
	7-30-92	0635	785	7.4	22.0	1.7	23	660	.24	--
	7-31-92	0715	822	7.3	22.5	1.5	20	662	--	--
	8-02-92	0647	647	7.4	21.0	1.1	14	660	--	--
	8-05-92	0750	749	7.0	19.0	1.3	16	660	.19	--
	8-05-92	0755	--	--	--	--	--	--	.19	--
	8-07-92	0830	965	6.9	19.0	3.2	40	665	--	--
	8-07-92	1756	495	8.7	24.0	15.4	211	664	--	--
	8-09-92	0809	546	7.6	18.5	2.7	33	662	--	--
	8-12-92	0810	603	7.7	23.0	2.2	30	655	.27	--
	8-14-92	0920	771	7.2	21.5	4.7	61	665	--	--
	8-14-92	1030	--	7.8	--	--	--	--	--	--
	8-16-92	0737	529	6.7	21.0	2.9	38	660	--	--
	8-19-92	0755	420	8.1	23.0	5.0	68	660	.15	--
	8-21-92	0840	562	7.0	19.0	4.6	58	660	--	--
	8-21-92	1325	523	7.9	21.0	10.7	140	656	.06	--
	8-23-92	0915	500	7.6	15.0	4.2	48	660	--	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temper-ature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
5	8-26-92	0805	514	7.4	16.0	4.4	51	665	0.12	--
	8-28-92	0915	334	7.9	17.0	5.7	68	665	--	--
	8-30-92	0900	499	6.2	17.0	5.1	61	660	--	--
	9-08-92	1255	479	8.3	18.0	11.1	136	660	.11	--
6	6-12-91	1000	341	9.1	18.0	4.8	60	650	--	--
	7-03-91	0820	619	8.2	22.0	4.2	56	660	--	--
	7-24-91	0825	381	6.8	21.0	4.0	53	650	--	--
	8-19-91	1625	411	8.7	28.0	14.2	211	660	--	--
	7-20-92	1250	590	8.3	25.0	5.0	70	659	.05	--
	7-28-92	1330	528	8.3	28.5	8.3	124	661	--	--
	7-31-92	1010	588	8.5	22.0	4.5	60	660	.07	--
	8-20-92	0835	496	7.6	20.5	1.8	23	660	.32	--
	9-09-92	0930	396	8.3	16.0	6.7	79	660	.03	--
7	6-05-91	0905	738	8.8	12.0	8.3	91	650	--	--
	6-07-91	1155	902	9.0	17.5	18.1	220	660	--	--
	6-09-91	1109	760	8.9	20.0	14.0	179	660	--	--
	6-12-91	0951	673	9.1	19.0	9.4	120	650	--	--
	6-13-91	1345	709	9.2	20.0	15.1	195	653	--	--
	6-14-91	1024	472	9.3	15.0	7.7	88	660	--	--
	6-16-91	0850	462	9.2	16.5	6.1	72	660	--	--
	6-19-91	0840	718	8.5	16.0	2.8	33	650	--	--
	6-21-91	1145	660	8.9	20.5	9.0	118	650	--	--
	6-23-91	1020	1,180	8.2	17.0	7.8	95	650	--	--
	6-26-91	0824	962	8.0	15.0	5.0	58	660	--	--
	6-28-91	0950	988	7.9	16.0	5.1	61	650	--	--
	6-30-91	1025	1,180	8.2	18.0	9.0	110	662	--	--
	7-03-91	0820	1,500	7.7	20.0	2.7	35	660	--	--
	7-05-91	1015	1,250	8.1	23.0	8.7	118	660	--	--
	7-07-91	1000	1,090	7.9	22.0	8.9	118	660	--	--
	7-10-91	0856	995	8.1	19.0	6.2	78	660	--	--
	7-12-91	1043	716	8.6	22.5	7.7	105	650	--	--
	7-14-91	0945	826	8.2	22.0	6.3	85	650	--	--
	7-17-91	0822	653	7.3	18.0	2.8	34	660	--	0.31
	7-19-91	0935	696	8.1	21.0	5.8	76	660	--	--
	7-21-91	0935	795	8.2	21.0	10.6	138	660	--	--
	7-24-91	0843	573	8.2	21.0	5.8	76	660	--	.13
	7-26-91	0750	650	7.7	20.0	3.6	46	660	--	--
	7-28-91	0919	534	8.4	22.0	7.6	101	660	--	--
	7-30-91	1220	557	8.7	24.0	10.8	149	661	--	--
	7-31-91	0820	500	8.0	21.5	4.3	57	660	--	<.1

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temper-ature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
7	8-02-91	0935	549	8.5	20.5	7.6	98	660	--	--
	8-04-91	0845	520	8.0	21.0	4.3	57	650	--	--
	8-07-91	0845	489	7.9	20.0	5.8	75	650	--	<0.1
	8-07-91	1200	502	7.6	22.0	10.3	137	660	--	--
	8-07-91	1401	490	8.2	23.0	12.0	163	660	--	--
	8-07-91	1602	478	8.4	23.0	12.4	168	660	--	--
	8-07-91	1805	509	8.2	23.0	12.1	164	660	--	--
	8-07-91	2000	539	8.2	22.0	9.6	128	660	--	--
	8-07-91	2205	534	8.2	23.0	7.8	106	660	--	--
	8-07-91	2350	528	8.2	21.5	7.2	95	660	--	--
	8-08-91	0150	535	8.1	21.0	6.1	79	660	--	--
	8-08-91	0330	538	7.9	20.5	4.9	63	660	--	--
	8-08-91	0555	495	7.5	19.5	4.1	52	660	--	--
	8-08-91	0800	483	7.8	19.0	5.3	66	660	--	--
	8-08-91	0952	473	8.0	19.5	7.9	100	660	--	--
	8-08-91	1205	462	8.4	21.0	11.1	145	660	--	--
	8-09-91	1025	488	8.2	20.0	8.2	106	650	--	--
	8-11-91	0920	650	8.5	19.0	7.0	89	650	--	--
	8-12-91	1100	585	8.7	21.0	9.8	127	662	--	--
	8-14-91	0810	466	7.6	19.0	3.5	44	660	--	<.1
	8-16-91	0950	507	8.2	20.0	7.0	89	660	--	--
	8-18-91	0850	525	8.0	20.0	3.9	50	660	--	--
	8-21-91	0810	499	7.6	20.0	2.6	33	660	--	<.1
	8-21-91	1624	569	8.8	27.0	10.2	149	660	--	--
	8-23-91	1555	517	8.8	26.0	10.3	148	660	--	--
	8-25-91	0855	517	7.7	18.0	4.0	49	660	--	--
	8-28-91	0840	571	8.2	16.0	4.6	54	660	--	.12
	8-30-91	0945	416	7.7	16.5	3.6	43	660	--	--
	9-01-91	0815	455	8.0	16.5	3.9	46	660	--	--
	6-03-92	0915	1,130	8.1	19.0	--	--	655	0.28	.56
	6-05-92	1100	843	8.6	20.5	13.0	168	660	--	--
	6-07-92	0930	1,070	8.6	18.0	7.0	87	651	--	--
	6-10-92	0920	760	8.2	17.0	--	--	650	.29	.41
	6-12-92	1100	655	8.7	--	--	--	--	--	--
	6-14-92	1030	641	8.7	14.5	9.7	111	655	--	--
	6-16-92	1100	578	9.2	16.0	11.2	132	660	--	--
	6-17-92	0900	677	8.6	16.0	6.2	73	655	.06	<.1
	6-19-92	1004	--	8.7	19.5	10.2	--	660	--	--
	6-21-92	0937	1,020	8.1	22.0	9.6	128	661	--	--
	6-24-92	0910	903	8.1	21.5	6.0	80	655	.32	.41
	6-26-92	1000	1,100	8.0	20.0	11.5	147	660	--	--
	6-26-92	1650	994	8.8	26.0	15.8	229	655	--	--
	6-28-92	0953	1,200	7.8	19.0	6.7	84	660	--	--
	7-01-92	0935	962	7.5	15.0	8.1	95	650	.17	.16
	7-03-92	0940	1,260	7.9	19.0	--	--	--	--	--
	7-05-92	0905	1,110	7.8	18.5	6.9	86	655	--	--
	7-08-92	0924	1,050	7.8	18.5	8.9	110	660	.05	--
	7-10-92	1015	1,150	8.0	20.5	12.3	159	660	--	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temper-ature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
7	7-12-92	1025	884	8.2	20.5	16.0	207	660	--	--
	7-15-92	1005	946	8.1	21.5	9.4	123	663	0.04	--
	7-17-92	1002	750	8.2	23.5	7.3	98	665	--	--
	7-17-92	1724	818	8.4	24.5	10.8	151	660	--	--
	7-19-92	0935	1,000	7.8	22.0	9.6	127	664	--	--
	7-22-92	0853	786	8.0	19.0	8.0	101	655	.08	--
	7-23-92	1150	771	8.1	19.5	13.1	165	663	--	--
	7-24-92	0945	743	8.3	18.5	10.1	125	660	--	--
	7-26-92	0955	682	7.9	20.5	8.8	113	665	--	--
	7-28-92	1240	768	8.2	26.0	15.2	217	662	--	--
	7-29-92	0848	676	7.9	22.0	6.2	83	655	.06	--
	7-29-92	0850	--	--	--	--	--	--	.06	--
	7-30-92	0720	849	7.6	21.0	4.9	64	660	.08	--
	7-31-92	0755	697	7.6	20.5	1.7	22	663	--	--
	8-02-92	0750	488	7.3	21.0	4.9	64	660	--	--
	8-05-92	0710	671	7.7	19.5	1.5	19	660	.07	--
	8-07-92	0807	697	7.2	18.5	4.8	59	667	--	--
	8-09-92	0850	660	8.0	19.5	4.0	50	662	--	--
	8-12-92	0837	485	7.5	22.0	2.6	34	662	.19	--
	8-14-92	0945	658	--	22.5	5.4	72	665	--	--
	8-14-92	1658	700	8.5	31.0	10.8	170	660	--	--
	8-16-92	0808	685	7.0	20.5	4.1	53	660	--	--
	8-19-92	0823	632	7.6	22.0	3.8	51	660	.27	--
	8-21-92	0900	412	7.4	18.5	5.4	67	655	--	--
	8-21-92	1050	474	7.8	21.0	9.7	127	655	.10	--
	8-21-92	1635	500	8.7	22.0	13.0	173	660	--	--
	8-23-92	0855	649	7.8	14.0	4.3	48	660	--	--
	8-26-92	0836	647	7.6	14.5	3.5	40	665	.67	--
	8-28-92	0945	501	8.0	17.0	4.6	55	665	--	--
	8-30-92	0925	587	6.1	17.0	4.4	53	660	--	--
	9-08-92	1355	460	7.9	19.0	11.2	140	660	.37	--
8	6-12-91	1037	670	9.0	19.0	5.1	65	650	--	--
	7-03-91	0904	1,280	7.9	21.0	4.8	63	660	--	--
	7-24-91	0840	554	7.4	21.0	3.3	44	650	--	--
	8-19-91	1215	765	9.4	25.5	14.2	202	660	--	--
	7-20-92	1220	923	7.7	24.0	.2	3	659	.95	--
	7-28-92	1205	690	7.9	26.5	8.5	123	662	--	--
	7-31-92	0940	645	7.5	23.0	1.9	26	660	.41	--
	8-20-92	0815	643	7.9	21.5	1.3	17	660	.25	--
	9-09-92	0825	660	8.6	17.0	4.8	58	660	.15	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temperature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
9	6-05-91	0830	970	8.8	13.0	8.0	89	650	--	--
	6-07-91	1100	1,090	8.8	17.0	10.1	121	660	--	--
	6-09-91	1038	1,010	8.8	18.0	10.5	129	660	--	--
	6-12-91	0925	1,060	8.4	18.0	4.3	54	650	--	--
	6-14-91	1105	962	8.8	16.0	5.1	60	660	--	--
	6-16-91	0850	998	8.3	15.0	5.2	60	660	--	--
	6-19-91	0810	975	9.0	16.5	3.2	39	650	--	--
	6-20-91	1000	--	8.4	15.0	4.5	--	650	--	--
	6-21-91	1100	1,040	8.5	17.0	4.5	55	650	--	--
	6-23-91	1042	1,390	8.4	17.0	3.4	42	650	--	--
	6-26-91	0800	1,180	8.2	15.0	3.4	39	660	--	--
	6-28-91	0915	1,150	7.7	16.0	3.7	44	650	--	--
	6-30-91	1100	1,220	8.5	17.0	5.1	61	662	--	--
	7-03-91	0755	1,120	8.2	22.5	1.8	24	660	--	--
	7-05-91	1045	1,130	8.4	24.5	3.8	53	660	--	--
	7-07-91	0930	1,040	8.0	23.0	3.4	46	660	--	--
	7-10-91	0818	1,010	8.5	19.5	1.7	21	660	--	--
	7-12-91	1111	1,170	8.6	23.0	4.4	61	650	--	--
	7-14-91	0905	1,110	8.4	22.0	4.2	57	650	--	--
	7-17-91	0755	1,110	8.2	17.0	3.0	36	660	--	0.40
	7-17-91	0930	1,040	8.4	17.5	3.0	36	660	--	--
	7-19-91	0850	1,050	8.1	21.5	5.0	66	660	--	--
	7-21-91	1005	1,110	8.5	21.5	6.6	88	650	--	--
	7-24-91	0810	1,000	8.3	20.5	3.2	41	660	--	.24
	7-26-91	0820	885	8.8	20.0	2.6	33	660	--	--
	7-28-91	0943	882	8.8	22.5	6.2	83	660	--	--
	7-30-91	1310	1,010	9.0	25.5	14.1	200	661	--	--
	7-31-91	0755	968	8.2	21.0	2.2	29	660	--	.18
	8-02-91	0950	969	9.0	21.0	5.9	77	660	--	--
	8-04-91	0800	849	8.5	21.0	2.1	28	650	--	--
	8-07-91	0815	873	8.3	18.5	2.9	37	650	--	.37
	8-07-91	1225	876	8.0	22.5	9.6	129	660	--	--
	8-07-91	1420	878	8.5	24.0	11.4	158	660	--	--
	8-07-91	1630	860	8.6	23.0	12.8	174	660	--	--
	8-07-91	1820	874	8.4	23.0	11.6	157	660	--	--
	8-07-91	2020	956	8.7	--	8.8	--	660	--	--
	8-07-91	2230	959	8.3	19.0	5.2	65	660	--	--
	8-08-91	0020	967	8.1	18.0	3.6	44	660	--	--
	8-08-91	0215	965	8.0	19.0	2.8	35	660	--	--
	8-08-91	0400	901	7.9	18.0	1.5	18	660	--	--
	8-08-91	0620	950	7.8	17.5	1.3	16	660	--	--
	8-08-91	0825	965	8.1	19.0	3.0	38	660	--	--
	8-08-91	1007	972	8.6	25.0	9.9	140	660	--	--
	8-08-91	1225	972	8.6	25.0	9.9	140	660	--	--
	8-09-91	0940	950	8.2	21.0	5.5	73	650	--	--
	8-11-91	0855	800	8.8	19.0	4.2	53	650	--	--
	8-12-91	1150	920	8.9	23.0	8.4	114	662	--	--
	8-14-91	0750	879	8.0	20.0	1.9	24	660	--	.45
	8-16-91	1015	1,120	8.4	21.5	5.6	74	660	--	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temperature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
9	8-18-91	0915	1,030	8.5	21.0	3.6	47	660	--	--
	8-21-91	0740	966	8.0	19.5	1.7	22	660	--	0.76
	8-21-91	1605	1,010	9.1	28.0	12.9	192	660	--	--
	8-23-91	1420	850	9.0	26.5	14.8	214	660	--	--
	8-25-91	0920	1,040	8.5	19.0	4.4	55	660	--	--
	8-28-91	0819	865	9.0	16.5	3.6	43	660	--	.31
	8-30-91	1015	946	8.9	19.0	7.9	99	660	--	--
	9-01-91	0830	935	9.1	18.0	3.2	39	660	--	--
	6-03-92	0725	1,210	8.2	17.5	3.5	43	655	0.55	1.12
	6-05-92	1145	1,230	9.1	21.5	18.0	237	660	--	--
	6-07-92	1005	1,040	9.1	18.5	10.6	133	651	--	--
	6-10-92	0755	1,090	8.6	17.0	4.8	59	650	.38	.52
	6-12-92	0820	1,010	8.8	12.0	4.5	49	655	--	--
	6-14-92	1110	1,080	8.9	13.0	7.9	88	655	--	--
	6-16-92	0730	1,000	8.8	12.5	4.2	46	660	--	--
	6-17-92	0810	1,190	8.4	14.0	5.1	58	655	.33	.45
	6-19-92	1035	--	8.6	20.0	7.4	--	660	--	--
	6-21-92	1011	1,130	8.6	22.0	6.9	92	660	--	--
	6-24-92	0715	1,100	8.4	20.5	1.7	22	656	.44	.52
	6-26-92	1045	1,090	8.7	22.0	8.4	112	660	--	--
	6-28-92	1031	1,150	8.5	20.0	4.8	62	655	--	--
	7-01-92	0915	1,220	8.2	16.0	5.8	69	650	.24	.22
	7-03-92	1010	1,210	8.4	19.5	--	--	--	--	--
	7-05-92	0950	1,240	8.2	18.0	7.5	93	655	--	--
	7-08-92	0808	1,070	8.5	19.0	4.3	54	662	.19	--
	7-10-92	1050	1,090	8.7	22.0	7.8	104	660	--	--
	7-10-92	1850	1,110	8.9	25.0	14.9	211	657	--	--
	7-12-92	1112	1,110	8.4	21.5	9.5	125	660	--	--
	7-15-92	0755	1,180	8.1	21.0	1.3	17	655	.34	--
	7-17-92	1040	940	8.7	23.0	5.4	73	665	--	--
	7-19-92	1005	1,070	8.2	22.5	4.2	56	664	--	--
	7-22-92	0840	871	8.3	17.0	3.5	42	660	.43	--
	7-22-92	0845	--	--	--	--	--	--	.42	--
	7-23-92	1240	1,310	8.0	20.5	5.4	70	662	--	--
	7-24-92	1020	1,320	8.1	19.0	3.1	39	660	--	--
	7-26-92	1030	1,180	7.9	20.5	2.9	37	665	--	--
	7-28-92	0934	1,240	7.8	21.5	.8	11	663	--	--
	7-29-92	0730	1,190	7.8	20.5	.9	12	660	1.40	--
	7-30-92	0830	1,330	8.0	20.5	1.6	21	660	1.40	--
	7-31-92	0840	1,280	7.9	19.0	2.7	34	664	--	--
	8-02-92	0820	1,220	7.9	20.5	2.6	34	660	--	--
	8-05-92	0810	1,160	8.1	19.0	2.8	35	659	.58	--
	8-07-92	0725	1,190	8.0	18.0	3.7	45	665	--	--
	8-07-92	1822	1,290	8.6	26.0	15.3	219	663	--	--
	8-09-92	0930	1,180	8.7	19.5	4.1	52	662	--	--
	8-12-92	0750	1,220	8.5	22.0	4.7	62	661	.31	--
	8-14-92	1015	1,160	--	23.0	4.7	63	665	--	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temper-ature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
9	8-14-92	1130	--	8.2	--	--	--	--	--	--
	8-16-92	0843	1,090	8.0	21.5	4.5	59	660	--	--
	8-19-92	0725	1,130	7.6	20.0	2.4	31	655	1.50	--
	8-21-92	0930	817	8.7	19.0	6.1	77	655	--	--
	8-21-92	0955	926	8.9	20.0	7.3	93	660	.33	--
	8-23-92	0825	961	9.0	14.0	6.1	69	660	--	--
	8-26-92	0735	1,050	8.5	13.0	5.5	60	664	.11	--
	8-28-92	1010	1,060	8.7	17.0	6.6	79	665	--	--
	8-30-92	0950	918	8.1	17.5	6.4	78	660	--	--
	9-08-92	1445	962	9.0	23.0	12.4	168	660	.46	--
10	6-12-91	1120	715	9.0	19.0	5.9	74	660	--	--
	7-03-91	0940	1,160	8.4	23.5	3.8	52	660	--	--
	7-24-91	0910	1,110	6.7	21.0	3.3	44	650	--	--
	8-18-91	0831	658	9.1	20.0	4.1	52	660	--	--
	8-19-91	1300	905	9.4	27.5	--	--	--	--	--
	6-16-92	0930	1,010	8.9	--	--	--	660	--	--
	7-20-92	1150	1,170	8.8	23.0	3.5	48	659	.30	--
	7-28-92	0845	1,080	8.4	24.0	1.5	21	663	--	--
	7-31-92	0700	1,230	8.3	22.0	2.3	31	660	1.10	--
	8-20-92	0750	798	8.5	21.5	4.3	57	660	.17	--
	8-20-92	1520	1,110	8.6	26.0	20.0	286	660	--	--
	8-21-92	1610	999	8.5	23.0	19.0	260	655	.53	--
	9-09-92	0840	904	8.9	16.0	5.5	65	660	.41	--
11	6-05-91	0805	816	8.6	12.0	7.6	83	650	--	--
	6-07-91	0955	788	8.6	15.0	7.6	87	660	--	--
	6-09-91	1035	812	8.9	18.0	7.2	88	660	--	--
	6-12-91	0854	767	8.8	16.0	6.5	77	650	--	--
	6-13-91	1515	794	8.9	18.0	9.2	114	653	--	--
	6-14-91	0815	745	8.9	13.0	7.9	87	660	--	--
	6-16-91	0815	769	9.0	13.0	10.1	111	660	--	--
	6-19-91	0729	810	9.7	15.0	6.6	77	650	--	--
	6-21-91	1000	827	9.1	16.0	8.4	100	650	--	--
	6-23-91	1105	915	9.4	18.0	13.8	169	660	--	--
	6-26-91	0735	779	9.2	14.0	7.3	82	660	--	--
	6-27-91	0950	780	9.2	15.5	6.6	78	653	--	--
	6-28-91	0930	880	9.3	16.0	7.6	91	650	--	--
	6-30-91	0945	765	8.6	16.0	7.4	88	650	--	--
	7-03-91	0730	793	9.2	23.0	7.7	104	660	--	--
	7-05-91	0845	729	8.5	22.0	3.5	47	660	--	--
	7-07-91	0930	754	8.9	27.0	2.8	41	660	--	--
	7-10-91	0748	726	8.9	18.0	1.2	15	660	--	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temperature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
11	7-12-91	0850	760	8.9	20.0	2.5	32	650	--	--
	7-14-91	1030	769	8.9	21.0	5.2	69	650	--	--
	7-17-91	0725	774	8.2	17.0	3.3	40	660	--	--
	7-19-91	0847	680	9.2	19.0	4.0	50	660	--	--
	7-21-91	0918	619	9.0	19.5	4.6	59	650	--	--
	7-23-91	1250	647	9.5	23.0	6.6	89	660	--	--
	7-24-91	0740	599	8.8	20.5	4.5	58	660	--	0.35
	7-26-91	0800	709	8.6	18.0	4.7	58	660	--	--
	7-28-91	0755	589	9.4	20.0	4.9	63	660	--	--
	7-31-91	0730	615	9.2	20.5	5.5	71	660	--	.23
	8-02-91	0825	691	9.3	19.0	4.6	58	660	--	--
	8-04-91	0815	578	9.1	21.0	4.7	62	660	--	--
	8-07-91	0735	731	9.2	17.5	4.6	57	660	--	.13
	8-07-91	1255	728	8.7	19.0	5.5	69	660	--	--
	8-07-91	1435	737	8.9	19.0	6.7	84	660	--	--
	8-07-91	1655	733	8.8	20.5	8.1	105	660	--	--
	8-07-91	1835	732	8.8	21.0	8.8	115	660	--	--
	8-07-91	2050	786	9.1	20.5	9.7	125	660	--	--
	8-07-91	2250	783	8.9	19.5	8.8	111	660	--	--
	8-08-91	0040	774	8.9	18.0	8.0	98	660	--	--
	8-08-91	0230	771	9.0	17.5	7.8	95	660	--	--
	8-08-91	0420	760	9.0	18.0	6.0	74	660	--	--
	8-08-91	0640	738	9.0	17.5	5.6	68	660	--	--
	8-08-91	0850	726	9.2	17.5	5.4	66	660	--	--
	8-08-91	1018	721	9.0	17.5	5.2	63	660	--	--
	8-08-91	1250	759	9.2	19.5	6.9	87	660	--	--
	8-09-91	1104	607	9.2	19.0	6.6	84	650	--	--
	8-11-91	0825	560	9.1	17.0	5.6	68	650	--	--
	8-12-91	1220	643	9.2	20.5	7.1	91	662	--	--
	8-14-91	0725	688	8.4	20.0	6.8	87	660	--	.21
	8-16-91	0840	720	9.3	20.0	5.8	74	660	--	--
	8-21-91	0730	595	9.1	20.5	3.3	43	660	--	.29
	8-21-91	1550	570	9.8	25.0	7.6	107	660	--	--
	8-23-91	1356	622	9.3	23.0	7.1	98	650	--	--
	8-25-91	0830	585	9.1	18.0	4.2	51	660	--	--
	8-28-91	0800	661	9.1	16.0	6.0	71	660	--	.22
	8-30-91	0955	560	9.2	17.5	4.5	55	660	--	--
	9-01-91	0847	463	8.9	17.0	4.4	53	660	--	--
	6-03-92	0820	465	9.3	19.0	4.9	62	655	0.25	.68
	6-05-92	1214	438	9.8	22.0	6.5	86	660	--	--
	6-07-92	1037	382	9.9	18.0	6.1	76	651	--	--
	6-10-92	0835	411	9.5	18.5	6.6	83	650	.29	.38
	6-12-92	0735	394	9.3	14.0	5.2	59	650	--	--
	6-14-92	1150	404	9.8	14.5	5.7	65	655	--	--
	6-15-92	1145	416	9.7	14.5	6.8	78	658	--	--
	6-17-92	0736	389	9.1	12.0	6.4	69	655	.23	.34
	6-17-92	1005	407	9.7	14.0	7.4	83	660	--	--
	6-19-92	1110	--	9.7	21.5	8.6	--	660	--	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temperature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
11	6-19-92	1706	386	9.5	25.0	8.6	121	658	--	--
	6-21-92	1045	374	9.7	30.5	7.5	117	660	--	--
	6-24-92	0810	393	9.2	21.0	4.1	54	656	0.20	0.34
	6-26-92	1130	411	9.2	24.0	8.7	120	660	--	--
	6-28-92	1057	392	9.1	21.0	3.8	50	655	--	--
	7-01-92	0945	444	9.0	16.5	4.8	58	650	.33	.37
	7-03-92	1055	407	--	20.0	--	--	--	--	--
	7-05-92	1000	396	9.1	17.0	5.2	63	655	--	--
	7-08-92	0847	418	9.6	17.0	5.5	66	662	.13	--
	7-10-92	1130	--	9.0	22.0	7.3	--	660	--	--
	7-12-92	1200	402	8.8	23.5	4.6	63	660	--	--
	7-15-92	0825	384	9.1	21.0	3.7	49	655	.17	--
	7-17-92	1110	338	9.2	22.0	5.9	79	655	--	--
	7-19-92	1035	409	8.5	23.5	4.1	56	664	--	--
	7-22-92	0755	399	8.3	18.0	3.4	42	659	.08	--
	7-23-92	1320	430	8.2	22.0	5.0	66	660	--	--
	7-24-92	1100	428	8.8	19.5	5.1	64	663	--	--
	7-26-92	1055	407	8.7	21.0	6.2	80	665	--	--
	7-28-92	0710	431	8.4	20.5	2.9	37	663	--	--
	7-29-92	0815	462	8.5	21.0	4.4	57	660	.09	--
	7-30-92	0945	453	9.1	22.0	5.4	72	660	.07	--
	7-31-92	0915	754	8.8	21.5	6.0	79	663	--	--
	8-02-92	0925	449	8.9	22.5	4.3	58	660	--	--
	8-05-92	0740	488	9.5	19.0	4.9	61	659	.04	--
	8-07-92	0655	512	9.4	19.0	5.0	62	665	--	--
	8-07-92	1215	779	8.8	23.5	14.6	200	659	--	--
	8-09-92	1010	512	9.3	20.0	6.7	85	662	--	--
	8-12-92	0840	508	8.8	20.5	6.9	89	661	.05	--
	8-14-92	1040	515	--	23.0	9.4	127	660	--	--
	8-14-92	1725	538	9.4	29.0	14.8	224	660	--	--
	8-16-92	0911	549	8.5	22.0	.4	5	660	--	--
	8-19-92	0800	336	8.6	21.5	6.4	85	655	.05	--
	8-21-92	0840	530	9.1	19.0	7.5	95	655	.06	--
	8-21-92	1000	464	8.9	19.5	6.8	87	655	--	--
	8-23-92	0755	554	9.4	15.0	6.3	72	660	--	--
	8-26-92	0800	566	9.4	16.0	10.2	119	664	.03	--
	8-28-92	1035	622	9.4	19.0	11.6	144	665	--	--
	8-30-92	1010	627	10.1	18.0	9.3	114	660	--	--
	9-08-92	1530	947	9.1	18.5	11.2	139	660	.05	--
12	6-05-91	1040	947	8.5	17.0	7.5	90	660	--	--
	6-07-91	1220	--	8.6	21.0	8.9	--	660	--	--
	6-09-91	1150	925	8.6	21.0	6.2	81	660	--	--
	6-12-91	1114	828	8.6	21.0	4.3	57	650	--	--
	6-14-91	0940	750	9.0	16.0	6.7	79	660	--	--
	6-16-91	1005	827	8.8	16.5	5.9	70	660	--	--
	6-19-91	1030	847	9.2	18.5	6.3	79	650	--	--
	6-20-91	1127	--	9.2	19.5	7.4	--	650	--	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temperature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
12	6-21-91	1055	920	8.7	18.5	4.4	55	650	--	--
	6-23-91	0940	1,770	8.6	18.0	5.6	69	660	--	--
	6-26-91	1004	1,850	8.5	18.0	8.6	106	660	--	--
	6-28-91	1045	2,020	8.5	17.0	6.2	76	650	--	--
	6-30-91	1000	2,200	8.5	17.0	6.8	83	650	--	--
	7-03-91	0935	2,440	8.9	25.0	5.3	75	660	--	--
	7-05-91	1020	2,320	8.6	25.0	6.2	88	660	--	--
	7-07-91	1050	2,430	--	25.0	5.7	81	660	--	--
	7-10-91	1023	843	9.2	22.0	3.5	47	660	--	--
	7-12-91	1024	820	9.2	22.5	4.2	57	650	--	--
	7-14-91	0855	853	8.7	23.0	2.1	28	660	--	--
	7-17-91	1029	959	9.2	20.0	2.5	32	660	--	0.58
	7-19-91	1006	920	9.1	22.0	5.5	73	660	--	--
	7-21-91	1000	845	9.2	22.0	6.9	93	650	--	--
	7-23-91	1020	1,010	9.2	23.0	5.6	76	660	--	--
	7-24-91	1035	1,080	9.4	23.5	6.3	86	660	--	<.1
	7-26-91	1020	877	8.7	23.0	6.4	87	660	--	--
	7-28-91	0905	779	9.3	23.0	6.4	87	660	--	--
	7-31-91	0930	1,060	9.3	23.5	8.1	111	660	--	.13
	8-02-91	0905	1,150	9.3	22.0	8.8	117	660	--	--
	8-04-91	0855	1,090	9.4	22.5	7.2	98	650	--	--
	8-07-91	1026	1,590	9.2	20.0	8.7	113	650	--	<.1
	8-09-91	1000	1,490	8.7	20.5	8.6	113	650	--	--
	8-11-91	0910	1,300	9.0	20.0	6.7	86	660	--	--
	8-12-91	1340	1,290	9.0	24.0	10.6	147	660	--	--
	8-14-91	0935	1,130	8.2	22.0	7.4	99	660	--	<.1
	8-16-91	0935	1,150	8.9	21.5	5.5	73	660	--	--
	8-18-91	0915	1,260	8.9	22.0	6.7	89	660	--	--
	8-19-91	1245	1,140	8.9	25.0	9.1	128	660	--	--
	8-19-91	1425	1,160	8.9	27.0	8.9	130	660	--	--
	8-19-91	1635	1,150	8.9	27.5	9.6	142	660	--	--
	8-19-91	1800	1,150	8.9	27.5	12.4	183	660	--	--
	8-19-91	2050	1,150	8.9	26.0	12.0	172	660	--	--
	8-19-91	2230	1,140	9.0	25.5	11.1	158	660	--	--
	8-20-91	0040	1,150	9.0	25.0	10.2	144	660	--	--
	8-20-91	0230	1,160	9.0	24.0	9.1	126	660	--	--
	8-20-91	0425	1,180	9.0	24.0	8.2	113	660	--	--
	8-20-91	0640	1,140	8.9	23.0	7.4	100	660	--	--
	8-20-91	0920	1,140	8.9	22.5	7.6	102	660	-	--
	8-20-91	1035	1,140	8.7	23.5	8.1	111	660	--	--
	8-20-91	1250	1,140	8.8	26.0	8.8	126	660	--	--
	8-21-91	0850	1,160	8.8	23.0	5.0	68	660	--	<.1
	8-21-91	1435	1,270	9.0	27.0	7.8	114	660	--	--
	8-23-91	1425	1,250	9.0	27.0	7.9	116	660	--	--
	8-25-91	0915	1,090	8.9	21.0	6.5	85	660	--	--
	8-28-91	0955	845	9.2	19.0	6.2	78	660	--	<.1
	8-30-91	0905	916	8.8	19.0	6.0	75	660	--	--
	9-01-91	0922	818	9.3	19.0	6.6	83	660	--	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temperature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
12	6-03-92	0955	363	8.4	23.0	3.2	43	659	0.22	0.22
	6-05-92	0840	387	8.0	21.0	3.7	48	660	--	--
	6-07-92	0817	370	7.3	21.0	2.4	31	655	--	--
	6-10-92	0702	355	8.8	20.0	6.1	78	655	.04	<.1
	6-12-92	0855	317	8.2	14.0	6.2	70	655	--	--
	6-14-92	0955	308	8.1	15.0	4.2	49	655	--	--
	6-15-92	1040	312	8.2	16.0	4.0	47	657	--	--
	6-17-92	0800	276	8.5	17.0	6.2	74	659	.36	.42
	6-17-92	0805	--	--	--	--	--	--	.36	--
	6-19-92	1030	245	7.9	21.0	5.6	73	659	--	--
	6-24-92	0720	246	8.5	24.0	4.6	63	660	.20	.24
	6-26-92	0910	228	8.1	23.0	5.2	71	657	--	--
	6-26-92	1647	211	9.1	28.0	12.4	186	655	--	--
	6-28-92	1005	258	8.4	20.0	--	--	650	--	--
	7-01-92	0750	218	8.5	16.0	6.0	71	655	.17	.14
	7-03-92	0915	201	8.8	21.5	4.8	64	655	--	--
	7-05-92	1005	262	--	19.0	6.8	86	654	--	--
	7-08-92	0737	228	8.9	20.5	8.5	109	665	.04	--
	7-10-92	0930	323	8.3	22.0	9.8	130	660	--	--
	7-12-92	0915	400	8.8	21.5	8.7	115	658	--	--
	7-15-92	0800	384	8.8	22.5	7.2	97	660	.03	--
	7-17-92	0840	284	8.5	24.5	8.3	116	660	--	--
	7-17-92	1600	230	8.7	24.0	10.4	143	660	--	--
	7-19-92	0845	283	8.8	24.0	5.8	80	660	--	--
	7-22-92	0738	315	8.7	20.5	6.4	83	655	.03	--
	7-24-92	0800	322	8.9	20.0	13.0	166	660	--	--
	7-24-92	1035	268	9.2	23.0	16.0	217	660	--	--
	7-26-92	0930	250	9.1	20.5	7.0	90	662	--	--
	7-27-92	1113	275	9.4	26.0	15.2	218	660	--	--
	7-28-92	1320	297	9.8	24.0	16.2	223	662	.04	--
	7-29-92	0730	199	9.0	19.0	5.1	64	660	.03	--
	7-31-92	0845	177	8.7	22.0	3.7	49	655	--	--
	8-02-92	0955	294	9.3	22.5	3.5	47	665	--	--
	8-05-92	0700	421	9.2	19.0	3.2	40	660	.06	--
	8-07-92	1045	229	9.5	22.5	11.8	158	659	--	--
	8-07-92	1658	232	10.1	25.0	14.5	203	663	--	--
	8-09-92	0810	424	8.8	18.5	3.1	38	665	--	--
	8-12-92	0800	207	8.9	23.0	.7	9	660	.26	--
	8-14-92	1120	200	9.5	25.0	9.0	127	660	--	--
	8-16-92	0835	183	8.8	21.0	5.0	65	660	--	--
	8-19-92	0825	171	8.5	22.0	1.5	20	655	.15	--
	8-21-92	0845	186	9.3	20.0	3.0	38	660	--	--
	8-23-92	0840	150	9.5	16.0	6.7	79	655	--	--
	8-24-92	1110	192	9.4	18.0	9.9	121	660	.03	--
	8-26-92	0705	--	9.5	17.0	5.9	71	660	.09	--
	8-28-92	0915	194	9.7	17.5	8.7	105	660	--	--
	8-30-92	0835	196	9.4	17.0	5.8	70	660	--	--
	9-08-92	1730	183	10.0	20.0	17.0	217	660	.05	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temperature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
13	6-05-91	1115	658	8.3	16.0	5.5	65	660	--	--
	6-07-91	1315	--	8.3	19.5	4.2	--	660	--	--
	6-09-91	1230	492	8.0	22.0	3.5	46	660	--	--
	6-12-91	1154	455	7.8	21.0	3.0	40	650	--	--
	6-14-91	1015	574	8.9	15.5	4.4	51	660	--	--
	6-16-91	1040	429	7.8	16.5	5.9	70	660	--	--
	6-19-91	1113	391	8.1	19.0	4.3	55	650	--	--
	6-20-91	1225	--	7.9	17.0	4.7	--	650	--	--
	6-21-91	1145	351	7.8	18.0	4.9	61	650	--	--
	6-23-91	1045	608	8.2	18.0	4.3	53	660	--	--
	6-26-91	1042	965	8.3	18.0	4.6	56	660	--	--
	6-28-91	1120	1,280	8.4	17.0	4.1	50	650	--	--
	6-30-91	1050	1,190	8.1	18.0	4.8	60	650	--	--
	7-03-91	1010	969	8.6	26.0	4.0	57	660	--	--
	7-05-91	1110	683	8.4	26.5	1.8	26	660	--	--
	7-07-91	1130	1,030	--	26.0	2.7	39	660	--	--
	7-10-91	1053	714	8.4	22.0	5.3	70	660	--	--
	7-12-91	1114	390	8.3	23.0	3.5	48	650	--	--
	7-14-91	0940	617	8.4	23.0	4.9	67	650	--	--
	7-17-91	1102	415	8.0	19.5	2.0	25	660	--	0.43
	7-21-91	1031	436	7.7	22.0	3.0	40	650	--	--
	7-21-91	1045	471	7.7	22.0	3.0	40	660	--	--
	7-23-91	1130	484	8.0	23.5	1.9	26	660	--	--
	7-24-91	1107	574	7.9	22.0	2.1	28	660	--	.96
	7-26-91	1055	376	7.7	22.0	1.6	21	660	--	--
	7-28-91	0845	521	8.5	21.0	5.3	69	660	--	--
	7-31-91	1000	602	9.0	23.5	--	178	660	--	.10
	8-02-91	0935	353	8.4	22.0	3.5	46	660	--	--
	8-04-91	0920	458	8.3	23.5	3.4	47	650	--	--
	8-07-91	1050	406	8.2	19.5	3.4	43	660	--	.38
	8-09-91	0901	486	8.0	20.0	4.2	54	650	--	--
	8-11-91	1020	302	8.1	20.0	4.3	56	650	--	--
	8-12-91	1440	393	8.1	23.0	5.7	77	660	--	--
	8-14-91	1008	455	7.8	20.0	3.7	47	660	--	.28
	8-16-91	1010	382	7.6	21.0	2.6	34	660	--	--
	8-18-91	1000	323	7.6	22.0	3.0	40	660	--	--
	8-19-91	1205	441	8.8	25.0	11.0	155	660	--	--
	8-19-91	1400	500	8.9	26.0	11.3	162	660	--	--
	8-19-91	1600	680	8.8	27.0	11.6	170	660	--	--
	8-19-91	1745	493	8.6	27.0	11.5	168	660	--	--
	8-19-91	2010	502	8.3	25.5	9.7	138	660	--	--
	8-19-91	2210	491	8.4	25.0	9.5	134	660	--	--
	8-20-91	0005	503	8.6	25.0	11.2	158	660	--	--
	8-20-91	0200	550	8.7	25.5	11.2	159	660	--	--
	8-20-91	0350	498	8.8	25.0	9.4	132	660	--	--
	8-20-91	0600	489	8.6	23.0	7.2	98	660	--	--
	8-20-91	0840	545	8.7	22.5	5.6	75	660	--	--
	8-20-91	1015	542	8.6	24.0	6.4	88	660	--	--
	8-20-91	1215	546	8.6	24.5	7.6	106	660	--	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temperature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
13	8-21-91	0917	522	8.2	22.0	3.5	47	660	--	0.27
	8-21-91	1400	407	8.4	25.0	8.0	113	660	--	--
	8-23-91	1345	324	8.2	27.0	10.2	149	660	--	--
	8-25-91	0945	365	7.8	21.0	3.3	43	660	--	--
	8-28-91	1020	302	8.6	18.5	3.0	37	660	--	.11
	8-30-91	0830	530	7.7	18.0	3.6	44	660	--	--
	9-01-91	0943	365	8.2	19.0	2.9	36	660	--	--
	6-03-92	0836	617	8.0	23.0	2.3	31	658	0.68	.94
	6-05-92	0935	580	7.6	18.0	2.2	27	660	--	--
	6-07-92	0905	441	7.0	19.5	2.0	25	655	--	--
	6-10-92	0758	524	7.5	17.0	1.6	19	655	.58	.68
	6-10-92	0800	--	--	--	--	--	--	.57	--
	6-12-92	1020	427	7.5	13.0	3.8	42	655	--	--
	6-14-92	1110	485	7.4	15.0	5.2	60	656	--	--
	6-15-92	0845	429	7.7	13.5	4.1	46	650	--	--
	6-17-92	0950	312	8.9	18.0	4.5	55	659	.16	.45
	6-19-92	0840	451	7.4	21.0	4.5	59	659	--	--
	6-24-92	0830	630	8.3	22.0	4.4	58	660	.05	<.1
	6-26-92	1020	681	8.3	23.0	7.2	98	660	--	--
	6-28-92	1100	711	8.2	19.0	--	--	650	--	--
	7-01-92	0715	719	7.8	14.5	5.4	62	655	1.5	1.65
	7-03-92	1015	695	8.6	22.5	8.2	111	655	--	--
	7-05-92	1040	342	--	20.0	3.4	44	654	--	--
	7-08-92	0826	651	8.6	21.5	5.7	74	665	.22	--
	7-10-92	1005	659	8.1	23.0	4.4	60	660	--	--
	7-12-92	1005	835	8.1	22.0	4.4	59	659	--	--
	7-15-92	0855	665	8.3	22.0	3.7	49	660	.49	--
	7-17-92	0750	537	8.1	23.0	2.2	30	660	--	--
	7-19-92	0935	431	7.8	23.0	3.0	41	660	--	--
	7-22-92	0820	564	7.3	20.0	1.6	21	655	.44	--
	7-24-92	0900	--	7.3	19.5	3.3	--	660	--	--
	7-24-92	0950	610	7.3	19.5	3.3	42	660	--	--
	7-26-92	1010	651	7.7	22.0	2.7	36	662	--	--
	7-27-92	0815	690	7.8	22.5	3.6	48	660	--	--
	7-27-92	1145	647	8.3	28.0	7.5	111	662	.18	--
	7-29-92	0815	718	8.0	21.0	4.0	52	660	.41	--
	7-31-92	0752	--	7.6	23.0	3.1	--	655	--	--
	8-02-92	0820	701	8.3	22.0	3.2	42	665	--	--
	8-05-92	0755	770	8.3	19.0	4.0	50	660	.04	--
	8-09-92	0720	679	8.5	17.5	7.4	89	665	--	--
	8-12-92	0840	789	8.6	24.0	8.6	119	660	.04	--
	8-14-92	1046	708	9.0	23.0	10.8	146	660	--	--
	8-16-92	0910	792	8.9	20.0	7.0	89	660	--	--
	8-19-92	0726	703	8.8	22.5	7.1	96	655	.03	--
	8-21-92	0804	686	8.6	19.0	4.3	54	660	--	--
	8-21-92	1730	672	9.1	20.0	8.3	106	660	--	--
	8-23-92	0900	503	9.1	17.5	3.3	40	660	--	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temperature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
13	8-24-92	0945	808	8.8	16.5	2.2	26	660	0.03	--
	8-26-92	0755	699	8.9	14.0	2.2	25	660	.03	--
	8-28-92	0955	710	9.1	18.0	7.0	86	660	--	--
	8-30-92	0750	716	9.2	17.0	7.0	84	660	--	--
	9-08-92	1830	676	9.1	18.0	9.6	118	660	.04	--
15	6-03-92	0640	116	9.7	19.5	8.6	109	656	.06	0.13
	6-05-92	1205	137	9.8	19.5	10.4	132	660	--	--
	6-07-92	1048	121	9.8	19.0	9.0	113	655	--	--
	6-10-92	0944	--	10.1	19.0	10.2	--	655	.05	<.1
	6-12-92	1110	148	10.1	15.5	9.3	109	655	--	--
	6-14-92	1200	144	10.2	14.5	10.3	117	660	--	--
	6-15-92	0700	--	10.0	14.0	9.3	--	654	--	--
	6-17-92	0640	134	10.5	15.5	9.2	107	657	.05	<.1
	6-19-92	0736	128	9.9	18.0	13.8	170	657	--	--
	6-21-92	0730	144	10.0	20.0	7.8	100	658	--	--
	6-24-92	1000	123	10.0	25.0	6.6	93	660	.07	<.1
	6-26-92	1109	117	9.7	22.0	7.0	94	655	--	--
	6-28-92	0730	111	9.5	20.5	4.4	57	652	--	--
	7-01-92	0625	114	9.0	16.0	4.6	54	654	.22	.24
	7-03-92	1120	117	8.5	18.5	8.3	103	656	--	--
	7-05-92	0725	128	--	17.5	6.5	79	654	--	--
	7-08-92	0640	117	9.2	19.0	6.6	82	660	.05	--
	7-10-92	1051	121	9.3	21.0	6.2	81	660	--	--
	7-12-92	1055	122	9.1	19.5	6.9	87	657	--	--
	7-15-92	0630	123	8.8	22.0	5.8	77	660	.05	--
	7-17-92	0650	113	8.9	23.0	6.7	91	657	--	--
	7-19-92	1020	102	9.5	23.0	7.6	103	660	--	--
	7-22-92	0620	125	8.6	20.0	4.7	60	655	.05	--
	7-24-92	0830	118	8.7	18.0	6.8	83	660	--	--
	7-24-92	1215	--	8.7	20.0	9.2	--	660	--	--
	7-26-92	1055	119	9.0	21.5	8.7	114	662	--	--
	7-27-92	0635	124	8.7	22.0	7.3	97	660	--	--
	7-27-92	1015	136	9.0	22.0	6.4	85	662	.08	--
	7-29-92	0625	119	9.3	22.0	5.1	68	660	.05	--
	7-31-92	0638	127	8.5	24.0	5.3	74	655	--	--
	8-02-92	0720	140	9.0	22.5	4.1	55	660	--	--
	8-05-92	0840	125	9.2	20.5	4.3	55	660	.05	--
	8-07-92	1315	130	9.3	21.5	7.7	101	659	--	--
	8-09-92	0622	114	8.7	19.0	5.1	63	665	--	--
	8-12-92	0625	122	9.1	21.0	6.3	82	660	.04	--
	8-14-92	0730	119	9.1	23.0	5.0	68	660	--	--
	8-14-92	1827	133	9.3	28.0	9.0	134	660	--	--
	8-16-92	0615	123	8.6	23.0	3.3	45	659	--	--
	8-19-92	0635	120	8.6	24.0	5.7	79	655	.05	--
	8-21-92	0700	132	9.2	22.0	4.6	61	660	--	--
	8-23-92	0950	227	9.2	17.5	5.1	62	660	--	--
	8-24-92	0800	135	8.3	16.0	6.2	73	660	.01	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temper-ature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
15	8-26-92	0840	186	9.0	16.0	7.7	90	660	0.06	--
	8-28-92	1035	128	8.9	18.5	6.9	85	660	--	--
	8-30-92	0650	128	9.0	18.0	5.5	67	660	--	--
	9-09-92	1300	137	8.4	16.0	8.1	95	659	.03	--
LL6	7-10-92	1730	1,510	8.5	--	--	--	--	--	--
	7-11-92	1653	1,540	7.7	21.0	5.4	--	--	--	--
LL7	7-10-92	1700	1,560	8.1	24.5	11.8	--	--	--	--
	7-11-92	1625	1,460	7.5	21.0	16.0	--	--	--	--
LL7A	7-06-92	1605	1,490	8.9	21.0	10.8	--	--	--	--
	7-07-92	1835	1,970	8.1	18.5	4.4	--	--	--	--
LL8	7-10-92	1800	1,510	8.1	23.0	5.9	--	--	--	--
	7-11-92	1720	1,660	7.2	20.5	3.9	--	--	--	--
LL13	7-06-92	1640	1,020	8.4	19.0	15.6	--	--	--	--
	7-07-92	2004	1,380	9.0	21.0	20.0	--	--	--	--
	7-08-92	1825	1,450	8.5	22.0	20.0	--	--	--	--
	7-09-92	1855	1,460	8.8	23.5	20.0	--	--	--	--
	7-10-92	1830	1,290	8.7	22.0	20.0	--	--	--	--
	7-11-92	1825	1,420	8.2	21.0	20.0	--	--	--	--
LL14	7-06-92	1715	1,460	7.9	20.0	10.8	--	--	--	--
	7-07-92	1915	1,940	8.5	23.0	8.5	--	--	--	--
LL16	8-20-92	1515	847	9.2	25.5	11.4	162	660	--	--
	8-21-92	1525	747	9.3	23.0	10.2	139	655	.06	--
LL17	7-08-92	1940	720	9.5	24.0	10.8	--	--	--	--
	7-09-92	1815	711	9.6	27.5	13.8	--	--	--	--
	7-10-92	1900	741	9.5	24.0	11.8	--	--	--	--
	7-11-92	1853	746	9.1	24.0	11.3	--	--	--	--
LL18	7-08-92	1915	983	9.0	22.0	10.0	--	--	--	--
LL25	7-04-92	2028	1,034	9.5	21.0	12.3	--	--	--	--
LL26	7-04-92	1947	1,040	9.5	21.5	12.1	--	--	--	--
	8-20-92	1445	1,140	8.8	25.5	13.0	185	660	--	--
	8-21-92	1500	972	8.8	23.5	10.8	149	655	.06	--
LL27	7-04-92	1738	1,580	8.1	21.0	--	--	--	--	--
LL28	7-04-92	1830	1,620	8.4	20.0	13.9	--	--	--	--
LL29	7-04-92	1853	1,670	8.4	20.0	--	--	--	--	--
LL30	7-04-92	1915	1,770	8.5	19.5	12.4	--	--	--	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temper-ature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
LL31	8-20-92	1430	1,050	8.8	25.0	9.0	127	660	--	--
	8-21-92	1445	1,010	8.9	22.5	9.7	131	655	0.06	--
LL32	8-20-92	1410	1,010	9.1	25.5	12.1	172	660	--	--
	8-21-92	1420	1,020	8.8	24.5	10.8	152	655	.06	--
LL33	7-08-92	1713	1,860	7.8	25.0	11.0	--	--	--	--
	7-11-92	1802	1,510	7.5	23.5	5.9	--	--	--	--
LL34	8-20-92	1815	1,080	9.0	24.0	13.6	188	660	--	--
	8-21-92	1550	1,030	8.8	23.0	6.7	92	655	.05	--
LL35	7-08-92	1629	1,450	8.7	22.0	20.0	--	--	--	--
LL41	7-05-92	2000	1,330	8.8	19.0	--	--	--	--	--
LL46	8-19-92	1445	1,630	7.9	29.0	16.5	250	661	--	--
	8-20-92	1517	1,650	7.9	26.0	6.0	87	657	16.0	--
LL56	7-09-92	1700	563	9.2	25.5	17.8	--	--	--	--
	7-10-92	1730	330	9.0	25.0	8.4	--	--	--	--
	7-11-92									
LL57	7-07-92	1630	378	9.1	25.0	17.4	--	--	--	--
	7-10-92	1700	332	9.0	24.5	8.6	--	--	--	--
	7-11-92	1710	316	8.9	23.0	13.0	--	--	--	--
	8-19-92	1515	274	8.5	26.0	16.2	232	661	--	--
	8-20-92	1546	251	8.3	24.5	9.2	129	657	.06	--
	8-20-92	1551	251	8.3	24.5	9.2	129	657	.06	--
LL70	7-09-92	1855	374	8.8	26.0	5.9	--	--	--	--
	7-10-92	1840	371	8.7	26.0	7.1	--	--	--	--
	7-11-92	1850	373	8.9	24.6	11.2	--	--	--	--
LL71	7-08-92	2005	1,960	6.4	19.5	7.4	--	--	--	--
	7-09-92	1730	2,090	7.7	--	--	--	--	--	--
	7-10-92	1805	2,010	7.4	21.0	5.5	--	--	--	--
	7-11-92	1830	2,050	7.5	19.5	10.8	--	--	--	--
LL77	7-08-92	1830	1,940	7.5	23.5	2.2	--	--	--	--
LL78	7-08-92	1905	1,890	7.5	25.0	2.7	--	--	--	--
LL79	8-19-92	1545	1,050	8.4	26.0	19.1	274	661	--	--
	8-20-92	1615	1,390	8.2	24.5	16.8	236	657	.10	--
LL87	7-10-92	1930	418	8.3	25.0	9.8	--	--	--	--
	7-11-92	2030	930	8.6	22.0	7.8	--	--	--	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temper-ature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
LL88	7-03-92	1830	307	7.6	23.0	7.9	--	--	--	--
	7-10-92	1950	415	8.8	24.5	6.8	--	--	--	--
	7-11-92	2016	795	8.4	22.0	7.0	--	--	--	--
LL89	7-03-92	1916	321	8.2	--	6.7	--	--	--	--
	7-10-92	2010	415	8.6	24.5	6.4	--	--	--	--
	7-11-92	1955	803	8.4	22.0	6.5	--	--	--	--
LL90	8-19-92	1630	504	9.4	28.0	12.6	187	661	--	--
	8-20-92	1655	367	8.3	25.0	7.9	112	657	0.02	--
	8-22-92	1455	398	8.6	22.0	12.0	160	659	.06	--
LL91	7-03-92	2020	311	7.9	23.0	6.0	--	--	--	--
LL92	7-03-92	2030	307	8.1	23.0	6.0	--	--	--	--
LL93	7-03-92	2100	300	8.9	25.0	9.3	--	--	--	--
	8-20-92	1635	318	8.1	22.0	7.2	--	--	--	--
LL146	8-19-92	1720	283	8.1	27.0	12.2	178	661	--	--
	8-20-92	1738	268	8.3	27.0	13.2	194	657	.06	--
LL148	7-04-92	1700	274	9.0	25.0	14.4	--	--	--	--
	7-05-92	1930	268	8.9	22.0	9.7	--	--	--	--
	7-06-92	1825	265	9.6	25.0	14.9	--	--	--	--
	7-08-92	1850	416	8.8	26.0	12.8	--	--	--	--
LL172	8-19-92	1700	320	8.4	27.0	12.0	175	660	--	--
	8-20-92	1718	336	8.4	27.0	12.2	179	657	.06	--
LL173	8-19-92	1742	385	7.2	20.0	6.3	80	661	--	--
	8-20-92	1753	392	6.9	21.0	3.4	44	657	.09	--
LL174	7-06-92	1740	348	7.3	22.0	5.3	--	--	--	--
	7-08-92	1745	409	7.1	24.0	2.4	--	--	--	--
	7-09-92	1725	381	7.5	25.0	2.6	--	--	--	--
LL175	7-06-92	1705	548	7.2	19.0	.4	--	--	--	--
LL176	8-19-92	1815	322	7.7	24.0	5.3	73	660	--	--
	8-20-92	1820	300	7.7	24.0	4.8	67	657	.09	--
LL201	7-31-92	1640	773	9.2	28.0	12.4	184	662	--	--
	8-01-92	1655	755	9.1	27.0	15.1	221	660	.06	--
LL205	8-10-92	1817	1,050	--	29.0	10.0	151	662	--	--
	8-11-92	1750	1,070	9.6	28.0	11.2	167	659	.04	--
	8-12-92	1711	955	9.1	26.0	9.1	131	659	--	--
	8-14-92	1715	888	9.4	29.0	9.2	139	660	--	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temper-ature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
LL206	8-10-92	1600	1,850	7.3	27.0	0.4	6	662	--	--
	8-11-92	1630	1,950	7.5	22.0	.1	1	659	1.40	--
	8-12-92	1608	1,740	7.4	23.0	.6	8	659	--	--
	8-14-92	1615	1,750	7.1	25.0	.7	10	660	--	--
LL214	7-31-92	1800	816	9.2	27.0	11.8	172	662	--	--
	8-01-92	1800	789	9.4	27.0	15.6	228	660	--	--
LL215	7-31-92	1715	784	9.6	28.0	12.0	179	660	--	--
	8-01-92	1730	790	9.4	27.0	13.6	199	660	.03	--
LL218	7-30-92	1655	293	8.9	31.0	10.5	165	660	--	--
	7-31-92	1830	271	8.5	25.0	9.6	135	660	.03	--
LL220	8-06-92	1800	268	8.0	25.0	9.8	137	665	--	--
	8-07-92	1713	256	8.8	27.0	11.8	170	667	.02	--
LL221	7-30-92	1730	284	8.5	29.0	12.4	198	626	--	--
	7-31-92	1800	256	8.4	24.0	14.2	196	660	.06	--
LL222	8-06-92	1735	609	7.8	25.0	5.7	80	665	--	--
	8-07-92	1640	337	8.0	27.0	7.1	104	660	.25	--
	8-08-92	1617	388	8.7	28.0	6.5	97	660	.13	--
	8-08-92	1620	--	--	--	--	--	--	.13	--
LL223	8-06-92	1705	892	7.5	20.0	3.4	43	665	--	--
	8-07-92	1545	351	7.5	25.0	4.0	57	657	.25	--
	8-08-92	1710	434	7.5	27.0	6.0	88	660	.10	--
LL224	8-09-92	1725	314	8.8	25.0	12.2	172	660	--	--
	8-10-92	1700	396	8.7	27.0	14.6	213	662	.09	--
LL225	8-09-92	1806	501	8.7	26.0	14.0	201	660	--	--
	8-10-92	1700	521	--	27.0	14.4	210	662	.05	--
LL226	7-31-92	2025	1,140	6.9	25.0	.3	4	660	--	--
	8-01-92	1930	1,060	7.1	21.0	.7	9	665	1.70	--
	8-02-92	1755	1,100	6.6	26.0	.2	3	660	2.56	--
LL227	7-31-92	1955	932	7.8	25.0	5.3	75	660	--	--
	8-01-92	1825	1,610	7.5	21.0	1.5	19	665	.29	--
	8-02-92	1840	1,670	6.8	23.0	1.3	18	660	.22	--
	8-07-92	1335	1,670	6.8	23.0	1.3	18	660	--	--
LL230	7-30-92	1830	753	7.4	24.0	3.7	51	660	--	--
	7-31-92	1905	566	8.1	23.0	1.6	22	660	.27	--
LL232	7-30-92	1755	327	8.1	26.0	9.8	140	660	--	--
	7-31-92	1720	302	8.9	26.0	9.8	140	660	.05	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temperature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
LL233	8-10-92	1959	390	8.0	23.0	7.5	102	660	--	--
	8-11-92	1715	472	7.8	23.0	4.9	66	659	0.12	--
	8-12-92	2040	594	6.9	21.0	.7	9	660	--	--
	8-13-92	1837	572	7.0	22.0	3.2	43	660	--	--
	8-14-92	1920	559	7.3	24.0	2.9	40	660	--	--
LL234	8-10-92	1915	284	8.0	24.0	10.1	138	665	--	--
	8-11-92	1802	266	8.4	25.0	10.6	150	658	.03	--
	8-12-92	2030	284	8.4	25.0	9.1	128	660	--	--
LL235	8-10-92	1932	300	8.1	23.0	9.3	125	665	--	--
	8-11-92	1825	271	8.2	25.0	10.8	152	660	.03	--
	8-12-92	2000	284	8.4	25.0	9.1	128	660	--	--
	8-13-92	1815	285	8.2	26.0	12.2	175	660	--	--
	8-14-92	1855	284	8.4	27.0	12.6	184	660	--	--
LL237	7-24-92	1705	318	8.0	23.5	10.4	--	--	--	--
LL238	7-24-92	1645	486	7.0	22.5	.6	--	--	--	--
LL248	8-10-92	1625	2,240	7.2	25.0	.8	11	662	--	--
	8-11-92	1710	1,940	7.4	23.0	1.4	19	659	.70	--
	8-12-92	1642	2,020	7.0	23.0	.4	5	659	--	--
	8-14-92	1645	2,000	7.2	24.0	.7	10	660	--	--
LL251	7-31-92	1910	921	9.3	26.0	11.2	160	662	--	--
	8-01-92	1855	788	9.2	26.0	11.1	159	660	.02	--
LL255	8-10-82	1640	588	6.5	23.0	.8	11	665	--	--
	8-11-92	1950	543	6.7	20.0	1.3	17	660	.85	--
	8-12-92	1900	776	6.7	22.0	.6	8	660	--	--
	8-13-92	1740	786	7.9	21.0	.7	9	645	--	--
LL259	8-10-92	1810	255	--	29.0	18.2	273	665	--	--
	8-11-92	2032	242	9.2	26.0	13.2	189	660	.05	--
	8-12-92	1720	250	9.3	28.0	12.0	178	660	--	--
	8-13-92	1703	297	8.9	29.0	14.6	221	660	--	--
	8-14-92	1753	328	7.8	26.5	14.6	221	660	--	--
LL260	8-10-92	1620	319	7.9	24.0	6.7	91	668	--	--
	8-11-92	1928	264	7.3	24.0	3.7	51	660	.14	--
	8-13-92	1724	320	7.1	25.0	4.3	60	660	--	--
	8-14-92	1715	341	7.3	27.0	5.0	73	660	--	--
LL261	7-24-92	1730	324	8.2	25.5	14.8	--	--	--	--
LL262	8-10-92	1755	260	9.3	29.5	16.0	247	665	--	--
	8-11-92	2011	293	9.0	28.0	11.2	166	660	.03	--
	8-12-92	0810	274	9.3	28.0	12.4	184	660	--	--
	8-13-92	1640	265	9.2	31.0	14.9	234	660	--	--
	8-14-92	1811	341	7.9	26.0	9.2	132	660	--	--

Table 7. Field and laboratory measurements of selected properties and constituents in surface water from primary and additional sampling sites, 1991-92--*Continued*

Site	Date	Time	Specific conductance (µS/cm)	pH (standard units)	Temperature (°C)	Oxygen, dissolved (mg/L)	Oxygen, dissolved (percent saturation)	Barometric pressure (mm of Hg)	Nitrogen, ammonia (mg/L as N) (lab)	Nitrogen, ammonia (mg/L as NH_3) (field)
LR5	8-21-91	1305	211	8.6	23.0	7.3	99	660	--	--
	8-21-91	1450	197	8.8	24.0	8.8	121	660	--	--
	8-21-91	1620	195	9.4	24.5	8.9	124	660	--	--
	8-21-91	1750	198	8.8	24.5	9.4	131	660	--	--
	8-21-91	2100	178	8.6	23.5	8.2	112	660	--	--
	8-21-91	2220	182	8.7	23.0	9.2	124	660	--	--
	8-22-91	0015	196	8.2	23.0	5.8	78	660	--	--
	8-22-91	0215	174	7.9	22.0	4.7	62	660	--	--
	8-22-91	0355	183	7.8	22.0	4.2	56	660	--	--
	8-22-91	0650	224	7.8	21.5	3.1	41	660	--	--
	8-22-91	0840	210	7.7	22.0	3.7	49	660	--	--
	8-22-91	1005	221	8.0	22.0	3.8	50	660	--	--
	8-22-91	1300	208	8.4	22.0	7.2	96	660	--	--
LR6	8-21-91	1350	131	9.2	27.0	13.5	197	660	--	--
	8-21-91	1530	136	9.5	26.0	13.2	189	660	--	--
	8-21-91	1645	143	9.9	27.0	16.5	241	660	--	--
	8-21-91	1820	149	10.0	27.0	19.8	289	660	--	--
	8-21-91	2130	119	9.5	24.5	13.2	184	660	--	--
	8-21-91	2240	135	9.5	23.0	12.0	162	660	--	--
	8-22-91	0030	117	9.1	23.0	9.4	127	660	--	--
	8-22-91	0245	127	9.3	22.5	9.4	126	660	--	--
	8-22-91	0410	118	9.3	22.0	7.5	100	660	--	--
	8-22-91	0715	126	8.8	22.5	6.4	86	660	--	--
	8-22-91	0900	128	9.2	22.0	7.1	94	660	--	--
	8-22-91	1035	128	9.2	23.0	8.4	114	660	--	--
	8-22-91	1340	130	9.2	24.0	9.1	126	660	--	--
UTL3	7-31-92	0845	984	9.4	22.0	5.2	69	660	0.03	--
	8-20-92	0705	921	8.8	20.5	3.3	43	660	.04	--
	9-09-92	1030	986	9.4	17.0	10.4	125	661	.05	--
UTL5	7-31-92	1155	401	9.1	25.0	7.5	106	660	.03	--
	8-20-92	1000	346	8.5	22.0	3.0	40	660	.06	--
	9-09-92	1000	300	8.4	18.0	4.0	49	661	.07	--
UTL7	7-31-92	0910	1050	9.0	23.0	6.5	88	660	.02	--
	8-20-92	0735	934	8.9	22.0	5.8	77	660	.04	--
	9-09-92	0750	836	9.5	16.0	10.8	127	660	.06	--
	9-09-92	0900	866	9.6	16.0	11.2	132	660	.04	--
9A	8-19-91	1310	952	8.6	27.0	1.5	22	660	--	--
	8-19-91	1435	953	8.7	28.0	2.5	37	660	--	--
	8-19-91	1555	879	8.6	28.0	2.6	39	660	--	--
	8-19-91	1810	958	8.6	27.5	2.7	40	660	--	--
	8-19-91	2110	878	8.7	27.0	3.2	47	660	--	--
	8-19-91	2255	878	8.7	26.0	2.7	39	660	--	--
	8-20-91	0100	883	8.7	25.5	2.1	30	660	--	--
	8-20-91	0245	903	8.7	25.0	1.5	21	660	--	--
	8-20-91	0440	882	8.6	24.5	1.0	14	660	--	--
	8-20-91	0700	875	8.5	24.0	.6	8	660	--	--
	8-20-91	0935	948	8.4	24.0	.7	10	660	--	--
	8-20-91	1050	948	8.1	24.5	1.0	14	660	--	--
	8-20-91	1315	950	8.5	28.5	2.0	30	660	--	--

Table 8. Water-quality data from frog call survey sites, 1991-92

[See figures 2 and 3 for site locations. °C, degree Celsius; mg/L, milligram per liter; µS/cm, microsiemen per centimeter at 25°C; --, no data]

Date	Time	pH	Water temperature (°C)	Oxygen, dissolved (mg/L)
Indian Tom Lake (1991)				
Site T1				
May 22	2055	8.9	14.5	9.6
May 29	2030	9.1	14.0	7.2
June 5	2330	8.9	17.0	8.4
June 12	2345	9.0	17.0	7.9
June 19	2330	9.1	15.0	8.4
June 26	2025	9.3	16.0	10.2
July 3	2350	9.0	21.0	9.3
July 10	2040	9.4	21.0	11.0
Lower Klamath Refuge (1991)				
Site 2				
May 22	2045	8.8	21.0	8.5
May 29	2300	8.7	22.0	9.0
June 5	2135	--	19.0	--
June 12	2050	8.0	23.0	5.4
June 19	2300	7.4	20.0	5.4
June 26	2230	8.4	20.0	7.2
July 3	2100	8.1	28.0	8.1
Site 22				
May 22	2130	8.8	18.5	7.4
May 29	2105	9.1	15.5	7.4
June 5	2105	9.0	19.0	10.0
June 12	2100	9.6	15.0	11.4
June 19	2050	9.9	15.0	11.2
June 26	2215	10.1	17.0	13.4
July 3	2325	10.1	24.0	5.6
July 10	2240	10.0	23.0	10.2
Site 28				
May 22	2330	7.9	17.0	7.0
May 29	2200	8.1	20.0	2.2
June 5	2240	7.9	21.0	1.4
June 12	2225	8.0	15.0	.7
June 19	2150	8.2	16.0	1.5
June 27	0020	8.2	19.0	.7
July 10	2200	8.5	25.0	1.0
Site 29				
May 22	2345	8.3	18.5	5.3
May 29	2215	9.0	17.0	8.5
June 5	2255	9.0	19.0	7.4
June 12	2240	8.1	15.0	.2
June 19	2205	9.2	16.0	2.5
Site 29--*Continued*				
July 10	2215	9.0	23.0	0.2
Site 34				
May 23	0145	8.7	16.5	6.5
June 5	2025	8.6	14.0	6.6
June 12	2325	8.5	15.0	6.5
June 19	2315	8.9	16.0	3.3
June 26	2125	9.0	15.0	6.8
July 10	2320	9.5	21.0	4.0
Tule Lake (1991)				
Site 1				
May 21	2045	9.1	18	11.7
May 30	0015	9.5	15.0	11.0
June 5	2340	8.3	17.0	8.4
June 12	2315	9.0	22.0	6.7
June 19	2235	8.8	16.0	6.6
June 26	2155	8.4	18.0	8.2
July 3	2045	8.7	24.0	7.4
Site 8				
May 21	2150	8.8	17.5	7.7
May 29	2035	8.6	17.5	6.5
June 4	0035	8.7	16.5	7.4
June 13	0010	8.5	22.0	4.5
June 19	2325	8.6	16.0	6.4
June 26	2245	8.6	17.0	6.3
July 3	2145	8.8	25.0	6.8
July 10	2105	9.2	22.0	12.2
Site 13				
May 21	2240	9.1	16.5	11.1
May 29	2100	9.3	16.0	11.0
June 5	2045	8.6	20.0	9.0
June 13	0100	9.5	23.0	7.5
June 20	0005	10.0	17.0	14.2
June 26	2325	9.8	17.0	11.2
July 4	2230	10.3	25.0	12.8
July 10	2200	10.3	23.0	10.6
Site 23				
May 22	0010	9.1	13.5	10.2
May 29	2240	9.3	16.0	11.3
June 5	2210	8.8	19.0	8.2
June 12	2200	9.6	23.0	8.6

Table 8. Water-quality data from frog call survey sites, 1991-92--*Continued*

Date	Time	pH	Water temperature (°C)	Oxygen, dissolved (mg/L)
Site 23--*Continued*				
June 19	2100	10.4	16.0	16.2
June 27	0040	10.0	18.0	12.2
July 3	2340	9.9	22.0	15.6
July 10	2250	9.5	20.0	8.7
Site 28				
May 22	0055	9.3	17.0	8.6
June 5	2250	8.7	19.0	7.2
June 12	2235	9.0	24.0	1.0
June 19	2150	9.9	16.5	1.0
June 26	2100	7.9	17.0	.3
July 4	0020	9.2	20.0	.4
July 10	2335	9.2	20.0	.3

Date	Time	pH	Water temperature (°C)	Oxygen, dissolved (mg/L)	Specific conductance (µS/cm)
Indian Tom Lake (1992)					
Site T1					
May 17	2025	8.4	15.0	7.7	--
May 24	2330	8.9	16.0	6.7	--
May 30	2330	9.3	13.0	--	1,450
June 6	2045	9.2	16.0	9.6	1,450
June 14	0005	9.6	14.0	7.3	1,500
June 20	2015	8.9	26.0	7.8	1,360
June 27	2315	9.2	15.0	8.2	1,530
Lower Klamath Refuge (1992)					
Site 2					
May 17	2100	8.8	16.0	7.7	--
May 24	2230	9.1	19.0	7.3	215
May 30	2140	9.9	22.0	--	178
June 6	2115	9.8	22.5	12.2	172
June 13	2320	9.1	17.0	6.4	159
June 20	2150	8.5	23.0	6.8	175
June 27	2100	9.1	24.5	10.0	160
July 4	2215	8.9	26.0	15.2	154
Site 15					
May 17	2300	8.0	16.0	7.2	--
May 24	2130	8.2	20.0	4.5	730
May 30	2045	8.8	23.0	--	1,350
June 6	2325	8.2	18.0	4.9	507
June 13	2245	8.3	16.0	6.2	364
Site 15--*Continued*					
June 20	2125	8.0	23.0	3.0	330
June 27	2315	8.8	19.0	5.8	283
July 4	2130	8.0	23.0	5.5	250
Site 21					
May 17	2055	8.9	16.0	9.5	--
May 24	2315	9.2	19.0	1.0	660
May 30	2130	7.8	19.0	3.6	--
June 6	2105	9.8	19.0	12.0	824
Site 29					
May 17	2210	8.8	16.0	8.8	--
May 24	2110	9.5	22.0	--	1,307
May 30	2235	9.8	16.0	7.1	--
June 6	2200	9.4	12.0	6.6	1,120
June 13	2125	8.9	21.0	5.1	1,390
June 20	2300	8.7	22.0	.6	1,480
July 4	2210	--	10.0	4.9	1,530
Tule Lake (1992)					
Site 1					
May 17	2045	9.2	23.0	11.9	230
May 25	0020	8.8	20.0	5.5	218
May 30	2345	8.9	20.0	6.2	290
June 6	2320	8.8	17.0	3.2	258
June 13	2305	7.6	15.0	5.8	232
June 20	2200	8.0	26.0	4.1	--
June 27	2100	7.5	17.0	--	250
July 5	0040	7.4	19.0	3.3	262
Site 8					
May 17	2055	8.2	22.0	5.8	1,000
May 24	2035	8.1	25.0	3.8	1,080
June 1	0050	7.9	17.0	7.3	1,080
June 13	2305	8.8	13.0	8.5	993
June 20	2250	7.2	22.0	2.6	--
June 27	2210	8.2	15.0	--	725
July 4	2055	9.0	18.0	12.9	--
Site 13					
May 17	2125	9.2	22.0	12.0	901
May 24	2105	9.2	23.0	8.4	950
May 30	2030	10.3	23.0	9.2	813
June 7	0045	10.1	21.0	9.1	798
June 13	2325	9.4	14.0	8.0	714

Table 8. Water-quality data from frog call survey sites, 1991-92--*Continued*

Date	Time	pH	Water temperature (°C)	Oxygen, dissolved (mg/L)	Specific conductance (µS/cm)
Site 13--*Continued*					
June 20	2315	9.6	25.0	6.5	--
June 27	2240	9.4	15.0	--	690
July 4	2150	8.9	19.0	8.4	872
Site 23					
May 17	2310	8.9	17.0	9.2	932
May 24	2240	9.1	21.0	3.5	915
May 30	2220	10.1	20.0	13.2	820
June 6	2140	10.3	21.0	9.1	779
June 13	2045	9.4	14.0	8.0	714
June 21	0100	9.5	--	8.9	--
Site 23--*Continued*					
June 28	0015	8.4	15.0	--	620
July 4	2320	8.3	17.0	0.6	800
Site 28					
May 18	0025	9.1	17.0	7.1	426
May 24	2340	9.2	20.0	4.4	410
May 30	2315	9.1	20.0	6.7	325
June 6	2240	7.9	18.0	3.4	298
June 20	2100	8.0	24.0	4.1	--
June 28	0115	8.0	14.5	--	312
July 5	0105	7.3	17.0	2.5	383

Table 9. Concentrations of arsenic and mercury in surface water from selected sites in Lower Klamath National Wildlife Refuge, February 28, 1991

[See figure 1 for site locations. Concentrations in micrograms per liter. <, actual value is less than value shown]

Site	Time	Arsenic, dissolved	Arsenic, total	Mercury, dissolved	Mercury, total recoverable
LK1	1440	22	27	<0.1	<0.10
LK2	1000	19	20	<.1	<.10
LK3	1405	24	28	<.1	<.10
LK4	1615	66	78	<.1	<.10
LK5	1120	9	9	<.1	<.10
12	1530	20	22	<.1	<.10
P1	1150	10	10	<.1	<.10

Table 10. Concentrations of total and dissolved nitrogen, phosphorus, and organic carbon in surface water, 1991-92

[See figure 1 for site locations. Concentrations in milligrams per liter. <, actual value is less than value shown; >, actual value is greater than value shown; --, no data]

Site	Date	Time	Nitrogen, nitrite, total	Nitrogen nitrite, dis-solved	Nitrogen, NO_2+NO_3, total	Nitrogen, NO_2+NO_3, dis-solved	Nitrogen, ammonia, total	Nitrogen, ammonia, dis-solved
1	8-21-91	1420	--	0.030	--	0.190	--	0.070
	8-21-91	1720	--	.030	--	.210	--	.080
	8-21-91	2200	--	.030	--	.230	--	.070
	8-22-91	0158	--	.030	--	.230	--	.120
	8-22-91	0615	--	.030	--	.220	--	.110
	8-22-91	0940	--	.030	--	.250	--	.100
	7-24-92	1300	--	--	--	--	--	--
	7-28-92	1550	0.090	.090	0.270	.320	0.410	.430
	7-28-92	1555	.090	.090	.270	.320	.410	.420
	8-24-92	1445	.050	.040	.290	.260	.180	.190
	8-24-92	1450	--	--	--	--	--	--
2	8-05-91	1340	--	.010	--	.084	--	.100
	7-24-92	1200	--	--	--	--	--	--
	7-28-92	1520	.070	.070	.130	.170	.280	.270
	8-24-92	1250	.070	.060	.260	.240	.180	.160
	9-08-92	1055	.030	.030	.140	.150	.150	.110
3	8-05-91	1220	--	.050	--	.220	--	.160
	7-23-92	1000	--	--	--	--	--	--
	7-30-92	0530	.060	.060	.180	.200	.170	.170
	8-24-92	1335	.070	.060	.230	.200	.160	.180
	9-08-92	1150	.020	.020	.250	.250	.070	.070
4	7-31-92	1105	.050	.050	.150	.160	.170	.160
	8-20-92	0900	.070	.060	.190	.180	.256	.230
	9-09-92	0940	.020	.020	.170	.170	.050	.040
5	8-05-91	1300	--	.060	--	1.30	--	.070
	7-23-92	1105	--	--	--	--	--	--
	7-30-92	0635	.160	.160	3.30	3.40	.240	.250
	8-21-92	1325	.080	.080	2.20	2.20	.060	.060
	9-08-92	1255	.040	.040	.250	.250	.110	.100
6	7-31-92	1010	.010	< .010	< .050	< .050	.070	.040
	8-20-92	0835	.020	.010	< .050	< .050	.320	.310
	9-09-92	0930	.020	.020	.086	.073	.030	.030
7	8-07-91	1200	--	.030	--	.750	--	.060
	8-07-91	1602	--	.030	--	.580	--	.050

Table 10. Concentrations of total and dissolved nitrogen, phosphorus, and organic carbon in surface water, 1991-92--*Continued*

Site	Date	Nitrogen, ammonia, plus organic, total	Nitrogen, ammonia, plus organic, dissolved	Phosphorus, total	Phosphorus, dissolved	Phosphorus, ortho, total	Phosphorus, ortho, dissolved	Carbon, organic, dissolved	Carbon, organic, suspended, total
1	8-21-91	--	1.1	--	0.290	--	0.230	--	--
	8-21-91	--	1.0	--	.280	--	.230	--	--
	8-21-91	--	1.3	--	.290	--	.230	--	--
	8-22-91	--	1.4	--	.290	--	.230	--	--
	8-22-91	--	1.3	--	.300	--	.230	--	--
	8-22-91	--	1.2	--	.300	--	.240	--	--
	7-24-92	--	--	--	--	--	--	28	0.4
	7-28-92	4.9	2.1	0.970	.290	0.240	.220	--	--
	7-28-92	2.5	1.7	.390	.270	.240	.220	--	--
	8-24-92	2.1	.90	.330	.170	.180	.170	11	.1
	8-24-92	--	--	--	--	--	--	10	.1
2	8-05-91	--	1.5	--	.330	--	.270	--	--
	7-24-92	--	--	--	--	--	--	32	> 4.5
	7-28-92	2.2	1.7	.540	.310	.330	.250	--	--
	8-24-92	2.0	1.2	.300	.210	.180	.150	10	.8
	9-08-92	2.1	1.2	.250	.150	.160	.150	10	.4
3	8-05-91	--	1.2	--	.330	--	.280	--	--
	7-23-92	--	--	--	--	--	--	38	3.4
	7-30-92	1.5	1.3	.420	.360	.330	.310	--	--
	8-24-92	2.0	1.3	.450	.320	.360	.260	11	.4
	9-08-92	1.2	1.0	.260	.180	.210	.200	9.7	.2
4	7-31-92	1.6	1.4	.410	.390	.280	.300	10	.1
	8-20-92	1.9	1.2	.560	.320	.330	.280	11	.2
	9-09-92	1.4	1.0	.260	.200	.210	.180	9.7	.1
5	8-05-91	--	1.5	--	.340	--	.290	--	--
	7-23-92	--	--	--	--	--	--	43	.4
	7-30-92	2.4	2.4	.400	.370	.310	.300	--	--
	8-21-92	1.8	1.1	.400	.280	.290	.270	13	.2
	9-08-92	1.8	1.3	.370	.300	.290	.280	14	.1
6	7-31-92	3.3	2.4	.540	.440	.320	.330	23	.2
	8-20-92	3.0	2.9	.800	.620	.550	.560	19	.2
	9-09-92	2.5	1.3	.390	.260	.270	.220	14	.1
7	8-07-91	--	2.0	--	.370	--	.310	--	--
	8-07-91	--	1.3	--	.350	--	.300	--	--

Table 10. Concentrations of total and dissolved nitrogen, phosphorus, and organic carbon in surface water, 1991-92--*Continued*

Site	Date	Time	Nitrogen, nitrite, total	Nitrogen nitrite, dis-solved	Nitrogen, NO_2+NO_3, total	Nitrogen, NO_2+NO_3, dis-solved	Nitrogen, ammonia, total	Nitrogen, ammonia, dis-solved
7	8-07-91	2000	--	0.030	--	0.650	--	0.060
	8-07-91	2350	--	.030	--	.530	--	.070
	8-08-91	0330	--	.030	--	.530	--	.070
	8-08-91	0800	--	.010	--	.560	--	.050
	8-08-91	1205	--	.020	--	.350	--	.060
	7-23-92	1150	--	--	--	--	--	--
	7-30-92	0720	0.110	.100	0.380	.390	0.080	.070
	8-21-92	1050	.040	.030	.063	.050	.100	.090
	9-08-92	1355	.080	.070	.680	.700	.370	.300
8	7-31-92	0940	.050	.040	.097	.075	.410	.400
	8-20-92	0815	.030	.020	< .050	< .050	.250	.200
	9-09-92	0825	.020	.020	< .050	< .050	.150	.160
9	8-07-91	1225	--	.080	--	.270	--	.360
	8-07-91	1630	--	.070	--	.320	--	.340
	8-07-91	2020	--	.080	--	.430	--	.480
	8-08-91	0020	--	.080	--	.370	--	.300
	8-08-91	0400	--	.100	--	.350	--	.460
	8-08-91	0825	--	.080	--	.270	--	.480
	8-08-91	1225	--	.080	--	.300	--	.320
	7-23-92	1240	--	--	--	--	--	--
	7-30-92	0830	.040	.040	.170	.190	1.40	1.40
	8-21-92	0955	.010	< .010	< .050	< .050	.330	.340
	9-08-92	1445	.010	.020	.290	.270	.460	.490
10	7-31-92	0700	.160	.140	.410	.420	1.10	1.10
	8-20-92	0750	.020	.020	< .050	< .050	.170	.160
	9-09-92	0840	.020	.030	.360	.390	.410	.380
11	8-07-91	1255	--	.030	--	.070	--	.230
	8-07-91	1655	--	.020	--	.050	--	.120
	8-07-91	2050	--	.020	--	.085	--	.170
	8-08-91	0040	--	.020	--	.074	--	.160
	8-08-91	0420	--	.020	--	.082	--	.190
	8-08-91	0850	--	.020	--	.062	--	.210
	8-08-91	1250	--	.020	--	.071	--	.230
	7-23-92	1320	--	--	--	--	--	--
	7-30-92	0945	.010	.010	< .050	< .050	.070	.060
	8-21-92	0840	< .010	< .010	< .050	< .050	.060	.050
	9-08-92	1530	< .010	< .010	< .050	< .050	.050	.040

Table 10. Concentrations of total and dissolved nitrogen, phosphorus, and organic carbon in surface water, 1991-92--*Continued*

Site	Date	Nitrogen, ammonia, plus organic, total	Nitrogen, ammonia, plus organic, dissolved	Phosphorus, total	Phosphorus, dissolved	Phosphorus, ortho, total	Phosphorus, ortho, dissolved	Carbon, organic, dissolved	Carbon, organic, suspended, total
7	8-07-91	--	1.3	--	0.380	--	0.330	--	--
	8-07-91	--	1.4	--	.380	--	.320	--	--
	8-08-91	--	1.2	--	.380	--	.310	--	--
	8-08-91	--	.70	--	.360	--	.340	--	--
	8-08-91	--	1.3	--	.370	--	.320	--	--
	7-23-92	--	--	--	--	--	--	80	0.5
	7-30-92	2.3	2.2	0.580	.550	0.470	.460	--	--
	8-21-92	2.0	1.0	.510	.330	.380	.290	14	.1
	9-08-92	2.5	1.6	.470	.340	.360	.310	15	.2
8	7-31-92	2.8	2.0	.640	.510	.500	.480	17	.1
	8-20-92	3.5	1.7	.630	.320	.330	.250	21	.1
	9-09-92	2.8	2.1	.300	.190	.180	.170	21	--
9	8-07-91	--	2.7	--	.530	--	.480	--	--
	8-07-91	--	2.7	--	.510	--	.450	--	--
	8-07-91	--	2.7	--	.460	--	.410	--	--
	8-08-91	--	2.4	--	.430	--	.370	--	--
	8-08-91	--	2.7	--	.480	--	.430	--	--
	8-08-91	--	3.1	--	.500	--	.450	--	--
	8-08-91	--	2.8	--	.490	--	.410	--	--
	7-23-92	--	--	--	--	--	--	110	1.2
	7-30-92	5.9	5.1	1.10	.410	.420	.350	--	--
	8-21-92	3.0	2.5	.260	.170	.140	.110	27	.1
	9-08-92	4.4	2.9	.370	.090	.120	.060	30	.2
10	7-31-92	5.0	4.5	.410	.310	.260	.240	32	.2
	8-20-92	3.3	2.4	.220	.110	.090	.080	27	.1
	9-09-92	5.2	2.8	.430	.120	.160	.100	29	.2
11	8-07-91	--	2.2	--	.600	--	.550	--	--
	8-07-91	--	2.5	--	.530	--	.470	--	--
	8-07-91	--	2.6	--	.490	--	.430	--	--
	8-08-91	--	2.4	--	.510	--	.430	--	--
	8-08-91	--	2.5	--	.530	--	.460	--	--
	8-08-91	--	2.5	--	.550	--	.500	--	--
	8-08-91	--	2.3	--	.600	--	.520	--	--
	7-23-92	--	--	--	--	--	--	40	.1
	7-30-92	1.8	1.7	.330	.270	.220	.200	--	--
	8-21-92	2.5	1.6	.190	.050	.040	.020	20	--
	9-08-92	4.4	2.3	.190	.020	.020	.010	30	.2

Table 10. Concentrations of total and dissolved nitrogen, phosphorus, and organic carbon in surface water, 1991-92–*Continued*

Site	Date	Time	Nitrogen, nitrite, total	Nitrogen nitrite, dis-solved	Nitrogen, NO_2+NO_3, total	Nitrogen, NO_2+NO_3, dis-solved	Nitrogen, ammonia, total	Nitrogen, ammonia, dis-solved
12	2-28-91	1530	--	0.020	--	0.055	--	0.260
	8-19-91	1245	--	< .010	--	.058	--	.050
	8-19-91	1635	--	< .010	--	< .050	--	.040
	8-19-91	2050	--	< .010	--	< .050	--	.050
	8-20-91	0040	--	< .010	--	< .050	--	.040
	8-20-91	0425	--	< .010	--	< .050	--	.040
	8-20-91	0920	--	< .010	--	< .050	--	.050
	8-20-91	1250	--	< .010	--	.073	--	.100
	7-24-92	1035	--	--	--	--	--	--
	7-28-92	1320	<0.010	< .010	<0.050	.078	0.040	.040
	8-24-92	1110	< .010	< .010	< .050	< .050	.030	.030
	9-08-92	1730	.020	< .010	< .050	< .050	.050	.030
13	8-19-91	1205	--	.070	--	.230	--	.100
	8-19-91	1600	--	.130	--	.330	--	.170
	8-19-91	2010	--	.140	--	.260	--	.180
	8-20-91	0005	--	.090	--	.180	--	.120
	8-20-91	0350	--	.070	--	.170	--	.200
	8-20-91	0840	--	.080	--	.200	--	.280
	8-20-91	1215	--	.090	--	.240	--	.320
	7-24-92	0950	--	--	--	--	--	--
	7-27-92	1145	.020	.020	< .050	.110	.180	.170
	8-24-92	0945	< .010	< .010	< .050	< .050	.030	.040
	9-08-92	1830	< .010	< .010	< .050	< .050	.040	.030
15	7-24-92	0830	--	--	--	--	--	--
	7-27-92	1015	.010	.010	< .050	.091	.080	.080
	8-24-92	0800	< .010	< .010	< .050	< .050	.010	.010
	9-09-92	1300	< .010	< .010	< .050	< .050	.030	.020
UTL3	7-31-92	0845	<.010	<.010	<.050	<.050	.030	.030
	8-20-92	0705	<.010	<.010	<.050	<.050	.040	.040
	9-09-92	1030	<.010	<.010	<.050	<.050	.050	.040
UTL5	7-31-92	1155	<.010	<.010	<.050	<.050	.030	.030
	8-20-92	1000	.020	< .010	< .050	< .050	.056	.020
	9-09-92	1000	< .010	< .010	< .050	< .050	.070	.040
UTL7	7-31-92	0910	< .010	< .010	< .050	< .050	.020	.030
	8-20-92	0735	.020	< .010	< .050	< .050	.040	.056
	9-09-92	0750	< .010	< .010	< .050	< .050	.060	.040
	9-09-92	0900	< .010	< .010	< .050	< .050	.040	.020

Table 10. Concentrations of total and dissolved nitrogen, phosphorus, and organic carbon in surface water, 1991-92--*Continued*

Site	Date	Nitrogen, ammonia, plus organic, total	Nitrogen, ammonia, plus organic, dissolved	Phosphorus, total	Phosphorus, dissolved	Phosphorus, ortho, total	Phosphorus, ortho, dissolved	Carbon, organic, dissolved	Carbon, organic, suspended, total
12	2-28-91	--	2.8	--	0.290	--	0.220	--	--
	8-19-91	--	3.7	--	1.10	--	1.00	--	--
	8-19-91	--	3.5	--	1.10	--	1.00	--	--
	8-19-91	--	2.7	--	1.10	--	1.00	--	--
	8-20-91	--	2.1	--	1.10	--	1.00	--	--
	8-20-91	--	3.1	--	1.10	--	1.00	--	--
	8-20-91	--	2.3	--	1.10	--	.990	--	--
	8-20-91	--	2.6	--	1.10	--	1.00	--	--
	7-24-92	--	--	--	--	--	--	40	0.2
	7-28-92	5.2	2.4	0.460	.100	0.100	.040	--	--
	8-24-92	5.7	1.6	.440	.050	.040	< .010	16	.1
	9-08-92	7.4	1.0	.510	.020	.080	< .010	17	.2
13	8-19-91	--	1.9	--	.230	--	.180	--	--
	8-19-91	--	2.6	--	.260	--	.200	--	--
	8-19-91	--	1.9	--	.230	--	.180	--	--
	8-20-91	--	1.9	--	.210	--	.160	--	--
	8-20-91	--	2.0	--	.230	--	.180	--	--
	8-20-91	--	2.0	--	.270	--	.230	--	--
	8-20-91	--	2.2	--	.300	--	.250	--	--
	7-24-92	--	--	--	--	--	--	90	.2
	7-27-92	6.3	2.5	.990	.350	.460	.270	--	--
	8-24-92	6.4	2.4	1.50	.730	.640	.560	28	.2
	9-08-92	5.1	1.7	.990	.260	.310	.240	29	.2
15	7-24-92	--	--	--	--	--	--	38	2.5
	7-27-92	4.0	1.7	.270	.040	.030	< .010	--	--
	8-24-92	3.7	.80	.280	.020	.030	< .010	10	.4
	9-09-92	2.0	.80	.100	< .010	.030	< .010	8.7	.3
UTL3	7-31-92	3.0	2.9	.080	.080	.020	.030	31	.1
	8-20-92	2.9	2.6	.060	.070	.020	.020	29	.1
	9-09-92	5.4	2.4	.210	.020	.040	< .010	32	.2
UTL5	7-31-92	2.1	1.6	.630	.540	.440	.430	14	.1
	8-20-92	2.8	1.2	.880	.530	.600	.560	15	.1
	9-09-92	2.4	1.2	.440	.320	.300	.270	13	.2
UTL7	7-31-92	2.9	2.6	.170	.120	.080	.070	28	.1
	8-20-92	3.0	2.8	.160	.080	.056	.030	29	.2
	9-09-92	5.9	2.4	.310	.030	.050	.010	29	.2
	9-09-92	6.2	2.5	.330	.040	.060	< .010	31	.3

Table 10. Concentrations of total and dissolved nitrogen, phosphorus, and organic carbon in surface water, 1991-92--*Continued*

Site	Date	Time	Nitrogen, nitrite, total	Nitrogen nitrite, dis-solved	Nitrogen, NO_2+NO_3, total	Nitrogen, NO_2+NO_3, dis-solved	Nitrogen, ammonia, total	Nitrogen, ammonia, dis-solved
LK1	2-28-92	1440	--	0.050	--	0.076	--	0.100
LK2	2-28-92	1405	--	.080	--	.081	--	.020
LR5	8-21-91	1450	0.030	.280	0.070	.280	--	.070
	8-21-91	1750	.030	.240	.040	.240	--	.040
	8-21-91	2220	.030	.230	.040	.230	--	.040
	8-22-91	0215	.030	.260	.090	.260	--	.090
	8-22-91	0650	.040	.270	.120	.270	--	.120
	8-22-91	1005	.030	.260	.050	.260	--	.050
LR6	8-21-91	1530	.010	< .050	.090	<.050	--	.090
	8-21-91	1820	< .010	< .050	.070	<.050	--	.070
	8-21-91	2240	.010	.098	.100	.098	--	.100
	8-22-91	0245	< .010	.063	.090	.063	--	.090
	8-22-91	0715	< .010	< .050	.100	<.050	--	.100
	8-22-91	1035	< .010	< .050	.080	<.050	--	.080
9A	8-19-91	1310	.020	.120	.600	.120	--	.600
	8-19-91	1555	.020	.110	.610	.110	--	.610
	8-19-91	2110	.020	< .050	.570	<.050	--	.570
	8-20-91	0100	.020	< .050	.620	<.050	--	.620
	8-20-91	0440	.020	< .050	.640	<.050	--	.640
	8-20-91	0935	.010	.056	.640	.056	--	.640
	8-20-91	1315	.010	.091	.600	.091	--	.600

Table 10. Concentrations of total and dissolved nitrogen, phosphorus, and organic carbon in surface water, 1991-92--*Continued*

Site	Date	Nitrogen, ammonia, plus organic, total	Nitrogen, ammonia, plus organic, dissolved	Phosphorus, total	Phosphorus, dissolved	Phosphorus, ortho, total	Phosphorus, ortho, dissolved	Carbon, organic, dissolved	Carbon, organic, suspended, total
LK1	2-28-91	--	2.7	--	0.120	--	0.060	--	--
LK2	2-28-91	--	3.4	--	.110	--	.040	--	--
LR5	8-21-91	--	1.4	--	.270	--	.210	--	--
	8-21-91	--	1.2	--	.280	--	.190	--	--
	8-21-91	--	1.5	--	.270	--	.210	--	--
	8-22-91	--	1.5	--	.290	--	.230	--	--
	8-22-91	--	1.4	--	.300	--	.240	--	--
	8-22-91	--	1.1	--	.290	--	.220	--	--
LR6	8-21-91	--	1.1	--	.160	--	.100	--	--
	8-21-91	--	1.3	--	.160	--	.100	--	--
	8-21-91	--	1.4	--	.160	--	.120	--	--
	8-22-91	--	1.2	--	.170	--	.110	--	--
	8-22-91	--	1.2	--	.170	--	.120	--	--
	8-22-91	--	1.1	--	.160	--	.100	--	--
9A	8-19-91	--	3.9	--	.860	--	.850	--	--
	8-19-91	--	3.3	--	.830	--	.790	--	--
	8-19-91	--	3.3	--	.850	--	.790	--	--
	8-20-91	--	3.2	--	.920	--	.770	--	--
	8-20-91	--	3.4	--	.850	--	.810	--	--
	8-20-91	--	2.9	--	.910	--	.860	--	--
	8-20-91	--	3.5	--	.840	--	.800	--	--

Table 11. Concentrations of major dissolved constituents in surface water. 1992

[See figure 1 for site locations. mg/L, milligrams per liter; µg/L, micrograms per liter; <, actual value is less than value shown]

Site	Date	Time	Calcium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	Silica (mg/L)	Boron (mg/L)	Iron (µg/L)	Manganese (µg/L)
1	July 28	1550	12	7.0	18	3.1	9.2	6.1	0.20	50	0.09	65	36
	July 28	1555	12	7.2	20	3.0	8.9	5.9	.20	50	.08	65	37
	Aug. 24	1445	14	8.3	22	3.5	13	4.3	.20	<.10	.09	28	17
2	July 28	1520	14	9.0	24	3.5	11	4.9	.20	32	.09	56	33
	Aug. 24	1250	12	6.8	19	3.3	10	5.7	.10	43	.08	31	30
	Sept. 8	1055	14	7.7	21	3.5	12	6.2	.20	38	.09	26	42
3	July 30	0530	17	9.8	25	3.2	22	5.7	.20	39	.08	62	45
	Aug. 24	1335	18	9.3	25	3.5	21	6.5	.20	46	.08	29	49
	Sept. 8	1150	16	9.4	25	4.0	18	8.8	.20	47	.09	24	10
4	July 31	1105	18	9.9	25	3.9	27	7.9	.20	40	.91	120	46
	Aug. 20	0900	17	9.6	24	4.1	19	6.6	.20	47	.09	27	26
	Sept. 9	0940	16	9.4	24	4.0	18	7.2	<.10	47	.10	26	3
5	July 30	0635	68	26	63	4.1	180	9.0	.30	38	.12	44	34
	Aug. 21	1325	37	16	42	4.8	83	8.5	.30	56	.11	22	21
	Sept. 8	1255	39	17	42	5.0	82	10	.30	43	.10	18	37
6	July 31	1010	31	24	59	13	72	19	.40	36	.26	34	8
	Aug. 20	0835	37	21	46	9.3	59	9.1	.30	37	.18	15	73
	Sept. 9	0930	30	16	36	6.0	46	9.9	.30	38	.12	16	6
7	July 30	0720	64	28	76	6.4	170	12	.30	35	.14	22	120
	Aug. 21	1050	33	17	41	6.9	66	9.9	.30	41	.11	16	40
	Sept. 8	1355	35	16	41	6.7	54	11	.30	41	.12	20	58
8	July 31	0940	47	23	62	7.8	140	15	.30	35	.15	19	64
	Aug. 20	0815	41	25	74	11	130	16	.40	47	.21	6	26
	Sept. 9	0825	33	24	79	9.5	140	17	.40	36	.16	5	5
9	July 30	0830	66	47	180	16	420	30	.30	28	.16	37	320
	Aug. 21	0955	34	26	130	11	270	21	.30	32	.14	15	51
	Sept. 8	1445	36	28	130	14	280	23	.40	31	.15	19	60
10	July 31	0700	59	41	160	14	370	33	.50	27	.18	21	170
	Aug. 20	0750	33	28	120	12	250	23	.40	32	.08	6	15
	Sept. 9	0840	40	29	120	12	240	22	.40	36	.17	12	44
11	July 30	0945	29	10	47	6.8	90	8.4	.30	33	.12	16	3
	Aug. 21	0840	26	10	69	7.8	130	13	.30	43	.12	5	3
	Sept. 8	1530	31	27	120	12	250	22	.40	36	.15	<3	2
12	July 28	1320	20	6.2	35	5.0	37	7.8	.30	33	.13	21	10
	Aug. 24	1110	14	5.5	22	4.3	9.6	6.1	.20	49	.11	19	4
	Sept. 8	1730	12	4.7	18	3.7	6.3	5.6	.20	58	.10	12	4
13	July 27	1145	53	28	61	9.3	100	10	.50	42	.31	95	85
	Aug. 24	0945	49	29	86	2.7	110	17	.50	44	.36	16	59
	Sept. 8	1830	40	22	86	16	76	16	.60	47	.40	23	7

Table 11. Concentrations of major dissolved constituents in surface water, 1992--*Continued*

Site	Date	Time	Calcium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	Silica (mg/L)	Boron (mg/L)	Iron (µg/L)	Manganese (µg/L)
15	July 27	1015	8.1	3.8	12	2.1	2.9	4.3	0.10	50	0.07	130	14
	Aug. 24	0800	8.4	3.8	12	2.2	3.7	4.4	.10	42	.08	42	5
	Sept. 9	1300	9.3	4.6	13	2.3	4.6	4.5	.20	57	.08	44	2
UTL3	July 31	0845	25	27	140	11	310	29	.50	13	.11	7	1
	Aug. 20	0705	25	28	140	13	260	22	.40	29	.04	4	1
	Sept. 9	1030	30	32	140	13	300	25	.40	35	.17	4	2
UTL5	July 31	1155	30	18	31	8.5	27	10	.30	29	.16	20	21
	Aug. 20	1000	27	14	29	6.6	22	10	.30	41	.13	38	350
	Sept. 9	1000	22	11	26	4.7	20	8.1	.30	22	.10	29	9
UTL7	July 31	0910	35	34	130	10	300	23	.40	17	.16	15	2
	Aug. 20	0735	33	29	120	12	230	17	.30	29	.15	32	3
	Sept. 9	0750	29	28	110	12	220	21	.40	35	.17	9	2
	Sept. 9	0900	28	28	120	12	240	21	.40	36	.17	17	4

Table 12. Concentrations of pesticides and related compounds detected in surface water, 1991-92

[See figure 1 for site locations. Other elements analyzed for but not detected are shown at the end of this table. Concentrations in microgram per liter. **Detections** are shown in bold print. <, below method-detection limit]

Site	Date	Atra-zine	Benflu-ralin	Chlor-pyrifos	Cyana-zine	Disul-foton	DDE	Eptam	Etho-prop
1	6-10-92	<0.002	<0.005	<0.002	<0.010	<0.010	<0.002	**0.012**	<0.005
	6-17-92	<.002	<.005	<.004	<.010	<.050	<.002	**.011**	<.005
	7-08-92	<.002	<.005	<.010	<.020	<.050	<.010	<.002	<.005
	7-29-92	<.002	<.005	<.010	<.020	<.050	<.010	<.002	<.005
	8-19-92	<.002	<.005	<.010	<.020	<.050	<.010	<.002	<.005
2	7-10-91	<.002	<.005	<.010	**.021**	**.050**	<.010	<.005	<.005
	6-03-92	**.010**	**.005**	**.018**	<.010	<.050	<.002	**.320**	<.005
	6-24-92	<.002	<.005	<.002	<.010	<.050	<.002	**.015**	<.005
	7-08-92	<.002	<.005	<.010	<.020	<.050	<.002	<.002	<.005
	7-15-92	<.002	<.005	<.010	<.020	<.050	<.002	<.002	<.005
	7-22-92	<.002	<.005	<.010	<.020	<.050	<.002	<.002	<.005
	8-12-92	<.002	<.005	<.010	<.020	<.050	<.002	<.002	<.005
3	7-10-91	<.004	<.010	<.020	<.020	<.100	<.004	<.004	<.005
	7-24-91	<.004	<.010	<.020	<.020	<.100	<.004	<.004	<.005
	8-14-91	<.002	<.010	<.020	<.020	<.100	<.004	<.004	<.005
	6-24-92	<.002	<.005	<.002	<.010	<.050	<.002	**.020**	<.005
	7-08-92	<.002	<.005	<.010	<.020	<.050	<.010	<.002	<.005
	7-22-92	<.002	<.005	<.010	<.020	<.050	<.010	<.002	<.005
	7-29-92	<.002	<.005	<.010	<.020	<.050	<.010	<.002	<.005
5	7-03-91	<.004	<.010	<.020	<.020	<.050	<.010	<.002	<.005
	7-10-91	<.004	<.010	<.020	<.020	<.050	<.010	<.002	<.005
	7-17-91	<.004	<.010	<.020	<.020	<.050	<.010	<.002	<.005
	7-24-91	<.004	<.010	<.020	<.020	<.050	<.010	<.002	<.005
	6-03-92	<.002	<.005	**.004**	<.010	<.050	<.002	**.040**	**.002**
	6-17-92	<.002	<.005	<.002	<.010	<.050	<.002	**.015**	<.005
	6-24-92	<.002	<.005	<.002	<.010	<.050	<.002	**.013**	<.005
	7-01-92	<.002	<.005	<.002	<.010	<.050	<.002	**.016**	<.005
	7-08-92	<.055	<.005	<.002	<.010	<.100	<.002	<.010	<.005
	7-29-92	<.002	<.005	<.010	<.020	<.050	<.002	<.002	<.005
	8-05-92	<.002	<.005	<.010	<.020	<.050	<.002	**.006**	<.005
7	7-10-91	<.002	<.010	<.010	<.020	<.050	<.010	<.005	<.005
	7-17-91	<.002	<.010	<.010	<.020	**.026**	<.010	<.005	<.005
	7-24-91	<.002	<.010	<.010	<.020	<.050	<.010	<.005	<.005
	6-17-92	<.002	**.003**	**.011**	<.010	<.050	**.002**	**.028**	<.005
	6-24-92	<.002	<.005	<.002	<.010	<.050	<.002	**.021**	**.004**
	7-01-92	<.002	<.005	<.010	<.010	<.010	<.002	<.001	<.005
	7-08-92	<.002	<.005	<.010	<.020	<.050	<.010	**.014**	<.005
	7-15-92	<.002	<.005	<.010	<.020	<.050	<.010	**.010**	<.005
	7-29-92	<.002	<.005	<.010	<.020	<.050	<.010	<.002	<.005
	8-05-92	<.002	<.005	<.010	<.020	<.050	<.010	**.006**	<.005
	8-19-92	**.003**	<.005	<.010	<.020	<.050	<.010	<.002	<.005

Table 12. Concentrations of pesticides and related compounds detected in surface water, 1991-92--*Continued*

Site	Date	Malathion	Methyl parathion	Metolachlor	Metribuzin	Pronamide	Simazine	Terbufos	Trifluralin
1	6-10-92	<0.010	<0.005	<0.005	<0.010	<0.010	<0.002	<0.010	<0.005
	6-17-92	<.010	<.005	**.002**	<.010	**.008**	**.011**	<.010	<.005
	7-08-92	<.005	<.005	<.005	**.024**	<.010	**.008**	<.050	<.005
	7-29-92	<.005	<.005	<.005	<.005	<.010	<.002	<.050	<.005
	8-19-92	<.005	<.005	<.005	<.005	<.010	<.002	<.050	<.005
2	7-10-91	<.005	<.005	**.029**	**.077**	<.010	**.005**	<.010	<.010
	6-03-92	**.010**	<.005	**.002**	<.010	**.010**	**.006**	<.010	**.005**
	6-24-92	<.010	<.005	<.002	**.012**	<.010	**.004**	**.037**	<.005
	7-08-92	<.005	<.005	<.005	**.023**	<.010	**.004**	<.050	<.005
	7-15-92	<.005	<.005	<.005	**.035**	<.010	**.005**	<.050	<.005
	7-22-92	<.005	<.005	<.005	<.005	<.010	<.002	<.050	<.005
	8-12-92	<.005	<.005	<.005	<.005	<.010	**.009**	<.050	<.005
3	7-10-91	<.010	<.005	**.008**	**.430**	<.010	<.005	<.010	<.010
	7-24-91	<.010	<.005	**.005**	**.039**	<.010	**.010**	<.010	<.010
	8-14-91	<.010	<.005	<.005	<.005	<.010	<.005	<.010	<.010
	6-24-92	<.010	<.005	<.002	**.043**	<.010	**.007**	<.050	<.005
	7-08-92	<.005	<.005	**.042**	**.056**	<.010	**.004**	<.050	<.005
	7-22-92	**.013**	<.005	<.005	<.005	<.010	**.007**	<.050	<.005
	7-29-92	<.010	<.005	<.005	<.005	<.010	**.005**	<.050	<.005
5	7-03-91	<.005	<.005	<.005	<.010	<.010	<.005	<.050	<.005
	7-10-91	<.005	<.005	<.005	<.010	<.010	<.005	<.050	<.005
	7-17-91	<.005	<.005	<.005	<.010	<.010	<.005	<.050	<.005
	7-24-91	<.005	<.005	<.005	<.010	<.010	<.005	<.050	<.005
	6-03-92	<.010	<.005	**.002**	**.012**	<.005	**.005**	<.010	<.005
	6-17-92	<.010	<.005	**.003**	**.008**	<.010	**.005**	**.024**	<.005
	6-24-92	<.010	<.005	<.002	**.028**	<.010	**.005**	**.029**	<.005
	7-01-92	<.010	<.005	**.060**	**.045**	<.010	**.005**	**.020**	<.005
	7-08-92	<.010	<.005	<.005	<.005	<.010	<.010	<.050	<.005
	7-29-92	<.005	<.005	<.005	<.005	<.010	**.008**	<.050	<.005
	8-05-92	<.005	<.005	<.005	<.005	<.010	**.003**	<.050	<.005
7	7-10-91	<.010	<.005	<.005	<.010	<.010	<.010	<.010	<.010
	7-17-91	<.010	<.005	**.006**	**.190**	<.010	**.007**	<.010	<.010
	7-24-91	<.010	<.005	**.005**	**.053**	<.010	<.010	<.010	<.010
	6-17-92	<.010	<.005	**.004**	**.012**	<.005	**.004**	<.050	**.003**
	6-24-92	<.010	<.005	<.002	**.015**	<.010	**.004**	**.024**	<.005
	7-01-92	<.010	<.005	<.002	<.005	<.010	<.002	<.050	<.005
	7-08-92	<.005	<.005	**.020**	**.088**	<.010	**.003**	<.050	<.005
	7-15-92	<.005	<.005	**.022**	**.069**	<.010	**.005**	<.050	<.005
	7-29-92	<.005	<.005	<.005	<.005	<.010	<.002	<.050	<.005
	8-05-92	<.005	**.025**	<.005	<.005	<.010	**.006**	<.050	<.005
	8-19-92	<.005	<.005	<.005	<.005	<.010	**.006**	<.050	<.005

Table 12. Concentrations of pesticides and related compounds detected in surface water, 1991-92--*Continued*

Site	Date	Atra-zine	Benflu-ralin	Chlor-pyrifos	Cyana-zine	Disul-foton	DDE	Eptam	Etho-prop
9	7-10-91	<0.002	<0.010	<0.010	<0.010	<0.050	<0.010	<0.005	<0.005
	7-17-91	<.002	<.010	<.010	<.010	<.050	<.010	<.005	<.005
	7-24-91	<.002	<.010	<.010	<.010	<.050	<.010	<.005	<.005
	8-14-91	<.002	<.010	<.010	<.010	<.050	<.010	<.005	<.005
	6-10-92	<.002	**.003**	<.002	<.010	<.050	<.002	**.027**	<.005
	6-24-92	<.002	<.005	<.002	<.010	<.050	<.002	**.008**	**.004**
	7-08-92	<.002	<.005	<.002	<.010	<.050	<.002	**.007**	<.005
	7-29-92	<.002	<.005	<.010	<.020	<.050	<.010	<.002	<.005
	8-26-92	<.002	<.005	<.010	<.020	<.050	<.010	<.002	<.005
11	7-10-91	<.002	<.005	<.010	<.020	<.050	<.010	<.005	**.007**
	7-17-91	<.002	<.005	<.010	<.020	<.050	<.010	<.005	<.010
	7-24-91	<.002	<.005	<.010	<.020	<.050	<.010	<.005	<.010
	6-10-92	<.002	<.005	<.002	<.010	<.050	<.002	**.042**	<.005
	6-24-92	<.002	<.005	<.002	<.010	<.050	<.002	**.041**	<.005
	7-01-92	<.002	<.005	<.002	<.010	<.050	<.002	**.023**	<.005
	7-22-92	<.002	<.005	<.002	<.010	<.050	<.010	<.002	<.005
	7-29-92	<.002	<.005	<.010	<.020	<.050	<.010	<.002	<.005
	8-05-92	<.002	<.005	<.010	<.020	<.050	<.010	<.002	<.005
12	6-03-92	<.002	<.005	<.002	<.010	<.050	<.002	<.002	<.005
	6-24-92	<.002	**.003**	<.002	<.010	<.050	**.001**	**.006**	<.005
	7-15-92	<.002	<.005	<.002	<.010	<.050	<.002	<.002	<.005
13	6-03-92	<.002	<.005	<.010	<.020	<.050	<.010	**.002**	<.005
	6-17-92	<.002	<.005	<.010	<.020	<.050	<.010	<.002	<.005
	7-15-92	<.002	<.005	<.010	<.020	<.050	<.010	<.002	<.005
	7-29-92	<.002	<.005	<.010	<.020	<.050	<.010	<.002	<.005
	8-05-92	<.002	<.005	<.010	<.020	<.050	<.010	<.002	<.005
	8-12-92	<.002	<.005	<.010	<.020	<.050	<.010	<.002	<.005
	8-26-92	<.002	<.005	<.010	<.020	<.050	<.010	<.002	<.005
15	6-10-92	<.002	<.005	<.002	<.010	<.050	<.002	**.001**	<.005
	6-17-92	<.002	<.005	<.002	<.010	<.050	<.002	<.002	<.005
	6-24-92	<.002	<.005	<.002	<.010	<.050	<.002	<.002	<.005
	7-01-92	<.002	<.005	<.002	<.010	<.050	<.010	<.002	<.005
	7-22-92	<.002	<.005	<.010	<.020	<.050	<.010	<.002	<.005
	8-12-92	<.002	<.005	<.010	<.020	<.050	<.010	<.002	<.005
	8-26-92	<.002	<.005	<.010	<.020	<.050	<.010	<.002	<.005

Other compounds analyzed for but not detected

Alachlor	Diethylanaline, 2,6-	Dieldrin	α-HCH
Butylate	Dacthal	Dimethoate	γ-HCH (Lindane)
Carbaryl	Desethylatrazine	Ethalfluralin	Linuron
Carbofuron	Diazinon	Fonofos	

Table 12. Concentrations of pesticides and related compounds detected in surface water, 1991-92--*Continued*

Site	Date	Malathion	Methyl parathion	Metolachlor	Metribuzin	Pronamide	Simazine	Terbufos	Trifluralin
9	7-10-91	<0.010	<0.005	**0.005**	**0.028**	<0.010	**0.006**	<0.010	<0.010
	7-17-91	<.010	<.005	**.002**	<.010	<.010	**.004**	<.010	<.010
	7-24-91	<.010	<.005	**.005**	**.047**	<.010	<.005	<.010	<.010
	8-14-91	<.010	<.005	**.008**	<.010	<.010	<.005	<.010	<.010
	6-10-92	<.010	<.005	<.002	**.010**	**.006**	**.005**	<.050	**.003**
	6-24-92	<.010	<.005	<.002	**.015**	<.010	**.004**	**.024**	<.005
	7-08-92	<.010	<.005	<.005	<.010	<.010	**.004**	<.050	<.005
	7-29-92	<.005	<.005	<.005	<.010	<.010	<.002	<.050	<.005
	8-26-92	<.005	<.005	<.005	<.010	<.010	**.004**	<.050	<.005
11	7-10-91	<.010	<.010	**.005**	<.010	<.010	**.010**	<.010	<.010
	7-17-91	<.010	<.010	**.005**	**.013**	<.010	**.010**	<.010	<.010
	7-24-91	<.010	<.010	**.005**	<.010	<.010	<.005	<.010	<.010
	6-10-92	<.010	<.005	<.002	<.010	**.009**	**.010**	<.005	<.005
	6-24-92	<.010	<.005	<.002	<.010	<.010	**.005**	**.039**	<.005
	7-01-92	<.010	<.005	<.002	**.008**	<.010	**.007**	**.020**	<.005
	7-22-92	<.010	<.005	<.005	<.010	<.010	**.005**	<.005	<.005
	7-29-92	<.010	<.005	**.012**	<.010	<.010	**.004**	<.005	<.005
	8-05-92	<.010	<.005	<.005	<.010	<.010	**.003**	<.005	<.005
12	6-03-92	<.010	<.005	<.002	<.010	**.011**	<.005	<.010	<.005
	6-24-92	<.010	<.005	<.002	<.010	<.010	<.005	**.027**	**.003**
	7-15-92	<.005	<.005	<.005	<.005	<.010	<.005	<.050	<.005
13	6-03-92	<.005	<.005	<.005	**.003**	**.007**	<.010	<.010	<.005
	6-17-92	<.005	<.005	<.005	<.005	<.010	<.020	<.010	<.005
	7-15-92	<.005	<.005	<.005	<.005	<.010	<.020	<.010	<.005
	7-29-92					<.010	<.020	<.010	<.005
	8-05-92	<.005	<.005	<.005	<.005	<.010	<.020	<.010	<.005
	8-12-92	<.005	<.005	<.005	<.005	<.010	<.020	<.010	<.005
	8-26-92	<.005	<.005	<.005	<.005	<.010	<.020	<.010	<.005
15	6-10-92	<.010	<.005	**.001**	<.010	**.008**	<.005	<.010	<.005
	6-17-92	<.010	<.005	<.002	<.010	<.010	<.005	<.010	<.005
	6-24-92	<.010	<.005	<.002	<.010	<.010	<.005	<.010	<.005
	7-01-92	<.010	<.005	<.002	<.010	<.010	<.005	<.010	<.005
	7-22-92	<.010	<.050	<.005	<.010	<.010	<.005	<.010	<.005
	8-12-92	<.005	<.005	<.005	<.005	<.010	<.005	<.010	<.005
	8-26-92	<.005	<.005	<.005	<.005	<.010	<.050	<.010	<.005

Other compounds analyzed for but not detected

Methyl azimphos	Pebulate	Prometon	Tebuthiuron
Molinate	Pendimethalin	Propachlor	Terbacil
Napropamide	Permethrin	Propanil	Thiobencarb
Parathion	Phorate	Propargite	Triallate

Table 13. Concentrations of acrolein (Magnicide-H®) in sites downstream from an acrolein application in the J-7 Canal, July 1992

[See figure 2 for location of injection point. Post-application water samples were collected from the 44 Drain and the J-7 and N Canals. km, kilometer; mg/L, milligram per liter; <, actual value is less than value shown]

Date	Time	Distance downstream (km)	Acrolein (mg/L)
July 13	0950	1.0	<0.02
	1035	1.0	<.02
	1120	1.0	<.02
	1235	.6	4.5
	1305	2.6	<.02
	1405	3.2	<.02
	1605	Injection point	<.02
	1605	3.5	<.02
	1620	1.0	<.02
July 14	1100	4.8	<.02
July 15	0830	Injection point	<.02
	0903	3.5	<.02
	0930	4.8	.027

Table 14. Concentrations of methamidophos recovered from deposition samplers placed in leaseland waterways at Tule Lake National Wildlife Refuge, 1992

[See figure 4 for site locations. The method detection limit for methamidophos was 2.0 total µg. µg, microgram; µg/m^2, microgram per square meter]

Site	Sample identification	Date	Total recovery (µg)	Concentration (µg/m^2)
LL224	224A0810	Aug. 10	4.0	1,039
	224B0810	Aug. 10	2.4	624
	224C0810	Aug. 10	3.6	935
LL226	226A0802	Aug. 2	4.4	1,143
	226B0802	Aug. 2	3.6	935
	226C0802	Aug. 2	3.6	935
LL227	227A0802	Aug. 2	4.4	1,143
	227B0802	Aug. 2	4.0	1,039
	227C0802	Aug. 2	4.8	1,247

Table 15. Concentrations of trace elements in blue-green algae (*Aphanezomenon flos-aquae*) samples, September 1991

[See figure 1 for site locations. Trace-element values in micrograms per gram, wet weight; <, actual value is less than value shown]

	Site		
	1	3	13
Moisture content (percent)	98.7	96.1	97.8
Aluminum	6.2	69.4	14.2
Arsenic	.02	.07	.06
Barium	.12	.40	.28
Beryllium	<.001	<.001	<.001
Boron	.16	.47	.29
Cadmium	.007	.012	.022
Chromium	<.007	.055	.016
Copper	.06	.32	.24
Iron	8.6	56.1	18.4
Lead	<.03	.04	.04
Magnesium	35.1	82.6	42.8
Manganese	1.4	4.7	4.2
Mercury	<.001	.002	.002
Molybdenum	.04	.08	.04
Nickel	.04	.26	.14
Selenium	.004	<.008	.031
Strontium	.38	.85	.44
Vanadium	.04	.43	.08
Zinc	.1	.51	38.2

Table 16. Moisture content and concentrations of arsenic, mercury, and selenium in biological tissue samples, 1990-92

[Sample locations described in table 2. Trace-element values in milligrams per kilogram, wet weight; <, actual value is less than value shown; --, no data; aquatic invertebrates, - 10-gram composites; fish, 20-gram composites]

Sample type	Sample No.	Date	Moisture content (percent)	Arsenic	Mercury	Selenium
			Aquatic invertebrates			
Backswimmer	LK6BS	6-23-92	75.6	2.70	0.029	4.41
Waterboatman	LK6WB	6-23-92	76.0	.72	.048	2.88
			Fish			
Fathead minnow	12FH01J	6-23-92	88.2	--	0.038	--
	12FH02J	6-23-92	88.3	--	.027	--
	12FH03J	6-23-92	83.5	--	.039	--
Tui chub	CLTC01A	6-24-92	73.8	--	.098	--
	CLTC01J	6-24-92	75.3	--	.042	--
	CLTC02A	6-24-92	75.0	--	.090	--
	CLTC02J	6-24-92	73.4	--	.056	--
	CLTC03A	6-24-92	74.7	--	.098	--
	CLTC03J	6-24-92	75.3	--	.045	--
	2TC01A	6-24-92	74.5	--	.074	--
	2TC01J	6-24-92	76.7	--	.057	--
	2TC02A	6-24-92	74.8	--	.077	--
	2TC02J	6-24-92	75.8	--	.055	--
	2TC03A	6-24-92	75.8	--	.055	--
	2TC03J	6-24-92	74.8	--	.050	--
	3TC02J	6-25-92	88.6	--	.061	--
	3TC03J	6-25-92	84.1	--	.062	--
	7TC01J	6-26-92	84.4	--	.031	--
	7TC02J	6-26-92	85.4	--	.032	--
	7TC03J	6-26-92	19.8	--	.029	--
	11TC01J	6-25-92	80.6	--	.017	--
	11TC02J	6-25-92	80.1	--	.027	--
	11TC03J	6-25-92	79.5	--	.026	--
			Birds			
American avocet egg	4BA1	6-15-91	73.7	<0.13	0.028	0.33
	4BA2	6-15-91	73.0	<.13	.086	.77
	4BA3	6-15-91	74.0	<.13	.030	.57
	4BA4	6-15-91	74.0	<.13	.040	.25
	4BA6	6-15-91	72.9	<.13	.066	.25
	4BA7	6-15-91	74.6	<.13	.046	.33
	4BA8	6-15-91	73.9	<.13	.060	.33
	4BA9	6-15-91	73.6	<.13	.027	.49
	4BA10	6-15-91	72.1	<.13	.071	.33
	4BA11	6-15-91	75.4	<.13	.042	.40
	4BA12	6-15-91	73.0	<.13	.054	<.17

Table 16. Moisture content and concentrations of arsenic, mercury, and selenium in biological tissue samples, 1990-92--*Continued*

Sample type	Sample No.	Date	Moisture content (percent)	Arsenic	Mercury	Selenium
			Birds--*Continued*			
American coot egg	7AC1	8-15-91	73.9	<0.13	0.050	--
	7AC2	8-15-91	73.6	<.13	.055	--
	7AC3	8-15-91	73.6	<.13	.063	--
	7AC4	8-15-91	75.9	<.13	.123	--
	7AC5	8-15-91	76.1	<.13	.076	--
	LK12CC1	6-29-91	70.3	<.13	.188	--
	LK12CC2	6-29-91	74.7	<.13	.161	--
	LK12CC3	6-29-91	74.6	<.13	.142	--
	LK12CC4	6-29-91	75.6	<.13	.196	--
	LK12CC5	6-29-91	76.0	<.13	.113	--
Egret egg	E1	7-02-90	79.0	--	.084	--
Mallard egg	M441	6-16-90	61.9	--	.104	--
	M447	5-15-90	58.5	--	.244	--
	M459A	5-15-90	56.5	--	.080	--
	M459B	5-15-90	52.8	--	.147	--
	M499A	6-12-90	63.0	--	.330	--
	M499B	6-12-90	62.8	--	.050	--
	M516A	6-08-90	59.5	--	.036	--
	M516B	6-08-90	62.1	--	.033	--
	M563	6-19-90	57.7	--	.080	--
	M574	6-19-90	61.5	--	<.025	--
	92M2	7-01-92	70.1	--	.149	--
Western grebe egg	3AG1	6-20-91	77.6	<.13	.093	--
	3AG2	6-20-91	76.7	<.13	.123	--
	3AG3	6-20-91	76.7	--	.065	--
	3AG4	6-20-91	78.1	--	.115	--
	3AG5	6-20-91	75.8	<.13	.066	--
	3AG6	6-20-91	77.2	<.13	.097	--
	TLG1	6-29-91	77.8	<.13	.077	--
	TLG2	6-29-91	76.7	<.13	.063	--
	TLG3	6-29-91	77.9	<.13	.072	--
	TLG4	6-29-91	78.2	<.13	.098	--
	TLG5	6-29-91	76.7	<.13	.139	--
	TLG6	6-29-91	78.2	--	.054	--
	TLG7	6-29-91	74.5	--	.084	--
	TLG8	6-29-91	78.2	--	.043	--
	TLG9	6-29-91	78.5	--	.063	--
	TLG10	6-29-91	78.6	--	.050	--
	92TLWG1	6-08-91	80.4	--	.081	--
	92TLWG2A	6-08-91	74.3	--	.053	--
	92TLWG2B	6-08-91	78.9	--	.053	--
	92TLWG3A	6-08-91	80.0	--	.078	--
	92TLWG3B	6-08-91	79.9	--	.075	--
	92TLWG5A	6-08-91	74.6	--	.079	--
	92TLWG6A	6-08-91	77.9	--	.072	--
	92TLWG7A	6-08-91	78.0	--	.089	--
	92TLWG8	6-08-91	78.0	--	.108	--

Table 16. Moisture content and concentrations of arsenic, mercury, and selenium in biological tissue samples, 1990-92--*Continued*

Sample type	Sample No.	Date	Moisture content (percent)	Arsenic	Mercury	Selenium
			Birds--*Continued*			
White-faced ibis egg	I1	7-02-90	82.2	--	0.179	--
	I2	7-02-90	81.5	--	.128	--
	I3	7-02-90	82.1	--	.140	--
	I4	7-02-90	80.7	--	.331	--
	I5	7-02-90	83.2	--	.319	--
	LK12AI2	7-01-91	84.3	--	.089	--
	LK12AI3	7-01-91	84.9	--	.036	--
	LK12AI4	7-01-91	80.7	--	.104	--
	LK12AI7	7-01-91	83.5	--	.076	--
	LK12AI8	7-01-91	83.4	--	.048	--
	LK12AI9	7-01-91	82.7	--	.096	--
	LK12AI10	7-01-91	79.3	--	.246	--
	LK12AI11	7-01-91	81.7	--	.020	--
	LK12AI12	7-01-91	80.2	--	.169	--
	92LKI2	6-24-92	82.9	--	.123	--
	92LKI3	6-24-92	84.9	--	.199	--
	92LKI6	6-24-92	84.8	--	.082	--
	92LKI9	6-24-92	83.5	--	.124	--
White-faced ibis nestling	I6Y	7-02-90	76.4	--	.114	--

Table 17. Moisture content, lipid content, and concentrations of organochlorine compounds in biological tissue samples, 1990-92

[Sample locations described in table 2. **Detections** are shown in bold print. Concentrations in micrograms per gram, wet weight; <, actual value is less than value shown; --, no data; aquatic invertebrates, 10-gram composites; fish, 20-gram composites]

Sample type	Sample No.	Date	Moisture content (percent)	Lipid content (percent)	BHC alpha	BHC beta	BHC delta	BHC gamma	Alpha-chlor-dane
				Aquatic invertebrates					
Chironomid larvae	TLCH07A	8-91	91.1	1.2	<0.01	<0.01	<0.01	<0.01	<0.01
	TLCH08A	8-91	96.0	.5	<.01	<.01	<.01	<.01	<.01
Leeches	TLL07A	8-91	89.0	.9	<.01	<.01	<.01	<.01	<.01
				Fish					
Fathead minnow	12FH01J	6-23-92	87.2	2.4	<0.01	<0.01	--	<0.01	<0.01
Tui chub	CLTC01A	6-24-92	71.4	3.9	<.01	<.01	--	<.01	<.01
	CLTC03J	6-24-92	75.1	6.5	<.01	<.01	--	<.01	<.01
	2TC01A	6-24-92	73.2	6.3	<.01	<.01	--	<.01	<.01
	2TC01J	6-24-92	75.8	4.9	<.01	<.01	--	<.01	<.01
	2TC02A	6-24-92	73.9	6.1	<.01	<.01	--	<.01	<.01
	2TC03A	6-24-92	76.3	7.1	<.01	<.01	--	<.01	<.01
	3TC01J	6-25-92	85.4	2.3	<.01	<.01	--	<.01	<.01
	7TC01J	6-26-92	84.4	2.6	<.01	<.01	--	<.01	<.01
	7TC02J	6-26-92	84.4	3.0	<.01	<.01	--	<.01	<.01
	7TC03J	6-26-92	80.7	2.7	<.01	<.01	--	<.01	<.01
	11TC01J	6-25-92	80.4	8.3	<.01	<.01	--	<.01	<.01
	11TC02J	6-25-92	79.0	2.4	<.01	<.01	--	<.01	<.01
	11TC03J	6-25-92	79.7	9.3	<.01	<.01	--	<.01	<.01
				Birds					
Eared grebe egg	92TLEG4A	7-08-92	--	10.2	<0.012	<0.012	--	<0.012	<0.012
	92TLEG4B	7-08-92	76.8	9.8	<.008	<.008	--	<.008	<.008
	92TLEG9A	7-08-92	76.8	8.4	<.008	<.008	--	<.008	<.008
	92TLEG9B	7-08-92	76.6	10.6	<.008	<.008	--	<.008	<.008
Mallard egg	92M2	7-01-92	29.8	11.0	<.01	<.01	--	<.01	<.01
Western grebe egg	3AG3	6-20-91	74.5	10.1	<.01	<.01	--	<.01	<.01
	3AG4	6-20-91	75.8	9.5	<.01	<.01	--	<.01	<.01
	3AG7	6-20-91	75.8	9.1	<.02	<.02	--	<.02	<.02
	TLG6	6-29-91	76.2	10.4	<.01	<.01	--	<.01	<.01
	TLG7	6-29-91	80.8	11.1	<.01	<.01	--	<.01	<.01
	TLG8	6-29-92	77	10.3	<.01	<.01	--	<.01	**.01**
	TLG9	6-29-91	75.4	10.2	<.01	<.01	--	<.01	<.01
	TLG10	6-29-91	76.0	9.5	<.01	<.01	--	<.01	<.01
	92TLWG1	7-08-92	79.9	10.4	<.01	<.01	--	<.01	<.01
	92TLWG2A	7-08-92	74.3	10.1	<.01	<.01	--	<.01	<.01
	92TLWG2B	7-08-92	77.7	10.9	<.01	<.01	--	<.01	<.01
	92TLWG3A	7-08-92	80.8	7.6	<.01	<.01	--	<.01	<.01
	92TLWG3B	7-08-92	78.9	7.8	<.01	<.01	--	<.01	<.01
	92TLWG5A	7-08-92	75.9	9.8	<.01	<.01	--	<.01	<.01
	92TLWG6A	7-08-92	77.5	8.5	<.01	<.01	--	<.01	<.01
	92TLWG7A	7-08-92	79.1	10.8	<.01	<.01	--	<.01	<.01
	92TLWG8	7-08-92	78.8	9.1	<.01	<.01	--	<.01	<.01

Table 17. Moisture content, lipid content, and concentrations of organochlorine compounds in biological tissue samples, 1990-92--*Continued*

Sample type	Sample No.	Date	Gamma chlor-dane	Oxychlor-dane	o,p' DDD	p,p' DDD	p,p' DDE	o,p' DDE	p,p' DDT	o,p' DDT
				Aquatic invertebrates						
Chironomid larvae	TLCH07A	8-91	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	TLCH08A	8-91	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01
Leeches	TLL07A	8-91	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01
				Fish						
Fathead minnow	12FH01J	6-23-92	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tui chub	CLTC01A	6-24-92	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01
	CLTC03J	6-24-92	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01
	2TC01A	6-24-92	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01
	2TC01J	6-24-92	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01
	2TC02A	6-24-92	<.01	<.01	<.01	<.01	**.01**	<.01	<.01	<.01
	2TC03A	6-24-92	<.01	<.01	<.01	<.01	**.01**	<.01	<.01	<.01
	3TC01J	6-25-92	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01
	7TC01J	6-26-92	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01
	7TC02J	6-26-92	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01
	7TC03J	6-26-92	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01
	11TC01J	6-25-92	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01
	11TC02J	6-25-92	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01
	11TC03J	6-25-92	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01
				Birds						
Eared grebe egg	92TLEG4A	7-08-92	<0.012	<0.012	<0.012	<0.012	**0.19**	<0.01	<0.01	<0.01
	92TLEG4B	7-08-92	<.008	<.008	<.008	<.008	**.17**	<.01	<.01	<.01
	92TLEG9A	7-08-92	<.008	<.008	<.008	<.008	**.16**	<.01	<.01	<.01
	92TLEG9B	7-08-92	<.008	<.008	<.008	<.008	**.06**	<.01	<.01	<.01
Mallard egg	92M2	7-01-92	<.01	<.01	<.01	<.01	**.02**	<.01	<.01	<.01
Western grebe egg	3AG3	6-20-91	<.01	<.01	<.01	**.38**	**.93**	<.15	<.01	<.01
	3AG4	6-20-91	<.01	<.01	<.01	**.03**	**.35**	<.01	<.01	<.01
	3AG7	6-20-91	<.02	<.02	<.02	**.09**	**.70**	<.01	<.01	<.01
	TLG6	6-29-91	<.01	<.01	<.01	**.22**	**.56**	<.01	<.01	<.01
	TLG7	6-29-91	<.01	<.01	<.01	**.36**	**.91**	<.01	<.01	<.01
	TLG8	6-29-92	<.01	<.01	<.01	**.02**	**.38**	<.01	<.01	<.01
	TLG9	6-29-91	<.01	<.01	<.01	**.05**	**.52**	<.025	<.01	<.01
	TLG10	6-29-91	<.01	<.01	<.01	**.18**	**.47**	<.01	<.01	<.01
	92TLWG1	7-08-92	<.01	<.01	<.01	**.06**	**.35**	<.01	<.01	<.01
	92TLWG2A	7-08-92	<.01	<.01	<.01	**.13**	**.42**	<.01	**.03**	<.01
	92TLWG2B	7-08-92	<.01	<.01	<.01	**.15**	**.46**	<.01	**.02**	<.01
	92TLWG3A	7-08-92	<.01	<.01	<.01	**.38**	**.91**	<.01	**.02**	<.01
	92TLWG3B	7-08-92	<.01	<.01	<.01	**.36**	**.87**	<.01	<.01	<.01
	92TLWG5A	7-08-92	<.01	<.01	<.01	**.25**	**.7**	<.01	<.01	**.01**
	92TLWG6A	7-08-92	<.01	<.01	<.01	**.21**	**3.0**	<.01	**.04**	<.01
	92TLWG7A	7-08-92	<.01	<.01	<.01	**.94**	**2.6**	<.01	**.02**	<.01
	92TLWG8	7-08-92	<.01	**.01**	<.01	**.96**	**4.6**	<.01	**.04**	<.01

Table 17. Moisture content, lipid content, and concentrations of organochlorine compounds in biological tissue samples, 1990-92--*Continued*

Sample type	Sample No.	Date	Dieldrin	Endrin	HCB	Heptachlor epoxide	Mirex	*cis*-Nonachlor	*t*-Nonachlor	PCBs, total	Toxaphene
					Aquatic invertebrates						
Chironomid larvae	TLCH07A	8-91	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05
	TLCH08A	8-91	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.05	<.05
Leeches	TLL07A	8-91	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.05	<.05
					Fish						
Fathead minnow	12FH01J	6-23-92	<0.01	<0.01	<0.01	<0.01	<0.01	--	<0.01	<0.1	<0.1
Tui chub	CLTC01A	6-24-92	<.01	<.01	<.01	<.01	<.01	--	<.01	<.1	<.1
	CLTC03J	6-24-92	<.01	<.01	<.01	<.01	<.01	--	<.01	<.1	<.1
	2TC01A	6-24-92	<.01	<.01	<.01	<.01	<.01	--	<.01	<.1	<.1
	2TC01J	6-24-92	<.01	<.01	<.01	<.01	<.01	--	<.01	<.1	<.1
	2TC02A	6-24-92	<.01	<.01	<.01	<.01	<.01	--	<.01	<.1	<.1
	2TC03A	6-24-92	<.01	<.01	<.01	<.01	<.01	--	<.01	<.1	<.1
	3TC01J	6-25-92	<.01	<.01	<.01	<.01	<.01	--	<.01	<.1	<.1
	7TC01J	6-26-92	<.01	<.01	<.01	<.01	<.01	--	<.01	<.1	<.1
	7TC02J	6-26-92	<.01	<.01	<.01	<.01	<.01	--	<.01	<.1	<.1
	7TC03J	6-26-92	<.01	<.01	<.01	<.01	<.01	--	<.01	<.1	<.1
	11TC01J	6-25-92	<.01	<.01	<.01	<.01	<.01	--	<.01	<.1	<.1
	11TC02J	6-25-92	<.01	<.01	<.01	<.01	<.01	--	<.01	<.1	<.1
	11TC03J	6-25-92	<.01	<.01	<.01	<.01	<.01	--	<.01	<.1	<.1
					Birds						
Eared grebe egg	92TLEG4A	7-08-92	<0.01	<0.01	<0.01	<0.01	<0.01	--	<0.01	<0.1	<0.1
	92TLEG4B	7-08-92	<.01	<.01	<.01	<.01	<.01	--	<.01	<.1	<.1
	92TLEG9A	7-08-92	<.01	<.01	<.01	<.01	<.01	--	<.01	<.1	<.1
	92TLEG9B	7-08-92	<.01	<.01	<.01	<.01	<.01	--	<.01	<.1	<.1
Mallard egg	92M2	7-01-92	<.01	<.01	<.01	<.01	<.01	--	<.01	<.1	<.1
Western grebe egg	3AG3	6-20-91	**.02**	<.01	<.01	<.01	<.01	--	**.03**	**.82**	<.1
	3AG4	6-20-91	<.01	<.01	<.01	<.01	<.01	--	**.01**	**.49**	<.1
	3AG7	6-20-91	<.01	<.01	<.01	<.01	<.01	--	<.01	**.23**	<.1
	TLG6	6-29-91	**.03**	<.01	**.01**	<.01	<.01	--	**.05**	**1.37**	<.1
	TLG7	6-29-91	**.01**	<.01	<.01	<.01	<.01	--	**.02**	**.4**	<.1
	TLG8	6-29-92	<.01	<.01	<.01	<.01	<.01	--	<.01	**.38**	<.1
	TLG9	6-29-91	<.01	<.01	<.01	<.01	<.01	--	**.02**	**.99**	<.1
	TLG10	6-29-91	<.01	<.01	**.01**	<.01	<.01	--	**.01**	**.27**	<.1
	92TLWG1	7-08-92	<.01	<.01	<.01	<.01	<.01	--	**.01**	**.38**	<.1
	92TLWG2A	7-08-92	<.01	<.01	**.01**	<.01	<.01	--	**.02**	**.2**	<.1
	92TLWG2B	7-08-92	**.01**	<.01	**.01**	<.01	<.01	--	**.02**	**.22**	<.1
	92TLWG3A	7-08-92	<.01	<.01	**.01**	<.01	<.01	--	**.03**	**1.4**	<.1
	92TLWG3B	7-08-92	<.01	<.01	<.01	<.01	<.01	--	**.03**	**1.5**	<.1
	92TLWG5A	7-08-92	<.01	<.01	<.01	<.01	<.01	--	**.07**	**3.8**	<.1
	92TLWG6A	7-08-92	<.01	<.01	<.01	<.01	<.01	--	**.05**	**.89**	<.1
	92TLWG7A	7-08-92	<.01	<.01	**.01**	<.01	<.01	--	**.09**	**.59**	<.1
	92TLWG8	7-08-92	<.01	<.01	**.04**	**.01**	<.01	--	**.10**	**3.1**	<.1

Table 17. Moisture content, lipid content, and concentrations of organochlorine compounds in biological tissue samples, 1990-92--*Continued*

Sample type	Sample No.	Date	Moisture content (percent)	Lipid content (percent)	BHC alpha	BHC beta	BHC delta	BHC gamma	Alpha-chlor-dane
			Birds-*Continued*						
White-faced ibis egg	I1	7-20-90	83.0	6.1	<0.01	**0.01**	<0.01	<0.01	<0.01
	I2	7-20-90	82.0	5.2	<.01	**.08**	<.01	<.01	<.01
	I3	7-20-90	82.0	5.3	<.01	**.01**	<.01	<.01	<.01
	I4	7-20-90	82.5	6.2	<.01	**.06**	<.01	<.01	<.01
	I5	7-20-90	84.5	4.1	<.01	<.01	<.01	<.01	<.01
	LK12AI1	7-01-91	79.5	6.1	<.01	**.09**	--	<.01	<.01
	LK12AI2	7-01-91	84.3	5.7	<.01	<.01	--	<.01	<.01
	LK12AI5	7-01-91	82.9	6.1	<.01	<.01	--	<.01	<.01
	LK12AI10	7-01-91	79.3	5.4	<.01	**.04**	--	<.01	<.01
	LK12AI11	7-01-91	81.7	3.6	<.01	<.01	--	<.01	<.01
	LK12AI12	7-01-91	80.2	8.6	<.01	<.01	--	<.01	<.01
	92LKI1	6-24-92	85.4	15.0	<.01	<.01	--	<.01	<.01
	92LKI2	6-24-92	82.9	5.1	<.01	<.01	--	<.01	<.01
	92LKI3	6-24-92	84.9	10.5	<.01	<.01	--	<.01	<.01
	92LKI4	6-24-92	83.8	3.7	<.01	<.01	--	<.01	<.01
	92LKI5	6-24-92	84.3	3.8	<.01	<.01	--	<.01	<.01
	92LKI6	6-24-92	84.8	4.4	<.01	<.01	--	<.01	<.01
	92LKI7	6-24-92	82.4	5.0	<.01	<.01	--	<.01	<.01
	92LKI8	6-24-92	83.1	6.0	<.01	<.01	--	<.01	<.01
	92LKI9	6-24-92	83.5	6.1	<.01	<.01	--	<.01	<.01
	92LKI10	6-24-92	81.3	5.5	<.01	<.01	--	<.01	<.01
White-faced ibis nestling	16Y	7-02-90	77.5	1.3	<.01	<.01	<.01	<.01	<.01

Table 17. Moisture content, lipid content, and concentrations of organochlorine compounds in biological tissue samples, 1990-92--*Continued*

Sample type	Sample No.	Date	Gamma chlor-dane	Oxychlor-dane	o,p' DDD	p,p' DDD	p,p' DDE	o,p' DDE	p,p' DDT	o,p' DDT
				Birds--*Continued*						
White-faced ibis egg	I1	7-20-90	<0.01	**0.04**	<0.01	<0.01	**1.3**	<0.01	<0.01	<0.01
	I2	7-20-90	<.01	**.01**	<.01	<.01	**1.4**	<.01	<.01	<.01
	I3	7-20-90	<.01	**.01**	<.01	<.01	**1.2**	<.01	**.04**	<.01
	I4	7-20-90	<.01	**.01**	<.01	**.01**	**1.9**	<.01	<.01	<.01
	I5	7-20-90	<.01	**.02**	<.01	**.05**	**3.4**	<.01	<.01	<.01
	LK12AI1	7-01-91	<.01	**.07**	<.01	**.08**	**9.08**	<.01	**.27**	<.01
	LK12AI2	7-01-91	<.01	**.03**	<.01	**.26**	**13.36**	<.01	<.01	<.01
	LK12AI5	7-01-91	<.01	**.04**	<.01	**.29**	**14.14**	<.01	<.01	<.01
	LK12AI10	7-01-91	<.01	<.01	<.01	**.02**	**.68**	<.01	<.01	<.01
	LK12AI11	7-01-91	<.01	<.01	<.01	**.22**	**19.71**	<.01	<.01	<.01
	LK12AI12	7-01-91	<.01	<.01	<.01	**<.01**	**.46**	<.01	<.01	<.01
	92LKI1	6-24-92	<.01	<.01	<.01	<.01	**1.5**	<.01	<.01	<.01
	92LKI2	6-24-92	<.01	<.01	<.01	<.01	**8.1**	<.01	**.13**	<.01
	92LKI3	6-24-92	<.01	<.01	<.01	<.01	**2.5**	<.01	**1.0**	<.01
	92LKI4	6-24-92	<.01	<.01	<.01	<.01	**.29**	<.01	<.01	<.01
	92LKI5	6-24-92	<.01	<.01	<.01	<.01	**.85**	<.01	<.01	<.01
	92LKI6	6-24-92	<.01	<.01	<.01	<.01	**9.7**	<.01	**.13**	<.01
	92LKI7	6-24-92	<.01	**.03**	<.01	<.01	**.6**	<.01	<.01	<.01
	92LKI8	6-24-92	<.01	<.01	<.01	<.01	**11.0**	<.01	**.22**	<.01
	92LKI9	6-24-92	<.01	**.02**	<.01	**<.01**	**.34**	<.01	**.05**	<.01
	92LKI10	6-24-92	<.01	<.01	<.01	<.01	**.32**	<.01	**.02**	<.01
White-faced ibis nestling	16Y	7-02-90	<.01	<.01	<.01	.01	**.16**	<.01	**.01**	<.01

Table 17. Moisture content, lipid content, and concentrations of organochlorine compounds in biological tissue samples, 1990-92--*Continued*

Sample type	Sample No.	Date	Dieldrin	Endrin	HCB	Heptachlor epoxide	Mirex	*cis*-Non achlor	*t*-Non-achlor	PCBs, total	Toxa-phene
					Birds--*Continued*						
White-faced ibis egg	I1	7-20-90	**0.02**	<0.01	**0.57**	**0.03**	<0.01	<0.01	**0.03**	**0.34**	<0.1
	I2	7-20-90	<.01	<.01	**.01**	**.01**	<.01	<.01	**.01**	**.31**	<.1
	I3	7-20-90	**.02**	<.01	**.21**	**.01**	<.01	<.01	**.02**	<.1	<.1
	I4	7-20-90	**.03**	<.01	<.01	**.01**	<.01	<.01	**.01**	<.1	<.1
	I5	7-20-90	**.03**	<.01	**.12**	**.02**	<.01	<.01	**.03**	**.84**	<.1
	LK12AI1	7-01-91	**.20**	<.01	**.02**	**.09**	<.01	--	**.17**	<.1	<.1
	LK12AI2	7-01-91	**.17**	**.05**	**.45**	**.05**	<.01	--	**.08**	<.1	<.1
	LK12AI5	7-01-91	**.11**	**.11**	**8.02**	**.08**	<.01	--	**.10**	**.13**	<.1
	LK12AI10	7-01-91	<.01	<.01	<.01	**.01**	<.01	--	**.02**	<.1	<.1
	LK12AI11	7-01-91	**.22**	<.01	**.06**	<.01	<.01	--	**.04**	<.1	<.1
	LK12AI12	7-01-91	<.01	<.01	**.01**	<.01	<.01	--	<.01	<.1	<.1
	92LKI1	6-24-92	<.01	<.01	**.02**	<.01	<.01	--	<.01	<.1	<.1
	92LKI2	6-24-92	**.2**	**.02**	**.12**	**.01**	<.01	--	**.02**	<.1	<.1
	92LKI3	6-24-92	**.07**	<.01	**.19**	**.12**	<.01	--	**.03**	<.1	<.1
	92LKI4	6-24-92	<.01	<.01	<.01	<.01	<.01	--	<.01	<.1	<.1
	92LKI5	6-24-92	<.01	<.01	<.01	<.01	<.01	--	<.01	<.1	<.1
	92LKI6	6-24-92	**.04**	<.01	**.24**	<.01	<.01	--	**.02**	<.1	<.1
	92LKI7	6-24-92	**.01**	<.01	**.03**	**.01**	<.01	--	**.13**	**1.5**	<.1
	92LKI8	6-24-92	**.12**	**.06**	**.1**	**.03**	<.01	--	**.03**	<.1	<.1
	92LKI9	6-24-92	**.03**	<.01	**.02**	**.04**	<.01	--	**.02**	<.1	<.1
	92LKI10	6-24-92	<.01	<.01	<.01	<.01	<.01	--	<.01	<.1	<.1
White-faced ibis nestling	16Y	7-02-90	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1

Table 18. Cholinesterase (ChE) activity of waterfowl brain tissue collected, 1991-92

[Sample number refers to Fish and Wildlife Service identification number; no specific site locations given for these samples. ChE activity is expressed as micromoles of substrate hydrolyzed per minute per gram of tissue. LK is Lower Klamath National Wildlife Refuge. TL is Tule Lake National Wildlife Refuge]

Sample type	Sample No.	Sex	ChE activity
	1991		
Gadwall	LK91-000X	unknown	11.18
Gadwall	LK91-0010	F	11.12
Gadwall	LK91-0019	unknown	15.73
Gadwall	LK91-0020	M	14.04
Gadwall	LK91-0029	M	12.81
Lesser scaup	LK91-0024	F	10.73
Mallard	LK91-00X2	F	8.71
Mallard	LK91-00X3	F	10.92
Mallard	LK91-0009	M	8.19
Mallard	LK91-0011	M	11.38
Mallard	LK91-0012	unknown	8.00
Mallard	LK91-0013	F	9.36
Mallard	LK91-0014	F	6.11
Mallard	LK91-0015A	F	10.97
Mallard	LK91-0015B	F	12.55
Mallard	LK91-0017	F	10.53
Mallard	LK91-0018	M	5.72
Mallard	LK91-0022	M	12.35
Mallard	LK91-0031	F	12.22
Ruddy duck	LK91-0025	F	13.46
	1992		
Mallard	LK92-27	F	13.00
Mallard	LK92-28	F	15.34
Mallard	LK92-29	F	13.65
Mallard	LK92-30	M	16.25
Mallard	LK92-31	M	15.60
Mallard	LK92-32	F	11.44
Northern shoveler	LK92-33	M	16.90
Northern shoveler	LK92-34	M	13.70
Mallard	TL92-1	F	12.35
Mallard	TL92-2	M	13.39
Mallard	TL92-3	M	11.05
Mallard	TL92-5	M	11.70
Mallard	TL92-7	F	14.95
Mallard	TL92-8	F	11.70
Mallard	TL92-17	M	12.09
Mallard	TL92-21	F	13.65
Mallard	TL92-22	M	10.79
Mallard	TL92-24	M	13.65
Mallard	TL92-25	M	15.60
Mallard	TL92-26	M	11.05
Northern shoveler	TL92-10	F	17.29
Northern shoveler	TL92-11	F	12.61
Pintail	TL92-6	F	13.65
Pintail	TL92-9	F	12.74
Pintail	TL92-13	M	13.00
Pintail	TL92-16	F	12.22
Pintail	TL92-23	M	14.95

Table 19. Eggshell thickness of avian eggs collected, 1990-92

[Sample locations described in table 2. Values for eggshell thickness in millimeters, accurate to 0.01 mm, third fractional digit estimated]

Sample type	Sample No.	Date	Eggshell thickness
American avocet	4BA1	6-15-91	0.240
	4BA2	6-15-91	.240
	4BA3	6-15-91	.251
	4BA4	6-15-91	.235
	4BA6	6-15-91	.266
	4BA7	6-15-91	.239
	4BA8	6-15-91	.258
	4BA9	6-15-91	.254
American coot	7AC1	8-15-91	.330
	7AC2	8-15-91	.341
	7AC3	8-15-91	.344
	7AC4	8-15-91	.302
	7AC5	8-15-91	.313
	LK12CC1	6-29-91	.325
	LK12CC2	6-29-91	.336
	LK12CC3	6-29-91	.331
	LK12CC4	6-29-91	.341
	LK12CC5	6-29-91	.284
Eared grebe	92TLEG4A	7-08-92	.304
	92TLEG4B	7-08-92	.302
	92TLEG9A	7-08-92	.288
	92TLEG9B	7-08-92	.290
Mallard	M441	5-16-90	.359
	M447	5-15-90	.346
	M459A	5-15-90	.316
	M459B	5-15-90	.317
	M499A	6-12-90	.330
	M499B	6-12-90	.318
	M516A	6-08-90	.326
	M516B	6-08-90	.342
	M563	6-19-90	.374
	M574	6-19-90	.363
Western grebe	3AG1	6-20-91	.443
	3AG2	6-20-91	.390
	3AG3	6-20-91	.407
	3AG4	6-20-91	.420
	3AG5	6-20-91	.409
	3AG6	6-20-91	.399
	3AG7	6-20-91	.499
	TLG1	6-29-91	.466
Western grebe--*Continued*	TLG2	6-29-91	.496
	TLG3	6-29-91	.498
	TLG4	6-29-91	.513
	TLG5	6-29-91	.463
	TLG6	6-29-91	.416
	TLG7	6-29-91	.435
	TLG8	6-29-91	.415
	TLG9	6-29-91	.482
	TLG10	6-29-91	.448
	92TLWG1	6-08-92	.354
	92TLWG2A	6-08-92	.402
	92TLWG2B	6-08-92	.396
	92TLWG3A	6-08-92	.389
	92TLWG3B	6-08-92	.406
	92TLWG5A	6-08-92	.411
	92TLWG6A	6-08-92	.425
	92TLWG7A	6-08-92	.454
	92TLWG8	6-08-92	.411
White-faced ibis	I1	7-02-90	.316
	I2	7-02-90	.320
	I3	7-02-90	.343
	I4	7-02-90	.295
	I5	7-02-90	.315
	LK12AI2	7-01-91	.284
	LK12AI3	7-01-91	.282
	LK12AI4	7-01-91	.279
	LK12AI5	7-01-91	.291
	LK12AI7	7-01-91	.331
	LK12AI8	7-01-91	.304
	LK12AI9	7-01-91	.297
	LK12AI10	7-01-91	.316
	LK12AI11	7-01-91	.247
	LK12AI12	7-01-91	.332
	92LKI1	6-24-92	.310
	92LKI2	6-24-92	.334
	92LKI3	6-24-92	.308
	92LKI4	6-24-92	.319
	92LKI5	6-24-92	.301
	92LKI6	6-24-92	.297
	92LKI7	6-24-92	.323
	92LKI8	6-24-92	.270
	92LKI9	6-24-92	.313
	92LKI10	6-24-92	.309

Table 20. Benthic invertebrate surveys, 1990-91

[See figure 1 for site locations.]
Following are notes regarding taxonomic entries.

Coelenterata: few specimens were found. All belong to the genus *Hydra*.

Oligochaeta: minimum of three species were found, representing at least two families, Lumbriculidae and Naididae.

Hirudinea: at least two species of Glossiphoniidae were found including a widespread and easily recognizable species, *Helobdella stagnalis* (L.). Erpobdellidae may be represented by more than one species.

Gastropoda: only one species of Valvatidae, *Valvata sp.*, probably only one species of Hydrobiidae, one to three species of Lymnaeidae, more than one species of Physidae, and six or more species of Planorbidae are represented in the samples.

Pelecypoda: at lease two species were found.

Ephemeroptera: only one species of Caenidae, *Caenis sp.*, was found. All Baetidae able to be keyed to genus (specimens with gills and/or head and caudal appendages intact) were identified as *Callibaetis sp.* There may be more than one genus (most likely *Baetis*) and more than one species of *Callibaetis*, however. Only a single species of Ephemeridae was present, *Hexagenia sp.*, and it appears to be confined to Clear Lake and a short stretch of Lost River just below the Clear Lake Dam.

Trichoptera: only one genus, *Oecetis sp.*, was found. One, possibly two, species occur within the study area.

Coleoptera: a single species of Haliplidae was found, *Haliplus sp.*, represented mainly by larvae. Few specimens, but several species, of Dytiscidae were found. Most sample sites were too deep for most aquatic coleopteran species.

Chironomidae: many specimens from the 1990 samples were identified to genus. The dominate genus within the study area is *Chironomus*. Other common genera within the study area are *Cryptochironomus, Cryptotendipes, Glyptotendipes, Einfeldia, Microtendipes, Cricotopus, and Psectrocladius.* Only one to a very few specimens of *Paramerina, Rheotanytarsus, Cladopelma, Dicrotendipes, Goeldichironomus, Paralanterborniella, Polypedilum,* and *Corynoneura* were found.

Cladocera, Corixidae, and Ephydridae (pupae): also found in samples, but not included because they occur primarily in the water column or at the water surface, rather than on or within the substrate, and entered the sampling apparatus as it traveled through the water column to the substrate. This is also true of adult Coleoptera to some extent. Organisms occurring on vegetation anchored to the substrate, such as gastropods and baetids, are included and are considered part of the benthic community because they do not surface for air and often occur very near to or on the substrate. Floating and emergent vegetation was avoided while sampling.

Table 20. Benthic invertebrate surveys, 1990-91--*Continued*

Taxonomic entry	Individuals		
	Replicate number		
	1	2	3
Site 1			
Sampling date: June 20, 1991			
Coelenterata	0	1	0
Platyhelminthes			
Tubellaria	2	17	1
Nematoda	29	18	13
Annelida			
Oligochaeta	59	52,700	970
Hirudinea			
Erpobdellidae	0	31	9
Glossiphoniidae	2	12	103
Mollusca			
Gastropoda			
Valvatidae	0	2	1
Hydrobiidae	30	73	535
Planorbidae	0	2	2
Pelecypoda	21	346	381
Arthropoda			
Crustacea			
Conchostraca	0	1	0
Copepoda	0	0	5
Amphipoda	16	25	0
Isopoda	0	14	0
Chelicerata			
Hydrachnellae	0	1	0
Insecta			
Diptera			
Chironomidae	47	0	2
Sampling date: July 23, 1991			
Nematoda	1	3	1
Annelida			
Oligochaeta	4	9	7
Hirudinea			
Erpobdellidae	0	1	0
Mollusca			
Gastropoda			
Hydrobiidae	107	44	17
Planorbidae	2	0	0
Pelecypoda	1	0	1
Arthropoda			
Crustacea			
Amphipoda	1	1	1
Insecta			
Diptera			
Chironomidae	5	1	4
Site 1--*Continued*			
Sampling date: August 12, 1991			
Coelenterata	0	0	4
Platyhelminthes			
Tubellaria	0	0	4
Nematoda	8	0	4
Annelida			
Oligochaeta	0	8	8
Hirudinea			
Erpobdellidae	4	0	0
Mollusca			
Gastropoda			
Valvatidae	0	4	4
Hydrobiidae	232	112	252
Planorbidae	0	0	12
Pelecypoda	12	4	0
Arthropoda			
Crustacea			
Amphipoda	4	0	12
Insecta			
Diptera			
Simuliidae	0	0	4
Chironomidae	28	12	20
Site 2			
Sampling date: June 13, 1991			
Nematoda	4	0	0
Annelida			
Oligochaeta	1,376	464	816
Hirudinea			
Erpobdellidae	4	0	4
Glossiphoniidae	0	8	20
Mollusca			
Gastropoda			
Valvatidae	0	8	16
Arthropoda			
Crustacea			
Copepoda	0	0	4
Amphipoda	4	16	8
Chelicerata			
Hydrachnellae	4	0	0
Insecta			
Diptera			
Chironomidae	12	4	0

Table 20. Benthic invertebrate surveys, 1990-91--*Continued*

Taxonomic entry	Individuals, Replicate number 1	2	3
Site 2--*Continued*			
Sampling date: July 30, 1991			
Nematoda	56	104	32
Annelida			
Oligochaeta	484	876	200
Hirudinea			
Erpobdellidae	0	0	4
Glossiphoniidae	32	68	60
Mollusca			
Gastropoda			
Valvatidae	4	24	60
Planorbidae	0	4	0
Pelecypoda	0	0	16
Arthropoda			
Crustacea			
Conchostraca	0	4	4
Copepoda	36	4	56
Amphipoda	0	0	12
Chelicerata			
Hydrachnellae	0	96	4
Insecta			
Coleoptera			
Haliplidae	16	16	0
Diptera			
Chironomidae	52	84	152
Sampling date: August 13, 1991			
Coelenterata	0	4	24
Platyhelminthes			
Tubellaria	1	11	10
Nematoda	117	97	27
Annelida			
Oligochaeta	592	1,523	545
Hirudinea			
Erpobdellidae	1	0	0
Glossiphoniidae	61	107	20
Mollusca			
Gastropoda			
Valvatidae	29	30	24
Physidae	2	3	0
Planorbidae	8	7	8
Pelecypoda	6	6	3
Arthropoda			
Crustacea			
Conchostraca	0	10	4
Copepoda	137	183	91
Amphipoda	5	18	36
Site 2--*Continued*			
Sampling date: August 13, 1991--*Continued*			
Arthropoda--*Continued*			
Chelicerata			
Hydrachnellae	5	3	8
Insecta			
Ephemeroptera			
Caenidae	2	1	0
Baetidae	7	13	13
Odonata			
Aeshnidae	0	0	1
Libellulidae	1	0	0
Coenagrionidae	2	3	5
Coleoptera			
Haliplidae	5	4	0
Dytiscidae	0	0	1
Diptera			
Ceratopogonidae	0	5	1
Chironomidae	79	58	45
Site 3			
Sampling date: June 13, 1991			
Coelenterata	1	1	0
Platyhelminthes			
Tubellaria	1	0	0
Nematoda	33	17	33
Annelida			
Oligochaeta	358	262	263
Hirudinea			
Erpobdellidae	0	3	2
Glossiphoniidae	7	4	2
Mollusca			
Gastropoda			
Hydrobiidae	0	1	2
Planorbidae	1	0	0
Pelecypoda	1	3	2
Arthropoda			
Crustacea			
Conchostraca	16	1	2
Copepoda	5	1	0
Amphipoda	4	3	2
Chelicerata			
Hydrachnellae	2	0	1
Insecta			
Ephemeroptera			
Caenidae	4	0	3
Odonata			
Coenagrionidae	1	0	2

Table 20. Benthic invertebrate surveys, 1990-91--*Continued*

Taxonomic entry	Individuals, Replicate number 1	2	3
Site 3--*Continued*			
Sampling date: June 13, 1991--*Continued*			
Arthropoda--*Continued*			
Insecta--*Continued*			
Diptera			
Chironomidae	146	27	69
Sampling date: July 30, 1991			
Platyhelminthes			
Tubellaria	72	278	84
Nematoda	328	20	14
Annelida			
Oligochaeta	1,828	270	134
Hirudinea			
Erpobdellidae	8	6	0
Glossiphoniidae	28	16	10
Mollusca			
Gastropoda			
Valvatidae	2	10	0
Hydrobiidae	14	10	13
Lymnaeidae	2	0	0
Physidae	4	14	1
Planorbidae	18	18	7
Pelecypoda	6	8	2
Arthropoda			
Crustacea			
Conchostraca	2	4	0
Copepoda	14	42	0
Amphipoda	4	6	0
Chelicerata			
Hydrachnellae	8	8	3
Insecta			
Odonata			
Coenagrionidae	0	2	0
Coleoptera			
Haliplidae	0	4	0
Diptera			
Chironomidae	0	14	1
Sampling date: August 13, 1991			
Coelenterata	0	8	50
Platyhelminthes			
Tubellaria	15	172	175
Nematoda	63	31	28
Annelida			
Oligochaeta	198	32	162
Hirudinea			
Erpobdellidae	8	0	1
Glossiphoniidae	18	3	4
Site 3--Continued			
Sampling date: August 13, 1991--*Continued*			
Mollusca			
Gastropoda			
Valvatidae	0	1	0
Hydrobiidae	12	12	3
Lymnaeidae	2	0	0
Physidae	1	0	1
Planorbidae	4	5	6
Pelecypoda	3	6	3
Arthropoda			
Crustacea			
Conchostraca	0	0	2
Copepoda	28	20	14
Amphipoda	1	14	12
Chelicerata			
Hydrachnellae	1	6	2
Insecta			
Diptera			
Chironomidae	0	3	2
Site 4			
Sampling date: August 19, 1991			
Coelenterata	12	4	28
Platyhelminthes			
Tubellaria	192	1,132	36
Nematoda	0	0	92
Annelida			
Oligochaeta	628	1,476	804
Hirudinea			
Erpobdellidae	0	8	0
Glossiphoniidae	16	84	36
Mollusca			
Gastropoda			
Valvatidae	8	92	0
Hydrobiidae	24	164	0
Lymnaeidae	4	0	0
Physidae	0	4	0
Planorbidae	8	8	0
Pelecypoda	144	132	0
Arthropoda			
Crustacea			
Conchostraca	4	0	0
Ostracoda	0	4	0
Copepoda	4	0	12
Amphipoda	156	152	384
Chelicerata			
Hydrachnellae	4	4	4
Insecta			
Ephemeroptera			
Caenidae	0	0	12
Baetidae	0	0	16

Table 20. Benthic invertebrate surveys, 1990-91--*Continued*

Taxonomic entry	Individuals, Replicate number 1	2	3
Site 4--*Continued*			
Sampling date: August 19, 1991--*Continued*			
Arthropoda--*Continued*			
Insecta--*Continued*			
Odonata			
Coenagrionidae	0	0	12
Diptera			
Ceratopogonidae	0	0	4
Chironomidae	4	4	28
Site 5			
Sampling date: June 13, 1991			
Annelida			
Oligochaeta	48	128	4
Hirudinea			
Erpobdellidae	0	8	0
Glossiphoniidae	4	0	4
Arthropoda			
Insecta			
Diptera			
Chironomidae	0	4	0
Sampling date: July 30, 1991			
Nematoda	12	24	24
Annelida			
Oligochaeta	548	720	1,220
Hirudinea			
Erpobdellidae	4	0	36
Glossiphoniidae	8	0	16
Mollusca			
Gastropoda			
Valvatidae	0	0	4
Planorbidae	0	0	4
Pelecypoda	4	0	0
Arthropoda			
Crustacea			
Conchostraca	4	4	20
Copepoda	8	0	12
Amphipoda	4	0	12
Chelicerata			
Hydrachnellae	4	0	0
Insecta			
Ephemeroptera			
Baetidae	0	0	8
Odonata			
Coenagrionidae	0	0	4
Site 5--*Continued*			
Sampling date: July 30, 1991--*Continued*			
Arthropoda--*Continued*			
Insecta--*Continued*			
Coleoptera			
Haliplidae	0	0	8
Diptera			
Chironomidae	20	12	34
Sampling date: August 12, 1991			
Coelenterata	0	0	8
Platyhelminthes			
Tubellaria	0	0	16
Nematoda	12	8	4
Annelida			
Oligochaeta	584	608	1,156
Hirudinea			
Erpobdellidae	32	4	8
Glossiphoniidae	56	0	36
Mollusca			
Gastropoda			
Valvatidae	4	2	76
Lymnaeidae	4	0	24
Physidae	0	0	4
Planorbidae	4	0	48
Pelecypoda	0	2	0
Arthropoda			
Crustacea			
Conchostraca	12	0	20
Copepoda	0	0	104
Amphipoda	4	22	224
Insecta			
Ephemeroptera			
Caenidae	0	0	8
Baetidae	0	4	16
Coleoptera			
Haliplidae	0	0	4
Dytiscidae	0	0	8
Diptera			
Ceratopogonidae	0	2	28
Chironomidae	0	6	8
Site 6			
Sampling date: August 19, 1991			
Coelenterata	0	20	12
Nematoda	52	212	152
Annelida			
Oligochaeta	2,044	1,324	280

Table 20. Benthic invertebrate surveys, 1990-91--*Continued*

Taxonomic entry	Individuals, Replicate number 1	2	3
Site 6--*Continued*			
Sampling date: August 19, 1991--*Continued*			
Annelida--*Continued*			
Hirudinea			
Erpobdellidae	4	4	8
Glossiphoniidae	40	88	116
Mollusca			
Gastropoda			
Valvatidae	4	24	100
Lymnaeidae	0	0	32
Physidae	0	0	20
Planorbidae	0	4	20
Pelecypoda	16	0	4
Arthropoda			
Crustacea			
Conchostraca	0	16	12
Ostracoda	4	4	0
Copepoda	32	8	16
Amphipoda	16	16	36
Insecta			
Ephemeroptera			
Caenidae	0	0	4
Baetidae	4	20	112
Odonata			
Coenagrionidae	4	0	8
Coleoptera			
Haliplidae	0	8	0
Diptera			
Ceratopogonidae	0	4	0
Chironomidae	12	8	76
Site 7			
Sampling date: June 13, 1991			
Nematoda	41	42	88
Annelida			
Oligochaeta	64	671	2,471
Hirudinea			
Erpobdellidae	1	1	18
Glossiphoniidae	20	4	34
Mollusca			
Gastropoda			
Valvatidae	7	4	2
Lymnaeidae	1	1	2
Planorbidae	1	1	0
Pelecypoda	0	2	2
Anthropoda			
Crustacea			
Conchostraca	6	8	2
Copepoda	10	1	1
Site 7--*Continued*			
Sampling date: June 13, 1991--*Continued*			
Arthropoda--*Continued*			
Crustacea--*Continued*			
Amphipoda	4	5	11
Chelicerata			
Hydrachnellae	0	0	2
Insecta			
Ephemeroptera			
Caenidae	4	6	0
Baetidae	0	0	1
Coleoptera			
Hydrophilidae	0	1	0
Diptera			
Chironomidae	187	286	6
Sampling date: July 30, 1991			
Platyhelminthes			
Tubellaria	1	0	0
Nematoda	28	90	74
Annelida			
Oligochaeta	84	1,498	195
Hirudinea			
Erpobdellidae	0	4	0
Glossiphoniidae	75	26	13
Mollusca			
Gastropoda			
Valvatidae	34	6	0
Lymnaeidae	1	0	5
Physidae	1	0	2
Pelecypoda	2	0	1
Arthropoda			
Crustacea			
Conchostraca	0	0	6
Copepoda	19	0	38
Amphipoda	48	0	6
Chelicerata			
Hydrachnellae	2	2	0
Insecta			
Ephemeroptera			
Caenidae	0	0	3
Baetidae	1	0	0
Coleoptera			
Haliplidae	4	0	0
Dytiscidae	0	0	1
Hydrophilidae	0	0	1
Diptera			
Chironomidae	9	4	488

Table 20. Benthic invertebrate surveys, 1990-91--*Continued*

Taxonomic entry	Individuals, Replicate number 1	2	3
Site 7--*Continued*			
Sampling date: August 12, 1991			
Nematoda	127	60	5
Annelida			
Oligochaeta	1,765	167	381
Hirudinea			
Erpobdellidae	47	22	13
Glossiphoniidae	42	124	55
Mollusca			
Gastropoda			
Valvatidae	1	18	5
Lymnaeidae	1	5	0
Physidae	1	8	2
Planorbidae	0	0	2
Pelecypoda	7	1	0
Arthropoda			
Crustacea			
Conchostraca	2	2	0
Copepoda	3	13	0
Amphipoda	0	12	10
Chelicerata			
Hydrachnellae	0	2	1
Insecta			
Ephemeroptera			
Caenidae	0	3	0
Baetidae	4	39	48
Odonata			
Coenagrionidae	0	3	0
Coleoptera			
Haliplidae	0	3	1
Dytiscidae	0	4	1
Diptera			
Chironomidae	0	7	0
Site 9			
Sampling date: June 20, 1991			
Nematoda	9	43	9
Annelida			
Oligochaeta	75	144	30
Hirudinea			
Glossiphoniidae	1	13	4
Arthropoda			
Crustacea			
Conchostraca	0	2	2
Copepoda	0	10	1
Chelicerata			
Hydrachnellae	1	2	1
Insecta			
Ephemeroptera			
Caenidae	1	0	0
Baetidae	0	1	0
Site 9--*Continued*			
Sampling date: June 20, 1991--*Continued*			
Arthropoda--*Continued*			
Insecta--*Continued*			
Diptera			
Chironomidae	1,209	897	1,180
Sampling date: July 30, 1991			
Nematoda	4	3	3
Annelida			
Oligochaeta	230	210	280
Hirudinea			
Erpobdellidae	0	1	3
Glossiphoniidae	2	22	3
Arthropoda			
Crustacea			
Conchostraca	2	0	0
Copepoda	2	1	0
Amphipoda	24	7	16
Insecta			
Coleoptera			
Dytiscidae	0	1	0
Diptera			
Chironomidae	100	50	9
Sampling date: August 12, 1991			
Nematoda	2	2	1
Annelida			
Oligochaeta	168	181	89
Hirudinea			
Erpobdellidae	2	2	1
Glossiphoniidae	178	209	89
Mollusca			
Gastropoda			
Valvatidae	0	2	0
Physidae	0	5	0
Arthropoda			
Crustacea			
Copepoda	5	0	1
Amphipoda	12	55	11
Chelicerata			
Hydrachnellae	1	0	0
Insecta			
Ephemeroptera			
Baetidae	0	5	0
Coleoptera			
Haliplidae	0	1	0

Table 20. Benthic invertebrate surveys, 1990-91--*Continued*

Taxonomic entry	Individuals, Replicate number 1	2	3
Site 10			
Sampling date: August 19, 1991			
Coelenterata	24	8	16
Platyhelminthes			
Tubellaria	8	12	0
Nematoda	4	0	42
Annelida			
Oligochaeta	498	8	528
Hirudinea			
Erpobdellidae	14	0	12
Glossiphoniidae	94	162	84
Mollusca			
Gastropoda			
Valvatidae	22	72	56
Lymnaeidae	4	6	0
Physidae	2	6	6
Planorbidae	10	16	14
Pelecypoda			
Arthropoda			
Crustacea			
Conchostraca	14	0	4
Ostracoda	0	0	2
Copepoda	70	46	28
Amphipoda	58	130	26
Chelicerata			
Hydrachnellae	104	0	68
Insecta			
Ephemeroptera			
Caenidae	4	10	0
Baetidae	12	18	8
Odonata			
Coenagrionidae	10	6	8
Coleoptera			
Dytiscidae	0	2	0
Diptera			
Ceratopogonidae	4	0	0
Chironomidae	10	2	4
Site 11			
Sampling date: June 13, 1991			
Coelenterata	0	12	0
Nematoda	8	0	0
Annelida			
Oligochaeta	776	840	558
Hirudinea			
Glossiphoniidae	72	28	68
Site 11--*Continued*			
Sampling date: June 13, 1991--*Continued*			
Mollusca			
Gastropoda			
Planorbidae	4	4	0
Arthropoda			
Crustacea			
Conchostraca	8	0	0
Copepoda	148	108	58
Amphipoda	0	0	6
Chelicerata			
Hydrachnellae	4	4	2
Insecta			
Ephemeroptera			
Caenidae	16	12	12
Odonata			
Coenagrionidae	0	0	2
Diptera			
Chironomidae	48	96	14
Sampling date: July 23, 1991			
Nematoda	0	2	0
Annelida			
Oligochaeta	928	1,800	162
Hirudinea			
Erpobdellidae	16	6	0
Glossiphoniidae	144	88	14
Mollusca			
Gastropoda			
Lymnaeidae	16	0	0
Planorbidae	0	0	4
Arthropoda			
Crustacea			
Conchostraca	0	8	8
Copepoda	24	50	28
Amphipoda	28	4	0
Chelicerata			
Hydrachnellae	16	4	4
Insecta			
Ephemeroptera			
Caenidae	4	12	2
Baetidae	0	8	6
Odonata			
Coenagrionidae	4	0	0
Coleoptera			
Haliplidae	20	24	2
Diptera			
Chironomidae	56	36	12

Table 20. Benthic invertebrate surveys, 1990-91--*Continued*

Taxonomic entry	Individuals, Replicate number 1	2	3
Site 11--*Continued*			
Sampling date: August 12, 1991			
Annelida			
Oligochaeta	1,102	4,920	24
Hirudinea			
Erpobdellidae	10	24	1
Glossiphoniidae	76	168	0
Mollusca			
Gastropoda			
Lymnaeidae	4	36	12
Physidae	2	24	1
Planorbidae	4	66	0
Arthropoda			
Crustacea			
Conchostraca	0	8	1
Copepoda	24	58	8
Amphipoda	0	88	2
Chelicerata			
Hydrachnellae	8	62	7
Insecta			
Ephemeroptera			
Caenidae	8	10	1
Baetidae	2	24	5
Odonata			
Coenagrionidae	0	10	0
Coleoptera			
Haliplidae	8	30	7
Diptera			
Chironomidae	20	54	46
Site 12			
Sampling date: August 24, 1990			
Nematomorpha	0	0	1
Nematoda	2	1	1
Annelida			
Oligochaeta	5	0	28
Hirudinea			
Erpobdellidae	0	0	1
Glossiphoniidae	0	2	4
Mollusca			
Gastropoda			
Planorbidae	5	0	3
Arthropoda			
Crustacea			
Conchostraca	0	1	3
Copepoda	7	9	7
Amphipoda	2	1	1
Chelicerata			
Hydrachnellae	1	0	1
Site 12--*Continued*			
Sampling date: August 24, 1990--*Continued*			
Arthropoda--*Continued*			
Insecta			
Ephemeroptera			
Caenidae	1	0	0
Coleoptera			
Haliplidae	1	1	0
Dytiscidae	1	0	0
Diptera			
Chironomidae	56	13	42
Sampling date: June 20, 1991			
Coelenterata	0	2	0
Nematoda	252	0	6
Annelida			
Oligochaeta	1,136	138	79
Hirudinea			
Erpobdellidae	8	0	0
Glossiphoniidae	0	4	0
Mollusca			
Gastropoda			
Planorbidae	0	2	0
Arthropoda			
Crustacea			
Conchostraca	20	24	2
Ostracoda	516	8	0
Copepoda	1,156	234	1,260
Amphipoda	12	6	0
Chelicerata			
Hydrachnellae	4	2	0
Insecta			
Ephemeroptera			
Baetidae	0	2	0
Coleoptera			
Dytiscidae	0	2	0
Diptera			
Chironomidae	408	170	482
Sampling date: July 23, 1991			
Nematoda	52	26	2
Annelida			
Oligochaeta	934	132	8
Hirudinea			
Glossiphoniidae	49	2	2
Mollusca			
Gastropoda			
Planorbidae	1	2	0

Table 20. Benthic invertebrate surveys, 1990-91--*Continued*

Taxonomic entry	Individuals, Replicate number 1	2	3
Site 12--*Continued*			
Sampling date: July 23, 1991--*Continued*			
Arthropoda			
Crustacea			
Conchostraca	5	0	20
Copepoda	216	40	10
Amphipoda	27	0	11
Chelicerata			
Hydrachnellae	1	0	0
Insecta			
Ephemeroptera			
Baetidae	8	0	0
Odonata			
Coenagrionidae	19	0	0
Coleoptera			
Haliplidae	1	2	0
Dytiscidae	11	0	0
Diptera			
Chironomidae	356	612	7
Sampling date: August 12, 1991			
Coelenterata	0	0	6
Nematoda	40	24	6
Annelida			
Oligochaeta	260	324	9
Hirudinea			
Erpobdellidae	0	4	0
Glossiphoniidae	188	220	162
Mollusca			
Gastropoda			
Physidae	0	4	0
Planorbidae	4	0	12
Arthropoda			
Crustacea			
Conchostraca	60	20	90
Ostracoda	0	0	90
Copepoda	48	28	576
Amphipoda	148	96	321
Chelicerata			
Hydrachnellae	4	4	6
Insecta			
Ephemeroptera			
Caenidae	0	0	3
Baetidae	28	60	129
Odonata			
Coenagrionidae	8	4	24
Coleoptera			
Haliplidae	4	8	0
Dytiscidae	0	0	12
Diptera			
Chironomidae	424	320	102
Site 13			
Sampling date: June 20, 1991			
Coelenterata	0	10	50
Platyhelminthes			
Tubellaria	0	4	48
Nematoda	4	6	5
Annelida			
Oligochaeta	2,104	1,407	1,065
Hirudinea			
Erpobdellidae	15	3	5
Glossiphoniidae	37	14	72
Mollusca			
Gastropoda			
Lymnaeidae	0	0	2
Physidae	0	1	0
Planorbidae	0	2	41
Pelecypoda	37	48	8
Arthropoda			
Crustacea			
Conchostraca	5	1	2
Copepoda	2	0	0
Amphipoda	4	2	29
Isopoda	0	0	1
Insecta			
Ephemeroptera			
Caenidae	0	0	4
Odonata			
Coenagrionidae	0	0	3
Diptera			
Chironomidae	14	0	0
Sampling date: July 23, 1991			
Coelenterata	0	0	2
Platyhelminthes			
Tubellaria	1	0	17
Nematoda	12	2	3
Annelida			
Oligochaeta	2,924	2,201	355
Hirudinea			
Erpobdellidae	5	2	2
Glossiphoniidae	21	7	4
Mollusca			
Gastropoda			
Planorbidae	0	0	1
Pelecypoda	30	16	7
Arthropoda			
Crustacea			
Conchostraca	3	2	0
Amphipoda	1	0	1
Chelicerata			
Hydrachnellae	1	0	0

Table 20. Benthic invertebrate surveys, 1990-91--*Continued*

Taxonomic entry	Individuals, Replicate number 1	2	3
Site 13--*Continued*			
Sampling date: July 23, 1991--*Continued*			
Anthropoda--*Continued*			
Insecta			
Diptera			
Chironomidae	224	68	28
Sampling date: August 12, 1991			
Coelenterata	6	0	0
Platyhelminthes			
Tubellaria	42	1	28
Nematoda	12	28	0
Annelida			
Oligochaeta	3,067	930	776
Hirudinea			
Erpobdellidae	8	1	3
Glossiphoniidae	32	3	18
Mollusca			
Gastropoda			
Valvatidae	0	0	1
Lymnaeidae	1	0	0
Planorbidae	10	0	5
Pelecypoda	22	13	18
Arthropoda			
Crustacea			
Conchostraca	6	0	3
Copepoda	32	0	5
Amphipoda	27	0	1
Isopoda	7	0	2
Insecta			
Ephemeroptera			
Baetidae	4	0	0
Odonata			
Coenagrionidae	2	0	0
Coleoptera			
Haliplidae	0	1	0
Dytiscidae	2	0	1
Diptera			
Chironomidae	31	33	4
Site UTL2			
Sampling date: July 12, 1990			
Coelenterata	9	0	1
Nematoda	4	29	0
Annelida			
Oligochaeta	519	385	4
Hirudinea			
Erpobdellidae	1	0	0
Site UTL2--*Continued*			
Sampling date: July 12, 1991--*Continued*			
Annelida--*Continued*			
Hirudinea--*Continued*			
Glossiphoniidae	5	24	2
Mollusca			
Gastropoda			
Lymnaeidae	7	0	0
Physidae	0	0	2
Planorbidae	5	0	5
Arthropoda			
Crustacea			
Conchostraca	11	3	0
Copepoda	28	6	3
Amphipoda	232	2	18
Chelicerata			
Hydrachnellae	59	2	6
Insecta			
Ephemeroptera			
Caenidae	109	7	43
Baetidae	4	0	3
Odonata			
Coenagrionidae	1	1	3
Trichoptera			
Leptoceridae	3	0	0
Diptera			
Chironomidae	688	352	128
Site UTL3			
Sampling date: July 12, 1990			
Nematoda	0	1	4
Nematomorpha	1	0	0
Annelida			
Oligochaeta	45	21	74
Hirudinea			
Erpobdellidae	0	0	53
Glossiphoniidae	43	51	22
Arthropoda			
Crustacea			
Conchostraca	12	6	2
Copepoda	0	1	0
Chelicerata			
Hydrachnellae	2	0	2
Insecta			
Ephemeroptera			
Caenidae	14	4	11
Baetidae	1	0	0
Diptera			
Tipulidae	2	3	3
Chironomidae	95	47	108

Table 20. Benthic invertebrate surveys, 1990-91--*Continued*

Taxonomic entry	Individuals		
	Replicate number		
	1	2	3
Site UTL4			
Sampling date: July 12, 1990			
Nematoda	1	2	
Annelida			
Oligochaeta	2	1	
Hirudinea			
Glossiphoniidae	0	2	
Arthropoda			
Crustacea			
Conchostraca	1	3	
Copepoda	0	17	
Chelicerata			
Hydrachnellae	0	3	
Insecta			
Diptera			
Tipulidae	0	1	
Chironomidae	42	31	
Site UTL5			
Sampling date: July 19, 1990			
Nematoda	1	5	3
Annelida			
Oligochaeta	115	167	95
Hirudinea			
Erpobdellidae	2	3	1
Glossiphoniidae	4	14	8
Mollusca			
Gastropoda			
Valvatidae	0	3	0
Lymnaeidae	28	5	0
Physidae	0	1	0
Arthropoda			
Crustacea			
Conchostraca	1	2	0
Copepoda	2	1	3
Amphipoda	5	81	3
Chelicerata			
Hydrachnellae	1	4	1
Insecta			
Ephemeroptera			
Caenidae	0	15	1
Baetidae	1	45	5
Trichoptera			
Leptoceridae	5	7	11
Site UTL5--*Continued*			
Sampling date: July 19, 1990--*Continued*			
Anthropoda--*Continued*			
Insecta--*Continued*			
Diptera			
Chironomidae	9	9	36
Site UTL6			
Sampling date: July 19, 1990			
Coelenterata	0	0	2
Annelida			
Oligochaeta	92	137	97
Hirudinea			
Glossiphoniidae	18	30	50
Mollusca			
Gastropoda			
Planorbidae	1	0	0
Arthropoda			
Crustacea			
Conchostraca	3	2	2
Copepoda	1	0	1
Amphipoda	18	4	3
Chelicerata			
Hydrachnellae	10	3	2
Insecta			
Ephemeroptera			
Caenidae	1	2	0
Baetidae	7	5	0
Odonata			
Coenagrionidae	3	0	0
Trichoptera			
Leptoceridae	2	2	2
Diptera			
Chironomidae	52	12	25
Sampling date: August 19, 1991			
Nematoda	2	0	4
Annelida			
Oligochaeta	6	18	672
Hirudinea			
Erpobdellidae	0	0	4
Glossiphoniidae	2	10	32

Table 20. Benthic invertebrate surveys, 1990-91--*Continued*

Taxonomic entry	Individuals, Replicate number 1	2	3
Site UTL6--*Continued*			
Sampling date: August 19, 1991--*Continued*			
Mollusca			
Gastropoda			
Physidae	0	0	4
Arthropoda			
Crustacea			
Conchostraca	1	4	24
Copepoda	3	4	8
Amphipoda	0	2	0
Chelicerata			
Hydrachnellae	2	10	8
Insecta			
Ephemeroptera			
Baetidae	15	0	4
Diptera			
Chironomidae	16	2	32
Site UTL7			
Sampling date: July 19, 1990			
Annelida			
Oligochaeta	262	92	98
Hirudinea			
Erpobdellidae	0	20	14
Glossiphoniidae	60	59	64
Mollusca			
Gastropoda			
Lymnaeidae	0	0	2
Arthropoda			
Crustacea			
Conchostraca	17	6	0
Copepoda	5	2	2
Amphipoda	0	2	12
Chelicerata			
Hydrachnellae	1	0	0
Insecta			
Ephemeroptera			
Caenidae	3	2	6
Baetidae	0	0	4
Trichoptera			
Leptoceridae	1	1	3
Diptera			
Tipulidae	3	3	2
Chironomidae	104	49	48
Site UTL8			
Sampling date: July 12, 1990			
Coelenterata	0	0	3
Nematoda	0	0	2
Annelida			
Oligochaeta	307	305	322
Hirudinea			
Erpobdellidae	0	0	2
Glossiphoniidae	117	70	48
Mollusca			
Gastropoda			
Lymnaeidae	0	2	4
Physidae	0	3	0
Planorbidae	4	3	5
Arthropoda			
Crustacea			
Conchostraca	1	9	8
Copepoda	2	0	5
Amphipoda	25	0	5
Chelicerata			
Hydrachnellae	3	4	6
Insecta			
Ephemeroptera			
Caenidae	40	48	9
Baetidae	19	11	5
Diptera			
Chironomidae	181	130	193
Sampling date: August 19, 1991			
Nematoda	0	23	
Annelida			
Oligochaeta	920	30	
Hirudinea			
Erpobdellidae	2	0	
Glossiphoniidae	30	3	
Mollusca			
Gastropoda			
Planorbidae	20	8	
Arthropoda			
Crustacea			
Conchostraca	26	6	
Ostracoda	2	1	
Copepoda	12	65	
Amphipoda	6	1	
Chelicerata			
Hydrachnellae	32	5	

Table 20. Benthic invertebrate surveys, 1990-91--*Continued*

Taxonomic entry	Individuals, Replicate number 1	2	3
Site UTL8--*Continued*			
Sampling date: August 19, 1991--*Continued*			
Arthropoda--*Continued*			
Insecta			
Ephemeroptera			
Caenidae	16	0	
Baetidae	2	1	
Diptera			
Chironomidae	254	51	
Site UTL9			
Sampling date: July 19, 1990			
Nematoda	5	6	34
Annelida			
Oligochaeta	65	94	130
Hirudinea			
Erpobdellidae	16	19	15
Glossiphoniidae	8	11	10
Mollusca			
Gastropoda			
Valvatidae	13	2	6
Lymnaeidae	8	3	6
Physidae	1	3	1
Planorbidae	11	1	4
Arthropoda			
Crustacea			
Conchostraca	3	0	3
Copepoda	6	6	63
Amphipoda	4	7	19
Chelicerata			
Hydrachnellae	1	2	3
Insecta			
Ephemeroptera			
Caenidae	2	2	9
Baetidae	1	1	3
Odonata			
Coenagrionidae	0	0	1
Trichoptera			
Leptoceridae	1	0	0
Diptera			
Chironomidae	7	4	47
Site UTL10			
Sampling date: August 14, 1990			
Nematoda	5	1	0
Annelida			
Oligochaeta	62	34	20
Erpobdellidae	2	0	1
Site UTL10--*Continued*			
Sampling date: August 14, 1990--*Continued*			
Annelida--*Continued*			
Hirudinea			
Glossiphoniidae	18	5	2
Mollusca			
Gastropoda			
Valvatidae	7	3	1
Lymnaeidae	1	18	1
Physidae	1	3	0
Planorbidae	2	5	2
Pelecypoda	17	4	1
Arthropoda			
Crustacea			
Conchostraca	9	12	6
Copepoda	7	1	5
Amphipoda	2	0	0
Chelicerata			
Hydrachnellae	1	0	3
Insecta			
Ephemeroptera			
Caenidae	0	0	1
Baetidae	1	5	2
Diptera			
Chironomidae	2	12	4
Site UTL11			
Sampling date: August 14, 1990			
Nematoda	1	0	0
Annelida			
Oligochaeta	29	80	3
Hirudinea			
Erpobdellidae	3	10	0
Glossiphoniidae	9	21	18
Mollusca			
Gastropoda			
Valvatidae	5	4	0
Lymnaeidae	10	1	2
Planorbidae	0	2	1
Arthropoda			
Crustacea			
Conchostraca	1	6	0
Copepoda	7	3	0
Amphipoda	11	9	1
Chelicerata			
Hydrachnellae	10	6	1
Insecta			
Ephemeroptera			
Caenidae	2	6	0
Baetidae	8	6	2

Table 20. Benthic invertebrate surveys, 1990-91--*Continued*

Taxonomic entry	Individuals, Replicate number 1	2	3
Site UTL11--*Continued*			
Sampling date: August 14, 1990--*Continued*			
Arthropoda--*Continued*			
Insecta--*Continued*			
Trichoptera			
Leptoceridae	1	1	4
Diptera			
Tipulidae	0	0	2
Chironomidae	2	43	8
Site UTL13			
Sampling date: August 14, 1990			
Nematoda	2	4	3
Annelida			
Oligochaeta	96	54	133
Hirudinea			
Erpobdellidae	13	6	4
Glossiphoniidae	40	23	9
Mollusca			
Gastropoda			
Valvatidae	60	21	37
Lymnaeidae	453	36	18
Physidae	1	2	1
Planorbidae	121	35	34
Arthropoda			
Crustacea			
Conchostraca	2	6	0
Copepoda	9	11	2
Amphipoda	15	3	39
Chelicerata			
Hydrachnellae	6	4	2
Insecta			
Ephemeroptera			
Caenidae	1	3	0
Baetidae	79	71	16
Odonata			
Coenagrionidae	3	0	2
Diptera			
Chironomidae	121	40	295
Sampling date: August 19, 1991			
Coelenterata	16	44	8
Nematoda	8	8	12
Annelida			
Oligochaeta	176	372	632
Hirudinea			
Erpobdellidae	4	0	8
Site UTL13--*Continued*			
Sampling date: August 19, 1991--*Continued*			
Annelida--*Continued*			
Hirudinea--*Continued*			
Glossiphoniidae	44	148	64
Mollusca			
Gastropoda			
Valvatidae	24	56	8
Lymnaeidae	0	0	48
Planorbidae	4	20	8
Arthropoda			
Crustacea			
Conchostraca	8	0	4
Ostracoda	4	0	0
Copepoda	20	4	124
Amphipoda	20	16	12
Chelicerata			
Hydrachnellae	4	4	0
Insecta			
Ephemeroptera			
Caenidae	4	4	0
Baetidae	24	48	24
Trichoptera			
Leptoceridae	0	4	0
Diptera			
Chironomidae	8	68	12
Site LTL2			
Sampling date: August 13, 1990			
Coelenterata	0	3	4
Annelida			
Oligochaeta	48	42	31
Hirudinea			
Glossiphoniidae	17	19	11
Mollusca			
Gastropoda			
Lymnaeidae	0	0	1
Planorbidae	1	1	1
Arthropoda			
Crustacea			
Amphipoda	0	1	1
Chelicerata			
Hydrachnellae	4	5	6
Ephemeroptera			
Caenidae	1	3	3
Baetidae	8	18	26
Odonata			
Coenagrionidae	0	3	0
Diptera			
Chironomidae	3	5	3

Table 20. Benthic invertebrate surveys, 1990-91--*Continued*

Taxonomic entry	Individuals, Replicate number 1	2	3
Site LTL4			
Sampling date: August 13, 1990			
Coelenterata	0	1	0
Nematoda	4	0	1
Annelida			
Oligochaeta	0	6	25
Hirudinea			
Erpobdellidae	0	1	0
Glossiphoniidae	3	10	10
Mollusca			
Gastropoda			
Physidae	0	3	1
Planorbidae	0	14	39
Arthropoda			
Crustacea			
Conchostraca	0	1	0
Copepoda	4	14	9
Amphipoda	0	3	8
Chelicerata			
Hydrachnellae	0	3	4
Insecta			
Ephemeroptera			
Caenidae	0	28	42
Baetidae	0	65	69
Odonata			
Libellulidae	0	0	1
Coenagrionidae	0	4	18
Trichoptera			
Leptoceridae	0	1	0
Diptera			
Chironomidae	1	8	24
Site LTL5			
Sampling date: August 13, 1990			
Coelenterata	5	0	0
Annelida			
Oligochaeta	122	99	54
Hirudinea			
Erpobdellidae	1	1	1
Glossiphoniidae	6	46	6
Mollusca			
Gastropoda			
Lymnaeidae	1	0	0
Planorbidae	10	0	6
Arthropoda			
Crustacea			
Copepoda	3	0	1
Amphipoda	3	1	0
Site LTL5--*Continued*			
Sampling date: August 13, 1990--*Continued*			
Arthropoda--*Continued*			
Chelicerata			
Hydrachnellae	3	0	6
Insecta			
Ephemeroptera			
Caenidae	1	1	0
Baetidae	21	0	5
Odonata			
Coenagrionidae	3	1	0
Diptera			
Stratiomyidae	1	0	0
Chironomidae	6	1	2
Site LTL6			
Sampling date: August 13, 1990			
Coelenterata	0	0	11
Nematoda	0	1	0
Annelida			
Oligochaeta	1	1	510
Hirudinea			
Erpobdellidae	1	2	4
Glossiphoniidae	0	3	5
Mollusca			
Gastropoda			
Lymnaeidae	0	0	10
Planorbidae	0	0	4
Arthropoda			
Crustacea			
Conchostraca	1	5	0
Copepoda	5	4	1
Amphipoda	0	5	13
Chelicerata			
Hydrachnellae	1	1	6
Insecta			
Ephemeroptera			
Caenidae	1	2	3
Baetidae	0	1	10
Odonata			
Coenagrionidae	0	0	2
Trichoptera			
Leptoceridae	0	1	1
Diptera			
Chironomidae	9	7	130

Table 20. Benthic invertebrate surveys, 1990-91--*Continued*

Taxonomic entry	Individuals, Replicate number 1	2	3
Site SSD1 Sampling date: August 27, 1990			
Coelenterata	16	7	15
Platyhelminthes			
Tubellaria	6	0	0
Nematoda	5	10	9
Annelida			
Oligochaeta	73	49	105
Hirudinea			
Erpobdellidae	2	2	6
Glossiphoniidae	21	20	23
Mollusca			
Gastropoda			
Valvatidae	159	155	159
Hydrobiidae	0	0	4
Lymnaeidae	16	3	7
Physidae	44	19	18
Planorbidae	98	26	91
Pelecypoda	35	14	5
Arthropoda			
Crustacea			
Conchostraca	2	2	0
Copepoda	22	9	3
Amphipoda	108	48	53
Chelicerata			
Hydrachnellae	0	4	0
Insecta			
Ephemeroptera			
Caenidae	6	22	27
Baetidae	6	7	7
Odonata			
Coenagrionidae	3	0	0
Coleoptera			
Haliplidae	0	1	0
Diptera			
Chironomidae	3	9	15
Site JCN1 Sampling date: August 27, 1990			
Coelenterata	0	0	138
Platyhelminthes			
Tubellaria	1	0	2
Nematoda	83	58	169
Annelida			
Oligochaeta	355	225	477
Hirudinea			
Erpobdellidae	0	2	14
Glossiphoniidae	58	4	338
Site JCN1--*Continued* Sampling date: August 27, 1990--*Continued*			
Mollusca			
Gastropoda			
Valvatidae	33	27	187
Hydrobiidae	1	0	0
Lymnaeidae	0	1	36
Physidae	0	0	2
Planorbidae	2	7	28
Pelecypoda	29	38	280
Arthropoda			
Crustacea			
Conchostraca	5	8	0
Ostracoda	1	0	0
Copepoda	0	1	0
Amphipoda	14	10	195
Chelicerata			
Hydrachnellae	0	8	4
Insecta			
Ephemeroptera			
Caenidae	19	8	55
Baetidae	1	10	13
Odonata			
Coenagrionidae	0	1	7
Coleoptera			
Haliplidae	0	6	44
Trichoptera			
Leptoceridae	0	0	2
Diptera			
Ceratopogonidae	2	0	0
Chironomidae	7	8	9
Site NC1 Sampling date: August 27, 1990			
Coelenterata	2	2	86
Platyhelminthes			
Tubellaria	2	32	23
Nematoda	9	14	22
Annelida			
Oligochaeta	304	84	549
Hirudinea			
Erpobdellidae	3	13	11
Glossiphoniidae	9	20	19
Mollusca			
Gastropoda			
Valvatidae	42	32	83
Hydrobiidae	77	8	41
Physidae	0	0	4
Planorbidae	4	3	3
Pelecypoda	16	0	5

Table 20. Benthic invertebrate surveys, 1990-91--*Continued*

Taxonomic entry	Individuals, Replicate number 1	2	3
Site NC1--*Continued*			
Sampling date: August 27, 1990--*Continued*			
Arthropoda			
Crustacea			
Conchostraca	0	0	1
Copepoda	0	3	4
Amphipoda	6	13	140
Chelicerata			
Hydrachnellae	5	1	4
Insecta			
Ephemeroptera			
Caenidae	5	4	6
Baetidae	2	0	11
Odonata			
Coenagrionidae	0	6	7
Coleoptera			
Haliplidae	1	1	0
Dytiscidae	0	0	1
Diptera			
Chironomidae	13	7	52
Site 4C			
Sampling date: August 24, 1990			
Annelida			
Oligochaeta	173	148	516
Hirudinea			
Glossiphoniidae	0	4	0
Mollusca			
Gastropoda			
Lymnaeidae	2	0	4
Physidae	1	0	0
Planorbidae	59	16	72
Pelecypoda	0	4	0
Arthropoda			
Crustacea			
Ostracoda	136	176	156
Copepoda	36	64	12
Amphipoda	165	176	64
Chelicerata			
Hydrachnellae	2	0	0
Insecta			
Ephemeroptera			
Caenidae	0	0	4
Baetidae	25	36	20
Odonata			
Coenagrionidae	6	0	12
Trichoptera			
Leptoceridae	3	0	0
Diptera			
Chironomidae	177	188	256
Site 9A			
Sampling date: August 24, 1990			
Annelida			
Oligochaeta	0	4	12
Arthropoda			
Crustacea			
Conchostraca	8	12	16
Copepoda	0	4	16
Amphipoda	4	0	0
Insecta			
Ephemeroptera			
Baetidae	12	4	16
Diptera			
Chironomidae	24	16	100
Site LR0			
Sampling date: August 14, 1990			
Coelenterata	11	5	0
Platyhelminthes			
Tubellaria	0	0	1
Nematoda	16	9	23
Annelida			
Oligochaeta	652	471	612
Hirudinea			
Erpobdellidae	64	44	39
Glossiphoniidae	41	25	55
Mollusca			
Gastropoda			
Valvatidae	511	433	351
Planorbidae	283	202	70
Pelecypoda	197	256	223
Arthropoda			
Crustacea			
Copepoda	0	4	13
Amphipoda	3	6	4
Chelicerata			
Hydrachnellae	7	7	4
Insecta			
Ephemeroptera			
Caenidae	0	1	0
Baetidae	6	26	10
Odonata			
Coenagrionidae	2	4	1
Trichoptera			
Leptoceridae	1	1	1
Diptera			
Ceratopogonidae	0	1	2
Chironomidae	4	12	4

Table 20. Benthic invertebrate surveys, 1990-91--*Continued*

Taxonomic entry	Individuals, Replicate number 1	2	3
Site LR5			
Sampling date: August 28, 1990			
Coelenterata	0	1	11
Nematoda	99	74	107
Annelida			
Oligochaeta	729	669	953
Hirudinea			
Erpobdellidae	25	28	12
Glossiphoniidae	53	32	130
Mollusca			
Gastropoda			
Valvatidae	6	25	71
Hydrobiidae	23	1	2
Lymnaeidae	0	0	1
Physidae	0	0	11
Planorbidae	0	0	17
Pelecypoda	41	51	237
Arthropoda			
Crustacea			
Conchostraca	0	1	1
Copepoda	2	3	2
Amphipoda	1	2	12
Insecta			
Ephemeroptera			
Caenidae	0	0	1
Baetidae	2	0	4
Odonata			
Coenagrionidae	0	0	57
Neuroptera			
Sialidae	1	0	3
Coleoptera			
Haliplidae	0	0	1
Dytiscidae	0	0	2
Diptera			
Chironomidae	31	7	134
Site CL1			
Sampling date: August 21, 1990			
Nematoda	0	0	2
Annelida			
Oligochaeta	2	1	4
Site CL1--*Continued*			
Sampling date: August 21, 1990--*Continued*			
Annelida--*Continued*			
Hirudinea			
Erpobdellidae	0	1	0
Mollusca			
Gastropoda			
Valvatidae	1	2	0
Planorbidae	0	0	2
Arthropoda			
Crustacea			
Copepoda	1	4	13
Amphipoda	1	0	0
Insecta			
Ephemeroptera			
Ephemeridae	0	0	1
Diptera			
Chironomidae	1	2	3
Site CL2			
Sampling date: August 21, 1990			
Nematoda	19	9	22
Annelida			
Oligochaeta	13	9	10
Mollusca			
Gastropoda			
Valvatidae	1	0	0
Lymnaeidae	0	1	0
Arthropoda			
Crustacea			
Copepoda	5	0	9
Insecta			
Ephemeroptera			
Ephemeridae	1	0	0
Trichoptera			
Leptoceridae	1	0	0
Diptera			
Chironomidae	3	2	0

Table 21. Water-column invertebrate surveys, 1992

[See figure 1 for site locations. Number of organisms identified in duplicate collections (A and B) done at 2-week intervals at each site]

Taxonomic entry	June 15		July 5		July 17		July 31		August 14		August 26	
	A	B	A	B	A	B	A	B	A	B	A	B
Site 1												
Annelida												
Oligochaeta			1			4			2			
Mollusca												
Gastropoda												
Lymnaeidae									1	1		
Planorbidae					1					1		
Arthropoda												
Crustacea												
Cladocera	51		32	14	6	5	2		11	7	29	65
Copepoda	1				13	5	2		1	14	70	14
Amphipoda												
Talitridae								3	3	5		2
Insecta												
Ephemeroptera												
Baetidae										22		
Odonata												
Coenagrionidae							1			2		1
Hemiptera												
Gerridae										1		
Notonectidae										3		
Coleoptera												
Halpidae					1					1		
Diptera												
Chironomidae			3		5	7	34	17	8	49	1	
Total organisms	52		36	14	26	21	39	20	26	106	100	82
Site 2												
Annelida												
Oligochaeta	1			12	50		11					
Hirudinea						95			3			
Mollusca												
Gastropoda												
Physidae			1									
Lymnaeidae	2	2	1					2	3			
Planorbidae		19	2	4		1		1	64	1	1	1
Arthropoda												
Crustacea												
Ostracoda												5
Cladocera	56	30	56	65	21		14	23	2	65	100	100
Copepoda	2	12	16	7	9	4		6		13	4	7
Amphipoda												
Talitridae	3	16	4	3	3				20	21		1
Hydracarina	3		4						6			
Insecta												
Ephemeroptera												
Baetidae	1											

Table 21. Water-column invertebrate surveys, 1992--*Continued*

Taxonomic entry	June 15		July 5		July 17		July 31		August 14		August 26	
	A	B	A	B	A	B	A	B	A	B	A	B
Site 2--*Continued*												
Arthropoda--*Continued*												
Insecta--*Continued*												
Odonata												
Aeshnidae	3		1									
Coenagrionidae		1	3	1			4			3	2	1
Hemiptera												
Corixidae	17	8	9	2								
Notonectidae		3		3								
Coleoptera												
Halpidae	2				1				2			
Dytiscidae	2	3	1		1							
Hydrophilidae		1							1			
Diptera												
Chironomidae	2	4	1		3							
Total organisms	94	99	99	97	88	100	29	32	101	103	107	115
Site 3												
Annelida												
Oligochaeta	4				2					9	10	
Mollusca												
Gastropoda												
Physidae		2										
Lymnaeidae		1			1					2		
Planorbidae	2			2	1							
Arthropoda												
Crustacea												
Ostracoda												21
Cladocera	78	71	85	93	68		28		85	82	20	49
Copepoda		9	8		4	96	12		5	4	10	12
Amphipoda												
Talitridae		7		2	6		17		1	5	5	17
Hydracarina	2			1	2	1	1			2	1	2
Insecta												
Ephemeroptera												
Baetidae	1				3				4		1	
Odonata												
Aeshnidae		1		1	1							
Coenagrionidae	1	2			1				3	1	1	
Hemiptera												
Corixidae	5					1	1		1	4		
Notonectidae		3	1		8							
Coleoptera												
Halpidae	1									2		
Dytiscidae		3	4	1	2					2		
Diptera												
Chironomidae	1		2		2	2					2	1
Total organisms	95	99	100	100	101	100	59		99	113	50	102

Table 21. Water-column invertebrate surveys, 1992--*Continued*

Taxonomic entry	June 15		July 5		July 17		July 31		August 14		August 26	
	A	B	A	B	A	B	A	B	A	B	A	B
Site 5												
Annelida												
Oligochaeta					70	26	16				6	15
Hirudinea					1		2					
Mollusca												
Gastropoda												
Physidae					2							
Lymnaeidae			2		1		2					
Planorbidae	2			1	4	3	2	1		1		1
Arthropoda												
Crustacea												
Cladocera	2	2	1				1	5	1		3	
Copepoda							3	27		2	8	
Amphipoda												
Talitridae					9		39	5		1	2	2
Hydracarina	1		1	8	3	1				1	1	
Insecta												
Ephemeroptera												
Baetidae							11	1	1		5	2
Caenidae					1							
Odonata												
Coenagrionidae					1		1					1
Hemiptera												
Corixidae			1	2		1			1		1	
Coleoptera												
Halpidae					4			1				
Dytiscidae							1					
Diptera												
Chironomidae	1	7	3	2	3		2			2		6
Total organisms	6	9	8	13	99	31	80	40	3	7	26	27
Site 7												
Annelida												
Oligochaeta	1			1						1		
Hirudinea									1	6		
Mollusca												
Gastropoda												
Physidae		1	1				1	1	1	1		
Lymnaeidae			10	2	5			1				
Planorbidae			19	2	6		1	2	9	2		
Arthropoda												
Crustacea												
Cladocera		10	3	2	36		9	53	18	4	1	4
Copepoda	11		4				2	5	20	12	100	92
Amphipoda												
Talitridae			5	3	8		7	4	8	6		1
Hydracarina	2		1	2				1		1	1	
Insecta												
Ephemeroptera												
Baetidae					12		31	3		12		1
Caenidae								1		1		

Table 21. Water-column invertebrate surveys, 1992--*Continued*

Taxonomic entry	June 15		July 5		July 17		July 31		August 14		August 26	
	A	B	A	B	A	B	A	B	A	B	A	B
Site 7--*Continued*												
Arthropoda--*Continued*												
Insecta--*Continued*												
Odonata												
Coenagrionidae				1	2							
Hemiptera												
Corixidae	10	9	19	13	29		31	2		10	1	5
Notonectidae								2				
Coleoptera												
Halpidae			1	1	1						1	
Dytiscidae			1	2				2		1		
Diptera												
Chironomidae	2		3	1	1		1			2	1	1
Total organisms	26	20	67	30	100		83	77	57	59	105	104
Site 9												
Annelida												
Oligochaeta		38		10	4							2
Hirudinea									1			
Mollusca												
Gastropoda												
Physidae								3	1	1		
Lymnaeidae								11		2		
Planorbidae			1		1			1				
Arthropoda												
Crustacea												
Cladocera	99	10	1	4	32	10	6			4	1	1
Copepoda				3		11	4				2	
Amphipoda												
Talitridae					26	5	21	55	1		1	4
Hydracarina		1			2		3					1
Insecta												
Ephemeroptera												
Baetidae					9	3	9	1			1	
Caenidae						2				2		
Odonata												
Coenagrionidae					12		2	3		1		
Hemiptera												
Corixidae	1		1	6	10	3	3	2				1
Coleoptera												
Halpidae				2	1	1						
Diptera												
Chironomidae					3	1	1	4	4			1
Total organisms	100	49	3	25	100	36	49	80	7	10	5	10
Site 11												
Annelida												
Oligochaeta									1			

Table 21. Water-column invertebrate surveys, 1992--*Continued*

Taxonomic entry	June 15		July 5		July 17		July 31		August 14		August 26	
	A	B	A	B	A	B	A	B	A	B	A	B
Site 11--*Continued*												
Mollusca												
Gastropoda												
Physidae				4			1	1	1			
Lymnaeidae						4		6				
Planorbidae							7	27	1			1
Arthropoda												
Crustacea												
Cladocera	3	2	8		70	56	4	3	1	23	1	3
Copepoda	24	26	13			1	4	2	1	7		7
Amphipoda												
Talitridae						3	1	2		5		
Hydracarina	7	6		10	3	2	4					
Insecta												
Ephemeroptera												
Baetidae			2	10	7	13	12	13	7	14		
Caenidae					1			1	6	1	1	5
Odonata												
Coenagrionidae				11	1	5	3	4	1	1	2	
Hemiptera												
Corixidae	3	5	2	5		1				2		
Notonectidae		1		2		1		1				
Saldidae										1		
Coleoptera												
Halpidae				1		1				1		
Dytiscidae						5	1	1				
Diptera												
Chironomidae	1	2	2	6	8	7	8	6	5	1	2	1
Total organisms	38	42	27	49	90	99	45	67	24	56	6	17
Site 12												
Annelida												
Hirudinea					1							
Mollusca												
Gastropoda												
Lymnaeidae				6		6			9	1	1	1
Planorbidae			2	14	1	9	5		6	1		1
Arthropoda												
Crustacea												
Ostracoda				5					1			
Cladocera	80	90	8	16	26	60	8					
Copepoda	20	15	4		31	1	34	95	64		57	90
Amphipoda												
Talitridae						8			2		1	1
Hydracarina				3							1	
Insecta												
Ephemeroptera												
Baetidae				5	20	3	4	4	3	1		1
Caenidae				1								
Odonata												
Coenagrionidae			4	3	2	9	4		5	6		1

Table 21. Water-column invertebrate surveys, 1992--*Continued*

Taxonomic entry	June 15		July 5		July 17		July 31		August 14		August 26	
	A	B	A	B	A	B	A	B	A	B	A	B
Site 12--*Continued*												
Arthropoda--*Continued*												
Insecta--*Continued*												
Hemiptera												
Corixidae	1	1	11	6	4	4	1		2	2	4	1
Notonectidae			3	3					2	2		1
Coleoptera												
Halpidae							1		1			
Diptera												
Chironomidae		2	2	3	1	6	8		10	9	1	6
Total organisms	101	108	34	65	86	106	65	99	105	22	65	103
Site 13												
Annelida												
Oligochaeta				1								
Mollusca												
Gastropoda												
Lymnaeidae									1			
Arthropoda												
Crustacea												
Ostracoda									1	1		
Cladocera	15	26	2									
Copepoda	7	10		1	11		85	94	90	93	93	99
Hydracarina		1	1		1		1		1		1	
Insecta												
Hemiptera												
Corixidae	1		1				1		4	5	10	4
Notonectidae									1			2
Coleoptera												
Halpidae							1			1		
Diptera												
Chironomidae		1	3		10		12	6	1			1
Total organisms	23	38	7	2	22		100	100	99	100	104	106
Site 15												
Annelida												
Mollusca												
Gastropoda												
Physidae			1									
Planorbidae			16									
Arthropoda												
Crustacea												
Cladocera	100	100	10		100	64	13					
Copepoda			28			36	87	100	100	100	100	100
Amphipoda												
Talitridae			8									
Hydracarina			4									
Total organisms	100	100	67		100	100	100	100	100	100	100	100

Table 22. Frog call surveys, 1991-92

[See figures 2 and 3 for site locations. Numbers separated by slash represent two different species heard; first number represents *Pseudacris regilla*, second number represents *Rana catesbeiana*; * denotes frog calls heard in canals adjacent to lake or impoundment units; --, site not surveyed; >, more than number shown]

Indian Tom Lake

Site	May 1991		May 1992			June 1991				June 1992				July 1991		July 1992
	22	29	17	24	30	5	12	19	26	6	13	20	27	3	10	4
T1	>5/0	0/0	0/0	3/0	3/0	>5/0	3/0	4/0	0/0	2/0	3/0	0/0	0/0	4/0	0/0	0/0
T2	0/0	0/0	0/0	0/0	0/0	0/0	2/0	2/0	0/0	0/0	0/0	0/0	0/0	3/0	0/0	0/0

Lower Klamath National Wildlife Refuge

Site	May 1991		May 1992			June 1991				June 1992				July 1991		July 1992
	22	29	17	24	30	5	12	19	26	6	13	20	27	3	10	4
1	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/3*	0/3*	0/0
2	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/4
3	1/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/2
4	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
5	0/0	0/0	0/0	0/0	0/0	0/0	--	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	--
6	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
7	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
8	0/0	0/0	0/0	0/0	1*/0	1*/0	0/0	0/0	0/0	1/0	0/0	0/0	0/0	0/0	0/0	0/0
9	0/0	0/0	0/0	0/0	0/0	1/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
10	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	--
11	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	--
12	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	--
13	0/0	1*/0	--	--	--	0/0	1/0	0/0	--	--	--	--	--	--	--	--
14	0/0	1/0	--	--	--	0/0	1/0	0/0	0/0	--	--	--	--	1/0	1/0	--
15	5/0	>5/0	>5/0	0/0	0/0	0/0	3/0	1/0	2/0	2/0	3/0	0/0	2/0	2/0	0/0	0/0
16	3,1*/0	>5/0	3/0	2/0	0/0	0/0	0/0	0/0	0/0	2/0	0/0	0/0	0/0	0/0	0/0	0/0
17	2/0	1/0	0/0	0/0	0/0	0/0	0/0	1*/0	0/0	--	--	--	--	0/0	0/0	--
18	1*/0	1/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	1/0	0/0	0/0
19	1/0	1/0	0/0	1/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
20	0/0	0/0	0/0	1/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
21	1/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	1/0	1/0	0/0	0/0	0/0	0/0
22	0/0	1/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/1	0/0	0/0	0/0	0/0	0/0
23	2/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
24	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	1/0	2/0	0/0	0/0	0/0	0/0
25	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/1	0/0	0/0	0/0	0/0	0/0	0/0	0/0
26	0/0	0/0	--	--	--	0/0	0/0	0/0	0/0	--	--	--	--	0/0	0/0	--
27	5/0	4/0	3/0	--	--	>5/0	>5/0	4/0	5/0	--	--	--	--	4/0	1/0	--
28	>5/0	>5/0	4/0	2/0	4/0	>5/0	>5/0	4/0	>5/0	--	--	--	--	5/0	1/0	--
29	2/0	1/0	4/0	3/0	>5/0	2/0	0/0	0/0	0/0	1/0	4/0	2/0	0/0	3/0	0/0	--
30	3/0	>5/0	4/0	2/0	3/0	0/0	3/0	2/0	0/0	2/0	0/0	1/0	0/0	3/0	1/0	--
31	0/0	>5/0	0/0	0/0	0/0	0/0	0/0	0/0	1/0	0/0	1/0	0/0	0/0	1/0	0/0	0/0
32	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
33	0/0	>5*/0	0/0	>5*/0	3*/0	0/0	0/0	2*/0	0/0	0/0	0/0	0/0	0/0	0/0	1*/0	0/0
34	0/0	0/0	0/0	--	--	0/0	0/0	0/0	4*/0	--	--	--	--	0/0	0/0	--
35	0/0	0/0	0/0	--	--	0/0	0/0	0/0	0/0	--	--	--	--	0/0	0/0	--
36	0/0	0/0	0/0	--	--	0/0	0/0	0/0	0/0	--	--	--	--	0/0	0/0	--

Table 22. Frog call surveys, 1991-92--*Continued*

Tule Lake National Wildlife Refuge																
Site	May 1991		May 1992			June 1991				June 1992				July 1991		July 1992
	22	29	17	24	30	5	12	19	26	6	13	20	27	3	10	4
1	1/0	1/0	0/0	2*/0	2*/0	2*/0	1/0	2/0	1/0	1*/0	2*/0	1/0	0/0	0/0	1*/0	0/0
2	2*/0	0/0	0/0	1*/0	0/0	0/0	1*/0	1/0	0/0	0/0	0/0	0/0	0/0	0/0	1/0	1/0
3	5*/0	3*/0	0/0	3*/0	3*/0	>5*/0	>5*/0	5*/0	>5*/0	3*/0	3*/0	2*/0	0/0	0/0	0/0	1*/0
4	4*/0	2*/0	--	--	--	4*/0	3*/0	3*/0	3*/0	--	--	--	--	4*/0	0/0	--
5	2/0	3/0	0/0	0/0	3/0	4/0	3/0	5/0	4/0	3/0	3/0	3/0	0/0	4/0	2/0	2/0
6	2/0	0/0	0/0	0/0	0/0	0/0	0/0	1/0	2/0	2/0	0/0	0/0	0/0	0/0	0/0	0/0
7	5/0	3/0	4/0	0/0	3/0	>6/0	3/0	5/0	5/0	>5/0	4/0	>5/0	0/0	>5/0	0/0	2/0
8	1/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	2/0	0/0	0/0	0/0
9	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
10	2*/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	1/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
11	0/0	0/0	0/0	0/0	0/0	0/0	1*/0	2*/0	1*/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
12	3*/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	2*/0	--	2*/0	1*/0	1*/0	0/0	0/0	0/0
13	>5/0	1*/0	0/0	2*/0	0/0	0/0	3*/0	1/0	4*/0	2*/0	>5*/0	0/0	0/0	0/0	0/0	0/0
14	>5/0	>5/0	>5/0	>5/0	>5/0	4/0	0/0	2/0	>5/0	4/0	>5/0	>5/0	0/0	4/0	2/0	>5/0
15	4/0	>5/0	3/0	4/0	4/0	>5/0	>5/0	5/0	>5/0	1/0	3/0	4/0	3/0	>5/0	3/0	2/0
16	>5/0	>5/0	>5/0	>5/0	>5/0	>5/0	>5/0	>5/0	>5/0	>5/0	>5/0	>5/0	>5/0	4/0	1/0	>5/0
17	4/0	>5/0	4/0	>5/0	>5/0	>5/0	2/0	>5/0	>5/0	0/0	>5/0	>5/0	>5/0	5/0	2/0	>5/0
18	3*/0	>5*/0	4*/0	2*/0	2*/0	2*/0	0/0	3*/0	2*/0	2*/0	4*/0	2*/0	3*/0	2*/0	1*/0	2*/0
19	>5/0	>5/0	>5/0	>5/0	>5/0	>5/0	>5/0	>5/0	>5/0	>5/0	>5/0	>5/1	>5/0	>5/0	5/0	>5/0
20	>5*/0	>5*/0	>5*/0	>5*/0	>5*/0	>5*/0	>5*/0	>5*/0	>5*/0	>5*/0	>5*/0	>5*/0	>5*/0	>5*/2*	4*/2*	>5*/1*
21	0/0	0/0	2*/0	2*/0	2*/0	0/0	0/0	0/0	0/0	2*/0	0/0	0/0	0/0	0/0	0/0	1*/0
22	1*/0	0/0	3*/0	1*/0	2*/0	0/0	0/0	0/0	0/0	0/0	0/0	2*/0	1*/0	0/0	0/0	0/0
23	0/0	0/0	0/0	1*/0	0/0	0/0	0/0	0/0	0/0	1*/0	0/0	1*/0	0/0	0/0	0/0	1*/0
24	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
25	3,2*/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	--	--	--	--	1,1*/0	0/0	--
26	0/0	0/0	--	--	--	0/0	0/0	0/0	0/0	--	--	--	--	0/0	0/0	--
27	0/0	0/0	0/0	0/0	0/0	1*/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
28	2*/0	1*/0	1,1*/0	2,2*/0	1*/0	2/0	2/0	2/0	0/0	3/0	3/0	3/0	2/0	2/0	1/0	3/0
29	1/0	0/0	2/0	3/0	0/0	4/0	1/0	0/0	0/0	3/0	1/0	1/0	--	1/0	1/0	2/0
30	2*/0	1*/0	1*/0	3*/0	1,1*/0	1*/0	1/0	0/0	1/0	2/0	--	1/0	0/0	2*/0	1*/0	1/0

Table 23. Fish surveys, 1991-92

[See figure 1 for site locations. Site locations are approximations as collection covered a broad area. g, gram; --, no data]

Species	Total caught	Adult		Juvenile		Total external anomolies
		Number surveyed	Mean weight (g)	Number surveyed	Mean weight (g)	
Site LR1, October 20, 1991, electroshock						
Tui chub	63	8	13.5	55	1.9	8
Fathead minnow	67	20	2.8	47	1.7	60
Total	130	28		102		68
Site 11, October 20, 1991, trap and dip net						
Tui chub	37	13	5.6	24	1.9	10
Sacramento perch	29	6	--	23	1.0	2
Total	66	19		47		12
Site 12, October 19, 1991, seine						
Fathead minnows	20	20	2.5	--	--	13
G Canal near Site LR6, October 22, 1991, seine and electroshock						
Tui chub	888	68	11.5	820	0.4	41
Large scale chub	10	10	34.0	0	--	--
Sacramento perch	1	1	17.0	0	--	--
Sculpin	2	2	13.0	0	--	--
Shortnose sucker	3	2	--	1	--	--
Total	904	83		821		41
Lost River below Clear Lake Dam, June 24, 1992, seine						
Tui chub	117	66	9.4	51	2.2	36
Sacramento perch	5	0	--	5	3.9	0
Sculpin	1	0	--	1	7.6	0
Total	123	66		57		36
Site LR3, June 24, 1992, seine						
Tui chub	252	100	19.6	152	6.7	104
Large scale chub	20	15	18.3	5	8.9	10
Blue chub	42	13	14.4	29	3.1	8
Fathead minnows	94	94	2.4	0	--	61
Sacramento perch	2	2	18.1	0	--	0
Total	410	224		186		183

Table 23. Fish surveys, 1991-92--*Continued*

Species	Total caught	Adult Number surveyed	Adult Mean weight (g)	Juvenile Number surveyed	Juvenile Mean weight (g)	Total external anomolies
Site LR3, August 21, 1992, seine						
Tui chub	297	297	15.0	0	--	198
Blue chub	14	14	9.2	0	--	11
Fathead minnows	748	748	1.9	0	--	28 (100 examined)
Juvenile Cyprinidae	459	0	--	459	1.2	42
Sacramento perch	4	0	0	4	2.4	0
Juvenile sucker	1	0	--	1	--	0
Total	1,523	1,059		464		279 (875 examined)
Site 3, June 6, 1992, seine						
Tui chub	481	1	5.4	480	0.2	13
Large scale chub	12	9	4.1	3	2.5	2
Blue chub	5	5	2.9	0	--	2
Fathead minnow	40	34	1.5	6	1.2	19 (34 examined)
Sacramento perch	1	1	7.0	0	--	1
Yellow perch	1	1	44.5	0	--	0
Total	540	51		489		37 (534 examined)
Site 3, August 31, 1992, seine						
Blue chub	1	0	--	1	1.0	0
Fathead minnow	526	4	1.1	522	0.3	69
Sacramento perch	2	0	--	2	1.1	0
Total	529	4		525		69
Site 4, September 2, 1992, seine						
Tui chub	1	1	3.0	0	--	1
Fathead minnow	92	39	0.8	53	0.4	13 (20 examined)
Juvenile Cyprinidae	245	0	--	245	1.3	80
Sacramento perch	1	0	--	1	--	0
Total	339	40		299		94 (266 examined)
Site 7, June 25, 1992, seine						
Tui chub	9	2	1.2	7	2.4	0
Fathead minnow	20	20	1.7	0	--	7
Juvenile Cyprinidae	1,574	0	--	1,574	0.5	72
Total	1,603	22		1,581		79

Table 23. Fish surveys, 1991-92--*Continued*

Species	Total caught	Adult: Number surveyed	Adult: Mean weight (g)	Juvenile: Number surveyed	Juvenile: Mean weight (g)	Total external anomolies
Site 7, September 2, 1992, seine						
Tui chub	10	4	18.1	6	1.3	3
Fathead minnow	33	7	1.0	26	0.3	2
Sacramento perch	12	1	2.0	11	0.5	0
Total	55	12		43		5
Site 11, June 25, 1992, seine						
Tui chub	98	0	--	98	--	46
Large Scale chub	30	0	--	30	3.5	14
Blue chub	57	0	--	57	2.9	16
Fathead minnow	71	71	1.2	0	--	50
Juvenile Cyprinidae	490	0	--	490	--	--
Sacramento perch	1	0	--	1	5.5	0
Total	747	71		676		126
Site 11, September 2, 1992, seine						
Tui chub	493	140	10.5	353	2.1	175
Sacramento perch	101	0	--	101	0.7	47
Fathead minnow	13	13	--	--	--	7
Total	607	153		454		229
Site 12, June 23, 1992, seine						
Fathead minnow	807	66	2.9	745	0.2	29 (66 examined)
Site 12, August 31, 1992, seine						
Tui chub	3	3	19.7	0	--	0
Fathead minnow	122	92	1.4	30	0.6	47 (65 examined)
Juvenile Cyprinidae	1,758	0	--	1,758	0.4	221
Sacramento perch	3	3	3.6	0	--	0
Total	1,886	98		1,788		268 (1,829 examined)

Table 24. Fish health surveys of native fathead minnows, 1991-92

[See figure 1 for site locations. Fish Health Index: Number, type, and severity of abnormalities is visually assessed for each fish. Extremities, gills, eyes, mesenteric fat, hind gut, liver, and kidney are assigned numbers representing degree of affected tissue and type of lesion or abnormality. For example, a fish with no abnormalities of the extremities would receive a 0 (zero) for that category, and a fish with severe, actively hemorrhaging bacterial lesions would receive a 3 or 4 (depending on type and extent of damage). The seven categories are added to produce an index total for each fish. The total range for overall health index is 0 (a perfectly healthy fish) to 25 (a severely affected fish)]

Fish No.	Index total	Fish No.	Index total	Fish No.	Index total	Fish No.	Index total	Fish No.	Index total	Fish No.	Index total
					Site LR3						
					October 20, 1991						
1	5	6	7	11	6	16	1	21	5	25	7
2	2	7	8	12	0	17	3	22	3	26	3
3	6	8	8	13	1	18	6	23	2	27	6
4	4	9	2	14	2	19	0	24	1	28	5
5	5	10	2	15	4	20	2				
					June 25, 1992						
1	2	17	2	33	0	49	1	65	2	80	5
2	0	18	3	34	3	50	4	66	3	81	7
3	1	19	1	35	1	51	0	67	4	82	1
4	3	20	0	36	1	52	6	68	4	83	1
5	1	21	3	37	1	53	2	69	4	84	0
6	1	22	2	38	0	54	2	70	5	85	2
7	4	23	2	39	1	55	0	71	1	86	3
8	2	24	4	40	1	56	1	72	6	87	3
9	7	25	1	41	3	57	2	73	4	88	3
10	4	26	1	42	2	58	2	74	5	89	1
11	3	27	1	43	4	59	2	75	5	90	3
12	6	28	0	44	3	60	1	76	2	91	3
13	4	29	2	45	2	61	4	77	1	92	0
14	4	30	3	46	1	62	9	78	5	93	1
15	3	31	0	47	3	63	4	79	5	94	0
16	5	32	5	48	4	64	1				
					September 2, 1991						
1	0	18	0	35	2	52	0	69	0	85	0
2	4	19	0	36	1	53	1	70	3	86	1
3	0	20	1	37	1	54	0	71	0	87	0
4	1	21	1	38	2	55	0	72	1	88	0
5	2	22	1	39	1	56	0	73	0	89	1
6	0	23	0	40	0	57	6	74	1	90	0
7	0	24	1	41	2	58	1	75	0	91	0
8	4	25	3	42	2	59	3	76	1	92	0
9	0	26	2	43	0	60	1	77	5	93	1
10	0	27	2	44	1	61	3	78	2	94	1
11	0	28	0	45	0	62	0	79	3	95	2
12	1	29	0	46	0	63	1	80	4	96	0
13	0	30	0	47	2	64	4	81	3	97	1
14	0	31	1	48	1	65	3	82	2	98	1
15	0	32	0	49	3	66	2	83	0	99	0
16	1	33	0	50	0	67	1	84	1	100	0
17	4	34	2	51	1	68	0				

Table 24. Fish health surveys of native fathead minnows, 1991-92--*Continued*

Fish No.	Index total	Fish No.	Index total	Fish No.	Index total	Fish No.	Index total	Fish No.	Index total	Fish No.	Index total
Site 12											
October 20, 1991											
1	1	5	2	9	3	12	2	15	1	18	2
2	2	6	2	10	5	13	2	16	5	19	4
3	2	7	3	11	2	14	5	17	0	20	2
4	4	8	1								
June 25, 1992											
1	0	12	0	23	0	34	0	45	0	56	1
2	0	13	1	24	1	35	1	46	1	57	0
3	3	14	2	25	3	36	3	47	3	58	2
4	3	15	0	26	7	37	0	48	3	59	1
5	2	16	6	27	2	38	0	49	0	60	5
6	7	17	2	28	2	39	1	50	1	61	6
7	0	18	1	29	2	40	0	51	3	62	3
8	1	19	7	30	0	41	0	52	2	63	1
9	0	20	0	31	2	42	0	53	1	64	1
10	0	21	0	32	1	43	0	54	1	65	1
11	4	22	4	33	2	44	1	55	2	66	1
September 2, 1992											
1	0	7	0	13	3	19	0	25	1	31	2
2	1	8	2	14	3	20	3	26	0	32	0
3	0	9	2	15	2	21	2	27	0	33	2
4	2	10	2	16	0	22	0	28	2	34	0
5	0	11	2	17	0	23	0	29	2	35	0
6	1	12	1	18	3	24	1	30	2		
Composite of sites 3, 7, and 11											
October 20, 1991											
1	2	5	8	8	5	11	1	14	5	17	4
2	5	6	0	9	2	12	2	15	2	18	7
3	8	7	0	10	1	13	2	16	3	19	0
4	2										
June 25, 1992											
1	6	18	3	35	1	52	0	69	2	86	4
2	2	19	2	36	5	53	0	70	0	87	0
3	5	20	1	37	1	54	2	71	0	88	0
4	3	21	1	38	1	55	0	72	2	89	3
5	1	22	1	39	1	56	0	73	2	90	5
6	0	23	0	40	0	57	1	74	6	91	0
7	1	24	2	41	1	58	3	75	1	92	3
8	2	25	4	42	2	59	1	76	3	93	1
9	4	26	0	43	0	60	1	77	0	94	0
10	4	27	5	44	2	61	1	78	0	95	4
11	1	28	1	45	1	62	1	79	8	96	4
12	5	29	2	46	1	63	1	70	1	97	2
13	2	30	1	47	1	64	3	71	0	98	1
14	7	31	4	48	3	65	1	82	2	99	2
15	1	32	0	49	1	66	1	83	3	100	4
16	4	33	4	50	1	67	1	84	1	101	5
17	4	34	3	51	0	68	1	85	2	102	3

Table 24. Fish health surveys of native fathead minnows, 1991-92--*Continued*

Fish No.	Index total	Fish No.	Index total	Fish No.	Index total	Fish No.	Index total	Fish No.	Index total	Fish No.	Index total
Composite of sites 3, 7, and 11--*Continued*											
June 25, 1992--*Continued*											
103	0	107	0	111	3	115	0	119	0	123	0
104	0	108	0	112	0	116	2	120	1	124	0
105	2	109	1	113	1	117	0	121	0	125	0
106	5	110	3	114	4	118	0	122	3		
September 2, 1992											
1	2	7	2	13	1	19	1	25	2	30	1
2	0	8	2	14	1	20	3	26	2	31	1
3	1	9	1	15	1	21	0	27	1	32	1
4	2	10	0	16	0	22	0	28	0	33	0
5	3	11	2	17	0	23	3	29	1		
6	1	12	3	18	0	24	0				

Table 25. Microtox® sediment (solid phase) bioassay, 1991

[See figure 1 for site locations. Value EC50 is percentage of sediment that causes 50-percent decrease in luminescence of Microtox® bacteria (*Photobacterium phosphoreum*); *, mean of three field replicates]

Site	Date	Value EC50	Site	Date	Value EC50
1	July 27	1.5	10	Aug. 14	.5
	Aug. 13	3.1		Aug. 21	1.2*
2	Aug. 13	1.0	11	July 26	.3
				Aug. 14	.6
3	Aug. 13	1.5			
			12	July 26	.6
4	Aug. 13	1.0		Aug. 14	1.1
	Aug. 21	2.8*			
			13	July 27	.5
5	Aug. 13	1.0		Aug. 14	.7
6	Aug. 13	1.3	CL2	Aug. 13	.9
	Aug. 21	2.1*			
			UTL6	Aug. 21	2.0*
7	Aug. 14	.8			
			UTL8	Aug. 21	1.2*
8	Aug. 14	.7			
			UTL13	Aug. 21	2.4*
9	Aug. 13	.5			

Table 26. Microtox® sediment porewater bioassay, 1991

[See figure 1 for site locations. Value EC50 is percentage of porewater that causes 50-percent decrease in luminescence of Microtox® bacteria (*Photobacterium phosphoreum*); >, actual value is greater than value shown; *, mean of three field replicates]

Site	Date	Value EC50	Site	Date	Value EC50
1	July 9	>90	10	Aug. 14	0.6
	July 23	15.6		Aug. 20	1.1*
	Aug. 14	>100			
			11	July 23	.2
2	July 9	18.2		Aug. 14	.1
	Aug. 14	>100			
			12	July 23	.3
3	June 19	2.9		Aug. 14	.001
	Aug. 14	65.4			
			13	July 23	>100
4	Aug. 14	>100		Aug. 14	24.0
	Aug. 20	66.7*			
5	June 19	46.1	CL2	Aug. 14	>100
	Aug. 14	>100			
			LR1	June 19	>100
6	Aug. 14	>100			
	Aug. 20	9.6*	LR2	June 19	.8
7	July 9	38.0			
	Aug. 14	7.0	UTL6	Aug. 20	13.1*
8	Aug. 14	>100	UTL8	Aug. 20	5.4*
9	July 9	>100			
	Aug. 14	33.6	UTL13	Aug. 20	10.7*

Table 27. Microtox® sediment porewater bioassay, 1992

[See figure 1 for site locations. Value EC50 is percentage of porewater that causes 50-percent decrease in luminescence of Microtox® bacteria (*Photobacterium phosphoreum*). >, actual value is greater than value shown]

Site	Date	Value EC50	Site	Date	Value EC50
1	June 18	>100	10	June 18	1.4
	July 1	>100		July 29	.4
	July 29	>100		Aug. 13	.4
	Aug. 13	>100			
	Aug. 26	>100	11	June 18	36.5
				July 1	30.1
2	June 18	>100		July 29	7.3
	July 1	36.4		Aug. 13	>100
	July 29	47.4		Aug. 26	58.3
	Aug. 13	>100			
	Aug. 26	>100	12	June 18	>100
				July 1	12.8
3	June 18	>100		July 29	17.2
	July 1	>100		Aug. 13	>100
	July 29	24.3		Aug. 26	25.6
	Aug. 13	>100			
	Aug. 26	41.1	13	June 18	>100
				July 1	>100
4	June 18	>100		July 29	>100
	July 29	27.3		Aug. 13	>100
	Aug. 13	>100		Aug. 26	>100
5	June 18	>100	15	July 1	>100
	July 1	>100		July 29	>100
	July 29	>100		Aug. 13	>100
	Aug. 13	>100		Aug. 26	>100
	Aug. 26	>100			
			4C	July 1	2.5
6	June 18	>100			
	July 29	4.9	9A	July 1	2.0
	Aug. 13	>100		July 29	.5
				Aug. 26	.3
7	June 18	>100			
	July 1	>100	13B	July 1	.7
	July 29	4.8		July 29	23.3
	Aug. 13	11.6		Aug. 26	>100
	Aug. 26	3.2			
			LR3	July 1	34.0
8	June 18	2.0		July 29	39.5
	July 29	2.4		Aug. 26	17.3
	Aug. 13	.8			
			LR4	July 1	100
9	June 18	5.4		July 29	100
	July 1	4.3		Aug. 26	100
	July 29	.8			
	Aug. 13	4.8			
	Aug. 26	2.5			

Table 28. Aquatic plant, invertebrate, and vertebrate laboratory and *in situ* bioassays, 1991-92

[See figure 1 for site locations. Bioassays were done with Klamath Basin drainwater. --, no data]

Green Algae (*Selenastrum capricornutum*) Laboratory Static Bioassay, 1991

Results are the average response observed in duplicate test vessels expressed as a percent of control growth (number of algal cells)

Date	Site								
	1	2	3	5	7	9	11	12	13
July 10	4	4	2	5	5	3	2	4	5
July 17	30	10	10	20	20	30	30	50	20
July 24	10	20	10	10	10	20	10	20	10
July 31	20	20	0	10	30	30	100	30	10
Aug. 14	10	20	20	40	10	20	20	30	30
Aug. 21	20	10	10	20	20	20	0	0	10

Daphnia (*Daphnia magna*) Laboratory Static Bioassay, 1991

Results are the average percent survival observed in duplicate test vessels

Date	Site													
	1	2	3	4	5	6	7	8	9	10	11	12	13	Control
June 5	95	100	100	--	85	--	90	--	90	--	95	85	95	100
June 12	100	95	95	95	100	100	100	100	95	90	100	95	95	100
June 19	100	100	100	--	100	--	100	--	100	--	100	85	100	100
June 26	95	100	100	--	100	--	100	--	95	--	100	100	100	100
July 3	95	95	100	100	85	100	95	100	100	100	100	100	100	100
July 10	100	100	95	--	100	--	90	--	100	--	100	95	100	100
July 17	95	90	95	--	100	--	95	--	100	--	100	100	100	90
July 24	80	90	100	100	100	100	95	95	100	100	95	100	100	95
July 31	100	100	100	--	100	--	100	--	100	--	100	100	100	95
Aug. 7	100	100	100	--	95	--	75	--	95	--	100	100	100	100
Aug. 14	100	100	100	--	95	--	95	--	95	--	100	95	95	100
Aug. 21	100	95	100	--	100	--	100	--	100	--	95	100	100	100
Aug. 28	100	95	100	--	95	--	90	--	95	--	95	100	95	100

Daphnia (*Daphnia magna*) *In Situ* Bioassay, 1991

Results are the average percent survival observed in duplicate test chambers

Date	Site								
	1	2	3	5	7	9	11	12	13
June 5	75	80	70	10	85	65	85	85	65
June 12	30	70	85	0	65	35	75	70	--
June 19	0	60	45	65	35	70	65	90	65
June 26	80	50	55	45	70	55	55	65	85
July 3	40	0	10	5	80	75	40	75	70
July 10	65	55	60	35	80	95	70	80	100
July 17	80	90	90	80	95	95	90	90	95
July 24	25	30	50	5	25	30	45	75	15
July 31	70	65	5	25	90	95	80	80	50

Table 28. Aquatic plant, invertebrate, and vertebrate laboratory and *in situ* bioassays, 1991-92--*Continued*

Daphnia (*Daphnia magna*) *In Situ* Bioassay, 1991--*Continued*

Date	Site								
	1	2	3	5	7	9	11	12	13
Aug. 7	0	80	35	0	0	5	50	0	10
Aug. 14	90	65	0	40	60	65	85	85	85
Aug. 21	30	85	30	30	65	10	50	45	90
Aug. 28	45	100	10	55	80	60	70	100	80

Hyalella (*Hyalella azteca*) Laboratory Static Bioassay, 1991

Results are the average percent survival observed in duplicate test vessels

Date	Site									
	1	2	3	5	7	9	11	12	13	Control
June 12	--	95	100	100	95	90	95	--	--	95
June 19	--	50	45	60	0	0	90	--	--	35
June 26	--	100	100	100	95	80	100	50	--	50
July 3	--	100	65	55	70	45	95	65	--	95
July 10	100	95	100	90	95	90	100	100	100	100
July 17	90	90	95	80	80	80	75	90	95	80
July 24	80	80	85	85	80	100	95	100	100	90
July 31	90	100	100	85	65	90	95	95	80	100
Aug. 7	--	--	90	60	80	--	--	--	--	--
Aug. 14	100	100	100	100	100	100	100	90	100	100
Aug. 21	100	95	90	95	100	95	85	100	95	95
Aug. 28	85	95	100	95	90	95	90	90	95	100

Hyalella (*Hyalella azteca*) Laboratory *In Situ* Bioassay, 1991

Results are the average percent survival observed in duplicate test chambers

Date	Site								
	1	2	3	5	7	9	11	12	13
June 19	5	20	0	5	5	0	5	15	5
June 26	75	95	100	80	65	55	90	85	90
July 3	--	--	65	35	45	35	--	--	--
July 10	30	80	20	25	35	30	35	100	90
July 17	25	70	85	35	0	90	100	100	70
July 24	40	45	10	90	25	70	45	45	35
July 31	70	50	75	15	60	30	25	70	85
Aug. 7	--	--	0	0	0	10	25	--	--
Aug. 14	70	100	100	85	90	95	75	90	30
Aug. 21	75	30	35	50	45	--	35	75	80
Aug. 28	100	80	95	85	100	95	100	85	95

Table 28. Aquatic plant, invertebrate, and vertebrate laboratory and *in situ* bioassays, 1991-92--*Continued*

Fathead Minnow (*Pimephales promelas*) Laboratory Static Bioassay, 1991

Results are the average percent survival observed in duplicate test vessels

Date	Site									
	1	2	3	5	7	9	11	12	13	Control
June 5	--	100	95	--	65	--	--	--	60	100
June 12	95	100	90	75	85	65	85	85	80	95
June 19	100	100	95	80	100	85	90	100	80	100
June 26	75	95	80	80	--	--	60	--	--	95
July 3	90	100	100	95	95	100	95	100	100	100
July 10	100	100	80	90	90	100	80	100	55	100
July 17	100	100	75	100	90	90	80	95	100	100
July 24	--	100	85	70	95	95	85	100	80	95
July 31	100	100	100	100	95	100	100	100	100	100
Aug. 7	90	100	90	85	90	90	100	95	70	--
Aug. 14	100	95	100	95	95	85	100	80	100	95
Aug. 21	100	100	95	100	95	95	100	100	95	100
Aug. 28	85	85	90	100	45	80	95	100	100	95

Fathead Minnow (*Pimephales promelas*) *In Situ* Bioassays, 1991

Results are the average percent survival observed in duplicate test chambers

Date	Site								
	1	2	3	5	7	9	11	12	13
June 5	30	35	35	0	35	15	25	15	10
June 12	25	55	30	50	20	25	20	65	0
June 19	25	30	50	20	0	5	50	90	0
June 26	35	0	10	5	40	0	40	50	35
July 3	50	15	40	0	20	10	50	25	10
July 10	60	40	25	0	60	25	20	45	5
July 17	40	30	35	30	20	15	40	25	5
July 24	10	10	10	5	20	0	25	15	0
July 31	0	0	5	0	20	0	20	20	20
Aug. 7	0	15	35	10	0	0	5	0	0
Aug. 14	15	5	0	15	0	0	5	0	0
Aug. 21	10	5	5	5	5	0	50	55	0
Aug. 28	25	15	20	5	40	5	10	85	0

African Clawed Frog (*Xenopus laevis*) Laboratory Static-Renewal Bioassay, 1991

Results are the average percent survival observed in duplicate test vessels

Date	Site									
	1	2	3	5	7	9	11	12	13	Control
June 5	58	53	65	75	75	85	78	48	68	60
June 19	100	93	98	98	98	88	93	100	95	100
June 26	98	95	93	100	95	93	98	98	98	95
July 10	98	85	93	95	100	95	98	95	98	98
July 17	98	98	100	100	100	100	100	98	98	100
Aug. 7	--	90	100	98	93	95	95	--	--	100
Aug. 14	98	100	88	90	98	88	98	95	88	100

Table 28. Aquatic plant, invertebrate, and vertebrate laboratory and *in situ* bioassays, 1991-92--*Continued*

African Clawed Frog (*Xenopus laevis*) Laboratory Static-Renewal Bioassay, 1991

Results are the average percent malformation observed in duplicate test vessels. *n = 24

Date	Site									
	1	2	3	5	7	9	11	12	13	Control
June 5	33	53	35	75	75	70	20	48	53	48
June 19	50	53	98	40	53	88	48	18	88	100
June 26	8*	80	43	85	15	88	48	63	93	35
July 10	63	40	88	85	18	60	75	45	10	5
July 17	45	13	38	98	53	3	95	25	48	5
Aug. 7	--	30	10	10	3	18	5	--	--	23
Aug. 14	35	13	13	40	40	13	18	18	8	0

African Clawed Frog (*Xenopus laevis*) Laboratory Static-Renewal Bioassay, 1991

Results are the average percent survival observed in duplicate test vessels (pilot larval/tadpole study)

Date	Site									
	1	2	3	5	7	9	11	12	13	Control
					7-day-old larvae					
July 17	--	--	100	100	100	100	--	--	--	100
Aug. 21	--	--	100	100	100	100	--	--	--	100
					14-day-old larvae					
July 24	--	--	100	100	100	100	--	--	--	100

Mallard duckling (*Anas platyrynchos*) *In Situ* Bioassay, 1991

Results are the average percent survival observed in duplicate test cages

Date	Site			
	1	3	5	7
June 5	--	100	100	100
June 19	--	100	100	100
July 3	100	100	100	100
July 24	100	100	100	100
Aug. 21	100	100	100	100

Duckweed (*Lemna minor*) Laboratory Static Bioassay, 1992

Results are the average response from duplicate test dishes expressed as a percent of control growth (increase in number of leaves)

Date	Site									
	1	2	3	5	7	9	11	12	13	15
June 3	74	68	82	69	74	84	80	83	46	82
June 10	58	108	103	92	116	97	100	103	104	63
June 17	63	60	51	87	54	84	63	58	60	40
June 24	20	46	63	80	49	61	41	37	37	34
July 1	69	64	56	93	87	91	56	53	53	60
July 8	58	58	72	56	67	48	52	53	67	53
July 15	51	49	57	46	63	57	63	63	46	57
July 22	49	50	51	46	43	51	48	49	49	43
July 29	92	82	68	76	64	78	66	58	68	50
Aug. 5	76	75	66	58	61	54	51	63	66	63
Aug. 12	74	71	71	65	65	70	59	73	62	47
Aug. 19	78	90	85	100	88	80	76	63	73	80
Aug. 26	67	76	73	79	80	76	66	70	70	72

Table 28. Aquatic plant, invertebrate, and vertebrate laboratory and *in situ* bioassays, 1991-92--*Continued*

Daphnia (*Daphnia magna*) Laboratory Static Bioassay, 1992

Results are the average percent survival observed in duplicate test vessels

Date	Site										
	1	2	3	5	7	9	11	12	13	15	Control
June 3	100	100	95	100	100	100	100	100	100	100	100
June 10	100	100	100	100	100	100	100	75	100	100	100
June 17	100	100	90	100	100	100	100	100	100	100	95
June 24	100	100	100	100	100	100	100	100	100	100	100
July 1	95	100	100	100	100	100	100	100	100	100	100
July 8	85	100	100	100	100	100	90	100	100	100	90
July 15	100	100	100	100	100	100	100	100	100	100	100
July 22	100	100	85	100	100	100	90	100	100	100	100
July 29	100	100	100	100	100	100	95	95	100	95	100
Aug. 5	95	100	100	100	100	100	95	95	100	95	--
Aug. 12	95	50	100	100	100	95	95	90	90	95	100
Aug. 19	80	95	100	85	80	80	90	95	100	100	--
Aug. 26	95	100	95	95	100	100	95	80	95	75	75

Daphnia (*Daphnia magna*) *In Situ* Bioassay, 1992

Results are the average percent survival observed in duplicate test chambers

Date	Site										
	1	2	3	5	7	9	11	12	13	15	Control
June 10	100	90	95	90	85	90	85	95	90	80	--
June 17	65	35	100	85	60	40	55	100	100	30	--
June 24	40	65	90	90	80	90	75	95	80	45	100
July 1	70	85	75	65	70	55	100	85	95	90	90
July 8	20	55	40	40	50	0	20	25	25	25	85
July 15	55	55	100	80	45	90	100	65	45	40	100
July 22	100	10	40	40	60	100	100	80	35	40	100
July 29	55	40	45	60	20	55	90	70	95	85	80
Aug. 5	30	0	60	80	80	100	--	95	100	30	80
Aug. 12	85	0	50	40	95	30	90	85	95	75	95
Aug. 19	80	90	0	45	45	75	80	65	65	85	100
Aug. 26	70	90	85	80	85	95	65	85	75	100	95

Table 28. Aquatic plant, invertebrate, and vertebrate laboratory and *in situ* bioassays, 1991-92--*Continued*

Hyalella (*Hyalella azteca*) Laboratory Static Bioassay, 1992

Results are the average percent survival observed in duplicate test vessels

Date	Site										
	1	2	3	5	7	9	11	12	13	15	Control
June 3	80	100	85	90	40	95	90	85	15	85	100
June 10	70	65	70	75	65	85	80	90	80	65	95
June 17	80	70	75	85	95	90	65	95	75	20	100
June 24	100	100	100	85	100	90	95	85	85	90	100
July 1	95	75	100	90	95	90	90	85	65	70	85
July 8	55	95	50	90	100	75	75	60	100	75	100
July 15	90	95	95	100	100	100	95	100	100	100	--
July 22	90	95	100	100	100	95	100	100	100	90	100
July 29	100	90	85	90	100	65	85	95	95	90	--
Aug. 5	100	95	90	100	90	100	100	90	80	80	90
Aug. 12	90	90	95	95	95	100	90	100	90	100	100
Aug. 19	100	90	100	85	95	90	100	85	90	100	--
Aug. 26	95	85	90	100	80	60	65	85	85	85	95

Hyalella (*Hyalella azetca*) *In Situ* Bioassay, 1992

Results are the average percent survival observed in duplicate test chambers

Date	Site										
	1	2	3	5	7	9	11	12	13	15	Control
June 10	70	--	100	70	100	100	90	95	80	0	--
June 17	95	35	85	80	100	95	65	95	90	5	--
June 24	85	85	100	100	100	100	90	100	100	60	100
July 1	85	95	100	70	90	85	85	70	55	75	100
July 8	100	75	75	60	65	--	30	60	100	75	100
July 15	55	65	85	60	85	60	90	90	45	40	100
July 22	100	60	80	100	100	80	95	60	90	30	100
July 29	75	65	45	80	65	65	65	80	80	40	100
Aug. 5	65	90	95	90	--	80	--	75	60	50	100
Aug. 12	80	0	60	70	50	80	85	50	65	50	100
Aug. 19	60	95	40	60	85	90	85	70	85	55	100
Aug. 26	90	100	85	95	80	100	90	85	100	100	100

Table 28. Aquatic plant, invertebrate, and vertebrate laboratory and *in situ* bioassays, 1991-92--*Continued*

Fathead Minnow (*Pimephales promelas*) Laboratory Static Bioassay, 1992

Results are the average percent survival observed in duplicate test vessels

Date	Site										
	1	2	3	5	7	9	11	12	13	15	Control
June 3	100	100	100	100	100	100	100	100	100	100	--
June 10	90	100	100	100	100	95	90	100	95	100	--
June 17	100	100	90	80	70	100	85	95	90	100	--
June 24	100	100	100	95	90	90	95	95	100	95	--
July 1	100	95	95	95	75	100	100	100	85	95	100
July 8	95	75	90	80	85	100	100	75	65	100	90
July 15	100	100	95	100	70	100	100	100	95	100	95
July 22	95	75	60	95	95	85	90	100	100	95	100
July 29	100	100	100	100	100	95	95	95	85	100	95
Aug. 5	100	90	100	50	95	80	95	90	35	80	100
Aug. 12	95	100	85	85	80	100	100	70	40	100	100
Aug. 19	100	100	100	100	95	100	100	80	85	100	100
Aug. 26	80	100	75	95	85	95	90	100	70	85	90

Fathead Minnow (*Pimephales promelas*) *In Situ* Bioassay, 1992

Results are the average percent survival observed in duplicate test chambers

Date	Site										
	1	2	3	5	7	9	11	12	13	15	Control
June 17	25	0	45	50	80	35	60	60	45	5	--
June 24	0	0	50	65	40	40	40	60	40	65	90
July 1	65	75	85	50	35	0	85	80	15	35	100
July 8	60	5	60	25	50	10	30	65	55	65	100
July 15	45	0	60	20	60	60	40	45	0	80	90
July 22	25	0	90	30	60	0	55	35	45	80	70
July 29	0	20	75	75	60	0	65	35	65	30	80
Aug. 5	30	0	0	40	20	50	--	30	0	0	75
Aug. 12	60	0	25	40	45	50	70	50	0	70	75
Aug. 19	65	40	0	20	30	10	55	0	0	90	90
Aug. 26	0	35	20	30	35	20	60	5	10	50	70

African Clawed Frog (*Xenopus laevis*) Laboratory Static-Renewal Bioassay, 1992

Results are the average percent survival observed in duplicate test vessels. Site results that are separated by / represent tests using pH-nonadjusted and pH-adjusted samples

Date	Site										
	1	2	3	5	7	9	11	12	13	15	Control
June 7	--	--	90/83	85/70	78/60	88/98	90/98	--	--	90/88	95
June 24	--	--	73	60	75	60/60	48/53	73	--	25/70	90
July 8	70	73	78	48	23	20/53	60/83	75/68	65/75	70/65	95
July 22	98	93	95/100	95/100	100	95	93	98/90	98	95	100
July 29	--	--	78	90	73	65	60	--	--	--	98
Aug. 5	--	--	73	63	55	73	58	--	--	--	93
Aug. 12	83	78	88	70	55	65/83	83/78	--	--	83/60	93
Aug. 19	--	--	98	100	100	98/95	95/98	--	--	--	100

Table 28. Aquatic plant, invertebrate, and vertebrate laboratory and *in situ* bioassays, 1991-92--*Continued*

African Clawed Frog (*Xenopus laevis*) Laboratory Static-Renewal Bioassay, 1992

Results are the average percent malformation observed in duplicate test dishes. Site results that are separated by / represent tests using pH-nonadjusted and pH-adjusted samples

Date	Site										
	1	2	3	5	7	9	11	12	13	15	Control
June 7	--	--	0/8	5/10	8/8	5/5	8/5	--	--	3/3	0
June 24	--	--	25	5	15	15/13	18/28	25	--	5/20	0
July 8	23	8	10	10	10	5/10	20/25	25/23	33/43	35/35	5
July 22	3	5	5/3	3/5	8	5	0	3/3	3	5	0
July 29	--	--	15	20	25	20	10	--	--	--	5
Aug. 5	--	--	15	10	5	15	28	--	--	--	3
Aug. 12	8	5	5	10	13	18/28	33/40	--	--	23/8	8
Aug. 19	--	--	5	0	8	0/0	0/5	--	--	--	--

African Clawed Frog (*Xenopus laevis*) Laboratory Static-Renewal Bioassay, 1992

Results are the average percent survival of 7-day-old larvae observed in duplicate test dishes. Site results that are separated by / represent tests using pH-nonadjusted and pH-adjusted samples

Date	Site										
	1	2	3	5	7	9	11	12	13	15	Control
June 10	--	--	100/95	100/95	95/95	95/100	95/100	--	--	--	95
June 17	--	--	95/90	100/85	100/100	100/95	100/100	--	--	--	100
July 1	--	--	95	90	100	95	100	--	--	--	100
July 15	--	--	100	100	100	90	--	--	--	--	95
July 22	--	--	95	90	95	100	100	--	--	--	100
Aug. 5	--	--	100	100	95	90	95/100	--	--	--	100
Aug. 26	--	--	100	100	100	100/95	90/100	--	--	--	100

Table 29. Sodium chloride positive-control bioassays, 1991-92

[Results are the average percent organism survival observed in duplicate test vessels. Sodium chloride shown in parts per thousand (ppt)]

Daphnia, 1991

Date	0	1.25	2.5	5.0	10.0
June 5	100	100	100	70	0
June 12	100	100	100	100	0
June 19	100	100	100	90	0
June 26	100	100	100	100	0
July 3	100	100	95	95	0
July 10	100	100	100	55	0
July 17	90	100	85	100	0
July 24	95	100	100	5	0
July 31	95	100	100	0	0
Aug. 7	100	100	100	35	0
Aug. 14	100	100	100	45	0
Aug. 21	100	100	100	100	0
Aug. 28	100	95	100	55	0

Daphnia, 1992

Date	0	2.5	5.0	10.0
June 3	85	100	80	0
June 10	100	100	80	0
June 17	95	85	90	0
June 24	100	100	70	0
July 1	100	90	95	0
July 8	90	100	80	0
July 15	100	85	60	0
July 22	100	100	90	0
July 29	100	100	70	0
Aug. 5	0	95	90	0
Aug. 12	100	80	35	0
Aug. 19	0	65	35	0
Aug. 26	75	90	60	0

Hyalella, 1991

Date	0	1.25	2.5	5.0	10.0
June 12	90	--	10	10	0
June 19	70	90	10	0	0
June 26	50	100	70	0	0
July 3	95	90	90	0	0
July 10	100	00	100	0	0
July 17	70	75	65	0	0
July 24	90	95	80	0	0
July 31	100	100	90	5	0
Aug. 14	100	10	90	5	0
Aug. 21	95	100	80	0	0
Aug. 28	100	100	80	0	0

Hyalella, 1992

Date	0	2.5	5.0	10.0
June 3	100	70	50	0
June 10	95	100	85	50
June 17	100	85	85	5
June 24	100	90	85	15
July 1	85	85	85	15
July 8	100	100	90	70
July 15	70	95	85	15
July 22	100	95	100	30
July 29	70	85	85	0
Aug. 5	90	100	100	60
Aug. 12	100	95	100	60
Aug. 19	30	95	80	95
Aug. 26	95	70	85	5

Fathead minnow, 1991

Date	0	1.25	2.5	5.0	10.0
June 5	100	100	100	60	0
June 12	95	100	100	100	0
June 19	100	100	100	100	0
June 26	95	100	95	95	0
July 3	100	100	100	100	0
July 10	100	95	100	100	0
July 17	100	100	100	95	0
July 24	95	100	100	100	0
July 31	100	100	100	95	0
Aug. 7	0	20	30	20	0
Aug. 14	95	100	100	100	0
Aug. 21	100	100	95	90	0
Aug. 28	95	100	100	85	0

Fathead minnow, 1992

Date	0	2.5	5.0	10.0
June 3	65	50	0	0
June 10	55	45	0	0
June 17	65	75	25	0
June 24	60	65	0	0
July 1	100	100	100	0
July 8	85	100	100	0
July 15	95	100	100	0
July 22	100	100	100	0
July 29	95	95	100	0
Aug. 5	100	100	65	0
Aug. 12	100	100	100	5
Aug. 19	100	100	100	10
Aug. 26	100	100	100	5

Table 30. Frog embryo (*Xenopus laevis*) positive-control bioassays, 1991-92

[Tests conducted using the LD50 concentration of 6-amino-nicotinamide. All malformed embryos were total body failures, and, consequently, were not predicted to survive. --, no data]

Date	Percent mortality	Percent malformation in survivors
6-05-91	65	100
6-19-91	85	100
6-29-91	85	100
7-10-91	68	100
7-17-91	83	100
8-07-91	88	100
8-14-91	75	100
6-17-92	88	100
6-24-92	83	100
7-08-92	100	--
7-22-92	63	100
7-30-92	85	100
8-06-92	100	--
8-12-92	100	--
8-20-92	58	100

Table 31. *Chironomus tentans* sediment bioassay, 1991

[See figure 1 for site locations. °C, degree Celsius; mg/L, milligram per liter; culture, the medium that test animals are raised in; control, clean potting soil; rep, replicate sample]

Sediment collection date	Test start date	Percent sample sediment	Percent survival
Site 1			
July 8	July 9	6.25	90
		12.5	95
		25	90
		50	100
		100	100
July 21	July 24	6.25	60
		12.5	100
		25	80
		50	90
		100	80
Aug. 12	Aug. 14	6.25	80
		12.5	75
		25	85
		50	80
		100	75
Site 2			
July 8	July 9	6.25	90
		12.5	95
		25	100
		50	95
		100	95
Aug. 12	Aug. 14	6.25	85
		12.5	70
		25	100
		50	85
		100	70
Site 3			
June 18	June 21	6.25	81
		12.5	75
		25	95
		50	90
		100	80
Site 4			
Aug. 12	Aug. 14	6.25	85
		12.5	70
		25	90
		50	70
		100	55
Site 4--*Continued*			
Aug. 19	Aug. 28	6.25	85
		12.5	65
		25	95
		50	60
		100	75
Aug. 19	Aug. 28 rep	6.25	85
		12.5	80
		25	85
		50	95
		100	75
Site 5			
June 18	June 21	6.25	55
		12.5	95
		25	90
		50	70
		100	90
June 18	June 21 rep	6.25	55
		12.5	75
		25	95
		50	55
		100	90
Site 6			
Aug. 12	Aug. 14	6.25	85
		12.5	70
		25	85
		50	50
		100	65
Aug. 19	Aug. 27	6.25	90
		12.5	85
		25	90
		50	95
		100	100
Aug. 19	Aug. 27 rep	6.25	90
		12.5	85
		25	85
		50	75
		100	60
Site 7			
July 8	July 9	6.25	90
		12.5	100

Table 31. *Chironomus tentans* sediment bioassay, 1991--*Continued*

Sediment collection date	Test start date	Percent sample sediment	Percent survival
Site 7--*Continued*			
July 8	July 9	25	85
		50	100
		100	100
Aug. 12	Aug. 14	6.25	60
		12.5	90
		25	70
		50	95
		100	90
Site 8			
Aug. 12	Aug. 14	6.25	55
		12.5	60
		25	65
		50	70
		100	75
Aug. 19	Aug. 27	6.25	85
		12.5	80
		25	85
		50	85
		100	85
Aug. 19	Aug. 28 rep	6.25	85
		12.5	85
		25	75
		50	75
		100	75
Site 9			
July 8	July 9	6.25	95
		12.5	90
		25	95
		50	100
		100	100
Site 10			
Aug. 12	Aug. 14	6.25	60
		12.5	55
		25	65
		50	60
		100	50
Aug. 19	Aug. 27 rep	6.25	85
		12.5	100
		25	95
		50	100
Site 10--*Continued*			
Aug. 19	Aug. 27	100	90
Aug. 19	Aug. 28 rep	6.25	85
		12.5	85
		25	70
		50	75
		100	55
Site 11			
July 21	July 24	6.25	100
		12.5	90
		25	90
		50	100
		100	90
Aug. 12	Aug. 14	6.25	80
		12.5	80
		25	80
		50	65
		100	85
Site 12			
July 21	July 24	6.25	90
		12.5	80
		25	70
		50	50
		100	40
Aug. 12	Aug. 14	6.25	85
		12.5	70
		25	80
		50	75
		100	70
Site 13			
July 21	July 24	6.25	90
		12.5	90
		25	70
		50	100
		100	90
Aug. 12	Aug. 14	6.25	90
		12.5	85
		25	65
		50	80
		100	85

Table 31. *Chironomus tentans* sediment bioassay, 1991--*Continued*

Sediment collection date	Test start date	Percent sample sediment	Percent survival
Site UTL6			
Aug. 19	Aug. 27	6.25	75
		12.5	90
		25	85
		50	85
		100	75
Aug. 19	Aug. 27 rep	6.25	90
		12.5	90
		25	95
		50	85
		100	75
Site UTL13			
Aug. 19	Aug. 28	6.25	100
		12.5	90
		25	85
		50	80
		100	90
Aug. 19	Aug. 28 rep	6.25	60
		12.5	75
		25	75
		50	65
		100	75
Site CL1			
Aug. 9	Aug. 14	6.25	90
		12.5	95
		25	85
		50	85
		100	90

Water quality during *C. tentans* sediment bioassay

Date	Temperature (°C)	Alkalinity as $CaCO_3$ (mg/L)	pH (standard units)	Hardness as $CaCO_3$ (mg/L)
June 21	21	147	7.4 - 8.1	240
July 9	20	120	7.2 - 8.4	200
July 24	22	143	7.4 - 8.0	260
Aug. 14	21	132	7.9 - 8.9	200
Aug. 27	22	163	7.5 - 8.1	280
Aug. 28	21	163	7.4 - 7.9	260

Culture and control percent survival

Date	Culture	Control
June 18	98	100
July 8	100	90
July 9	100	90
July 21	100	90
July 24	100	90
Aug. 12	90	90
Aug. 19	95	90

Reference sediment

Date	Percent sample sediment	Percent survival
July 9	6.25	95
	12.5	95
	25	90
	50	90
	100	75
July 24	6.25	60
	12.5	20
	25	20
	50	30
	100	20

Table 32. *Chironomus tentans* sediment bioassay, 1992

[See figure 1 for site locations. Culture, the medium that test animals are raised in; control, clean potting soil]

Sediment collection date	Test start date	Percent survival
Site 1		
June 1	June 2	85
June 15	June 16	65
June 28	June 30	75
July 27	July 28	90
July 27	July 28	90
Aug. 10	Aug. 11	75
Aug. 25	Aug. 26	100
Site 2		
May 31	June 1	80
May 31	June 1	90
June 15	June 16	75
June 29	June 30	62
July 27	July 28	90
Aug. 10	Aug. 11	95
Aug. 25	Aug. 26	90
Site 3		
June 1	June 2	75
June 16	June 17	90
June 29	June 30	70
July 28	July 29	100
Aug. 11	Aug. 12	90
Aug. 25	Aug. 26	100
Site 4		
June 16	June 17	90
July 28	July 29	80
Aug. 11	Aug. 12	90
Site 5		
June 1	June 2	65
June 16	June 17	95
June 29	June 30	70
July 28	July 29	95
Aug. 11	Aug. 12	50
Aug. 25	Aug. 26	100
Site 6		
June 16	June 17	85
July 28	July 29	100
Aug. 11	Aug. 12	95
Site 7		
June 1	June 2	65
June 16	June 17	85
June 29	June 30	33
June 29	June 30	55
July 28	July 29	80
Aug. 11	Aug. 12	90
Aug. 11	Aug. 12	76
Aug. 25	Aug. 26	70
Site 8		
June 16	June 17	80
July 28	July 29	90
Aug. 11	Aug. 12	85
Site 9		
June 1	June 2	40
June 16	June 17	40
June 29	June 30	80
July 28	July 29	75
Aug. 11	Aug. 12	5
Aug. 25	Aug. 26	77
Site 10		
June 16	June 17	70
July 28	July 29	50
Aug. 11	Aug. 12	50
Site 11		
June 1	June 2	71
June 15	June 16	65
June 15	June 16	65
June 29	June 30	75
July 28	July 29	100
Aug. 10	Aug. 11	75
Aug. 25	Aug. 26	80
Aug. 25	Aug. 26	100
Site 12		
May 31	June 1	65
June 15	June 16	70
June 28	June 30	40
July 27	July 28	100
Aug. 10	Aug. 11	75
Aug. 24	Aug. 25	95

Table 32. *Chironomus tentans* sediment bioassay, 1992--*Continued*

Sediment collection date	Test start date	Percent survival
Site 13		
May 31	June 1	85
June 15	June 16	86
June 15	June 16	80
June 28	June 30	80
July 27	July 28	90
Aug. 10	Aug. 11	90
Aug. 24	Aug. 25	70
Site 15		
May 31	June 1	81
June 15	June 16	70
June 15	June 16	65
June 28	June 30	45
July 27	July 28	90
Aug. 11	Aug. 12	90
Aug. 24	Aug. 25	95
Aug. 25	Aug. 26	65
Site LR3		
May 31	June 1	85
June 28	June 30	65
July 27	July 28	90
Aug. 24	Aug. 25	85
Site LR4		
May 31	June 1	90
June 28	June 30	90
July 27	July 28	90
Aug. 24	Aug. 25	95
Site 4C		
May 31	June 1	95
June 28	June 30	70
Site 9A		
May 31	June 1	60
June 28	June 30	55
July 27	July 28	75
Aug. 24	Aug. 25	50
Site 13B		
May 31	June 1	35
June 28	June 30	70
June 28	June 30	100
July 27	July 28	90
Aug. 11	Aug. 25	95
Site B		
June 16	June 17	65
July 28	July 29	85
Aug. 4	Aug. 12	90

Culture and control percent survival

Date	Culture	Control
June 1	81	79
June 2	97	80
June 16	95	44
June 17	92	72
June 30	88	62
July 28	94	93
July 29	98	98
Aug. 11	100	90
Aug. 12	92	89
Aug. 25	100	100
Aug. 26	100	96

Table 33. Mallard duckling bioassay, 1991

[See figure 1. AChE, brain acetylcholinesterase activity expressed as micromoles of substrate hydrolyzed per minute per gram of tissue. Weights are in grams. ΔT, change in body temperature of mallard duckling during cold stress test; °C, degree Celsius; --, no data]

Site	Bird identification No.	Weight for indicated day of testing					Terminal liver weight, day 4 of testing	Brain weight, day 4 of testing	AChE activity	ΔT (°C)
		0	1	2	3	4				
Test period 1: June 2 to 5										
Control	61	47.1	56.8	65.6	80.8	86.5	4.659	1.838	15.60	--
Control	62	53.1	59.5	69.8	84.3	93.4	4.314	1.879	11.37	--
Control	63	58.4	67.4	82.8	95.1	102.9	5.294	1.746	12.67	--
Control	64	58.7	71.7	87.4	102.1	112.5	7.053	1.862	--	--
Control	65	59.5	66.0	80.6	95.1	101.8	5.166	1.828	14.30	--
Control	66	55.5	65.4	76.6	92.0	95.4	5.600	1.975	13.32	--
Control	67	52.4	62.3	75.5	88.6	99.8	5.015	2.133	13.97	--
Control	68	51.8	60.8	69.7	84.5	91.6	4.616	1.827	13.65	--
Control	69	47.8	55.5	64.6	79.8	84.5	4.238	1.756	11.70	--
Control	70	60.6	69.0	82.6	99.1	104.5	5.981	1.857	9.10	--
Control	71	47.2	51.5	61.6	68.3	77.4	4.142	1.803	15.27	--
Control	72	47.0	53.2	63.3	72.0	84.1	4.334	1.991	15.60	--
Control	73	54.2	63.0	78.0	84.9	96.3	5.305	1.994	13.65	--
Control	74	50.2	57.2	68.7	75.7	84.4	4.487	1.681	13.32	--
Control	75	49.7	59.4	72.5	84.2	93.1	4.922	1.736	15.27	--
Control	76	60.2	67.5	83.7	91.9	98.6	4.795	1.714	11.37	--
Control	77	57.2	64.8	78.8	86.9	96.0	5.653	1.922	14.62	--
Control	78	60.0	66.5	79.1	91.5	101.5	6.998	1.607	11.05	--
Control	79	53.6	62.6	76.0	81.4	95.0	4.982	1.874	15.92	--
Control	80	64.3	75.4	92.4	101.7	113.7	6.226	1.799	11.05	--
3	1	40.8	48.0	59.3	76.2	83.5	5.764	1.716	17.55	--
3	2	43.2	47.6	53.4	66.9	73.4	4.905	1.617	14.95	--
3	3	43.4	50.1	58.3	72.0	74.8	4.740	1.605	12.35	--
3	4	49.7	56.2	69.6	87.4	98.1	7.500	2.116	13.00	--
3	5	51.2	57.2	69.9	92.4	95.3	5.546	1.772	12.35	--
3	6	52.5	61.4	75.9	99.3	105.0	6.955	1.868	14.30	--
3	7	53.7	61.6	74.6	92.8	98.2	5.108	1.946	11.37	--
3	8	52.9	62.9	77.3	95.6	103.3	7.062	1.867	14.30	--
3	9	59.8	69.1	85.6	109.0	119.4	6.910	2.003	13.00	--
3	10	60.0	66.0	81.9	104.9	111.7	9.075	1.907	13.98	--
3	11	46.0	52.9	65.7	84.6	90.5	5.051	1.755	13.65	--
3	12	44.0	49.6	59.1	78.1	82.9	5.253	1.670	11.37	--
3	13	54.4	61.8	78.6	105.6	110.3	6.888	1.806	13.32	--
3	14	54.9	65.1	78.3	100.2	106.2	6.296	1.860	13.00	--
3	15	53.1	63.5	74.0	98.3	100.7	6.215	1.881	9.75	--
3	16	50.5	56.9	69.0	88.1	95.9	5.766	1.868	14.25	--
3	17	48.0	55.7	69.0	89.5	97.1	6.426	2.007	12.02	--
3	18	48.1	53.1	63.4	80.0	84.6	4.930	1.757	14.95	--
3	19	59.8	68.0	79.0	101.3	105.7	6.165	1.893	14.62	--
3	20	58.8	70.0	89.0	121.3	125.6	7.804	1.997	12.67	--
5	21	47.2	53.0	67.0	81.5	93.8	5.435	1.760	10.07	--
5	22	44.7	52.0	60.7	72.6	81.6	4.677	1.704	12.35	--
5	23	48.8	55.0	68.5	81.9	95.5	6.181	1.832	7.80	--
5	24	51.5	60.3	70.7	86.2	96.1	5.528	1.899	13.65	--

Table 33. Mallard duckling bioassay, 1991--*Continued*

Site	Bird identi-fication No.	Weight for indicated day of testing					Terminal liver weight, day 4 of testing	Brain weight, day 4 of testing	AChE activity	ΔT (°C)
		0	1	2	3	4				
Test period 1: June 2 to 5--*Continued*										
5	25	49.3	54.0	64.2	76.4	86.5	4.082	1.886	10.72	--
5	26	53.5	61.2	71.9	87.4	97.4	5.264	1.788	13.00	--
5	27	55.0	63.7	74.5	87.2	96.6	5.227	2.033	14.08	--
5	28	59.0	63.0	77.5	89.9	102.2	5.356	1.782	11.37	--
5	29	58.3	65.7	82.1	96.0	110.2	6.006	1.938	10.72	--
5	30	59.8	67.7	80.9	95.4	107.3	7.017	1.784	12.35	--
5	31	45.3	52.7	62.8	77.1	85.5	4.882	1.759	10.40	--
5	32	48.1	54.2	63.4	75.7	82.8	--	1.859	11.70	--
5	33	51.3	59.1	69.8	88.0	94.9	5.085	1.924	14.62	--
5	34	50.3	57.2	65.6	80.9	87.2	3.825	1.998	14.30	--
5	35	49.2	56.4	65.5	82.9	89.3	4.964	1.771	10.07	--
5	36	54.6	62.7	73.8	89.2	94.1	4.839	1.769	14.62	--
5	37	56.9	61.8	73.0	88.5	95.5	5.286	1.896	11.70	--
5	38	54.7	63.4	71.4	85.8	93.7	4.507	2.111	10.40	--
5	39	54.6	63.1	75.0	89.7	98.8	5.864	1.950	11.05	--
5	40	61.3	69.4	79.2	94.7	101.8	5.366	1.759	11.37	--
7	41	46.6	54.7	68.5	78.4	91.5	5.651	1.966	11.70	--
7	42	43.0	49.3	56.8	67.9	78.2	4.063	1.898	11.70	--
7	43	50.5	58.2	70.7	87.0	96.1	5.605	2.058	15.27	--
7	44	48.4	53.5	67.0	77.7	92.4	5.429	1.967	11.37	--
7	45	47.5	52.4	61.2	77.4	85.0	5.915	1.899	12.67	--
7	46	56.0	65.2	76.8	90.1	104.5	5.773	1.721	13.97	--
7	47	52.0	62.2	76.1	87.7	100.9	6.086	1.811	13.00	--
7	48	55.0	62.1	72.0	83.5	91.6	6.934	1.894	11.75	--
7	49	56.5	64.7	74.8	90.1	101.8	6.339	1.835	11.27	--
7	50	52.4	61.8	74.0	87.6	101.1	6.235	2.151	13.65	--
7	51	46.6	52.5	61.4	73.2	81.9	3.938	1.914	13.97	--
7	52	46.9	52.5	60.7	70.5	77.3	3.550	1.871	12.35	--
7	53	53.1	62.0	71.4	86.1	101.1	6.577	1.674	13.00	--
7	54	48.7	54.4	62.0	77.0	87.6	5.407	1.640	11.05	--
7	55	51.2	58.5	70.2	82.8	97.1	5.566	1.951	13.00	--
7	56	55.8	62.5	73.3	89.8	105.6	6.571	1.947	11.05	--
7	57	58.5	63.3	76.6	91.9	105.2	5.578	1.940	13.00	--
7	58	56.1	65.0	73.8	88.3	99.8	4.212	1.786	14.30	--
7	59	54.4	62.1	71.7	86.9	101.9	6.306	1.885	13.32	--
7	60	65.4	72.6	84.8	102.1	114.6	6.534	2.103	12.67	--
Test period 2: June 15 to 18										
Control	61	44.8	51.0	52.9	70.6	76.7	--	1.803	16.25	2.1
Control	62	43.3	49.0	50.0	67.9	72.5	--	1.858	12.67	1.4
Control	63	43.6	47.9	49.8	64.9	70.4	--	1.886	14.30	5.0
Control	64	46.3	50.8	54.7	70.0	72.6	4.990	1.960	13.32	--
Control	65	42.7	44.6	47.0	57.1	60.4	--	1.646	16.25	4.5
Control	66	46.7	52.6	56.0	73.1	77.5	--	1.860	7.80	5.5
Control	67	45.2	51.2	52.0	70.9	77.9	--	1.759	12.67	.5
Control	68	42.9	46.7	48.7	62.2	69.0	5.600	2.014	11.05	--
Control	69	48.9	55.7	60.8	77.7	84.1	5.570	1.780	15.60	--

Table 33. Mallard duckling bioassay, 1991--*Continued*

Site	Bird identification No.	Weight for indicated day of testing					Terminal liver weight, day 4 of testing	Brain weight, day 4 of testing	AChE activity	ΔT (°C)
		0	1	2	3	4				
Test period 2: June 15 to 18--*Continued*										
Control	70	45.5	51.2	55.0	68.0	74.0	4.748	1.962	14.95	--
Control	71	44.9	47.6	43.8	49.9	55.5	--	1.571	10.07	6.0
Control	72	44.0	54.2	57.0	73.3	80.8	6.159	1.922	12.67	--
Control	73	43.4	52.0	58.6	74.4	80.4	--	1.792	14.95	4.2
Control	74	46.8	51.4	56.8	70.0	76.1	--	1.790	13.65	--
Control	75	43.1	48.9	45.8	62.0	63.6	3.683	1.622	12.02	--
Control	76	46.0	51.6	57.4	71.5	79.4	4.598	1.929	15.92	--
Control	77	45.0	53.5	58.5	74.2	77.7	--	1.692	12.67	8.0
Control	78	51.9	57.8	61.2	76.3	82.1	4.359	1.810	13.32	--
Control	79	49.8	54.5	60.0	77.1	81.5	--	1.663	11.70	3.6
Control	80	50.1	56.6	61.5	75.5	81.7	--	1.814	13.65	--
3	1	47.2	50.0	61.5	69.7	81.1	--	1.917	14.95	.6
3	2	43.9	48.6	58.8	67.5	83.1	--	1.675	14.30	.5
3	3	46.3	51.1	61.0	74.1	88.4	--	1.846	12.35	3.8
3	4	43.0	48.9	59.2	66.6	75.5	--	1.689	13.32	4.6
3	5	45.9	51.4	63.7	77.7	96.4	7.182	1.787	13.00	--
3	6	45.6	52.1	63.0	73.7	85.6	--	1.930	11.37	5.4
3	7	45.5	50.9	57.5	66.8	77.6	6.253	1.856	15.27	--
3	8	50.5	55.8	67.0	80.8	94.0	--	1.941	12.02	2.8
3	9	50.0	52.0	63.4	73.7	85.9	5.477	--	--	--
3	10	55.1	58.1	69.1	83.0	91.8	6.259	1.963	13.97	--
3	11	43.6	48.1	57.2	70.0	82.9	5.183	1.940	10.40	--
3	12	46.9	53.1	59.9	70.9	82.3	--	1.971	13.00	7.4
3	13	46.6	51.7	60.6	71.3	84.6	--	2.113	12.35	2.7
3	14	44.8	49.4	58.6	69.6	83.0	--	1.581	14.95	.3
3	15	49.9	54.0	58.4	71.1	83.1	5.078	2.149	15.27	--
3	16	56.7	59.1	71.2	80.6	98.6	7.400	1.932	10.40	--
3	17	51.8	58.0	69.9	78.7	97.8	--	2.046	12.35	1.4
3	18	48.7	53.2	63.6	72.2	86.4	--	1.858	6.82	5.2
3	19	49.5	56.5	65.5	76.1	92.1	--	--	--	--
3	20	44.9	47.2	55.1	65.3	78.2	5.457	1.913	13.00	--
5	21	46.0	54.4	62.9	74.0	85.0	5.216	--	--	--
5	22	48.4	55.8	66.2	77.3	91.1	6.730	2.094	14.30	--
5	23	46.1	54.0	61.5	68.7	72.3	5.172	1.552	13.65	--
5	24	51.6	58.5	66.1	77.7	89.7	6.266	1.971	13.32	--
5	25	44.7	52.6	64.2	73.0	83.2	5.390	1.753	12.35	--
5	26	48.2	56.0	67.1	71.2	78.6	4.990	--	--	--
5	27	50.5	61.7	74.0	83.0	99.7	5.652	--	--	--
5	28	50.5	56.0	66.2	75.9	88.6	6.142	1.764	10.07	--
5	29	54.6	62.3	75.2	90.2	100.5	7.008	--	--	--
5	30	50.2	56.5	64.1	75.2	85.2	5.397	--	--	--
5	31	49.1	52.2	64.1	72.5	86.7	6.018	1.926	12.35	--
5	32	42.7	48.3	59.0	69.0	76.7	5.057	--	--	--
5	33	45.2	49.7	62.3	71.6	81.3	4.899	1.844	12.02	--
5	34	42.2	49.7	56.0	60.9	70.0	5.040	1.602	12.67	--
5	35	43.6	48.0	58.5	67.0	77.2	4.231	1.520	9.75	--
5	36	41.6	47.7	55.9	62.1	72.7	4.932	--	--	--
5	37	51.4	57.4	71.1	79.2	90.4	3.982	--	--	--

Table 33. Mallard duckling bioassay, 1991–*Continued*

Site	Bird identi-fication No.	Weight for indicated day of testing					Terminal liver weight, day 4 of testing	Brain weight, day 4 of testing	AChE activity	ΔT (°C)
		0	1	2	3	4				
Test period 2: June 15 to 18--*Continued*										
5	38	49.3	53.9	64.1	72.6	87.2	5.890	--	--	--
5	39	51.8	56.8	69.6	83.5	93.6	5.815	1.967	12.35	--
5	40	53.4	59.9	79.0	91.3	103.5	6.425	--	--	--
7	41	48.2	55.0	66.1	80.7	86.3	5.643	1.955	12.67	--
7	42	47.7	51.4	60.3	71.5	81.6	4.535	--	--	--
7	43	45.0	51.0	59.9	71.2	83.4	5.375	2.063	12.02	--
7	44	48.1	52.7	64.1	72.5	84.8	5.165	--	--	--
7	45	42.6	46.8	53.3	63.6	69.0	4.229	--	--	--
7	46	49.7	56.9	66.7	77.8	90.4	4.922	--	--	--
7	47	49.2	52.2	61.9	76.1	85.2	4.147	2.059	9.75	--
7	48	50.4	57.4	69.4	76.1	88.0	5.820	--	--	--
7	49	49.9	52.6	64.9	73.8	82.9	4.791	1.757	11.70	--
7	50	49.5	55.7	65.9	78.9	91.5	6.320	1.778	13.32	--
7	51	46.4	50.9	61.1	67.8	78.4	6.170	--	--	--
7	52	47.6	51.1	60.4	74.0	82.3	5.090	1.565	13.00	--
7	53	45.0	53.5	62.8	72.4	82.7	--	--	--	--
7	54	44.6	50.7	59.1	69.6	80.5	4.648	1.616	13.32	--
7	55	46.8	52.8	64.3	75.6	85.3	5.653	1.936	10.72	--
7	56	47.3	51.6	63.8	74.0	84.1	5.725	--	--	--
7	57	50.8	52.5	62.8	75.7	85.7	3.573	2.013	14.30	--
7	58	53.0	61.1	73.0	85.9	98.6	5.737	--	--	--
7	59	51.7	55.6	65.3	77.5	88.4	4.855	1.975	12.02	--
7	60	51.0	57.2	69.8	76.2	87.6	6.020	--	--	--
Test period 3: July 6 to 9										
Control	61	56.6	71.9	81.3	99.5	108.2	--	1.867	13.97	3.1
Control	62	43.6	56.9	66.4	77.7	82.0	5.530	1.680	11.37	--
Control	63	40.0	52.3	58.0	74.0	75.1	4.440	1.856	10.07	--
Control	64	46.6	64.3	74.1	84.1	89.8	4.880	1.800	13.97	--
Control	65	50.2	63.7	73.2	86.1	90.8	5.490	2.088	14.95	--
Control	66	44.6	54.2	62.9	72.7	76.8	4.430	2.033	12.67	--
Control	67	46.3	55.8	61.9	70.3	84.8	--	1.939	12.35	4.2
Control	68	47.8	61.2	72.1	86.8	98.3	--	1.960	15.27	3.9
Control	69	51.8	65.5	73.0	86.5	92.1	6.890	--	--	--
Control	70	42.5	53.2	59.3	70.8	74.9	3.420	--	--	--
Control	71	44.9	57.3	68.9	87.8	86.7	6.049	1.918	12.67	--
Control	72	43.8	44.8	51.9	62.9	68.8	--	1.709	13.65	4.4
Control	73	47.7	57.0	68.3	82.1	84.5	5.629	--	--	--
Control	74	41.4	49.0	57.6	70.5	77.4	--	--	--	4.5
Control	75	52.3	64.0	78.7	96.7	105.7	--	2.130	12.02	5.2
Control	76	46.3	58.1	69.3	87.0	85.7	5.912	1.928	13.32	--
Control	77	43.0	54.7	66.7	84.1	85.1	5.383	--	--	--
Control	78	45.2	52.4	65.1	77.1	80.0	4.445	1.658	14.30	--
Control	79	48.0	58.3	73.9	90.1	90.5	4.611	1.930	14.30	--
Control	80	50.5	61.3	74.6	92.0	95.3	4.932	1.868	16.90	--
3	1	42.2	46.6	55.4	75.6	84.4	4.786	1.949	13.65	--
3	2	55.6	59.9	74.5	93.2	102.5	6.872	--	--	--

Table 33. Mallard duckling bioassay, 1991--*Continued*

Site	Bird identi-fication No.	Weight for indicated day of testing					Terminal liver weight, day 4 of testing	Brain weight, day 4 of testing	AChE activity	ΔT (°C)
		0	1	2	3	4				
Test period 3: July 6 to 9--*Continued*										
3	3	51.0	56.4	66.8	84.2	92.2	5.062	2.029	11.05	--
3	4	47.3	54.2	68.1	80.7	88.9	--	1.794	11.70	4.4
3	5	52.8	56.3	66.2	80.8	86.8	6.008	--	--	--
3	6	45.9	49.1	58.0	76.2	81.4	4.937	1.908	13.97	--
3	7	50.8	55.7	65.3	82.2	91.9	--	1.961	12.35	3.7
3	8	49.4	54.5	65.2	82.6	92.5	--	1.962	13.00	1.3
3	9	43.1	48.4	61.7	77.0	90.8	5.080	1.867	13.00	--
3	10	45.9	51.5	58.3	73.2	81.9	4.338	1.717	13.32	--
3	11	45.5	50.7	60.6	77.4	86.1	--	1.865	12.35	.5
3	12	46.8	50.8	60.8	83.4	89.3	6.423	1.988	14.62	--
3	13	49.1	54.9	62.9	83.0	90.0	7.189	1.974	14.62	--
3	14	47.9	52.3	61.3	78.9	85.5	4.453	--	--	--
3	15	44.1	47.9	54.3	68.7	72.7	4.084	--	--	--
3	16	53.5	56.1	65.7	83.4	91.5	--	1.894	12.35	3.5
3	17	40.9	43.9	51.4	65.3	65.0	3.622	1.805	14.30	--
3	18	49.8	57.6	69.7	89.0	99.5	--	2.222	14.62	3.5
3	19	49.5	56.2	62.1	80.9	86.7	5.742	1.995	16.90	--
3	20	41.5	48.8	57.1	74.6	78.1	5.552	1.827	9.75	--
5	21	53.5	59.0	71.3	89.3	95.1	--	1.972	16.90	3.8
5	22	46.0	51.4	61.3	70.3	71.9	4.077	1.879	13.00	--
5	23	53.1	64.6	78.3	105.8	109.6	7.915	1.892	13.00	--
5	24	47.9	54.4	65.5	83.9	84.8	5.012	2.028	11.70	--
5	25	50.7	55.3	68.0	84.9	90.0	--	1.468	11.05	2.9
5	26	57.0	60.9	73.0	92.4	96.4	5.497	--	--	--
5	27	43.5	49.5	56.8	69.7	77.7	--	--	--	4.5
5	28	43.8	48.9	59.7	73.4	75.4	4.649	1.823	12.35	--
5	29	44.4	50.9	63.9	84.8	86.7	4.941	--	--	--
5	30	50.6	58.1	70.0	89.7	88.5	4.828	1.852	12.67	--
5	31	55.5	63.0	77.3	102.2	109.4	--	2.138	11.70	--
5	32	48.9	56.6	65.6	87.8	96.6	--	1.775	11.70	1.9
5	33	51.0	56.0	69.3	88.2	94.2	5.784	1.940	13.32	--
5	34	41.4	46.5	56.1	75.3	78.8	5.090	1.721	13.00	--
5	35	42.3	47.8	56.2	74.5	83.4	--	1.727	13.97	3.9
5	36	50.1	53.3	59.7	73.8	77.5	4.144	--	--	--
5	37	44.4	49.0	62.1	80.9	84.8	5.302	1.974	13.00	--
5	38	49.1	56.8	67.5	89.1	92.1	5.249	2.012	12.35	--
5	39	45.1	52.0	62.9	83.5	85.6	6.044	1.921	13.00	--
5	40	44.0	49.7	60.8	74.2	82.1	4.935	--	--	--
7	41	56.2	63.9	78.6	93.1	101.0	6.828	1.965	12.67	--
7	42	52.0	60.5	67.9	82.5	88.5	5.733	--	--	--
7	43	49.1	55.3	67.6	79.2	87.8	4.959	1.882	12.02	--
7	44	44.3	52.2	65.6	77.6	90.0	--	1.878	13.65	4.3
7	45	49.8	56.3	68.9	82.3	89.3	5.912	1.717	13.97	--
7	46	44.9	51.6	63.2	77.1	86.1	4.891	1.872	12.02	--
7	47	43.3	45.5	55.1	76.8	90.2	--	--	--	4.3
7	48	47.7	54.2	67.6	82.1	86.4	4.678	--	--	--
7	49	49.1	54.3	68.7	79.7	92.9	--	1.889	12.02	2.6
7	50	47.6	54.9	67.7	87.2	95.9	5.504	1.878	14.62	--
7	51	44.7	54.4	64.3	76.2	81.8	--	1.825	14.95	5.9

Table 33. Mallard duckling bioassay, 1991--*Continued*

Site	Bird identi-fication No.	Weight for indicated day of testing					Terminal liver weight, day 4 of testing	Brain weight, day 4 of testing	AChE activity	ΔT (°C)
		0	1	2	3	4				
Test period 3: July 6 to 9--*Continued*										
7	52	47.7	54.5	67.9	84.1	91.6	--	2.039	13.32	--
7	53	44.2	52.7	61.1	76.1	78.1	4.997	1.837	13.00	--
7	54	48.1	54.4	63.0	78.3	82.1	4.281	1.814	10.40	--
7	55	50.4	58.2	69.8	84.8	90.2	4.722	1.936	10.72	--
7	56	50.8	57.9	68.7	82.9	91.6	5.518	2.041	13.97	--
7	57	48.0	53.8	65.5	78.1	87.6	--	1.837	12.35	3.7
7	58	42.6	48.2	60.2	73.2	77.8	4.420	--	--	--
7	59	54.6	59.8	74.9	87.9	94.0	5.375	1.858	11.05	--
7	60	48.3	51.2	58.7	70.5	76.5	4.051	--	--	--
1	81	42.5	50.1	58.0	70.8	74.2	3.819	--	--	--
1	82	41.8	48.0	58.3	73.0	75.5	5.012	2.018	12.35	--
1	83	48.7	60.3	68.6	83.7	86.1	4.169	1.750	9.42	--
1	84	54.2	68.6	77.2	97.0	97.1	5.578	--	--	--
1	85	51.2	59.2	66.9	80.3	82.6	4.549	--	--	--
1	86	44.1	56.7	64.6	80.1	83.8	5.189	--	--	--
1	87	43.7	51.7	56.6	70.3	72.1	3.919	1.741	14.62	--
1	88	54.0	63.1	73.5	90.6	98.6	5.653	1.874	11.05	--
1	89	46.3	59.3	65.9	76.8	84.1	4.110	--	--	--
1	90	51.1	58.7	67.2	78.7	82.8	4.726	1.910	16.57	--
1	91	48.0	57.1	64.9	80.5	85.0	4.050	--	--	--
1	92	53.8	70.2	73.0	94.3	93.3	5.200	1.855	12.67	--
1	93	46.9	56.3	61.7	76.2	79.1	3.800	--	--	--
1	94	51.1	59.0	69.2	86.6	90.1	4.724	1.837	12.02	--
1	95	38.9	46.1	51.5	63.1	65.2	3.407	1.770	14.95	--
1	96	46.2	52.6	58.2	71.7	75.1	3.631	--	--	--
1	97	38.9	45.3	50.1	62.7	65.1	3.914	1.818	13.32	--
1	98	44.5	51.8	58.9	73.6	76.7	4.115	--	--	--
1	99	48.3	60.6	68.9	89.3	89.0	4.490	1.927	11.05	--
1	100	50.8	59.6	67.4	83.2	88.7	4.279	--	--	--
Test period 4: July 25 to 29										
Control	61	32.7	43.1	52.2	60.0	66.3	3.499	1.660	15.27	--
Control	62	31.4	42.5	51.1	57.5	68.4	4.453	--	--	--
Control	63	35.8	46.8	58.6	74.6	85.1	5.784	1.839	9.75	--
Control	64	33.5	44.3	50.8	66.7	74.5	--	1.728	13.00	5.0
Control	65	33.9	45.3	56.4	65.6	72.9	4.259	1.744	14.30	--
Control	66	33.7	46.9	51.3	62.4	67.6	4.448	1.820	13.32	--
Control	67	38.8	48.8	55.4	65.1	75.2	4.600	--	--	--
Control	68	39.4	47.3	58.8	69.2	75.7	--	1.642	12.35	5.2
Control	69	35.5	44.3	53.3	61.6	68.1	4.272	1.800	12.35	--
Control	70	36.2	47.2	56.6	68.9	81.6	--	1.646	14.95	2.0
Control	71	33.8	47.0	58.7	73.5	80.8	4.235	--	--	--
Control	72	32.0	42.1	51.1	60.5	69.5	3.547	1.721	13.97	--
Control	73	33.6	44.3	52.9	62.4	69.2	3.277	1.896	11.37	--
Control	74	33.7	44.6	56.6	66.1	74.5	--	1.841	12.02	5.8
Control	75	31.6	42.8	54.2	63.3	67.6	3.247	--	--	--
Control	76	32.8	41.4	51.0	61.1	68.7	3.737	1.784	13.97	--

Table 33. Mallard duckling bioassay, 1991--*Continued*

Site	Bird identification No.	Weight for indicated day of testing					Terminal liver weight, day 4 of testing	Brain weight, day 4 of testing	AChE activity	ΔT (°C)
		0	1	2	3	4				
Test period 4: July 25 to 29--*Continued*										
Control	77	39.0	51.6	65.6	74.8	82.8	--	1.772	12.35	3.1
Control	78	36.5	46.1	56.1	66.2	77.0	4.194	1.915	13.65	--
Control	79	36.3	47.6	58.1	70.7	76.8	--	1.709	11.05	3.1
Control	80	39.6	54.5	66.9	74.9	87.2	4.143	1.886	13.32	--
3	1	35.2	43.6	52.3	62.5	68.9	3.271	--	--	--
3	2	33.3	41.4	47.3	57.4	63.8	--	1.854	13.97	3.8
3	3	34.1	41.5	47.1	56.4	67.0	--	1.537	13.32	4.9
3	4	33.9	41.0	48.3	57.3	63.8	3.224	1.649	13.97	--
3	5	31.3	37.4	44.6	55.8	62.3	3.104	1.799	10.40	--
3	6	35.4	38.1	46.1	56.7	61.6	3.321	1.586	14.30	--
3	7	35.8	43.7	48.7	55.3	63.3	3.703	--	--	--
3	8	36.6	43.5	48.6	55.0	64.1	3.727	1.786	14.62	--
3	9	36.9	43.8	47.6	58.7	62.2	--	.725	14.30	3.2
3	10	32.2	39.4	45.0	56.1	62.6	3.347	1.612	14.62	--
3	11	34.4	41.8	45.3	53.6	61.7	3.721	1.862	14.95	--
3	12	31.5	37.5	40.7	47.9	55.3	--	1.555	14.95	4.2
3	13	33.0	42.8	50.0	63.4	71.5	3.916	1.672	15.60	--
3	14	33.6	45.0	54.7	65.8	74.0	3.785	1.918	14.62	--
3	15	34.7	40.7	45.9	56.5	64.5	--	1.709	13.32	1.9
3	16	34.1	41.3	47.2	55.3	61.2	3.073	--	--	--
3	17	40.1	49.4	54.9	63.1	70.4	4.243	1.787	14.62	--
3	18	35.7	40.8	45.4	50.0	57.4	--	1.561	--	5.0
3	19	36.8	54.4	61.9	74.6	84.1	4.060	1.778	13.32	--
3	20	39.6	49.4	57.7	69.9	77.3	5.044	--	--	--
5	21	30.5	39.8	47.6	56.1	63.2	--	1.787	13.32	3.6
5	22	32.6	41.2	48.7	53.4	61.3	3.038	1.778	13.97	--
5	23	32.7	40.7	50.9	56.6	66.1	3.734	1.665	12.35	--
5	24	33.8	43.0	52.7	60.9	71.7	--	1.792	13.32	5.3
5	25	34.5	43.0	54.5	68.0	74.6	3.921	1.650	11.70	--
5	26	33.1	40.7	48.5	56.3	62.5	4.133	1.574	14.95	--
5	27	34.2	44.6	54.0	63.0	68.8	3.814	1.705	12.35	--
5	28	35.4	43.2	56.3	61.6	71.0	--	1.646	9.75	4.5
5	29	39.5	47.6	60.0	71.3	80.0	4.107	--	--	--
5	30	36.2	45.6	48.7	59.7	63.1	3.431	--	--	--
5	31	34.3	46.6	54.2	60.3	62.5	3.488	--	--	--
5	32	36.2	45.1	51.1	55.6	57.9	--	1.950	13.32	--
5	33	33.1	42.3	51.4	62.0	62.3	--	1.718	15.27	4.4
5	34	34.0	41.2	49.1	54.1	56.2	2.158	1.684	14.62	--
5	35	32.6	39.6	46.3	53.8	55.6	--	1.684	14.30	4.1
5	36	38.5	48.1	58.6	65.1	68.0	3.360	1.760	14.62	--
5	37	35.4	43.3	53.3	62.5	62.8	3.268	--	--	--
5	38	40.6	50.6	58.3	64.6	68.9	3.204	1.784	14.30	--
5	39	36.4	46.4	52.5	60.7	63.3	2.643	1.827	15.27	--
5	40	40.0	47.6	57.2	65.0	65.2	3.023	1.782	13.65	--
7	41	34.0	42.7	50.6	64.0	70.1	4.085	1.865	14.62	--
7	42	31.1	39.3	49.8	62.2	69.0	4.537	1.728	14.30	--
7	43	31.3	39.0	44.6	58.8	62.5	--	1.594	14.95	5.2
7	44	32.5	40.5	46.3	61.4	63.6	3.989	1.670	13.00	--
7	45	33.2	43.5	52.4	63.5	68.0	--	1.605	14.30	4.3

Table 33. Mallard duckling bioassay, 1991--*Continued*

Site	Bird identi-fication No.	Weight for indicated day of testing					Terminal liver weight, day 4 of testing	Brain weight, day 4 of testing	AChE activity	ΔT (°C)
		0	1	2	3	4				
Test period 4: July 25 to 29--*Continued*										
7	46	34.1	38.8	48.4	64.0	67.6	3.494	1.806	10.40	--
7	47	40.2	49.1	62.1	73.1	76.4	--	1.936	14.62	3.1
7	48	36.9	41.8	55.8	67.3	72.3	3.458	--	--	--
7	49	39.3	44.0	49.8	60.8	68.4	3.388	1.647	13.30	--
7	50	37.3	43.8	48.4	60.3	66.6	3.667	--	--	--
7	51	31.4	38.5	47.3	53.1	59.0	2.492	1.769	14.95	--
7	52	35.2	40.4	46.2	57.4	65.1	--	1.732	13.97	3.7
7	53	31.6	39.5	45.3	57.2	63.2	--	1.692	13.22	4.9
7	54	35.9	44.1	49.4	63.5	68.9	3.499	1.689	11.37	--
7	55	34.7	41.8	49.8	60.6	69.1	4.037	--	--	--
7	56	32.3	37.9	44.2	55.3	62.3	--	1.632	14.62	4.2
7	57	39.2	49.2	58.0	71.1	76.4	3.743	1.841	11.70	--
7	58	38.1	45.0	53.5	60.5	68.4	3.803	1.737	13.97	--
7	59	38.0	45.3	48.3	60.6	65.9	3.170	1.612	14.30	--
7	60	39.4	47.0	52.4	64.0	71.6	3.326	--	--	--
1	81	35.0	45.0	51.0	64.4	68.6	3.355	--	--	--
1	82	34.8	43.8	48.8	60.0	66.1	3.326	1.819	11.70	--
1	83	33.1	41.7	47.2	61.9	66.7	3.004	--	--	--
1	84	33.1	42.6	50.2	61.5	66.6	3.589	1.883	11.05	--
1	85	31.9	41.8	48.7	60.9	65.6	3.238	--	--	--
1	86	35.8	44.8	54.3	67.0	73.7	3.557	1.958	9.75	--
1	87	36.6	46.8	55.4	69.4	76.3	4.131	--	--	--
1	88	36.1	45.7	51.9	64.8	66.9	3.913	1.622	15.60	--
1	89	40.2	49.3	57.4	73.8	77.1	4.741	1.768	13.00	--
1	90	38.1	48.0	58.1	69.6	74.8	4.233	--	--	--
1	91	30.8	40.1	47.1	57.1	63.7	3.022	--	--	--
1	92	36.1	47.0	56.9	68.1	74.7	4.622	--	--	--
1	93	34.2	44.5	54.5	67.3	75.3	4.500	--	--	--
1	94	33.6	42.5	51.9	63.6	66.4	3.654	1.663	13.65	--
1	95	35.7	47.2	54.0	66.2	72.1	3.808	--	--	--
1	96	30.7	38.8	45.0	54.0	59.9	3.024	--	--	--
1	97	35.0	44.8	51.4	64.3	72.0	3.720	2.041	13.65	--
1	98	38.3	50.0	58.1	70.6	78.0	4.517	--	--	--
1	99	32.4	39.8	48.0	58.7	61.7	3.004	1.475	13.97	--
1	100	32.9	43.6	52.9	65.2	71.1	3.604	--	--	--
Test period 5: August 22 to 26										
Control	61	45.3	54.6	63.0	78.4	86.3	--	1.873	13.65	3.7
Control	62	47.9	58.5	66.6	72.7	83.1	5.200	1.729	15.27	--
Control	63	51.0	62.7	68.8	89.3	95.0	6.700	1.813	13.97	--
Control	64	45.1	56.2	64.4	80.3	86.2	5.500	--	--	--
Control	65	41.5	47.1	54.1	65.5	69.4	4.100	1.816	14.30	--
Control	66	44.6	56.3	63.9	81.3	91.9	--	1.784	13.97	3.6
Control	67	42.5	50.9	57.2	70.3	75.5	5.300	1.711	13.97	--
Control	68	45.2	52.3	60.8	73.0	81.5	--	1.892	13.32	1.8
Control	69	49.8	58.5	69.6	84.8	89.4	6.400	1.837	10.40	--
Control	70	40.2	50.3	55.0	71.3	74.3	5.000	--	--	--

Table 33. Mallard duckling bioassay, 1991--*Continued*

Site	Bird identification No.	Weight for indicated day of testing					Terminal liver weight, day 4 of testing	Brain weight, day 4 of testing	AChE activity	ΔT (°C)
		0	1	2	3	4				
Test period 5: August 22 to 26--*Continued*										
Control	71	40.3	44.8	55.2	68.3	77.5	--	1.731	13.00	4.5
Control	72	46.1	53.3	60.7	73.3	79.3	5.300	2.048	15.27	--
Control	73	46.5	56.4	62.2	78.3	83.0	5.900	1.852	14.95	--
Control	74	46.4	54.1	63.0	77.7	84.4	5.300	--	--	--
Control	75	41.8	50.6	58.3	75.4	80.5	5.500	--	--	--
Control	76	52.7	66.4	74.9	92.4	103.2	8.000	1.638	10.40	--
Control	77	41.7	47.2	57.0	68.0	76.9	--	1.839	13.65	5.7
Control	78	46.1	57.6	68.5	86.1	90.4	7.700	1.597	14.62	--
Control	79	49.0	57.7	70.2	85.8	96.4	--	1.881	13.00	1.3
Control	80	45.0	54.6	62.9	76.7	81.1	4.600	1.912	16.57	--
3	1	48.5	51.7	65.1	78.4	84.5	5.000	1.730	14.62	--
3	2	45.7	53.0	63.5	78.0	89.3	--	1.818	13.97	3.4
3	3	43.1	50.3	59.9	76.6	81.5	5.100	1.895	13.97	--
3	4	43.8	49.6	59.9	74.8	79.8	4.500	1.850	14.30	--
3	5	43.7	49.8	59.9	76.0	81.5	5.200	--	--	--
3	6	45.6	49.6	58.4	76.0	79.7	4.900	--	--	--
3	7	46.3	52.5	66.0	83.9	92.2	--	1.840	13.32	2.3
3	8	48.7	56.5	66.9	81.6	86.7	--	1.775	13.32	2.0
3	9	40.9	44.6	54.6	55.0	56.9	4.300	1.807	15.60	--
3	10	41.1	46.6	56.7	70.3	74.4	4.500	1.913	12.02	--
3	11	40.8	47.3	55.5	69.9	75.9	--	1.780	13.97	6.9
3	12	48.3	55.5	65.7	81.4	85.1	4.600	1.808	12.35	--
3	13	45.8	54.5	63.4	74.8	75.1	4.800	--	--	--
3	14	43.0	49.3	59.3	74.0	78.0	4.700	1.850	13.97	--
3	15	41.6	48.2	57.2	72.1	74.4	4.400	--	--	--
3	16	49.7	56.8	66.4	82.7	89.0	4.800	1.906	12.67	--
3	17	49.0	59.5	69.3	85.8	88.7	5.300	1.952	13.32	--
3	18	46.5	55.5	65.3	81.1	83.8	5.200	1.970	13.65	--
3	19	47.5	56.3	69.3	86.8	93.3	--	1.796	14.62	5.4
3	20	44.8	52.1	60.3	73.2	81.7	--	1.755	13.00	5.4
5	21	46.5	53.6	63.3	85.6	86.9	5.800	1.877	13.65	--
5	22	41.2	46.6	54.6	69.8	73.3	--	1.748	15.27	4.1
5	23	48.7	55.5	62.5	82.0	86.2	4.900	1.769	13.65	--
5	24	48.3	53.7	64.0	79.4	87.4	--	1.790	12.02	3.7
5	25	47.0	54.2	66.6	83.9	88.2	5.900	1.668	12.35	--
5	26	44.2	50.1	58.6	73.2	77.9	--	1.780	13.00	3.3
5	27	43.5	49.3	58.3	74.4	74.7	4.000	1.765	11.70	--
5	28	44.8	49.9	58.9	72.9	77.0	4.800	--	--	--
5	29	48.3	53.4	67.2	86.9	89.4	5.700	1.809	13.32	--
5	30	47.1	55.3	66.4	84.4	89.8	5.400	--	--	--
5	31	46.4	51.3	60.4	73.6	80.9	--	1.790	13.32	1.4
5	32	46.9	51.8	60.5	75.7	79.4	3.800	1.777	15.60	--
5	33	51.0	56.9	67.6	85.5	96.5	--	1.790	12.35	--
5	34	40.0	46.3	55.6	69.4	72.5	4.000	1.790	14.73	--
5	35	48.5	56.2	65.7	81.6	90.1	--	1.755	13.65	4.9
5	36	40.0	66.7	--	--	--	--	--	--	--
5	37	45.3	52.0	62.4	77.1	82.1	5.200	1.820	13.65	--
5	38	45.3	53.5	61.5	80.6	82.1	5.900	--	--	--
5	39	39.8	45.7	55.7	70.5	72.0	3.500	1.633	14.30	--

Table 33. Mallard duckling bioassay, 1991--*Continued*

Site	Bird identi-fication No.	Weight for indicated day of testing					Terminal liver weight, day 4 of testing	Brain weight, day 4 of testing	AChE activity	ΔT (°C)
		0	1	2	3	4				
Test period 5: August 22 to 26--*Continued*										
5	40	51.0	57.6	72.5	91.6	90.0	6.000	1.798	12.35	--
7	41	40.9	50.9	55.5	67.4	73.6	4.800	1.865	14.30	--
7	42	47.1	56.5	62.4	81.6	88.6	--	1.899	12.67	2.0
7	43	45.0	54.7	62.0	81.4	85.8	5.400	1.942	16.25	--
7	44	44.8	54.3	60.2	73.6	84.2	--	1.861	14.95	4.2
7	45	48.4	52.6	60.3	75.6	81.0	--	1.878	15.27	2.2
7	46	45.1	54.8	61.8	82.0	85.7	5.700	1.686	10.72	--
7	47	47.4	55.4	61.4	75.7	83.2	4.900	--	--	--
7	48	47.1	59.6	64.6	82.0	88.7	6.100	1.939	10.72	--
7	49	43.3	51.9	55.8	70.3	72.4	4.000	1.890	14.30	--
7	50	43.2	50.6	57.5	71.1	74.5	4.500	--	--	--
7	51	44.3	51.5	61.7	74.5	79.6	--	1.477	14.95	5.6
7	52	43.2	49.8	56.6	74.7	75.8	4.200	--	--	--
7	53	48.0	55.7	61.7	80.7	83.2	5.400	1.897	16.90	--
7	54	44.8	57.6	59.2	72.2	77.3	4.600	--	--	--
7	55	48.5	56.6	63.4	82.2	85.2	4.200	1.954	14.95	--
7	56	45.9	53.7	62.1	76.0	83.4	--	1.721	13.00	2.6
7	57	48.8	49.9	58.2	72.7	77.6	4.600	2.043	14.30	--
7	58	42.4	56.7	62.0	77.6	80.6	5.100	1.991	14.30	--
7	59	51.2	57.0	62.8	79.3	85.2	--	1.801	11.37	1.9
7	60	47.3	57.1	63.6	80.6	85.5	5.900	1.789	14.63	--
1	81	42.8	51.1	58.3	71.3	77.6	4.500	1.792	15.27	--
1	82	44.5	52.6	62.5	77.4	82.3	4.500	1.879	15.92	--
1	83	44.4	51.3	59.0	73.2	77.2	5.600	--	--	--
1	84	40.6	45.6	52.3	58.4	61.6	5.300	1.786	13.32	--
1	85	44.9	53.1	61.3	77.9	79.5	5.600	1.840	14.62	--
1	86	41.4	50.2	59.7	77.1	82.8	4.700	--	--	--
1	87	49.2	55.4	68.0	82.9	86.5	4.700	--	--	--
1	88	38.9	45.9	52.7	65.6	69.0	3.800	--	--	--
1	89	45.2	50.7	61.0	75.0	80.4	4.900	1.759	13.97	--
1	90	46.5	55.3	60.2	81.7	81.0	5.900	--	--	--
1	91	50.8	59.9	70.2	90.5	94.9	7.500	--	--	--
1	92	47.2	58.1	68.6	83.0	91.3	5.600	--	--	--
1	93	46.8	55.0	62.1	78.9	83.4	6.200	1.787	17.55	--
1	94	44.4	52.5	60.4	75.5	81.6	5.900	--	--	--
1	95	44.8	54.6	62.6	81.4	85.2	6.500	1.929	16.90	--
1	96	41.4	43.1	46.2	52.5	53.4	3.300	--	--	--
1	97	41.2	48.3	58.6	72.3	76.2	4.400	1.638	15.60	--
1	98	49.2	62.0	71.0	91.8	97.0	6.300	--	--	--
1	99	42.5	52.0	59.2	74.5	80.9	5.600	1.664	14.95	--
1	100	39.5	48.6	53.7	67.5	69.8	4.800	1.827	16.90	--

Table 34. *In situ* bioassay in sites downstream from an acrolein (Magnicide-H®) application in the J-7 Canal, July 13-14, 1992

[See figure 2 for location of injection point. Daphnia and minnow bioassay values in percent survival; a new set of animals was set out every 24 hours; km, kilometers]

Distance downstream (km)	Daphnia				Minnows			
	24 hours pre-application	0 hour at application	2 hours post-application	24 hours post-application	24 hours pre-application	0 hour at application	2 hours post-application	24 hours post-application
1.0	80	0	0	75	65	0	0	10
3.2	90	80	95	65	60	70	10	10
3.9	95	70	100	100	85	80	60	55
4.8	95	95	95	100	85	85	90	25

Table 35. *In situ* bioassay in leaseland waterways at Tule Lake National Wildlife Refuge, 1992

[See figures 4 and 5 for site locations. --, no data. Results of Daphnia (*Daphnia magna*) and mallard (*Anas platyrynchos*) *in situ* bioassays. Test results are the average percent survival observed in test chambers]

Daphnia *In Situ* Bioassay									
Site	Water-way	Canal or drain	Test date	Daphnia survival	Site	Water-way	Canal or drain	Test date	Daphnia survival
LL6	102-C-Bypass	drain	July 10	25	LL41	102	drain	July 5	75
			July 11	70	LL46	101	drain	July 8	10
LL7	102-C-1	drain	July 10	5				Aug. 2	85
			July 11	55	LL56	N-1	canal	July 9	45
LL7A	102-C-1	drain	July 6	85				July 10	20
			July 7	100				July 11	40
LL8	102-C-2	drain	July 10	40	LL57	N-1	canal	July 9	75
			July 11	75				July 10	25
LL10	102-C-2	drain	July 6	90				July 11	35
			July 7	75				Aug. 20	20
			Aug. 21	70	LL70	N-4	canal	July 9	85
LL13	102-C-1	drain	July 6	90				July 10	100
			July 7	65				July 11	0
			July 8	100	LL71	101-C-4	drain	July 8	60
			July 9	80				July 9	0
			July 10	80				July 10	10
			July 11	90				July 11	0
LL14	102-C-1	drain	July 6	65	LL77	101-C-2	drain	July 8	10
			July 7	95	LL78	101-C-2	drain	July 8	15
LL16	R-1	canal	July 8	75	LL79	101-C	drain	July 8	30
			Aug. 21	100				Aug. 20	45
LL17	R-1	canal	July 8	15	LL87	N-12-c	canal	July 10	100
			July 9	90				July 11	35
			July 10	55	LL88	N-12-c	canal	July 3	45
			July 11	100				July 10	50
LL18	102-C-1-b	drain	July 8	55				July 11	65
LL25	Q-3-b	canal	July 4	55	LL89	N-12-c	canal	July 3	90
LL26	Q-3	canal	July 4	25				July 10	55
			Aug. 21	95				July 11	0
LL27	102-H	drain	July 4	55	LL90	N-12-c	canal	July 3	70
LL28	102-H	drain	July 4	70				July 10	75
LL29	102-H	drain	July 4	5				July 11	20
LL30	102-H	drain	July 4	55				Aug. 22	100
LL31	Q-3-a	canal	July 3	90	LL91	N-12-c	canal	July 3	85
			Aug. 21	100	LL92	N-12-c	canal	July 3	80
LL32	Q-3	canal	July 3	95	LL93	N-12	canal	July 3	70
			Aug. 21	100				Aug. 20	0
LL33	102-G	drain	July 8	75	LL146	N-15-b	canal	July 4	70
			July 9	90				July 5	45
			July 10	85				July 6	0
			July 11	85				July 8	0
LL34	102	drain	July 5	60				Aug. 20	100
			July 8	65	LL148	N-15-b	canal	July 4	95
			Aug. 21	95				July 5	60
LL35	102-C-1	drain	July 8	60				July 6	60
								July 8	55

Table 35. *In situ* bioassay in leaseland waterways at Tule Lake National Wildlife Refuge, 1992--*Continued*

Daphnia *In Situ* Bioassay--*Continued*

Site	Water-way	Canal or drain	Test date	Daphnia survival
LL172	101-B-5	drain	July 6	90
			July 8	85
			Aug. 20	0
LL173	101-B-5-a	drain	July 6	65
			July 8	20
			Aug. 20	100
LL174	101-B-5-a	drain	July 6	55
			July 8	10
			July 9	35
LL175	101-B-5-d	drain	July 6	0
LL176	N	canal	July 6	95
			July 8	70
			July 9	95
			Aug. 20	0
LL201	R	canal	Aug. 1	55
LL205	Q	canal	Aug. 11	70
			Aug. 12	95
			Aug. 13	90
			Aug. 14	80
LL206	102-F	drain	Aug. 11	5
			Aug. 12	0
			Aug. 13	5
LL214	R	canal	Aug. 1	75
LL215	R	canal	Aug. 1	60
LL218	N-4	canal	July 31	65
LL220	N-6	canal	Aug. 7	100
LL221	N-6	canal	July 31	60
LL222	101-C-6	drain	Aug. 7	35
			Aug. 8	40
LL223	101-C-6	drain	Aug. 7	95
			Aug. 8	100
LL224	101-C-6	drain	Aug. 10	45
LL225	101-C	drain	Aug. 10	55
LL226	101-B-2	drain	Aug. 1	0
			Aug. 2	10
LL227	101-B-2	drain	Aug. 1	70
			Aug. 2	100
LL230	101	drain	July 31	5
LL232	N-12-b	canal	July 31	30
LL233	101-B	drain	Aug. 11	0
			Aug. 12	0
			Aug. 14	0
LL234	N-12-b	canal	Aug. 11	85
LL235	N-12-b	canal	Aug. 11	90
			Aug. 12	70
			Aug. 13	80
			Aug. 14	100
LL237	101-B-5-b	drain	July 24	20
LL238	101-B-5-b	drain	July 24	35
LL248	102-F	drain	Aug. 11	70
			Aug. 12	0
			Aug. 13	0
			Aug. 14	0
LL251	R	canal	Aug. 1	90
LL255	101-B-5-c	drain	Aug. 11	0
			Aug. 12	0
			Aug. 13	0
LL259	N-13	canal	Aug. 11	80
			Aug. 12	95
			Aug. 13	85
LL260	N	canal	Aug. 11	90
			Aug. 14	80
LL261	101-B-5-d	drain	July 24	80
LL262	N-13	canal	Aug. 11	95
			Aug. 12	15

Mallard *In Situ* Bioassay

Site	Water-way	Canal or drain	Test date	Mallard survival
LL201	R	canal	Aug. 1	100
LL215	R	canal	Aug. 1	100
LL226	101-B-2	drain	Aug. 2	100
LL227	101-B-2	drain	Aug. 2	100
Control	--	--	Aug. 2	100
LL222	101-C-6	drain	Aug. 8	100
LL223	101-C-6	drain	Aug. 8	100
LL224	101-C	drain	Aug. 10	100
Control	--	--	Aug. 10	100

Table 36. Mallard duckling bioassay in leaseland waterways at Tule Lake National Wildlife Refuge, 1992

[See figures 4 and 5 for site locations. g, gram; --, no data. Cholinesterase activity expressed as micromoles of substrate hydrolyzed per minute per gram of tissue]

Site	Bird identification	Weight change (g) 5-day-old	Weight change (g) 6-day-old	Cholinesterase activity
		August 1 and 2		
LL201	21	3.30	--	14.95
	22	2.70	--	17.55
	23	2.20	--	15.92
	24	1.00	--	12.35
	25	.60	--	14.62
	26	-.10	--	15.60
	27	5.80	--	15.27
	28	1.60	--	15.60
	29	4.60	--	19.17
	30	2.50	--	17.87
LL215	11	4.30	--	14.62
	12	3.00	--	14.95
	13	5.40	--	20.47
	14	5.90	--	14.30
	15	3.40	--	14.62
	16	4.10	--	18.20
	17	3.50	--	19.17
	18	3.80	--	16.25
	19	3.20	--	19.83
LL226	1	--	3.80	16.25
	2	--	2.20	13.32
	3	--	3.50	13.65
	4	--	3.00	15.60
	5	--	4.60	17.87
	6	--	1.80	13.32
	7	--	4.60	13.97
	8	--	2.30	15.60
	9	--	.10	21.77
	10	--	4.00	17.55
LL227	51	--	4.10	16.90
	52	--	6.80	16.57
	53	--	5.20	18.20
	54	--	8.60	17.55
	55	--	6.00	16.90
	56	--	7.90	17.87
	57	--	7.30	15.92
	58	--	-3.30	15.60
	59	--	7.20	18.20
	60	--	4.20	17.55
LL251	41	2.00	--	15.27
	42	1.80	--	17.87
	43	3.50	--	14.95
	44	4.10	--	10.40
	45	2.10	--	19.17
	46	.60	--	19.50
	47	2.90	--	16.57
	48	1.10	--	18.20
	49	6.70	--	16.25
	50	3.90	--	15.27
Control	31	--	--	19.50
	32	2.70	--	12.02
	33	--	--	21.45
	34	--	--	18.20
	35	1.60	--	13.65
	36	5.50	--	17.55
	37	5.30	--	16.90
	38	--	--	19.50
	39	4.70	--	16.25
	40	--	--	17.55

Site	Bird identification	Weight change (g) 6-day-old	Cholinesterase activity
		August 7 and 8	
LL222	1	3.60	17.22
	2	3.90	13.32
	3	5.50	16.25
	4	1.90	16.90
	5	4.90	16.25
	6	5.60	14.95
	7	4.20	17.55
	8	3.40	16.90
	9	4.30	17.22
	10	3.90	15.60
LL223	11	5.70	13.32
	12	6.10	16.25
	13	6.50	15.92
	14	2.70	13.97
	15	6.60	17.87
	16	3.20	15.60
	17	5.30	14.30
	18	5.80	16.90
	19	2.80	13.65
	20	2.80	18.20
Control	21	7.40	19.82
	22	4.20	16.25
	23	7.30	--
	24	5.10	18.52
	25	6.40	14.95
	26	8.10	15.92
	27	7.60	13.32
	28	8.10	14.62
	29	6.30	16.25
	30	4.10	17.22

Site	Bird identification	Weight change (g) 7-day-old	Cholinesterase activity
		August 10	
LL224	31	9.4	12.35
	32	8.4	16.58
	33	8.1	18.52
	34	6.5	13.97
	35	4.9	15.92
	36	7.3	17.55
	37	3.5	16.90
	38	8.5	13.98
	39	11.1	11.70
	40	4.7	16.25
Control	41	--	--
	42	1.7	16.57
	43	--	--
	44	--	--
	45	--	--
	46	2.1	15.27
	47	-2.5	20.15
	48	-.5	14.95
	49	--	--
	50	4.2	13.00

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