

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

FLOW CHARACTERISTICS AND WATER-QUALITY CONDITIONS  
IN THE SPOKANE RIVER, COEUR D'ALENE LAKE  
TO POST FALLS DAM, NORTHERN IDAHO  
by Harold R. Seitz and Michael L. Jones

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Prepared in cooperation with the  
Idaho Department of Health and Welfare,  
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ABSTRACT

Cross-sectional properties and water-quality characteristics were determined for flows of 6,100 to 8,440 cubic feet per second during June 8 to 12; 750 to 1,760 cubic feet per second during August 24 to 27; and 1,790 to 1,630 cubic feet per second during November 3 to 7, 1980. Cross-sectional areas measured ranged from 4,430 square feet to 17,000 square feet. Flow velocities ranged from 2.00 feet per second during June to less than 0.10 foot per second during August and November. A small increase of total ammonia nitrogen occurred downstream of the Coeur d'Alene sewage-treatment plant.

INTRODUCTION

Coeur d'Alene Lake receives runoff from 3,700 mi<sup>2</sup> of the St. Joe and Coeur d'Alene watersheds. For about 80 years prior to 1970, the South Fork Coeur d'Alene River received mining wastes, which were carried into Coeur d'Alene Lake.

The Spokane River leaves the northern end of Coeur d'Alene Lake, flows westward past the cities of Coeur d'Alene and Post Falls, Idaho, through the Spokane Valley, and joins the Columbia River west of Spokane, Wash. The river is regulated by a series of dams in Idaho and Washington that are used for generating electricity.

Observations of eutrophic conditions in Long Lake, a large impoundment of the Spokane River 40 mi downstream from the city of Spokane, prompted an evaluation of nutrient loadings to the Spokane River in Washington and Idaho.

This study was a cooperative effort by the U.S. Geological Survey and the Idaho Department of Health and Welfare, Division of Environment, to provide the Department with data needed to make management decisions concerning release of sewage-treatment plant discharge to the Spokane River.

### Purpose and Scope

Purposes of this study were to describe: (1) The quality of water entering the Spokane River from Coeur d'Alene Lake and document any change in quality as water passed through the reach of the Spokane River to Post Falls Dam, and (2) the cross-sectional properties of water depth, width, area, velocity, and discharge at selected sites in the reach.

The scope of this study included: (1) Collection of monthly water samples and determination of temperature, DO (dissolved oxygen), specific conductance, pH, and discharge at selected sites during the period March 1980 through January 1981 in the Spokane River between Coeur d'Alene Lake and Post Falls Dam; and (2) determination of water depth, width, velocity, and discharge at eight locations during June, August, and November 1980.

Permanent monuments were set at the ends of each cross section, and elevation above NGVD (National Geodetic Vertical Datum of 1929) was established at each monument. Station numbers and locations of each data-collection site are listed in table 1.

### Description of Study Reach

The study reach of the Spokane River is between the outlet of Coeur d'Alene Lake (river mile 111.1) and Post

Falls Dam (river mile 102.1) in the panhandle of northern Idaho (fig. 1).

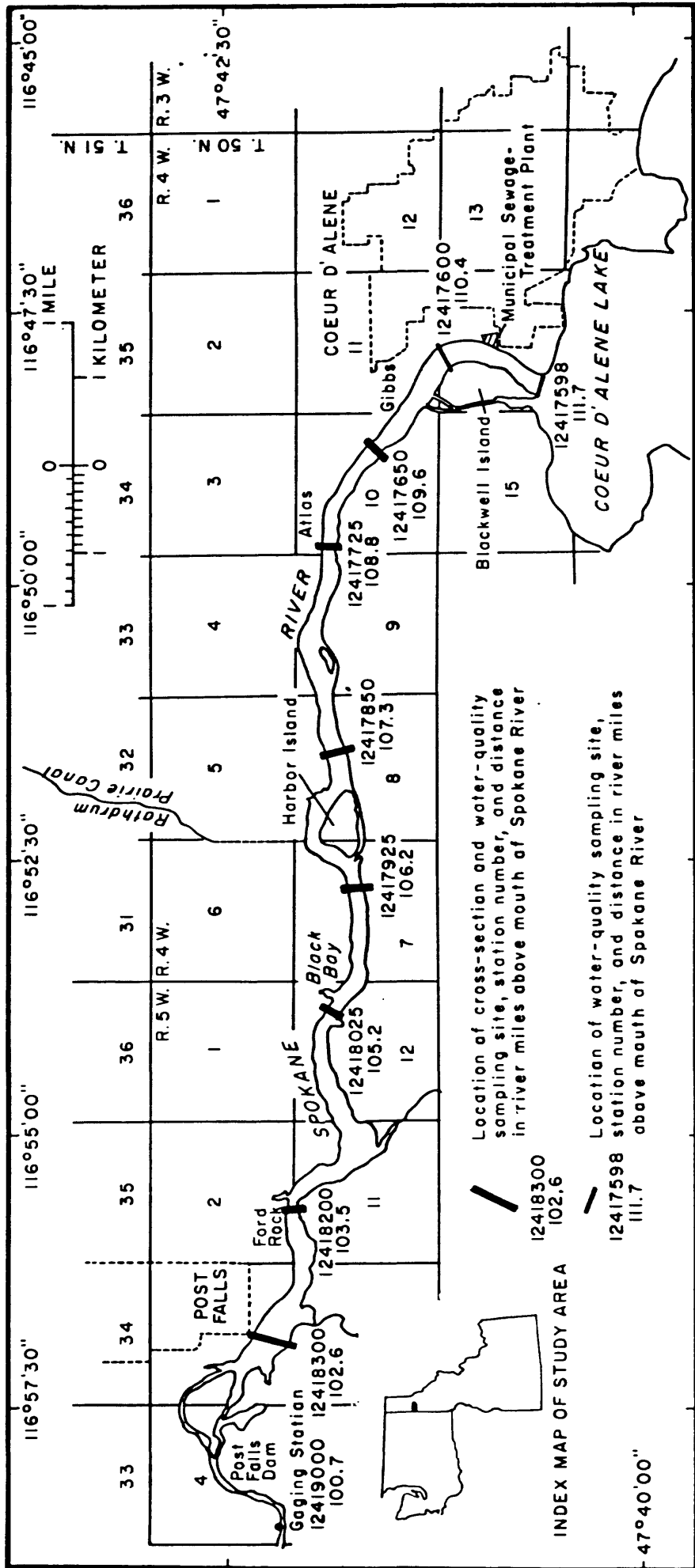
During spring snowmelt, after the storage capacity of Coeur d'Alene Lake is reached, regulation at Post Falls Dam is minimal and the study reach becomes similar to a flowing river. The reach becomes an extension of Coeur d'Alene Lake as snowmelt decreases, and the lake level is maintained with minimal releases at Post Falls.

### Methods of Collection and Analysis

Eight cross-section sites, stations 12417600 to 12418300, were selected on the reach of the Spokane River between Coeur d'Alene Lake and Post Falls Dam (fig. 1) to make measurements of water depth, width, velocity, and discharge. The measurements were made during June, when discharge was between 6,100 and 8,440 ft<sup>3</sup>/s; during August, when discharge was between 750 and 1,760 ft<sup>3</sup>/s; and during November, when discharge was between 1,790 and 1,630 ft<sup>3</sup>/s. Profiles of temperature, DO, and specific conductance were measured at seven of the cross-section sites, stations 12417650 to 12418300, during the three periods of discharge. Depth-integrated water samples were obtained at the seven sites to determine nutrient concentrations for each period of discharge.

Composite samples for laboratory analyses were obtained at each cross section by using a depth-integrated, equal-transit rate technique (Guy and Norman, 1970). At site 12417598, Coeur d'Alene Lake outlet, single depth-integrated samples were obtained from a floating dock that extends into the river above the city of Coeur d'Alene sewage-treatment plant. Measurements of water temperature, specific conductance, DO, and pH were made onsite.

Water samples collected for nutrient analysis were treated and prepared onsite and shipped to the U.S. Geological Survey National Water Quality Laboratory in Arvada, Colo. Samples collected at station 12417598 and gaging station 12419000 for BOD (biochemical-oxygen demand) analysis were chilled and taken, within 6 hours of collection, to the Idaho Department of Health and Welfare laboratory in Coeur d'Alene. Samples collected from the waste effluent at the Coeur d'Alene sewage-treatment plant were prepared and analyzed by the Idaho Department of Health and Welfare,



Base from U.S. Geological Survey  
 Coeur d'Alene NE 1:24,000, 1975 and  
 Coeur d'Alene NW 1:24,000, 1975

Figure 1.--Locations of cross sections and distances above mouth of Spokane River, in river miles.



where analytical methodology described by the U.S. Environmental Protection Agency (1974) and the American Public Health Association (1975) was used.

### Acknowledgments

The authors express thanks to the landowners along the Spokane River for allowing access to sampling and cross-section sites, and for permitting monuments to be established at each end of the cross sections. In addition, the authors thank personnel of the Idaho Department of Health and Welfare, Division of Environment, for collection of samples and analysis of sewage-treatment plant discharges.

### Station-Numbering System

Each sampling station and cross-section site has been assigned a number in downstream order in accordance with the permanent numbering system used by the U.S. Geological Survey. Numbers are assigned in a downstream direction along the main stream, and stations on tributaries between main-stream stations are numbered in the order that the tributaries enter the main stream. The complete 8-digit number, such as 12419000, which is used for "Spokane River near Post Falls," includes the part number, "12," indicating that Spokane River is in the upper Columbia River basin, plus a 6-digit station number.

## STREAMFLOW AND STREAM-CHANNEL CHARACTERISTICS

### Discharge

Discharge through the Spokane River reach from Coeur d'Alene Lake to Post Falls Dam is monitored at the gaging station below the dam near Post Falls at river mile 100.7 (fig. 1). The hydrograph of discharge through the reach for the period February 1980 through January 1981 is shown in figure 2. Discharge at the gaging station below Post Falls Dam during June 8 to 12, August 24 to 28, and November 3 to 7, is detailed in 4-hour increments in table 2.

Using a water budget for Coeur d'Alene Lake, Pluhowski and Thomas (1968) determined the seepage from Coeur d'Alene Lake and the reach of the Spokane River above Post Falls Dam averaged about 250 ft<sup>3</sup>/s. In an attempt to define losses

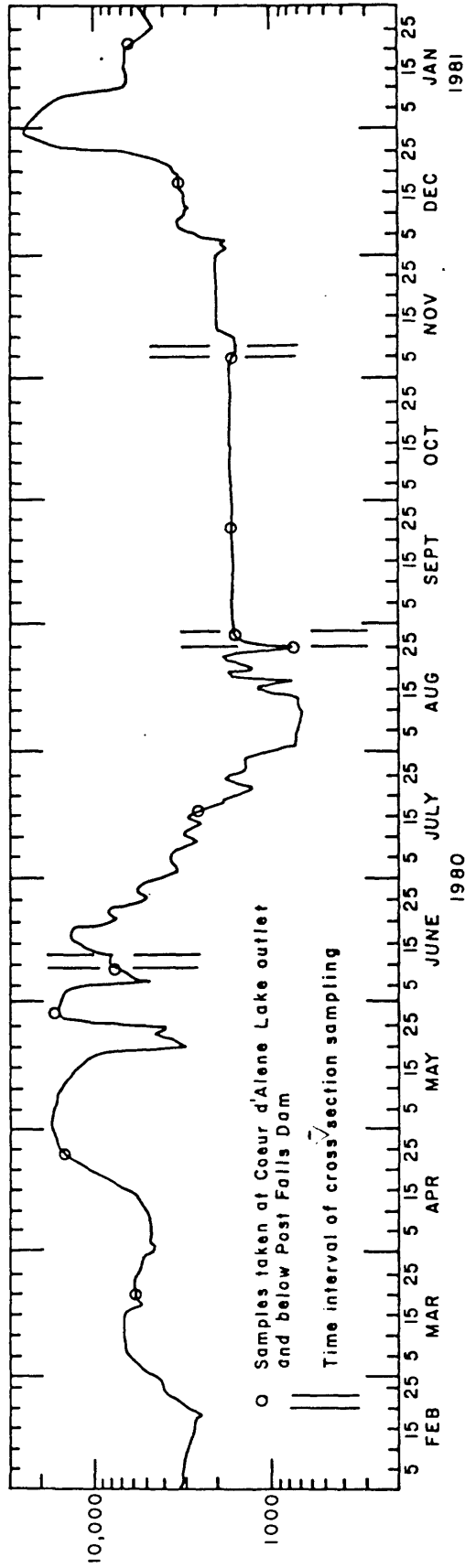


Figure 2.--Hydrograph showing discharge for station 12419000, Spokane River near Post Falls.

between selected cross sections in the Spokane River reach, stream discharge was measured at eight cross sections (fig. 2) during June 8 to 12, August 24 to 28, and November 3 to 7. Discharge measurements at Coeur d'Alene and Post Falls were made from highway bridges; discharge measurements at remaining sites were made from a boat. Under ideal conditions, the probable error in a discharge measurement is  $\pm 2.2$  percent (Carter, 1963). Measurements made from boats and suspended bridges may introduce additional errors. Therefore, an error of about  $\pm 5$  percent in any one discharge measurement made at a cross-section location is probably reasonable.

Comparing the discharge from one cross section to the next downstream cross section indicated that losses from the river reach probably cannot be determined, due to the small differences in flow involved and the limited accuracy of the measurement technique. An estimate of net seepage loss along the entire length of the study reach made by comparing discharge measurements at station 12417600, Spokane River at Highway 95 bridge, with 12419000, Spokane River near Post Falls, was not feasible.

The Rathdrum Prairie Canal diverted 24 ft<sup>3</sup> /s during June 8 to 12 and 43 ft<sup>3</sup> /s during August 24 to 28 from the reach at Harbor Island and was dry during November 3 to 7.

### Cross-Sectional Properties

At each cross section, depth, width, area, and velocity were determined during June, August, and November (table 3 and fig. 3). Velocities were determined at two points, 0.2 and 0.8 of total depth, in each cross section. Velocities ranged from a maximum of 2.00 ft/s in June to less than 0.10 ft/s during August and November. Cross-sectional widths, depths, and areas decreased as stage decreased due to regulation of Post Falls Dam.

The smallest cross-sectional area was 4,430 ft<sup>2</sup> measured November 4, at station 12417600; the largest was 17,000 ft<sup>2</sup> measured August 28 at station 12418300.

The greatest change in cross-sectional area was 2,500 ft<sup>2</sup> observed at stations 12417600 and 12418300; the smallest change was 1,040 ft<sup>2</sup> and occurred at station 12417825.

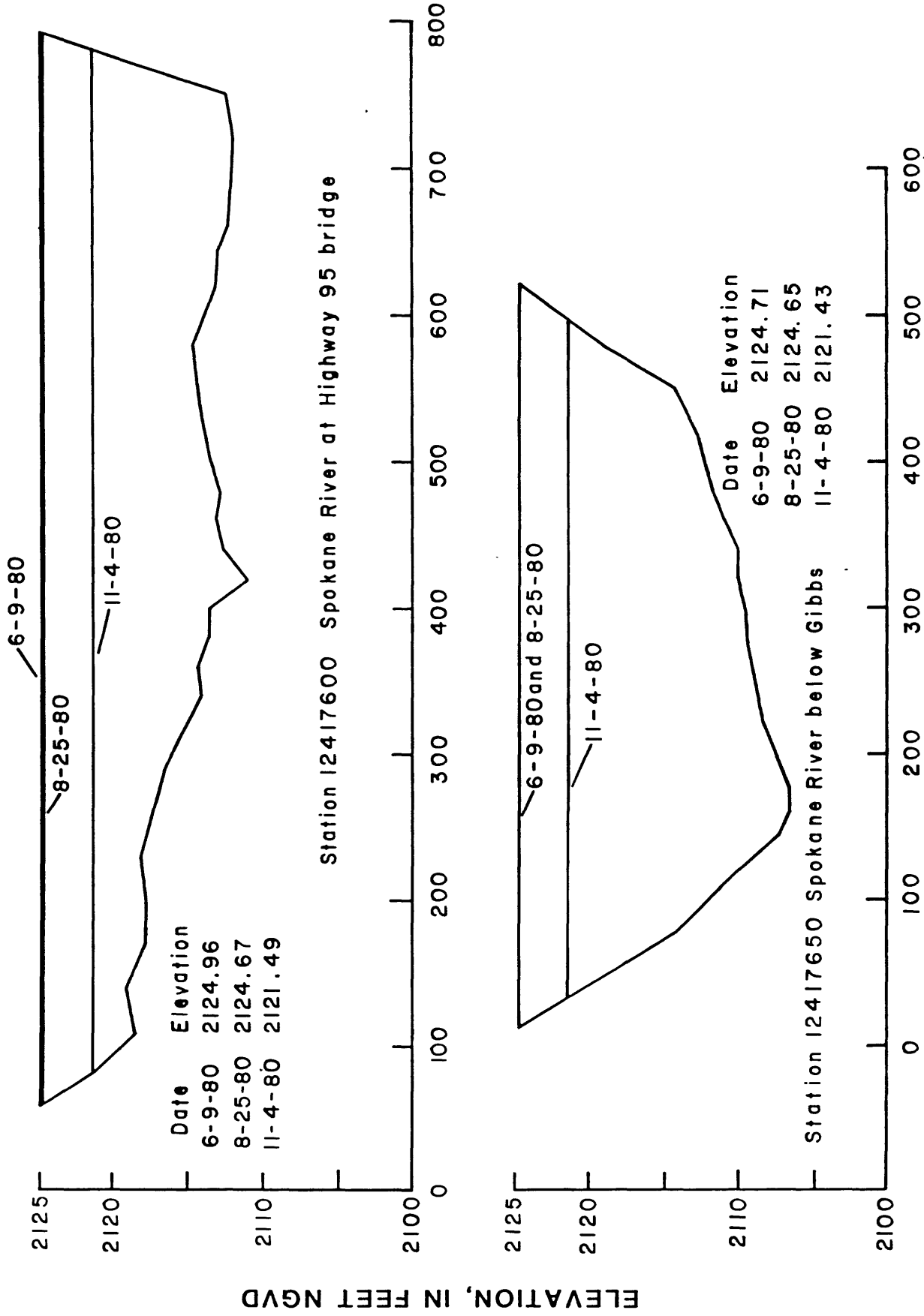


Figure 3.--Graphs showing cross-sectional properties at measuring sites.

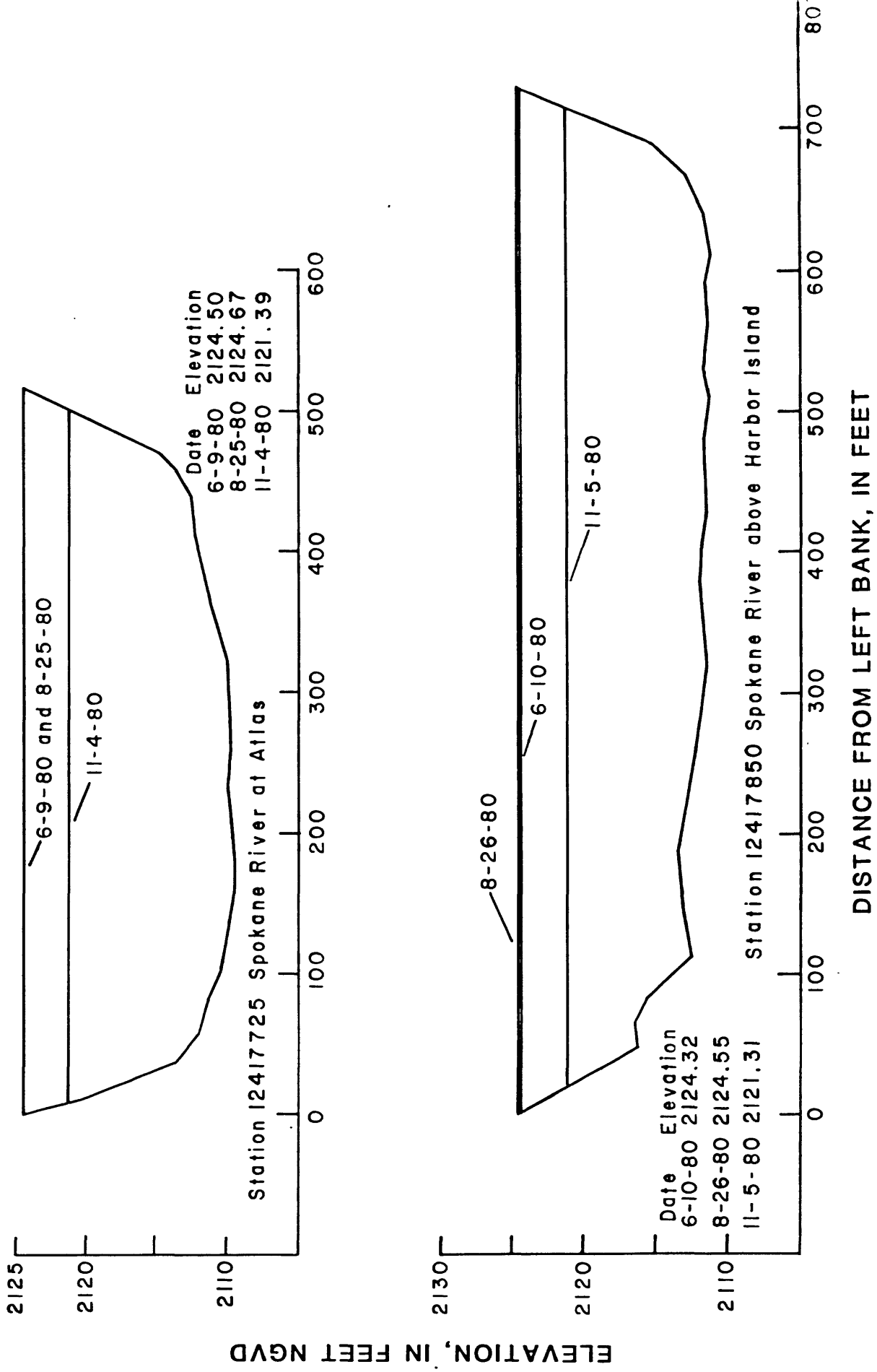
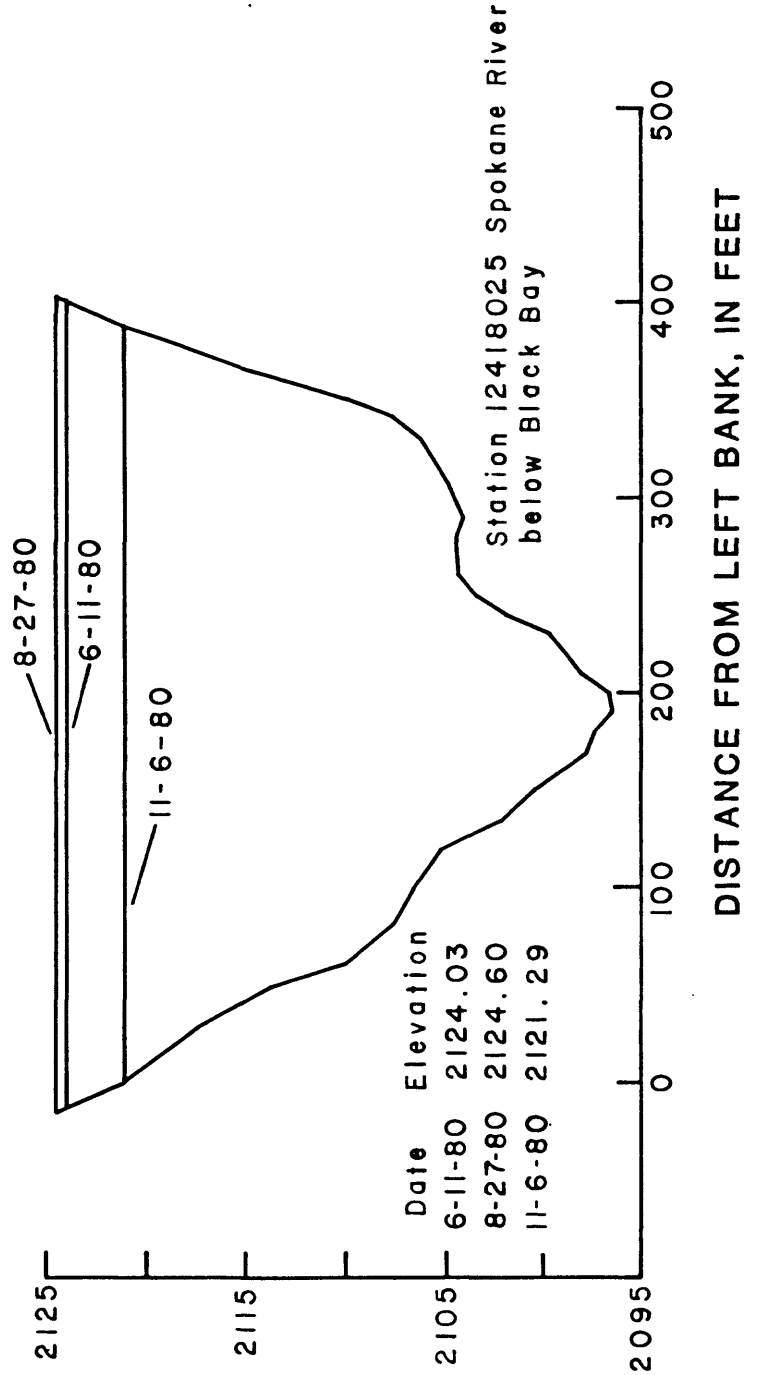
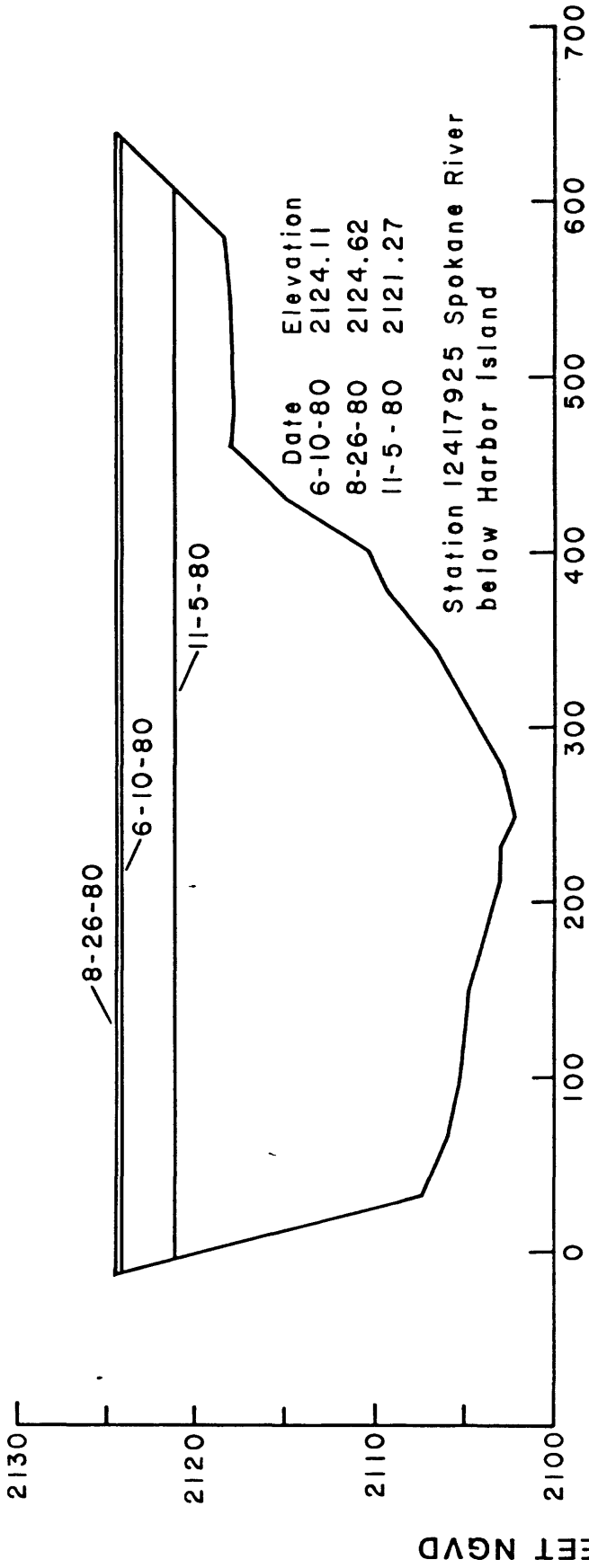


Figure 3.--Continued.



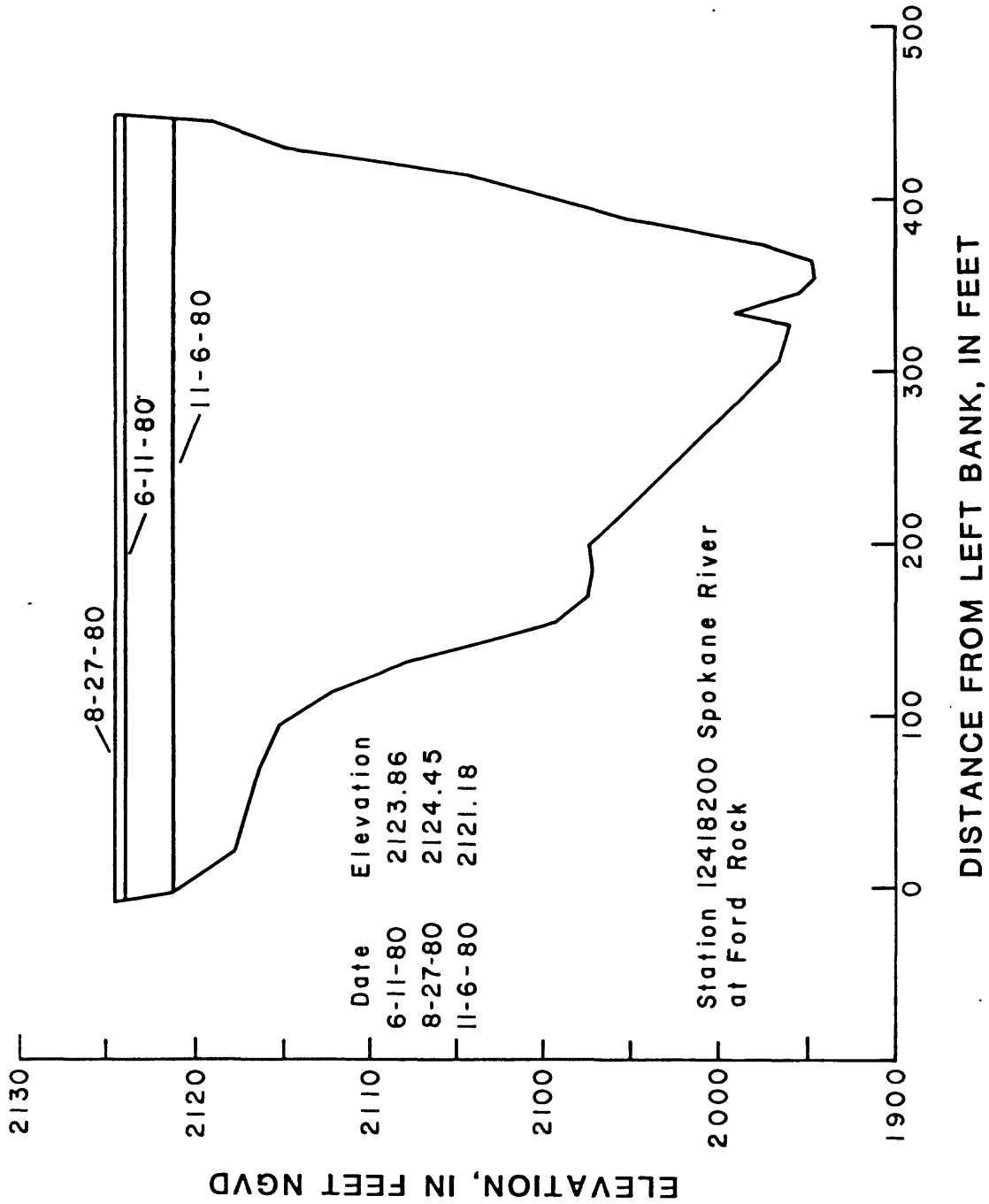
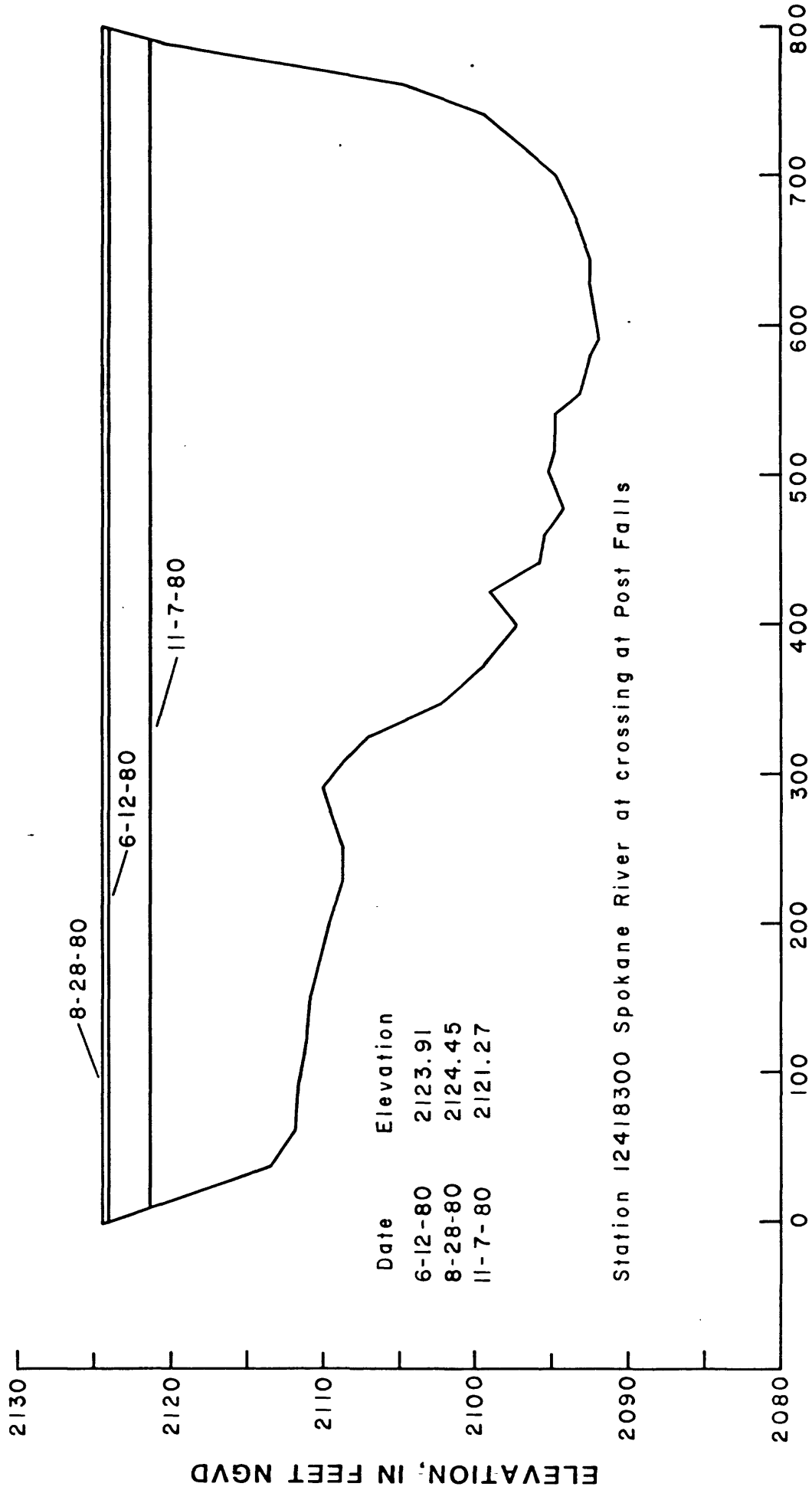


Figure 3.--Continued



DISTANCE FROM LEFT BANK, IN FEET

Figure 3.--Continued



## Channel Roughness

All hydraulic computations involving flow in open channels require an evaluation of the roughness characteristics of the channel and selection of a coefficient, "n," representing the channel roughness.

The value of "n" can be highly variable and depends on nature of the bed materials, width and depth of channel, type of vegetation along the banks, and debris in the channel. Table 4 contains values of "n," estimated using the descriptions of Chow (1959, table 5-5, p. 109-113) at eight cross-section locations in the river reach.

## Designated-Use and Water-Quality Standards

The Idaho Department of Health and Welfare, Division of Environment, has designated that the Spokane River from Coeur d'Alene Lake outlet to the Idaho-Washington border be protected as a domestic water supply. A domestic water supply is one that is suitable or is intended to be made suitable for drinking and demands that a high degree of water quality be maintained. Water quality in that part of the Spokane River in Idaho also will be maintained for other use classifications listed in table 5. Table 6 applies Idaho water-quality standards to designated-use classifications for the Spokane River in Idaho.

### RESULTS OF WATER-QUALITY ANALYSES Onsite Measurements

Measurements of water temperature, specific conductance, DO, and pH were made onsite for all samples collected during the study. At station 12417598, measurements were obtained in one vertical section; at station 12419000, measurements were obtained using the equal-transit rate technique (table 7). During the periods June 9 to 12, August 25 to 28, and November 4 to 7, onsite measurements were made in three vertical sections at each of the seven remaining cross sections (tables 8 and 10).

Temperatures were measured in each vertical section at increments of 5 ft or less using a DO meter that reads to the nearest degree; changes in temperature less than 1°C were not recorded. Temperatures throughout the study reach

ranged from 13.0° to 15.0°C during June, 18.0° to 21.0°C during August, and 10.0° to 11.0°C during November. Water temperatures along the reach are shown in figure 4.

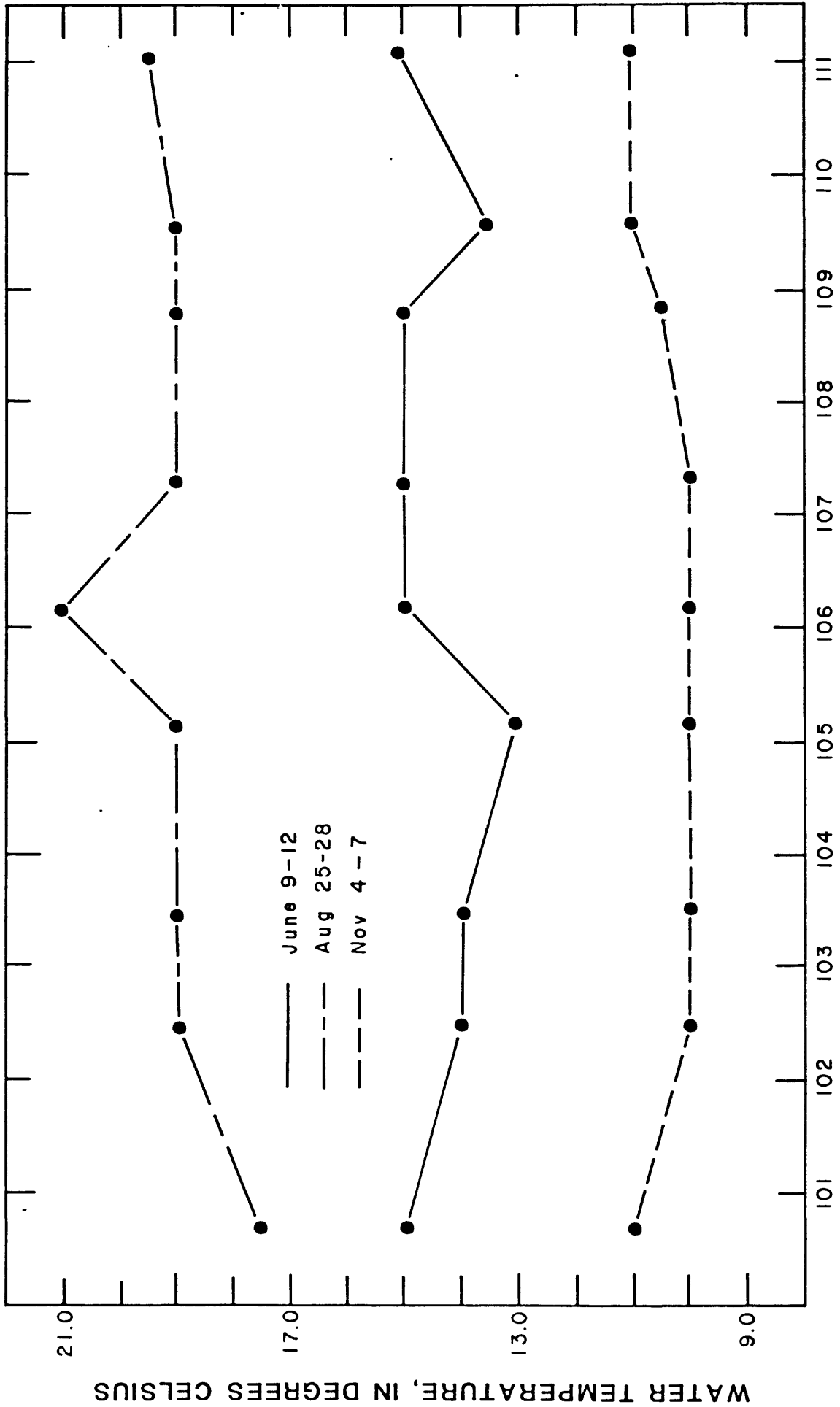
Specific conductance was measured in a composite water sample obtained from each of the three vertical sections at each station. Specific conductance was relatively consistent in the water throughout the reach and changed little during the three sampling periods. Specific conductance ranged from 51 to 56  $\mu\text{mho/cm}$  during June, 56 to 63  $\mu\text{mho/cm}$  during August, and 65 to 68  $\mu\text{mho/cm}$  during November (tables 7 and 10).

Concentration of DO was measured at increments of depth in each vertical section using a DO meter. Depth increments were the same as those used to obtain temperature measurements and were usually 5 ft or less. On several occasions, no measurement of DO concentration was obtained at the bottom of a vertical section, but rather at 1.0 ft above the bottom. No measurements were obtained at stations 12417600 and 12417650 during June. Concentration of DO was generally greater than the standard of 6 mg/L, established by the Idaho Department of Health and Welfare (1980) (tables 7 and 10). However, in some of the deeper sections of the reach, below about 20 ft, DO concentrations of about 3 mg/L or less were observed. Some decrease in concentration of DO with depth is not uncommon, due to consumption of oxygen near the bottom by bacterial and aquatic organisms. Concentrations of DO ranged from 9.2 to 10.2 mg/L during June, 7.7 to 8.8 mg/L during August, and 9.5 to 10.4 mg/L during November (fig. 5).

Measurements of pH were made in a composite sample obtained from the three vertical sections at each station. Values of pH ranged from 7.4 to 8.0 during June, 7.3 to 8.1 during August, and 7.7 to 8.8 during November (tables 7 and 10).

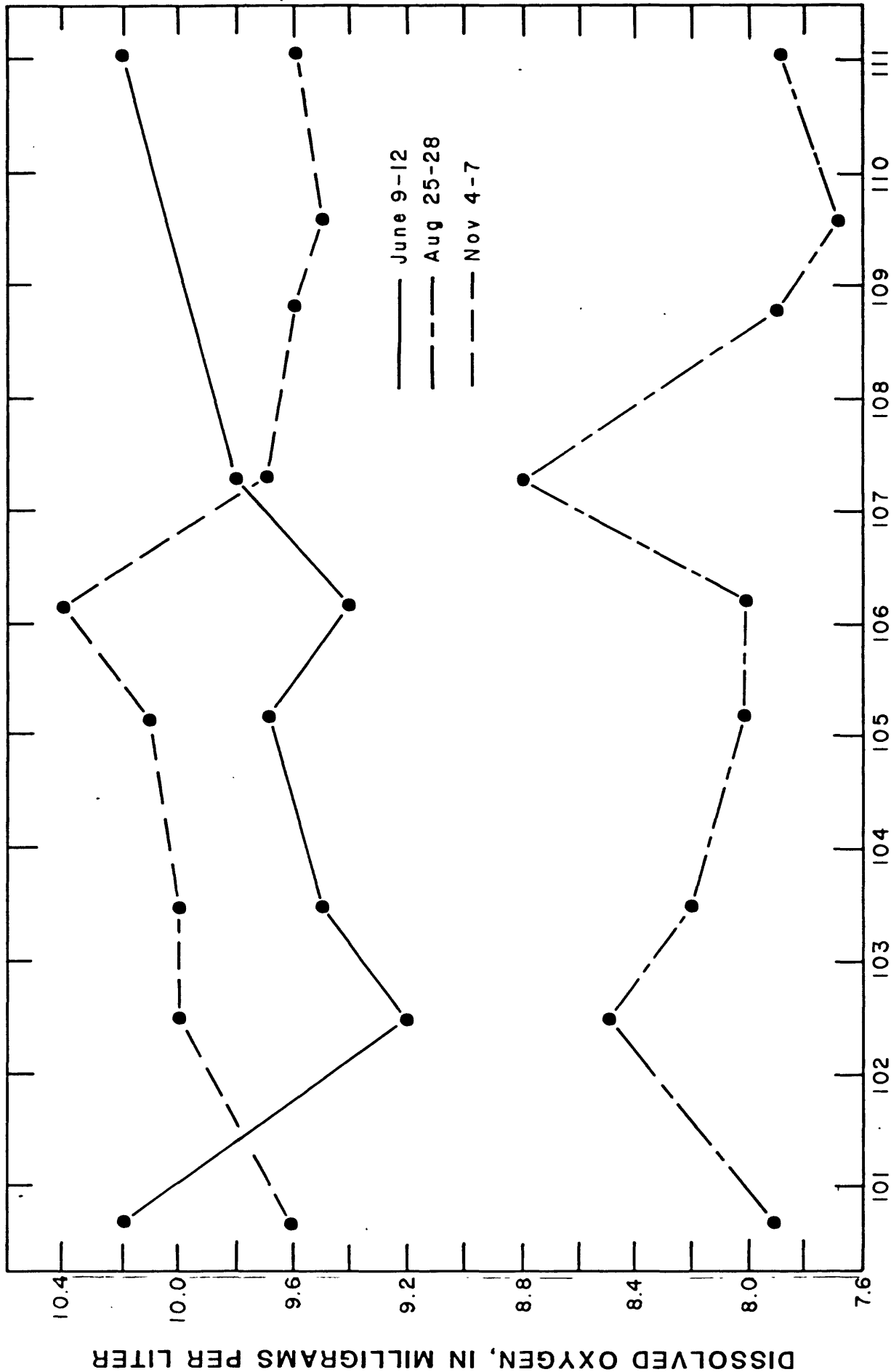
#### Nutrients

Results of nitrogen and phosphorus analyses are shown in tables 7 and 8. Concentrations of all species of nitrogen and phosphorus are reported in units of the basic elements of N (nitrogen) and P (phosphorus). Concentrations of total ammonia (fig. 6) for the periods June 9 to 12, August 25 to 27, and November 4 to 7 increased downstream from the Coeur d'Alene sewage-treatment plant discharge. The highest value of total ammonia as N reported was 0.12 mg/L during November at station 12417850.



DISTANCE, IN RIVER MILES ABOVE MOUTH

Figure 4.--Water temperature of Spokane River between outlet of Coeur d'Alene Lake and near Post Falls gaging station.



**DISTANCE, IN RIVER MILES ABOVE MOUTH**

Figure 5.--Dissolved oxygen concentrations in Spokane River between outlet of Coeur d'Alene Lake and near Post Falls gaging station.

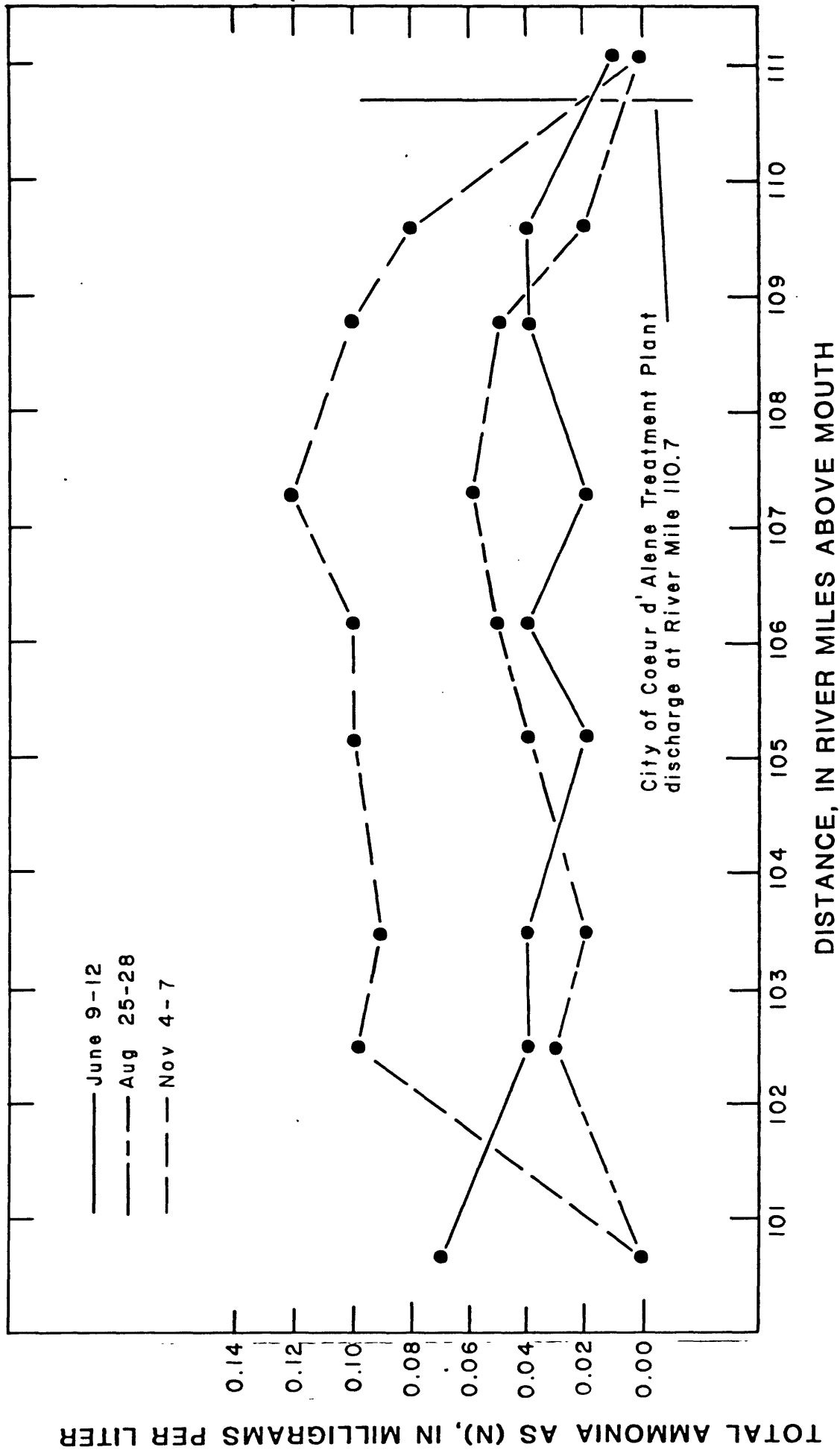


Figure 6.---Total ammonia concentrations in Spokane River between outlet of Coeur d'Alene and near Post Falls gaging station.

Figures 7 and 8 are graphs showing concentrations of total nitrogen and total phosphorus, respectively, along the study reach from March 1980 to January 1981. Concentrations of total nitrogen are highly variable, particularly in water sampled at Coeur d'Alene Lake outlet. With the exception of samples collected during April and August 1980, total nitrogen as N in water below Post Falls Dam ranged from about 0.30 to 0.55 mg/L. With the exception of samples collected in May and September 1980, concentrations of total phosphorus as P are generally lower in water entering the reach from Coeur d'Alene Lake than in water sampled below Post Falls Dam. Phosphorus concentrations were low. The highest value of total phosphorus as P, 0.11 mg/L, was observed May 28 in a sample from Coeur d'Alene Lake outlet.

Nitrogen and phosphorus concentrations discharged by the Coeur d'Alene sewage-treatment plant are listed in table 9. The highest observed value of total nitrogen in the sewage-treatment plant effluent was 21.65 mg/L in a flow of 2.69 ft<sup>3</sup>/s on February 11, 1980. The highest observed value of total phosphorus in effluent was 8.28 mg/L at 2.69 ft<sup>3</sup>/s, also on February 11, 1980.

### Bacteria

Bacteria may constitute a potential health hazard and therefore are of primary concern to recreational and public water-supply users. The occurrence of indicator bacteria such as FC (fecal coliform), and FS (fecal streptococci) in a water sample may indicate contamination by human or animal wastes and the potential presence of pathogenic organisms.

Results of FC and FS analyses of water samples from station 12417598, Coeur d'Alene Lake outlet, and station 12419000, Spokane River near Post Falls, are shown in table 7. Observed FC counts were low, with a maximum of 5 col/100 mL (colonies per 100 milliliters of water) on August 25, in the water leaving the lake, and 11 col/100 mL on August 28, in the water below Post Falls Dam. The highest observed count of FS at the lake outlet was 120 col/100 mL on July 16; highest observed count of FS below Post Falls Dam was 1,200 col/100 mL on July 16 and August 28.

### Trace Metals

Results of trace-metal analyses for water samples collected March through January from the Spokane River

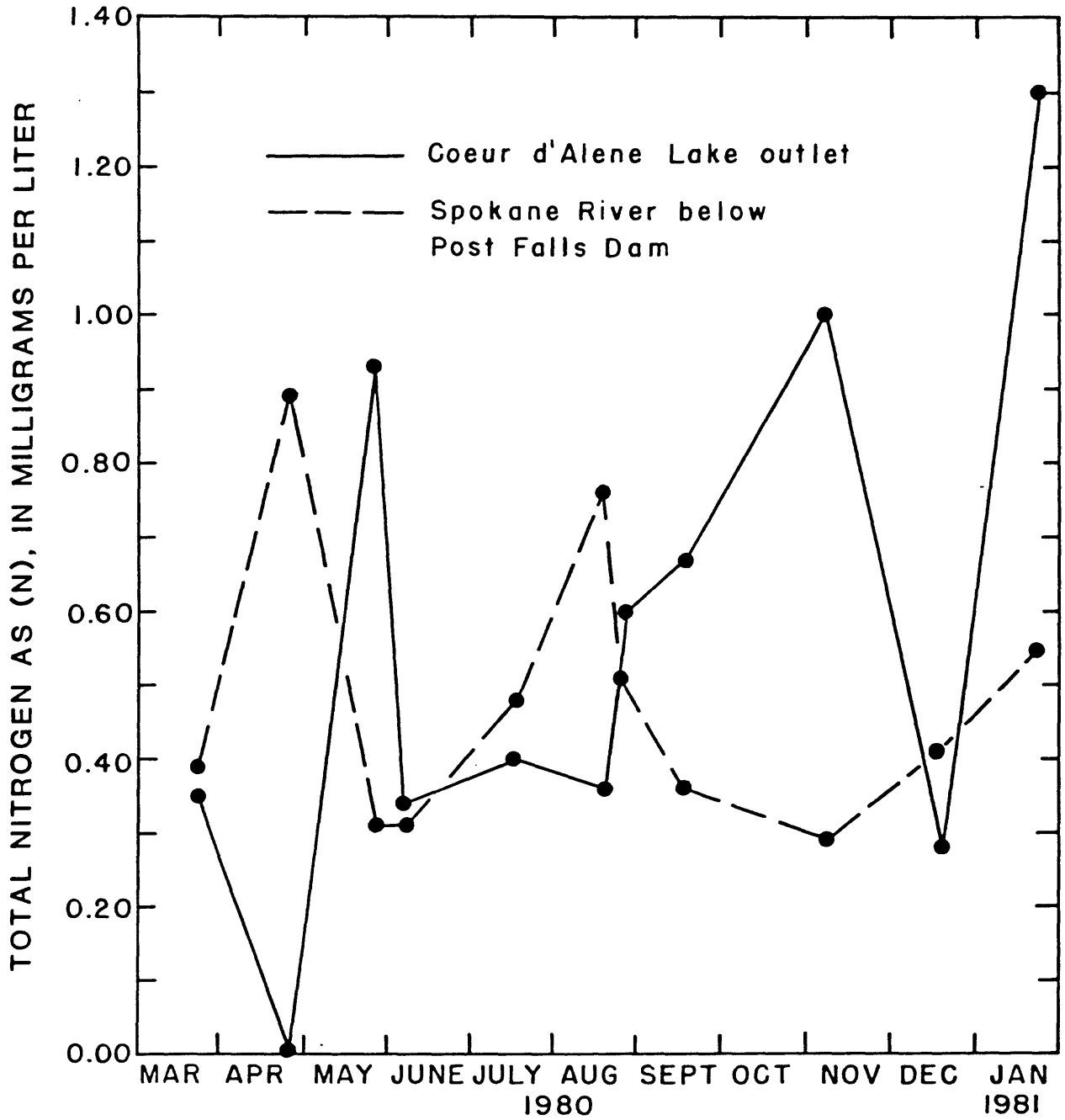


Figure 7.--Variations in total nitrogen concentrations entering and leaving the Spokane River reach, March 1980 to January 1981.

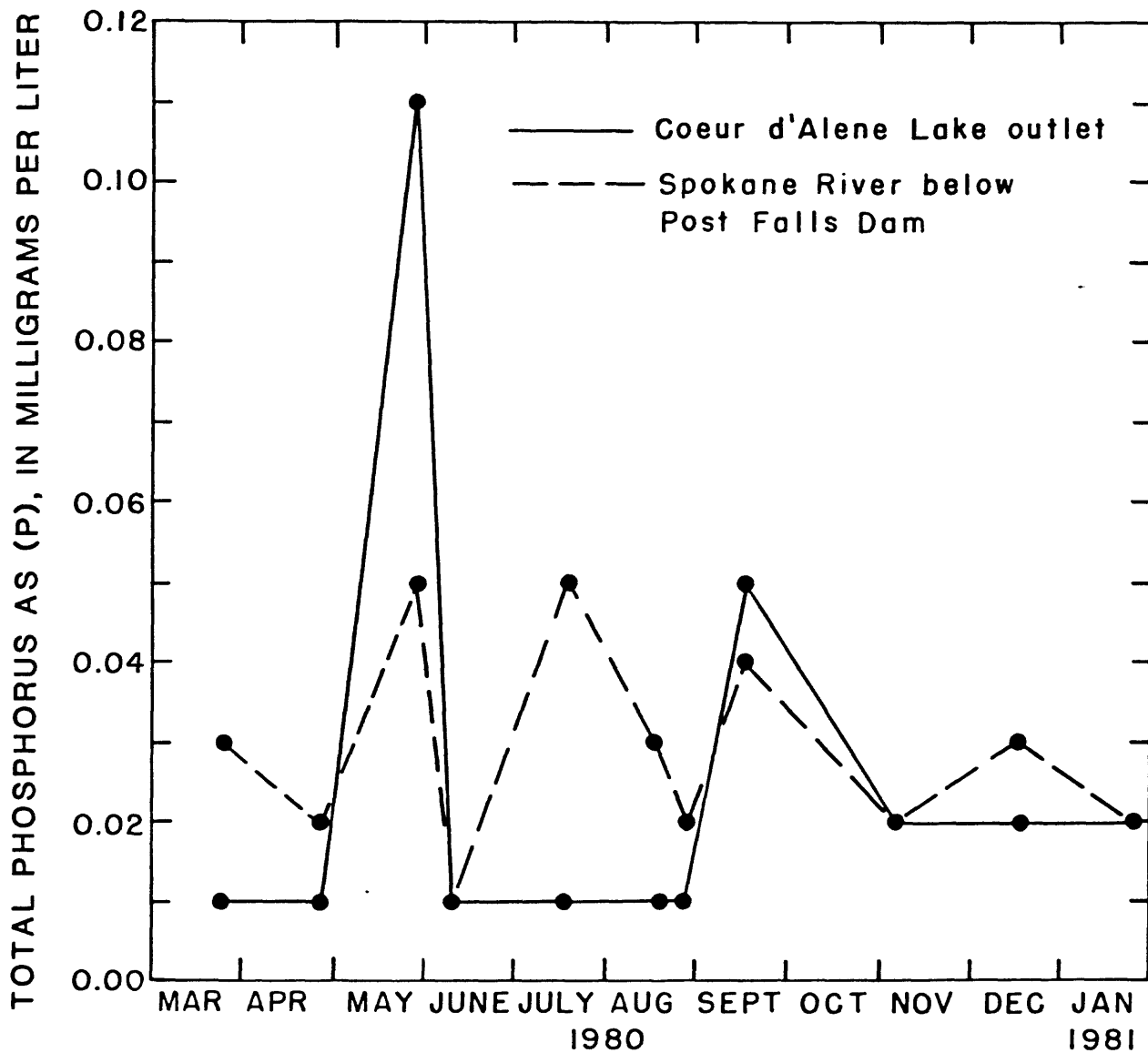


Figure 8.--Variations in total phosphorus concentrations entering and leaving the Spokane River reach, March 1980 to January 1981.



at Coeur d'Alene Lake outlet and below Post Falls Dam are shown in table 7. Analyses from effluent samples collected January through November at the Coeur d'Alene sewage-treatment plant are shown in table 9. Concentrations of trace metals were all low. Instream Idaho water-quality standards were not exceeded at Coeur d'Alene Lake outlet or below Post Falls Dam.

### Twenty-Four-Hour Monitoring

Water temperature and DO concentrations were measured hourly from 0900 hours, August 26, to 2400 hours, August 28; and from 1200 hours, November 5, to 1200 hours, November 7, for site 12417925 (fig. 9). These measurements were obtained by suspending a probe, equipped with an automatic stirring device, 5 ft below the surface. Water temperatures varied only 2°C during the August period and were constant during the November period. Concentrations of DO showed small diel variations for both periods; lows were recorded during the morning hours and highs were recorded during the afternoon hours.

### SUMMARY

Cross-sectional properties and water-quality characteristics were determined for flows of 6,100 to 8,440 ft<sup>3</sup>/s during June 8 to 12; 750 to 1,760 ft<sup>3</sup>/s during August 24 to 27; and 1,790 to 1,630 ft<sup>3</sup>/s during November 3 to 7. Water samples were obtained periodically for chemical analyses from March 1980 through January 1981 at the outlet of Coeur d'Alene Lake and below Post Falls Dam.

The smallest cross-sectional area was 4,430 ft<sup>2</sup> measured November 4 at station 12417600; the largest was 17,000 ft<sup>2</sup> measured August 28 at station 12418300. Flow velocities in the reach ranged from 2.00 ft/s during June to less than 0.10 ft/s during August and November.

Water temperatures ranged from 3.0°C in March to 20.0°C in August. Specific-conductance values were generally less than 75 µmho/cm and indicate water in the Spokane River contains little dissolved material.

Concentrations of DO exceeded 6 mg/L in all samples except those obtained at the bottom of the deep cross sections where oxygen was depleted.

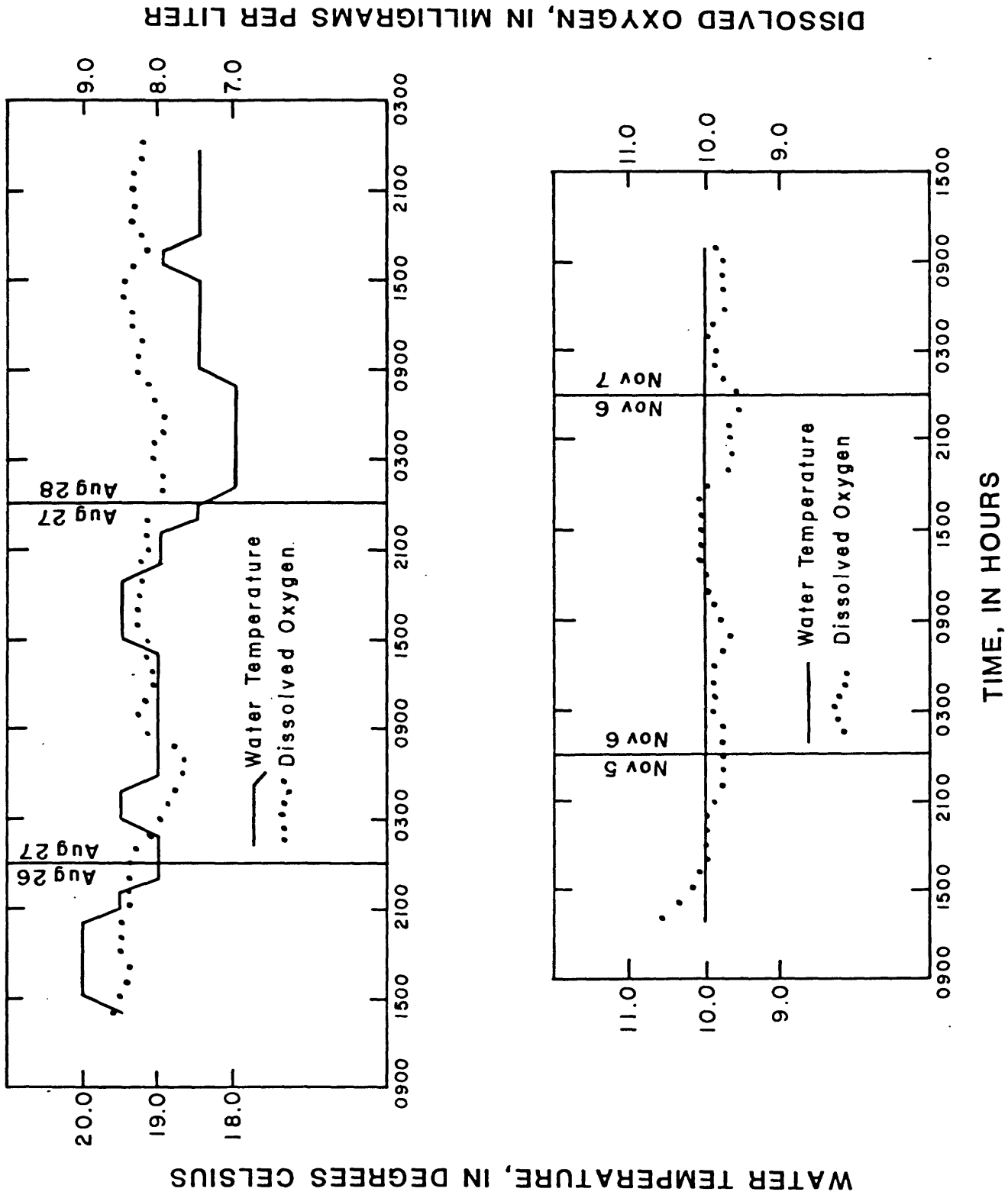


Figure 9.--Water temperature and concentrations of dissolved oxygen, measured hourly at Site 12417925, Spokane River below Harbor Island, near Post Falls.

Values of pH were near neutral to slightly alkaline and ranged from 7.3 to 8.8.

Results of nutrient analyses indicated low concentrations of phosphorus; the highest value of 0.11 mg/L was observed on May 28. An apparent increase in the concentration of total ammonia nitrogen occurred downstream from the Coeur d'Alene sewage-treatment plant; the highest value of 0.12 mg/L was observed on November 4 at station 12417850.

Bacteria analyses for FC and FS revealed low colony counts. Maximums of 11 col/100 mL FC on August 28 and 1,200 col/100 mL FS on July 16 and August 28 were observed.

Samples for analysis of trace metals were collected at Coeur d'Alene Lake outlet and below Post Falls Dam. Instream Idaho State water-quality standards were not exceeded.

## SELECTED REFERENCES

- American Public Health Association, 1975, Standard methods for the examination of water and waste water (14th ed.): Washington, American Public Health Association, 1193 p.
- Barnes, H. H. Jr., 1967, Roughness characteristics of natural channels: U.S. Geological Survey Water-Supply Paper 1894, 213 p.
- Carter, R. W., 1963, Accuracy of current meter measurements: American Society of Civil Engineers, v. 89, no. HY4, p. 105-115.
- Chow, Ven Te, 1959, Open-channel hydraulics: New York, McGraw-Hill, p. 109-123.
- Ehlke, T. A., Irwin, G. A., Lium, B. W., and Slack, K. V., editors, 1973, Methods for collection and analysis of aquatic biological and microbiological samples: U.S. Geological Survey, Techniques of Water-Resources Investigations, book 5, chapter A4, 332 p.
- Guy, H. P., and Norman, V. W., 1970, Field methods for fluvial sediment measurements: U.S. Geological Survey Techniques of Water-Resources Investigations, book 3, chapter C2, 55 p.
- Goerlitz, D. F., and Brown, Eugene, 1972, Methods for analysis of organic substances in water: U.S. Geological Survey, Techniques of Water-Resources Investigations, book 5, chapter A3, 40 p.
- Idaho Department of Health and Welfare, 1975, Idaho water quality status, surface water quality profile: Boise, Idaho, 88 p.
- \_\_\_\_\_ 1980, Water quality standards and waste-water treatment requirements: Boise, Idaho, 56 p.
- \_\_\_\_\_ 1981, Spokane River study, pollutant contributions of significant Idaho point sources: Boise, Idaho, 24 p.

- Limerinos, J. T., 1970, Determination of the Manning coefficient from measured bed roughness in natural channels: U.S. Geological Survey Water-Supply Paper 1898-B, 47 p.
- Pluhowski, E. J., and Thomas, C. A., 1968, A water-balance equation for the Rathdrum Prairie ground-water reservoir, near Spokane, Washington: U.S. Geological Survey Professional Paper 600-D, p. D75-D78.
- Skougstad, M. W., and others, editors, 1979, Methods for determination of inorganic substances in water and fluvial sediments: U.S. Geological Survey, Techniques of Water-Resources Investigations, book 5, chapter A1, 626 p.
- U.S. Environmental Protection Agency, 1974, Methods for chemical analysis of water and wastes: Washington, Office of Technology Transfer, 298 p.
- \_\_\_\_\_, 1976, Quality criteria for water: Washington, U.S. Government Printing Office, 256 p.
- \_\_\_\_\_, 1977, National interim primary drinking water regulations: Washington, Government Printing Office, 159 p.
- \_\_\_\_\_, 1978, Clean water act: Federal Register, v. 43, no. 21, January 31, 1978, p. 4108-4109.
- U.S. Geological Survey, 1981, Water resources data for Idaho, water year 1980: U.S. Geological Survey Water-Data Report ID-80-1, v. 1, 375 p.

## CONVERSION FACTORS

The following conversion table is included for the convenience of those who prefer to use SI (International System of Units) rather than the inch-pound system. Constituent concentrations are given in mg/L (milligrams per liter) or  $\mu\text{g/L}$  (micrograms per liter), which are (within the range of values presented) numerically equal to parts per million or parts per billion, respectively. Specific conductance is expressed as  $\mu\text{mho/cm}$  (micromhos per centimeter at 25 degrees Celsius).

<u>Multiply inch-pound unit</u>	<u>By</u>	<u>To obtain SI unit</u>
	<u>Length</u>	
foot (ft)	0.3048	meter
mile (mi)	1.609	kilometer
	<u>Area</u>	
square foot ( $\text{ft}^2$ )	0.0929	square meter
square mile ( $\text{mi}^2$ )	2.590	square kilometer
	<u>Volume per unit time</u>	
cubic foot per second ( $\text{ft}^3/\text{s}$ )	0.02832	cubic meter per second
	<u>Velocity</u>	
foot per second (ft/s)	0.3048	meter per second

Conversion of  $^{\circ}\text{C}$  (degrees Celsius) to  $^{\circ}\text{F}$  (degrees Fahrenheit) is by the equation  $^{\circ}\text{F}=(1.8)(^{\circ}\text{C})+32$ . Water temperatures are reported to the nearest one-half degree.

**DATA TABLES**

Table 1.--Locations of sampling stations

- 12417598 Spokane River at Lake Outlet, Coeur d'Alene, Idaho.  
Lat 47°40'34", long 116°48'05", in NE $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 14, T. 50 N., R. 4 W. Kootenai County, at Coeur d'Alene Lake outlet at Coeur d'Alene, mile 111.1.
- 12417600 Spokane River at Highway 95 crossing at Coeur d'Alene, Idaho.  
Lat 47°41'10", long 116°47'55", in NE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 14, T. 50 N., R. 4 W. Kootenai County, at Highway 95 bridge at Coeur d'Alene, mile 110.4.
- 12417650 Spokane River below Gibbs at Coeur d'Alene, Idaho.  
Lat 47°41'34", long 116°48'46", in NE $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 10, T. 50 N., R. 4 W. Kootenai County at Coeur d'Alene, mile 109.6.
- 12417725 Spokane River at Atlas near Coeur d'Alene, Idaho.  
Lat 47°41'51", long 116°49'40", in SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 10, T. 50 N., R. 4 W. Kootenai County, 1 mi west of Coeur d'Alene, mile 108.8.
- 12417850 Spokane River above Harbor Island near Coeur d'Alene, Idaho.  
Lat 47°41'49", long 116°51'32", in NW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 8, T. 50 N., R. 4 W., Kootenai County, 3 mi west of Coeur d'Alene, mile 107.3.
- 12417925 Spokane River below Harbor Island near Post Falls, Idaho.  
Lat 47°41'43", long 116°52'52", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 7, T. 50 N., R. 4 W. Kootenai County, 3 mi east of Post Falls, mile 106.2.
- 12418025 Spokane River below Black Bay near Post Falls, Idaho.  
Lat 47°41'52", long 116°53'51" in NW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 12, T 50 N., R 5 W. Kootenai County, 2 mi east of Post Falls, mile 105.2.
- 12418200 Spokane River at Ford Rock near Post Falls, Idaho.  
Lat 47°42'05", long 116°55'38" in NW $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 11, T. 50 N., R. 5 W. Kootenai County, 1 mi east of Post Falls, mile 103.5.



Table 1.--Locations of sampling stations--Continued

12418300 Spokane River at crossing at Post Falls, Idaho.

Lat 47°42'16", long 116°56'53" in NE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 3,  
T. 50 N., R. 5 W., Kootenai County at Post Falls,  
mile 102.5.

12419000 Spokane River near Post Falls, Idaho.

Lat 47°42'10", long 116°58'40", in SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 4,  
T. 50 N., R. 5 W. Kootenai County, 1 mi downstream  
from powerplant of Washington Water Power Co., 1.5  
mi southwest of Post Falls, and at mile 100.7.

Table 2.--Discharge at station 12419000, Spokane River near Post Falls

Period of June 8-12, 1980			Period of Aug. 24-28, 1980			Period of Nov. 3-7, 1980		
Date	Time (24-hour)	Discharge (ft <sup>3</sup> /s)	Date	Time (24-hour)	Discharge (ft <sup>3</sup> /s)	Date	Time (24-hour)	Discharge (ft <sup>3</sup> /s)
June 8	2400	6,110	Aug. 24	2400	760	Nov. 3	2400	1,790
	0400	6,100		0400	770		0400	1,790
	0800	6,110	Aug. 25	0800	750	Nov. 4	0800	1,780
	1200	8,430		1200	750		1200	1,770
	1600	8,380		1600	750		1600	1,630
June 9	2000	8,410	2000	2000	750	2000	2000	1,620
	2400	8,440		2400	750		2400	1,620
June 10	0400	8,320	Aug. 26	0400	760	Nov. 5	0400	1,630
	0800	8,390		0800	750		0800	1,630
	1200	8,320	1200	1200	1,330	1200	1200	1,640
	1600	8,360		1600	1,680		1600	1,640
	2000	8,340		2000	1,740		2000	1,630
June 11	2400	8,380	2400	2400	1,760	2400	2400	1,630
	0400	8,380		Aug. 27	0400		1,760	Nov. 6
June 12	0800	8,390	0800		0800	1,730	0800	
	1200	8,390		1200	1,730	1200		1,630
	1600	8,380		1600	1,730	1600		1,630
	2000	8,360	2000	2000	1,720	2000	2000	1,640
	2400	8,340		2400	1,720		2400	1,640
June 12	0400	8,360	Aug. 28	0400	1,720	Nov. 7	0400	1,640
	0800	8,320		0800	1,730		0800	1,640
	1200	7,320	1200	1200	1,720	1200	1200	1,640
	1600	7,370		1600	1,730		1600	1,640
	2000	8,290		2000	1,710		2000	1,640
2400	8,310	2400	1,730	2400	1,730	2400	1,730	

Table 3.--Cross-sectional area and stream velocities at selected sites on the Spokane River

Station No.	Date	Cross-sectional area (ft <sup>2</sup> )	Depth below water surface (tenths of total depth)	Stream velocity (ft/s)		
				Verticals 1/4	Verticals 1/2	Verticals 3/4
12417600	June 9, 1980	6,930	0.2	1.41	1.47	1.32
	Aug. 25, 1980	6,710	.8	1.16	1.18	1.08
	Nov. 4, 1980	4,430	.2	.18	.30	.13
12417650	June 9, 1980	6,150	.8	.13	.20	.18
	Aug. 25, 1980	6,180	.2	.29	.56	.47
	Nov. 4, 1980	4,620	.8	.25	.36	.39
12417725	June 9, 1980	6,130	.2	1.62	1.65	1.76
	Aug. 25, 1980	6,180	.8	.91	1.08	1.38
	Nov. 4, 1980	4,620	.2	.19	.16	.18
12417850	June 9, 1980	6,130	.8	.17	.11	.14
	Aug. 25, 1980	6,410	.2	.52	.42	.48
	Nov. 4, 1980	4,650	.8	.30	.32	.44
12417850	June 10, 1980	7,900	.2	1.84	2.00	1.01
	Aug. 26, 1980	8,250	.8	1.29	1.47	.91
	Nov. 5, 1980	5,780	.2	.17	.18	.21
12417925	June 10, 1980	8,460	.8	.12	.17	.22
	Aug. 26, 1980	8,980	.2	.45	.45	.26
	Nov. 5, 1980	6,870	.8	.35	.40	.17
12418025	June 11, 1980	6,800	.2	1.17	1.24	1.22
	Aug. 27, 1980	6,930	.8	1.08	1.04	.90
	Nov. 6, 1980	5,760	.2	.11	.20	.14
12418025	June 11, 1980	6,800	.8	.07	.14	.07
	Aug. 27, 1980	6,930	.2	.31	.28	.29
	Nov. 6, 1980	5,760	.8	.26	.24	.23
12418025	June 11, 1980	6,800	.2	1.22	1.27	.90
	Aug. 27, 1980	6,930	.8	1.12	.94	.71
	Nov. 6, 1980	5,760	.2	.18	.24	.18
12418025	June 11, 1980	6,800	.8	.16	.13	.18
	Aug. 27, 1980	6,930	.2	.29	.23	.24
	Nov. 6, 1980	5,760	.8	.24	.18	.14
12418025	June 11, 1980	6,800	.2	1.75	1.68	1.36
	Aug. 27, 1980	6,930	.8	.77	.84	1.04
	Nov. 6, 1980	5,760	.2	.27	.28	.24
12418025	June 11, 1980	6,800	.8	.27	.18	.13
	Aug. 27, 1980	6,930	.2	.39	.40	.31
	Nov. 6, 1980	5,760	.8	.20	.26	.27

Table 3.--Cross-sectional area and stream velocities at selected sites on the Spokane River--Continued

Station No.	Date	Cross-sectional area (ft <sup>2</sup> )	Depth below water surface (tenths of total depth)	Stream velocity (ft/s)		
				Verticals from left bank 1/4	1/2	3/4
12418200	June 11, 1980	9,940	0.2	0.45	0.88	1.07
			1.8	.28	.86	.84
	Aug. 27, 1980	10,300				
12418300	Nov. 6, 1980	8,890	.2	.11	.19	.19
			.8	.09	.17	.11
	June 12, 1980	16,600	.2	.54	.57	.63
	Aug. 28, 1980 <sup>2</sup>	17,000	.8	.47	.54	.38
	Nov. 7, 1980	14,500	.2	.08	.11	.14
			.8	.05	.11	.13

<sup>1</sup>Wind at time of measurement.

<sup>2</sup>Velocity readings not reliable.

Table 4.--Estimates of "n" roughness coefficients

Site No.	Range of roughness coefficients "n"	Comments
12417600	0.027 - 0.028	Mostly small gravels with much silt, wide channel, slow velocities, bridge piers
12417650	.026 - .027	Mostly small gravels and sands with much silt; wide, deep channel; slow velocities
12417725	.027 - .028	Mostly sand and small gravels with much silt, a few cobbles, wide and fairly deep channel
12417850	.027 - .028	Do.
12417925	.029 - .030	Left bank is shale rock, cobbles on right bank, middle of channel has much silt
12418025	.030 - .032	Left bank is large boulders, sand, and gravel; not much silt visible; right bank is gravel and rounded cobbles
12418200	.034 - .036	Large basalt boulders on both banks, fractured basalt, some silt
12418300	.029 - .030	Silt and bark covering channel, sand and fine gravel on banks, bridge piers

Table 5.--Designated-use classifications from Idaho  
water-quality standards

(Modified from Idaho Department of Health and Welfare,  
Division of Environment)

Spokane River - Coeur d'Alene Lake to Stateline

Designated Use:

1. Domestic water supply
  - a. Suitable or intended to be made suitable for drinking-water supply
2. Agricultural water supply
  - a. Irrigation
  - b. Stock water
3. Cold-water biota
  - a. Aquatic organisms with optimal growth below 18°C
4. Salmonid spawning
  - a. Self-propagation of salmonid fish
5. Primary contact recreation
  - a. Swimming, water skiing, skindiving
  - b. Ingestion of small quantities probable
6. Secondary contact recreation
  - a. Fishing, boating, wading
  - b. Ingestion of water not probable

Table 6.--Idaho water-quality standards as applied to designated-use classifications for the Spokane River

The following water-quality standards apply to waters of the State of Idaho for the use classifications listed in table 5.

1. Domestic water supply

- a. Domestic water supplies are to exhibit the following characteristics:

Substance	Maximum allowable concentrations (mg/L)	Temperature (°C)
Arsenic	0.050	
Barium	1.000	
Cadmium	0.010	
Chromium	0.050	
Cyanide	0.200	
Fluoride <sup>1</sup>	2.400	Up to 12.0
	2.200	12.1 - 14.6
	2.000	14.7 - 17.6
	1.800	17.7 - 21.4
	1.600	21.5 - 26.1
	1.400	26.3 - 32.5
Lead	0.050	
Mercury	0.002	
Nitrate (as N)	10.000	
Selenium	0.010	
Silver	0.050	

<sup>1</sup>As determined by the average annual maximum daily air temperature for the area where the water is to be used.

2. Cold-water biota

- a. Dissolved oxygen concentrations must exceed 6 mg/L at all times
- b. pH values must be within range of 6.5 to 9.0
- c. Water temperature must be less than 22°C
- d. Un-ionized ammonia must be less than 0.02 mg/L

Table 6.--Idaho water-quality standards as applied to designated-use classifications for the Spokane River--Continued

3. Salmonid spawning
  - a. DO concentrations must exceed 6 mg/L
  - b. pH values must be within range of 6.5 to 9.0
  - c. Water temperature must be less than 13°C
  - d. Un-ionized ammonia must be less than 0.02 mg/L
4. Primary contact recreation
  - a. Between May 1 and September 30 each year, waters may not contain fecal coliform bacteria exceeding 500 colonies per 100 milliliters of water at any time
5. Secondary contact recreation
  - a. Fecal coliform bacteria may not exceed 800 colonies per 100 milliliters of water at any time



Table 7.--Water-quality data for two selected sites in the Spokane River between Coeur d'Alene Lake and Post Falls Dam, March 1980 through January 1981

(TURBIDITY (NTU), nephelometric-turbidity unit; K, less than ideal colony count; UG/L, µg/L (micrograms per liter); <, less than; --, no data available.)

DATE	TIME (24-hour)	STREAM- FLOW, INSTAN- TANEOUS (ft <sup>3</sup> /s)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE, WATER (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN DEMAND, CHEM- ICAL (HIGH LEVEL) (MG/L)	
1241759d - SPOKANE RIVER AT LAKE OUTLET AT COUER D'ALENE ID (LAT 47 40 34 LONG 116 48 05)											
MAR , 1980											
MAR	20...	1200	5440	69	*7.3	12.0	3.0	1.4	12.4	100	7
APR	24...	1215	15900	74	*7.7	15.2	6.0	1.2	12.4	108	4
MAY	28...	1300	17200	55	--	14.0	12.0	3.7	10.1	102	3
JUN	09...	0915	8080	52	*7.4	18.5	15.0	1.7	10.2	110	9
JUL	16...	0715	3140	55	*7.8	18.5	19.0	1.1	8.2	94	18
AUG	20...	1200	1520	57	*7.7	20.0	20.0	1.0	8.2	98	5
	25...	1000	1300	62	*7.4	17.0	19.5	.80	7.9	106	15
SEP	18...	1145	2020	62	*7.4	18.0	17.0	.50	8.6	97	11
NOV	04...	0845	1680	66	--	10.5	11.0	--	9.6	93	8
Dec	17	1145	3240	66	* 7.8	4.0	5.0	.40	10.4	88	0
Jan	22	0930	5440	68	*7.2	4.0	4.0	2.1	11.4	91	18
12419000 - SPOKANE RIVER NEAR POST FALLS, IDAHO (LAT 47 42 10 LONG 116 58 40)											
MAR , 1980											
MAR	20...	0915	5820	61	*7.3	5.0	3.5	1.0	12.9	94	15
APR	24...	0800	15300	67	*7.8	11.5	7.0	2.2	13.0	116	5
MAY	28...	1030	17800	55	--	10.5	12.0	3.6	11.4	115	16
JUN	09...	1300	8440	53	*7.4	23.0	15.0	1.5	10.2	108	6
JUL	16...	1200	2670	54	*7.7	24.0	20.0	1.2	8.7	102	11
AUG	20...	1000	1340	56	--	19.5	20.0	1.5	7.6	89	6
	28...	0930	1660	62	*7.3	12.5	18.0	1.0	7.9	77	21
SEP	18...	0930	1760	61	*7.4	14.6	17.5	.50	8.2	95	30
NOV	07...	0945	1640	65	--	14.4	11.0	--	9.6	96	7
Dec	17	0945	3240	67	* 7.4	0.0	5.0	.60	10.8	91	1
Jan	21	0945	5790	65	7.2	5.0	4.0	1.2	11.2	92	20

\*Lab determination

Table 7.--Water-quality data for two selected sites in the Spokane River between Coeur d'Alene Lake and Post Falls Dam, March 1980 through January 1981--Continued

DATE	OXYGEN DEMAND, BIOCHEM UNINHIB 5 DAY (MG/L)	COLI-FORM, FECAL, 0,7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CAC03)	HARD-NESS, NONCARBONATE (MG/L CAC03)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNESIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO
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12417598 - SPOKANE RIVER AT LAKE OUTLET AT COUER D'ALENE ID (LAT 47 40 34 LONG 116 48 05)

MAR 20... 1980	1.6	K1	K3	26	10	7.3	1.9	1.8	13	0.2
APR 24...	.9	<1	K6	--	--	--	--	--	--	--
MAY 28...	.7	K4	K30	19	3	5.4	1.4	1.3	12	.1
JUN 09...		<1	K2	20	5	5.5	1.5	1.4	13	.1
JUL 16...	1.3	K4	120	--	--	--	--	--	--	--
AUG 20...	.6	K2	K3	--	--	--	--	--	--	--
25...	--	K5	K12	--	--	--	--	--	--	--
SEP 18...	.9	--	K6	26	8	7.1	1.9	1.5	11	.1
NOV 04...	.4	<1	K10	--	--	--	--	--	--	--
Dec 11	1.4	<1	K11	27	11	7.4	2.0	1.6	11	1
Jan 22	.6	K1	K3	--	--	--	--	--	--	--

12419000 - SPOKANE RIVER NEAR POST FALLS, IDAHO (LAT 47 42 10 LONG 116 58 40)

MAR 20... 1980	1.4	K3	53	24	7	7.0	1.7	1.7	13	.2
APR 24...	.8	<1	K2	--	--	--	--	--	--	--
MAY 28...	1.1	K4	56	20	4	5.4	1.6	1.3	12	.1
JUN 09...	--	K1	55	24	8	7.0	1.6	1.5	12	.1
JUL 16...	.9	K5	K1200	--	--	--	--	--	--	--
AUG 20...	1.1	K8	1000	--	--	--	--	--	--	--
28...	--	K11	1200	--	--	--	--	--	--	--
SEP 18...	.7	--	570	24	5	6.7	1.8	1.6	12	.1
NOV 07...	.8	K5	250	--	--	--	--	--	--	--
Dec 17	1.6	K2	240	28	9	7.9	1.9	1.8	12	.2
Jan 21	.3	K2	64	--	--	--	--	--	--	--

Table 7.--Water-quality data for two selected sites in the Spokane River  
between Coeur d'Alene Lake and Post Falls Dam, March 1980 through  
January 1981--Continued

DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE (MG/L AS HCO3)	CAR- BONATE (MG/L AS CO3)	ALKA- LINITY (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	FLUO- RIDF, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)
12417598 - SPOKANE RIVER AT LAKE OUTLET AT COUER D'ALENE ID (LAT 47 40 34 LONG 116 48 05)										
MAR , 1980										
20...	0.8	--	--	16	12	0.1	7.8	43	0.06	632
APR 24...	--	24	0	20	--	--	--	--	--	--
MAY 28...	.7	--	--	16	5.9	.1	6.9	32	.05	1760
JUN 09...	.7	22	--	18	6.8	.1	7.1	33	.04	720
JUL 16...	--	0	24	40	--	--	--	--	--	--
AUG 20...	--	24	0	20	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	.06	151
SEP 18...	.9	22	0	18	6.8	.1	7.1	37	.05	207
NOV 04...	--	--	--	--	--	--	--	--	--	--
Dec 17	.7	20	0	20	3	.1	7.5	43	.06	375
Jan 22	--	--	--	--	--	--	--	--	--	--
12419000 - SPOKANE RIVER NEAR POST FALLS, IDAHO (LAT 47 42 10 LONG 116 58 40)										
MAR , 1980										
20...	.8	--	--	17	11	.1	7.2	41	.06	644
APR 24...	--	24	0	20	--	--	--	--	--	--
MAY 28...	.6	--	--	16	6.9	.1	6.9	33	.06	1970
JUN 09...	.7	22	--	18	8.0	.1	7.1	36	.05	820
JUL 16...	--	24	--	20	--	--	--	--	--	--
AUG 20...	--	24	--	20	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	.07	220
SEP 18...	1.0	22	0	19	6.9	.1	6.8	37	.07	233
NOV 07...	--	--	--	--	--	--	--	--	--	--
Dec 17	.8	24	0	24	10	.1	7.4	43	.06	376
Jan 21	--	--	--	--	--	--	--	--	--	--

Table 7.--Water-quality data for two selected sites in the Spokane River between Coeur d'Alene Lake and Post Falls Dam, March 1980 through January 1981--Continued

DATE	SOLIDS, RESIDUE AT 105 DEG. C, SUS- PENDE (MG/L)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN+AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, ORTHOPH OSPHATE DISSOL. (MG/L AS P)	ARSENIC TOTAL (UG/L AS AS)
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12417598 - SPOKANE RIVER AT LAKE OUTLET AT COEUR D'ALENE ID (LAT 47 40 34 LONG 116 48 05)

MAR , 1980										
20...	0	0.06	0.08	0.00	0.29	0.29	0.35	0.010	0.04	1
APR										
24...	1	.00	--	.00	.35	.35	.00	.010	--	2
MAY										
28...	5	.01	.03	.01	.91	.92	.93	.110	.02	1
JUN										
09...	8	.00	.01	.01	.33	.34	.34	.010	.01	1
JUL										
16...	10	.00	--	.05	.35	.40	.40	.010	.01	1
AUG										
20...	7	.00	--	.02	.34	.36	.36	.010	.00	1
25...	81	.00	--	.00	.60	.60	.60	.010	.00	1
SEP										
18...	18	.00	.00	.00	.67	.67	.67	.050	.00	1
NOV										
04...	5	.00	--	.00	1.0	1.0	1.0	.020	--	--
Dec										
17	0	.01	.00	.00	.26	.26	.27	.020	--	1
Jan										
22	0	.07	--	.05	1.2	1.2	1.3	.020	.01	.2

12419000 - SPOKANE RIVER NEAR POST FALLS, IDAHO (LAT 47 42 10 LONG 116 58 40)

MAR , 1980										
20...	0	.06	.08	.00	.33	.33	.39	.020	.03	0
APR										
24...	0	.02	--	.00	.87	.87	.89	.020	.01	2
MAY										
28...	0	.00	.01	.00	.31	.31	.31	.050	.02	1
JUN										
09...	5	.02	.02	.07	.22	.29	.31	.010	.01	1
JUL										
16...	9	.00	--	.00	.48	.48	.48	.050	.00	1
AUG										
20...	6	.09	--	.00	.67	.67	.76	.030	.00	1
28...	75	.00	--	.00	.51	.51	.51	.020	.00	1
SEP										
18...	5	.00	.00	.00	.36	.36	.36	.040	.01	1
NOV										
07...	8	.00	--	.00	.29	.29	.29	.020	--	--
Dec										
17	0	.02	.01	.01	.38	.39	.41	.030	.00	1
Jan										
21	0	.03	--	.05	.47	.52	.55	.020	.00	1

Table 7.--Water-quality data for two selected sites in the Spokane River between Coeur d'Alene Lake and Post Falls Dam, March 1980 through January 1981--Continued

DATE	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)	ZINC, DIS- SOLVED (UG/L AS ZN)
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12417598 - SPOKANE RIVER AT LAKE OUTLET AT COUER D'ALENE ID (LAT 47 40 34 LONG 116 48 05)

MAR , 1980									
20...	1	12	3	1	100	31	0.1	180	180
APR									
24...	2	4	0	2	150	5	.1	210	150
MAY									
28...	1	0	5	<10	100	4	.1	140	73
JUN									
09...	1	7	30	3	120	38	.0	140	80
JUL									
16...	2	6	4	4	130	6	.0	140	80
AUG									
20...	1	0	16	2	70	7	.1	190	90
25...	1	11	7	--	110	6	.1	320	70
SEP									
18...	0	3	4	1	120	5	.0	130	--
NOV									
04...	2	4	8	--	100	3	--	140	--
Dec									
17	0	3	4	2	80	3	.1	160	160
Jan									
22	0	4	6	3	290	28	.3	210	180

12419000 - SPOKANE RIVER NEAR POST FALLS, IDAHO (LAT 47 42 10 LONG 116 58 40)

MAR , 1980									
20...	1	8	6	3	110	15	.0	180	170
APR									
24...	2	3	4	2	280	10	.2	260	--
MAY									
28...	1	0	13	<10	140	5	.1	200	64
JUN									
09...	1	2	13	3	100	11	.1	130	90
JUL									
16...	1	4	5	4	100	7	.0	130	0
AUG									
20...	1	0	32	2	120	10	.1	170	80
28...	1	11	8	--	70	6	.1	120	80
SEP									
18...	1	5	2	12	160	5	.0	180	--
NOV									
07...	--	4	16	--	120	9	--	140	--
Dec									
17	0	3	9	4	170	12	.6	180	170
Jan									
21	1	9	9	3	190	24	.2	190	170

Table 8.--Water-quality data at seven cross-section locations in the Spokane River between Coeur d'Alene Lake and Post Falls Dam, June 1980 through November 1980

[TURBIDITY (NTU), nephelometric-turbidity unit; --, no data available]

DATE	TIME (24-hour)	STREAM- FLOW INSTAN- TANEOUS (ft <sup>3</sup> /s)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN, DIS- SOLVED (MG/L)
12417500 - SPOKANE RIVER BL GIBBS NR COEUR D ALENE IDAHO (LAT 47 41 34 LONG 116 48 46)									
JUN	09...	1030	8240	56	7.9	18.5	13.5	1.1	--
AUG	25...	1100	868	62	8.0	29.5	14.0	.90	7.7
NOV	04...	1130	1830	67	8.8	17.5	11.0	.70	9.5
12417725 - SPOKANE RIVER AT ATLAS NR COEUR D ALENE IDAHO (LAT 47 41 51 LONG 116 49 40)									
JUN	09...	1530	8430	56	7.5	18.5	15.0	.70	--
AUG	25...	1530	920	62	8.0	30.0	19.0	.50	7.9
NOV	04...	1445	1530	68	8.0	12.0	10.5	1.0	9.6
12417850 - SPOKANE RIVER AB HARBOR ISLAND NR COEUR D ALENE (LAT 47 41 49 LONG 116 51 32)									
JUN	10...	1030	7540	54	7.9	26.0	15.0	.80	9.8
AUG	26...	1030	895	62	7.8	18.0	19.0	.25	8.8
NOV	05...	1015	1550	66	8.2	9.5	10.0	.70	9.7
12417925 - SPOKANE RIVER BL HARBOR ISLAND NR POST FALLS ID (LAT 47 41 43 LONG 116 52 52)									
JUN	10...	1445	7920	51	--	17.5	15.0	1.1	9.4
AUG	26...	1600	1410	--	8.0	24.0	21.0	.50	8.0
NOV	05...	1330	1490	67	7.7	12.5	10.0	1.2	10.4
12418025 - SPOKANE RIVER BL BLACK BAY NR POST FALLS IDAHO (LAT 47 41 52 LONG 116 53 51)									
JUN	11...	1030	8130	54	8.0	19.5	13.0	1.0	9.7
AUG	27...	0900	1590	63	7.9	13.5	19.0	1.0	8.0
NOV	06...	1000	1770	67	8.1	9.5	10.0	.90	10.1
12418200 - SPOKANE RIVER AT FORD ROCK NR POST FALLS IDAHO (LAT 47 42 05 LONG 116 55 38)									
JUN	11...	1500	7950	54	7.5	24.0	14.0	.90	9.5
AUG	27...	1130	1660	63	8.1	16.5	19.0	1.0	8.2
NOV	06...	1300	1510	68	7.8	12.0	10.0	1.2	10.0
12418300 - SPOKANE RIVER AT CROSSING AT POST FALLS IDAHO (LAT 47 42 16 LONG 116 56 53)									
JUN	12...	0910	7360	53	7.7	16.5	14.0	1.1	9.2
AUG	28...	0945	1660	62	7.9	14.0	19.0	.50	8.5
NOV	07...	0915	1570	66	8.2	14.5	10.0	.80	10.0

Table 8. Water-quality data at seven cross-section locations in the Spokane River between Coeur d'Alene Lake and Post Falls Dam, June 1980 through November 1980--Continued

DATE	OXYGEN (IFMANI), CHEMICAL (HIGH LEVEL) (MG/L)	NITRO- GENE NITRATE TOTAL (MG/L AS N)	NITRO- GENE NITRITE TOTAL (MG/L AS N)	NITRO- GENE AMMONIA TOTAL (MG/L AS N)	NITRO- GENE ORGANIC TOTAL (MG/L AS N)	NITRO- GENE TOTAL (MG/L AS N)	PHOS- PHORUS, ORTHOPH TOTAL (MG/L AS P)	PHOS- PHORUS, ORTHOPH OSPHATE DISSOL. (MG/L AS P)	
12417650 - SPOKANE RIVER BL GIBBS NR COEUR D ALENE IDAHO (LAT 47 41 34 LONG 116 48 46)									
JUN 1980									
09...	21	0.00	0.00	0.04	0.13	0.17	0.020	0.01	0.00
AUG									
25...	--	.00	.00	.02	.38	.40	.030	.00	.00
NOV									
04...	--	.00	.00	.06	.65	.73	.010	.00	.00
12417725 - SPOKANE RIVER AT ATLAS NR COEUR D ALENE IDAHO (LAT 47 41 51 LONG 116 49 40)									
JUN 1980									
09...	5	.00	.01	.04	.18	.22	.040	.01	.01
AUG									
25...	--	.00	.01	.05	.34	.39	.060	.04	.01
NOV									
04...	--	.00	.00	.10	.90	1.0	.020	.01	.00
12417850 - SPOKANE RIVER AB HARBOR ISLAND NR COEUR D ALENE (LAT 47 41 49 LONG 116 51 32)									
JUN 1980									
10...	9	.00	.01	.02	.17	.19	.010	.01	.00
AUG									
26...	--	.00	.00	.06	.48	.54	.050	.01	.01
NOV									
05...	--	.00	.00	.12	.34	.46	.020	.01	.00
12417925 - SPOKANE RIVER BL HARBOR ISLAND NR POST FALLS ID (LAT 47 41 43 LONG 116 52 52)									
JUN 1980									
10...	10	.00	.01	.04	.14	.18	.010	.01	.01
AUG									
26...	--	.00	.00	.05	.55	.60	.030	.00	.00
NOV									
05...	--	.00	.00	.10	.39	.49	.020	.01	.00
12418025 - SPOKANE RIVER BL BLACK BAY NR POST FALLS IDAHO (LAT 47 41 52 LONG 116 53 51)									
JUN 1980									
11...	6	.05	.01	.02	.16	.24	.020	.01	.01
AUG									
27...	--	.00	.01	.04	.35	.39	.040	.01	.01
NOV									
06...	--	.00	.00	.10	.54	.64	.020	.01	.00
12418200 - SPOKANE RIVER AT FORD ROCK NR POST FALLS IDAHO (LAT 47 42 05 LONG 116 55 38)									
JUN 1980									
11...	8	.03	.01	.04	.33	.41	.010	.01	.00
AUG									
27...	--	.00	.00	.02	.30	.32	.020	.00	.00
NOV									
06...	--	.00	.00	.09	1.2	1.3	.020	.00	.00
12418300 - SPOKANE RIVER AT CROSSING AT POST FALLS IDAHO (LAT 47 42 16 LONG 116 56 53)									
JUN 1980									
12...	13	.00	.00	.04	.12	.16	.020	.01	.00
AUG									
28...	--	.03	.00	.03	.27	.33	.030	.00	.00
NOV									
07...	--	.00	.00	.10	.50	.60	.020	.01	.00

Table 9.--Nutrient, trace-metal, and heavy-metal concentrations of the Coeur d'Alene sewage-treatment plant effluent during the period March 1980 through January 1981 (Modified from Idaho Department of Health and Welfare, 1981)

[-- = no data available; < = less than]

Nutrient concentrations

Date	Flow (ft <sup>3</sup> /s)	Total phosphorus (mg/L)	Ortho- phosphorus (mg/L)	Total nitrogen (mg/L)
Jan. 16, 1980	2.32	7.63	6.85	--
Feb. 11, 1980	2.69	8.28	7.43	21.7
Mar. 12, 1980	2.61	6.90	6.85	--
Apr. 9, 1980	3.45	7.82	7.01	17.7
May 14, 1980	2.82	7.95	7.37	16.7
June 11, 1980	3.00	7.50	6.84	16.3
Aug. 12, 1980	3.28	6.85	6.29	15.1
Sep. 9, 1980	3.57	--	--	--
Oct. 1, 1980	2.83	7.11	7.14	18.9
Nov. 5, 1980	2.85	6.8	6.6	--
Average	2.94			



Table 9.--Nutrient, trace-metal, and heavy-metal concentrations of the Coeur d'Alene sewage-treatment plant effluent during the period March 1980 through January 1981--Continued

Trace-metal concentrations

Date	Flow (ft <sup>3</sup> /s)	Dissolved cadmium (µg/L)	Dissolved copper (µg/L)	Dissolved lead (µg/L)	Dissolved zinc (µg/L)
Jan. 15, 1980	2.32	<5	30	<50	120
Feb. 10, 1980	2.69	<5	30	<50	720
Mar. 11, 1980	2.61.	<5	40	--	460
Apr. 8, 1980	3.45	1.4	50	<50	180
May 14, 1980	2.82	<5	30	<50	152
June 10, 1980	3.00	<5	30	<50	123
Aug. 12, 1980	3.28	<1	30	<50	120
Sep. 8, 1980	3.57	-	--	--	--
Sep. 30, 1980	2.83	<1	40	<50	163
Nov. 4, 1980	2.85	-	--	--	--

Table 9.--Nutrient, trace-metal, and heavy-metal concentrations of the Coeur d'Alene sewage-treatment plant effluent during the period March 1980 through January 1981--Continued

Heavy-metal concentrations

Date	Total cadmium (µg/L)	Total copper (µg/L)	Total lead (µg/L)	Total silver (µg/L)	Total zinc (µg/L)	Total mercury (µg/L)
Jan. 15, 1980	<5	30	<50	2	120	<0.5
Feb. 10, 1980	<5	20	<50	4.4	770	3.5
Mar. 11, 1980	<5	30	--	3.8	340	1.1
Apr. 8, 1980	1.2	50	<50	7	170	<0.5
May 14, 1980	<5	30	<50	2.1	105	0.9
June 10, 1980	<5	30	<50	2.8	77	<0.5
Aug. 12, 1980	<1	20	<50	5.4	101	<0.5
Sep. 30, 1980	2.6	50	<50	4	128	<0.5

Table 10.--Vertical-profile data from cross sections

[-- = no data available]

Date	Time (24-hour)	Cross section, distance from left bank (ft)	Depth (ft)	Water temperature (°C)	Dissolved oxygen (mg/L)	Specific conductance (µmho/cm at 25°C)	pH (units)	
<u>12417650 Spokane River below Gibbs</u>								
June 9, 1980	1030	80	1	13.0				
			4	13.0				
			8	13.0			56	
			12	13.0				
			12.8 bottom	--				
235			1	14.0				
			5	13.5				
			10	13.5			54	7.9
			15	13.5				
			15.7 bottom	--				
455			1	14.5				
			5	14.5			56	
			6.0 bottom	--				
			1	19.0				
			5	19.0			61	
110	1100		10	19.0				
			13.9 bottom					
			1	19.0				
			5	18.5			62	8.0
			10	18.5				
230			15.8 bottom					
			1	19.0				
			5	19.0			63	
			10	19.0				
			12.1 bottom					
410			1	19.0				
			5	19.0				
			10	19.0				
			10.7 bottom					
			1	11.0				
105	1630		5	11.0				
			10	11.0				
			10.7 bottom					
			1	11.0				
			5	11.0			67	8.8
230			10	11.0				
			12.6 bottom					
			1	11.0				
			5	11.0				
			10	11.0				
395			1	11.0				
			5	11.0				
			9.2 bottom					
			1	11.0				
			5	11.0				

Table 10.--Vertical-profile data from cross sections--Continued

Date	Time (24-hour)	Cross section, distance from left bank (ft)	Depth (ft)	Water temperature (°C)	Dissolved oxygen (mg/L)	Specific conductance ( $\mu$ mho/cm at 25°C)	pH (units)
<u>12417725 Spokane River at Atlas</u>							
June 9, 1980	1530	30	1	15.0		55	
			5	15.0			
			9	15.0			
			10.7 bottom	--			
		215	1	15.0		56	7.5
			5	15.0			
			10	15.0			
			14	15.0			
			14.7 bottom	--			
		380	1	15.5		55	
			5	15.5			
			10	15.5			
			11.5 bottom	--			
Aug. 25, 1980	1530	100	1	19.5	7.8	62	
			5	19.5	8.0		
			10	19.0	8.0		
			14.2 bottom	19.0	8.0		
		200	1	19.5	7.8	62	8.0
			5	19.5	7.8		
			10	19.0	7.9		
			14.9 bottom	19.0	7.9		
		290	1	20.0	7.8	62	
			5	19.5	7.8		
			10	19.0	7.9		
			14.8 bottom	19.0	7.9		
Nov. 4, 1980	1445	125	1	10.5	9.7	68	8.0
			5	10.5	9.7		
			10	10.5	9.7		
			11.5 bottom	10.5	9.7		
		280	1	11.0	9.6	68	8.0
			5	11.0	9.6		
			10	10.5	9.6		
			11.3 bottom	10.5	9.6		
		390	1	10.5	9.4	68	8.0
			5	10.5	9.4		
			9.3 bottom	10.5	9.4		

Table 10.--Vertical-profile data from cross sections--Continued

Date	Time (24-hour)	Cross section, distance from left bank (ft)	Depth (ft)	Water temperature (°C)	Dissolved oxygen (mg/L)	Specific conductance (μmho/cm at 25°C)	pH (units)
<u>12417850 Spokane River above Harbor Island</u>							
June 10, 1980	1030	95	1	14.0	9.5	55	7.9
			5	14.0	10.0		
			10	14.5	10.0		
			10.5 bottom	--	--		
		295	1	14.5	9.6	54	7.9
			5	14.5	9.8		
			10	15.0	9.8		
			12.6 bottom	--	--		
		520	1	15.0	9.4	54	
			5	15.0	9.7		
			10	15.0	9.8		
			12.2 bottom	--	--		
Aug. 26, 1980	1030	90	1	18.5	8.9	62	
			5	19.0	8.9		
			9.1 bottom	19.0	8.9		
			1	19.0	8.8		
		340	5	19.0	8.8	62	7.8
			10	19.0	8.8		
			13.0 bottom	19.0	8.8		
			1	18.5	8.7		
		565	5	18.5	8.7	62	
			10	18.5	8.7		
			13.1 bottom	18.5	8.8		
			1	10.0	9.8		
Nov. 5, 1980	1015	175	5	10.0	9.8	66	8.2
			8.1 bottom	10.0	9.8		
			1	10.0	9.7		
			5	10.0	9.7		
		350	9.5 bottom	10.0	9.7	66	8.2
			1	10.0	9.6		
			5	10.0	9.6		
			9.5 bottom	10.0	9.6		
		525	1	10.0	9.6	66	8.2
			5	10.0	9.6		
			9.5 bottom	10.0	9.6		
			1	10.0	9.6		

Table 10.--Vertical-profile data from cross sections--Continued

Date	Time (24-hour)	Cross section, distance from left bank (ft)	Depth (ft)	Water temperature (°C)	Dissolved oxygen (mg/L)	Specific conductance ( $\mu$ mho/cm at 25°C)	pH (units)	
<u>12417925 Spokane River below Harbor Island</u>								
June 10, 1980	1445		1	15.0	9.7			
			5	15.0	8.5			
			107	10	15.0	8.2	51	
			15	15.0	7.6			
			18.7 bottom	15.0				
		302	1	15.0	9.6			
			5	15.0	9.0			
			10	15.0	8.2	48		
			15	14.5	7.6			
			19.7 bottom	14.5	5.4			
		497	1	15.0	9.4			
			5	15.0	9.4			
			5.8 bottom	15.0	9.4	55		
Nov. 5, 1980	1330	150	1	10.5	10.8			
			5	10.5	10.8			
			10	10.5	10.7			
			16.5 bottom	10.5	10.4			
		300	1	10.5	10.4			
			5	10.5	10.4			
			10	10.5	10.3			
			16.2 bottom	10.5	10.2	67		
		450	1	10.5	10.1			
			3.2 bottom	10.5	10.0			
							7.7	

Table 10.--Vertical-profile data from cross sections--Continued

Date	Time (24-hour)	Cross section, distance from left bank (ft)	Depth (ft)	Water temperature (°C)	Dissolved oxygen (mg/L)	Specific conductance (umho/cm at 25°C)	pH (units)	
<u>12418025 Spokane River below Black Bay</u>								
June 11, 1980	1030	60	1	13.0	9.8	54	7.9	
			5	13.0	9.0			
			10	13.0	8.4			
				10.6 bottom	--	--		
		200	1	13.0	10.0	54	8.0	
			5	13.0	10.0			
10	13.0		10.0					
15	13.0		8.8					
20	13.0		8.0					
25	13.0		7.6					
		27.5 bottom	--	--				
300			1	13.0	10.2	54		
			5	13.0	10.2			
			10	13.0	10.2			
			15	13.0	9.6			
			18	13.0	9.4			
					19.5 bottom			--
Aug. 27, 1980	0900	90	1	19.0	8.0	63		
			5	19.0	8.0			
			10	19.0	8.0			
				16.8 bottom	19.0	8.0		
		195	1	19.0	8.0	63	7.9	
			5	19.0	8.0			
10	19.0		8.0					
15	19.0		8.0					
20	19.0		8.0					
			27.2 bottom	19.0	8.0			
295			1	19.0	8.0	63		
			5	19.0	8.0			
			10	19.0	8.0			
			15	19.0	8.0			
			19.8 bottom	19.0	8.0			

Table 10.--Vertical-profile data from cross sections--Continued

Date	Time (24-hour)	Cross section, distance from left bank (ft)	Depth (ft)	Water temperature (°C)	Dissolved oxygen (mg/L)	Specific conductance (µmho/cm at 25°C)	pH (units)
<u>12418025 Spokane River below Black Bay--Continued</u>							
Nov. 6, 1980	1000	100	1	10.0	10.2	67	8.1
			5	10.0	10.2		
			10	10.0	10.2		
			15.1 bottom	10.0	10.0		
	200			1	10.0	10.2	
				5	10.0	10.2	
				10	10.0	10.2	
				15	10.0	10.2	
				20	10.0	10.1	
	300			24.9 bottom	10.0	10.0	
				1	10.0	10.0	
				5	10.0	10.0	
				10	10.0	10.0	
				15	10.0	10.0	
		17.3 bottom	10.0	9.9			



Table 10.--Vertical-profile data from cross sections--Continued

Date	Time (24-hour)	Cross section, distance from left bank (ft)	Depth (ft)	Water temperature (°C)	Dissolved oxygen (mg/L)	Specific conductance (µmho/cm at 25°C)	pH (units)
<u>12418200 Spokane River at Ford Rock</u>							
June 11, 1980	1500	95	1	14.0	9.0	54	7.7
			5	14.0	6.6		
			7	14.0	5.6		
			8.4 bottom	--			
	205	1	14.0	9.8			
		5	14.0	7.0			
		10	14.0	5.0			
		15	14.0	4.2			
		20	14.0	3.4			
		25	14.0	3.0			
27.1 bottom	--	--					
Aug. 27, 1980	1130	80	1	14.0	10.4	63	8.1
			5	14.0	9.4		
			10	14.0	7.4		
			15	14.0	6.8		
			20	14.0	6.6		
			25	14.0	6.6		
			30	14.0	6.6		
			35	14.0	6.6		
			38.0 bottom	--	--		
			320	1	19.0		
5	19.0	8.3					
8.6 bottom	19.0	8.4					
1	19.0	8.2					
5	19.0	8.2					
10	19.0	8.2					
15	19.0	8.2					
20	19.0	8.2					
25	19.0	8.2					
27.3 bottom	19.0	8.2					
320	1	19.0	8.2				
	5	19.0	8.2				
	10	19.0	8.2				
	15	19.0	8.2				
	20	19.0	8.2				
	25	19.0	8.2				
	30	19.0	8.1				
	37.5 bottom	19.0	8.1				

Table 10.--Vertical-profile data from cross sections--Continued

Date	Time (24-hour)	Cross section, distance from left bank (ft)	Depth (ft)	Water temperature (°C)	Dissolved oxygen (mg/L)	Specific conductance (µmho/cm at 25°C)	pH (units)
<u>12418200 Spokane River at Ford Rock--Continued</u>							
Nov. 6, 1980	1300	100	1	10.5	10.0		
			5	10.5	10.0		
			8.6 bottom	10.5	9.8		
	200		1	10.5	10.0		
			5	10.5	10.0		
			10	10.5	10.0		
			15	10.5	10.0		
			20	10.5	10.0		
			25.6 bottom	10.5	9.8		
	300		1	10.5	10.0		
			5	10.5	10.0		
			10	10.5	10.0		
			15	10.5	10.0		
			20	10.5	10.0		
			25	10.5	10.0		
			30	10.5	10.0		
			35.1 bottom	10.5	10.0		
						63	8.1

Table 10.--Vertical-profile data from cross sections--Continued

Date	Time (24-hour)	Cross section, distance from left bank (ft)	Depth (ft)	Water temperature (°C)	Dissolved oxygen (mg/L)	Specific conductance (µmho/cm at 25°C)	pH (units)
<u>12418300 Spokane River at bridge at Post Falls</u>							
June 12, 1980	0910	150	1	14.0	10.0	53	7.9
			5	14.0	9.5		
			10	14.0	9.4		
			12	14.0	9.4		
			13.2 bottom	--	--		
		380	1	14.0	10.0	54	7.7
			5	14.0	9.8		
			10	14.0	7.7		
			15	14.0	6.1		
			20	14.0	5.4		
		740	25	14.0	5.0	54	7.7
			25.9 bottom	--	--		
			1	14.5	10.0		
			5	14.5	8.4		
			10	14.5	6.4		
Aug. 28, 1980	0945	140	15	14.5	5.8	62	7.9
			20	14.5	5.6		
			23.0 bottom	--	--		
			1	19.0	8.6		
			5	19.0	8.6		
		380	10	19.0	8.6	62	7.9
			12 bottom	19.0	8.5		
			1	19.0	8.7		
			5	19.0	8.6		
			10	19.0	8.6		
		580	15	19.0	8.5	62	7.9
			20	19.0	8.5		
			25	19.0	8.5		
			28 bottom	19.0	8.5		
			1	19.0	8.5		
			5	19.0	8.5	62	7.9
			10	19.0	8.5		
			15	19.0	8.5		
			20	19.0	8.5		
			25 bottom	19.0	8.5		

Table 10.--Vertical-profile data from cross sections--Continued

Date	Time (24-hour)	Cross section, distance from left bank (ft)	Depth (ft)	Water temperature (°C)	Dissolved oxygen (mg/L)	Specific conductance (µmho/cm at 25°C)	pH (units)		
<u>12418300 Spokane River at bridge at Post Falls--Continued</u>									
Nov. 7, 1980	0915		1	10.0	10.0	10.0			
			5	10.0	10.0	10.0			
			10	10.0	10.0	10.0			
			15	10.0	10.0	10.0			
			20	10.0	10.0	10.0			
			25	10.0	10.0	10.0			
		29 bottom	10.0	10.0	10.0				
		450	1	10.0	10.0	10.0			
			5	10.0	10.0	10.0			
			10	10.0	10.0	10.0			
			15	10.0	10.0	10.0			
			20	10.0	10.0	10.0			
			24 bottom	10.0	10.0	10.0		66	
		650	1	10.0	10.0	10.0			
			5	10.0	10.0	10.0			
10	10.0		10.0	10.0					
11.3 bottom	10.0		10.0	10.0			8.2		