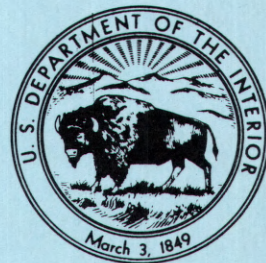


# 1976 Water-Quality Data in Bear Creek Basin, Medford, Oregon

---

U.S. GEOLOGICAL SURVEY  
Open-File Report 77-90



Prepared in cooperation with the  
ROUGE VALLEY COUNCIL OF GOVERNMENTS







# 1976 WATER-QUALITY DATA IN BEAR CREEK BASIN, MEDFORD, OREGON

By Stuart W. McKenzie and Loren A. Wittenberg

---

U.S. GEOLOGICAL SURVEY  
Open-File Report 77-90

Prepared in cooperation with the  
ROGUE VALLEY COUNCIL OF GOVERNMENTS



January 1977







UNITED STATES DEPARTMENT OF THE INTERIOR

Cecil D. Andrus, Secretary

GEOLOGICAL SURVEY

Vincent E. McKelvey, Director

---

For additional information write to:

U.S. Geological Survey  
P.O. Box 3202  
Portland, Oregon 97208







## CONTENTS

	Page
Abstract-----	1
Introduction-----	1
Basin description and sampling-site locations-----	2
Data collection-----	7
Sampling guidelines for the irrigation and drainage study-----	8
Sampling guidelines for the diel study-----	8
Equipment-----	8
Selected references-----	9
Water-quality data-----	10

## ILLUSTRATIONS

	Page
Figure 1. Map showing locations of irrigation and drainage sampling sites and diel sampling sites-----	5
2. Graphs showing diel fluctuations of water-quality parameters in Bear Creek at Kirtland Road near Central Point, August 23-24, 1976-----	43

## TABLES

	Page
Table 1. Locations of sampling sites for the irrigation and drainage study-----	3
2. Locations of sampling sites for the diel study-----	7
3. Data collected for the irrigation and drainage study-----	11
4. Data collected for the diel study-----	36
5. Specific conductance of Bear Creek and tributaries between South Valley View Road and Suncrest Road on September 3, 1976-----	44





## CONVERSION FACTORS

Factors for converting English units to the International System of Units (SI) are given below to four significant figures. However, in the text the metric equivalents are shown only to the number of significant figures consistent with the values for the English units.

<u>English</u>	<u>Multiply by</u>	<u>Metric (SI)</u>
miles (mi)	1.609	kilometers (km)
gallons (gal)	3.785	liters (l)
cubic feet per second ( $\text{ft}^3/\text{s}$ )	.02832	cubic meters per second ( $\text{m}^3/\text{s}$ )
feet (ft)	.3048	meters (m)



## 1976 WATER-QUALITY DATA IN BEAR CREEK BASIN, MEDFORD, OREGON

--

By Stuart W. McKenzie and Loren A. Wittenberg

--

### ABSTRACT

The U.S. Geological Survey, in cooperation with the Rogue Valley Council of Governments, is studying surface-water-quality problems and their causes in the Bear Creek basin of southwestern Oregon. Two specific areas of investigation include: measurements of the quality and quantity of water in the irrigation canals and drainage system and the diel (during a 24-hour period) variation of water-quality parameters in the main stem of Bear Creek. The irrigation and drainage study involves 25 sites in canals and natural drainageways. One hundred thirty-three samples were collected for analysis, and discharge was determined at the time of collection. The diel study includes six sites on Bear Creek. On August 23-24, four parameters were monitored at all six sites during a 24-hour period.

### INTRODUCTION

The U.S. Geological Survey, in cooperation with the Rogue Valley Council of Governments (RVCOG), is studying surface-water-quality problems and their causes in the Bear Creek basin. The study includes four elements, as follows:

1. Measurements of the quality and quantity of water in the irrigation canals and drainage system.
2. Determination of water-quality concentrations and loads in four specific areas in the basin resulting from storm-water runoff or combined-sewer overflow.
3. Intensive water-quality measurements in streams with suspected low dissolved oxygen (called the "diel study" in this report).
4. Determinations of the number of indicator bacteria in streams associated with areas where ground-water levels are high.

Each part of the investigation was planned to deal with potential water-quality problems identified by RVCOG. This report presents the data collected between March and November 1976 for the irrigation and drainage study and the



diel study (variation of water quality during a 24-hour period). The data in the report will be used to determine the need for further data collection during the summer of 1977. A second report, due in January 1978, will include (1) additional data collected during the summer of 1977 on the irrigation and drainage study and the diel study; (2) basic data concerning urban storm-water runoff and combined-sewer overflow; and (3) indicator bacteria. A final interpretive report will be prepared later in 1978.

#### BASIN DESCRIPTION AND SAMPLING-SITE LOCATIONS

Bear Creek, which begins at the junction of Neil and Emigrant Creeks 2 mi (3.2 km) east of Ashland, is 27 mi (43 km) long and flows northwestward. Bear Creek valley is approximately 2 mi (3 km) wide in the upper part and widens to about 8 mi (13 km) near the confluence of Bear Creek and the Rogue River. The valley is the most densely populated part in the Rogue River basin and includes the cities of Medford, Ashland, Jacksonville, Central Point, Talent, and Phoenix. Continued rapid urban expansion is expected in the Bear Creek valley.

Agriculture is one of the major sources of income in the Bear Creek valley. Agricultural production includes fruit (principally pears), livestock, grain, hay, grass-seed, and specialty crops. Because of the low precipitation during the growing season, irrigation is needed. The larger percentage of irrigated acreage has water applied by flooding and a smaller percentage by sprinkling. Parts of the basin have poor drainage, according to a report by the U.S. Soil Conservation Service (Latham, 1963).

The irrigation-distribution and drainage system in Bear Creek basin is complex. Within Bear Creek basin, irrigation water is supplied by Neil, Emigrant, Ashland, and Wagner Creeks, many smaller streams, and by Emigrant Reservoir. Irrigation water is also supplied from sources outside the basin, including Fish Lake, Howard Prairie Reservoir, and Hyatt Reservoir, via a system of canals, tunnels, and natural drainageways. Water is transported by gravity through interconnected irrigation systems operated by the Talent, Medford, and Rogue River Valley irrigation districts. Bear Creek, several small creeks, and canals are used to distribute water within each system and between the systems. Three major diversions of water are made from Bear Creek, and many more diversions are made from small tributaries of Bear Creek. The systems are becoming more complex as parcels of land are divided into small acreages for housing and the pursuit of farming as an avocation.

The locations and identification numbers of the 25 sites used in the irrigation and drainage study are shown in figure 1. These site numbers were assigned in a general down-canal order. Figure 1 also shows the locations of the six sites used in the diel study, with site numbers assigned in downstream order. These site numbers are used in tables 1 or 2, which list site names and locations of sampling sites determined from Geological Survey 15-minute topographic maps. The station numbers given for some sites are those assigned through the stream-gaging network operated by the Oregon Water Resources Department (OWRD).

Table 1.--Locations of sampling sites for the irrigation and drainage study

<u>Site no.</u>	<u>Station no.</u>	<u>Name and location</u>
1	14348500	Ashland lateral near Ashland (Green Springs powerplant), lat 42°07'20", long 122°32'55", in NE¼ sec. 2, T. 40 S., R. 2 E., Talent Irrigation District (TID).
2		Ashland lateral near downstream end, lat 42°11'05", long 122°42'45", in NW¼ sec. 16, T. 39 S., R. 1 E., TID.
3	14349500	East lateral at Emigrant Gap near Ashland, lat 42°09'50", long 122°36'10", in SE¼ sec. 20, T. 39 S., R. 2 E., TID.
4		Myers Creek at South Valley View Road, lat 42°14'05", long 122°44'25", in SE¼ sec. 30, T. 38 S., R. 1 E., return- flow site.
5		East lateral near downstream end at Barnett Road, lat 42°18'55", long 122°47'15", in NW¼ sec. 35, T. 37 S., R. 1 W., TID.
6		West lateral at Wagner Creek, lat 42°13'05", long 122°47'20", in SW¼ sec. 35, T. 38 S., R. 1 W., TID.
7	14352500	Talent lateral near Ashland, lat 42°13'10", long 122°43'20", in SE¼ sec. 32, T. 38 S., R. 1 E., TID.
8		East Low lateral near downstream end at Suncrest Road, lat 42°15'20", long 122°46'00", in NW¼ sec. 24, T. 38 S., R. 1 W., TID.
9		Talent lateral near downstream end at Knowles Road, lat 42°18'00", long 122°56'25", in NE¼ sec. 4, T. 38 S., R. 2 W., TID.
10	14346000	Medford Irrigation District (MID) Canal at Bradshaw Drop near Brownsboro, lat 42°26'50", long 122°44'20", in SW¼ sec. 8, T. 36 S., R. 1 E., MID.
11		Medford Canal at Fern Valley Road, lat 42°16'55", long 122°48'10", in NE¼ sec. 10, T. 38 S., R. 1 W., MID.
12		Payne Creek at Fern Valley Road and Medford Canal, lat 42°16'55", long 122°48'05", in NE¼ sec. 10, T. 38 S., R. 1 W., return-flow site.

Table 1.--Locations of sampling sites for the irrigation and drainage study--  
Continued

<u>Site no.</u>	<u>Station no.</u>	<u>Name and location</u>
13	14356500	Phoenix Canal at Talent, lat 42°15'10", long 122°47'30", in NW¼ sec. 23, T. 38 S., R. 1 W., MID.
14		Phoenix Canal upstream from Griffin Creek, lat 42°18'05", long 122°54'45", in NW¼ sec. 2, T. 38 S., R. 2 W., MID.
15		Phoenix Canal downstream from Griffin Creek, lat 42°18'05", long 122°54'50", in NE¼ sec. 3, T. 38 S., R. 2 W., MID.
16		Phoenix Canal at Jackson Creek, lat 42°19'15", long 122°57'25", in SE¼ sec. 29, T. 37 S., R. 2 W., MID.
17		Phoenix Canal at Old Military Road, lat 42°22'20", long 122°57'20", in NE¼ sec. 8, T. 37 S., R. 2 W., MID.
18	14346500	Rogue River Valley Canal at Bradshaw Drop near Brownsboro (Hopkins Canal), lat 42°26'55", long 122°44'20", in SW¼ sec. 8, T. 36 S., R. 1 E., Rogue River Valley Irrigation District (RRVID).
19		Dry Creek downstream from Agate Reservoir, lat 42°25'05", long 122°46'25", in SW¼ sec. 24, T. 36 S., R. 1 W. Discharge measured at Agate Dam spillway, lat 42°24'55", long 122°46'20", in SW¼ sec. 24, T. 36 S., R. 1 W., RRVID.
20		Hopkins Canal upstream from Lone Pine Creek, lat 42°21'30", long 122°51'15", in NW¼ sec. 17, T. 37 S., R. 1 W., RRVID.
21		Long Pine Creek near Crater Lake Avenue, Medford, lat 42°21'25", long 122°51'00", in NW¼ sec. 20, T. 37 S., R. 1 W., Medford municipal water supply bypass and return-flow site.
22		Hopkins Canal at Johnson Street, lat 42°20'40", long 122°51'40", in NE¼ sec. 19, T. 37 S., R. 1 W., RRVID.
23		Whetstone Creek at Kirtland Road, lat 42°25'50", long 122°54'50", in NE¼ sec. 22, T. 36 S., R. 2 W., return-flow site.
24	14358000	Bear Creek Canal at Medford, lat 42°19'55", long 122°52'15", in SW¼ sec. 19, T. 37 S., R. 1 W., RRVID.
25		Hopkins Canal at Scenic Avenue, lat 42°23'25", long 122°57'45", in SW¼ sec. 32, T. 36 S., R. 2 W., RRVID.



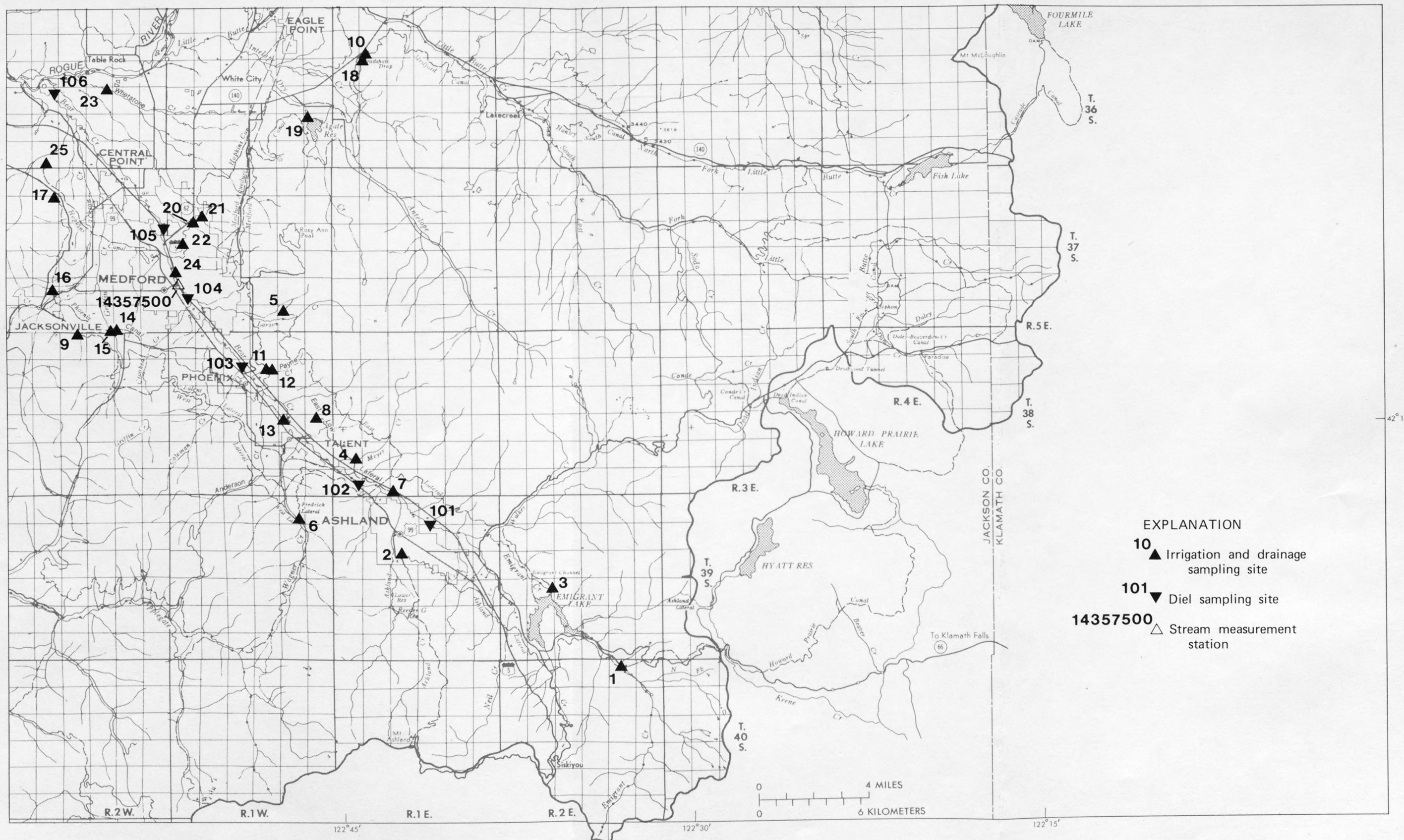


Figure 1.—Locations of irrigation and drainage sampling sites and diel sampling sites.



Table 2.--Location of sampling sites for the diel study

<u>Site no.</u>	<u>Name and location</u>
101	Bear Creek at Mountain Avenue near Ashland, lat 42°12'20", long 122°42'00", in SE¼ sec. 4, T. 39 S., R. 1 E.
102	Bear Creek at South Valley View Road near Talent, lat 42°13'20", long 122°44'25", in SE¼ sec. 31, T. 38 S., R. 1 E.
103	Bear Creek at Suncrest Road at Talent, lat 42°15'10", long 122°47'00", in NE¼ sec. 23, T. 38 S., R. 1 W.
104	Bear Creek at Barnett Road at Medford, lat 42°18'55", long 122°51'05", in NW¼ sec. 32, T. 37 S., R. 1 W.
105	Bear Creek at Table Rock Road near Medford, lat 42°21'55", long 122°53'05", in SW¼ sec. 12, T. 37 S., R. 2 W.
106	Bear Creek at Kirtland Road near Central Point, lat 42°25'40", long 122°57'25", in NE¼ sec. 20, T. 36 S., R. 2 W.

---

#### DATA COLLECTION

All data were collected using standard procedures of the U.S. Geological Survey and the American Public Health Association and others (1975). Reference to these methods can be found in the section, "Selected References." Sampling guidelines and equipment particular to this study are explained in the following sections.



## Sampling Guidelines for the Irrigation and Drainage Study

The objective of the irrigation and drainage study was to monitor flow and water quality of irrigation canals and return-flow streams. Baseline sampling began in March 1976, prior to the regular irrigation season. Regular monitoring was started at 24 sites in May and was continued until the first of October. One sampling site, upstream from a division of water, provides the water-quality data for the two canals downstream, thus making a total of 25 sites with water-quality information. Baseline data were again collected in either October or November.

Fieldwork at each site included measurement of stream discharge, temperature, dissolved oxygen, pH, and specific conductance, and collection of samples for determination of turbidity, suspended-sediment concentration, chemical constituents, and indicator bacteria. Chemical analyses of the samples were made by the U.S. Geological Survey central laboratory. Suspended-sediment analyses were made by the Oregon District of the Survey.

## Sampling Guidelines for the Diel Study

The objective of the diel study was to determine if there was a dissolved-oxygen-concentration problem in Bear Creek. Six sites were chosen for the study due to the many diversions on Bear Creek. The Bear Creek at Kirtland Road near Central Point site was monitored a second time.

Field measurements of temperature, dissolved oxygen, pH, and specific conductance were obtained at approximately 2-hour intervals from 6 a.m. to 8 p.m. and at least twice during the nighttime hours. Discharge was measured once during the daylight hours at each site and change in stage noted at the time of each site visit. Samples for turbidity, suspended sediment, and chemical analysis were collected during the day. Chemical analyses of the samples were made by the Oregon Department of Environmental Quality.

## Equipment

Discharge-measuring equipment.--Price AA type current meter--/ and Price pygmy meter, with appropriate equipment, were used for making discharge measurements. Measurements are considered to be within 10 percent accuracy unless otherwise indicated.

Depth-integrating sampler.--A manually operated depth-integrating suspended-sediment sampler was used to collect water samples for turbidity, suspended-sediment concentration, and chemical analyses. This sampler, US DH-48TM, a wading-type hand sampler, is equipped with a silicone-rubber gasket and Teflon nozzle and uses pint glass containers.

---

/ The use of brand names in this report is for identification purposes only and does not imply endorsement by the U.S. Geological Survey.

Turbidimeter.--A Hack Model 2100A turbidimeter at the Medford U.S. Geological Survey laboratory was used. Turbidities of more than 40 JTU's (Jackson turbidity units) were diluted to obtain reliable readings.

Bacteriological filtration equipment.--A Millipore membrane filter kit, utilizing a 0.45-micron filter, was used in the Medford U.S. Geological Survey laboratory. M-FC and M-enterococcus agars were used for the fecal coliform and fecal streptococcus determinations, respectively. Samples that did not have one or a combination of filters with a colony count between the ideal of 20 to 60 for fecal coliform or 20 to 100 for fecal streptococcus are reported with the remark "B."

#### SELECTED REFERENCES

- American Public Health Association and others, 1975, Standard methods for the examination of water and wastewater, 14th ed.: American Public Health Assoc., Washington, D. C., 1193 p.
- Brown, Eugene, Skougstad, M. W., and Fishman, M. J., 1970, Methods for collection and analysis of water samples for dissolved minerals and gases: U.S. Geol. Survey Techniques Water-Resources Inv., book 5, chap. A1, 160 p.
- Buchanan, T. J., and Somers, W. P., 1969, Discharge measurements at gaging stations: U.S. Geol. Survey Techniques Water-Resources Inv., book 3, chap. A8, 65 p.
- Guy, H. P., 1969, Laboratory theory and methods for sediment analysis: U.S. Geol. Survey Techniques Water-Resources Inv., book 5, chap. C1, 58 p.
- Hines, W. G., McKenzie, S. W., Rickert, D. A., and Rinella, F. A., 1976, Dissolved-oxygen regimen of the Willamette River, Oregon, under conditions of basinwide secondary treatment: U.S. Geol. Survey Circ. 715-I (in review).
- Latham, F. H., 1963, The Bear Creek valley drainage investigation: U.S. Soil Conservation Service, 37 p.
- Oregon Department of Environmental Quality, 1976, State-wide water quality management plan, beneficial uses, policies, standards, and treatment criteria for Oregon, volume 1: Portland, Oreg., 237 p.
- Slack, K. V., Averett, R. C., Greeson, P. E., and Lipscomb, R. G., 1973, Methods for collection and analysis of aquatic biological and microbiological samples: U.S. Geol. Survey Techniques Water-Resources Inv., book 5, chap. A4, 165 p.
- U.S. Environmental Protection Agency, 1974, Methods for chemical analysis of water and wastes: Cincinnati, Ohio, National Environmental Research Center, 298 p.

## WATER-QUALITY DATA

Data collected for the irrigation and drainage study are tabulated in table 3. The table is organized in a sequential site-number order. Remarks are used to describe information about the sites or anomalies in the data. If there was no water to sample at the time the site was visited, "0" is used to indicate no flow.

Data collected for the diel study are tabulated in table 4. The table is organized first in a sequential site-number order and secondly in chronological order. Remarks are used to report discharge, stage fluctuations, and weather conditions during the study. Figure 2 is a graphical display of some of the diel-study data.

On September 3, a followup study of specific conductance was done on that part of Bear Creek between South Valley View Road and Suncrest Road. The objective was to determine the cause of the increase in conductivity between the two sites. Table 5 is a log of this walking tour, listing temperature and specific-conductance measurements of streams and seeps into Bear Creek, of ponds alongside the creek, and of intermediate points within Bear Creek. Estimates of discharges into Bear Creek are also listed.



Table 3.--Data collected for the irrigation and drainage study

[Bacteriological samples that did not have one or a combination of filters with a colony count between the ideal of 20 to 60 for fecal coliform or 20 to 200 for fecal streptococcus are reported with the remark "B"]

Site number and name: 1 - Ashland lateral near Ashland (Sta. No. 14348500)

Remarks: At Green Springs powerplant. Gaging station operated by and discharge measurements supplied by Oregon Water Resources Department (OWRD)

Date sampled (1976)	3/24	5/5	7/1	7/29	9/1	9/22	10/21
Time (2400 hours)	--	1300	1300	1300	0850	0825	--
Discharge (ft <sup>3</sup> /s)	0	11	26	30	26	37	0
Temperature (°C)	--	10.0	15.0	18.5	17.5	15.5	--
Dissolved oxygen (mg/l)	--	10.6	9.9	9.0	9.3	9.5	--
pH (units)	--	7.9	7.0	--	--	8.0	--
Turbidity (JTU)	--	8	3	4	7	6	--
Suspended sediment (mg/l)	--	12	3	18	13	13	--
Specific conductance (micromhos/cm at 25°C)	--	95	52	71	82	86	--
Dissolved solids (mg/l)	--	65	--	62	59	41	--
Dissolved nitrate plus nitrite as N (mg/l)	--	.14	--	.07	.01	.11	--
Dissolved orthophosphate as P (mg/l)	--	.01	--	.01	.03	.00	--
Fecal coliform (count/ 100 ml)	--	9B	12B	10B	15B	4B	--
Fecal streptococci (count/100 ml)	--	10B	--	80	--	90	--

Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 2 - Ashland lateral near downstream end

Remarks: Concrete-lined canal at measuring site.

Date sampled (1976)	3/24	5/5	7/6	7/29	9/1	9/22	10/21
Time (2400 hours)	--	1515	1220	1220	1030	1100	--
Discharge (ft <sup>3</sup> /s)	0	1.14	.61	1.06	.83	<u>1</u> /1	0
Temperature (°C)	--	17.0	21.0	22.0	20.0	17.5	--
Dissolved oxygen (mg/l)	--	9.3	9.6	9.7	8.9	9.7	--
pH (units)	--	8.2	7.9	--	--	8.6	--
Turbidity (JTU)	--	15	6	6	5	4	--
Suspended sediment (mg/l)	--	95	6	9	11	6	--
Specific conductance (micromhos/cm at 25°C)	--	92	78	75	85	95	--
Dissolved solids (mg/l)	--	62	--	64	59	46	--
Dissolved nitrate plus nitrite as N (mg/l)	--	.04	--	.00	.01	.01	--
Dissolved orthophosphate as P (mg/l)	--	.02	--	.01	.03	.00	--
Fecal coliform (count/ 100 ml)	--	96	68B	84	58B	42B	--
Fecal streptococci (count/100 ml)	--	110	--	320	--	600	--

See footnote at end of table.

Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 3 - East lateral at Emigrant Gap near Ashland  
(Sta. No. 14349500)

Remarks: Canal is monitored 200 ft downstream from Emigrant Dam outlet.  
Oregon Water Resources Department supplied discharges.

Date sampled (1976)	3/24	5/5	7/1	7/28	9/1	9/22	10/21
Time (2400 hours)	--	1340	1400	1240	0940	0915	--
Discharge (ft <sup>3</sup> /s)	0	95	140	144	136	58	0
Temperature (°C)	--	9.0	11.5	15.5	19.0	18.0	--
Dissolved oxygen (mg/l)	--	11.4	11.1	10.1	9.0	8.8	--
pH (units)	--	7.4	7.4	--	--	7.9	--
Turbidity (JTU)	--	15	8	11	12	18	--
Suspended sediment (mg/l)	--	6	4	21	8	20	--
Specific conductance (micromhos/cm at 25°C)	--	125	95	113	120	117	--
Dissolved solids (mg/l)	--	77	--	88	93	67	--
Dissolved nitrate plus nitrite as N (mg/l)	--	.16	--	.09	.01	.16	--
Dissolved orthophosphate as P (mg/l)	--	.01	--	.02	3.4	.02	--
Fecal coliform (count/ 100 ml)	--	< 3	< 3	< 1	< 3	8B	--
Fecal streptococci (count/100 ml)	--	< 4	< 3	--	--	35B	--

Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 4 - Myers Creek at South Valley View Road

Remarks: Return flow site. Agricultural area only.

Date sampled (1976)	3/24	5/5	7/6	8/2	9/1	9/22	10/21
Time (2400 hours)	1230	1600	1000	0945	1200	1415	1045
Discharge (ft <sup>3</sup> /s)	.27	.63	3.69	2.62	1.48	1.3	.28
Temperature (°C)	10.0	15.5	14.5	16.5	20.0	17.5	11.0
Dissolved oxygen (mg/l)	14.1	9.7	9.8	9.1	8.2	8.8	10.0
pH (units)	8.2	8.1	7.7	7.6	7.9	8.4	8.3
Turbidity (JTU)	2	12	14	5	9	5	1
Suspended sediment (mg/l)	30	19	32	9	20	11	15
Specific conductance (micromhos/cm at 25°C)	484	289	242	390	298	393	436
Dissolved solids (mg/l)	291	169	--	268	193	236	349
Dissolved nitrate plus nitrite as N (mg/l)	.07	.14	--	.30	.20	.39	.61
Dissolved orthophosphate as P (mg/l)	.03	.01	--	.06	.06	.02	.06
Fecal coliform (count/ 100 ml)	--	340	1800B	1100	2900B	630	840
Fecal streptococci (count/100 ml)	52	220	2800B	--	8900	--	150



Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 5 - East lateral near downstream end at Barnett Road

Remarks: Very little return flow into canal over entire length.

Date sampled (1976)	3/25	5/6	7/8	8/3	9/7	9/27	10/21
Time (2400 hours)	--	1300	1300	1210	1400	1045	--
Discharge (ft <sup>3</sup> /s)	0	7.48	2.00	.15	13.0	9.34	0
Temperature (°C)	--	14.5	23.5	25.0	20.0	17.0	--
Dissolved oxygen (mg/l)	--	10.8	10.1	10.2	9.6	9.2	--
pH (units)	--	8.5	8.3	8.8	8.1	8.5	--
Turbidity (JTU)	--	36	21	17	22	28	--
Suspended sediment (mg/l)	--	46	34	18	25	48	--
Specific conductance (micromhos/cm at 25°C)	--	164	125	118	132	118	--
Dissolved solids (mg/l)	--	93	--	79	73	69	--
Dissolved nitrate plus nitrite as N (mg/l)	--	.02	--	.01	.07	.08	--
Dissolved orthophosphate as P (mg/l)	--	.01	--	.03	.03	.01	--
Fecal coliform (count/ 100 ml)	--	120	740	250	210	130B	--
Fecal streptococci (count/100 ml)	--	180	1000	--	480	--	--

Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 6 - West lateral at Wagner Creek

Remarks: Wagner Creek water was not being diverted into canal during monitoring visits.

Date sampled (1976)	3/24	5/6	7/7	7/29	9/7	9/23	10/22
Time (2400 hours)	--	0925	1010	1100	1000	1120	--
Discharge (ft <sup>3</sup> /s)	0	13.6	29.4	32.8	26.6	17.4	0
Temperature (°C)	--	8.0	12.5	16.5	16.5	16.5	--
Dissolved oxygen (mg/l)	--	12.0	10.9	10.6	9.5	9.6	--
pH (units)	--	8.1	7.5	--	7.7	8.4	--
Turbidity (JTU)	--	29	23	21	21	21	--
Suspended sediment (mg/l)	--	47	42	32	37	59	--
Specific conductance (micromhos/cm at 25°C)	--	125	92	117	123	117	--
Dissolved solids (mg/l)	--	77	--	87	75	64	--
Dissolved nitrate plus nitrite as N (mg/l)	--	.02	--	.03	.09	.09	--
Dissolved orthophosphate as P (mg/l)	--	.01	--	.03	.03	.06	--
Fecal coliform (count/ 100 ml)	--	160	--	230	210	210	--
Fecal streptococci (count/100 ml)	--	70B	60B	160	--	200B	--

Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 7 - Talent lateral near Ashland (Sta. No. 14352500)

Remarks: Water was diverted from Bear Creek at Oak St. near Ashland.  
Discharges obtained from Oregon Water Resources Department.

Date sampled (1976)	3/24	5/5	7/6	7/28	8/31	9/22	10/22
Time (2400 hours)	--	1435	1330	1150	1305	1135	--
Discharge (ft <sup>3</sup> /s)	0	31	39	31	14	26	0
Temperature (°C)	--	15.0	18.5	19.5	22.0	16.5	--
Dissolved oxygen (mg/l)	--	9.9	10.1	9.6	9.1	9.8	--
pH (units)	--	8.3	8.0	--	7.6	7.7	--
Turbidity (JTU)	--	12	11	11	9	8	--
Suspended sediment (mg/l)	--	14	19	27	12	13	--
Specific conductance (micromhos/cm at 25°C)	--	185	158	162	206	211	--
Dissolved solids (mg/l)	--	119	--	112	128	117	--
Dissolved nitrate plus nitrite as N (mg/l)	--	.06	--	.06	.06	.13	--
Dissolved orthophosphate as P (mg/l)	--	.05	--	.06	.06	.04	--
Fecal coliform (count/ 100 ml)	--	400	640	300	1100	2500	--
Fecal streptococci (count/100 ml)	--	160	2300	--	3600	--	--



Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 8 - East low lateral near downstream end at Suncrest Road.

Remarks: Agricultural area only. Samples taken when irrigation was underway. Site was visited at least 7 times throughout study, usually with no flow present.

Date sampled (1976)	7/7	8/2	9/1
Time (2400 hours)	1350	1030	1250
Discharge (ft <sup>3</sup> /s)	2.76	2.14	1.19
Temperature (°C)	18.0	18.5	22.0
Dissolved oxygen (mg/l)	8.8	8.3	9.9
pH (units)	7.7	7.7	8.2
Turbidity (JTU)	14	13	11
Suspended sediment (mg/l)	14	58	13
Specific conductance (micromhos/cm at 25°C)	239	226	304
Dissolved solids (mg/l)	--	171	199
Dissolved nitrate plus nitrite as N (mg/l)	--	.86	.28
Dissolved orthophosphate as P (mg/l)	--	.18	.09
Fecal coliform (count/ 100 ml)	>10,000	730	3400B
Fecal streptococci (count/100 ml)	6700B	--	8000B

Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 9 - Talent lateral near downstream end at Knowles Road.

Remarks: Water at this site was ponded by diversion box. Flow measurement not attempted on some visits due to sluggish flow conditions.

Date sampled (1976)	3/24	5/5	6/30	7/27	8/31	9/21	10/22
Time (2400 hours)	--	1045	1230	1220	1020	1430	--
Discharge (ft <sup>3</sup> /s)	0	1.05	.57	--	--	<u>1</u> /3	0
Temperature (°C)	--	13.5	17.0	22.0	22.0	21.5	--
Dissolved oxygen (mg/l)	--	11.4	10.1	10.5	10.4	9.1	--
pH (units)	--	8.3	7.9	--	7.6	8.1	--
Turbidity (JTU)	--	16	12	12	18	17	--
Suspended sediment (mg/l)	--	18	28	35	15	64	--
Specific conductance (micromhos/cm at 25°C)	--	251	150	181	178	172	--
Dissolved solids (mg/l)	--	147	--	123	114	96	--
Dissolved nitrate plus nitrite as N (mg/l)	--	.01	--	.07	.01	.07	--
Dissolved orthophosphate as P (mg/l)	--	.01	--	.05	.05	.01	--
Fecal coliform (count/ 100 ml)	--	230	1600B	290	320	110	--
Fecal streptococci (count/100 ml)	--	100	3900B	--	2000	--	--

See footnote at end of table.

Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 10 - Medford Irrigation District Canal at Bradshaw  
Drop near Brownsboro (Sta. No. 14346000)

Remarks: Data for this site are same as for site 18 except for discharge.  
Flow data supplied by Oregon Water Resources Department.

Date sampled (1976)	3/22	5/3	6/29	7/26	8/30	9/20	10/21
Time (2400 hours)	1500	1500	0845	1020	0930	1300	--
Discharge (ft <sup>3</sup> /s)	13	24	50	52	44	37	0
Temperature (°C)	9.0	14.5	16.5	22.0	17.0	16.0	--
Dissolved oxygen (mg/l)	10.0	11.3	9.5	9.2	9.3	10.3	--
pH (units)	6.8	7.7	7.0	--	7.8	8.6	--
Turbidity (JTU)	12	17	4	7	6	3	--
Suspended sediment (mg/l)	35	28	21	41	28	32	--
Specific conductance (micromhos/cm at 25°C)	94	72	66	68	87	102	--
Dissolved solids (mg/l)	73	58	--	66	77	66	--
Dissolved nitrate plus nitrite as N (mg/l)	.01	.01	--	.08	.01	.12	--
Dissolved orthophosphate as P (mg/l)	.04	.02	--	.09	.04	.03	--
Fecal coliform (count/ 100 ml)	84	76	440	1000	340	2100	--
Fecal streptococci (count/100 ml)	48	28	--	1200	--	550	--



Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 11 - Medford Irrigation District Canal at Fern Valley Road

Remarks: Agricultural and urban development along canal. Difficult to measure discharge accurately because of deep mud on bottom and strands of algae clogging meter.

Date sampled (1976)	3/23	5/6	7/7	8/2	9/7	9/23	10/22
Time (2400 hours)	--	1040	1230	1250	1300	1245	--
Discharge (ft <sup>3</sup> /s)	0	<u>1</u> /50	17.2	56.2	27.4	11.0	0
Temperature (°C)	--	12.5	21.0	21.5	19.0	17.5	--
Dissolved oxygen (mg/l)	--	11.1	8.5	8.5	9.6	11.4	--
pH (units)	--	8.3	7.1	7.8	7.7	8.6	--
Turbidity (JTU)	--	35	22	17	43	18	--
Suspended sediment (mg/l)	--	64	42	49	28	25	--
Specific conductance (micromhos/cm at 25°C)	--	127	117	141	128	152	--
Dissolved solids (mg/l)	--	129	--	113	87	87	--
Dissolved nitrate plus nitrite as N (mg/l)	--	.01	--	.20	.04	.02	--
Dissolved orthophosphate as P (mg/l)	--	.02	--	.09	.06	.02	--
Fecal coliform (count/ 100 ml)	--	600	>10,000	580	1700	200B	--
Fecal streptococci (count/100 ml)	--	560	--	3400	--	1600	--

See footnote at end of table.

Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 12 - Payne Creek at Fern Valley Road and Medford  
Irrigation District Canal

Remarks: Return-flow site; agricultural and urban use.

Date sampled (1976)	3/24	5/6	7/7	8/2	9/7	9/23	10/21
Time (2400 hours)	--	1045	1235	1100	1145	1240	1130
Discharge (ft <sup>3</sup> /s)	0	1.50	.16	8.44	3.50	1.56	.19
Temperature (°C)	--	11.0	17.0	17.5	17.0	17.5	10.5
Dissolved oxygen (mg/l)	--	10.1	7.1	8.9	8.8	8.5	9.5
pH (units)	--	8.0	6.9	7.6	7.8	8.1	8.2
Turbidity (JTU)	--	38	21	27	22	82	2
Suspended sediment (mg/l)	--	51	35	98	86	380	9
Specific conductance (micromhos/cm at 25°C)	--	176	249	169	215	230	460
Dissolved solids (mg/l)	--	113	--	121	134	127	369
Dissolved nitrate plus nitrite as N (mg/l)	--	.04	--	.15	.20	.30	.72
Dissolved orthophosphate as P (mg/l)	--	.05	--	.04	.06	.01	.06
Fecal coliform (count/ 100 ml)	--	2000B	>10,000	670	3600	2400	1900
Fecal streptococci (count/100 ml)	--	2900B	1600	--	5000	--	1300

Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 13 - Phoenix Canal at Talent (Sta. No. 14356500)

Remarks: Sampling site is 0.4 mile downstream from Suncrest Road. Flow information supplied by Oregon Water Resources Department.

Date sampled (1976)	3/25	5/6	7/2	7/28	8/31	9/22	11/02
Time (2400 hours)	--	1020	1245	1130	1340	1320	--
Discharge (ft <sup>3</sup> /s)	0	16	54	54	30	24	0
Temperature (°C)	--	10.0	19.0	20.5	24.0	19.0	--
Dissolved oxygen (mg/l)	--	10.8	9.3	9.2	9.2	9.0	--
pH (units)	--	8.0	8.1	--	7.4	8.3	--
Turbidity (JTU)	--	14	21	11	11	7	--
Suspended sediment (mg/l)	--	28	40	71	38	15	--
Specific conductance (micromhos/cm at 25°C)	--	173	197	212	273	261	--
Dissolved solids (mg/l)	--	112	--	147	168	158	--
Dissolved nitrate plus nitrite as N (mg/l)	--	.24	--	.39	.77	.91	--
Dissolved orthophosphate as P (mg/l)	--	.09	--	.19	.44	.29	--
Fecal coliform (count/ 100 ml)	--	320	390	140	610	330	--
Fecal streptococci (count/100 ml)	--	120	--	920	--	1100	--



Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 14 - Phoenix Canal upstream from Griffin Creek

Remarks: Site located at South Stage Road. Water in Griffin Creek is largely return flow from Talent Canal. Phoenix Canal was monitored upstream (site #14) and downstream (site #15).

Date sampled (1976)	3/23	5/5	7/2	7/28	8/31	9/23	11/02
Time (2400 hours)	1030	0930	1000	1030	1145	1040	1200
Discharge (ft <sup>3</sup> /s)	2.05	19.9	39.8	33.6	29.6	35.8	14.5
Temperature (°C)	10.0	12.5	15.5	20.0	21.0	16.0	12.0
Dissolved oxygen (mg/l)	8.2	9.3	9.8	9.2	8.8	9.5	10.4
pH (units)	7.7	7.9	7.6	--	7.4	8.3	7.9
Turbidity (JTU)	6	36	18	18	18	11	6
Suspended sediment (mg/l)	18	65	51	68	23	20	2
Specific conductance (micromhos/cm at 25°C)	168	196	228	242	295	236	--
Dissolved solids (mg/l)	129	125	--	158	149	140	221
Dissolved nitrate plus nitrite as N (mg/l)	.01	.24	--	.84	.71	.63	1.4
Dissolved orthophosphate as P (mg/l)	.08	.08	--	.21	.21	.18	.69
Fecal coliform (count/ 100 ml)	--	1100B	680	1400	2400	870	2800B
Fecal streptococci (count/100 ml)	37	370	--	4600	--	980	590B

Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 15 - Phoenix Canal downstream from Griffin Creek

Remarks: See Site No. 14 remarks.

Date sampled (1976)	3/23	5/5	7/2	7/28	8/31	9/23	11/2
Time (2400 hours)	--	0945	1100	1040	1115	1020	--
Discharge (ft <sup>3</sup> /s)	0	29.8	--	36.5	30.6	39.6	0
Temperature (°C)	--	12.5	16.0	20.0	21.5	16.0	--
Dissolved oxygen (mg/l)	--	9.4	9.3	9.2	9.1	9.3	--
pH (units)	--	7.9	7.5	--	7.6	8.2	--
Turbidity (JTU)	--	29	16	18	15	12	--
Suspended sediment (mg/l)	--	63	45	40	30	24	--
Specific conductance (micromhos/cm at 25°C)	--	195	205	236	246	222	--
Dissolved solids (mg/l)	--	125	--	159	137	128	--
Dissolved nitrate plus nitrite as N (mg/l)	--	.22	--	.86	.81	.41	--
Dissolved orthophosphate as P (mg/l)	--	.07	--	.29	.26	.09	--
Fecal coliform (count/ 100 ml)	--	920	580	1600	1300	490	--
Fecal streptococci (count/100 ml)	--	450	1150	--	3400	--	--

Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 16 - Phoenix Canal at Jackson Creek

Remarks: Site located at canal culvert under Highway 238 near Jacksonville.  
Jackson Creek added no flow over period of monitoring.

Date sampled (1976)	3/24	5/4	6/30	7/27	8/31	9/21	10/22
Time (2400 hours)	--	1130	1130	1340	0930	1350	--
Discharge (ft <sup>3</sup> /s)	0	19.9	22.3	11.6	20.2	33.0	0
Temperature (°C)	--	13.5	17.0	25.0	21.5	18.5	--
Dissolved oxygen (mg/l)	--	10.4	9.1	13.1	8.7	10.8	--
pH (units)	--	8.2	7.8	--	7.0	8.7	--
Turbidity (JTU)	--	32	16	17	13	11	--
Suspended sediment (mg/l)	--	65	83	39	19	28	--
Specific conductance (micromhos/cm at 25°C)	--	205	195	226	230	208	--
Dissolved solids (mg/l)	--	119	--	163	144	125	--
Dissolved nitrate plus nitrite as N (mg/l)	--	.01	--	.91	.75	.33	--
Dissolved orthophosphate as P (mg/l)	--	.03	--	.23	.20	.10	--
Fecal coliform (count/ 100 ml)	--	360	940	700	1730	220	--
Fecal streptococci (count/100 ml)	--	380	--	2800	--	1000	--

Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 17 - Phoenix Canal at old Military Road

Remarks: End of Phoenix Canal.

Date sampled (1976)	3/24	5/4	7/2	8/2	9/7	9/21	10/22
Time (2400 hours)	--	0945	0910	1310	0900	1300	--
Discharge (ft <sup>3</sup> /s)	0	2.15	3.18	5.88	3.55	2.01	0
Temperature (°C)	--	13.5	16.0	23.0	15.0	20.0	--
Dissolved oxygen (mg/l)	--	9.8	9.7	12.4	9.3	11.9	--
pH (units)	--	7.9	7.6	8.6	7.7	9.0	--
Turbidity (JTU)	--	26	21	14	22	12	--
Suspended sediment (mg/l)	--	41	38	31	--	20	--
Specific conductance (micromhos/cm at 25°C)	--	205	179	222	222	215	--
Dissolved solids (mg/l)	--	129	--	166	134	123	--
Dissolved nitrate plus nitrite as N (mg/l)	--	.01	--	.80	.32	.38	--
Dissolved orthophosphate as P (mg/l)	--	.02	--	.15	.13	.24	--
Fecal coliform (count/ 100 ml)	--	310	840	1000	1100	420	--
Fecal streptococci (count/100 ml)	--	420	1500	--	1500	--	--



Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 18 - Rogue River Valley Canal at Bradshaw Drop near Brownsboro (Sta. No. 14346500)

Remarks: (Hopkins Canal). See remarks for site #10.

Date sampled (1976)	3/22	5/3	6/29	7/26	8/30	9/20	10/21
Time (2400 hours)	--	1500	0845	1020	0930	1300	--
Discharge (ft <sup>3</sup> /s)	0	.7	23	34	17	1.8	0
Temperature (°C)	--	14.5	16.5	22.0	17.0	16.0	--
Dissolved oxygen (mg/l)	--	11.3	9.5	9.2	9.3	10.3	--
pH (units)	--	7.7	7.0	--	7.8	8.6	--
Turbidity (JTU)	--	17	4	7	6	3	--
Suspended sediment (mg/l)	--	28	21	41	28	32	--
Specific conductance (micromhos/cm at 25°C)	--	72	66	68	87	102	--
Dissolved solids (mg/l)	--	58	--	66	77	66	--
Dissolved nitrate plus nitrite as N (mg/l)	--	.01	--	.08	.01	.12	--
Dissolved orthophosphate as P (mg/l)	--	.02	--	.09	.04	.03	--
Fecal coliform (count/ 100 ml)	--	76	440	1000	340	2100	--
Fecal streptococci (count/100 ml)	--	28	--	1200	--	550	--

Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 19 - Dry Creek below Agate Reservoir

Remarks: Flow information obtained from meter in Agate Dam. (venturi weir).

Date sampled (1976)	3/24	5/3	6/29	7/26	8/30	9/20	10/21
Time (2400 hours)	--	1545	1010	1120	1010	1330	--
Discharge (ft <sup>3</sup> /s)	0	15.8	29.0	25.5	27.0	12.0	0
Temperature (°C)	--	18.0	15.5	19.5	19.5	20.0	--
Dissolved oxygen (mg/l)	--	7.8	8.6	6.8	8.2	8.2	--
pH (units)	--	8.2	7.1	--	7.7	8.8	--
Turbidity (JTU)	--	19	8	11	7	7	--
Suspended sediment (mg/l)	--	14	8	11	5	17	--
Specific conductance (micromhos/cm at 25°C)	--	145	102	114	112	116	--
Dissolved solids (mg/l)	--	94	--	93	85	71	--
Dissolved nitrate plus nitrite as N (mg/l)	--	.01	--	.07	.02	.15	--
Dissolved orthophosphate as P (mg/l)	--	.02	--	.07	.05	.01	--
Fecal coliform (count/ 100 ml)	--	4B	8B	6B	64B	4B	--
Fecal streptococci (count/100 ml)	--	140B	10B	--	20B	--	--

Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 20 - Hopkins Canal upstream from Lone Pine Creek

Remarks:

Date sampled (1976)	3/25	5/4	7/8	8/3	9/8	9/27	10/21
Time (2400 hours)	--	1400	1130	1020	0915	0900	--
Discharge (ft <sup>3</sup> /s)	0	5.60	1.31	1.76	11.6	<u>1</u> /1	0
Temperature (°C)	--	16.5	22.0	19.0	14.0	16.0	--
Dissolved oxygen (mg/l)	--	11.2	10.1	9.4	9.1	6.4	--
pH (units)	--	8.4	7.6	7.7	8.6	7.9	--
Turbidity (JTU)	--	40	28	17	28	19	--
Suspended sediment (mg/l)	--	54	18	31	74	41	--
Specific conductance (micromhos/cm at 25°C)	--	140	129	134	143	127	--
Dissolved solids (mg/l)	--	110	--	108	88	93	--
Dissolved nitrate plus nitrite as N (mg/l)	--	.01	--	.44	.09	.01	--
Dissolved orthophosphate as P (mg/l)	--	.02	--	.12	.07	.06	--
Fecal coliform (count/ 100 ml)	--	210	740	430	1500	6200	--
Fecal streptococci (count/100 ml)	--	400	--	--	7900	--	--

See footnote at end of table.

Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 21 - Lone Pine Creek near Crater Lake Ave., Medford

Remarks: Monitored above confluence of creek and Hopkins Canal. Base flow on upper portion of creek is bypass from city of Medford municipal water supply. Site contains agricultural return flow.

Date sampled (1976)	3/25	5/4	7/8	8/3	9/8	9/27	10/21
Time (2400 hours)	--	1400	1020	1130	1000	0920	1245
Discharge (ft <sup>3</sup> /s)	0	9.40	5.98	15.6	10.5	9.51	7.77
Temperature (°C)	--	11.5	19.0	14.5	11.5	10.5	10.5
Dissolved oxygen (mg/l)	--	10.7	8.2	10.1	10.5	10.8	11.1
pH (units)	--	7.7	7.2	7.6	7.5	7.8	8.1
Turbidity (JTU)	--	6	11	9	6	4	2
Suspended sediment (mg/l)	--	6	18	19	7	8	2
Specific conductance (micromhos/cm at 25°C)	--	104	110	106	128	115	106
Dissolved solids (mg/l)	--	77	--	94	94	86	80
Dissolved nitrate plus nitrite as N (mg/l)	--	.01	--	.02	.04	.01	.04
Dissolved orthophosphate as P (mg/l)	--	.07	--	.10	.09	.08	.10
Fecal coliform (count/ 100 ml)	--	270	5000B	240	130	--	0
Fecal streptococci (count/100 ml)	--	36B	8400B	600	--	58B	0



Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 22 - Hopkins Canal at Johnson St.

Remarks: Most of the water at this point is from Lone Pine Creek.

Date sampled (1976)	3/24	5/4	7/8	8/3	9/8	9/27	10/21
Time (2400 hours)	--	1400	0930	0945	0830	0800	--
Discharge (ft <sup>3</sup> /s)	0	.93	7.34	5.24	2.41	1.55	0
Temperature (°C)	--	18.5	16.0	15.0	11.0	10.0	--
Dissolved oxygen (mg/l)	--	10.4	10.1	12.1	10.3	9.8	
pH (units)	--	7.7	7.2	7.7	8.1	7.6	--
Turbidity (JTU)	--	8	9	8	6	3	--
Suspended sediment (mg/l)	--	250	20	18	5	6	--
Specific conductance (micromhos/cm at 25°C)	--	106	96	104	135	116	--
Dissolved solids (mg/l)	--	82	--	97	89	83	--
Dissolved nitrate plus nitrite as N (mg/l)	--	.02	--	.01	.06	.00	--
Dissolved orthophosphate as P (mg/l)	--	.08	--	.10	.10	.09	--
Fecal coliform (count/ 100 ml)	--	3B	1700B	170	209	100B	--
Fecal Streptococci (count/100 ml)	--	90	--	1100	--	250	--

Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 23 - Whetstone Creek at Kirtland Road

Remarks: Return flow site.

Date sampled (1976)	3/22	5/3	6/29	7/27	8/30	9/20	10/21
Time (2400 hours)	1700	1635	1240	1000	1045	1400	1330
Discharge (ft <sup>3</sup> /s)	1.96	.67	.55	2.23	3.84	1.28	.02
Temperature (°C)	12.0	23.5	24.0	18.5	21.0	20.0	14.0
Dissolved oxygen (mg/l)	10.8	10.0	8.1	7.9	9.7	12.5	15.5
pH (units)	6.8	8.4	8.2	--	7.7	9.0	9.5
Turbidity (JTU)	3	2	8	12	6	2	4
Suspended sediment (mg/l)	4	5	19	27	9	6	3
Specific conductance (micromhos/cm at 25°C)	350	370	105	136	177	188	207
Dissolved solids (mg/l)	214	214	--	108	140	138	126
Dissolved nitrate plus nitrite as N (mg/l)	.01	.01	--	.01	.02	.02	.02
Dissolved orthophosphate as P (mg/l)	.04	.04	--	.08	.06	.06	.07
Fecal coliform (count/ 100 ml)	64	220	140	750	158	20B	300
Fecal streptococci (count/100 ml)	5B	22	260	--	--	1400	83

Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 24 - Bear Creek Canal at Medford (Sta. No. 14358000)

Remarks: Located downstream from Jackson Street Bridge in Medford. Flow information supplied by Oregon Water Resources Department.

Date sampled (1976)	3/24	5/4	6/29	7/26	8/30	9/20	11/2
Time (2400 hours)	--	1540	1320	1300	1245	1430	--
Discharge (ft <sup>3</sup> /s)	0	25	28	29	20	15	0
Temperature (°C)	--	15.5	21.5	24.0	22.0	19.5	--
Dissolved oxygen (mg/l)	--	9.8	12.3	10.2	10.5	9.5	--
pH (units)	--	8.1	8.5	--	8.5	8.6	--
Turbidity (JTU)	--	20	7	11	8	8	--
Suspended sediment (mg/l)	--	40	11	32	10	29	--
Specific conductance (micromhos/cm at 25°C)	--	215	156	270	288	236	--
Dissolved solids (mg/l)	--	116	--	185	176	135	--
Dissolved nitrate plus nitrite as N (mg/l)	--	.01	--	1.5	.48	.39	--
Dissolved orthophosphate as P (mg/l)	--	.05	--	.20	.20	.15	--
Fecal coliform (count/ 100 ml)	--	340	1500B	1100	980	420	--
Fecal streptococci (count/100 ml)	--	320	--	3100	--	2000	--

Table 3.--Data collected for the irrigation and drainage study--  
Continued

Site number and name: 25 - Hopkins Canal at Scenic Avenue

Remarks: Downstream end of canal.

Date sampled (1976)	3/24	5/4	6/30	7/27	8/31	9/21	11/2
Time (2400 hours)	--	0900	1015	1100	0820	1200	--
Discharge (ft <sup>3</sup> /s)	0	4.43	8.67	5.50	8.07	3.60	0
Temperature (°C)	--	13.5	18.0	24.0	20.5	19.0	--
Dissolved oxygen (mg/l)	--	8.1	8.0	11.7	7.0	10.9	--
pH (units)	--	7.6	7.6	--	7.0	8.9	--
Turbidity (JTU)	--	24	13	8	14	8	--
Suspended sediment (mg/l)	--	41	53	16	40	33	--
Specific conductance (micromhos/cm at 25°C)	--	203	220	257	316	201	--
Dissolved solids (mg/l)	--	120	--	180	179	136	--
Dissolved nitrate plus nitrite as N (mg/l)	--	.27	--	.52	.35	.55	--
Dissolved orthophosphate as P (mg/l)	--	.09	--	.19	.15	.11	--
Fecal coliform (count/ 100 ml)	--	450	860	340	2000	610	--
Fecal streptococci (count/100 ml)	--	1000	1200	--	3900	--	--

1/ Estimate.



Table 4.--Data collected for the diel study

Site number and name: 101 - Bear Creek at Mountain Ave.  
near Ashland

Date: August 23-24, 1976

Remarks: Discharge 32.7 ft<sup>3</sup>/s (0.92 m<sup>3</sup>/s) at 0920 hours August 23. Range of stage fluctuations, 0.06 ft (0.018 m). Weather clear until 1615 hours with increasing clouds to 100 percent by 2000 hours. Sun on water 10 percent of the time during clear conditions.

Time (2400 hours)	0630	0800	1050	1200	1415	1615	1800	1955	2210	0205	0530
Temperature (°C)	16.0	16.0	18.0	19.5	22.0	23.0	22.0	21.5	20.0	19.0	18.0
Dissolved oxygen (mg/l)	8.8	9.6	9.5	9.1	8.7	8.8	8.5	8.0	7.9	8.6	8.3
Dissolved oxygen (percent saturation)	94	102	105	104	104	106	102	95	90	97	92
pH (units)	8.0	8.0	8.3	8.5	8.7	8.7	8.5	8.2	8.1	8.0	8.0
Turbidity (JTU)	4	--	--	--	4	--	--	--	--	--	--
Suspended sediment (mg/l)	13	--	--	--	9	--	--	--	--	--	--
Specific conductance (micromhos/cm at 25°C)	194	192	184	194	195	195	195	185	185	175	173
Dissolved solids (mg/l)	--	--	--	--	109	--	--	--	--	--	--
Dissolved nitrate plus nitrite as N (mg/l)	.06	--	.04	--	.03	.04	.06	--	--	--	--
Dissolved orthophosphate as P (mg/l)	.16	--	.13	--	.18	.20	.26	--	--	--	--
Total phosphorus as P (mg/l)	.28	--	.33	--	.32	.31	.42	--	--	--	--
Dissolved ammonia as N (mg/l)	.13	--	.12	--	.12	.11	.13	--	--	--	--
Total Kjeldahl nitrogen as N (mg/l)	--	--	--	--	.2	--	--	--	--	--	--
Total organic carbon (mg/l)	--	--	--	--	4	--	--	--	--	--	--
Chemical oxygen demand (mg/l)	--	--	--	--	< 5	--	--	--	--	--	--

Table 4.--Data collected for the diel study--Continued

Site number and name: 102 - Bear Creek at South Valley View  
Road near Talent

Date: August 23-24, 1976

Remarks: Discharge  $19.6 \text{ ft}^3/\text{s}$  ( $0.555 \text{ m}^3/\text{s}$ ) at 1245 hours August 23. Range of stage fluctuations 0.12 ft (0.037 m). Weather clear until 1615 hours with increasing clouds to 100 percent by 2000 hours. Sun on water 60 percent of the time during clear conditions.

Time (2400 hours)	0715	0830	1115	1230	1445	1645	1710	1830	2015	2230	0230	0550
Temperature ( $^{\circ}\text{C}$ )	15.5	16.0	19.0	20.5	23.5	23.0	22.5	22.5	21.0	20.0	19.0	18.0
Dissolved oxygen (mg/l)	9.0	9.6	8.5	8.6	8.1	--	8.2	8.4	8.0	7.9	8.5	8.3
Dissolved oxygen (percent saturation)	94	102	96	99	99	--	99	101	94	90	96	92
pH (units)	7.9	7.9	8.0	8.1	8.1	8.0	8.1	8.1	8.0	8.0	8.0	8.0
Turbidity (JTU)	4	--	--	--	4	--	--	--	--	--	--	--
Suspended sediment (mg/l)	12	--	--	--	20	--	--	--	--	--	--	--
Specific conductance (micromhos/cm at $25^{\circ}\text{C}$ )	217	217	245	242	262	261	254	253	251	245	220	204
Dissolved solids (mg/l)	--	--	129	--	--	--	--	--	--	--	--	--
Dissolved nitrate plus nitrite as N (mg/l)	.35	--	.40	--	.46	--	.46	.46	--	--	--	--
Dissolved orthophosphate as P (mg/l)	1.7	--	3.2	--	3.8	--	3.3	3.2	--	--	--	--
Total phosphorus as P (mg/l)	1.8	--	3.3	--	4.1	--	3.4	3.2	--	--	--	--
Dissolved ammonia as N (mg/l)	.96	--	1.8	--	2.3	--	2.0	2.1	--	--	--	--
Total Kjeldahl nitrogen as N (mg/l)	--	--	1.3	--	--	--	--	--	--	--	--	--
Total organic carbon (mg/l)	--	--	5	--	--	--	--	--	--	--	--	--
Chemical oxygen demand (mg/l)	--	--	10	--	--	--	--	--	--	--	--	--

Table 4.--Data collected for the diel study--Continued

Site number and name: 103 - Bear Creek at Suncrest Road  
at Talent

Date: August 23-24, 1976

Remarks: Discharge 32.3 ft<sup>3</sup>/s (0.915 m<sup>3</sup>/s) at 1005 hours August 23. Range of stage fluctuations, 0.08 ft (0.024 m). Weather clear until 1615 hours with increasing cloud cover to 100 percent by 2000 hours. Sun on water 90 percent of the time during clear conditions.

Time (2400 hours)	0635	0810	1010	1300	1435	1555	1810	2010	2300	0245
Temperature (°C)	15.5	15.5	17.0	22.0	23.5	23.5	23.0	21.5	20.0	18.5
Dissolved oxygen (mg/l)	7.7	9.4	9.7	11.2	10.8	9.2	8.8	7.2	6.9	7.7
Dissolved oxygen (percent saturation)	81	98	105	134	132	113	106	85	79	86
pH (units)	--	8.0	8.2	8.6	8.4	8.4	8.3	7.8	7.9	7.8
Turbidity (JTU)	--	4	--	3	--	--	--	--	--	--
Suspended sediment (mg/l)	--	10	--	6	--	--	--	--	--	--
Specific conductance (micromhos/cm at 25°C)	319	300	291	285	290	290	292	293	285	263
Dissolved solids (mg/l)	--	--	--	165	--	--	--	--	--	--
Dissolved nitrate plus nitrite as N (mg/l)	--	1.0	.84	.60	--	.76	1.1	--	--	--
Dissolved orthophosphate as P (mg/l)	--	1.8	1.3	1.3	--	1.3	2.3	--	--	--
Total phosphorus as P (mg/l)	--	1.9	1.7	1.3	--	1.5	2.3	--	--	--
Dissolved ammonia as N (mg/l)	--	.40	.20	.16	--	.11	.34	--	--	--
Total Kjeldahl nitrogen as N (mg/l)	--	--	--	1.2	--	--	--	--	--	--
Total organic carbon (mg/l)	--	--	--	6	--	--	--	--	--	--
Chemical oxygen demand (mg/l)	--	--	--	8	--	--	--	--	--	--

Table 4.--Data collected for the diel study--Continued

Site number and name: 104 - Bear Creek at Barnett Road  
at Medford

Date: August 23-24, 1976

Remarks: Discharge 56.8 ft<sup>3</sup>/s (1.61 m<sup>3</sup>/s) at 1155 hours August 23. Range of stage fluctuations, 0.07 ft (0.021 m). Weather clear until 1615 hours with increasing clouds to 100 percent by 2000 hours. Sun on water 70 percent of the time during clear conditions.

Time (2400 hours)	0715	0845	1100	1400	1530	1730	1940	2340	0315
Temperature (°C)	17.0	17.0	19.0	22.0	23.5	23.5	22.5	20.5	19.5
Dissolved oxygen (mg/l)	7.8	9.1	10.0	11.8	11.2	9.2	11.2	7.8	8.1
Dissolved oxygen (percent saturation)	84	99	113	141	137	113	135	90	93
pH (units)	--	8.1	8.7	9.1	9.1	9.0	8.8	8.0	8.0
Turbidity (JTU)	--	10	--	10	--	--	--	--	--
Suspended sediment (mg/l)	--	30	--	35	--	--	--	--	--
Specific conductance (micromhos/cm at 25°C)	157	183	155	178	179	180	187	168	176
Dissolved solids (mg/l)	--	120	--	--	--	--	--	--	--
Dissolved nitrate plus nitrite as N (mg/l)	--	.18	.17	.13	--	.14	.12	--	--
Dissolved orthophosphate as P (mg/l)	--	.31	.26	.30	--	.31	.28	--	--
Total phosphorus as P (mg/l)	--	.50	.53	.57	--	.55	.51	--	--
Dissolved ammonia as N (mg/l)	--	.16	.14	.15	--	.14	.16	--	--
Total Kjeldahl nitrogen as N (mg/l)	--	.9	--	--	--	.4	--	--	--
Total organic carbon (mg/l)	--	4	--	--	--	--	--	--	--
Chemical oxygen demand (mg/l)	--	12	--	--	--	--	--	--	--



Table 4.--Data collected for the diel study--Continued

Site number and name: 105 - Bear Creek at Table Rock Road  
near Medford

Date: August 23-24, 1976

Remarks: Discharge 59.3 ft<sup>3</sup>/s (1.68 m<sup>3</sup>/s) at 1115 hours August 23. Range of stage fluctuations, 0.05 ft (0.015 m). Weather clear until 1615 hours with increasing clouds to 100 percent by 2000 hours. Sun on water 70 percent of the time during clear conditions.

Time (2400 hours)	0650	0850	1100	1310	1520	1635	1830	2010	0030	0340	0710
Temperature (°C)	17.5	17.5	18.5	22.0	23.5	23.5	22.5	21.5	21.0	20.0	18.5
Dissolved oxygen (mg/l)	8.4	9.4	11.3	11.7	10.8	10.6	9.8	7.8	8.2	8.1	8.1
Dissolved oxygen (percent saturation)	92	103	127	140	132	130	118	92	96	93	91
pH (units)	7.9	8.2	9.1	9.4	9.4	8.2	8.1	8.0	7.5	8.1	--
Turbidity (JTU)	--	--	9	--	--	10	--	--	--	--	--
Suspended sediment (mg/l)	--	--	22	--	--	18	--	--	--	--	--
Specific conductance (micromhos/cm at 25°C)	217	216	217	210	204	209	220	216	220	230	231
Dissolved solids (mg/l)	--	--	--	--	129	--	--	--	--	--	--
Dissolved nitrate plus nitrite as N (mg/l)	--	--	.34	--	.10	.12	.10	--	--	--	--
Dissolved orthophosphate as P (mg/l)	--	--	.29	--	.33	.35	.37	--	--	--	--
Total phosphorus as P (mg/l)	--	--	.56	--	.66	.64	.64	--	--	--	--
Dissolved ammonia as N (mg/l)	--	--	.20	--	.12	.18	.16	--	--	--	--
Total Kjeldahl nitrogen as N (mg/l)	--	--	--	--	2	--	--	--	--	--	--
Total organic carbon (mg/l)	--	--	--	--	5	--	--	--	--	--	--
Chemical oxygen demand (mg/l)	--	--	--	--	13	--	--	--	--	--	--

Table 4.--Data collected for the diel study--Continued

Site number and name: 106 - Bear Creek at Kirtland Road  
near Central Point

July 21-22, 1976

Remarks: Range of stage fluctuation, 0.02 ft (0.006 m).

Time (2400 hours)	0600	0800	1000	1200	1400	1600	1800	2000	2200	0200	0500	0600
Temperature (°C)	18.0	18.0	19.0	21.0	24.5	25.5	25.5	24.5	22.0	19.5	18.0	17.5
Dissolved oxygen (mg/l)	7.2	8.0	8.9	9.9	9.8	9.8	8.6	8.1	7.6	7.2	7.4	7.7
Dissolved oxygen (percent saturation)	80	89	101	116	122	124	109	101	91	81	82	84
pH (units)	6.9	7.3	7.6	7.4	7.6	7.7	7.8	7.6	7.2	7.2	7.1	7.2
Turbidity (JTU)	--	--	--	--	--	--	--	--	--	--	--	--
Suspended sediment (mg/l)	--	--	--	--	--	--	--	--	--	--	--	--
Specific conductance (micromhos/cm at 25°C)	--	267	281	294	294	280	280	278	292	280	278	273
Dissolved solids (mg/l)	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved nitrate plus nitrite as N (mg/l)	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved orthophosphate as P (mg/l)	--	--	--	--	--	--	--	--	--	--	--	--
Total phosphorus as P (mg/l)	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved ammonia as N (mg/l)	--	--	--	--	--	--	--	--	--	--	--	--
Total Kjeldahl nitrogen as N (mg/l)	--	--	--	--	--	--	--	--	--	--	--	--
Total organic carbon (mg/l)	--	--	--	--	--	--	--	--	--	--	--	--
Chemical oxygen demand (mg/l)	--	--	--	--	--	--	--	--	--	--	--	--

Table 4.--Data collected for the diel study--Continued

Site number and name: 106 - Bear Creek at Kirtland Road  
near Central Point

Date: August 23-24, 1976

Remarks: Discharge 32.7 ft<sup>3</sup>/s (0.93 m<sup>3</sup>/s) at 0920 hours, August 23. Range of stage fluctuation, 0.06 ft (0.018 m). Weather clear until 1615 hours, with increasing clouds to 100 percent by 2000 hours. Sun on water 10 percent of the time during clear conditions.

Time (2400 hours)	0630	0800	1050	1200	1415	1615	1800	1955	2210	0205	0530
Temperature (°C)	16.0	16.0	18.0	19.5	22.0	23.0	22.0	21.5	20.0	19.0	18.0
Dissolved oxygen (mg/l)	8.8	9.6	9.5	9.1	8.7	8.8	8.5	8.0	7.9	8.6	8.3
Dissolved oxygen (percent saturation)	88	89	100	111	120	117	111	94	90	97	85
pH (units)	8.0	8.0	8.3	8.5	8.7	8.7	8.5	8.2	8.1	8.0	8.0
Turbidity (JTU)	4	--	--	--	4	--	--	--	--	--	--
Suspended sediment (mg/l)	--	--	--	--	--	--	--	--	--	--	--
Specific conductance (micromhos/cm at 25°C)	194	192	184	194	195	195	195	185	185	175	173
Dissolved solids (mg/l)	--	--	--	--	109	--	--	--	--	--	--
Dissolved nitrate plus nitrite as N (mg/l)	.06	--	.04	--	.03	.04	.06	--	--	--	--
Dissolved orthophosphate as P (mg/l)	.16	--	.13	--	.18	.20	.26	--	--	--	--
Total phosphorus as P (mg/l)	.28	--	.33	--	.32	.31	.42	--	--	--	--
Dissolved ammonia as N (mg/l)	.13	--	.12	--	.12	.11	.13	--	--	--	--
Total Kjeldahl nitrogen as N (mg/l)	--	--	--	--	.2	--	--	--	--	--	--
Total organic carbon (mg/l)	--	--	--	--	4	--	--	--	--	--	--
Chemical oxygen demand (mg/l)	--	--	--	--	<5	--	--	--	--	--	--

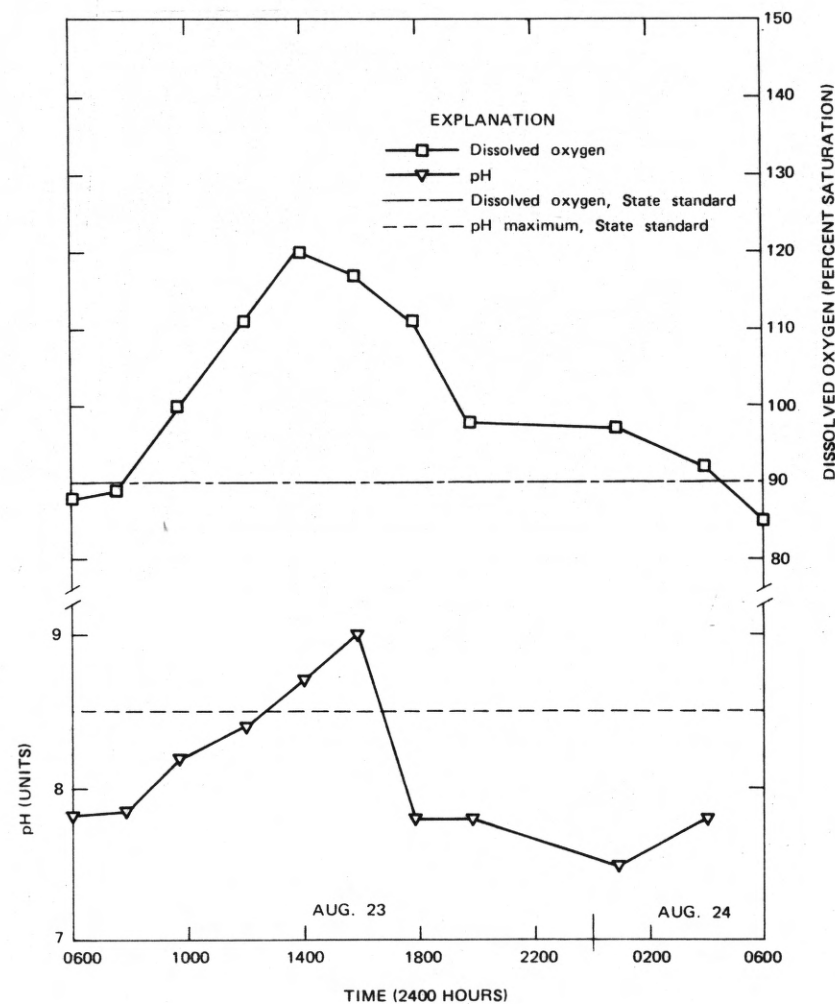
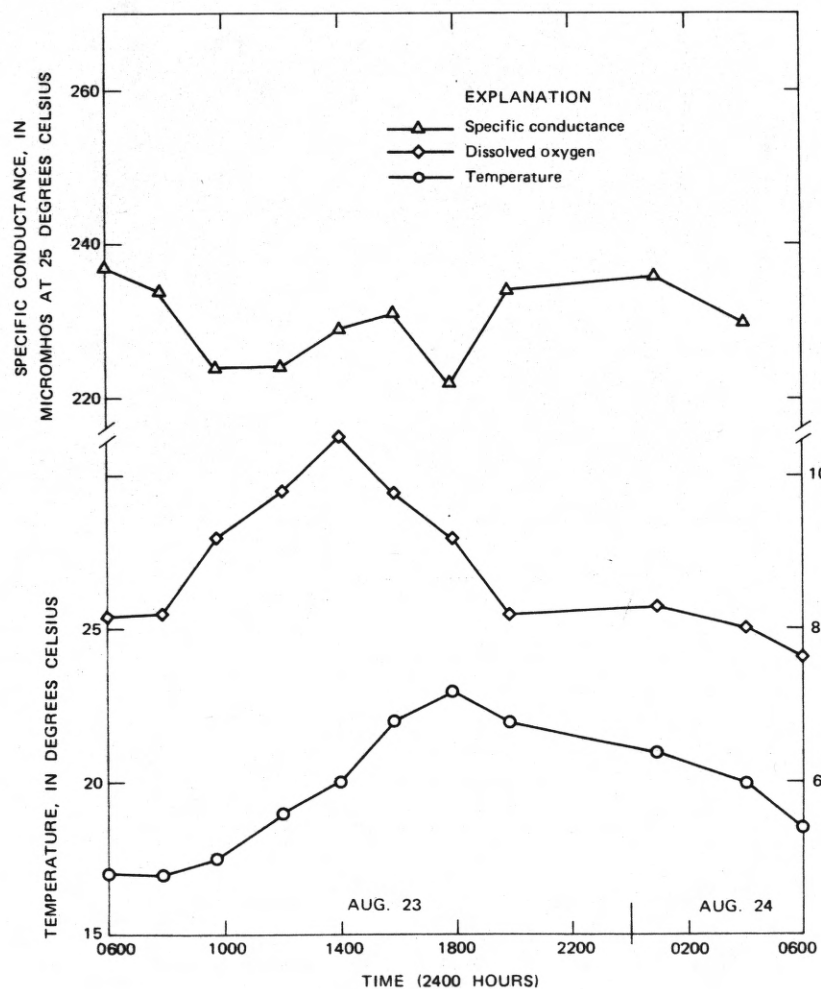


Figure 2.--Diel fluctuations of water-quality parameters in Bear Creek at Kirtland Road near Central Point, August 23-24, 1976 (site 106).



Table 5.--Specific conductance of Bear Creek and tributaries between South Valley View Road and Suncrest Road on September 3, 1976

Site	Time (2400 hours)	Temper- ature (°C)	Specific conduct- ance (micro- mhos/cm at 25°C)	Estimated discharge (ft <sup>3</sup> /s)
Bear Creek at South Valley View Road (VVRd)	1050	17.5	183	20
Bear Creek 1/4 mile downstream (ds) VVRd	1056	17.5	183	--
Bear Creek 1/2 mile ds VVRd	1103	17.6	186	--
Bear Creek 1 mile ds VVRd	1120	17.8	184	--
Bear Creek 1-1/2 mile ds VVRd	1135	17.9	187	--
First pond on west bank of Bear Creek	1155	17.0	525	--
Second pond on west bank across from Harry & David orchard	1200	17.5	462	--
Harry & David filter plant (stream)	1210	18.8	186	<1
Harry & David filter plant (pool)	1210	18.8	194	--
Bear Creek 1/10 mile ds from filter plant	1219	18.5	196	--
Unnamed stream 1/2 mile ds from filter plant on west bank of Bear Creek	1235	18.5	228	<1
Bear Creek 100 yards below confluence with above stream	1240	19.5	193	--
Bear Creek at Lynn Newbry Park	1300	19.7	197	--
Small seep from gravel operation at Lynn Newbry Park	1307	19.6	492	<.5
Second seep 200 ft ds from park	1310	21.0	456	<.5
Bear Creek 200 ft below second seep	1316	20.5	211	--
Bear Creek 100 ft upstream (us) from North VVRd at Talent	1325	20.5	206	--
Stream on east bank of Bear Creek under North VVRd bridge	1330	19.5	312	5
Bear Creek 100 yards ds from North VVRd	1335	19.0	226	--
Small pond on east bank 1/4 mile ds from North VVRd	1338	18.5	889	--
Wagner Creek on west bank	1342	17.5	275	5
Small seep 25 ft ds from Wagner Creek on west bank	1345	16.5	1,000	<.5
Bear Creek 200 yards ds from confluence with Wagner Creek	1351	21.0	216	--
Small stream on east bank	1352	19.5	460	<1
Bear Creek 1/4 mile ds from confluence with Wagner Creek	1359	21.0	221	--
Bear Creek 100 yards us from Suncrest Road	1405	21.5	217	--
Stream on east bank 200 ft us from Suncrest Road	1410	20.5	293	2
Bear Creek at Suncrest Road	1415	21.0	227	35

