WORKING PAPER NO.
E.P.A. - 910-8-75-091

INVESTIGATION OF BEAR RIVER BASIN WATER QUALITY

AUGUST, 1974

ENVIRONMENTAL
PROTECTION
AGENCY
SURVEILLANCE AND
ANALYSIS DIVISION
SEATTLE, WASHINGTON
REGION X

EPA-910/8-75-091
JULY 1975

BEAR RIVER EVALUATION REPORT

1974 SURVEY

PREPARED BY:

BILL SCHMIDT

KATHERINE BECK

SURVEILLANCE & ANALYSIS DIVISION

EPA REGION X

1200 SIXTH AVENUE

SEATTLE, WASHINGTON 98101

THIS DOCUMENT IS AVAILABLE TO THE PUBLIC IN LIMITED QUANTITIES THROUGH THE U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION X, SURVEILLANCE & ANALYSIS DIVISION, SEATTLE, WASHINGTON.

A WORKING PAPER PRESENTS RESULTS OF INVESTIGATIONS WHICH ARE, TO SOME EXTENT, LIMITED OR INCOMPLETE. THEREFORE, CONCLUSIONS OR RECOMMENDATIONS EXPRESSED OR IMPLIED MAY BE TENTATIVE.

ABSTRACT

The quality of the waters in the Bear River Basin was surveyed from August 27 to August 29, 1974. The purposes of the survey were to determine point and non-point source loading, to determine whether water quality has improved since the adoption of the 1958 Enforcement Conference pollution control measures, to determine the cause and effect relationships between major waste sources and receiving water quality, and to determine whether major waste sources are complying with their NPDES permits. Survey results show violations of Idaho Water Quality Standards in these parameters: bacteria, turbidity, and dissolved oxygen. Also, levels of Lindane, a chlorinated hydrocarbon pesticide and mercury significantly higher than the recommended maximal levels were found in the upper reaches of the Bear River. Although sufficient data since 1958 was not available to evaluate the pollution control measures, water quality changes in BOD's and Total Coliform bacteria were noted. The Monsanto Co. was found to comply with their NPDES permit in all but one area - there was an apparent temperature violation. Nutrient loading was investigated and related to algal productivity - but not all loading sources were located. Other findings include realization that point sources did not appreciably affect the quality of the Bear River except in very localized areas.

TABLE OF CONTENTS

TITLE	PAGE
Abstract	4
Summary	9
Basin Description	14
Previous Studies	18
Summary of 1958 Bear River Enforcement Conference	20
Idaho Water Quality Standards	23
Water Quality Trends	28
August 1974 Intensive Survey	32
Bibliography	58

APPENDICES

A - Ambient Data	A1
B - 1974 Survey Figures and Tables	B1
C - Monsanto Co. Compliance Report and August 1974 Survey Raw Data	C1

LIST OF FIGURES

FIGURE NO.		PAGE
1.	Location Map of Bear River Basin	8
2.	Bear River Hydrology	17
3.	Sampling Station Locations	35
4.	Flow Measuring Locations	36

INTRODUCTION

Unlike most major rivers of the United States that flush pollutants into the oceans, the Bear River discharges into the Great Salt Lake. Because the Great Salt Lake has a limited capacity to assimilate pollutants, it is important to identify and reduce the pollutant levels entering the lake from the Bear River.

There have been no water quality surveys conducted on the Idaho portion of the Bear River since 1955. As a consequence, little data is available to define the present water quality of the Bear River Basin as required by PL 92-500.

Region X of the Environmental Protection Agency conducted a water quality survey on August 27,28 and 29 of 1974. The purposes of this survey were to:

1. Determine the point source and non-point source loading during the period when the most severe water quality problems exist.

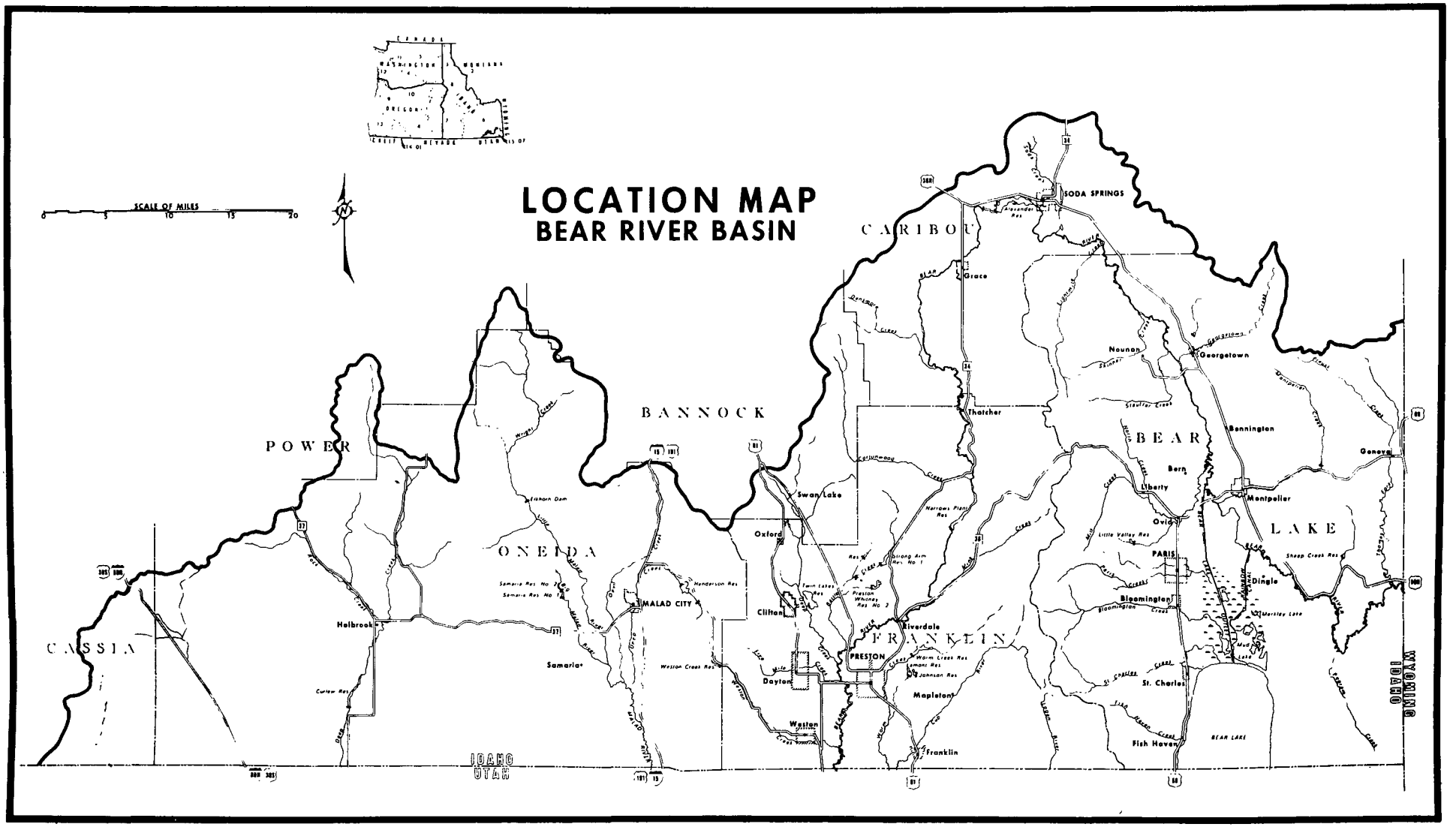
2. Determine whether there has been an improvement in the Bear River Basin water quality since the 1958 enforcement conference.

3. Expand the data base to support water quality standards revisions, waste discharge permitting activities and future pollution abatement actions.

4. Determine the cause and effect relationship between waste sources and receiving water quality.

5. Determine whether major waste sources are in compliance with the NPDES permits.

The results of this study are detailed in subsequent sections of this report.


LOCATION MAP
BEAR RIVER BASIN
SCALE OF MILES
0 5 10 15 20
CANADA
WASHINGTON
MONTANA
OREGON
IDAHO
WYOMING
NEVADA
UTAH
CARIBOU
BANNOCK
POWER
ONEIDA
CASSIA
FRANKLIN
BEAR
LAKE
SODA SPRINGS
Alexander Res
Grace
Thatcher
Nounan
Georgetown
Bennington
Genova
Bern
Liberty
Montpelier
Ovid
PARIS
Little Valley Res
Sheep Creek Res
Dingle
Bloomington
Mersley Lake
Mud Lake
St. Charles
Fish Haven
BEAR LAKE
Swan Lake
Oxford
Clifton
Twin Lakes Res
Preston Whitney Res No 2
Strong Arm Res No 1
Narrows Plant Res
Riverdale
PRESTON
Worm Creek Res
Lemont Res
Johnson Res
Mapleton
Franklin
Dayton
Weston
Weston Creek Res
MALAD CITY
Henderson Res
Samaria Res No 2
Samaria Res No 1
Samaria
Elkhorn Dam
Wright Creek
Halbrook
Curlew Res
Cottonwood Creek
Dry Creek
Sheep Creek
Stauffer Creek
Georgetown Creek
Bear River
Malad River
Portneuf River
Cub River
Worm Creek
Weston Creek
Franklin Creek
Bear Lake

BEAR RIVER EVALUATION REPORT

SUMMARY

Findings and Conclusions

1. Idaho's water quality standards for bacteria, turbidity and dissolved oxygen were violated during the August 1974 survey.
   A. Class A and B fecal coliform bacteria standards were violated in several tributaries to the Bear River as well as in Worm Creek.
   B. The 90% dissolved oxygen standards were violated periodically throughout the Bear River system over the last six years.
   C. Dramatic increases in turbidity levels in the Bear and Cub Rivers suggest water quality standards violations; however, the standards are difficult to apply due to the wide range of interpretations of the standard.
2. Recommended water quality criterion (1) of 0.05 ug/l for mercury (Hg) was exceeded throughout the entire reach of the Bear River in Idaho. Based upon survey data, there is a possibility of a mercury buildup in the bottom of Alexander Reservoir.
3. During the August 1974 survey, the chlorinated hydrocarbon pesticide, Lindane, exceeded the recommended criterion (1) of .005 ug/l in the Bear River. The highest levels of approximately .010 ug/l occurred in the vicinity of the Bear Lake outlet.

4. There has not been ample data collected since the 1958 Bear River Enforcement Conference to adequately document the effectiveness of pollution control actions resulting from the conference; however, the following water quality changes are apparent:

   A. Biochemical Oxygen Demand (BOD5) levels have increased in the lower Bear River and decreased in the Cub River following the enforcement conference.

   B. Total coliform bacteria levels generally are higher in the Bear and lower in the Cub River for the post conference period.

   C. The reduction of BOD5 and total coliform levels in the Cub River apparently resulted from installation of treatment facilities at Del Monte Corporation.

5. The compliance monitoring evaluation of Monsanto Company showed that the company was generally in compliance with the initial effluent limitations as specified in their NPDES permit except for an apparent violation of the discharge temperature stipulation.

6. High levels of total and fecal coliform bacteria were infiltrating the Mud Lake area from the Paris, Idaho septic tank drainfield during the survey period.

7. High levels of fecal coliform bacteria and the presence of some pathogenic bacteria were documented in Worm Creek below the Preston STP indicating poor disinfection of the STP effluent.

8. Nutrient loading of the Cub River in the Franklin area cannot be reconciled with the Del Monte discharge; apparently an unknown inflow in that area adds a large percentage of loading to the Cub River.

9. The bacteriological data collected during the August 1974 survey show that the domestic animal population along the Bear River has a heavy bacterial impact on water quality. Livestock appears to be the major source of warmblooded animal fecal contamination in this portion of southeastern Idaho. Even though the pathogen recoveries were more frequent near populated areas, the predominant source of fecal waste contamination still appears to be animal in origin.

10. High total solids concentrations are predominant in the Bear River basin. Most of the solids are dissolved with 20% to 30% of the total being of organic nature. The solids increase significantly from the Wyoming-Idaho to the Idaho-Utah border as the result of groundwater and irrigation return inflow.

11. The greatest number of game fish caught in the Idaho Bear River sustem occur from downstream of Soda Spring Reservoir to Grace Powerhouse. The greatest catch per angler occurs in the area between Grace Dam and Powerhouse where the only flow in the reach is from groundwater inflow. These high catch reaches are characterized by low turbidity and suspended solids. Alexander Reservoir apparently settles out the suspended solids.

12. During the survey period point sources did not appreciably affect water quality of the Bear River except in very localized areas. Non-point sources from agricultural runoff and groundwater affect the Bear River water quality to a greater extent.

The majority of the phosphorus in the Bear River Basin comes from identifiable but non-controllable sources. The primary

phosphorus sources are springs throughout the lower river from Alexander Reservoir to the Utah-Idaho border and Mud Lake, Georgetown Creek, Soda and Spring Creeks.

During the survey period considerably more phosphorus and suspended solids were being discharged from the Mud Lake area than were entering. This was probably due to scouring caused by the high volume of discharge from Bear Lake. Mud Lake at the same time was acting as a sink for organic material and NO3-N.

13. The potential for nuisance levels of algal productivity exists in the reservoir areas of the Bear River. High phosphorus, pH, and alkalinity levels as well as 120% to 130% daytime dissolved oxygen saturation levels indicate an insipient algal production problem in the slack water areas of the basin. Periphyton chlorophyll a levels below Grace Power Plant indicate that the water in that area can presently be classified as mesotrophic.

Recommendations

1. Permanent monitoring stations should be established at the following locations:

   A. Bear River at the Idaho-Wyoming Border

   B. Bear River just below Soda Springs Reservoir

   C. Bear River near the Idaho-Utah Border

   D. Cub River near the Utah-Idaho Border

Sampling should be minimally on a monthly frequency.

2. The following studies are needed based upon the results of the August 1974 water quality survey:

   A. More extensive surveys to evaluate the vertical water column and bottom muds of Alexander and Oneida Reservoirs.

   B. Evaluation of water quality during the non-irrigation season in the Soda Springs vicinity to determine effect of the Monsanto discharge.

   C. Diurnal studies during the late summer for dissolved oxygen in selected areas of the Bear River to assess actual water quality standard violations.

   D. Studies or research to determine what, if any, agricultural management practices could be used to reduce the turbidity and nutrient loading in the Bear River system.

BASIN DESCRIPTION

The Bear River, shown on Figure 1, drains approximately 6,800 square miles in three different states of which 2,350 square miles, or 35 percent, is in the State of Idaho. The total length of the river is approximately 500 miles; of which 160 miles, or 32 percent, is in Idaho. After flowing some 500 miles from its source in the Uinta Mountains of Utah and crossing state boundaries five times, the river terminates in the Great Salt Lake, only 90 miles west from its point of origin. Major tributaries to the Bear River in Idaho are shown on Figure 1.

The Bear River Compact, approved by the U.S. Congress in 1958, established a commission that administers the distribution of river water among the states of Idaho, Utah, and Wyoming. The compact stipulates the policy of the participating states to encourage additional projects for the maximum beneficial use of the available Bear River water.

The principal uses of water in the Bear River basin in order of priority are hydroelectric power, irrigation, domestic, stock and industrial purposes.

The Bear River enters Idaho near Border, Wyoming and flows in a westwardly direction towards Stewart Dam where water is diverted by canal into Mud Lake and then to Bear Lake. Bear Lake is approximately 70,400 surface acres in size and contains 1.4 million acre-feet of water. The Lifton Pumping Plant located at the north end of Bear Lake was constructed in 1914 to control the water level in Bear Lake and thereby regulate flows into the Bear River for downstream power generation and irrigation purposes. The pumping station contains no

power producing facilities.

Between the north end of Bear Lake and the city of Soda Springs, the river meanders through rolling farm and grazing lands. Near Soda Springs the river enters a narrow channel which it has cut through the lava. Alexander Reservoir, also called Soda Reservoir or Soda Point Reservoir, and its associated hydroelectric plant are located in this lava channel. The Alexander power plant was constructed in 1924, is operated by the Utah Power and Light Company, and contains a total installed generating capacity of 14,000 kilowatts. At capacity, Alexander Reservoir covers approximately 1,007 surface acres and contains 15,000 acre-feet of water.

West of Alexander Reservoir, the river passes Alexander Point and makes a sharp turn to the south where it enters Gem Valley. In Gem Valley, the river passes Last Chance Dam which is a mainstem irrigation diversion structure: the river then flows into the Grace Reservoir. Grace Reservoir was constructed in 1923 and contains approximately 200 acre-feet of water at capacity. At the Grace Dam the river water is diverted into a flume and sent cross-country for approximately 4.5 miles to the Grace Power Plant. This facility was constructed in 1923 and is operated by the Utah Power and Light Company. It has a total installed generating capacity of 31,000 kilowatts.

From the Grace Dam to the Grace Power Plant, the river is located in a steep walled canyon known locally as Black Canyon. When all river water is being diverted at the Grace Dam, flows in the Black Canyon consist almost entirely of spring water. It has been suggested that springs which arise in the Black Canyon are the result of leakage from the river between Alexander Dam and the Grace Dam.

Immediately downstream from the Grace Power Plant is the Cove Pond. At capacity, this pond is approximately five surface acres in size and contains 25 acre-feet of water. It serves as an equalizing reservoir and point of diversion for water which is used at the Cove Power Plant located approximately two miles downstream. Water demands by the Utah Power and Light Company's Cove Plant, which has an installed generating capacity of 7,000 kilowatts, render the river virtually unfishable between the Cove Pond and power plant.

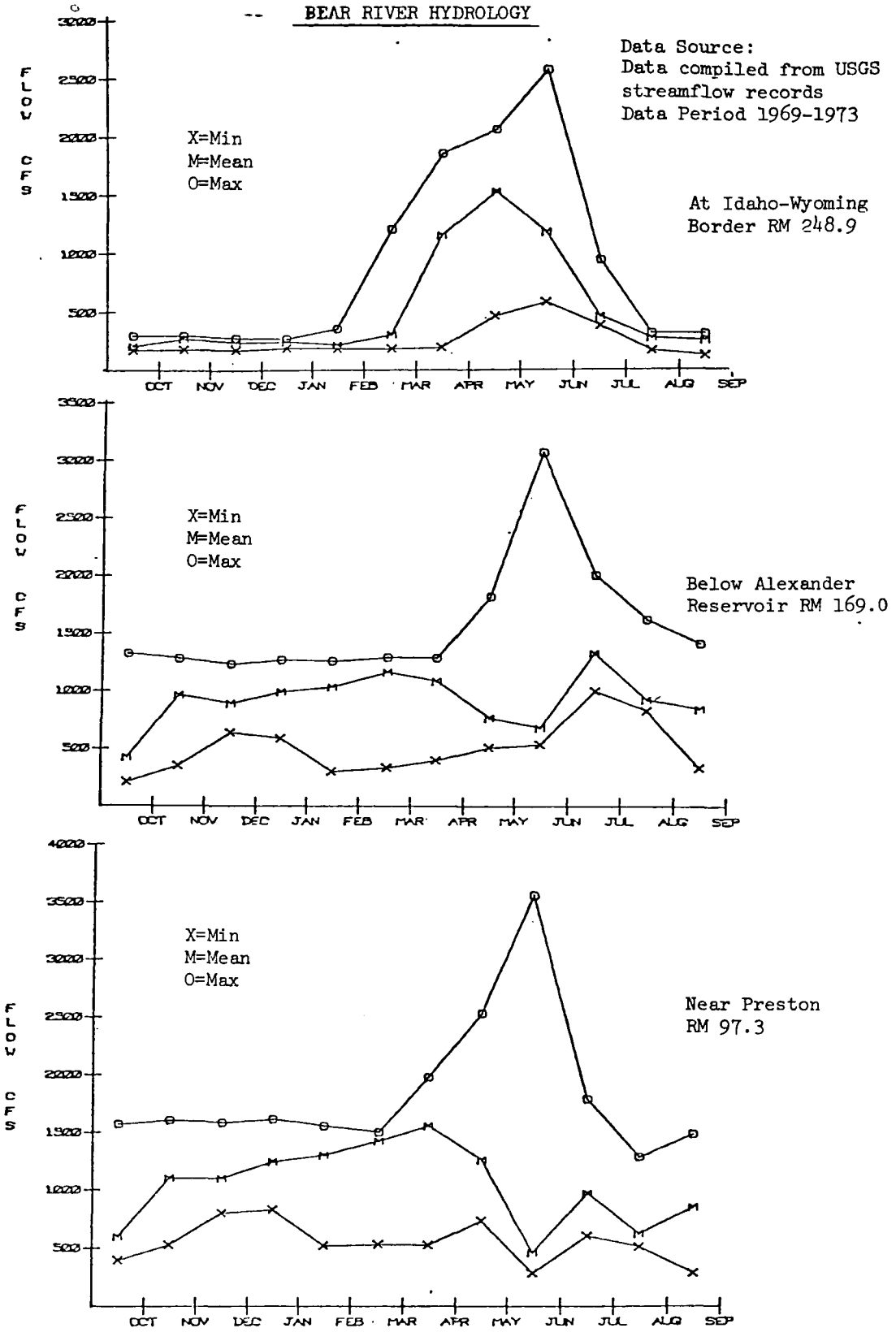
Downstream from the Cove Power Plant, the river meanders through Gentile Valley and Mound Valley and enters Oneida Narrows Reservoir near the small community of Cleveland. Oneida Reservoir and associated power plant is located in the upstream portion of a narrow canyon (Oneida Narrows) which is about 11 miles in length. At capacity, the reservoir covers approximately 480 surface acres and contains 11,485 acre-feet of water. This facility was constructed in 1920, is operated by the Utah Power and Light Company, and has a total installed generating capacity of 30,000 kilowatts. Water flows in the river downstream from the dam vary daily, depending on power demands at high flows. Because of this, fishing downstream of Oneida Reservoir is virtually impossible.

Downstream from Oneida Narrows, the river enters Cache Valley and leaves Idaho near the small community of Weston.

Figure 2 shows the hydrology of the Bear River at three stations for a data period of 1969 to 1973. Maximum river discharge normally occurs between March and July of each year ostensibly to satisfy irrigation needs downstream. The large difference in flow between maximum and minimum flows is the result of flow regulation at the dam for power and irrigation purposes.

FIGURE 2

-- BEAR RIVER HYDROLOGY



PREVIOUS STUDIES

Following is a list of water quality or related studies that have been conducted on the Bear River over the past twenty years:

1. In 1953, the States of Idaho and Utah conducted joint bacteriological studies of streams in the Idaho-Utah border area. More than 200 stream samples were collected at about fifteen stations in this area and coliform organism numbers were determined. These studies were made during March, June, and Sept., and consisted of a one-week's series of samples and tests in each of these months.

2. In 1954, United States Public Health Service (USPHS) personnel conducted a study of the Bear River and some of its tributaries from the Idaho-Utah border area to its mouth. The purpose of this study was to ascertain the effects, especially biological, of the cannery and sugar refinery wastes on the stream. A one-week study was made in August during the operating season of the canneries and another study of one week was made in November when the sugar refineries were in operation. In addition to detailed biological population analyses, temperature, turbidity, pH, alkalinity, and dissolved oxygen were determined.

3. From November 7 to December 9, 1955, a joint State-Federal study of water quality and industrial waste characteristics was made in the Idaho-Utah border area to obtain physical, chemical, and bacteriological data which Utah could use in classifying streams and ascertaining waste abatement needs. The study included analyses of

10 samples from each of 14 stations. Stream flows also were determined with the aid of the United States Geological Survey (USGS). Industrial waste studies also were made at three beet sugar refineries and two dairies. The 1955 study provided data which enables a reasonably complete analysis of the problem during the sugar refining season.

4. Idaho Fish and Game Department (IFG) conducted a fish creel census in the Idaho portion of the Bear River in 1972 and 1973. A report titled "Returns of Planted Rainbow Trout, Fishing Pressure and Catch in the Bear River and Fish Populations in Mainstem Reservoirs and Tributary Streams" was published in June 1974.

1958 BEAR RIVER ENFORCEMENT CONFERENCE SUMMARY

On October 8, 1958, the first session of a two session enforcement conference on pollution of interstate waters of the Bear River was convened at the request of the Utah Water Pollution Control Board. The Surgeon General of the Public Health called the conference under provisions of Section 8 of the Federal Pollution Control Act because it was feared that pollution occurring in Idaho was endangering the health and welfare of persons in the State of Utah.

At the conclusion of the first session, the conference unanimously made the following conclusions and recommendations:

1. The Bear River is an interstate stream within the meaning of the Federal Water Pollution Control Act.

2. The Bear River, as it flows back and forth from Wyoming and Utah in the Evanston area, may present a potential minor pollution problem.

3. Pollution of interstate waters subject to abatement under the Federal Water Pollution Control Act is occurring in the Bear River and its tributary, the Cub River, as they flow from Idaho to Utah. Municipal and industrial wastes from Preston, Idaho, the Franklin Sugar Company at Whitney, Idaho, and the California Packing Company at Franklin, Idaho, are finding their way into the waters of the Bear River. There they combine with waste from the Amalgamated Sugar Company at Lewiston, Utah, the Cache Valley Creamery at Lewiston, Utah, the community of Lewiston, Utah, the Sego Milk Company at Richmond, Utah, the California Packing Company and the Rocky Mountain Dairy Company at

Smithfield, Utah, the California Packing Company, E.A. Miller Packing Company, L.L. Miller Packing Company and the Morning Mild Company at Wellsville, Utah, the Community of Wellsville, Utah, and the City of Logan, Utah, which are also finding their way into the waters of the Bear River.

4. Such discharges from Idaho contribute to the pollution of the Bear River so as to endanger the health and welfare of persons in Utah, a State other than that in which the discharges originate. The effects of this pollution are:

A. Deterioration of water quality used for irrigation and stock watering so as to cause a potential health hazard.

B. Deterioration of water quality so as to interfere with aquatic life and fishlife.

C. Deterioration of water quality so as to interfere with the Cache River Basin area as a recreational area.

D. Deterioration of the river so as to make it unsuitable as a potential source of public water supply.

5. The State of Utah, with the advice and assistance of the USPHS was to gather information and data which would permit the State of Utah to classify the waters of the Bear River under the Utah State Law.

The second session of the conference was held on July 19, 1960 and ended with the recommendation that representatives from the states of Idaho and Utah meet and establish a time schedule for specific remedial action by the municipal and industrial dischargers in the Bear River area of concern.

Shortly after the conference ended, Idaho obtained commitment letters from the municipal and industrial dischargers and worked out waste load allocation and agreements with the State of Utah.

Since the 1960 session of the conference, Franklin Sugar Company closed down, and other significant dischargers have installed treatment facilities.

IDAHO WATER QUALITY STANDARDS FOR THE BEAR RIVER

According to Idaho's Water Quality Standards, the Bear and Cub Rivers have been designated as primary contact recreational waters (Class A). These are waters where the human body may come in direct contact with the raw water to the point of complete submergence. The raw water may be accidentally ingested and certain sensitive organs such as eyes, ears, nose, etc. may be exposed to the water. These waters may be used for swimming, water skiing, skin diving, support and propagation of fish, aquatic and semi-aquatic life and other forms of wildlife.

Worm Creek has been designated as secondary contact recreational waters (Class (B). Class B waters are for uses in which the raw water supply is suitable for support and propagation of fish and other aquatic and semi-aquatic life, and other forms of wildlife. These waters may be used for boating, wading, and other activities where ingestion of the raw water is not probable.

The following Idaho Water Quality Standards apply to special waterbodies of the Bear River Basin:

Bear Lake

1. Total Coliform concentrations were associated with a fecal source(s) shall not exceed a geometric mean of 50/100 ml., nor shall more than 20 percent of total samples during any 30 day period exceed 200/100 mg. (as determined by multiple-tube fermentation or membrane filter procedures and based on not less than 5 samples for any 30 day period).

2. Fecal Coliform concentrations shall not exceed a geometric mean of 10/100 ml., nor shall more than 10 percent of total samples during any 30-day period exceed 20/100 ml.; or greater than 50/100 ml. for any single sample. Coliform criteria for shoreline waters shall conform with that of Class A2 waters. Shoreline waters shall be defined as the first 100 feet of water surface as measured from the shoreline.

Bear River and Cub River

1. Total coliform concentrations where associated with a fecal source(s) shall not exceed a geometric mean of 240/100 ml., nor shall more than 20 percent of total samples during any 30-day period exceed 1000/100 ml. (as determined by multiple-tube fermentation or membrane filter procedures and based on not less than 5 samples for any 30-day period).

2. Fecal coliform concentrations shall not exceed a geometric mean of 50/100 ml., nor shall more than 10 percent of total samples during any 30-day period exceed 200/100 ml.; or greater than 500/100 ml. for any single sample.

Worm Creek Class B

1. Total coliform concentrations where associated with a fecal source(s) shall not exceed a geometric mean of 1000/100 ml., nor shall more than 20 percent of total samples during any 30-day period exceed 2400/100 ml. (as determined by multiple-tube fermentation or membrane filter procedures and based on not less than 5 samples for any 30-day period).

2. Fecal Coliform concentrations shall not exceed a geometric mean of 200/100 ml., nor shall more than 10 percent of total samples during any 30-day period exceed 400/100 ml.; or greater than 800/100 ml. for any single sample.

The following Idaho Water Quality Standards apply to the entire Bear River Basin:

Bear Lake, Bear River, Cub River and Worm Creek

The dissolved oxygen D.O.) concentration not to be less than 6 mg/l or 90 percent of saturation, whichever is greater.

1. The DO standard shall apply to all flowing waterways.
2. The DO standard shall apply to the waters of all natural lakes and reservoirs except as excluded below:
   a. In depths of water less than 100 feet in natural lakes or reservoirs, the bottom 20 percent of water depth shall be excluded from application of the DO standard. In water depths greater than 100 feet, the bottom 20 feet of water depth shall be excluded for application of the DO standard.
   b. Waters below a thermocline in stratified lakes or impoundments shall be excluded from application of the DO standard.
   c. No wastewaters shall be discharged and/or no activity shall be conducted in waters excluded by a. and b. above, which either alone or in combination with other wastewaters or activities will cause the DO concentration in these waters to be less than 4 mg/l.

c. Notwithstanding exclusion of a. and b. above, the DO standard shall always apply to the top two feet of any lake or reservoir.

The hydrogen ion concentration (pH) values are not to be outside the range of 6.5 to 9.0. The induced variations shall not be more than 0.5 pH units.

Any measurable increase when water temperature is 66 F or above, or more than 2°F increase other than from natural causes when water temperatures are 64°F or less (unless otherwise specified).

Any increase exceeding 0.5°F due to any single source, or 20°F due to all sources combined.

For purposes of determining compliance, a "measurable increase" means no more than 0.5°F rise in temperature of the receiving water as measured immediately outside of an established mixing zone. Where mixing zone boundaries have not been defined, cognizance will be given to the opportunity for admixture of wastewater with the receiving water.

The turbidity other than of natural origin shall not exceed 5 Jackson Turbidity Units (JTU). Whenever the receiving water is greater than 5 JTU, due to conditions other than those caused by man, then no discharge and/or activity either alone or in combination with other wastewater or activity shall cause an increase of more than 5 JTU.

Water Quality Criteria (1)

Other W.Q. criteria are also of concern in the Bear River although not defined in the water quality standards of the state. The following are only recommended criteria based on research:

1. Mercury - .05 ug/l aquatic life toxicity

   - 10 ug/l livestock water limit

2. Cadmium - .03 mg/l (T. hardness < mg/l) for aquatic life

   - .004 mg/l (T. hardness < 100 mg/l)

3. Chromium - 0.05 mg/l

   - .05 to .1 for livestock waters

4. Lead - 0.03 mg/l

5. Chlorine - 0.003 mg/l

   (when duration 30 min. in 24 hr.

   period level can reach 0.05 mg/l)

WATER QUALITY TRENDS

The State of Idaho has been sampling the Bear River at five stations each year on approximately a quarterly basis. Those stations are:

1. At the Wyoming-Idaho State line R.M. 273.9
2. Near Montpelier downstream of the Bear Lake Outlet Canal Confluence R.M. 219.3
3. At Soda Spring, Idaho (Above dam) R.M. 174.4
4. Near Grace, Idaho below Grace Power Plant R.M. 156.6
5. Near Preston, Idaho R.M. 97.3

Figures 1A through 11A (Appendix A) show plots of Dissolved Oxygen (D.O.), D.O. saturation, alkalinity and orth-phosphorus concentrations data collected from 1969 to the present time for these stations. Basically, for the parameters shown there has been very little change in water quality conditions in the Bear River in the last six years neither in time nor over the length of the River. Although standards were generally attained, water quality violations for D.O. were documented at Montpelier, Soda Springs and Preston stations over the six year period. Alkalinity, phosphorus and pH levels which are high throughout the six year period throughout the river system are indicative of high algal blooms condition which occur in predominately agricultural areas. The ortho-phosphorus levels shown on Figures 4A and 8A are considerably greater than the .025 mg/l PO4 which is considered a minimum requirement for an algal bloom.

Water quality of the Cub River and Worm Creek; like the Bear River, has not changed appreciably over the last six years. Figures

12A and 15A show the ambient monitoring data collected by the State of Idaho on a quarterly basis over the period. All data suggests a high level of algal activity. The high D.O.'s were obtained during the daylight hours during the period when algae are undergoing photosynthesis and, therefore, supersaturate the water with D.O. No D.O. data is available during early morning or night when D.O. levels would be the lowest. The pH levels on Cub River in 1973 exceeded the upper limit of the Idaho Water Quality standards again indicative of high algal activity.

Table IA (Appendix A) shows a comparison of the pre-enforcement conference (1954-1955) data collected in Idaho with the data collected since the enforcement conference. The post-enforcement data is a compilation of State of Idaho ambient monitoring data and EPA intensive survey data. Available data was selected for two periods to conform to the winter and summer food processing seasons. Those periods were November through December and July through September. The EPA intensive survey was conducted during the summer food processing season only, since the main winter industry cited during the enforcement conference, Franklin County Sugar Company, closed shortly after the conference.

There is not ample data available either before or after the enforcement conference to document changes conclusively, but the following indications are noted:

1. NOV-DEC period

Bear River

1. There appears to be higher levels of 5-day Biochemical

Oxygen Demand (BOD5) in the river since the enforcement conference although the D.O. levels don't reflect that increase. The unexpected high D.O. levels are probably due to high reareation rates typically found during November and December.

2. Total coliform populations are apparently greater during post enforcement period times than before. This difference is not significant due to the analytical techniques used.

Cub River

1. Instream BOD5 levels are significantly less following the enforcement conference than prior to it. This is due to the treatment installed at Del Monte Cannery following the conference.

2. JULY-SEPT. PERIOD

Bear River

1. Instream BOD5 levels are greater following the conference than before. This increase is reflected in the lower D.O. concentration reported on several occasions following the conference and including the values from the EPA intensive survey in 1974. This higher BOD5 and lower dissolved oxygen levels in the river could be due to a greater amount of algal activity in the river system resulting from increased agricultural activity in the basin.

2. Total coliform levels reported by Idaho appear to be considerably greater than prior data showed; however, total coliform data during a three day period shows the level to be very low. No conclusions can be drawn from this information.

Cub River

1. There appears to have been an improvement in the water quality in the Cub River during this time of the year. The BOD5 level reduction between the comparative periods is greater than appears because the stream flow is small. The meager post enforcement conference data indicates that the D.O. level is higher and the bacteria levels are lower in the reach below Del Monte Cannery. This is to be expected since treatment facilities have been installed and the BOD levels have dropped.

AUGUST 1974 SURVEY

SURVEY DESCRIPTION

The Bear River in Idaho cannot be adequately studied as one continuous river because major river diversions, inflows, and impoundments are located throughout the river which alter the river characteristics and make it function as nearly independent segments.

For the August 27 thru 29 Bear River survey, the river was divided into the following four independent reaches:

1. Bear River between the Wyoming-Idaho border and Rainbow Inlet to Mud Lake. R.M. 274.5 to R.M. 232.0
2. Bear River between the Bear Lake Outlet and Grace Dam R.M. 220.5 to $.M. 164.0
3. Bear River between Grace Power Plant and Oneida Dam. R.M. 157.0 to R.M. 126.0
4. Bear River between Oneida Dam and the Idaho-Utah border R.M. 126.8 to R.M. 93.8

Mud Lake and the Idaho portions of Cub River and Worm Creek were also analyzed separately since they function independently.

A reconnaissance trip was made to the basin by EPA personnel for the purpose of locating sampling points, measuring flows, placing macroinvertibrate samplers, and working out logistic problems. It was decided to sample the river daily for three consecutive days, the tributaries, drains and springs would be sampled only once since these flows are relatively constant. The reach of river between Oneida

Reservoir and the Utah-Idaho border had to be sampled early in the morning to obtain a sample at constant flow. The reservoir is used for power peaking and the flow fluctuates rapidly over the day. The reservoir release, however, is held fairly constant overnight and is not increased until about 8 or 9:00 each day. The sampling procedure was to sample just below this darin at about 6:00 each morning and work in a downstream direction completing the last station near the stateline before the raising flow reached the downstream station. The res lts of this study reach cannot be analyzed with the rest of the river since the flows are considerably lower than the rest of the river.

An automatic sampler was placed near the Idaho-Utah state line so that diurnal fluctuations in river quality could be determined over a 48 hour period. Samples were collected and analyzed at two hour increments over the period for turbidity, specific conductance, nutrients, and organic carbon.

Table IB (Appendix B) lists and the map on Figure 3 shows the survey sample locations. Figure 4 is a map showing all survey flow meausrement locations for the study area.

All river, tributary and spring samples were collected using the following procedures:

1. Samples were collected using a Kemmer sampler or by sample cubitainer.
2. Specific conductance, ph and temperature were analyzed at the sample site immediately. Samples collected for shipment

to the main EPA lab were preserved, tagged and iced on the site.

3. Dissolved oxygen samples were fixed at the site, iced and taken to the field lab in Preston for titration.
4. Samples for alkalinities and turbidity were taken to the field lab for analysis.

Flows were obtained by one of the following methods: reading river stage recorder charts that correspond to sample time then determining flow using a rating curve; obtaining flows from a water master or; measuring the flow using a gurley current meter.

Samples for pesticide analysis were collected in the water column in one (1) gallon glass jars and capped with teflon lined lids. The jars were kept in the dark and shipped to the Redmond, Washington lab for analysis.

Benthic macroinvertebrate samples were collected using artificial substrates of the rock-basket type. The substrates were exposed for an eight week period (August through September 1974) at representative sites on the Bear River. At the end of the eight week period, the colonized substrates were removed and the macroinvertebrates were scraped from the substrate into a jar containing a 70% ethanol solution. The samples were then shipped to the Redmond Laboratory where they were sorted, counted and identified by genus and species where possible. This information was used to calculate a species diversity index (DBAR) and species density.

Periphyton chlorophyll a determinations in the flowing water

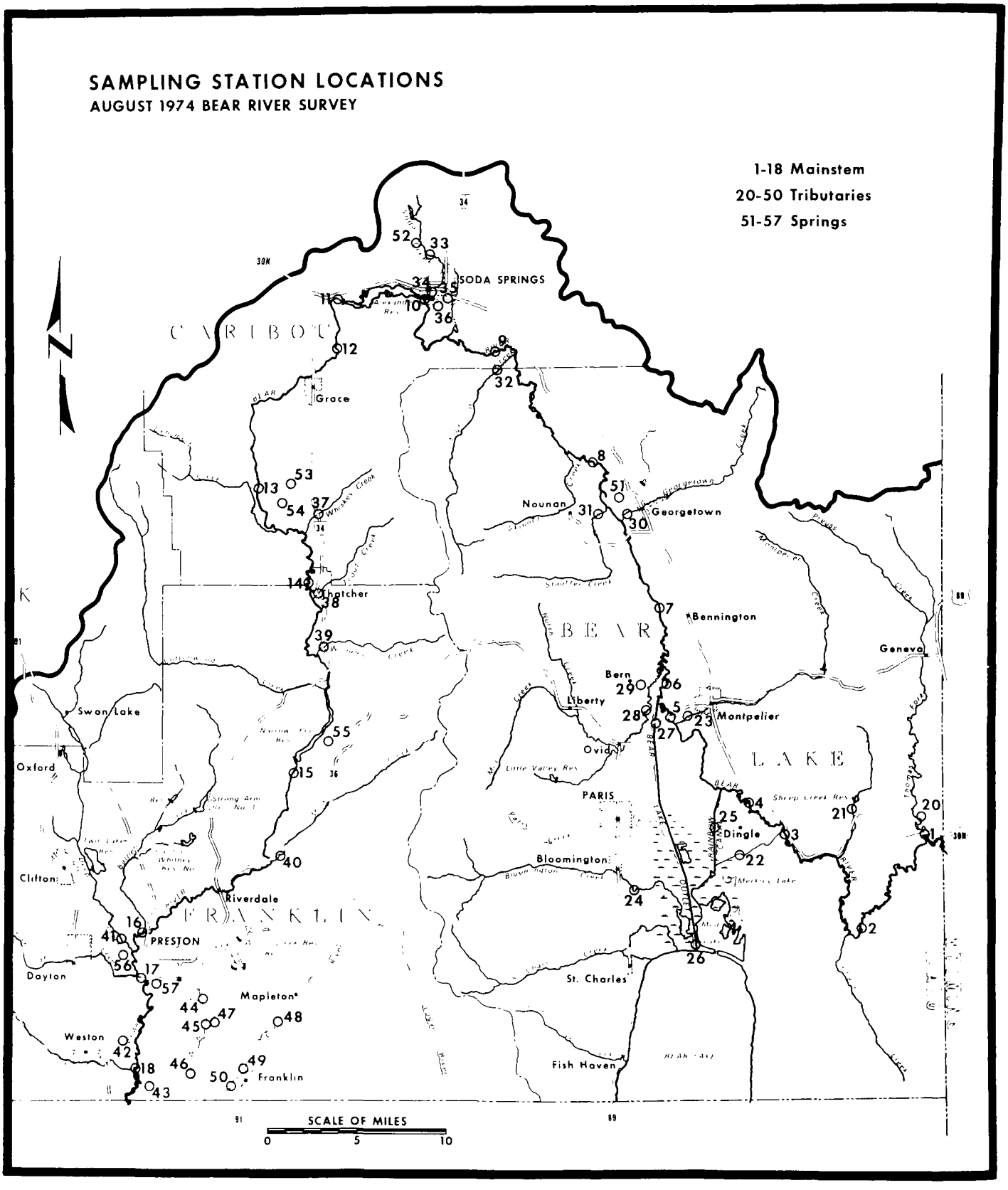

SAMPLING STATION LOCATIONS
AUGUST 1974 BEAR RIVER SURVEY
1-18 Mainstem
20-50 Tributaries
51-57 Springs
SODA SPRINGS
CARIBOU
Grace
Nounan
Georgetown
Thatcher
Bennington
BEAR
Geneva
Bern
Liberty
Montpelier
Swan Lake
Oxford
Ovid
LAKE
PARIS
Dingle
Bloomington
Clifton
Riverdale
FRANKLIN
PRESTON
Dayton
Mapleton
Weston
Franklin
St. Charles
Fish Haven
SCALE OF MILES
0
5
10

FIGURE 3

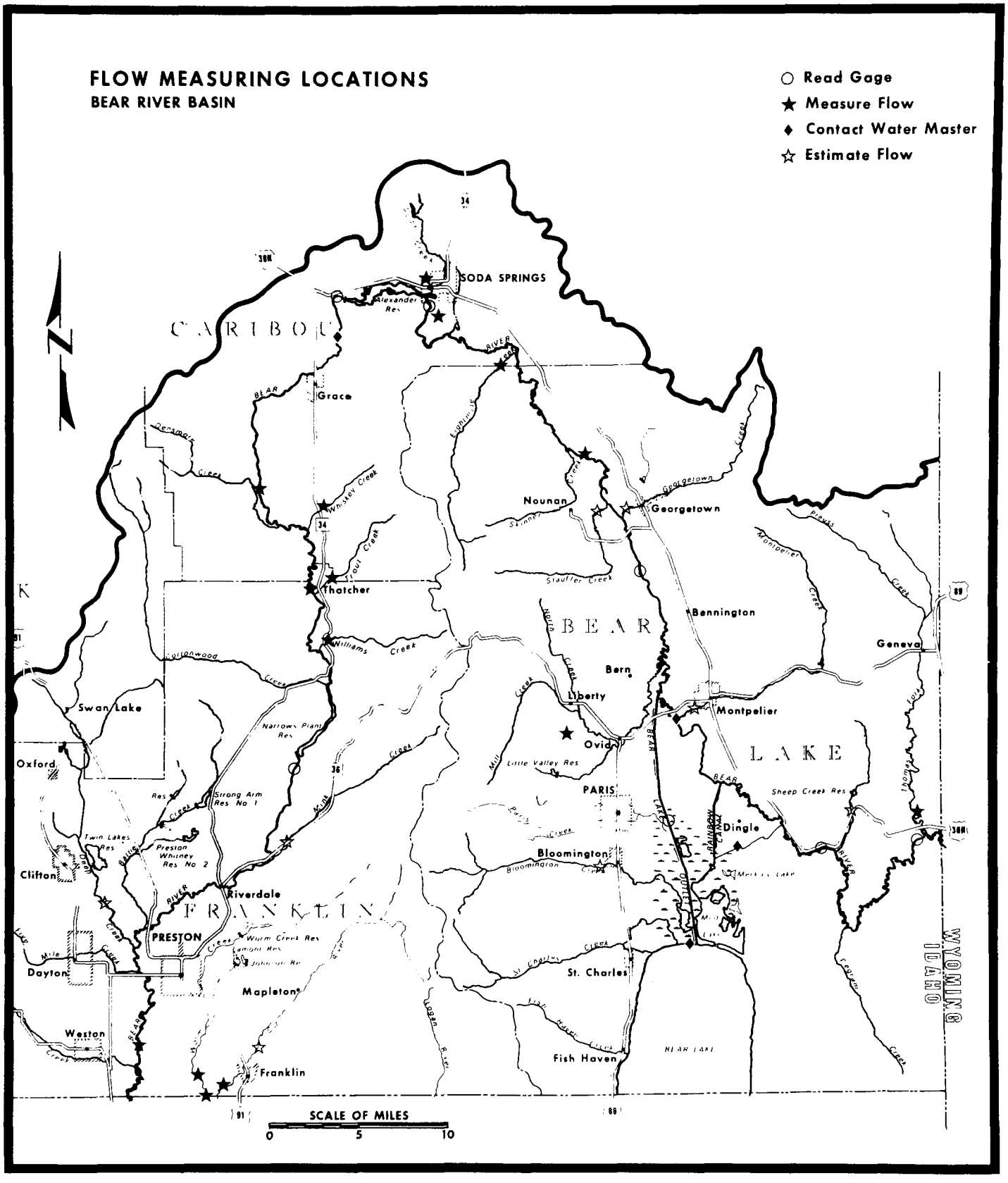

FLOW MEASURING LOCATIONS
BEAR RIVER BASIN
Read Gage
Measure Flow
Contact Water Master
Estimate Flow
SODA SPRINGS
Alexander Res
CARIBOU
Grace
Nounan
Georgetown
Thatcher
Bennington
BEAR
Geneva
Bern
Liberty
Montpelier
Swan Lake
Ovid
LAKE
Oxford
Little Valley Res
PARIS
Sheep Creek Res
Dingle
Bloomington
Clifton
Riverdale
FRANKLIN
PRESTON
Dayton
Mapleton
St. Charles
Weston
Fish Haven
Franklin
WYOMING
IDAHO
SCALE OF MILES
0
5
10

FIGURE 4

portions of the Bear River were obtained by exposing artificial substrates (glass microscope slides mounted in partially submerged wood frames). The slides were removed from the frames after an exposure period of eight weeks. The slides were frozen in dry ice and shipped to the Redmond Laboratory for spectrophotometric analysis.

Bacteria samples were collected and analyzed as follows:

All samples were collected according to standard methods (2) in sterile polyproplyene screw-cap bottles with aluminum foil hoods. To each bottle 0.5 ml of a 10% solution of sodium thiosulfate was added prior to sterilization.

Stations exhibiting a fecal coliform values greater than 150/100 ml were sampled an additional time. Bacteriological analyses of these samples were expanded to include *Pseudomonas aeruginosa* and *Staphylococcus aureus.*

Total coliforms, fecal coliforms and fecal streptococci were determined using the MF technique in accordance with standard methods (2), the medium selected for fecal streptococcus (Lancefield's Group D Streptococcus) enumeration was KF streptococcus agar with 1% TTC added. Quantatitive tests for *S. aureus* and *P. aeruginosa* were also performed. The former organism was isolated by the MF procedure on m-Staphylococcus broth and confirmed by coagulase-testing and DNase activity. *P. aeruginosa* was isolated on m-PA agar according to the method of Levin (3). Verification of suspected colonies was accomplished by observations of casein hydrolysis and fluorescent pyocyanin pigment production of milk agar.

Effluent samples from all significant wastewater sources were collected concurrent to the receiving water sampling. Municipal and Industrial samples were collected using automatic composite samplers that were located in the discharge line. Samples were collected by the automatic samplers on 15 minute intervals over a 24 hour period. A grab sample was taken at the Del Monte Plant in Franklin, Idaho since they have a lagoon treatment facility which characteristically produces an effluent of uniform quality.

All samples were collected in 1 gallon polyethelene containers and then split into individual containers for the various analyses that were needed. Preservatives were added to the samples according to standard EPA methods. Samples for BOD5 analysis were taken from the 24 hour composites, iced and shipped to the EPA laboratory at Redmond, Washington. Settleable solids analysis using the Imhoff Cone method were run the same evening of sample collection.

The BOD5 samples were set up immediately upon arrival at the EPA Redmond laboratory and all other samples were anlayzed according to their perishable priority. All samples were preserved and analyzed using standard EPA methods.

AUGUST 1974 INTENSIVE SURVEY RESULTS

Hydrology

Flow determinations during the survey were made by either 1-Reading USGS or Utah Power Co. existing gages, 2-Actual flow measurement, 3-flow determined by water master, and 4-flow estimation. Table IIb shows the actual values. The locations of the stations are shown on Figure 4.

The flow conditions existing at the time of the survey are discussed separately in the following paragraphs for the Bear River, Cub River and Mud Lake.

River Hydrology:

Figure IB is a stick diagram showing locations of the tributaries, diversions and irrigation returns that were significant during the three day survey period.

The curves on Figure 2B show the flow along the Bear River in Idaho for the three day study period of August 27,28 and 29th. The points on the figure represent instantaneous flow corresponding to sampling times.

Flows from R.M. 233 to 220 are minimal (approximately 5 to 10 cfs.), therefore, the river actually begins again downstream of the Bear Lake outlet confluence with the Bear River R.M. 15.9. The flows again are minimal below Grace Dam at about R.M. 167. The only flow in the reach from R.M. 167 to R.M. 156 or about 11 miles is from spring water. River flow fluctuates considerably below Oneida Reservoir due to varying power demand; therefore, the flow shown in the figure from R.M. 130

to the stateline is for a minimum release flow and cannot be compared to the upstream flows.

The Bear River flow is supplemented by groundwater throughout the entire river reach in Idaho with most occurring in the stretch of river from Alexander Reservoir to the stateline in the form of springs. Hot springs are abundant in the lower reach from approximately R.M. 150 to the stateline.

Cub River Hydrology:

The majority of the flow is diverted at Cub Canal diversion during the irrigation season. The Cub Canal diversion takes off at approximately R.M. 20.9 on the Cub River. Flow in Cub River during the August 1974 survey period, as shown in Figure 3B, at 40 cfs just downstream of the diversion. The river slows through agricultural land and appears to lose substantial flow to ground or diversions until it reaches Franklin, Idaho. Flow in the Cub River just upstream of Franklin (R.M. 16.5) was measured at 7.8 cfs. The next point of measurement was downstream of the Del Monte discharge at R.M. 15.1. Flow at that point was 22.5 cfs. The source of this inflow between the two flow measurement points is unknown. Worm Creek enters the Cub River at approximately R.M. 7.9. During the survey period approximately 12 cfs was measured in Worm Creek leaving Idaho and presumably entering the Cub River in Utah.

A "stick diagram" showing the inflows to and outflows from the Cub River is shown on Figure 4B.

Mud Lake Hydrology:

Mud Lake is located in the Bear Lake National Wildlife Refuge which is directly north of Bear Lake. Mud Lake is supplied by the Bear River via Rainbow Canal behind Stewart Dam. This water may be released from the canal for storage in Mud Lake or released directly into the Bear Lake outlet canal. The water from Mud Lake is diverted into Bear Cake by a sluiceway at a pumping plant or by gates in a causeway at the south end of Mud Lake if supplemented water for storage is needed in Bear Lake. Bear Lake, as an offstream reservoir is operated by the Utah Power and Light Company for power, downstream irrigation and maintenance of favorable flow conditions in the Bear River.

Other inflow sources to Mud Lake are Bloomington Creek and small irrigation return flows from the west as well as Crockett and Black Otter canals from the east.

Figure 5B is a "stick diagram" of the flow condition that existed during the August 27,28 and 29, 1974 survey period. Table IIIB contains the inflows and outflows that occurred during the survey period. During that period, approximately 900 cfs were flowing from Bear Lake into the Bear Lake outlet canal which runs through Mud Lake. Comparing the inflow and outflow, it appears that approximately 86 cfs are entering Mud Lake through groundwater or unaccounted for passages. This difference, however, is small and could partly be accounted for by the variance in accuracy of the flow measurement.

Point Source Dischargers

Table IVB shows the Organic and nutrient loadings in the basin, while Tables Vb and VIb, show the point source data collected from the main municipal and industrial dischargers in the Bear River Basin. The data represented is for average values during the August survey period and is based upon a 24 hour composite for all sources except the Del Monte Corporation discharge which has a lagoon treatment system and the Caribou Trout Farm which has a continuo s discharge. Grab samples were taken from these discharges.

All sewage treatment plants discharge into either the Bear River, or its tributaries. The effects of these discharges upon the receiving water are minimal for the most part; however, any noticeable effects will be discussed in the following sections.

Monsanto Corporation discharges into Soda Creek which is essentially an irrigation canal during the irrigation season. Very little if any of their discharge enters the Bear River system during the irrigation season; however, it is not known how much enters the Bear River system during the remainder of the year. The discharge sampling program for Monsanto corresponds with a compliance monitoring evaluation which was completed concurrently. The compliance monitoring evaluation report is included in the Appendix of this report.

Caribou Trout Farm utilizes spring water, supplemented by Little Spring Creek water for their operational water supply. Their discharge is into Little Spring Creek near its confluence with the Bear River in the backwater of Alexander Reservoir.

Del Monte Corporation discharges into the Cub River during food processing season. The effect of this waste on the receiving water will be discussed in the following sections.

Gem Valley Cheese is a small operation below Grace power plant. Loadings could not be calculated because flow from the plant is intermittent and could not be measured during the survey; however, discharge constituent concentrations were determined and are included in the tables. A compliance evaluation was made at this plant also but no report was prepared due to the small size of the operation.

Water Quality Standards Violations

The August 27,28 and 29 intensive survey data shows that although very few water quality standards were violated technically, values were either very close to limits or not enough samples were taken to support the numerical criteria of the standards.

Coliform Bacteria

Only three samples at each main river station were collected during each day, therefore, not enough samples were collected to apply the Bear River water quality standards. However, there is no reason to believe that total bacteria levels would not be violated if enough samples were taken. Figure 6B shows the bacteria results in the Bear River and the water quality standard levels for both total and Fecal coliforms.

Fecal coliform levels found on the survey exceed the Class A

single sample criteria of 500/100 ml. for the Bear River tributaries of Montpelier Creek, Stauffer Creek, a spring near Preston, and a creek north of West Pump Canal. These are tributaries to the Bear River and, therefore, are subject to the same standards. Class B waters of Worm Creek had single sample violations (800/100 ml.) at Worm Creek below the Preston STP and again near Franklin, Idaho. Bacteria levels for these tributaries, as well as other tributaries in the basin are shown on Table VIIB.

Dissolved Oxygen

All samples for dissolved oxygen analysis were taken during the daylight hours, therefore, they probably would not reflect the lowest values that would occur in the river system. However, one value is at the lower limit of acceptable concentration. Diurnal studies would have undoubtedly shown violations of Water Quality Standards for dissolved oxygen concentration.

Figure 7B shows actual daytime dissolved oxygen concentrations as well as percent saturation values by river mile for the mainstem of the Bear River. The 6 mg/l concentration standard is not violated, although the limit is approached in the Montpelier area. However, the 90 percent water quality criteria is violated at several points along the Bear River. The most notable area is in the Oneida Reservoir area. The 90% criteria is violated from approximately R.M. 140 in Oneida Reservoir to the Utah-Idaho border. Greater than 100 percent D.O. saturations are indicative of photosynthesis by algae and occurs

during the daylight hours. These same algae respire at night driving the D.O. levels below the 100% saturation level. Percent saturation levels of 120 to 130 percent normally means night time levels would be much lower than 90% and, therefore, concentrations would be below the 6 mg/l levels.

Based upon the above discussion, the magnitude of dissolved oxygen violations would probably be greater and cover a greater portion of the river if samples were collected during the early morning hours.

Turbidity

Idaho Water Quality standards state that a 5 JTU increase above background level of turbidity is a violation of Idaho water quality standards. The JTU value of Bear River water entering Idaho from Wyoming is around 10 JTU, therefore, any change of 5 JTU's other than natural would be a violation. Irrigation downstream from the Idaho-Wyoming border changes the turbidity level, shown in Figure 8B, drastically, resulting in Water Quality Standards violations from about the Bear Lake diversion (R.M. 242.7) to Alexander Dam (R.M. 169.4). Alexander Reservoir apparently acts as a settling basin, thereby reducing the turbidity levels again to the initial levels. Idaho water quality standards for turbidity in the Cub River were violated during the August EPA survey. Turbidity levels of the Cub River (Figure 9B) increased from less than 3 JTU upstream of the Del Monte discharge to about 11 JTU below the discharge, constituting an increase greater than 5 JTU due to man's activity.

pH

pH levels in the Bear River (Figure 10B) and Cub River (Figure 11B) did not violate water quality standards during the survey period; however, the levels are near the upper levels of the standard.

Cause and Effect Discussion

Bear River

Recreation

The health of a stream can be determined non-technically by looking at the actual recreational use of that stream. Figures 12B and 13B show the areas in the Bear River that successful fishing has been taking place as well as the numbers of fish that have been caught. (4) Limited fishing takes place between the Bear Lake outlet and Oneida Reservoir; however, the best fishing areas occur in the stretch of river from Alexander Dam to Grace Dam and in the area of Grace Dam to Grace Powerhouse where only a minimal flow due to river discharge occurs. The River is diverted at Grace Dam through a pipeline system to Grace Dam and the only flow in that reach is due to groundwater inflow.

Invertebrate Population

The benthic macroinvertebrate community also indicates the health of a stream. Unpolluted streams for the most part contain a biologic community with a high species diversity. Polluted waters support a community of low species diversity.

The species composition of the benthic macroinvertebrate community

in the Bear River is dominated by those organisms which are facultative in their tolerance to organic pollution. The diversity index calculations (See Figure 14B) further substantiate this contention by indicating moderately polluted water throughout the Bear River study reach. Diversity index of 3 or above is indicative of a healthy community. (5)

Heavy Metals

Figures 15B to 17B depict heavy meatls concentrations throughout the Bear River system. Toxicity levels shown on the curves are from the "1972 Water Quality Criteria" (1). Hardness as $CaCO_3$ (Figure 18B) is also included here since toxicity is related to the water's hardness. The heavy metals curves are dashed denoting that samples were taken only at selected points, not at all stations.

Bear River water is hard entering Idaho, it's $CaCO_3$ concentration is about 250 mg/l. Water from Bear Lake outlet canal that makes up the Bear River water just downstream of Montpelier has a hardness level on the order of 300 mg/l and the level gradually rises in a downstream direction due to groundwater and surface water inflow (See Table VIIIB for chemical constituents of these inflows). Figure 15B depicts the total mercury concentrations in the Bear River. The curve shows that the levels of these constituents recommended safe for aquatic life are exceeded throughout the entire Idaho reach of the river. The levels decrease considerably in Alexander Reservoir indicating that the Reservoir is concentrating Hg in it's bottom muds. Zinc and Cadmium levels are low in the basin (See Figures 16B and 17B).

Algal Bloom Potential

River mile graphs shown on Figures 19B through 22B represent the potential of the Bear River to support massive algal blooms. Phosphorus concentrations (Figure 19B) during the 3 day EPA survey exceeded the .05 mg/l (6) level considered minimum needed for algal blooms. Total phosphorus levels exceed this level for the entire length of the river while nitrate-nitrogen (Figure 20B), another required nutrient, never exceeded its 0.3 mg/l (6) level. However, blue-green algae have the ability to fix nitrogen from the atmosphere.

High total alkalinity (Figure 21B) and pH (Figure 10B) values support the potential for algal blooms. Total alkalinity values like hardness discussed earlier constantly increase through the river system, and the pH levels are near 8 most of the time indicating that bicarbonate alkalinity exists, thereby indirectly furnishing carbon dioxide for plant growth.

Periphyton samplers were placed at several locations on the river for the purpose of collecting samples for chlorophyll a analysis; however, only four samplers were recovered. Chlorophyll a results (Figure 22B) from these samples show that chlorophyll a levels are below the 10 mg/m^2 level which is considered a eutrophic threshold (7). Chlorophyll level at one station below Grace Powerhouse was at 5.5 mg/m^2 which shows that the water was in a mesotrophic condition in this area. Oneida Reservoir was observed to have heavy algal growth occurring during the survey. The low chlorophyll value near Preston cannot be explained by the survey results. Even though phosphorus

levels are low in that area during low-flow, the diurnal fluctuation of phosphorus concentrations (Figure 23B) appear to be directly related to flow and greatly exceed algal productive levels. Another possibility is that during the low flow period, debris floating down the river catches on the samplers, thereby limiting sunlight.

Dissolved oxygen concentrations and percent saturation values are shown on Figure 7B. These samples were collected during the day and, therefore, reflect the photosynthesis produced dissolved oxygen by algae in these areas where productivity is the greatest. Saturation values reach 120 to 130 percent between Soda Springs and Oneida Reservoir. Saturation values greater than 100% are indicative of photosynthesis.

Nutrients

Figures 24B and 25B show the relative total phosphorus and total nitrogen nutrient loading to the Bear River in terms of #/day as well as loadings from the sources. The survey results show that in the upper rivers considerable phosphorus has been picked up in the Mud Lake area (the relative contribution in the Mud Lake reach will be discussed in a later section).

Other measured sources of phosphorus which effect the Bear River are Georgetown and Soda Creeks. Both tributaries flow through populated and agricultural areas; however, samples of groundwater in the Georgetown area (See table VIIIB) showed total phosphorus concentrations of about 0.1 mg/l and most of Georgetown Creek water is composed of groundwater. Soda Creek is high in total phosphorus mostly resulting from irrigation water reuse in the Soda Springs area. Phosphorus

below Grace Power plant is due to mainly groundwater. Springs sampled between Soda Springs and Oneida Reservoirs (Table VIIIB) show total phosphorus concentrations of .17 mg/l.

Major nitrate nitrogen (NO^3-N) loadings in the River Basin are from Georgetown, Big Spring and Soda Spring creeks in the Reach between Mud Lake and Alexander Reservoirs. Again springs sampled in this reach show groundwater (approx. 3.4 mg/l) the main reason. In the reach between Alexander and Oneida Reservoirs Whiskey and Trout Creeks have measurable contributions; however, groundwater is the main reason for the high concentrations. Groundwater NO^3-N concentrations in this reach range between .09 mg/l for hot springs to 3.0 mg/l for cold springs. Diurnal NO^3-N measurements taken at R.M. 104.3 on the Bear River near Preston and shown on Figure 26B show that Nitrogen concentrations vary from 0.1 mg/l at high flow to 0.17 mg/l at low flow. This data shows that groundwater is a main contribution to nitrate nitrogen in this portion of the River.

Solids

Figure 27B shows the total, dissolved and volatile solids in the main stem of the Bear River.

There is a substantial increase in total solids concentrations in the Bear River from the Wyoming-Idaho border to the Utah-Idaho border. The increase is fairly constant throughout the study reach. The majority of the solids is in the form of dissolved solids and approximately 20 to 30% of the total solids are of organic nature. Suspended solids concentrations (Figure 28B) are minor compared to

the other forms of solids. However, suspended solids levels coincide with turbidity levels (Figure 8B) and affect the fishing to a greater extent than other forms of solids. The lower suspended solids and turbidity levels coincide directly with the highest fish catch levels in the Bear River (Figure 12B). Survey data (See Appendix C) show that spring water turbidity levels are minimal and since spring water makes up part of the flow in the Bear River below Alexander Reservoir, the ground water dilution plays an important role in this stretch.

High dissolved solids are representative of groundwater inflow and agricultural runoff. Specific conductance has a relationship to Total Dissolved solids. When the total dissolved solids level is less than 2000 mg/l, the T.D.S. level is approximately .6 to .7 times the specific conductance level. Figure 29B shows the conductivity levels in the Bear River. The conductivity-T.D.S. relationship described above holds true for the river. Table VIIIB shows the specific conductance for the tributaries and groundwater inflows for the various reaches of the Bear River. The data shows that the first major increase in conductivity occurs downstream of the Bear Lake outlet canal. The canal water itself measures nearly 700 umho/cm. Major inflows of ions occur in the Soda Springs area and downstream via Big Springs, Soda and Whiskey creeks as well as all hot and cold springs flowing into the River. The spring inflow conductivity range from 900 to 1400 umho/Cm.

Bacteria

Figure 6B shows river mile plots of total and fecal coliform bacteria along with fecal streptococci (strep) for the Bear River

and its tributaries. Figure 30B shows the relationship ratio of fecal coliform to fecal streptococci bacteria. Large fecal strep densities represent bacteria from agricultural sources and low fecal strep densities associated with higher fecal coliform densities represent evidence of domestic sources of bacteria. A mean FC/FS ratio of 2.0 from samples strongly suggests bacteria from a domestic source while a ratio of 0.7 or less strongly suggests animal sources of bacteria. A ratio between 1.0 and 2.0 indicates an uncertain source of bacteria contamination. However, this does not mean bacteria from domestic waste is not present only that there is a predominance of animal waste. The complete bacteria survey data is included in Appendix B.

Downstream from the Wyoming border to Montpelier all three bacterial indices increased progressively reflecting a loading due to increased agricultural use. From Montpelier to Soda Springs all bacterial counts were quite variable with no discernable pattern. However, from Soda Springs to Preston all three indicators reflected bacterial loading due to a combination of agricultural runoff and/or domestic use.

The FC/FS ratio for the Bear River were all lower than the .7 value indicating a predominance of bacteria of farm animal origin. However, high FC/FS ratio were detected on Ovid, Montpelier and Soda Springs Creeks which suggest possible bacterial contamination from human sources.

High bacterial levels were found in a spring located south of Oneida Rd. West of Preston (Station 153587). Total fecal and fecal

strep. populations were 10,000, 2,700 and 7,800 per 100 ml. respectively indicating contamination of the spring probably from a livestock source since the FC/FS ratio was about 0.4.

Table IXB summarizes the bacterial pathogen data. Coagulase-positive S. aureus was found in 8 out of 13 (62%) samples examined. High numbers of this organism were found in Montpelier Creek; Bear River, Trout Creek, Williams Creek near Thatcher; Bear River near Fairview and at Upper Canal near Fairview. The presence of these pathogen in water suggests pollution from a human rather than animal source.

Pesticides

Table XB shows the results of pesticide analysis at selected stations in the Bear River Basin. Many other chlorinated hydrocarbon and organophosphate parameters were analyzed; however, only those shown on the table were above the analytical threshold.

Lindane (BHC) levels exceeding 0.005 ug/l were equalled or exceeded at all but three locations sampled in the basin. The recommended toxic level for BHC is considered to be .005 ug/l according to Water Quality criteria. (1) Detectable levels of DDD, DDE, DDT and Lindane were found only in the reach above the confluence of the Bear River and the Bear Lake outlet. The levels of these parameters were below detection limits in the Bear Lake outlet which makes up the majority of flow below that point and, therefore, has an overwhelming influence on the character of the river flow during this time of year. It appears that most of the conservative pesticides are entering Idaho

from Wyoming. The toxic levels for DDD, DDE and DDT are considered to be approximately 0.05 ug/l.

Mud Lake

Table VIIIB shows the concentration of various constituents of the inflows and outflows to Mud Lake and Table XIB contains nutrient, organics and bacteria loading in the Mud Lake area. It appears that twice as much phosphorus is leaving the Mud Lake area as entering. The same ratio of suspended solids is leaving Mud Lake also. The reason for this transport out of the area was probably the high discharge (900 cfs) from Bear Lake scouring the sediments in Mud Lake that were deposited during a lower flow portion of year. Since phosphorus absorbs into soil particles, the phosphorus levels are also transported out of Mud Lake; therefore, during the survey period, Mud Lake was a source of suspended solids and phosphorus.

Nitrate nitrogen and total organic carbon (TOC) were reduced through Mud Lake; therefore, Mud Lake is functioning as a sink for these constituents.

Drainage from the Paris, Idaho septic tanks is main contributor of total fecal bacteria to the area; however, the high flow down the Bear Lake outlet canal dilutes the small amount of concentrated waste so that the bacterial levels entering the Bear River are less than 100/100 ml. A new treatment plant for Paris was under construction during the survey period; therefore, the high bacteria levels should be drastically reduced in the near future.

Cub River

The Cub River was sampled at three locations along a six mile reach. The three stations were at the Cub Canal diversion dam (R.M. 20.9), at R.M. 16.5 just upstream of the community of Franklin, Idaho and at R.M. 15.1 just below Franklin and the Del Monte discharge.

Results of the study are shown on Figures 31B through 36B and Table XIIB.

This table shows the nutrient loadings in the Cub River. Total phosphorus, nitrate and ammonia loadings have been reduced between R.M. 20.9 and 16.5. Water use for agricultural purpose may be the reason. The increase in loadings between R.M. 16.5 and 15.1 cannot be explained by the discharge from Del Monte alone. In the 1.4 mile reach the Cub River receives approximately 12.5 CFS flow, 18.5 lg/day of phosphorus, 30 lb/day NO^3-N, and 57.5 lg/day of NH^3-N which is unaccounted for. This area should be investigated further for additional waste sources.

Bacterial densities on the Cub River as well as the FC/FS ratio for the study reach are given on Table XIIB.

Del Monte discharges a high level of bacteria into the Cub River; however, the samples taken approximately 1/2 mile downstream of the discharge do not reflect the high densities. The dilution effect of the additional flow in that reach and the die-off could help explain this.

Cattle observed watering in the Cub River between R.M. 20.9 to 16.5 are probably the reason for the high fecal strep densities of 1600/100 ml. sampled at the lower station.

FC/FS ratios shown on the table strongly indicate bacterial contamination caused by animals.

There is another discharge between the Del Monte discharge and the downstream sample station. It appears the discharge is irrigation return flow; however, access to this area is difficult and could not be sampled. This could be the reason for the discrepancy.

Worm Creek

Samples were taken from Worm Creek at locations just above the Preston sewage treatment plant outfall (R.M. 9.9) and approximately 0.8 miles downstream of the outfall. Twenty-four hour composite samples were also taken from the Preston STP outfall concurrently as part of the point source sampling program. Table XIIIB shows the sample results.

The general quality of Worm Creek has not deteriorated much as the result of the Preston sewage treatment plant. In fact, in some respects the discharge has improved the water of Worm Creek.

However, during the August 1974 survey high levels of bacteria were observed in the discharge of Preston STP as well as Worm Creek immediately downstream and as far as 0.8 miles downstream from the outfall. Fecal counts as shown on the table, increase from 90/100 ml. upstream of the outfall to a high of 50,000/100 ml. just downstream

and are still high (870/100 ml.) at the downstream sample point. Pathogenic bacteria *P. aeruginosa* (40/100 ml) and *S. aureus* (200/100 ml.) were detected in Worm Creek below the Preston sewage treatment plant. Although the numbers of these pathogens are not extremely high, their presence is indicative of poor disenfection practices.

Fecal bacteria levels from Preston STP were on the order of 100/100 ml. which does not account for the high level in the stream; however, STP samples were taken August 28 and Worm Creek samples were taken on August 29th which could account for the bacteria differences. During this period the operator at Preston STP was having trouble with the chlorination equipment.

BIBLIOGRAPHY

1. 1972 Water Quality Criteria - National Academy of Science - National Academy of Engineering - Washington

2. American Public Health Association. 1971. Standard methods for the examination of water and wastewater, 13th Ed. APHA, New York.

3. Levin, M.A. and V.J. Cabelli, 1972. Membrane filter technique for enumeration of Pseudomonas aeruginosa. Appl. Microbiol. 24: 864-870

4. Return of Planted Rainbow Trout Fishing Pressure and Catch in The Bear River and Fish Populations in Mainstem Reservoirs and Tributary Stream, Idaho Fish and Game, Heimer, John T. 1974.

5. Biological Parameters For Water Quality Criteria, Bioscience Vol. 18, No. 6, Wilhm, Jerry L. and Dorris, Troy C. 1968

6. Report of The Committee on Water Quality Criteria, FWPCA, National Technical Advisory Committee to the Secretary of the Interior April 1, 1968.

7. Biological Field and Laboratory Methods for Measuring The Quality of Surface Waters and Effluents, Weber, C.I. and B. McFarland, 1973.

APPENDIX A

AMBIENT DATA

FIGURE 1A

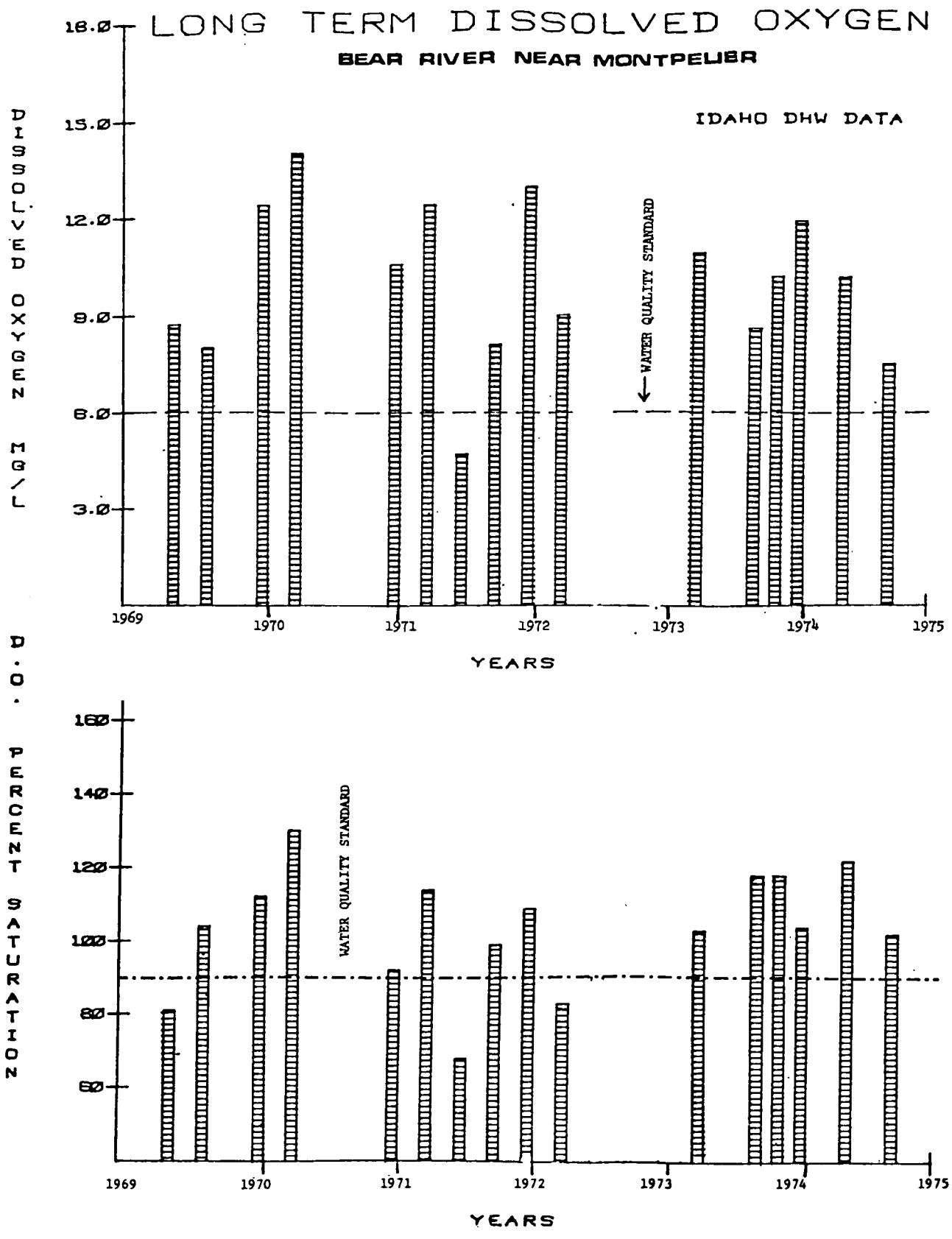

LONG TERM DISSOLVED OXYGEN
BEAR RIVER NEAR MONTPELIER
IDAHO DHW DATA
DISSOLVED OXYGEN MG/L
18.0
15.0
12.0
9.0
6.0
3.0
WATER QUALITY STANDARD
1969
1970
1971
1972
1973
1974
1975
YEARS
D.O. PERCENT SATURATION
160
140
120
100
80
60
WATER QUALITY STANDARD
1969
1970
1971
1972
1973
1974
1975
YEARS

FIGURE 2A

LONG TERM PH

BEAR RIVER NEAR MONTPELIER

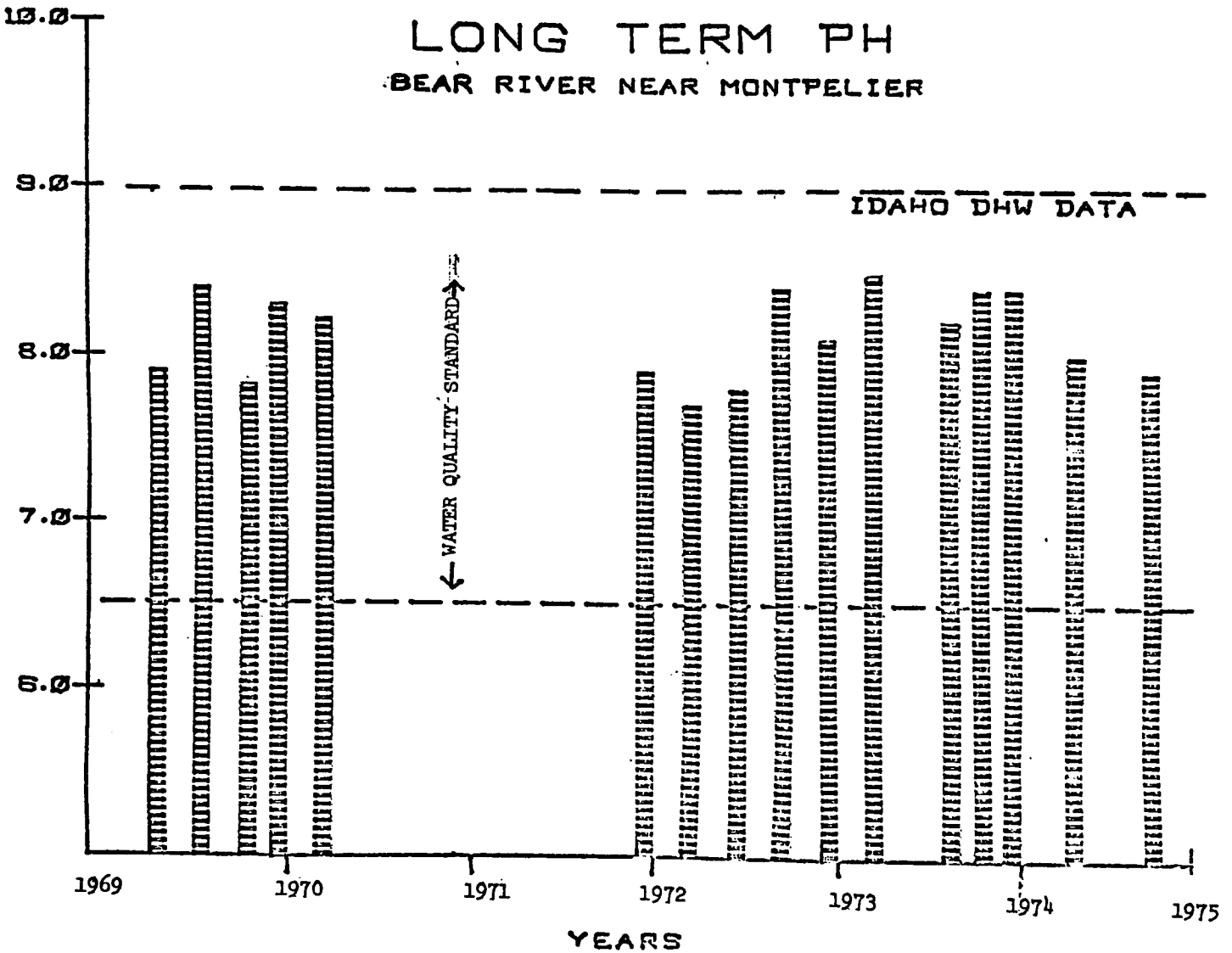


FIGURE 3A

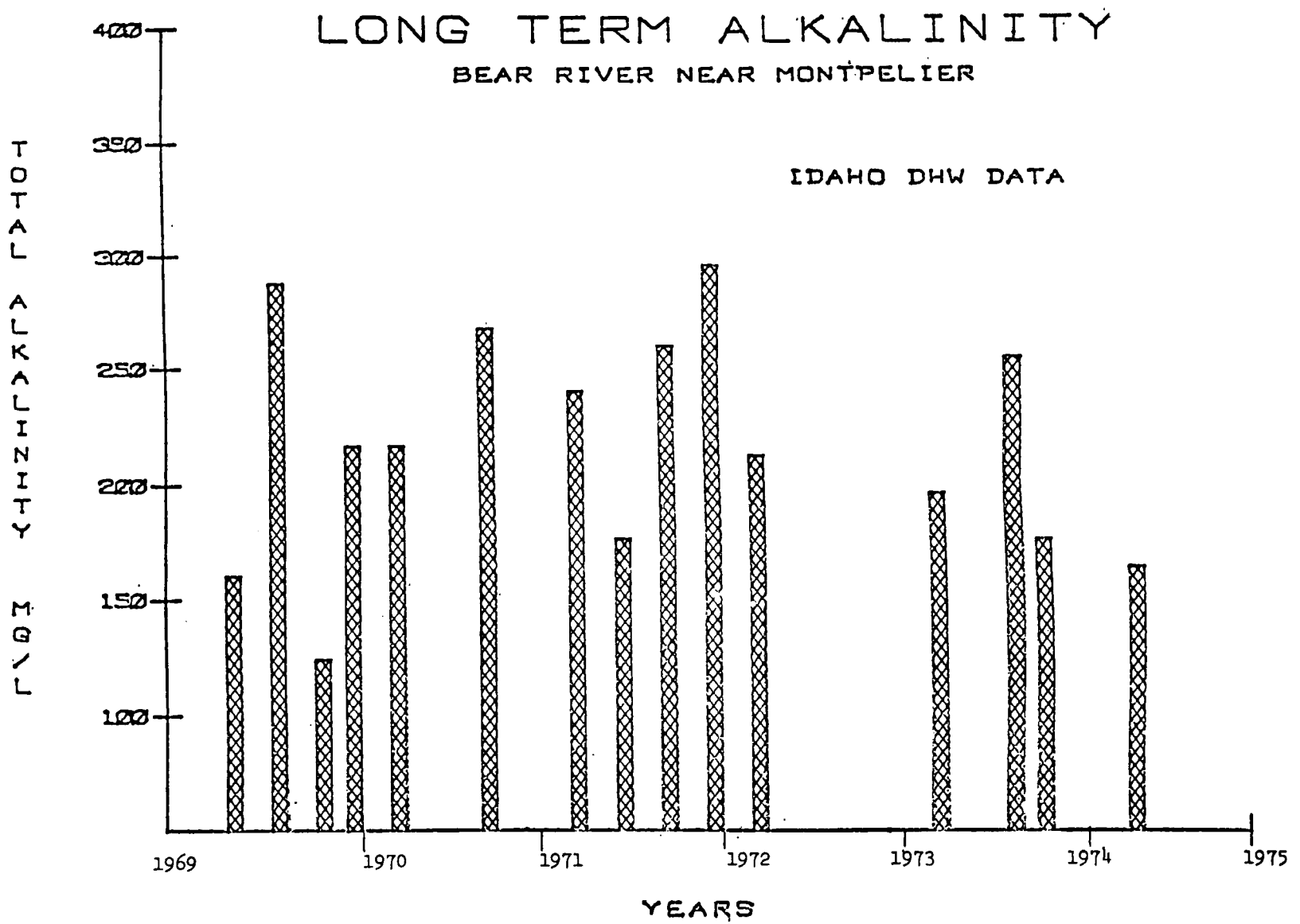

LONG TERM ALKALINITY
BEAR RIVER NEAR MONTPELIER
IDAHO DHW DATA
TOTAL ALKALINITY MG/L
400
350
300
250
200
150
100
1969
1970
1971
1972
1973
1974
1975
YEARS

FIGURE 4A

LONG TERM ORTHO PHOSPHATE

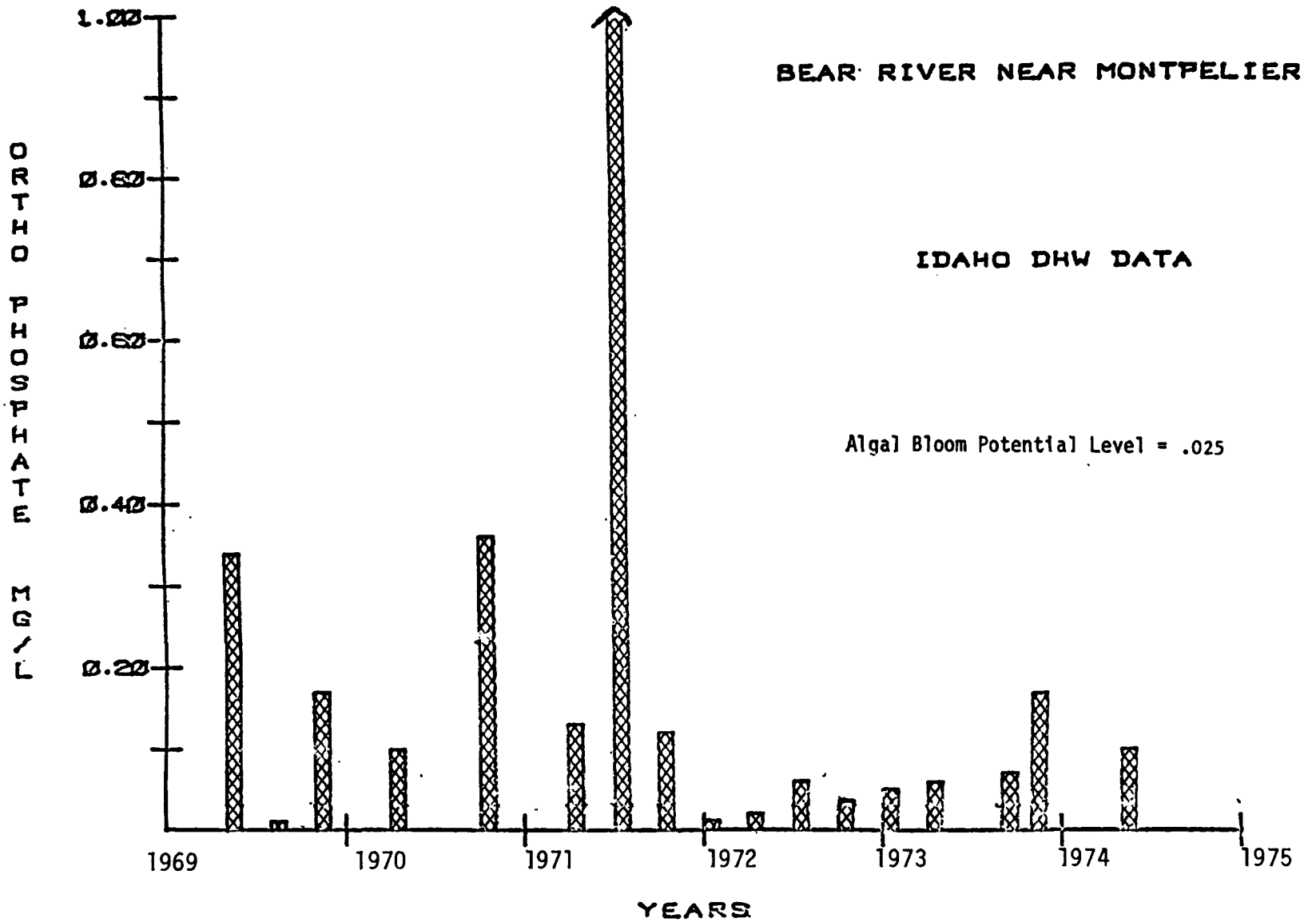
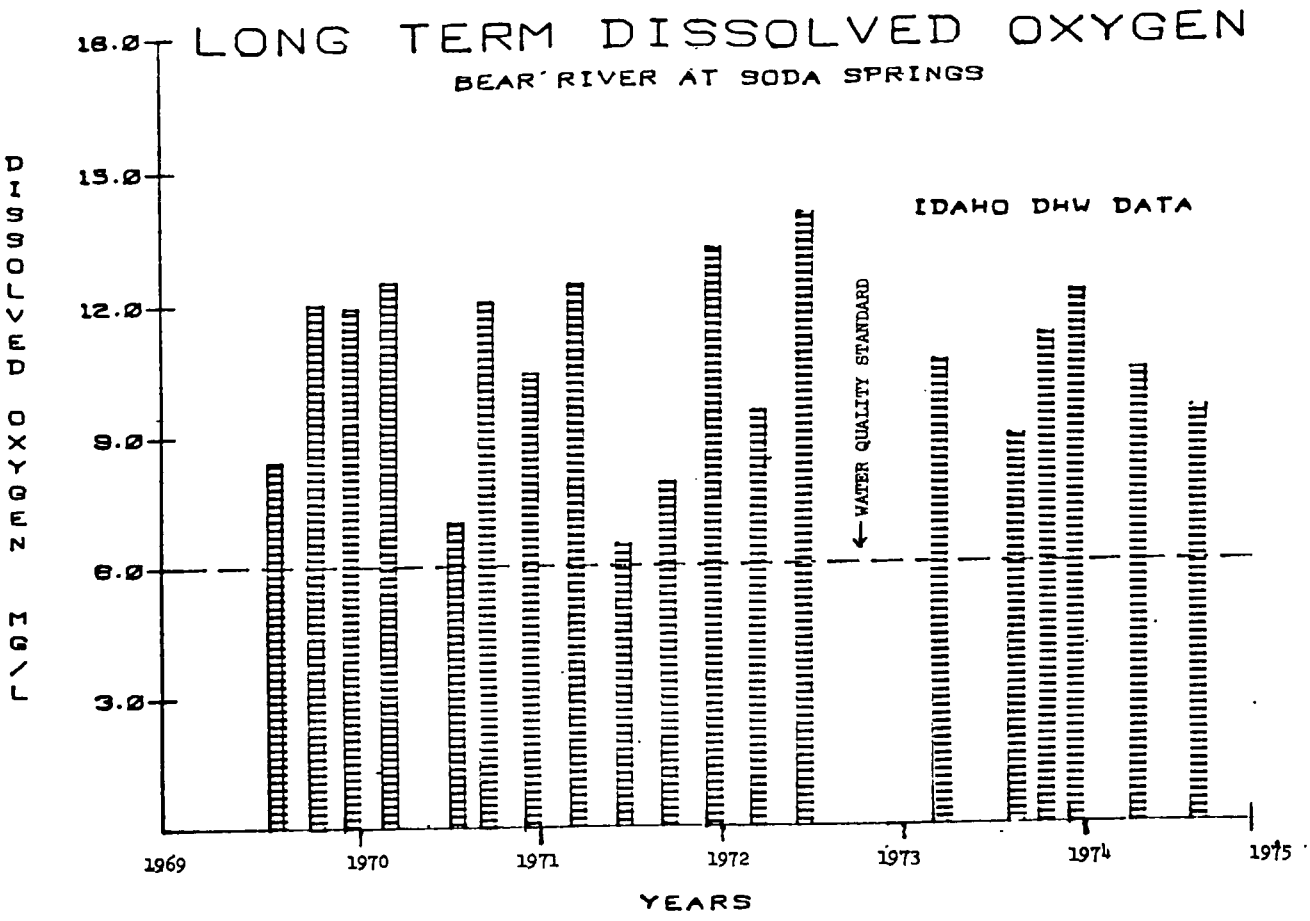


FIGURE 5A


LONG TERM DISSOLVED OXYGEN
BEAR RIVER AT SODA SPRINGS
IDAHO DHW DATA
WATER QUALITY STANDARD
DISSOLVED OXYGEN MG/L
18.0
15.0
12.0
9.0
6.0
3.0
1969
1970
1971
1972
1973
1974
1975
YEARS

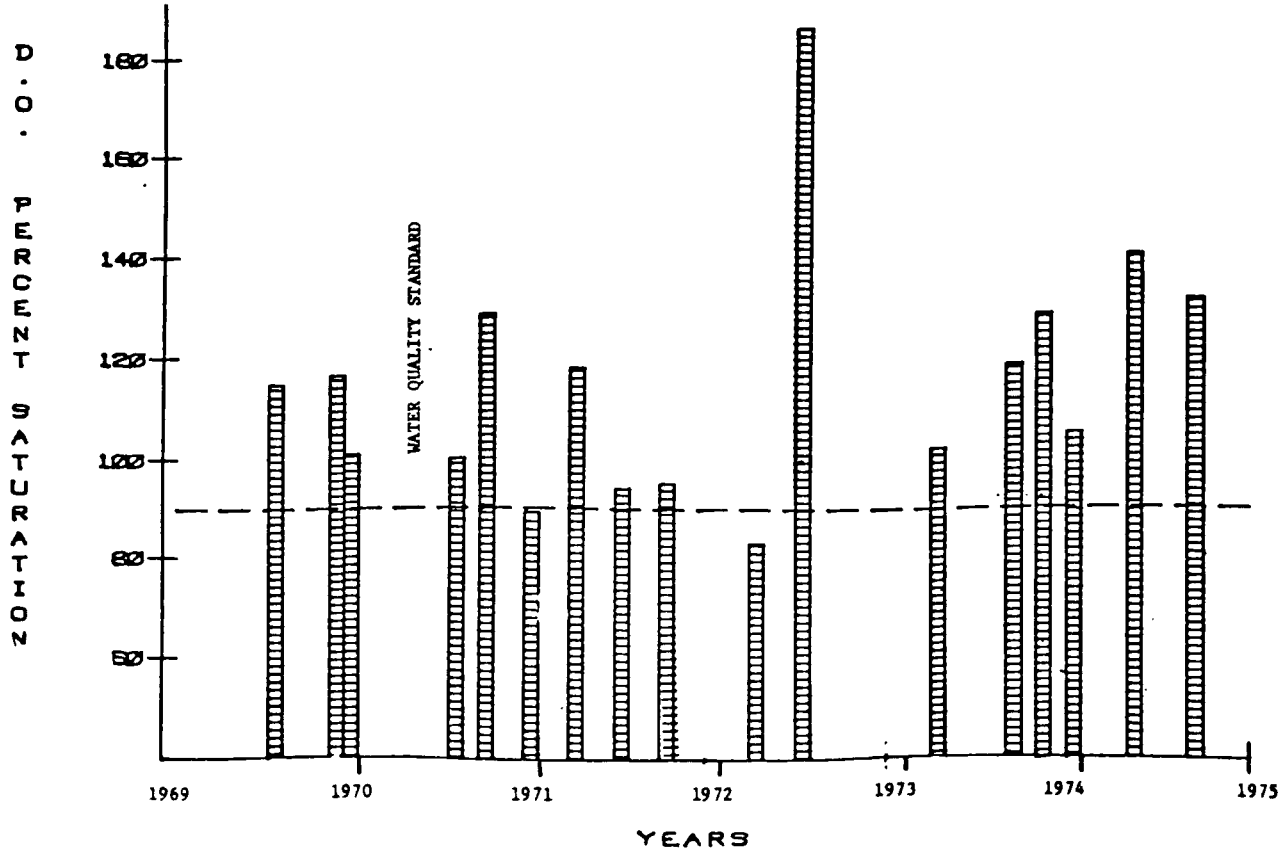

WATER QUALITY STANDARD
D.O. PERCENT SATURATION
180
160
140
120
100
80
60
1969
1970
1971
1972
1973
1974
1975
YEARS

FIGURE 8A

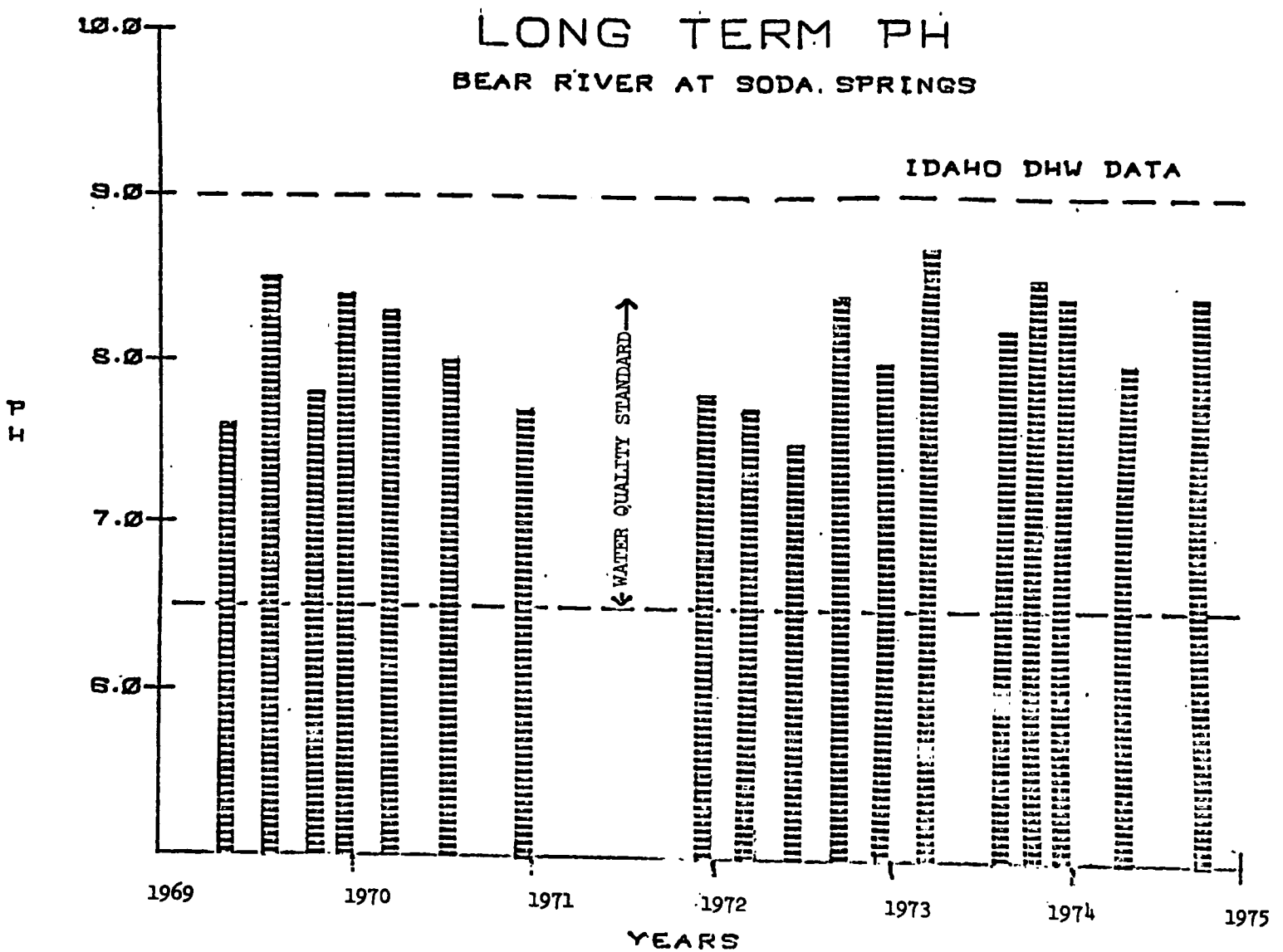

LONG TERM PH
BEAR RIVER AT SODA SPRINGS
IDAHO DHW DATA
WATER QUALITY STANDARD
10.0
9.0
8.0
7.0
6.0
PH
1969
1970
1971
1972
1973
1974
1975
YEARS

FIGURE 7A

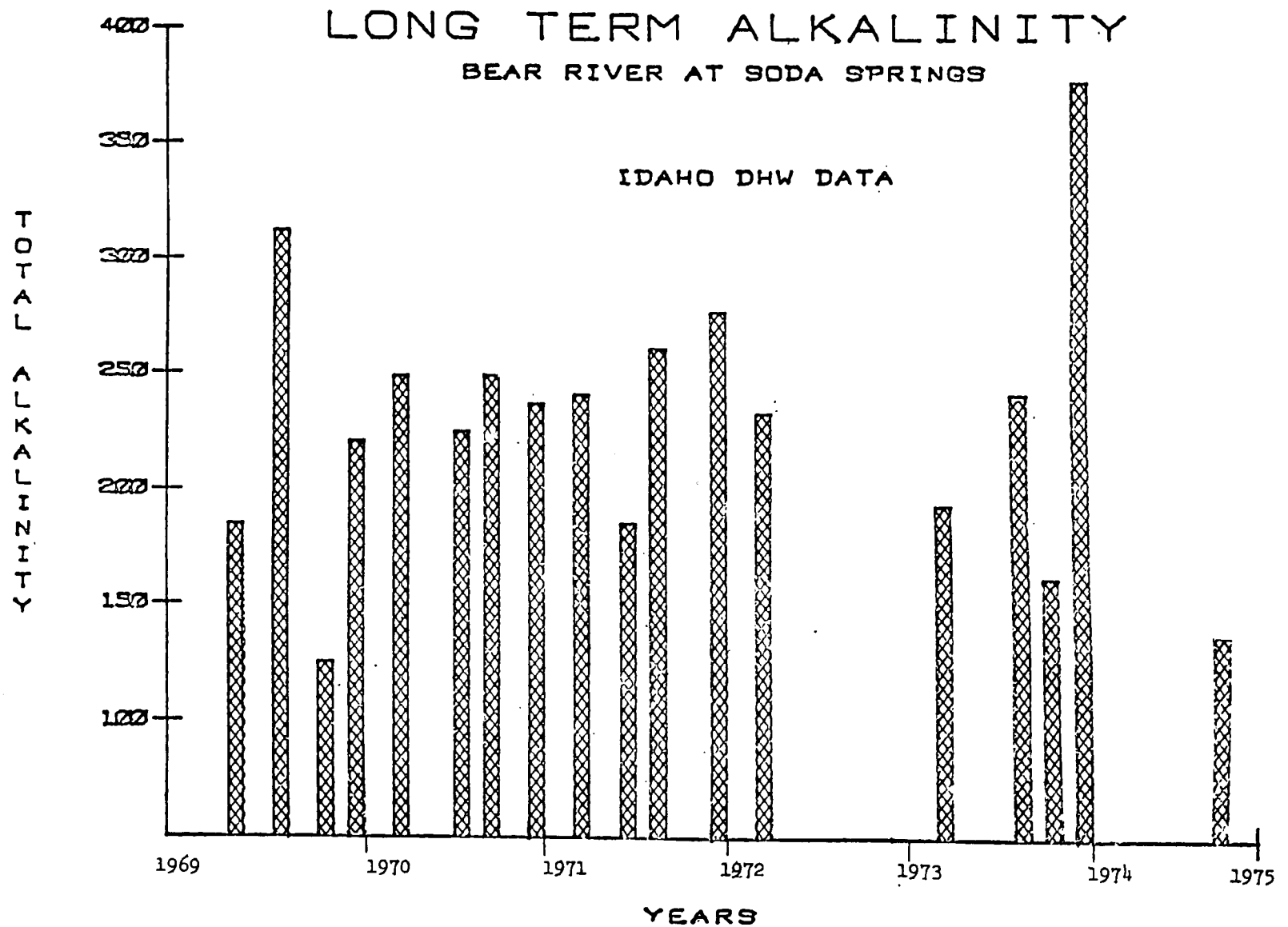

LONG TERM ALKALINITY
BEAR RIVER AT SODA SPRINGS
IDAHO DHW DATA
TOTAL ALKALINITY
400
350
300
250
200
150
100
1969
1970
1971
1972
1973
1974
1975
YEARS

FIGURE 8A

LONG TERM ORTHO PHOSPHATE

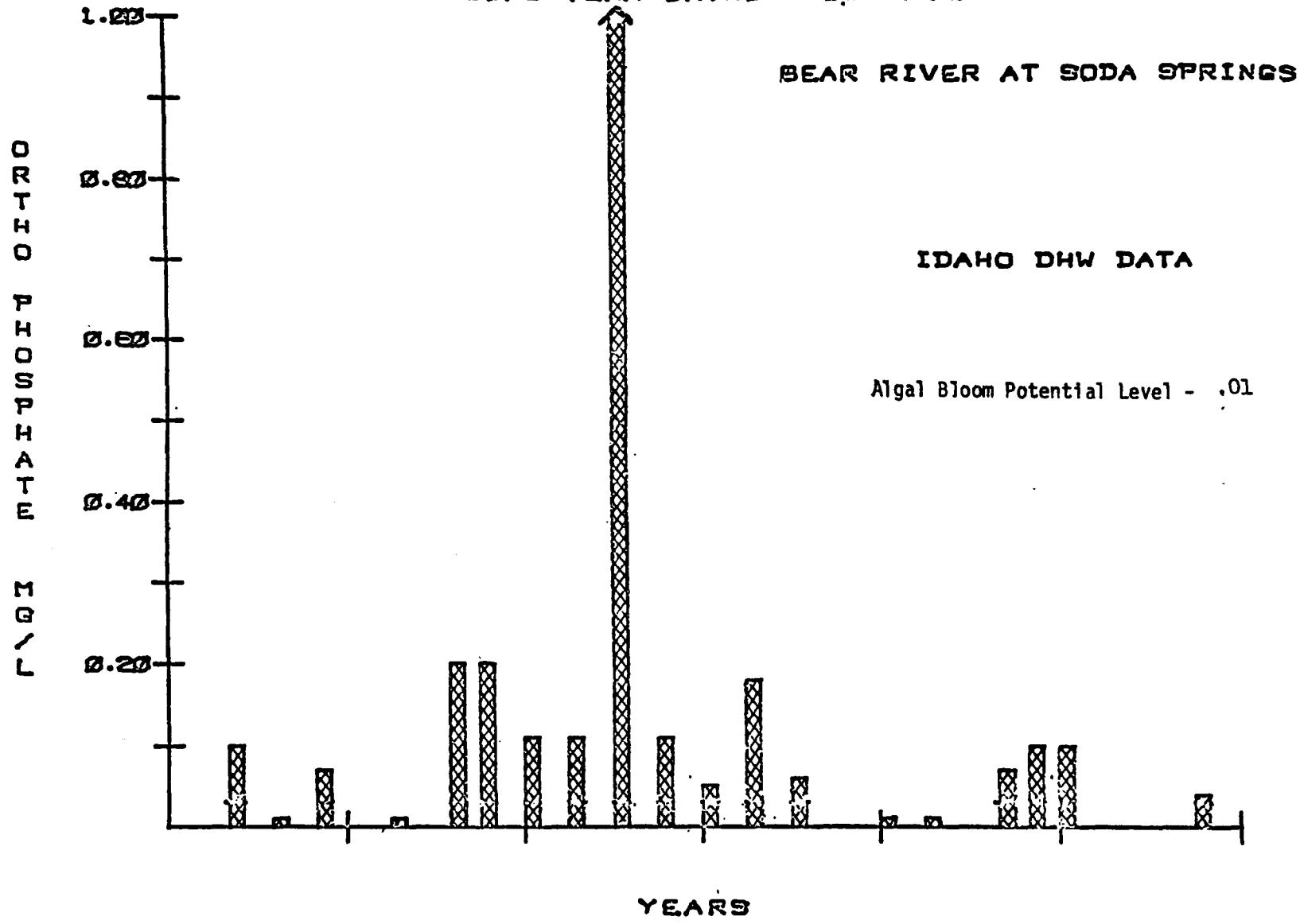
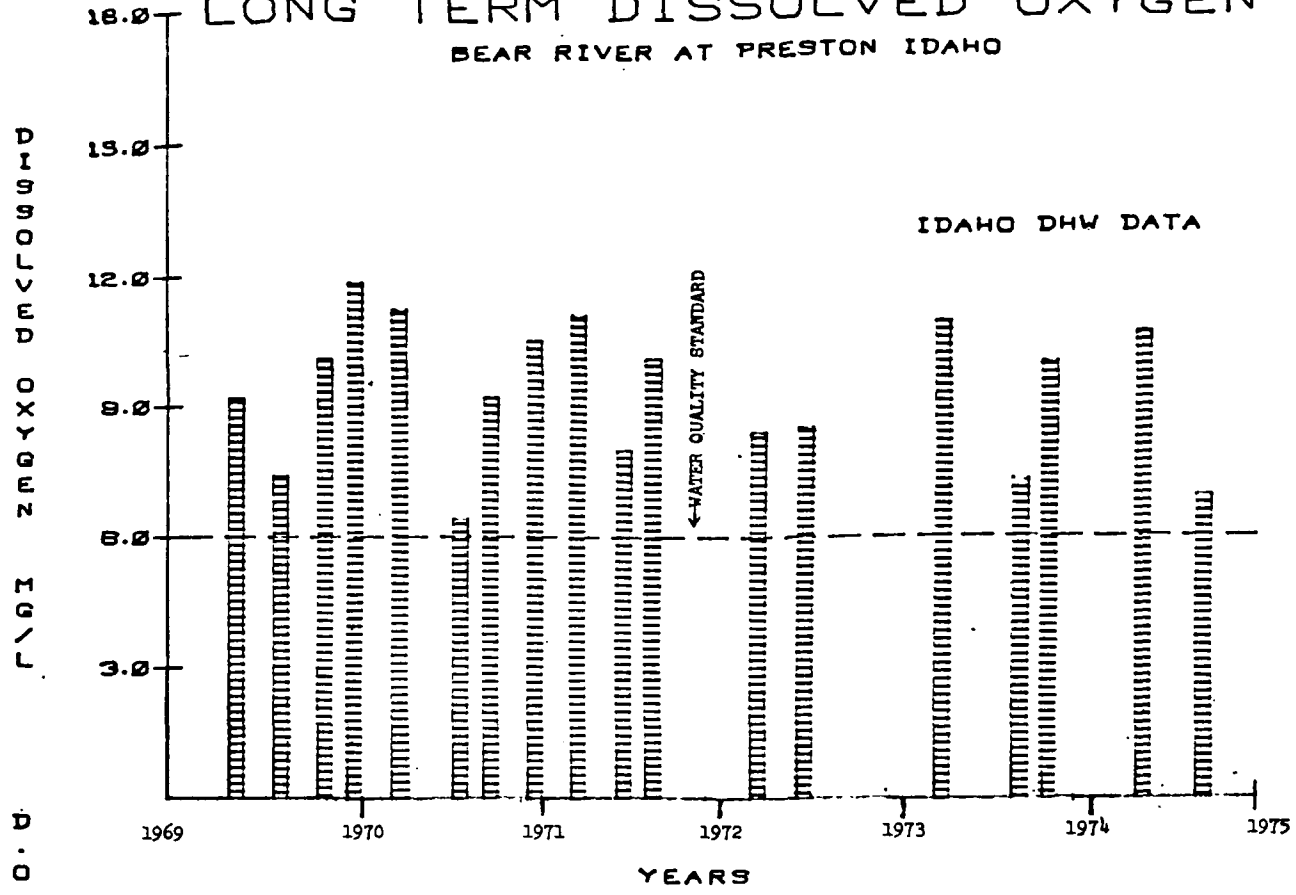


FIGURE 9A

LONG TERM DISSOLVED OXYGEN

BEAR RIVER AT PRESTON IDAHO



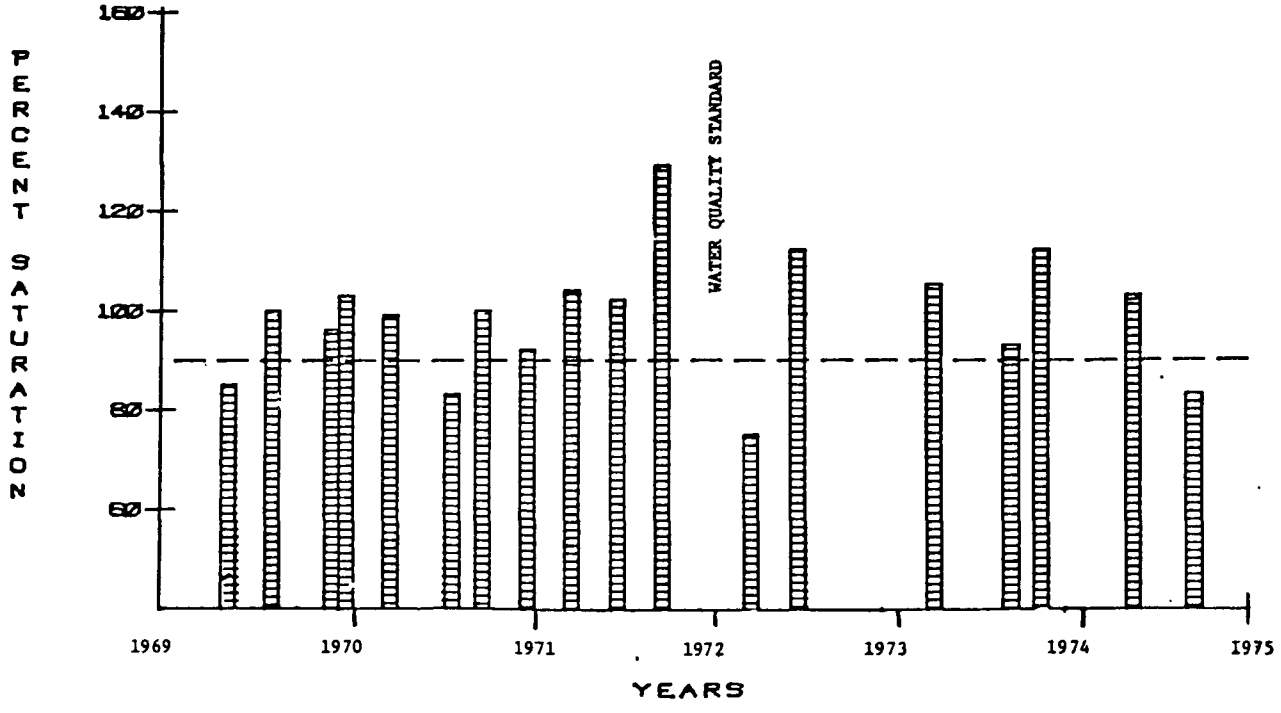


FIGURE 10A

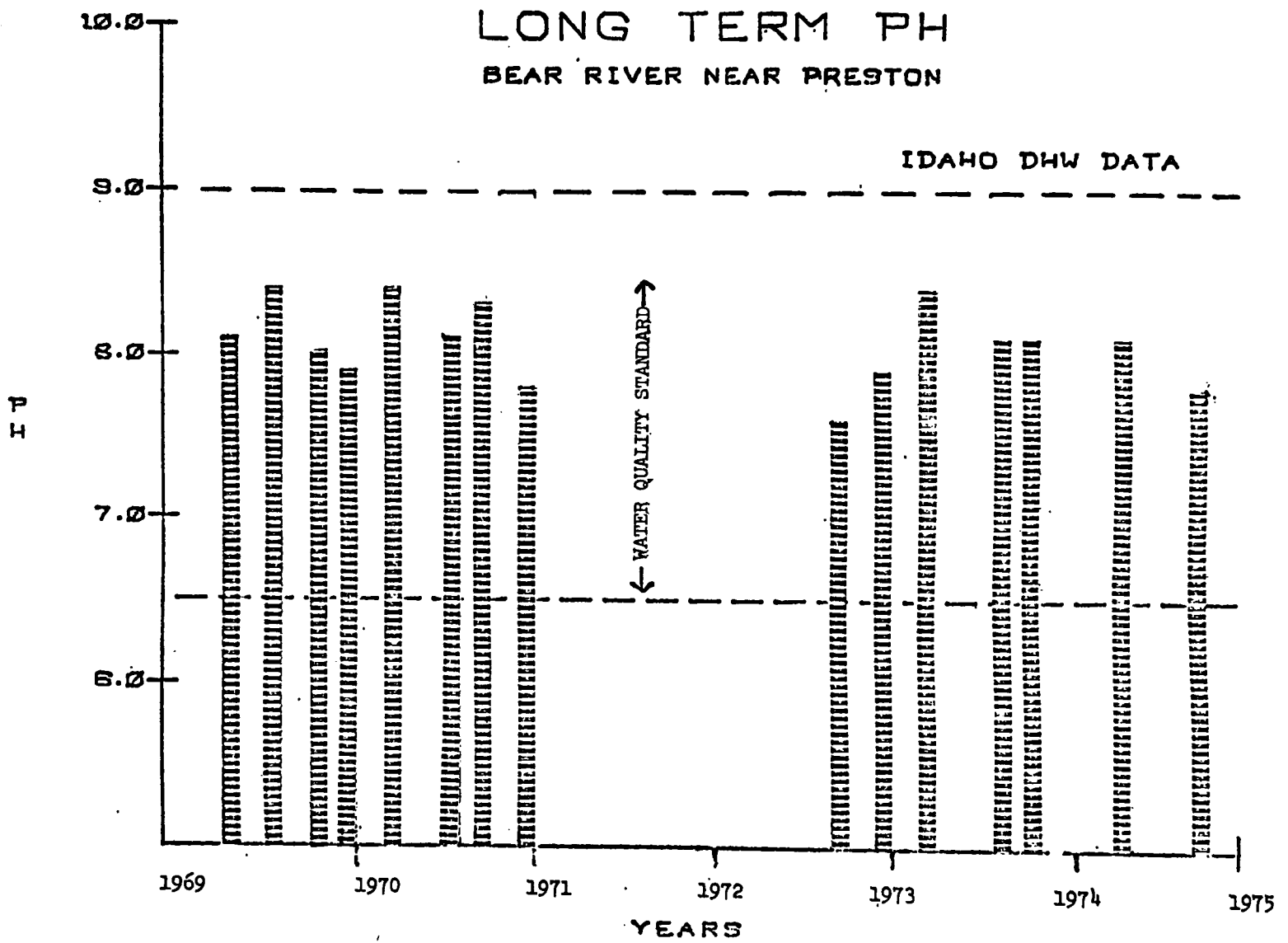

LONG TERM PH
BEAR RIVER NEAR PRESTON
IDAHO DHW DATA
WATER QUALITY STANDARD
10.0
9.0
8.0
7.0
6.0
pH
1969
1970
1971
1972
1973
1974
1975
YEARS

FIGURE 11A

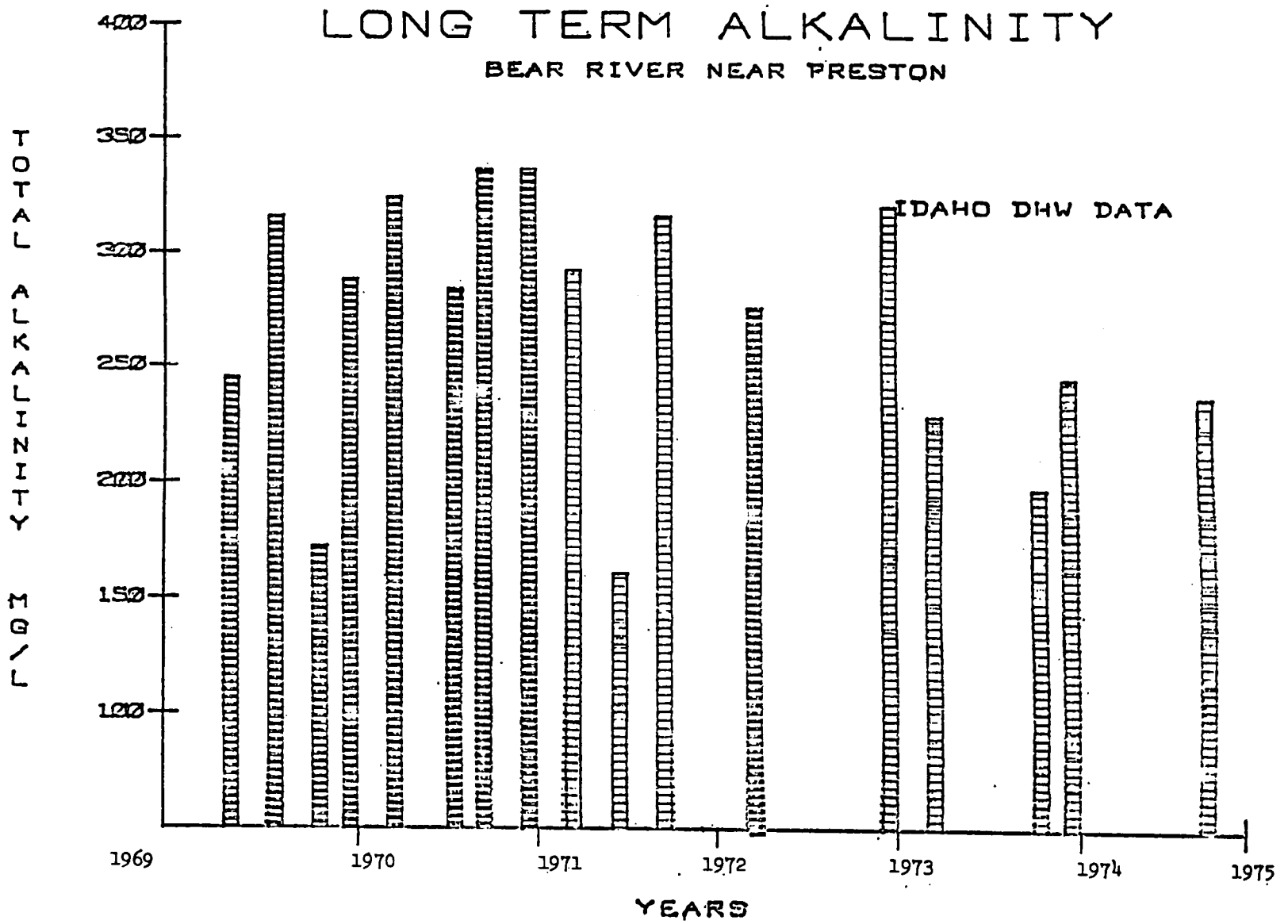
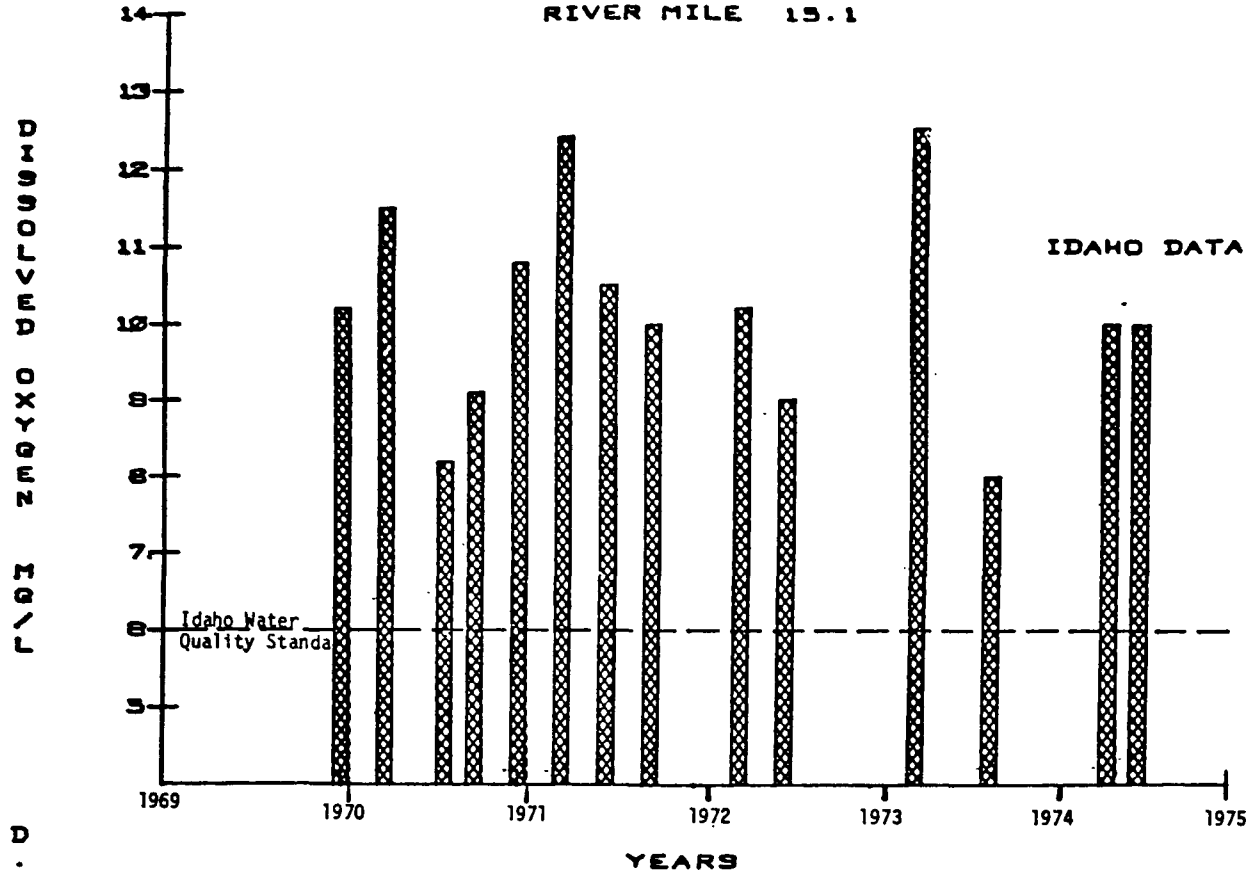

LONG TERM ALKALINITY
BEAR RIVER NEAR PRESTON
IDAHO DHW DATA
TOTAL ALKALINITY MG/L
400
350
300
250
200
150
100
1969
1970
1971
1972
1973
1974
1975
YEARS

FIGURE 12A
CUB RIVER BLW DEL MONTE CANNERY

RIVER MILE 15.1



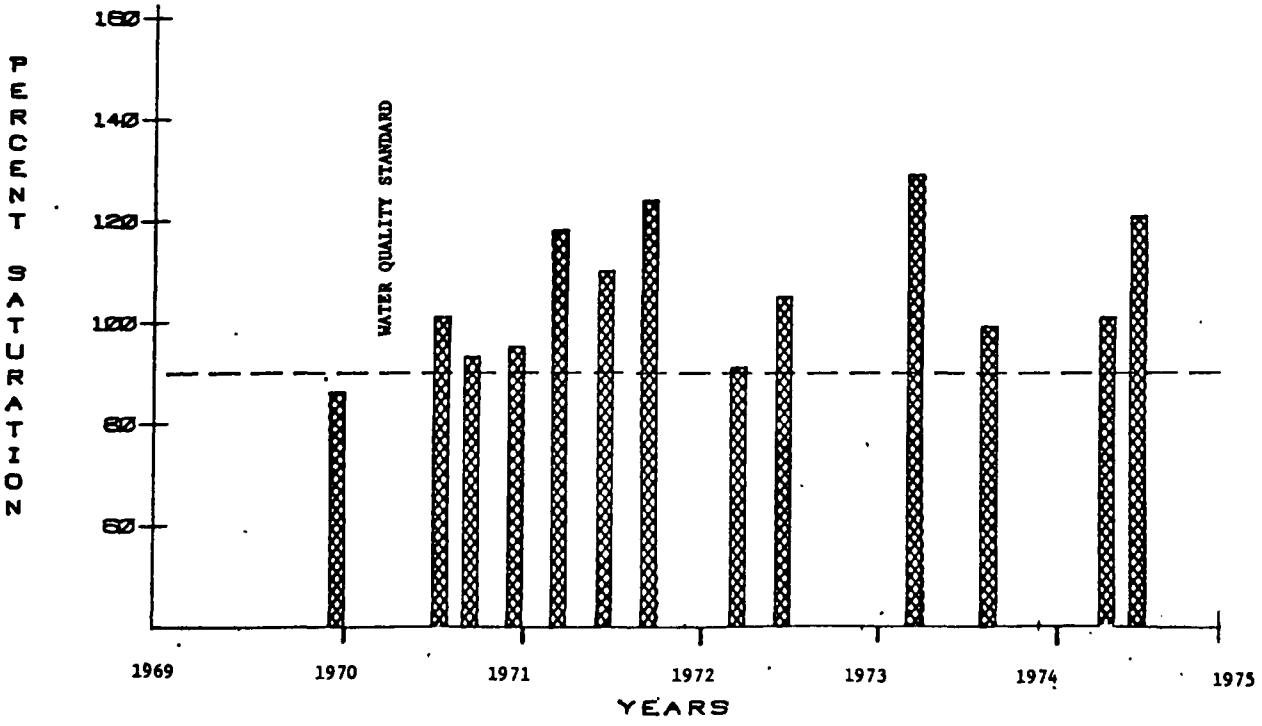


FIGURE 13A

CUB RIVER BLW DEL MONTE CANNERY

RIVER MILE 15.1

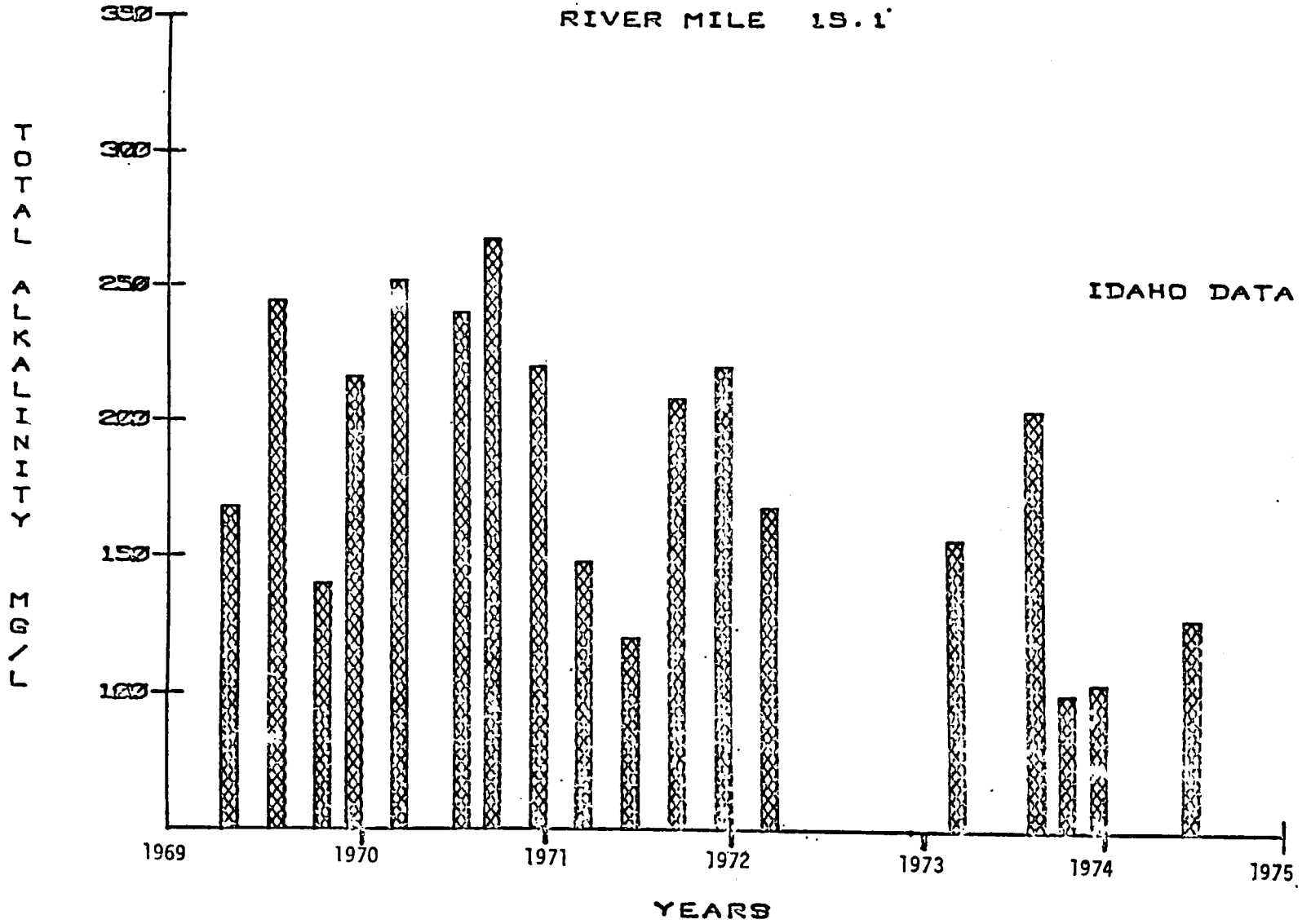


FIGURE 14A

WORM CREEK NEAR IDAHO-UTAH BORDER

RIVER MILE 4.0

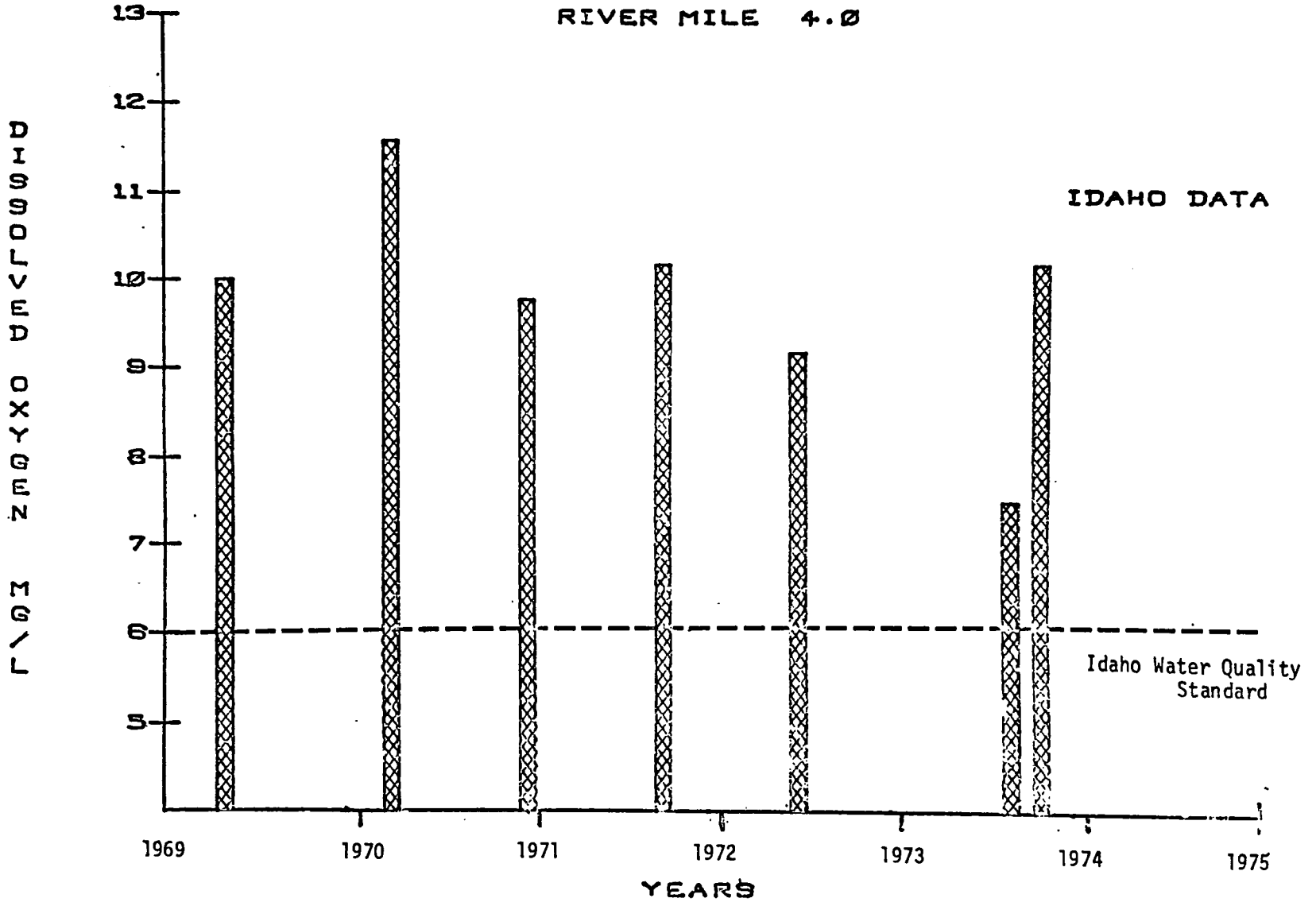
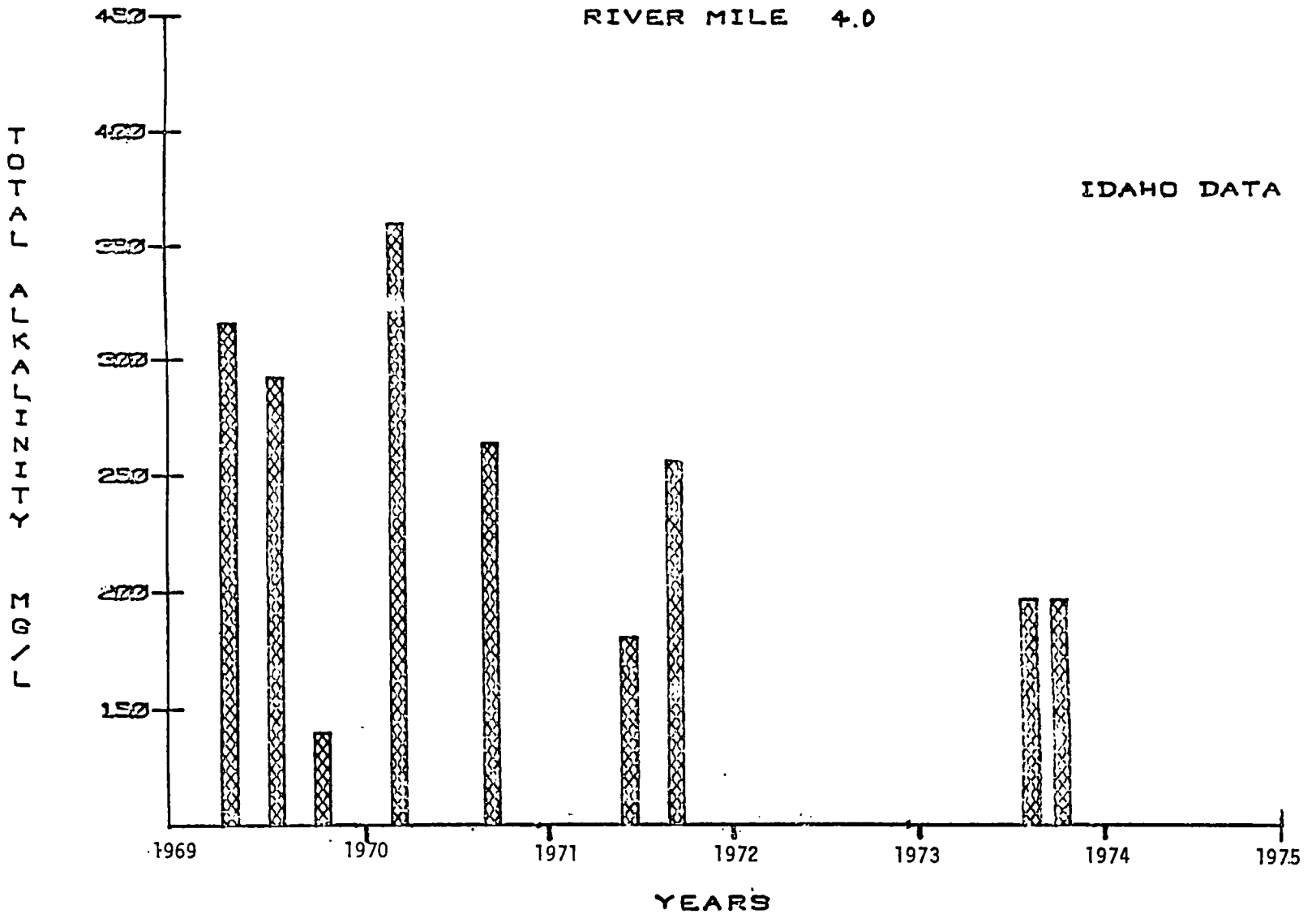


FIGURE 15A

WORM CREEK NEAR IDAHO-UTAH BORDER

RIVER MILE 4.0



APPENDIX B

1974 SURVEY FIGURES AND TABLES

FIGURE 1B

BEAR RIVER FLOW DIAGRAM

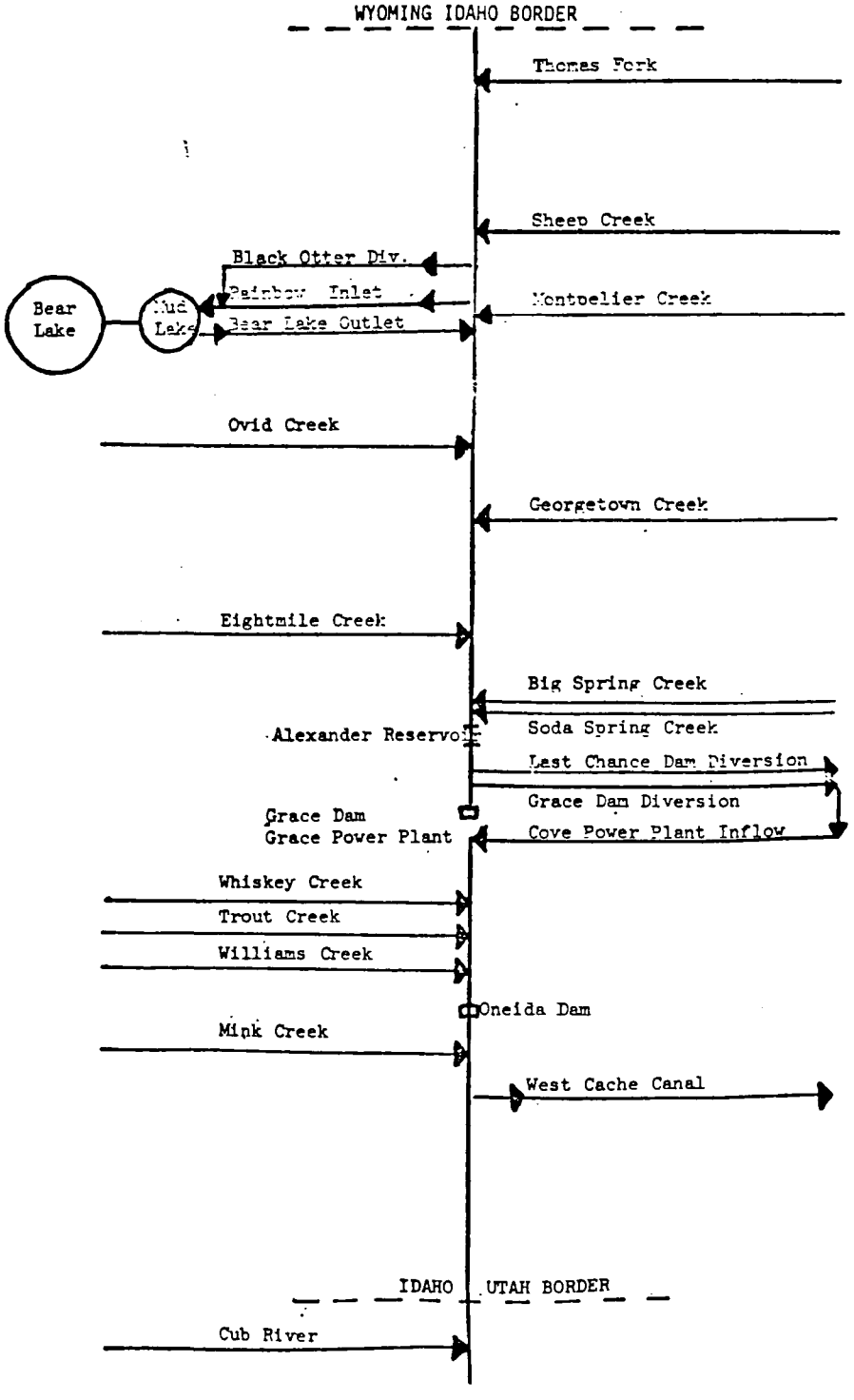


FIGURE 2B
FLOW
BEAR RIVER

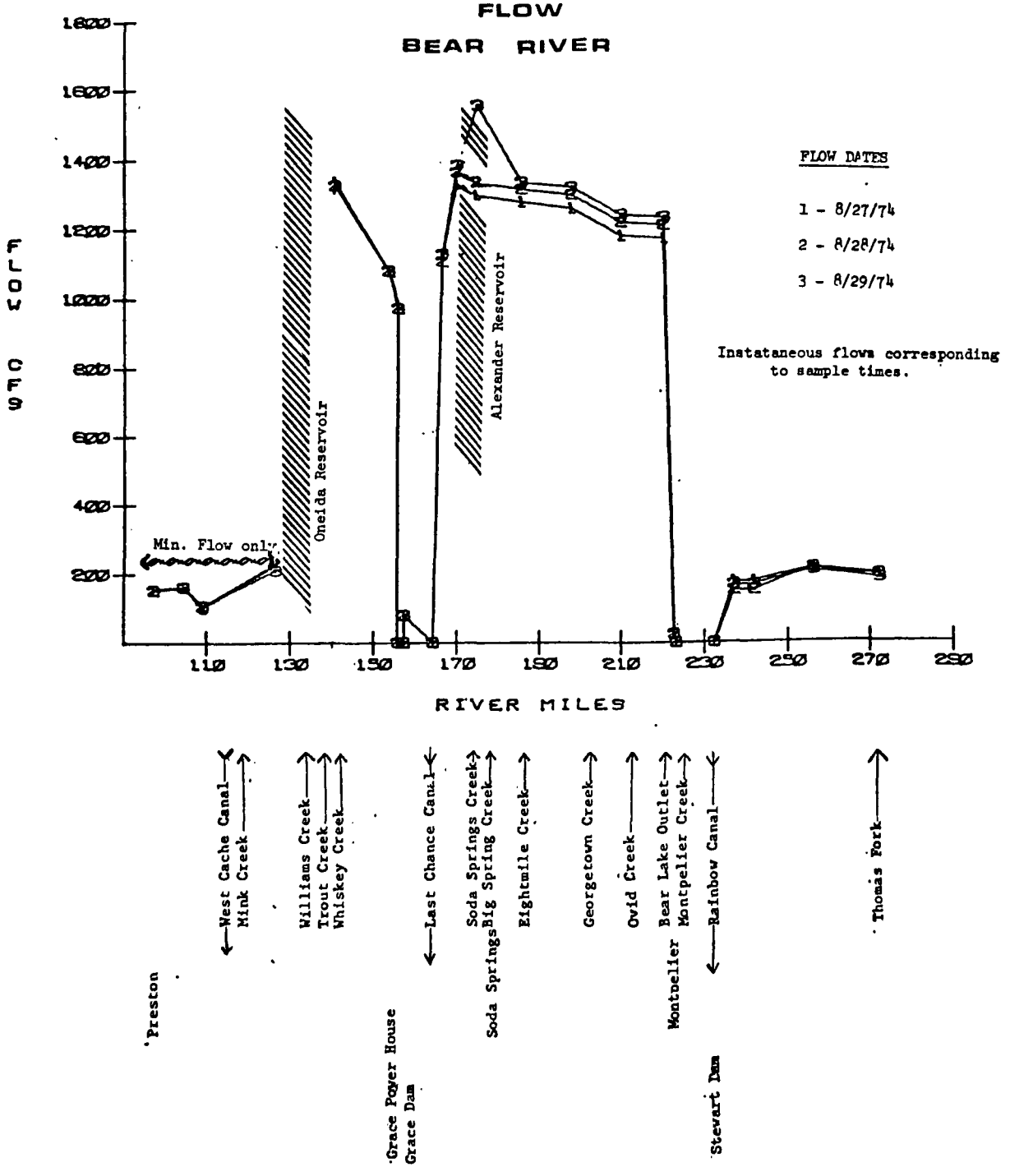


FIGURE 3B
BEAR RIVER SURVEY

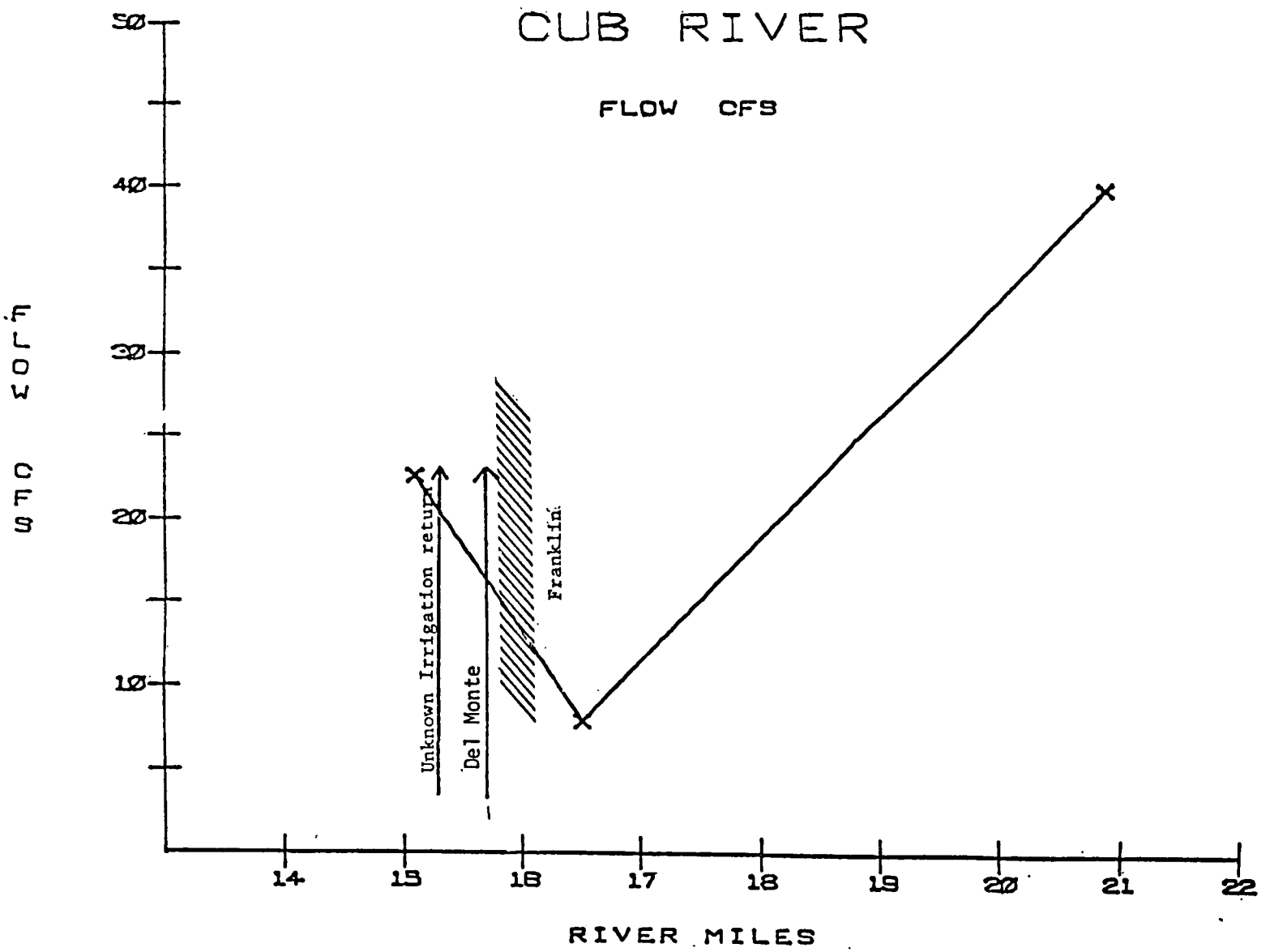


FIGURE 4B

FLOW DIAGRAM FOR CUB RIVER

Bear River Basin

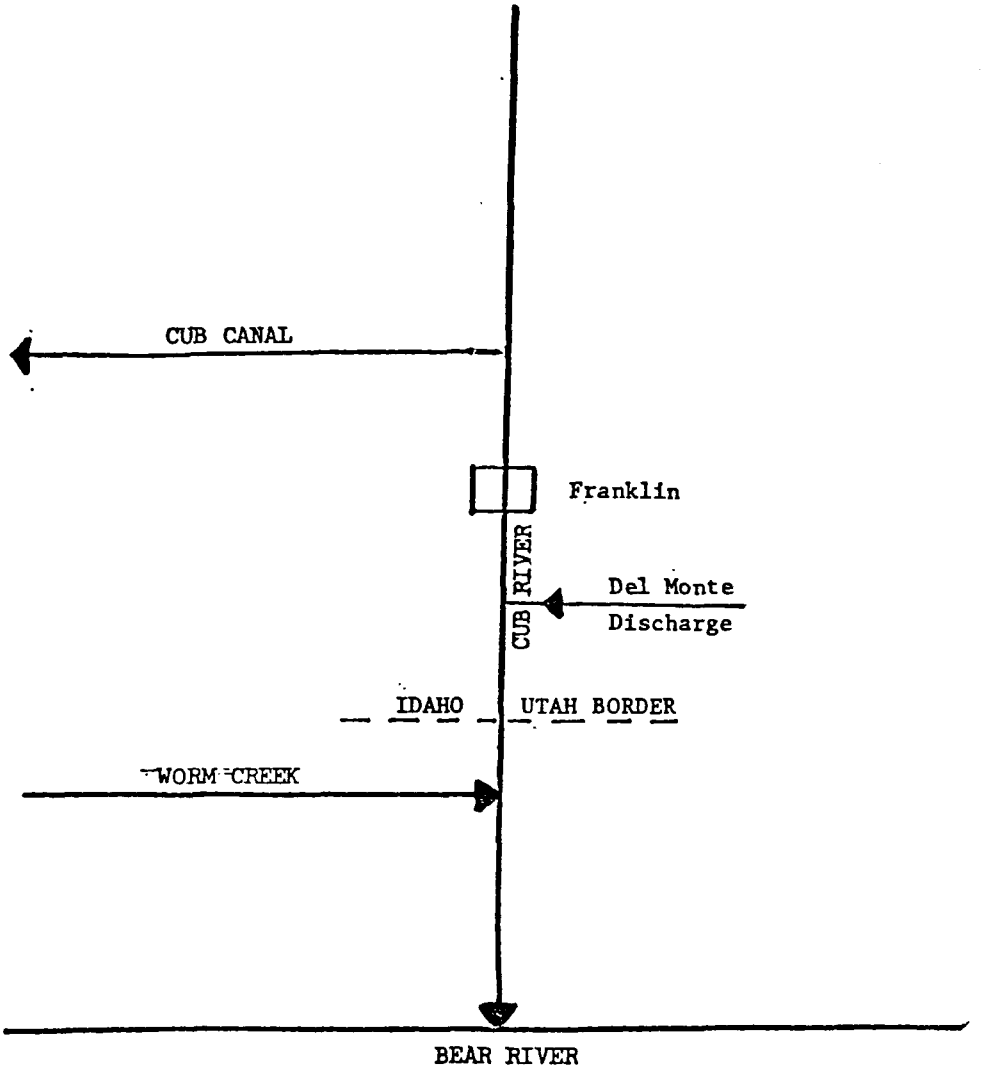


FIGURE 5B

FLOW DIAGRAM FOR BEAR LAKE

Bear River Basin

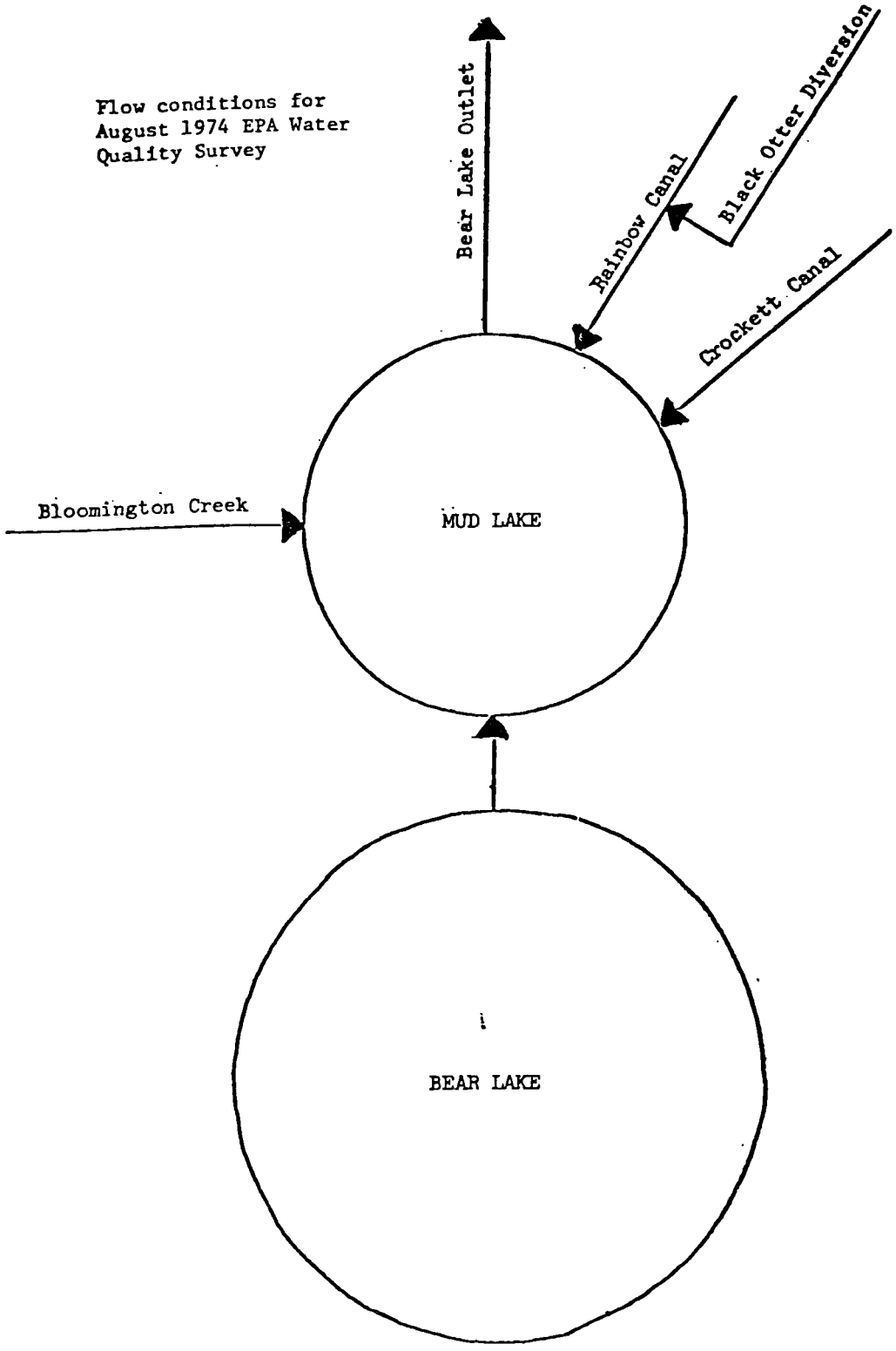


FIGURE 6B

COLIFORM ON THE BEAR RIVER

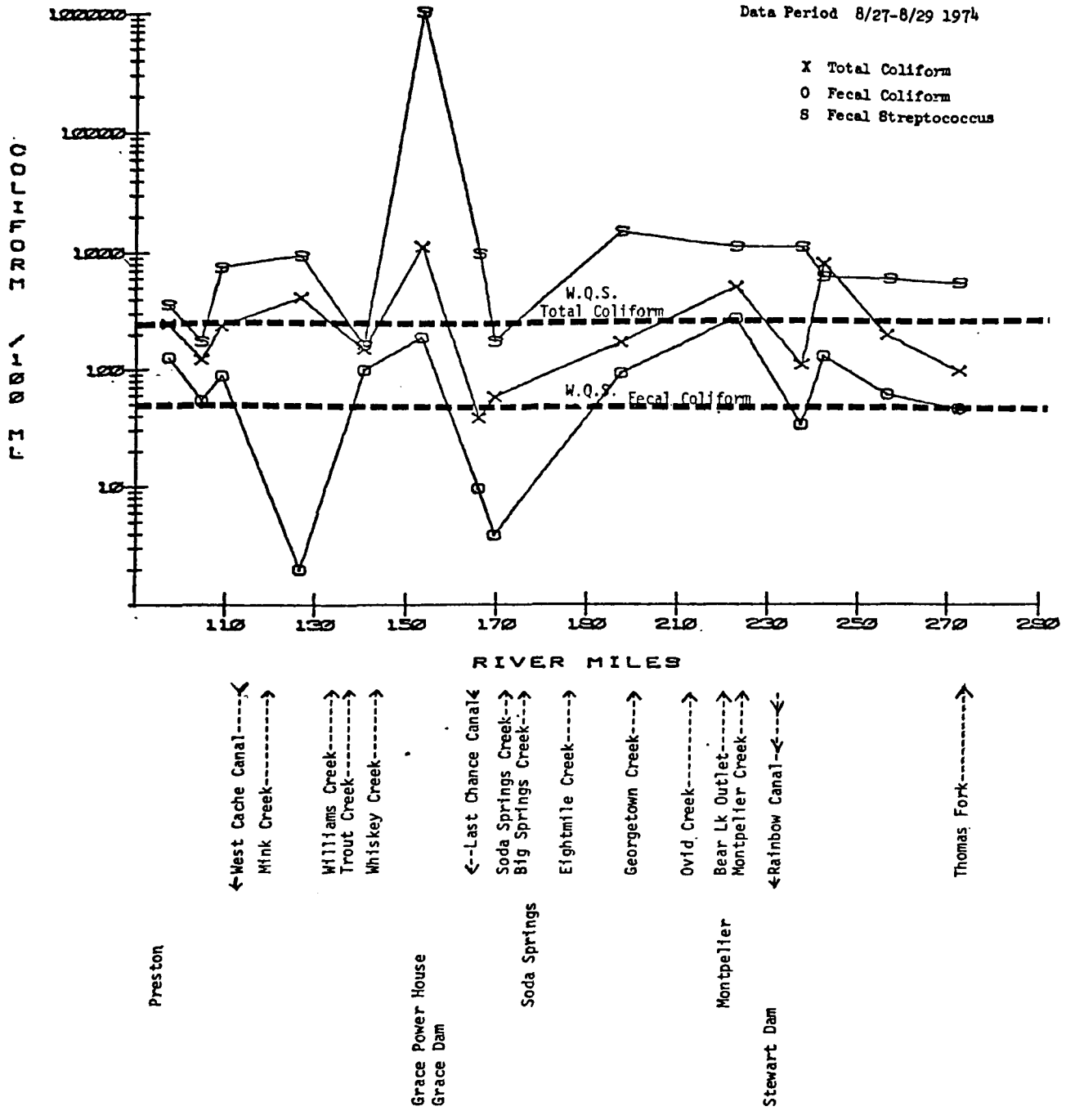
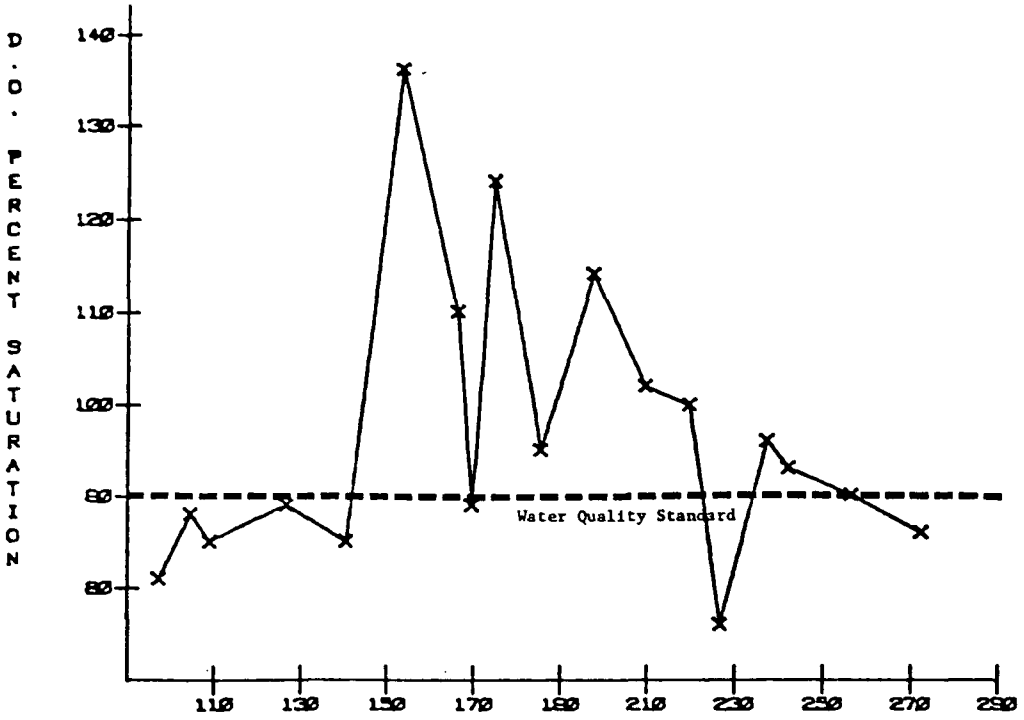
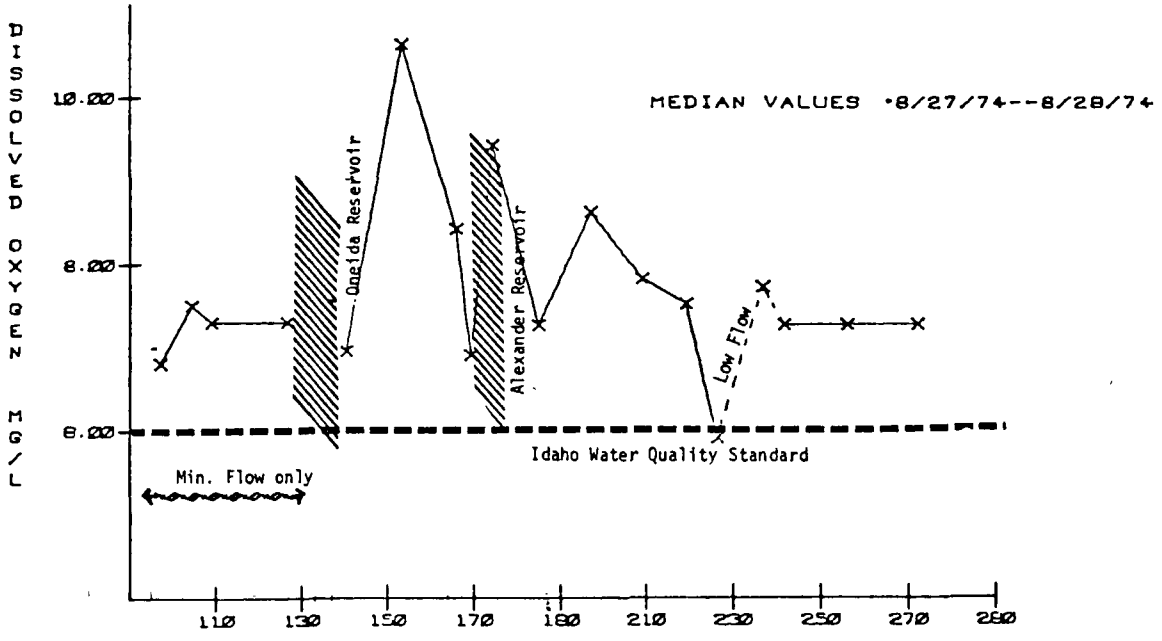


FIGURE 7B
DISSOLVED OXYGEN
BEAR RIVER





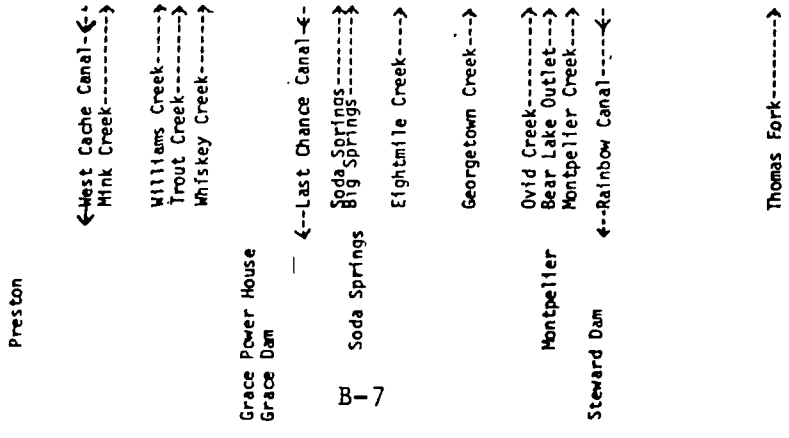


FIGURE 8B

TURBIDITY

BEAR RIVER

MEDIAN VALUES 8/27/74--8/28/74

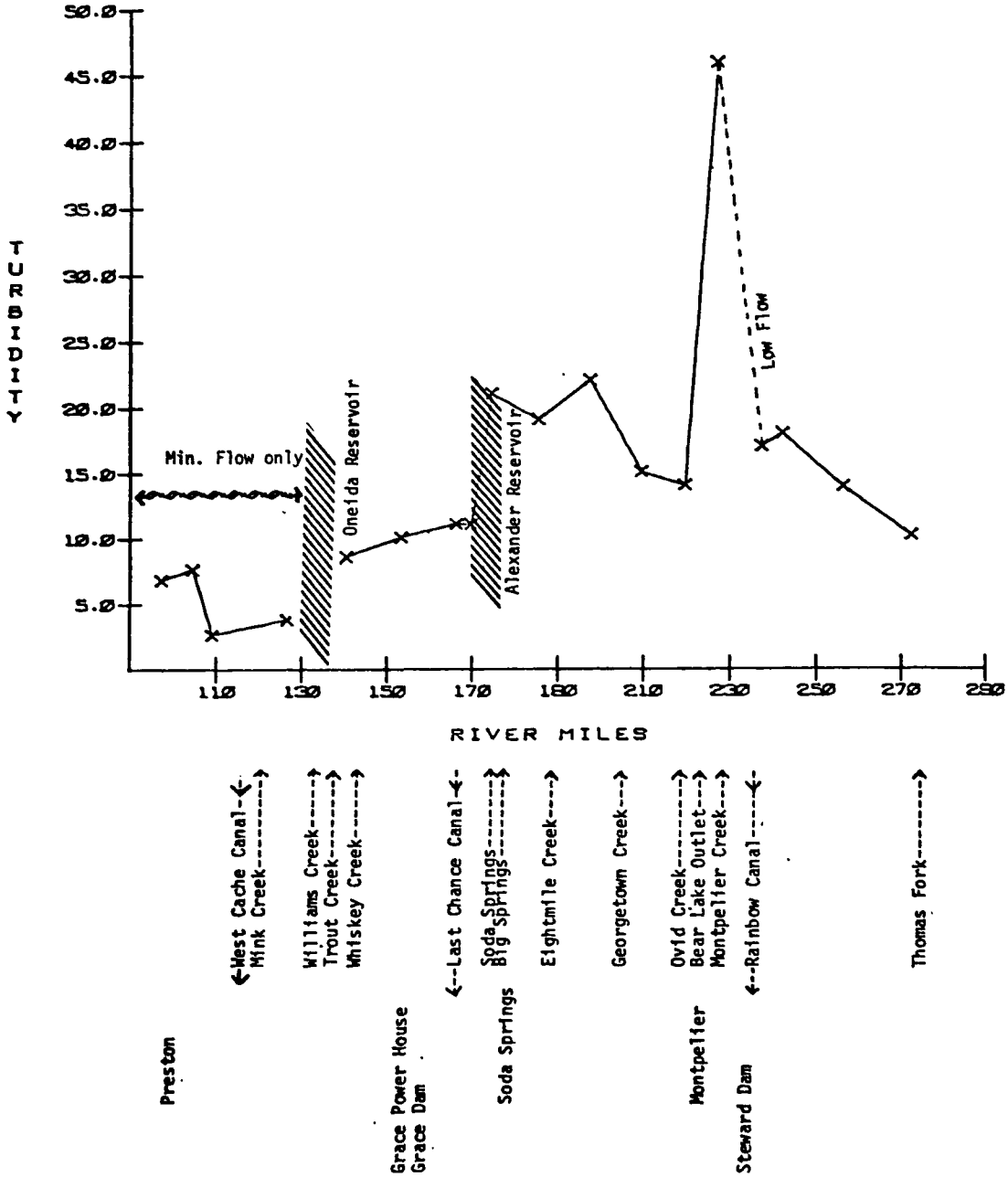


FIGURE 9B
TURBIDITY
CUB RIVER

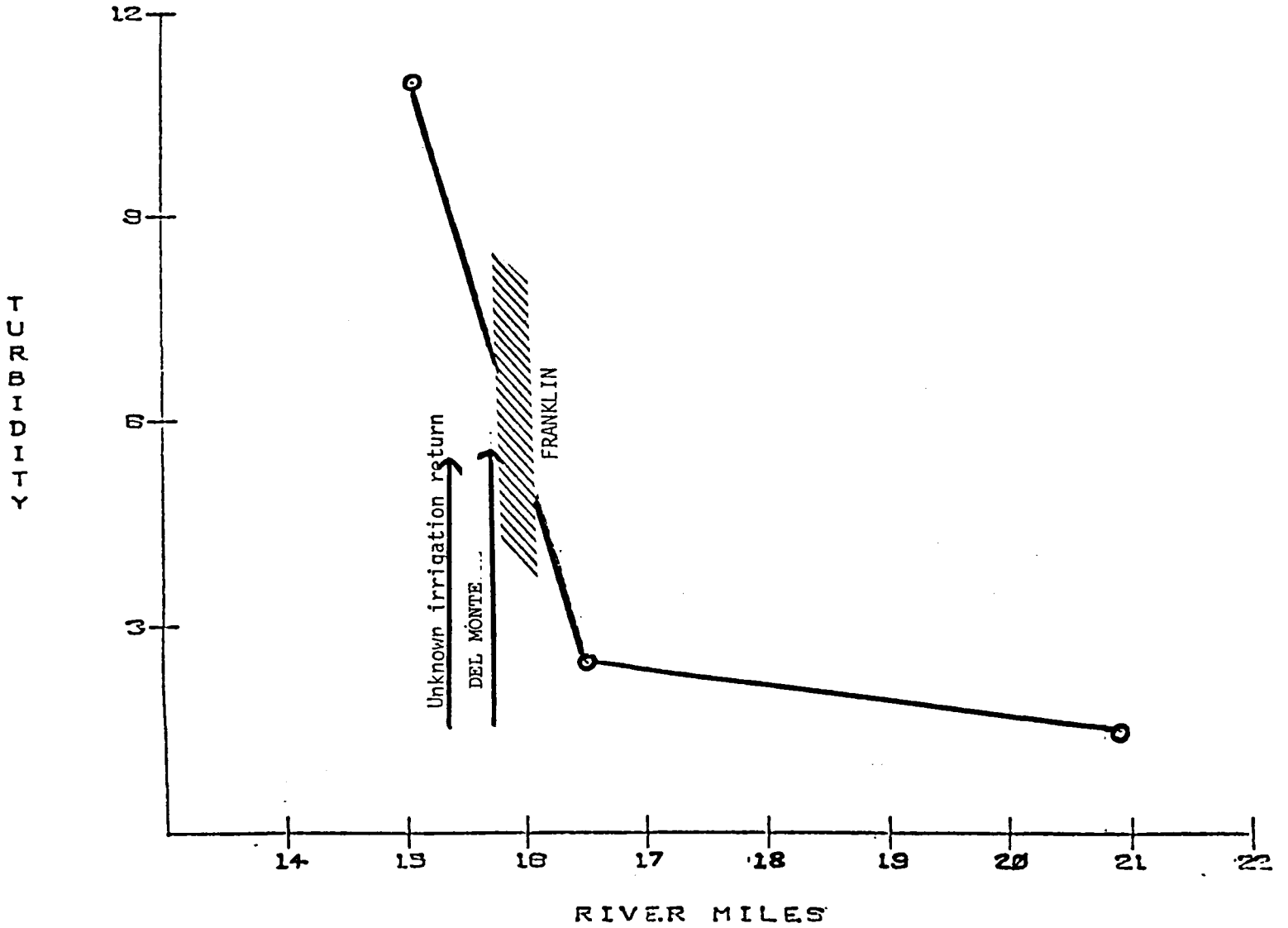


FIGURE 10B
pH
BEAR RIVER

MEDIAN VALUES 8/27/74--8/28/74

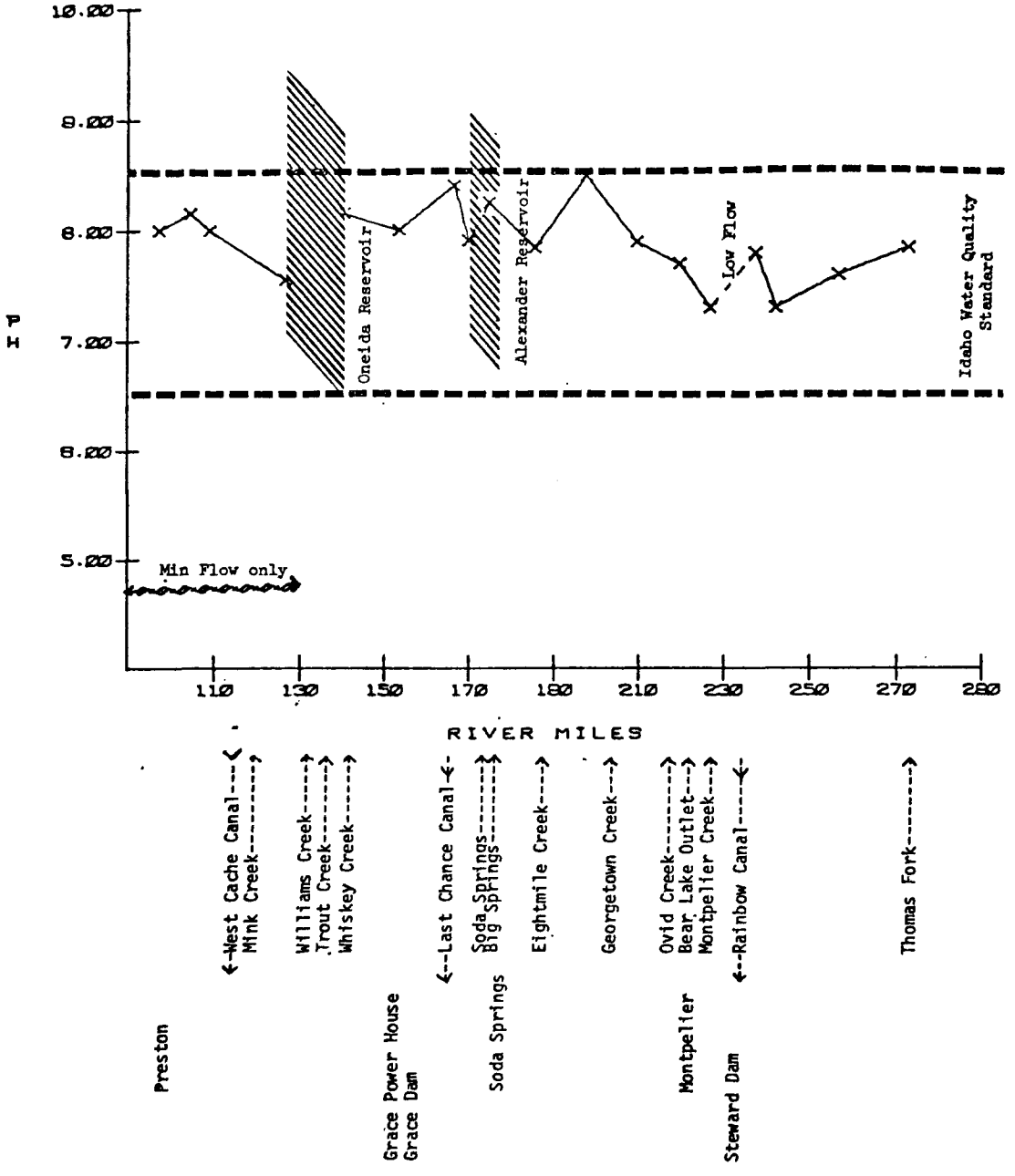


FIGURE 11B

pH

CUB RIVER

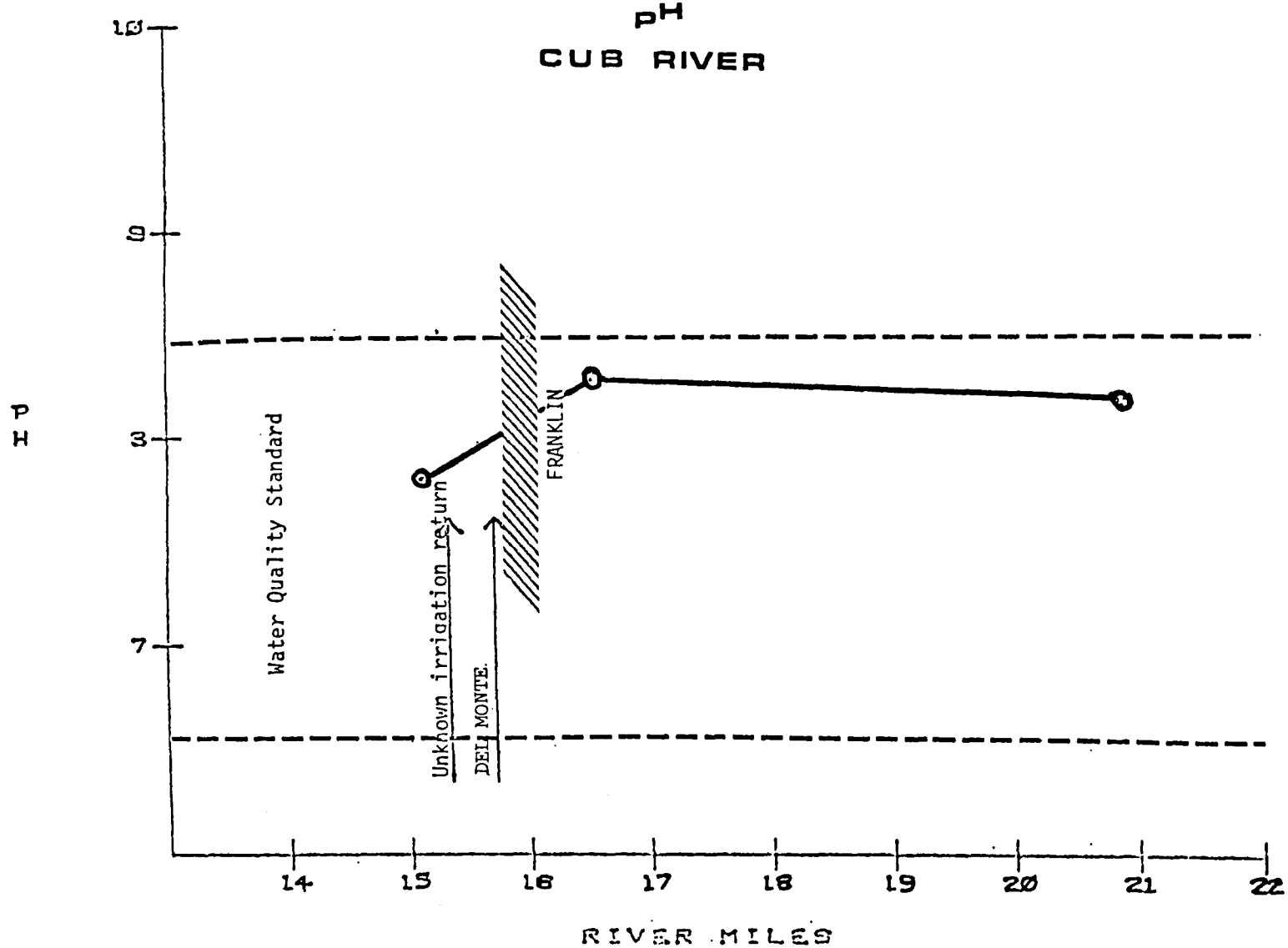


FIGURE 12B

RAINBOW FISH PER HOUR[4]

BEAR RIVER

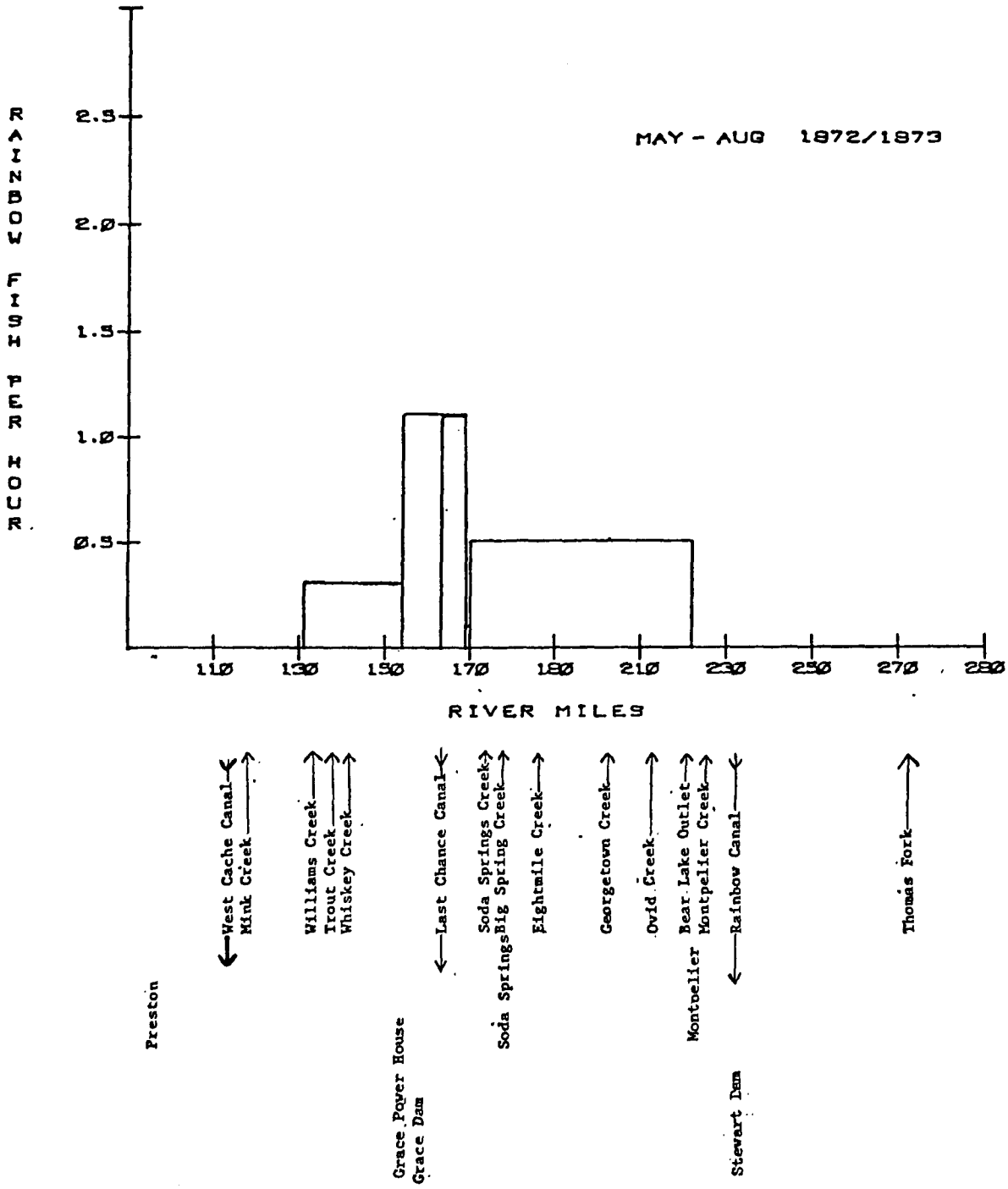


FIGURE 13B

RAINBOW FISH PER ANGLER[4]

BEAR RIVER

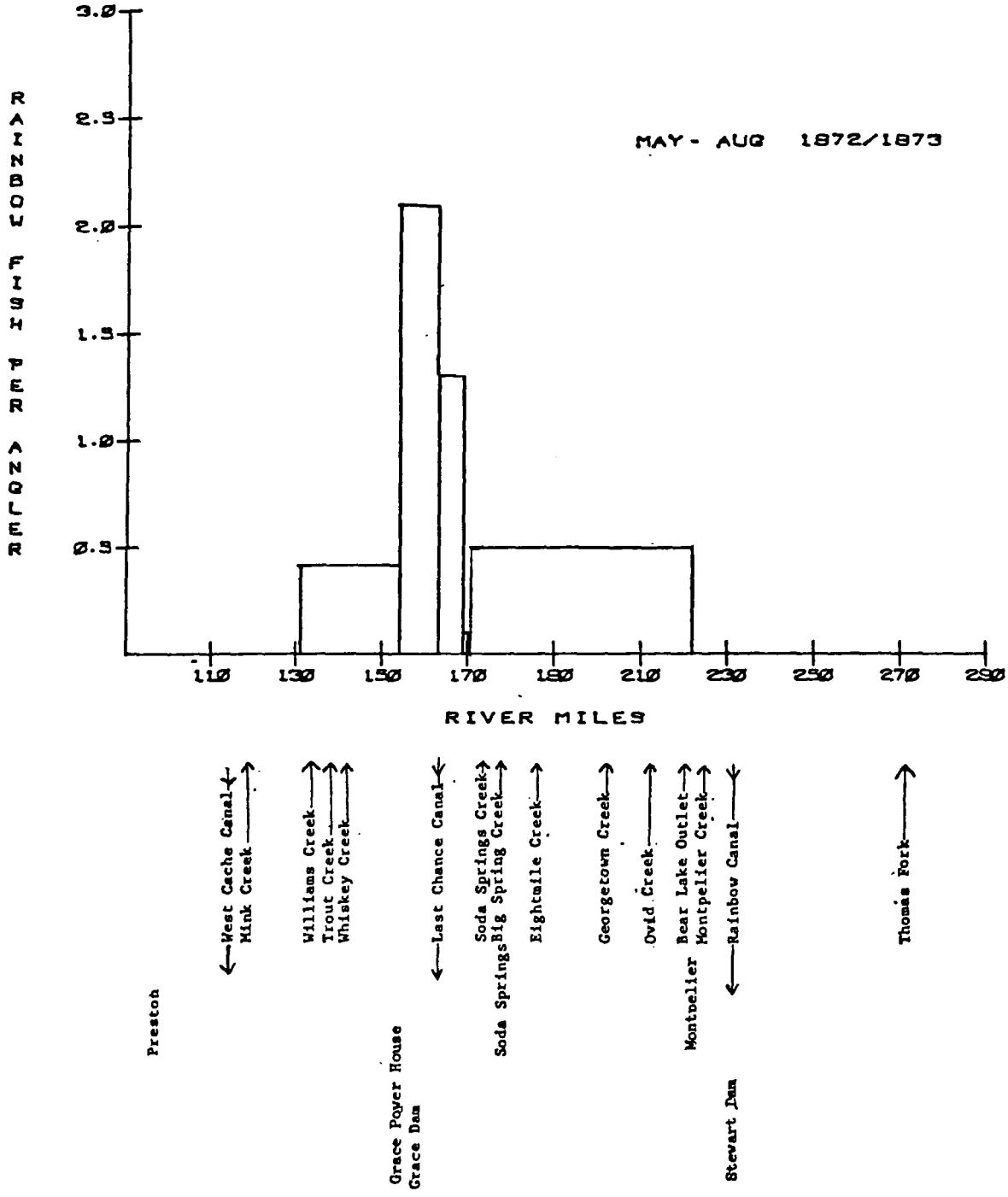
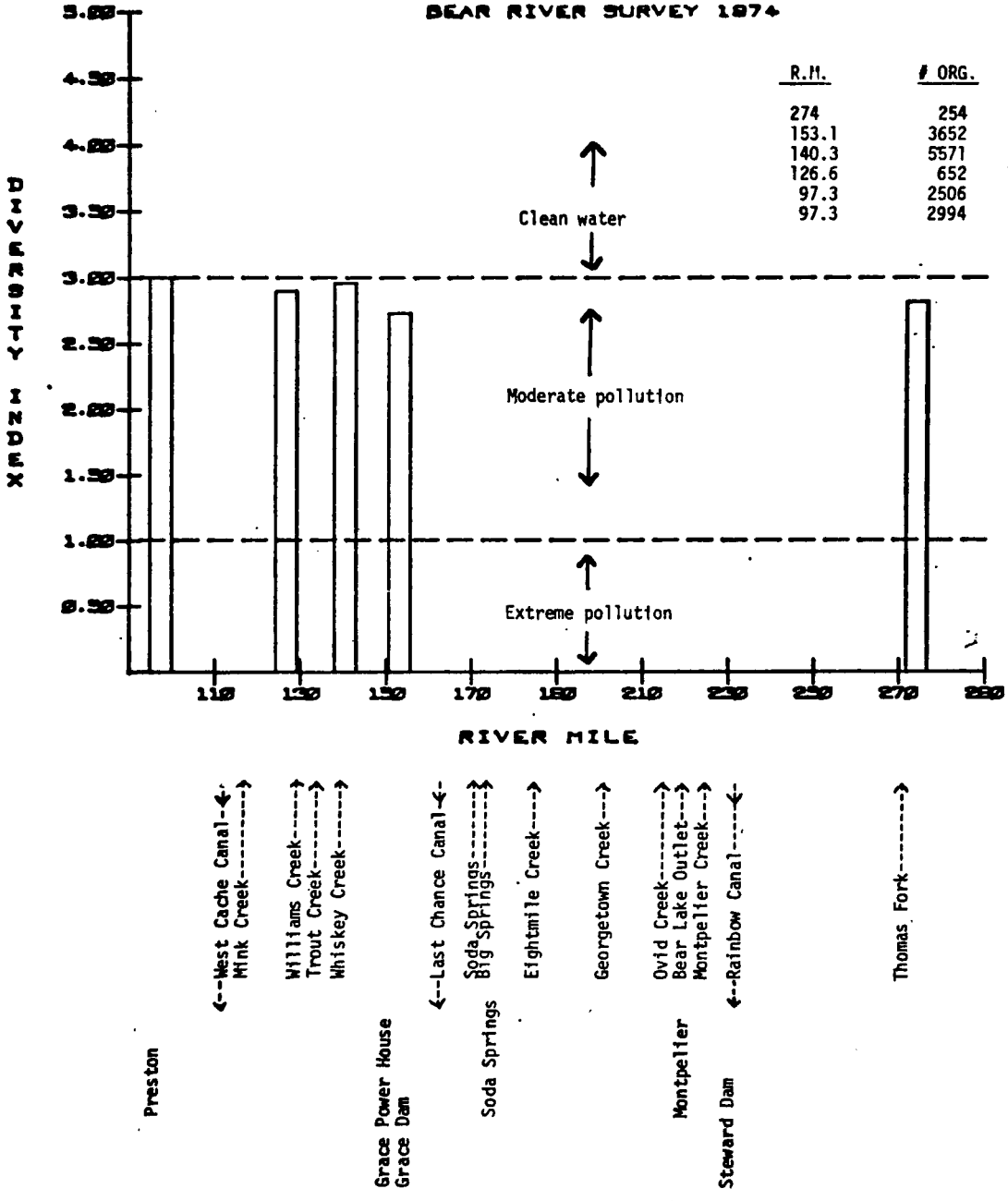


FIGURE 14B

MACRO INVERTIBRATE SPECIES DIVERSITY INDEX

BEAR RIVER SURVEY 1974



R.M.	# ORG.	D.I.
274	254	2.82
153.1	3652	2.73
140.3	5571	2.96
126.6	652	2.90
97.3	2506	2.85
97.3	2994	3.14

FIGURE 15B

TOTAL MERCURY
BEAR RIVER

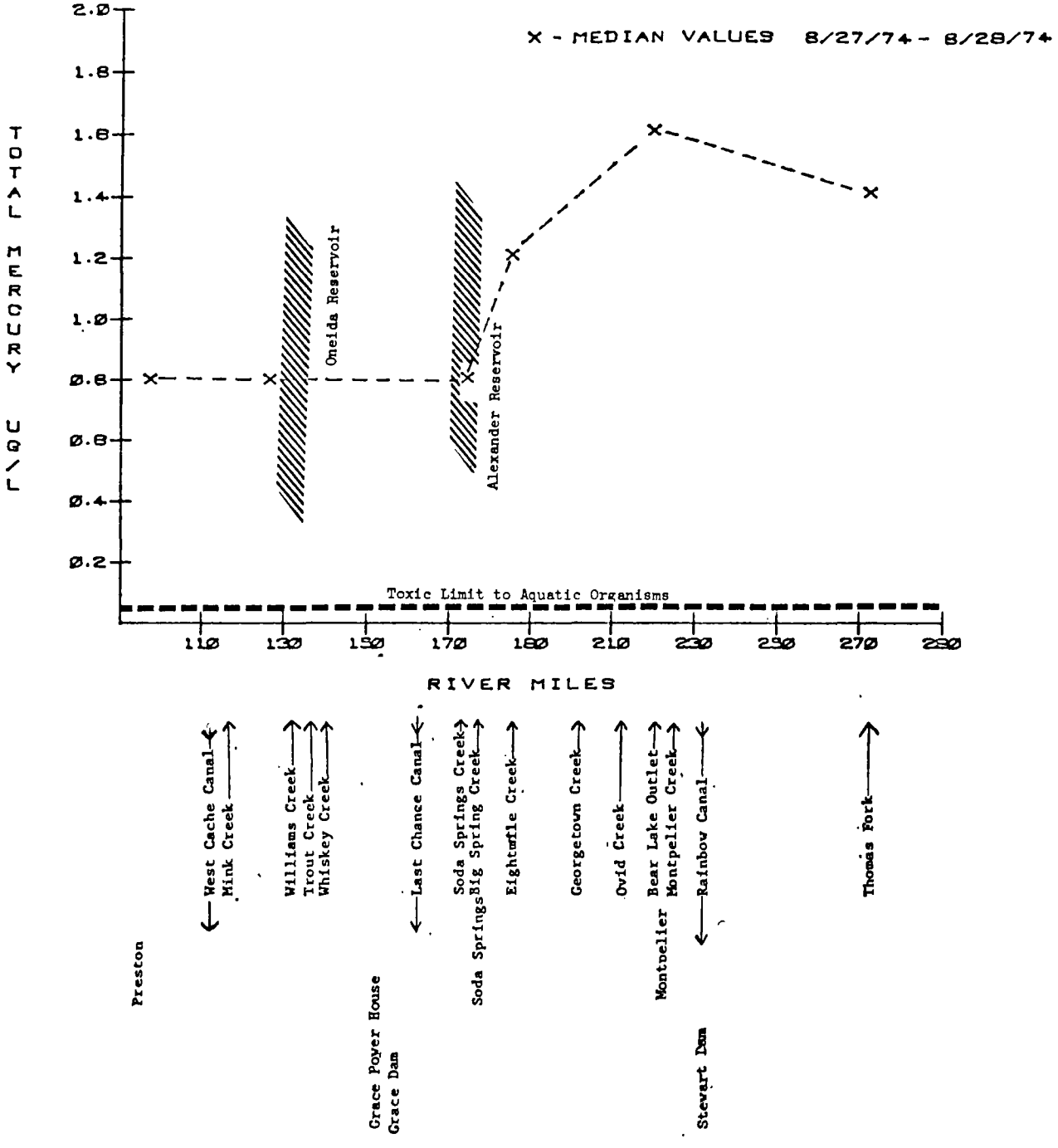


FIGURE 16B
TOTAL ZINC
BEAR RIVER

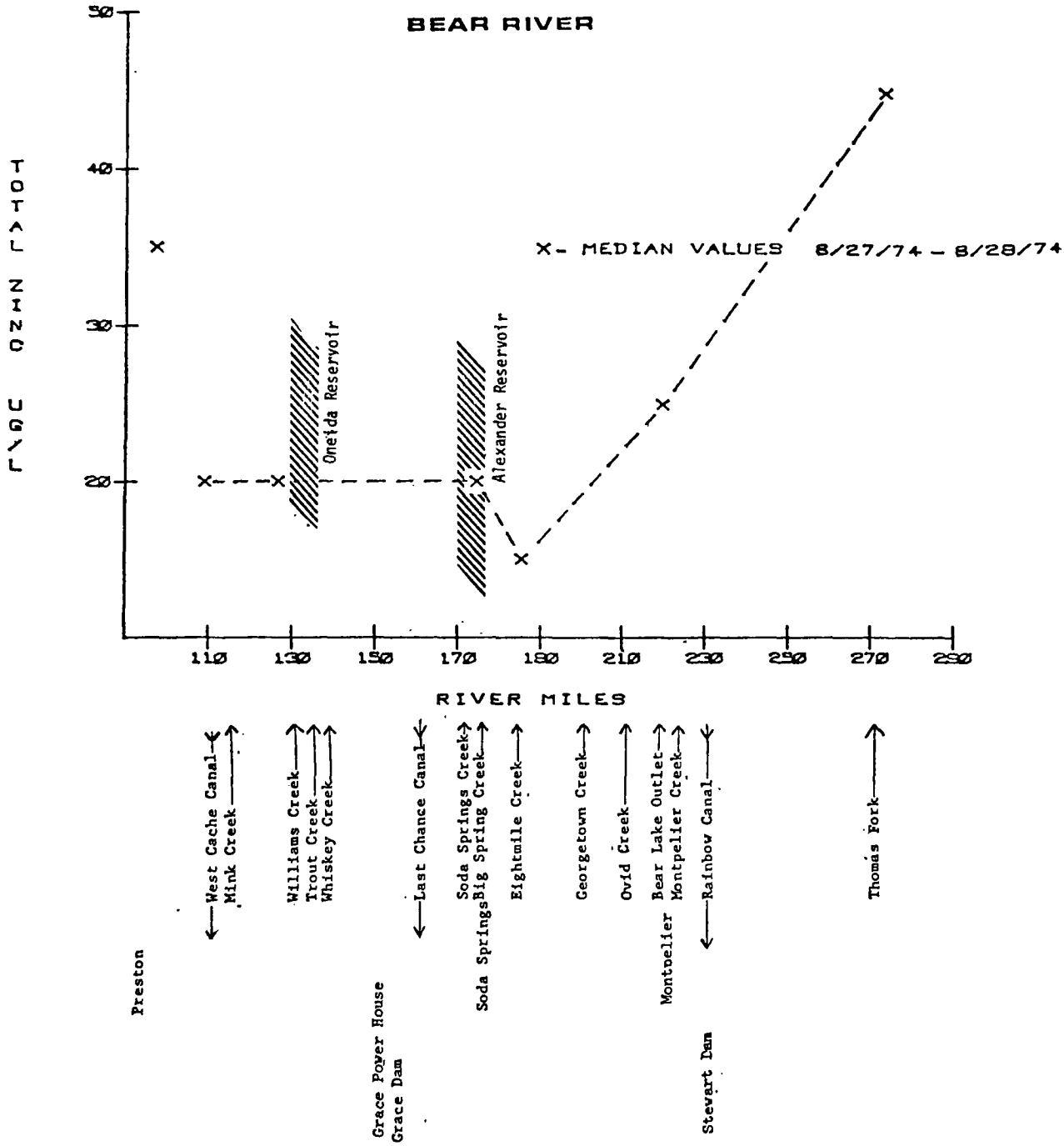


FIGURE 17B

TOTAL CADMIUM

BEAR RIVER

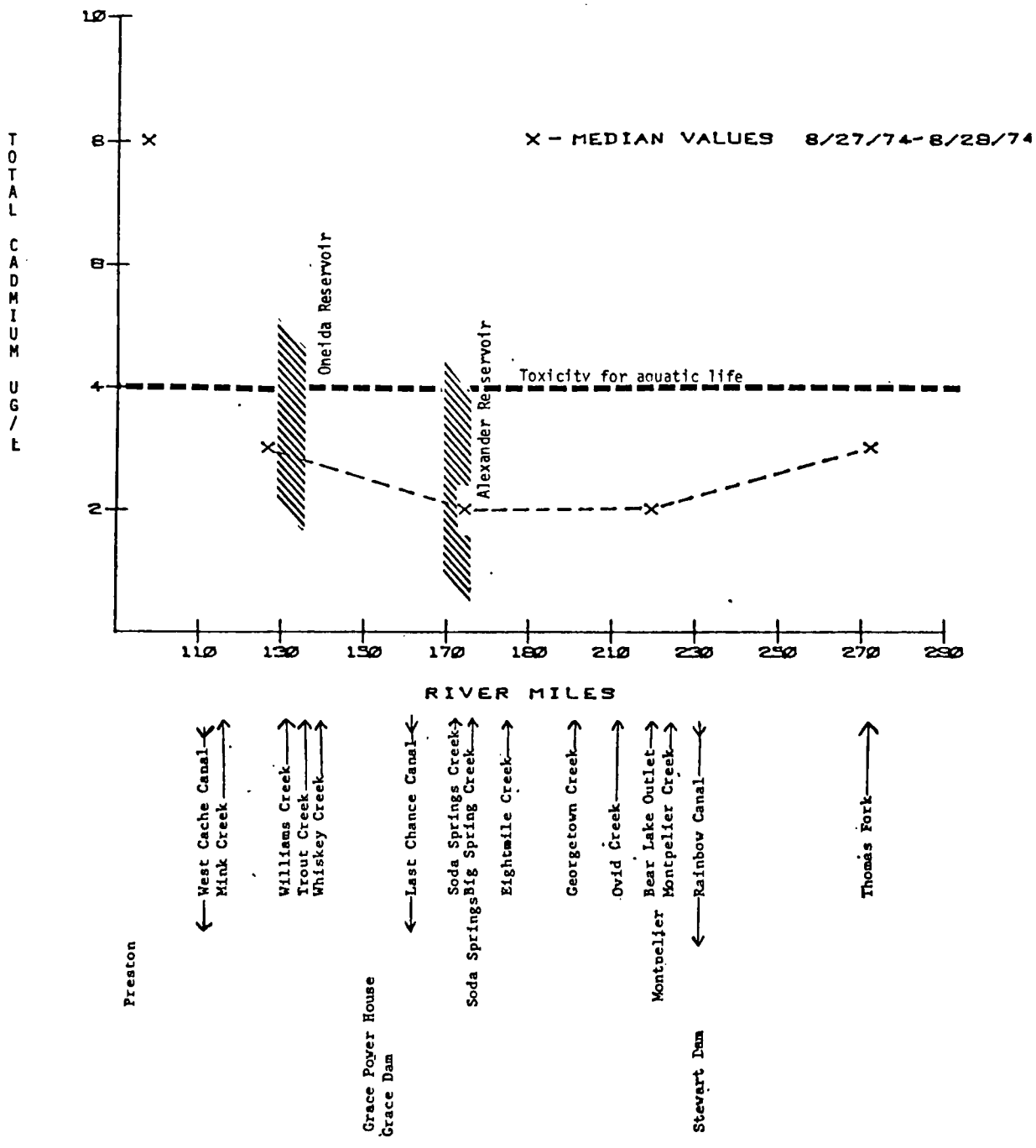


FIGURE 18B
TOTAL HARDNESS
BEAR RIVER

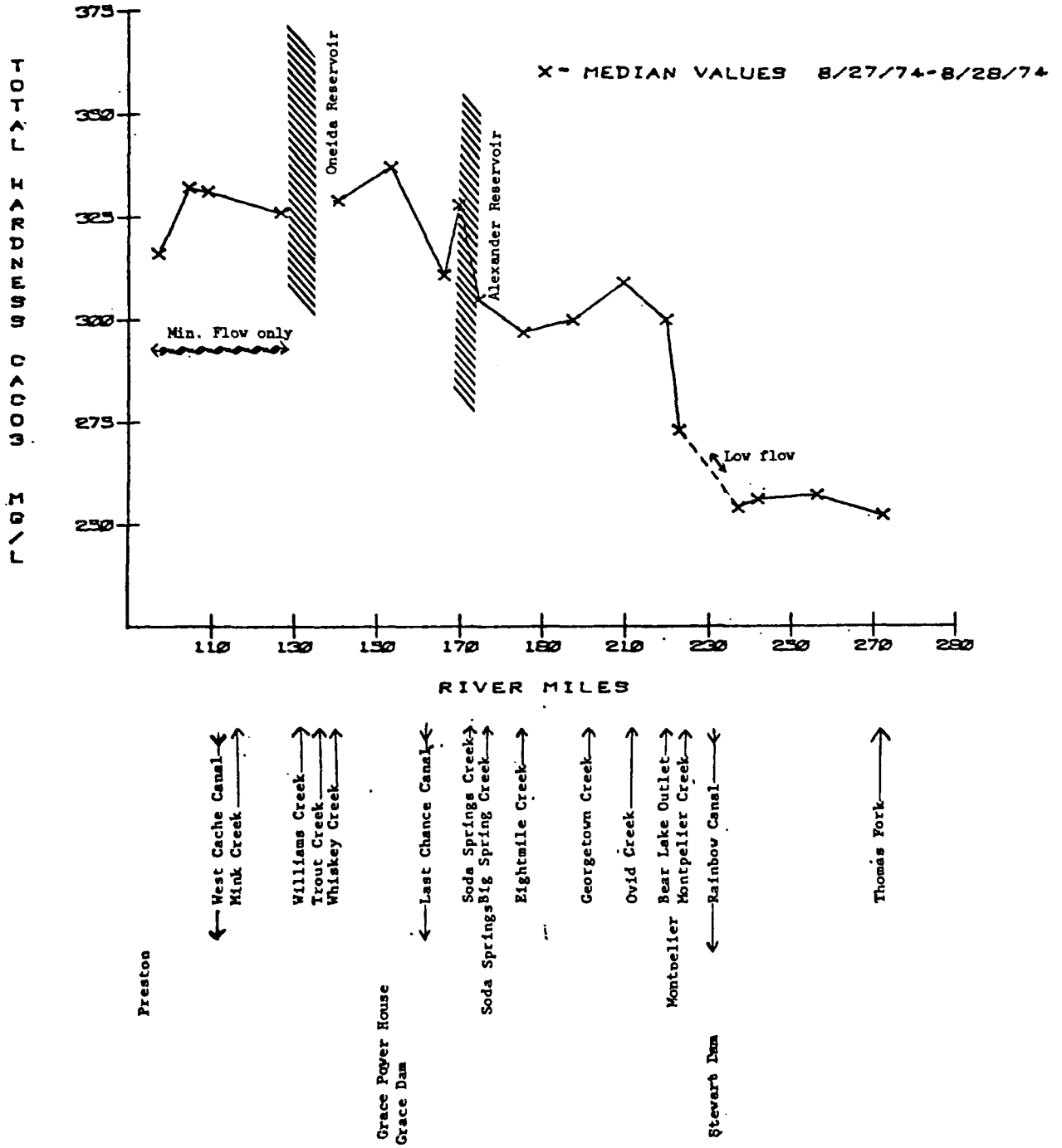


FIGURE 19B
TOTAL PHOSPHORUS
BEAR RIVER

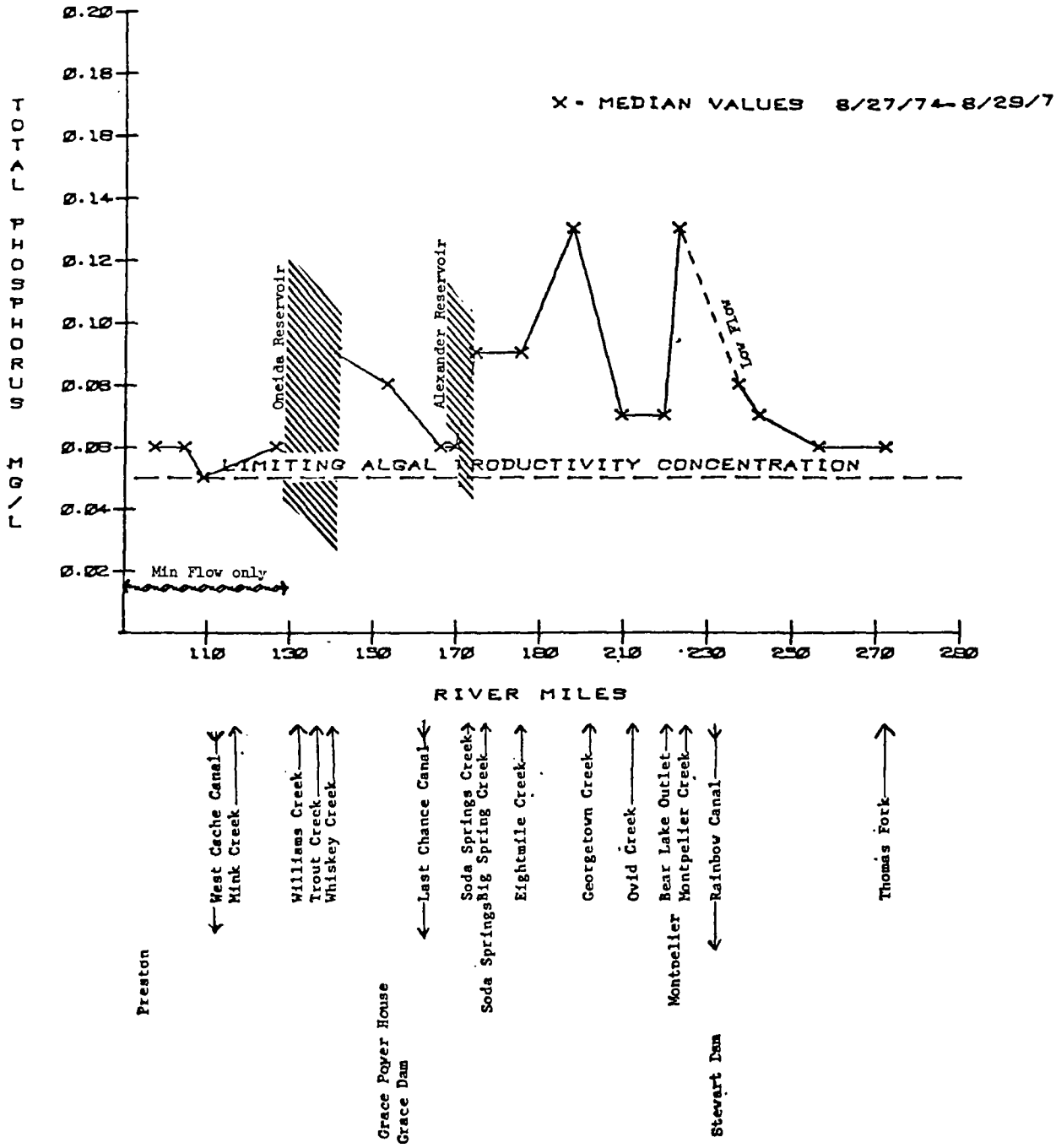


FIGURE 20B
NO_3^-N
BEAR RIVER

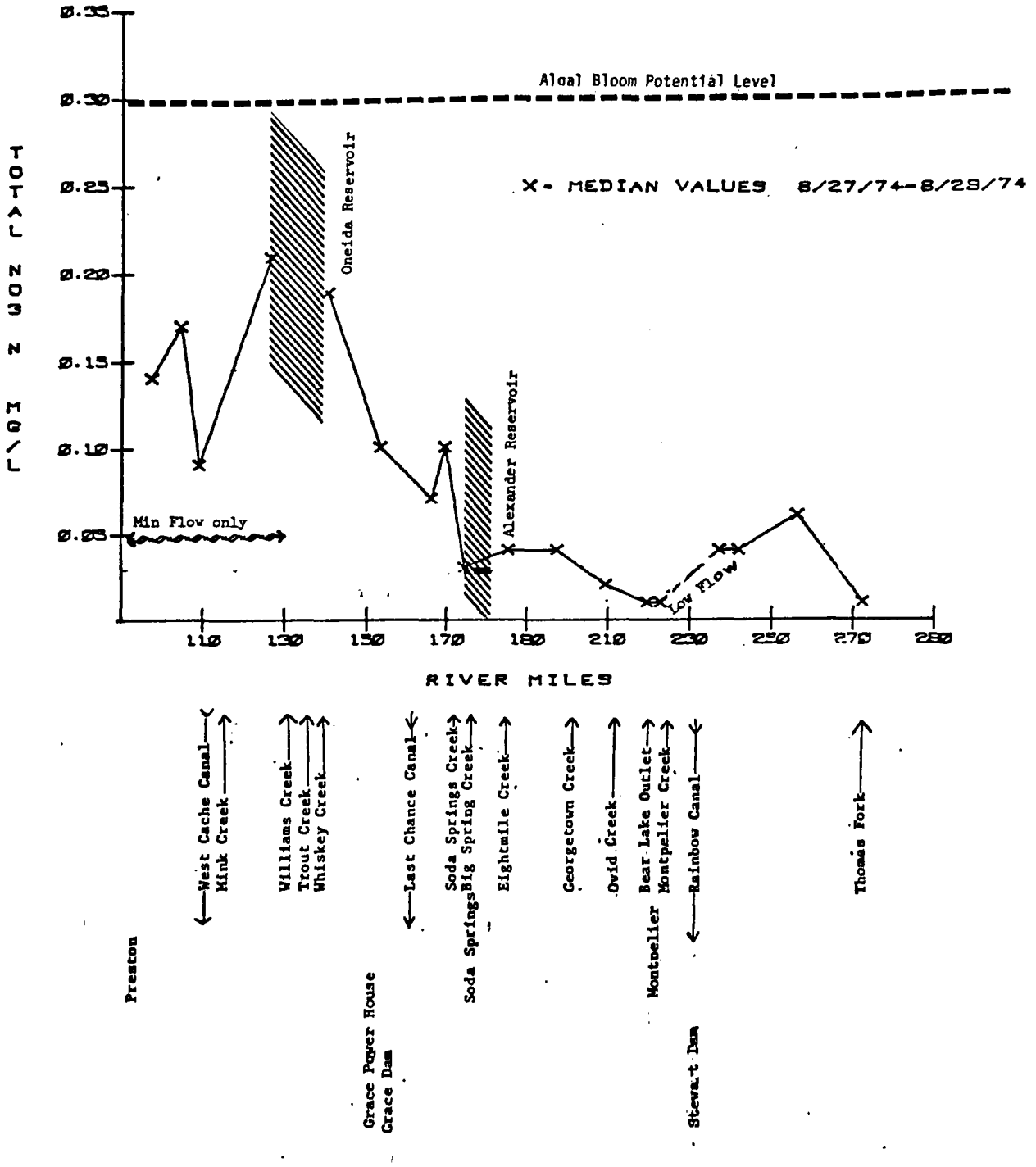


FIGURE 21B

ALKALITIY

MEDIAN VALUES 8/27/74--8/28/74

BEAR RIVER

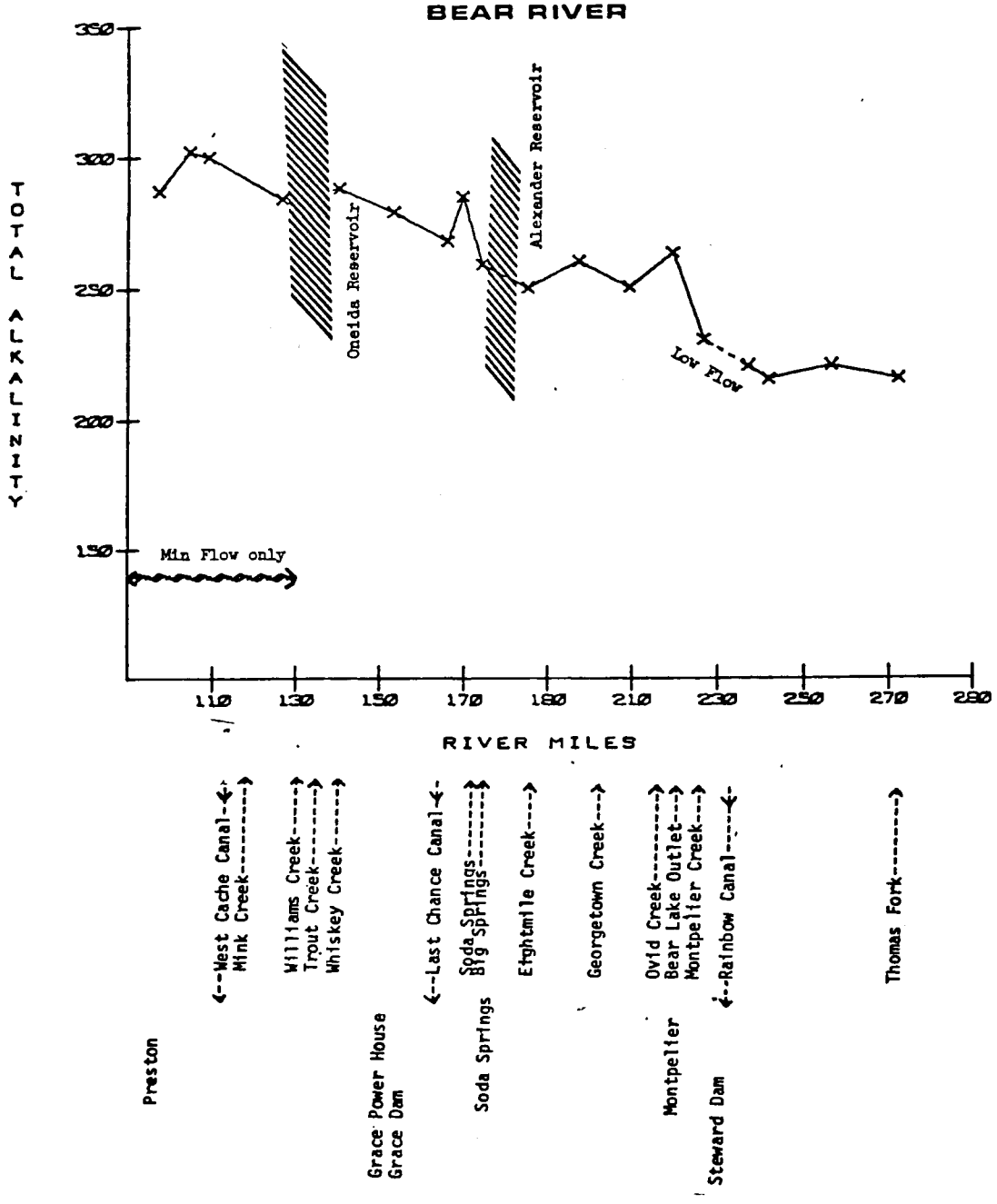


FIGURE 22B

BEAR RIVER

CHLOR A

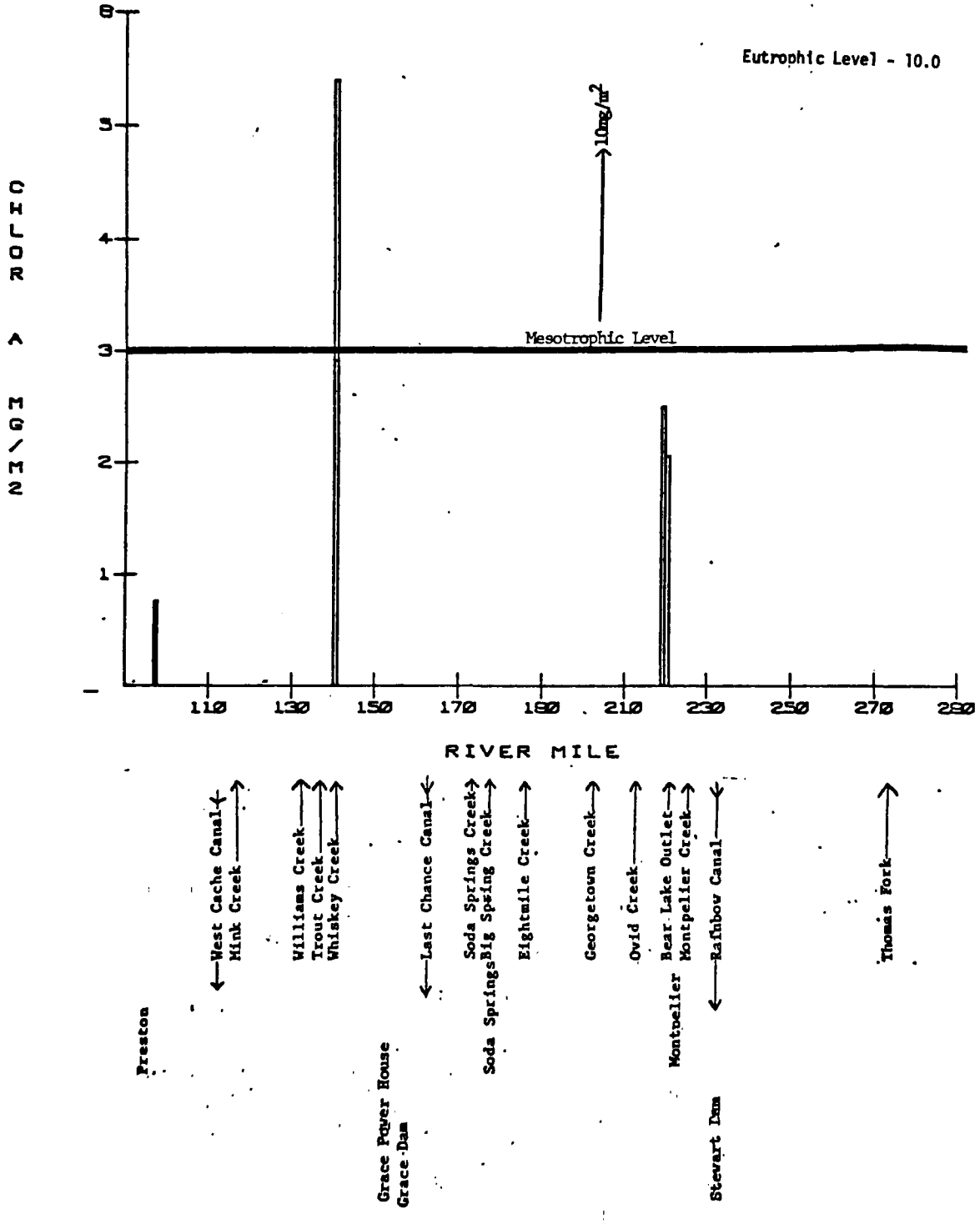


FIGURE 23B
TOTAL PHOSPHORUS
BEAR RIVER

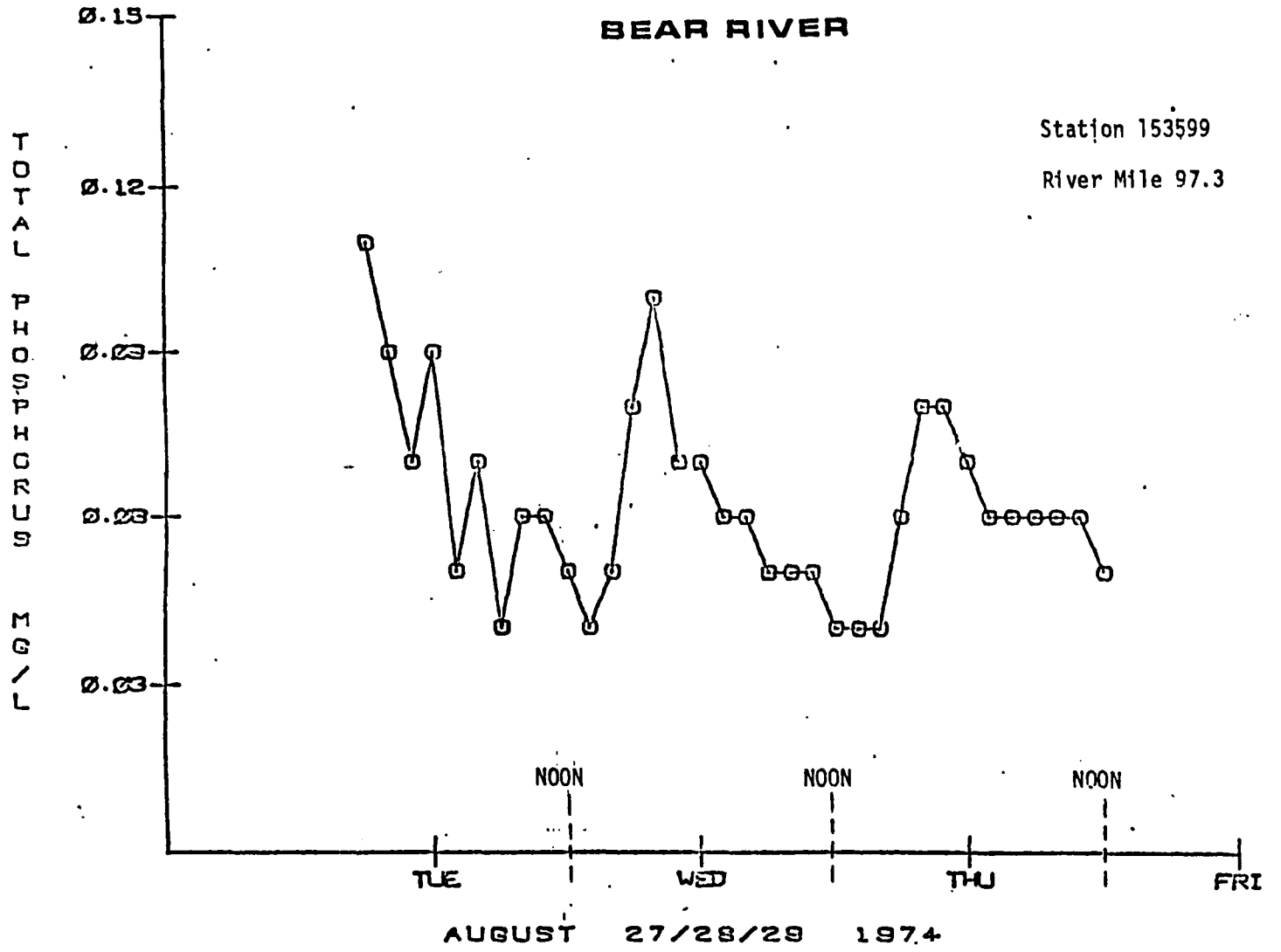


FIGURE 24B

TOTAL PHOSPHORUS LOADING

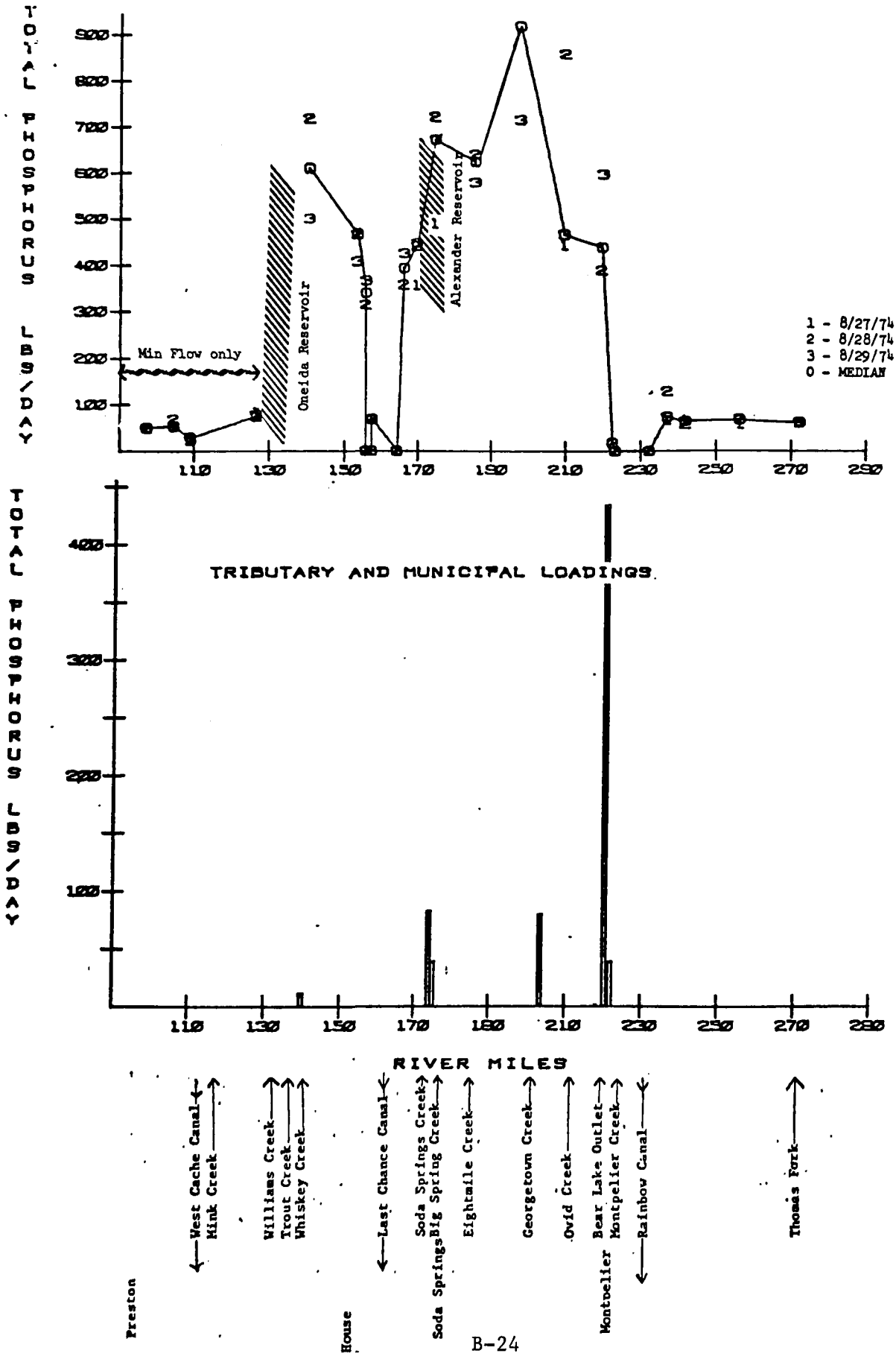
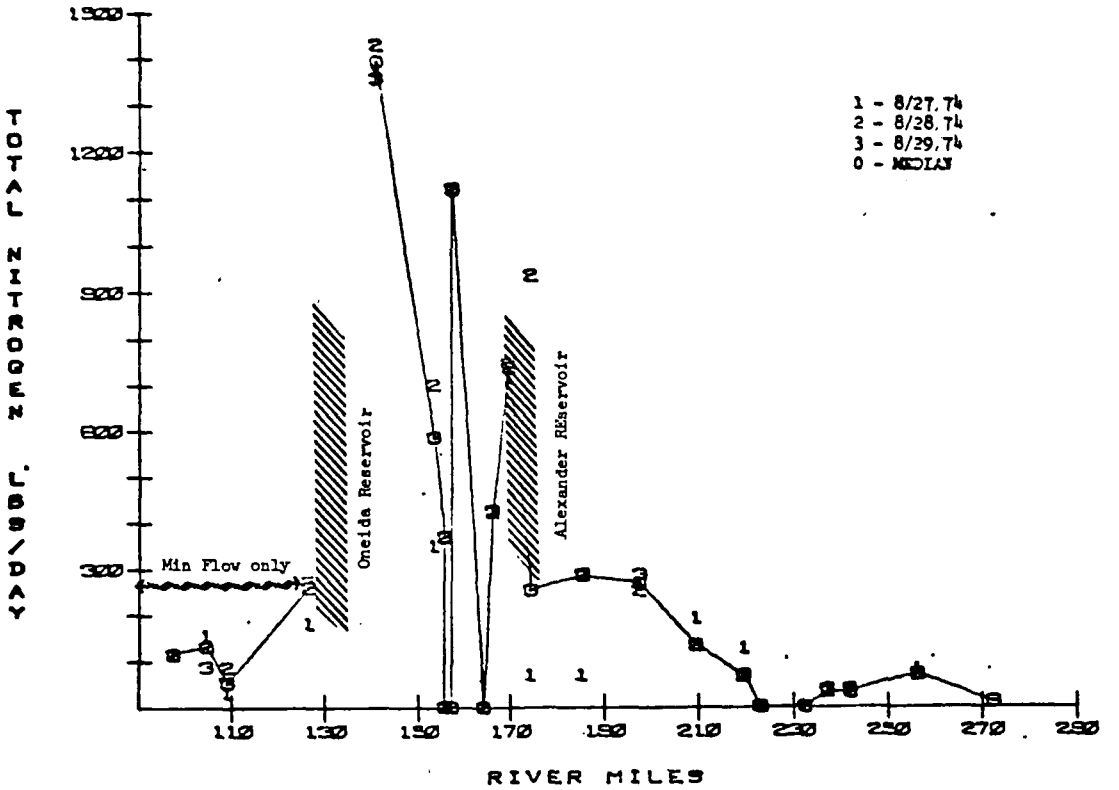


FIGURE 25B

TOTAL NITROGEN LOADING
BEAR RIVER



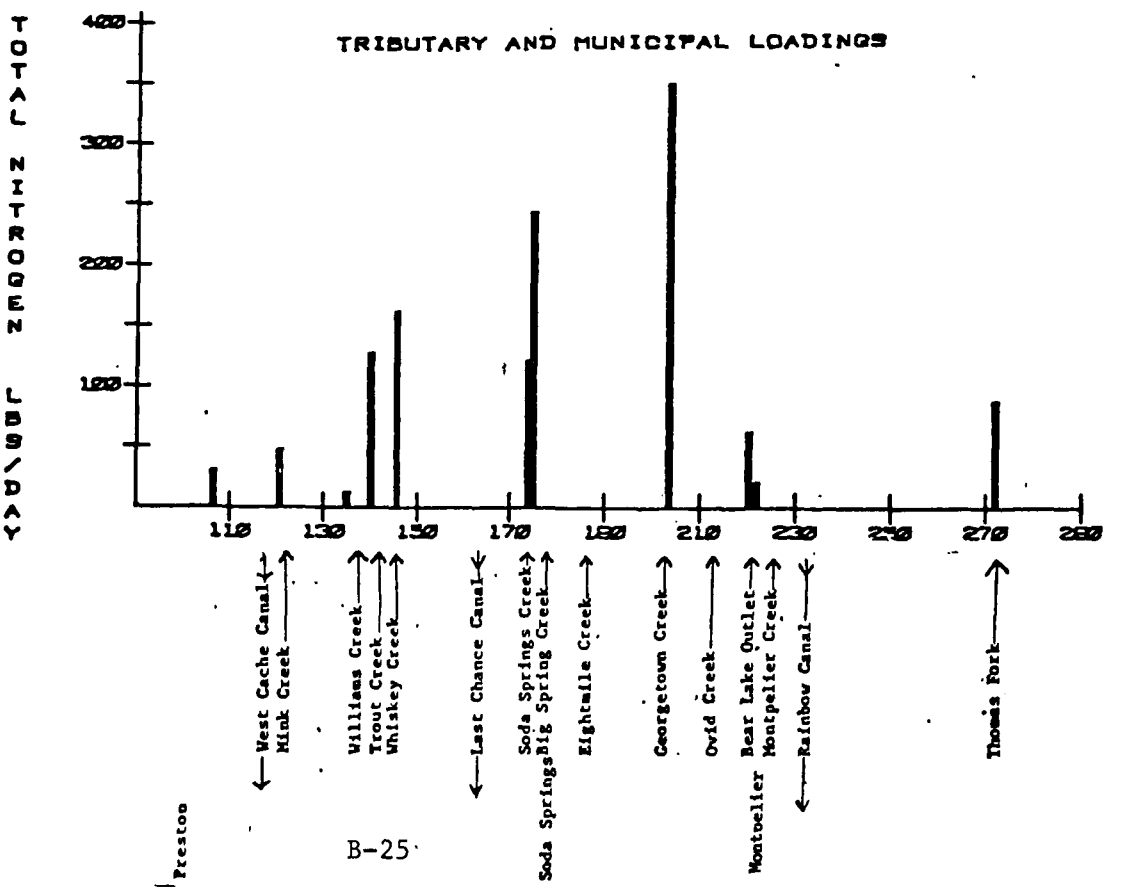


FIGURE 26B

TOTAL NITROGEN

BEAR RIVER

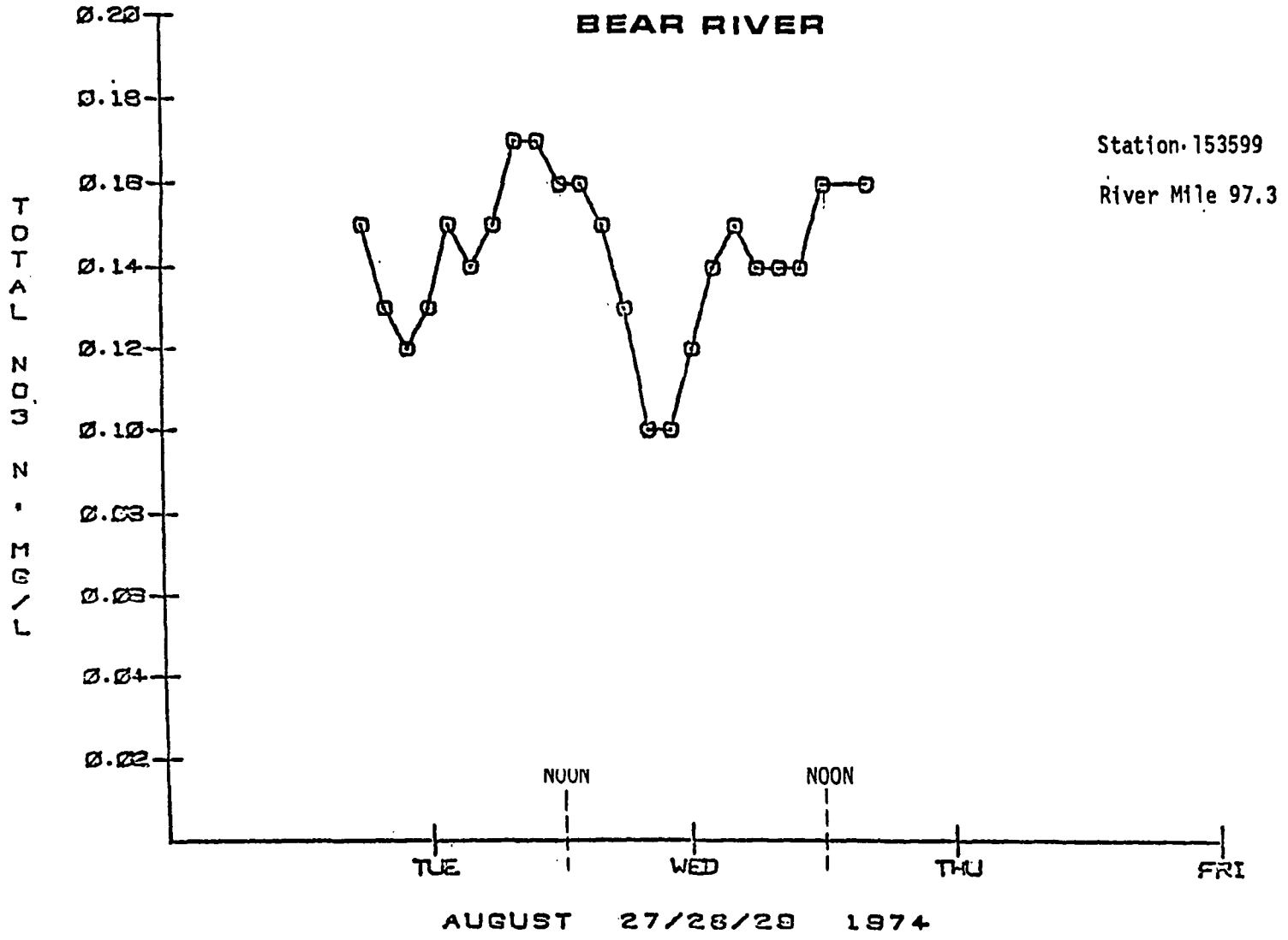


FIGURE 27B

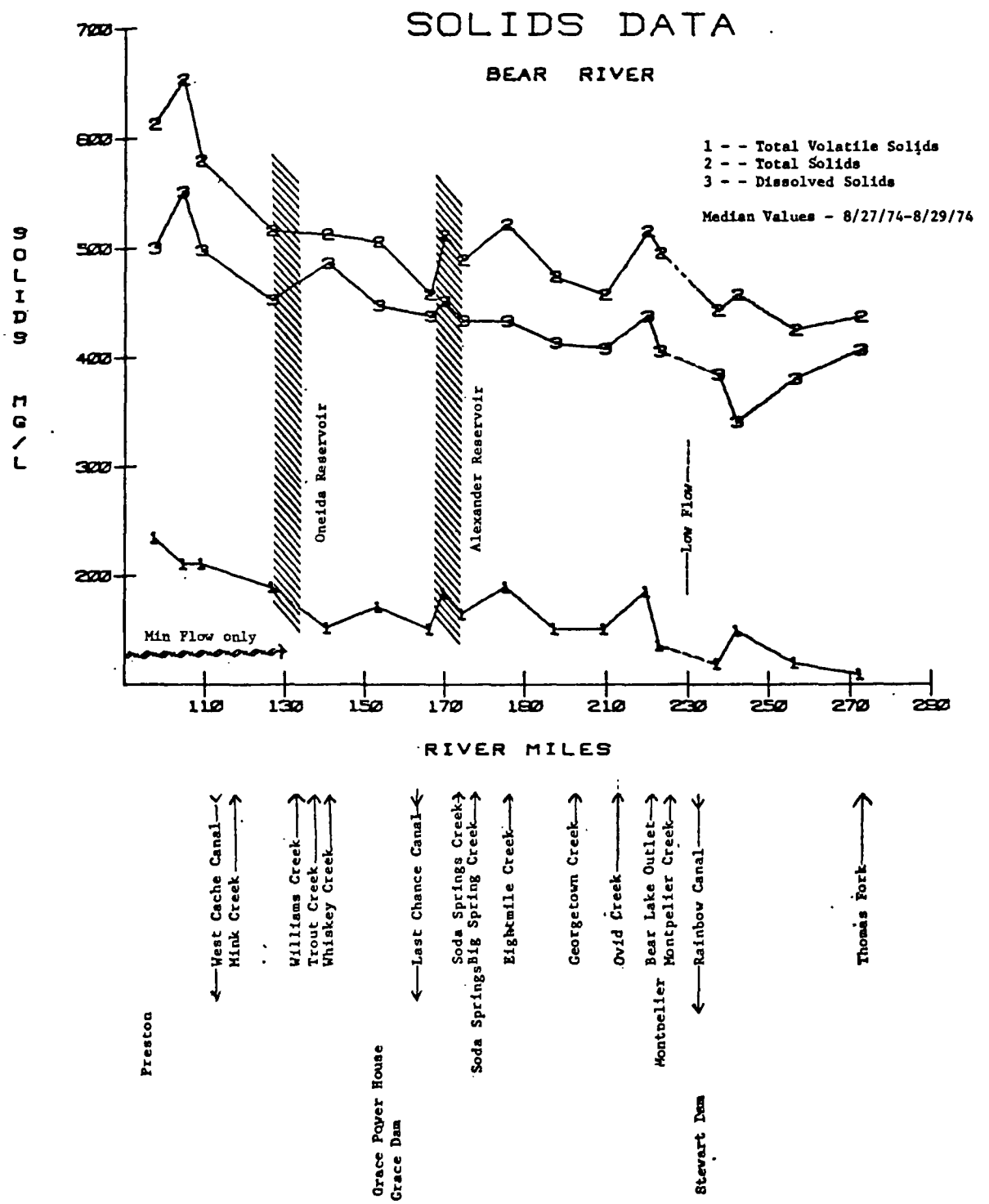

SOLIDS DATA
BEAR RIVER
1 - - Total Volatile Solids
2 - - Total Solids
3 - - Dissolved Solids
Median Values - 8/27/74-8/29/74
SOLIDS MG/L
700
600
500
400
300
200
Oneida Reservoir
Alexander Reservoir
Low Flow
Min Flow only
110
130
150
170
190
210
230
250
270
290
RIVER MILES
Preston
West Cache Canal
Mink Creek
Williams Creek
Trout Creek
Whiskey Creek
Grace Power House
Grace Dam
Last Chance Canal
Soda Springs Creek
Soda Springs
Big Spring Creek
Eightmile Creek
Georgetown Creek
Ovid Creek
Bear Lake Outlet
Montpelier Creek
Montpelier
Rainbow Canal
Stewart Dam
Thomas Fork

FIGURE 28B

SUSPENDED SOLIDS

(TOTAL RESIDUE NON FILTERABLE)

BEAR RIVER

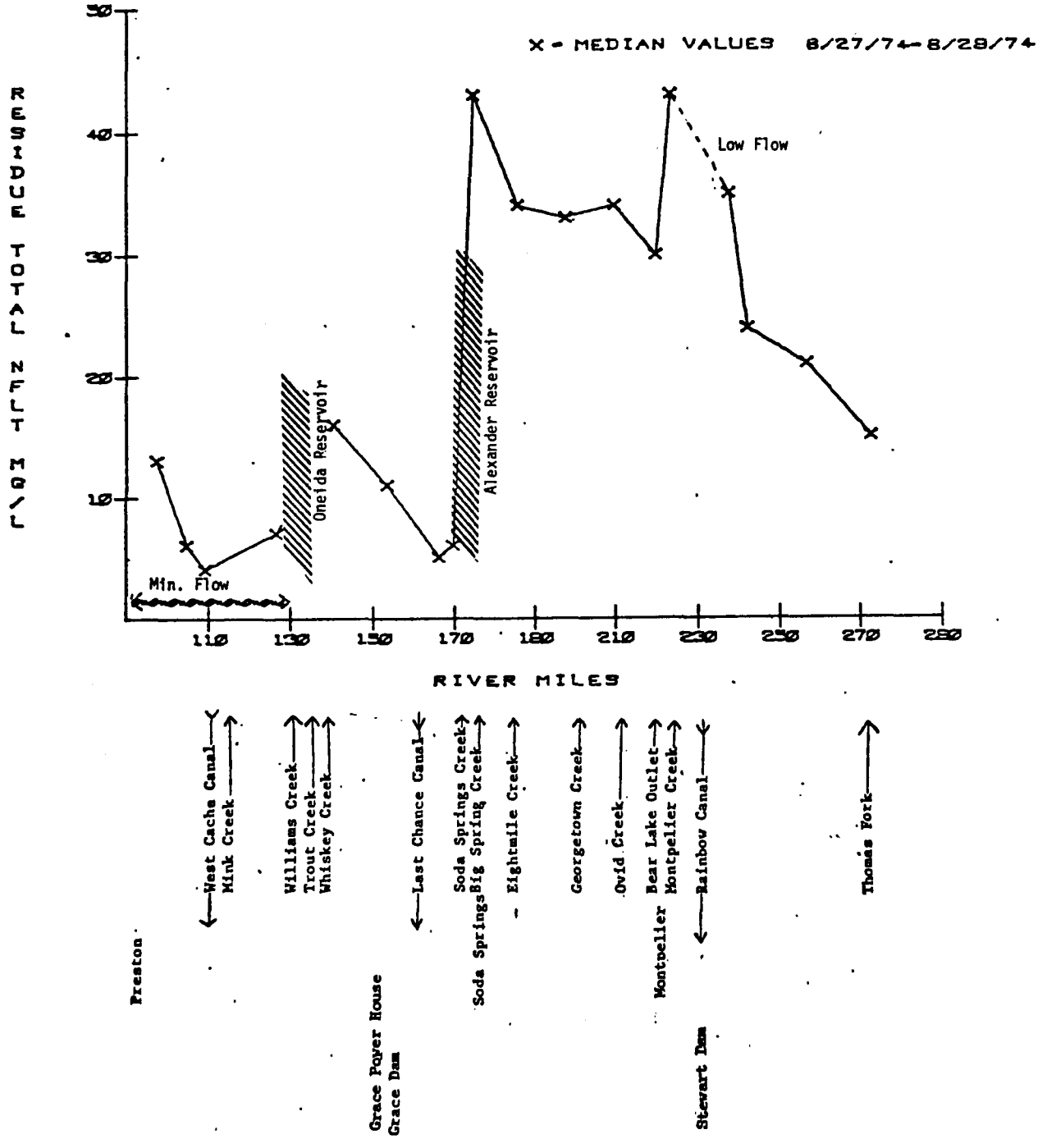


FIGURE 29 B

CONDUCTIVITY

BEAR RIVER

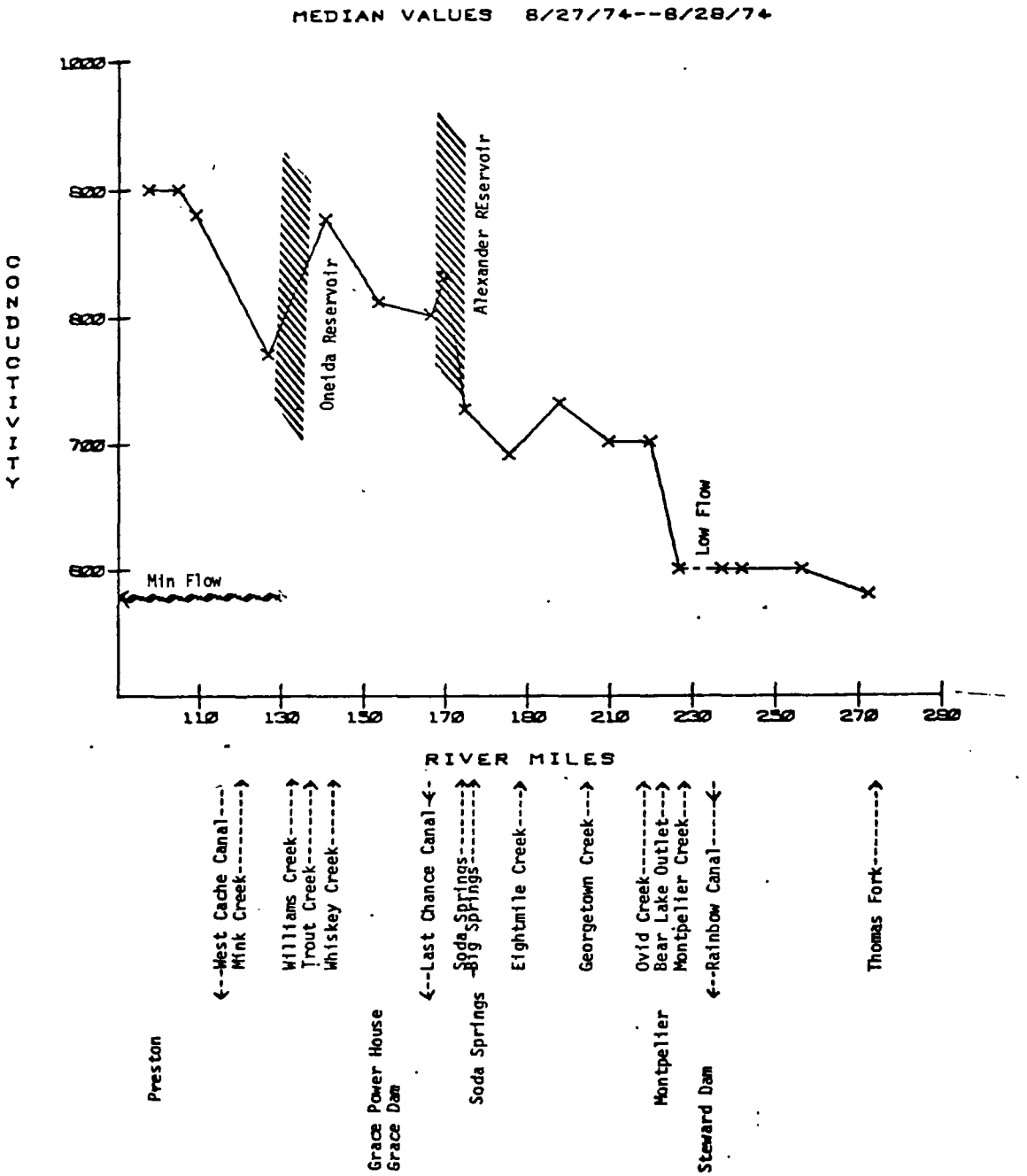
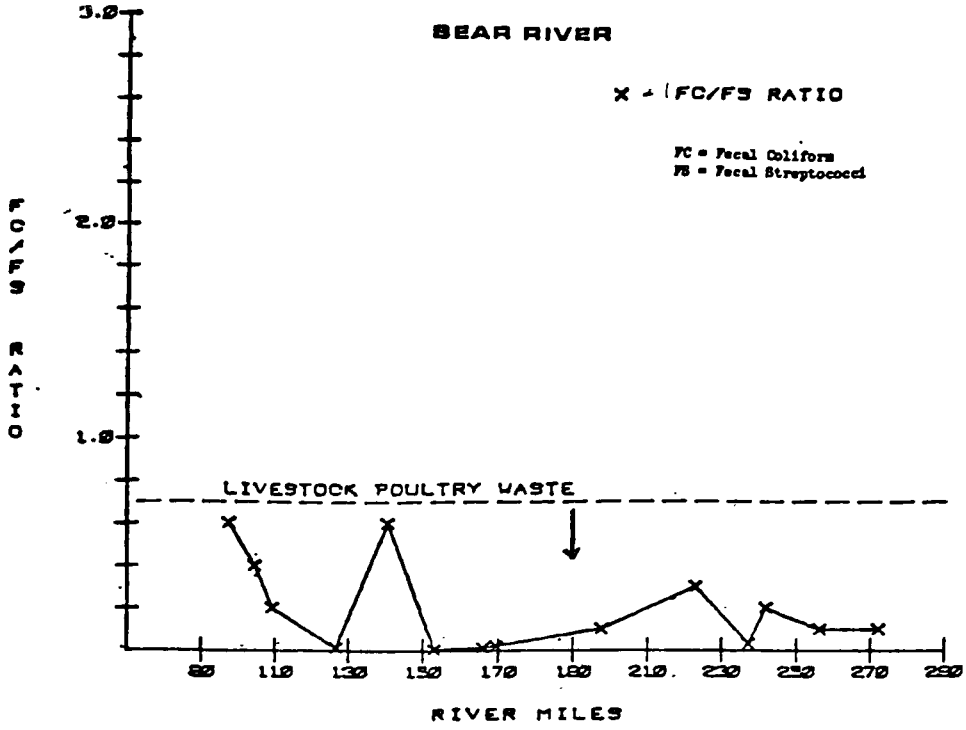


FIGURE 30B

FC/FS RATIO

BEAR RIVER



FC/FS Ratio of Tributaries on the Bear River

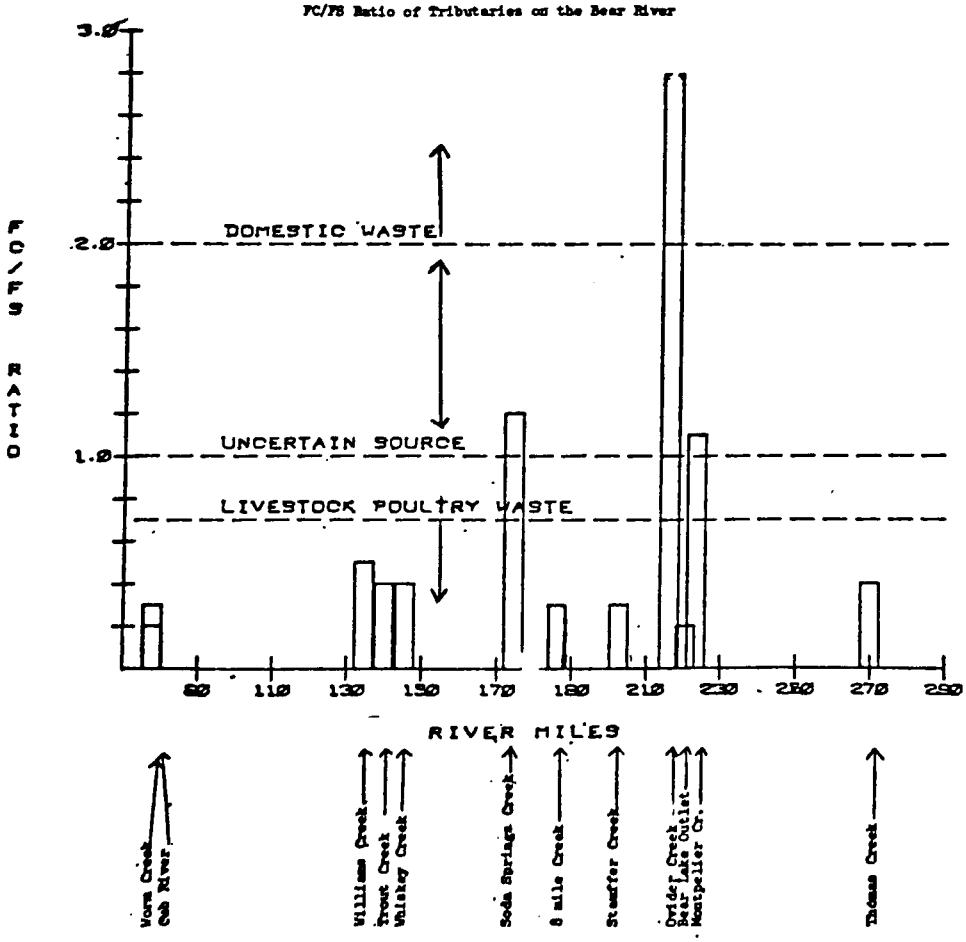


FIGURE 31B

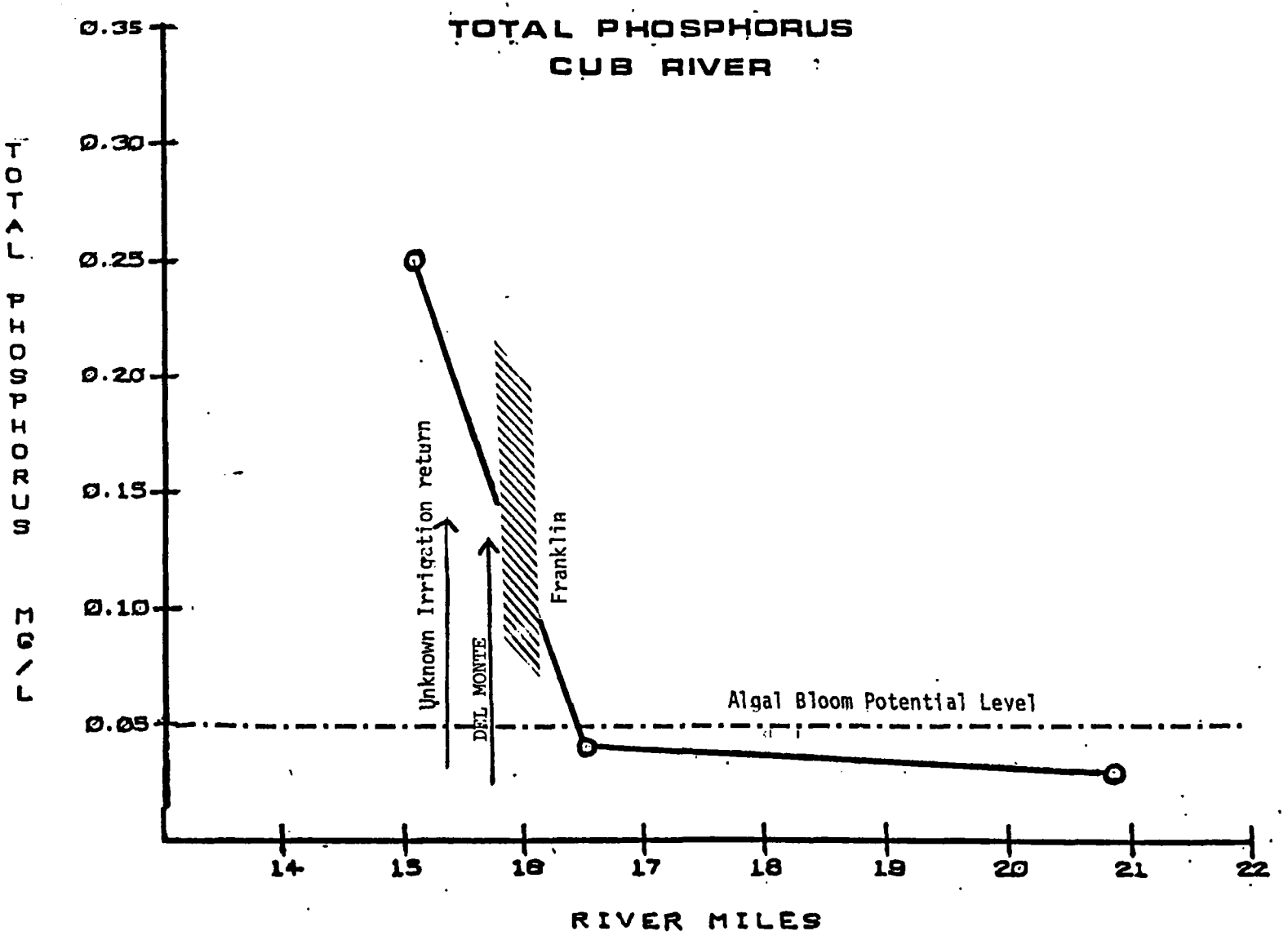

TOTAL PHOSPHORUS
CUB RIVER
TOTAL PHOSPHORUS MG/L
0.35
0.30
0.25
0.20
0.15
0.10
0.05
Unknown Irrigation return
DEL MONTE
Franklin
Algal Bloom Potential Level
14
15
16
17
18
19
20
21
22
RIVER MILES

FIGURE 32B

$NO_3 - N$

CUB RIVER

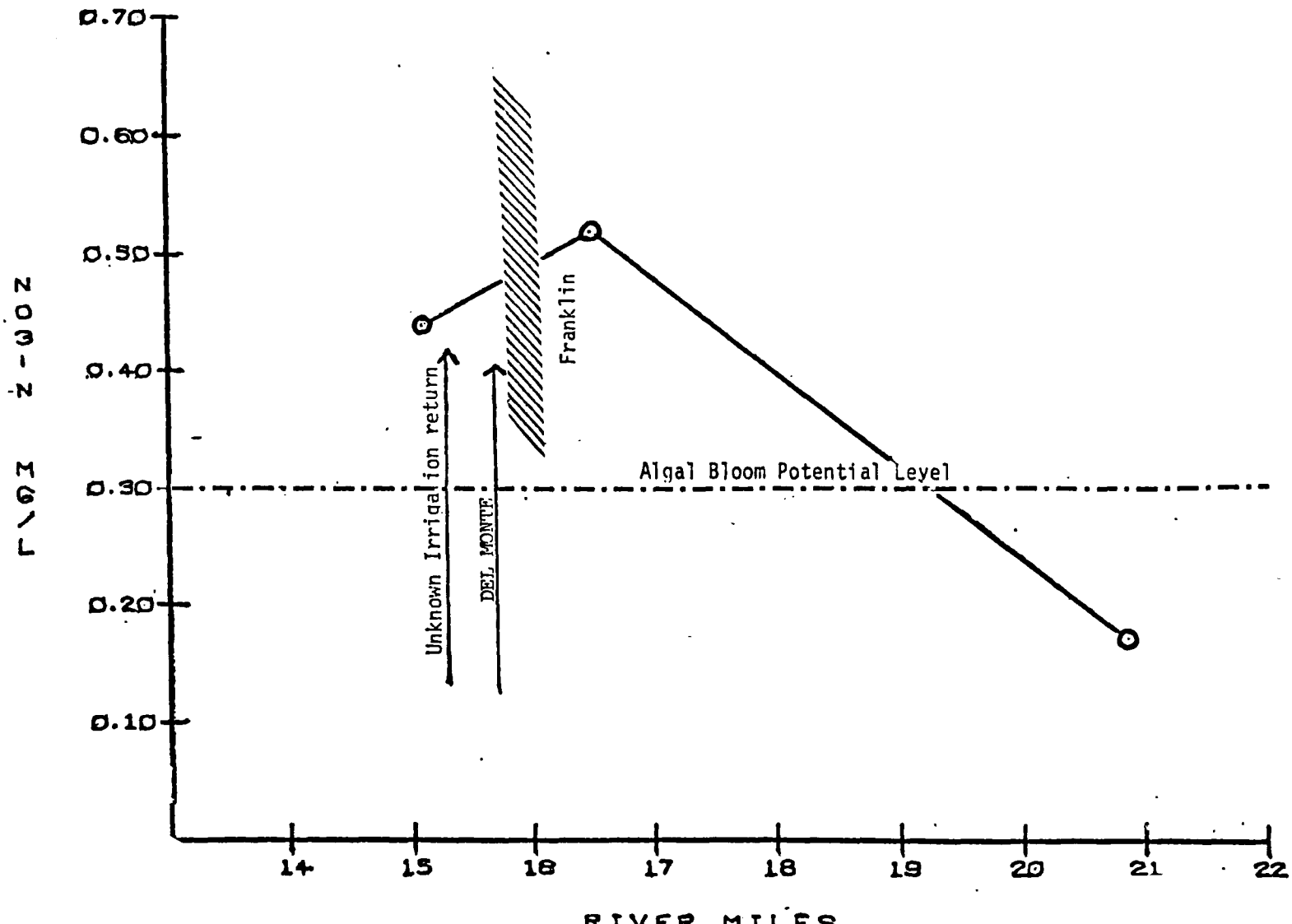


FIGURE 33B

NH_3-N

CUB RIVER

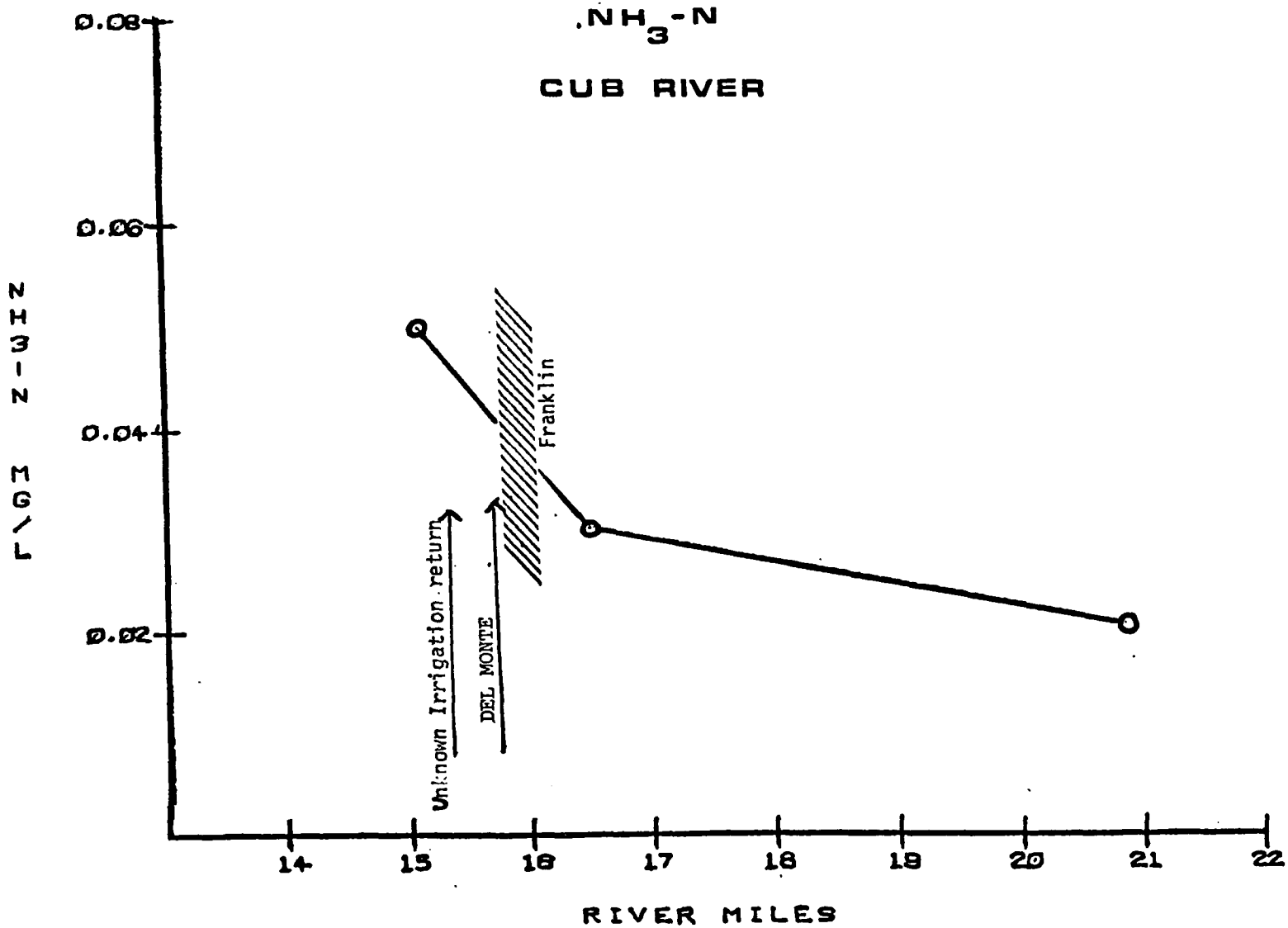


FIGURE 34B

TOTAL CHLORIDE

CUB RIVER

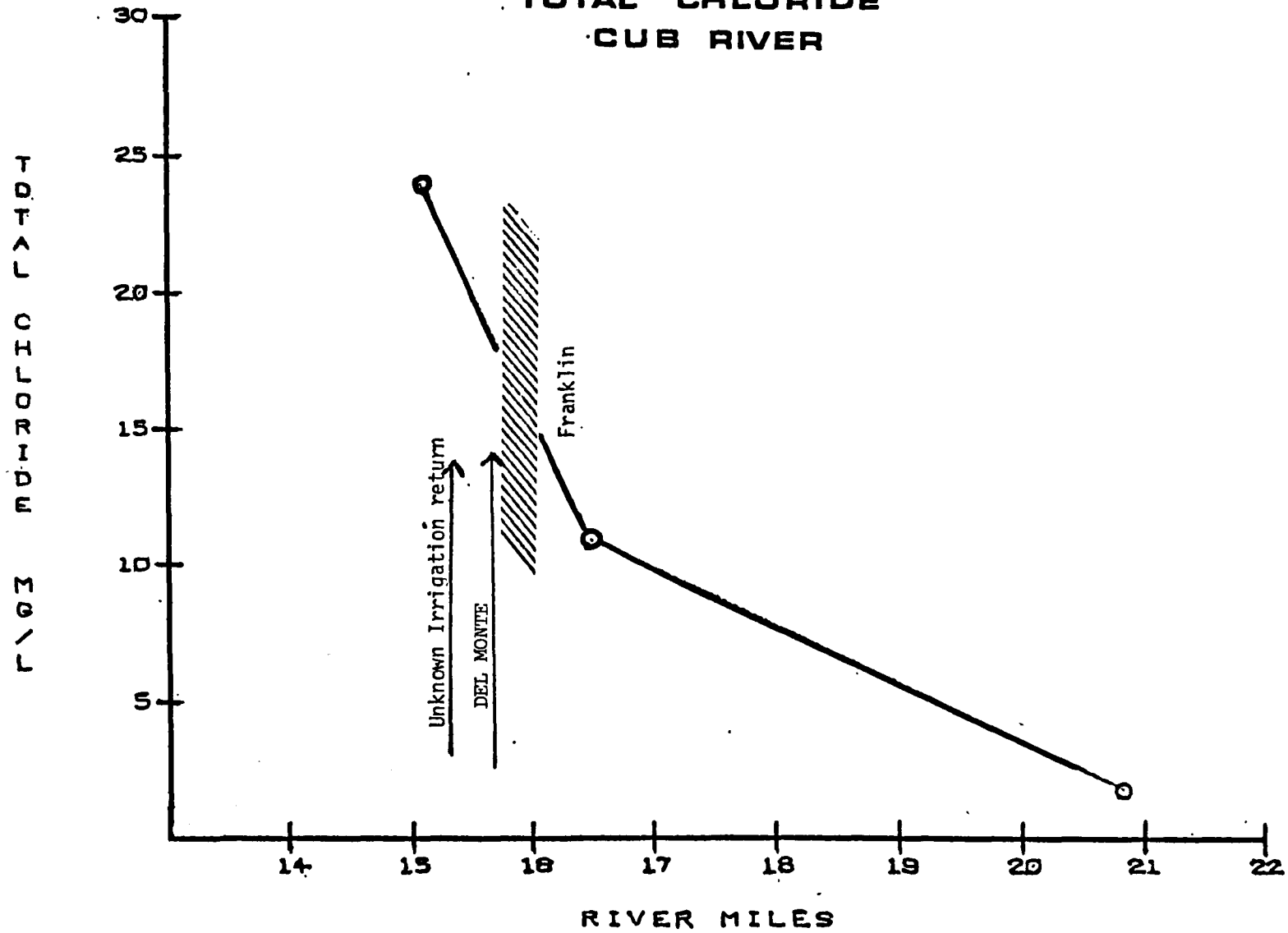


FIGURE 35B
DISSOLVED SOLIDS
CUB RIVER

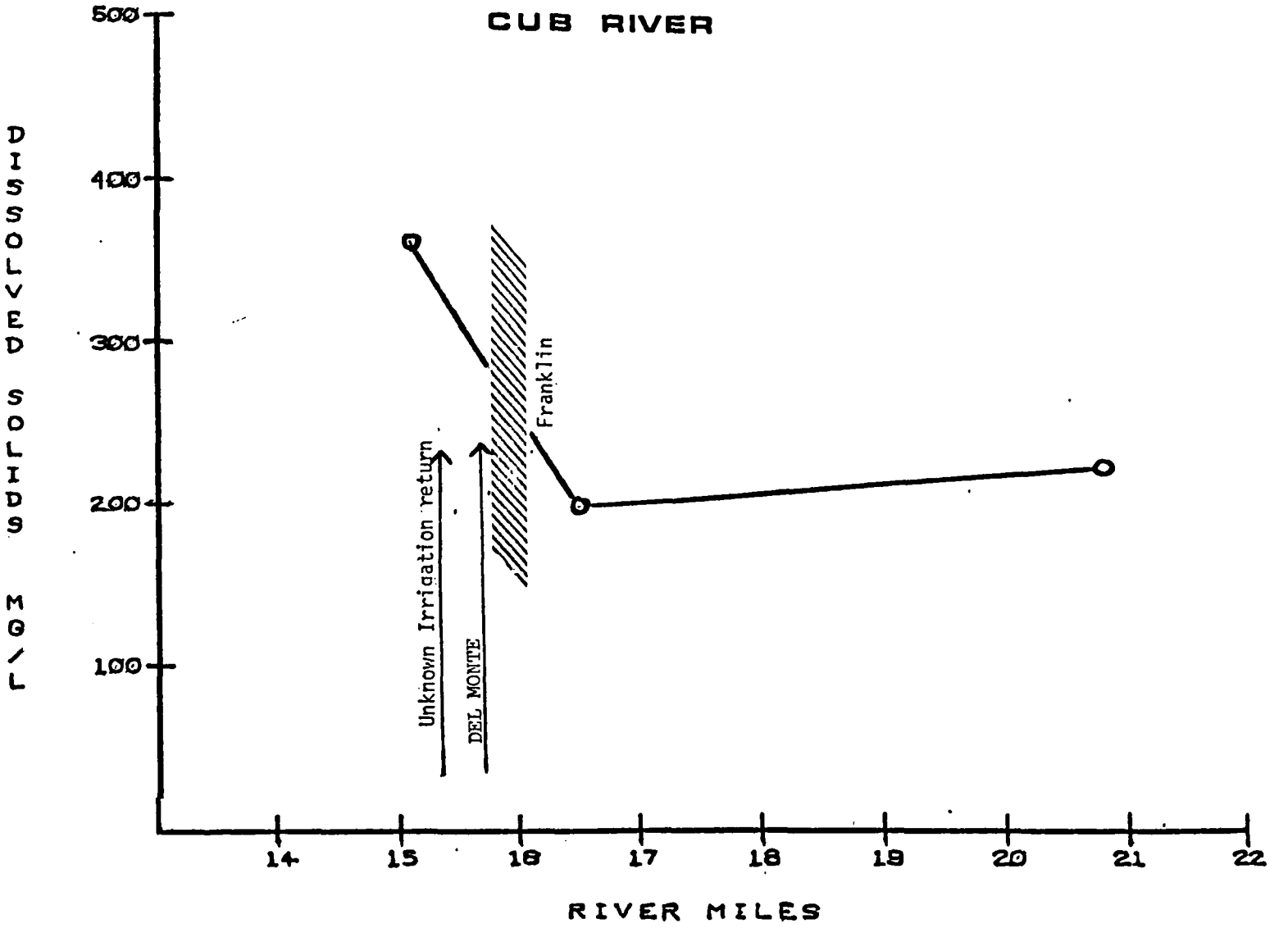


FIGURE 36B

TEMPERATURE

CUB RIVER

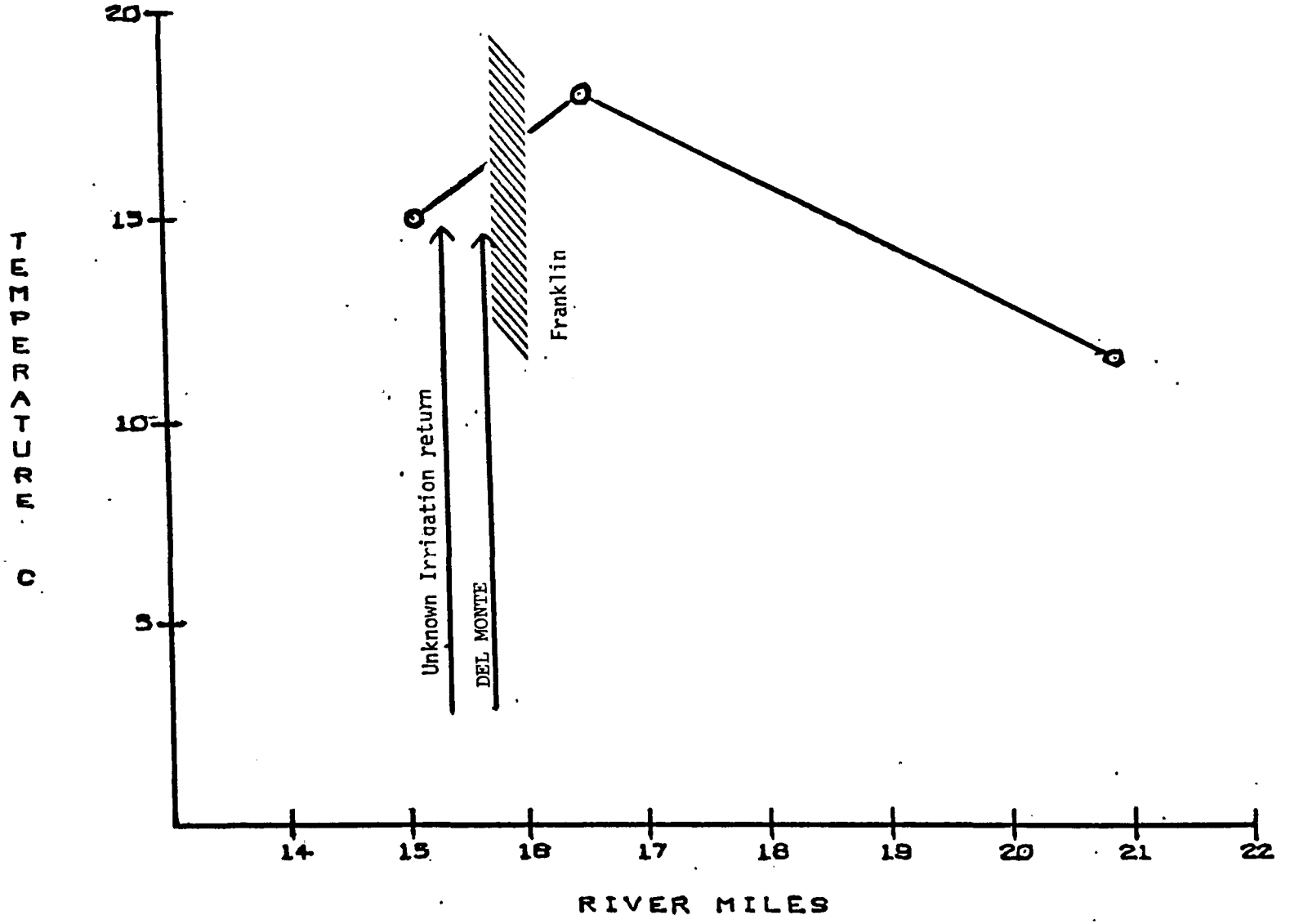


TABLE 18

AUGUST 1974 BEAR RIVER SURVEY

SAMPLING STATION LOCATIONS

NO. 1/	STATION	NAME	RIVER MILE
	MAINSTEM		
1	153596	Bear River @ Bridge .25 mi. W. of Idaho-Wyo Border	274.0
2	153550	Bear River @ Bridge 1 mi. S.W. of Pegram	256.2
3	153551	Bear River @ Div. Dam 3 mi. E. of Dingle	242.7
4	153552	Bear River @ Rd. 1 mi. N.E. of Dingle	237.9
5	153556	Bear River @ Hwy 89 bridge	223.6
6	153597	Bear River @ Bridge 1 mi blw outlet canal	219.3
7	153557	Bear River @ Bridge 2 mi. N.W. of Bennington	209.3
8	153558	Bear River @ 1.4 mi. abv. Skinner Creek	197.2
9	153595	Bear River @ Bridge 1 mi. blw Eightmile creek	185.3
10	153598	Bear River @ Bridge @ head Soda Reservoir	174.3
11	153559	Bear River @ guage blw Alexander Dam	169.4
12	153560	Bear River @ 1 mi. blw Last Chance Dam	166.1
13	153561	Bear River @ Bridge 3 mi. blw Grace power plant	153.1
14	153562	Bear River @ Bridge 5 mi. W. of Thatcher	140.3
15	153563	Bear River @ Bridge 1 mi. blw Oneida Dam	126.6
16	153549	Bear River @ Hwy 91 Bridge N. Of Preston	109.0
17	153546	Bear River @ Road bridge 2 mi. W. of Preston	104.3
18	153599	Bear River @ Road bridge 3 mi. E. of Weston	97.3
	TRIBUTARIES		
20	153564	Thomas Fork @ Hwy 30 Bridge @ mouth	272.0/.01
21	153565	Sheep Creek .2 mi. abv mouth	247.6/.2
22	153566	Crockett Canal @ bridge 1 mi. S. of Dingle	242.7
23	153568	Montpelier Creek @ RR Yd S.W. of Montpelier	224.4/2.1
24	153567	Bloomington Creek 2 mi. S.E. of Bloomington	220.4/10.2/3.0
25	153553	Rainbow Canal @ Bridge 1.5 mi. W. of Dingle	220.4/10.2/4.7
26	153554	Bear lk outlet canal @ br. @ Lifton Pump St.	220.4/14.1
27	153555	Bear lk outlet @ Hwy 89 bridge	220.4/1.1
28	153569	Ovid Creek @ br. 3 mi. N.W. of Montpelier	215.9/2.7
29	153570	Flowing well 1 mi. N.E. of Bern	
30	153571	Georgetown Creek @ rd. Br. near mouth	203.6/.1
31	153572	Stauffer Creek @ br 2 mi. E. of Nounan	202.5/.1
32	153574	Eightmile Creek @ br 1 mi. abv mouth	186.5/.8
34	153577	Big Spring Creek @ Trout Farm	175.0/.9
35	153578	Big Spring Creek near mouth	175.0/.4
33	153575	Soda Creek .25 mi. blw Hooper Spring	174.2/3.0
36	153579	Soda Creek @ br. .2 mi. abv. mouth	174.2/.2
37	153582	Whiskey Creek @ Hwy 34 bridge	145.6/1.1
38	153583	Trout Creek @ Hwy 34 bridge @ Thatcher	139.9/.8
39	153584	Williams Creek @ Hwy 34 bridge	134.8/.6
40	153586	Mink Creek @ culvert .1 mi. abv. mouth	120.7/.1
41	153548	Deep Creek @ culvert .2 mi. N. Squaw Spring	106.6/.2
42	153588	West Cache Canal @ Flume E. of Weston	115
43	153589	Upper Canal @ Culvert 2 mi. W. of Fairview	
44	153590	Worm Creek Abv. Preston STP	77.7/7.0/9.9
45	153545	Worm Creek @ culvert .8 mi. blw Preston	77.7/7.0/9.1
46	153591	Worm Creek @ culvert 2 mi. W. of Franklin	77.7/7.0/4.4
47	153544	Cub Canal South of Preston	
48	153592	Cub River @ Div. Dam 4 mi. N.E. of Franklin	77.7/20.9
49	153593	Cub River Hwy 91 Br. abv. Del Monte	77.7/16.5
50	153594	Cub River blw Del Monte	77.7/15.1
	SPRINGS		
51	153573	Natural spring 1½ mi. W. of Georgetown	
52	153576	Hooper spring 1 mi. N. of Soda Spring	
53	153580	Spring 1 mi. E. of Gem Valley Cheese	
54	153581	Spring 1 mi. S. of Niter, Idaho	
55	153585	Maple Grove Hot Springs	
56	153547	Hot Springs (Squaw)3 mi. N.W. of Preston	
57	153587	Spring S. of Oneida Rd. W. of Preston	

1/ No. refers to station location on Map, Figure

TABLE IIB

BEAR RIVER SURVEY
August 27,28,29, 1974

SURVEY FLOWS 1/

STATION	RIVER MILE	RECORDING GAGE 27	RECORDING GAGE 28	RECORDING GAGE 29	MEASURE 27	MEASURE 28	MEASURE 29	WATER MASTER 27	WATER MASTER 28	WATER MASTER 29	ESTIMATE FLOW 27	ESTIMATE FLOW 28	ESTIMATE FLOW 29	ACCUMULATED FLOWS 27	ACCUMULATED FLOWS 28	ACCUMULATED FLOWS 29
Bear River @ Idaho-Wyo Border	274.0	194	196	185												
Thomas Fork @ mouth	272.0/.01				20.7											
Bear River @ bridge S.W. of Pegram	256.2													214.7	217	205.7
Sheep Creek abv mouth	247.6/.2										1.0					
Bear River @ Div. Dam E. of Dingle	242.7	216	218	207												
Crockett Canal @ Br. S. of Dingle	242.7							-5								
Black Otter Diversion	241.5							-33								
Bear R. N.E. of Dingle	237.9	5	5	5												
Montpelier Creek	224.4/2.1										18					
Bear River @ Hwy 89 bridge	223.6							23	23	23						
Rainbow Canal W. of Dingle	220.4/10.2/4.7	-173	-175	-164												
Bear Lake Outlet-Lifton Pump St.	220.4/14.1							900								
Bear Lake Outlet Hwy 89 Bridge	220.4/1.1	1150	1190	1210												
Bloomington Creek	220.4/10.2/3.0										12.7					
Bear River 1 mi. blw outlet Canal	219.3													1173	1213	1233
Ovid Creek 3 mi. N.W. of Montpelier	215.9/2.7										7.4					
Bear River 2 mi. N.W. of Bennington	209.3	1180	1220	1240												

1/ Negative values denote diversions from river

TABLE IIB (CON'T)

STATION	RIVER MILE	RECORDING GAGE 27	RECORDING GAGE 28	RECORDING GAGE 29	MEASURE 27	MEASURE 28	MEASURE 29	WATER MASTER 27	WATER MASTER 28	WATER MASTER 29	ESTIMATE FLOW 27	ESTIMATE FLOW 28	ESTIMATE FLOW 29	ACCUMULATED FLOWS 27	ACCUMULATED FLOWS 28	ACCUMULATED FLOWS 29
Georgetown Creek	203.6/.1										73.7					
Stauffer Creek	202.5/.1										5.2					
Bear River 1.4 abv Skinner Creek	197.2													1259	1299	1319
Eightmile Creek	186.5/.8				16.1											
Bear River blw Eightmile Creek	185.3													1280	1315	1335
Big Spring Creek @ weir	175.0/.4					18.8										
Bear River head Soda Reservoir	174.3	1290	1334	1554												
Soda Creek abv mouth	174.2/.2					30										
Bear River blw Alexander Dam	169.4	1330	1310	1330												
Bear River blw Last Chance Dam	166.1							1127	1107	1127						
Bear River blw Grace Power Plant	153.1				983	971	971									
Whiskey Creek	145.6/1.1					13										
Bear River W. of Thatcher	140.3				1336	1324	1324									
Trout Creek	139.9/.8					23.6										
William Creek	134.8/.6					18.0										
Bear River blw Oneida Dam	126.6	223	227	209												
Mink Creek	120.7/.1											6				
West Cache Canal	115.0							-143	-141	-111						
Bear River N. of Preston	109.0													87	104	112
Deep Creek	106.6/.2												6			

TABLE IIB (CON'T)

STATION	RIVER MILE	RECORDING GAGE 27	RECORDING GAGE 28	RECORDING GAGE 29	MEASURE 27	MEASURE 28	MEASURE 29	WATER MASTER 27	WATER MASTER 28	WATER MASTER 29	ESTIMATE FLOW 27	ESTIMATE FLOW 28	ESTIMATE FLOW 29	ACCUMULATED FLOWS 27	ACCUMULATED FLOWS 28	ACCUMULATED FLOWS 29
Bear River W. of Preston	104.3													160	160	160
Bear River E. of Weston	97.3													174	150	150
Cub River blw Del Monte	77.7/15.1						22.5									
Cub River abv Del Monte	77.7/16.5						7.8									
Cub River @ Dive Dam	77.7/20.9						40									

TABLE IIIB

MUD LAKE FLOWS

AUGUST 1974 SURVEY

STREAM	INFLOW CFS 8/27	8/28	8/29	AVG	OUTFLOW CFS 8/27	8/28	8/29	AVG
Bear Lake Discharge	900	-		900				
Bloomington Ck.	13			13				
Crockett Canal	5.			5.				
Black Otter Canal	33			33				
Rainbow Canal	150	175	164	163				
Bear Lake Outlet						1190	1210	1200
TOTAL				1114				1200

TABLE IVB

BEAR RIVER BASIN

POINT SOURCE LOADINGS

Discharger	Receiving Waters	River Mile	BOD lbs/day	T. Phos. lbs/day	NO_3^- lbs/day	Sus. Solids lbs/day
Grace STP	Bear River	163.3	--	10.2	.6	47.5
Soda Springs STP	Bear River	174.8	1487	38.6	7.6	441.0
Paris STP	Bear Lake Outlet	220.5/8.0/4.6	1028	26.7	15.1	2704
Montpelier STP	Bear River	222.0	246	38.6	20.7	243
Preston STP	Worm Creek	77.7/7.7/9.9	--	9.7	13.8	2.1
Del Monte	Cub River	77.7/15.7	--	10.1	2.3	273
Monsanto	Irrigation Canal	174.2/3.1	21	172.4	100.5	123
Caribou Trout Farm	Big Spring Creek	175/0.4	--	9.6	243.6	964.4

TABLE VB

BEAR RIVER BASIN
POINT SOURCE DATA

MUNICIPALITIES	COD	$N\text{-}NH_3$ mg/l	$N\text{-}NO_3$ mg/l	Total phos. mg/l	Turb. JTU	Total Coli. #/100 ml	Fecal Coli. #/100 ml
Grace STP	180	18	.5	8.6	30	2,100,000	
Soda Springs STP	290	4.8	.83	4.2	18	400	100
Paris STP (south effluent)	-	1.7	2.1	1.6	2.2	1,500,000	1,500,000
Paris STP (north effluent)	570	2.4	1.4	4.6	132	1,100,000	240,000
Montpelier STP	140	9.3	2.9	5.4	14	400	100
Preston STP	40	1.7	5.1	3.6	4.3	100	100
INDUSTRIES							
Gem Valley Cheese	230	1.2	2.2	3.0	15	18,000	-
Del Monte Corp.	150	.4	.4	1.7	14	32,000	-
Monsanto Co.	16	.14	4.9	8.4	1.4	1,300	-
Caribou Trout Farm	-	.25	2.4	0.1	1.1	620	120

TABLE VI B

BEAR RIVER BASIN

Point Source Data

MUNICIPALITIES	Flow CFS	Temp. C	pH	Total Solids mg/l	Total Vol. Solids mg/l	Sus. Solids mg/l	BOD_5
Grace STP	22	22.0	7.3	624	173	40	-
Soda Springs STP	1.7	17.3	6.8	1195	331	48	162
Paris STP (south effluent)	.3	11.5	2.3	399	101	16	38
Paris STP (north effluent)	.5	12.6	2.2	1125	476	610	200
Montpelier STP	1.3	15.7	7.3	766	228	34	35
Preston STP	.5	19.6	7.4	510	165	1	-
INDUSTRIES							
Gem Valley Cheese	-	23.6	9.0	648	233	30	-
Del Monte Corp.	1.1	18.0	7.4	667	335	46	-
Monsanto Co.	3.8	21.8	8.0	763	76	6	1
Caribou Trout Farm	18.8	11.2	6.6	496	272	9.5	-

TABLE VII B

BACTERIA LEVELS IN TRIBUTARIES OF
BEAR RIVER BASIN

RIVER LOCATION	DATE	TOTAL COLI. #/100 ml	FECAL COLI. #/100 ml	FECAL STREP #/100 ml	STATE W.Q. CLASS.
WYOMING-IDAHO BORDER TO BEAR LAKE DIVERSION					
Thomas Fork	-	-	-	-	A
MUD LAKE TRIBUTARIES					
Crocket Canal	8/27/74	810	110	780	A
Bloomington Cr.	8/27/74	170	60	1200	A
BEAR RIVER FROM BEAR LAKE DIVERSION TO SODA SPRINGS RESERVOIR					
Montpelier Creek	8/27/74	4900	4800	4500	A
Ovid Creek	8/27/74	600	110	40	A
Georgetown Creek	8/28/74	330	170	1200	A
Stauffer Creek	8/28/74	720	570	1900	A
Eightmile Creek	8/28/74	430	150	550	A
Big Spring Creek	8/28/74	620	120	650	A
Cub Spring Creek	8/28/74	600	140	120	A
BEAR RIVER FROM SODA SPRINGS RES. TO ONEIDA RES.					
Whiskey Creek	8/28/74	140	34	92	A
Trout Creek	8/28/74	360	230	520	A
Williams Creek	8/28/74	470	180	350	A
BEAR RIVER FROM ONEIDA RES. TO BORDER					
Mink Creek	8/28/74	800	160	940	A
CUB RIVER FROM R.M. 21 to BORDER					
At Diversion Dam At. R.M. 21	8/28/74	690	260	620	A
At R.M. 16.5 (U/S from Del Monte)	8/28/74	200	190	1600	A
At R.M. 15 (D/S from Del Monte)	8/28/74	430	130	810	A
WORM CREEK					
Abv. Preston STP	8/28/74	520	90	2000	B
Bl. Preston STP	8/28/74	TNTC	50,000	21,000	B
Near State Border	8/28/74	5700	870	3500	B

* TNTC - Too numerous to count

TABLE VIIIB

WATER QUALITY OF BEAR RIVER TRIBUTARIES

August 1974 Survery

LOCATION OF CONFLUENCE R.M.		1/ NO.	TYPE OF INFLOW	FLOW cfs	PARAMETERS 2/ T.Hg ug/l	Hardness mg/l	Cond. umho/cm	T. Alk. mg/l	NO_3 mg/l	T.P. mg/l	Temp. °C	pH	TOC mg/l	NH_3
UPPER RIVER														
272.0	Thomas Fk.		Tributary	20.7		273	860		.78	.06	15.8	7.8	51.5	.03
247.6	Sheep Creek		Tributary	1		223	460		.01	.03	16.0	7.6		.01
MUD LAKE AREA														
	Bloomington Cr.		Tributary in	13		203	420		.07	.07	15.8	7.0		
	Rainbow Canal		Tributary in	171	1.4	242	600	221	.013	.08	16.7	7.5	19.7	.01
	Bloomington Cr.		Tributary in	12.7										.01
	Crockett Canal		Tributary in	5										
	Black Otter		Tributary in	33										
	Bear Lk. Outlet Clifton		Tributary in	900		314	720		.01	.02	19.3	8.2	61.0	
BEAR R. FROM MUD LAKE TO SODA SPRINGS														
224.4	Montpelier Ck.		Tributary	18	.5	236	520		.04	.04		7.5	45.5	.01
220.4	Bear Lake Outlet		Tributary	1180		297	690	258	.01	.07	19.5	7.9	22.7	.01
215.9	Ovid Ck.		Tributary	7.4		140	360		.01	.03	21.0	7.2		.01
	Spring nr. Georgetown		Groundwater	-	.6	306	610	253	3.4	.10	12.3	6.7		.03
203.6	Georgetown Ck		Tributary	73.7	.6	266	500	240	.88	.20	17.7	7.5	55	.025
202.5	Stauffer Ck		Tributary	5.2		130	240	135	.06	.08	20.5	7.8	34	.01
186.5	Eightmile Ck		Tributary	16.1		176	360	180	.10	.04	17.0	7.5	42	.02
175.0	Big Ck		Tributary	18.8	1.0	527	1180	412	2.40	.09	11.2	6.6	2.5	.25
	Hooper Spr.		Groundwater			777	1400	115	.01	.30	11.6	5.4		.5
174.2	Soda Ck.		Tributary	30.0		587	1090	555	.74	.51	15.9	6.6	3.0	.075
SODA SPRINGS TO ONIEDA RES.														
	Spring (Nr. Gem Valley)		Groundwater		1.2	421	900	366	2.6	.18	14.0	6.6		.07
	Spring (Nr. Niles)		Groundwater		1.0	429	1100	372	3.0	.17	14.0	7.0		.03
145.6	Wiskey Ck.		Tributary	13.0		370	960	327	2.3	.11	16.0	7.6	3.0	.025
139.9	Trout Ck		Tributary	23.6		306	720	278	1.0	.09	18.0	7.7	3.0	.04
134.8	Williams Ck		Tributary	18.0		218	480	218	.12	.03	16.5	7.7	4.0	.02
	Maple Grove (Hot Springs)		Groundwater		.6	333	600	389	.09	.05	-			1.2

TABLE VIII B (CON'T)

LOCATION OF CONFLUENCE R.M.		1/ NO.	TYPE OF INFLOW	FLOW cfs	PARAMETERS 2/									
					T.Hg ug/l	Hardness mg/l	Cond. umho/cm	T. Alk. mg/l	NO_3 mg/l	T.P. mg/l	Temp. °C	pH	TOC mg/l	NH_3
ONIEDA RESERVOIR TO IDAHO-UTAH BORDER														
120.7	Mink Ck.		Tributary	6	1.0	215	645	228	.68	.13	19.0	7.9	5.0	.04
	Squaw Hot Spring		Groundwater		1.0	490	1000	580	.30	.06		6.2	2.0	.8
	Spring Nr. Preston		Groundwater		.2	251	1300	250	4.30	.08	11.5	7.6	3.0	.02

1/ Number corresponds to station on Figure Map/

2/ Average of samples over survey period

TABLE IX B

Isolation of Pseudomonas Aeruginosa and Staphyloccus Aureus

Station Number	Lab Number	Date Collected	Station Description	P. Aeruginosa/(1) 100 ml (confirmed	S. Aureus/100ml ((confirmed)
153556	35068	8/29/74	Bear R. @Hwy 89 Br 2mi W. of Montpelier	0	0
153568	35070	"	Montpelier Cr. SW. of Montpelier	0	1800
153571	35071	"	Georgetown Cr ½mi W. of Georgetown	0	0
153561	35069	"	Bear R @Hwy Br W. of Thatcher	4	400
153583	35072	"	Trout Cr ¼mi E. of Thatcher	1	800
153584	35073	"	Williams Cr 3½mi S. of Thatcher	0	700
153587	35061	"	Springs S. of Oneida Rd W. of Preston	0	0
153599	35066	"	Bear R. 3 mi W. of Fairview	0	600
153589	35062	"	Cr. N. of West pump Canal	20	1200
153545	35060	"	Worm Cr. Below Preston STP	10	0
153591	35063	"	Worm Cr. @ culvert 2mi W. of Franklin	40	200
153592	35064	"	Cub R. @ Diverson Dam 4mi NE of Franklin	0	80
153593	35065	"	Cub R. Hwy 91 Br ½ mi N. of Franklin	0	0

(1) Confirmed on Milk Agar
(2) Confirmed by DNase Acitivity & Coagulase Reaction

TABLE XB

AUGUST 1974 BEAR RIVER SURVEY
PESTICIDE OCCURENCE

STATION	PARAMETER BHC (Lindane) ug/l	DDD ug/l	DDE ug/l	DDT ug/l
BEAR RIVER				
At Idaho-Wyoming Border	-	.003	.004	.004
Nr. Montpelier (abv. confluence with Bear Lk. outlet)		.009	.006	.007
Blw Bear Lk. outlet	.012	-	-	-
Blw Grace Power Plant	.005	-	-	-
THOMAS FORK				
Nr. Mouth	.006	-	-	-
BEAR LAKE OUTLET	.010	-	-	-
MONTPELIER CREEK	.005	-	-	-
BIG SPRING CREEK	-	-	-	-
SODA SPRING CREEK	.003	-	-	-
MINK CREEK	.003	-	-	-
CUB RIVER				
At Diversion Dam	.002	- -	- -	- -
Blw Del Monte Discharge	-	-	-	-

TABLE XIB

MUD LAKE LOADINGS

INFLOW/OUTFLOW	FLOW cfs	TOT. PHOS. #/day	NO_3 #/day	NH_3 #/day	T.O.C. #/day	SUS. SOLIDS #/day	AVG T. COLI. Per/100 ml	AVG F. COLI: Per 100/ml
INFLOW								
Bear Lake Discharge	900	97	49	49	297,000	24,400	350	2
Bloomington Creek	13	5	5	.7		2,200	170	60
Crocket Canal	5	3	1	.3		80	810	110
Black Otter Canal	33	10	5	2		5,400		
Rainbow Canal	163	70	11	9	17,600	30,500	220	120
Paris STP Discharge	.8	39	21	3		2,600	1,300,000	700,000
TOTAL INFLOW	1114.8	224	92	64	314,600	65,200		
OUTFLOW								
Bear Lake Outflow Canal	1200	445	64	65	145,000	112,000	50	20
TOTAL OUTFLOW	1200	445	64	65	145,000	112,000		

TABLE XII B

CUB RIVER LOADINGS

STATION	R.M.	FLOW cfs	CUB RIVER LOADINGS #/DAY			CUB RIVER BACTERIAL DENSITIES PER/100 ml			
			T. PHOS.	NO_3-N	NH_3-N	T. COLI.	F. COLI.	F. STREP	FC/FS
Cub River	20.9	40	5.4	39	4.3	690	260	620	.4
Cub River	16.5	7.8	1.8	22	1.3	200	190	1600	.1
Del Monte Disc.	15.7	1.1	10.1	2.4	2.4	32,000	-	N/A	-
Cub River	15.1	22.5	30.4	54	61	430	130	810	.2

TABLE XIII B

August 1974 Bear River Survey

WORM CREEK

STATION	Sample Date	PARAMETERS T. Phos.	NH_3-N	NO_3-N	Sus. Solids	TOC	T. COLI.	FEC. COLI.
		mg/l	mg/l	mg/l	mg/l	mg/l	Per 100/ ml	Per/100 ml
Worm Creek	8/29/74	0.75	1.30	.29	39.0	19.0	520	90
Preston STP discharge	8/28/74	3.6	1.7	5.1	.1			100
Worm Creek just blw STP	8/23/74	-	-	-	-	-	TNTC 2/	50,000
Worm Creek 0.8 mi. blw STP	8/29/74	1.14	1.55	.64	34.5	16.0	5700	870

1/ Values shown are an average of two values
2/ Colonies too numerous to count

APPENDIX C

MONSANTO COMPANY COMPLIANCE
MONITORING REPORT

AND

RAW DATA - AUGUST 1974 SURVEY

ENVIRONMENTAL PROTECTION AGENCY
REGION X
SURVEILLANCE AND ANALYSIS DIVISION

COMPLIANCE MONITORING REPORT

PERMITTEE	Monsanto Company Soda Springs, Idaho
NPDES PERMIT NO.	ID-000119-8 Effective 10/21/73
RECEIVING WATER	Soda Creek

PURPOSE

To assess compliance with NPDES permit conditions and provide discharge information in conjunction with a receiving water study conducted on the Bear River.

PARTICIPANTS

James Hileman	Region X, EPA
Douglas Houck	Region X, EPA
William Finfrock	Region X, EPA
Mark Hooper	Region X, EPA
Rick Walters	Region X, EPA, Idaho Operations Of

SUMMARY OF FINDINGS

Based upon the results of the effluent sampling conducted during August 27-29, 1974, and in inspection of the plant records, the Monsanto Company was generally in compliance with the initial effluent limitation as specified in their NPDES permit.

The following requirement, however, was found not to be in complia

1. Temperature

   Permit requirements (daily max. = 70°F)
   Survey results (8/29/74 - 71.2°F)

This violation is based on one grab sample only and should be considered as an apparent violation (not necessarily real).

PERMIT SUMMARY

PERMIT NUMBER	ID-000119-8
EFFECTIVE DATE	10/21/73

SPECIAL CONDITIONS:

S1. Initial effluent limitations

During the period beginning on the effective date of this permit

and lasting until September 30, 1975, discharges from outfall #001 shall be limited and monitored by the permittee as specified below:

a. The following shall be limited and monitored by the permittee as specified:

Effluent Characteristic	Discharge Limitation in kg/day (lbs/day) Daily Average	Daily Maximum	Other Limitations Average	Maximum	Monitoring Requirements Measurement Frequency	Sample Type
Flow	-	-	12,100 cu m/day (2.67 MGD)	14,500 cu m/day (3.83 MGD)	Daily	Continuo
Temperature	-	-	-	70°F	Daily	Grab
Total Phosphorous (as P)	80 (176)	126 (277)	-	-	Daily	24-hr. Composite
Suspended Solids	163 (359)	326 (718)	-	-	Monthly	24-Hr. Composite
Fluoride	10.9 (24)	32.7 (72)	-	-	Monthly	24-Hr. Composite

For the purposes of this subsection, the daily average discharge, except for flow and temperature, is the total discharge by weight during a calendar month divided by the number of days in the month that the production or commercial facility was operating. For flow, temperature, and those parameters sampled at a frequency other than daily, the daily average is the arithmetic mean of all samples collected during a calendar month.

For the purposes of this subsection, the daily maximum discharge, except for flow and temperature, means the total discharge by weight during any calendar day.

b. The pH shall not be less than 6.5 nor greater than 9.0. The pH shall be monitored daily by analyzing a grab sample.

c. The plant's intake well water shall be monitored weekly for total phosphorous (as P) by taking samples from the individual wells when operating and compositing according to their actual corresponding usage from each well during the week.

PROCESS DESCRIPTION

The following information is taken from a source test report (72-MM-27) for the Monsanto Company.

Elemental phosphorus is produced from phosphate rock by reduction in an electric arc furnace. Typical ores contain 10-13% phosphorus so

that about 10 tons of rock must be processed per ton of phosphorus produ Considerable quantities of coke, silica, and recycled materials are fed t the furnaces with the beneficiated ore.

Prior to being fed to the furnace, the rock is agglomerated and heat hardened in a kiln. The partially fused product is cooled and crushed to a specified size before being fed to the furnace as shown in Figure 1.

Phosphate feed is carefully proportioned with silica and coke before being transferred to feed bins directly above the furnace. The feed mixt then moves by gravity from the bins down into the furnace as the furnace feed is consumed.

The reaction within the furnace is approximated by the following equation:

$$2\ Ca_3\ (PO_4)_2 + 10\ C + 6\ Sio_2 \xrightarrow{(2300-2700^{o}F)} P_4 + 10\ CO + 6\ CaSio_3$$

Elemental phosphorous and carbon monoxide leave the furnace as gases Dust is removed from the stream by an electrostatic precipitator and the phosphorous vapor is later condensed out in direct-contact water condense Waste CO gas is used as a fuel in the kiln operation.

The molten process by-products and some coke must be periodically removed from the furnace by tapping. This molten material separates into two layers inside the furnace. The lighter top layer is a slag from the ore material. This slag has no economic value except as an aggregate. I is tapped alternately from two tapholes at 15-minute intervals. The slag runs out into water-filled pits behind the furnace building.

The heavier bottom layer is about twice the density of the slag, and islargely a phosphorous-iron mixture known as ferrophos. This metal by-product is tapped from the furnace twice each day. The ferrophos is poured into chills and then shipped to a nearby plant for vanadium recovery.

SELF MONITORING PROCEDURES

One outfall is used by the Company for discharge of cooling waters. At the time of the survey all process waste water was being discharged to non-overflow lagoons.

OUTFALL #001

Flow s measured continuously at this outfall by a Parshall flume in the outfall line. Flow rate is recorded on a strip chart. A composite sample is obtained daily.

SURVEY DESCRIPTION

Monsanto's outfall was monitored for one day utilizing automatic sampling equipment. Samples were obtained at the same location of company installed monitoring devices. Samples obtained by the ISCO's were time composited and split with Monsanto.

Although flow proportioning of the composite was not attempted, it is believed that a representative sample of the effluent was obtained. Flow on outfall #001 was observed to be quite stable during the sampling period. Due to the relatively stable operation of the mill processes, flow proportioning was deemed unnecessary.

Samples obtained by the ISCO were kept cold during the sampling process by packing ice into the center section. The company sampling device does not provide for refrigeration of the sample.

Sampling was initiated on Tuesday afternoon. The ISCO automatic sampler was set for a one hour sampling frequency. A 24-hour composite sample was obtained on Wednesday afternoon.

RESULTS

Table 1 presents the analytical results of the samples obtained during the survey. Based upon these results the Company was well within their daily maximum effluent limitation for flow, total phosphorous, suspended solids, fluoride and pH. An apparent violation occurred for temperature.

LIST OF ATTACHMENTS

Attachment 1	Plant Evaluation Form
Attachment 2	Form used for purpose of record keeping
Attachments 3,4,5	Process flow charts
Attachment 6	Facility map

TABLE 1. COMPARISON OF TOTAL COLFIRONS, FECAL COLIFORMS, FECAL STREP AND FC/FS RATIOS

Station Number	Lab Number	Date Coll.	Station Description	Total Coliform/ 100 ml	Fecal Coliform/ 100 ml	Fecal Strep/ 100 ml
153596	35008	8/27/4	Bear R @ Ed-Wyo Border	100	48	560
153564	35017	"	Bear R on Hwy 30 @ Thomas Crk	200	64	160
153550	35009	"	Bear R 1 mi SW of Pegram	200	62	600
153565	35018	"	Bear R on Hwy 30 @ Alton Crk	330	5[illegible]	400
153551	35010	"	Bear R @ Division Dam by Hwy	800	130	610
153552	35011	"	Bear R @ Hwy Br Near Dingle	110	34	1100
153553	35012	"	Bear R @ Rainbow Canal @ Br	220	120	1000
153566	35019	"	Crockett Canal SE of Bloomington	810	110	780
153554	35013	"	Bear Lake Outlet Blw Lifton Pumping Plant	350	2	2
153567	35020	"	Bloomington Cr near Bloomington	170	60	1200
153555	35014	"	Bear Lake outlet 3 mi W of Montpelier	50	20	130
153556	35015	"	Bear R @ Hwy 89 Br 2 mi W of Montpelier	500	270	1100
153568	35021	"	Montpelier or SW of Montpelier	4900	4800	4500
153569	35022	"	Ovider 3 min W of Montpelier	600	110	40
1041	35016	"	Bear Canal 1½ mi W of Montpelier	120	30	130
153571	35034	8/28/4	Georgetown Cr ½ mi W of Georgetown	330	170	1200
153572	35035	"	Stauffer Cr 2 mi E of Novnan	720	570	1900
153558	35036	"	Bear R 1 mi from Skinner Cr	170	94	1500
153574	35037	"	8 mile Cr 5 mise of Soda Springs	430	150	550
153578	35038	"	Big Spring Cr @ Weir of Trout Farm	620	120	650
153579	35039	"	Soda Spring Cr W of Soda Spr	600	140	120
153559	35040	"	Bear R. blw Soda Springs Res	60	4	180
153560	35041	"	Bear R 3 mi blw Grace Power Plt	40	10	980
153561	35042	"	Bear R @ Hwy Br W of Thatcher	1100	190	100,000
153582	35043	"	Whiskey Cr 3 mi NE of Thatcher	140	34	92
153562	35044	"	Bear R W of Thatcher Powerhouse	150	100	160
153583	35045	"	Trout Cr ¼ mi E of Thatcher	360	230	520
153584	35046	"	Williams Cr 3½ mi S of Thatcher	470	180	350
153563	35001	8/27/4	Bear R ½ mi blw Oneida	400	2	900
153586	35047	8/28/4	Mink Cr @ Hwy Culvert below Hwy 36	800	160	940
153549	35002	8/27/4	Bear R @ Hwy 91 Bridge	220	64	120
"	35008	"	" " " "	200	52	830
"	35023	8/28/4	" " " "	300	100	2000

Table 1 (continued)

Storet Station Number	Lab Number	Date Coll.	Station Description	Total Coliform/ 100 ml	Fecal Coliform/ 100 ml	Fecal Strep/ 100 ml
153549	35024	8/28/4	Bear R @ Hwy 91 Bridge	270	100	510
	35027	"	" " " "	150	120	190
153546	35003	8/27/4	Bear R S of Preston Airport	170	50	370
"	35006	"	" " " "	140	56	200
"	35025	8/28/4	" " " "	110	64	100
"	35026	"	" " " "	130	90	110
"	35048	"	" " " "	50	10	82
153587	35049	"	Sprin S of Oneida Rd W of Preston	10,000	2700	7800
153599	35004	8/27/4	Bear R 3 mi W of Fairview	390	170	350
"	35007	"	" " " "	320	120	650
"	35028	8/28/4	" " " "	130	92	56
"	35029	"	" " " "	140	110	390
153589	35057	"	Cr N of West Pump Canal	4700	1300	3800
153590	35050	"	Worm Cr abv Preston STP	520	90	2000
153545	35051	"	Worm Cr below Preston STP	TNTC	50,000	21,000
153544	35052	"	Cub Canal S of Preston	330	60	490
153591	35056	"	Worm Cr @ Culbert 2 mi W of Franklin	5700	870	3500
153592	35053	"	Cub R @ Diversion Dam 4 mi NE of Franklin	690	260	620
153593	35054	"	Cub R Hwy 91 Br ½ mi N of Franklin	200	190	1600
153594	35055	"	Cub R blw Del Monte Discharge	430	130	810

TABLE 2 - Comparison of bacterial populations from both residential and rural areas on the Bear River

	Residential Areas (1) (12 samples)	Rural Areas (41 samples)
Total Coliforms		
Mean	5700	540
Range	120-50,000	40-5700
Fecal Coliforms		
Mean	4900	150
Range	60-50,000	2-4800
Fecal Strept		
Mean	3400	3200
Range	40-21,000	2-100,000
FC/FS Ratios		
Mean	0-8	0.3
Range	0.1-2.8	0.01-1.6

1. Within ca. 3-4 sq miles radius of Montpelier, Soda Springs, Preston and Franklin.

TABLE 3 Isolation of Pseudomonas Aeruginosa and Staphyloccus Aureus from the Bear River

Station Number	Lab. Number	Date Collected	Station Description	P. Aeruginosa/(1) 100 ml (confirmed)	S. Aureus/1[illegible] (Confirmed)
153556	35068	8/29/74	Bear R @Hwy 89 Br 2 mi W. of Montpelier	0	0
153568	35070	"	Montpelier Cr SW of Montpelier	0	1800
153571	35071	"	Georgetown Cr ½mi W of Georgetown	0	0
153561	35069	"	Bear R @Hwy Br W of Thatcher	4	400
153583	35072	"	Trout Cr ¼ mi E of Thatcher	1	800
153584	35073	"	Williams Cr 3½ mi S of Thatcher	0	700
153587	35061	"	Spring's S of Oneida Rd W of Preston	0	0
153599	35066	"	Bear R 3 mi W of Fairview	0	600
153589	35062	"	Cr N of West p[illegible] canal	20	1200
153545	35060	"	Worm Cr below Preston STP	10	0
153591	35063	"	Worm Cr @culvert 2 mi W of Franklin	40	200
153592	35064	"	Cub R @Diversion Dam 4 mi NE of Franklin	0	80
153593	35065	"	Cub R Hwy 91 Br ½ mi N of Franklin	0	0

1. Confirmed on Milk Agar
2. Confirmed by DNase Acitivity & Coagulase Reaction

STORET #	AGENCY #	DATE	SUMMARY	01002 ARSENIC AS.TOT UG/L	01027 CADMIUM CD.TOT UG/L	01 COPPE CU.TOT UG/L	01045 IRON FE.TOT UG/L	01051 LEAD PB.TOT UG/L	71900 MERCURY HG.TOTAL UG/L	00929 SODIUM NA.TOT MG/L	00937 POTASSIUM K.TOT MG/L	31671 STAPH AUR CONF /100ML	71220 P AERUG WATER NO/100ML
BEAR R @ RD BR 3 MI E OF WESTON													
97.30/ 0.0 / 0.0		74/08/27	0945	3.50	3.00	9.00	630.0	30.0	1.00	62.00	8.70		
#153599	1119C050	74/08/27	0950	3.00		8.00	370.0	20.0	1.40	65.00	8.80		
		74/08/28	0940		5.00	9.00	360.0	30.0	0.40	59.00	8.00		
		74/08/28	1000	1.60	16.00	10.00	360.0	20.0	0.80	61.00	8.40		
		74/08/29	0910	3.70	3.00	5.00	410.0	20.0	0.80	59.00	8.00		
		74/08/29	1017										0.0
		STATION	MEAN	2.95	6.75	8.20	426.0	24.0	0.88	61.20	8.38		0.0
MONTPELIER CR @ RR YD SW MONT.													
224.40/ 2.10/ 0.0		74/08/27	1350	1.20		5.00	300.0	20.0	0.40	6.70	1.20		
#153568	1119C050	74/08/27	1355	1.20		4.00	300.0	20.0	0.60	6.70	1.20		
		74/08/29	1355									1800.0	0.0
		STATION	MEAN	1.20		4.50	300.0	20.0	0.50	6.70	1.20	1800.0	0.0
RAINBOW CAN @ RR 1.5 MI W DINGLE													
220.40/ 10.20/ 4.70		74/08/27	1210	2.20	3.00	8.00	960.0	20.0	1.20	34.00	2.50		
#153553	1119C050	74/08/28	1100	1.40	7.00	6.00	1000.0	20.0	1.60	34.00	2.40		
		74/08/29	1025	2.60	3.00	6.00	920.0	20.0	1.40	35.00	2.50		
		STATION	MEAN	2.07	4.33	6.67	960.0	20.0	1.40	34.33	2.47		
FLOWING WELL 1 MI NE OF BERN													
0.0 / 0.0 / 0.0		74/08/27	1300	0.20		4.00	540.0	20.0	0.40	31.00	6.20		
#153570	1119C050	74/08/27	1305	0.40		4.00	490.0	20.0	0.40	29.00	6.00		
		STATION	MEAN	0.30		4.00	515.0	20.0	0.40	30.00	6.10		
GEORGETOWN CR AT RD BR NR MOUTH													
203.60/ 0.10/ 0.0		74/08/27	1515	1.80		4.00	580.0	20.0	0.40	4.80	2.60		
#153571	1119C050	74/08/27	1520	1.20		5.00	550.0	20.0	0.80	4.80	2.60		
		74/08/29	1335									0.0	0.0
		STATION	MEAN	1.50		4.50	565.0	20.0	0.60	4.80	2.60	0.0	0.0
BIG SPR. CR @ WEIR OF TROUT FARM													
175.00/ 0.40/ 0.0		74/08/28	1010	1.00	5.00	7.00	50.0	30.0	1.20	31.00	4.30		
#153578	1119C050	74/08/28	1015	1.50	9.00	7.00	65.0	40.0	0.80	31.00	4.30		
		STATION	MEAN	1.25	7.00	7.00	57.5	35.0	1.00	31.00	4.30		
SODA CREEK .25 MI BLW HOOPER SPR													
174.20/ 3.00/ 0.0		74/08/28	0925	1.50	4.00	6.00	710.0	20.0	1.60	21.00	7.20		
#153575	1119C050	STATION	MEAN	1.50	4.00	6.00	710.0	20.0	1.60	21.00	7.20		

STORET # / RIVER MILES	AGENCY #	DATE	SUMMARY	00610 NH3-N TOTAL MG/L	00620 NO3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00680 TOT ORG C MG/L	00900 TOT HARD CACO3 MG/L	00940 CHLORIDE CL MG/L	00945 SULFATE SO4-TOT MG/L	00950 FLUORIDE F,DISS MG/L	01090 ZINC ZN,TOT UG/L	00927 MAGNESIUM MG,TOT MG/L
OVID CR @ BR 3 MI NW MONTPELIER													
215.40/ 2.70/ 0.0		74/08/27	1325	0.010	0.010	0.030		140.0	7.0	8.0	0.12		
#153569	1119C050	STATION	MEAN	0.010	0.010	0.030		140.0	7.0	8.0	0.12		
FLOWING WELL 1 MI NE OF BERN													
0.0 / 0.0 / 0.0		74/08/27	1300	2.700	0.010	0.130		247.0	13.0	24.0	0.23	20.0	23.00
#153570	1119C050	74/08/27	1305	2.700	0.010	0.130		253.0	14.0	24.0	0.23	10.0	23.00
		STATION	MEAN	2.700	0.010	0.130		250.0	13.5	24.0	0.23	15.0	23.00
GEORGETOWN CR AT RD BR NR MOUTH													
203.50/ 0.10/ 0.0		74/08/27	1515	0.030	0.880	0.190	55.00	249.0	3.0	44.0	0.20	15.0	19.00
#153571	1119C050	74/08/27	1520	0.020	0.870	0.210	55.00	282.0	1.0	46.0	0.19	40.0	19.00
		STATION	MEAN	0.025	0.875	0.200	55.00	265.5	2.0	45.0	0.19	27.5	19.00
STAUFFER CR AT BR 2 MI E NORMAN													
202.50/ 0.10/ 0.0		74/08/27	1540	0.010	0.060	0.080	34.00	136.0	5.0	4.0	0.11		
#153572	1119C050	STATION	MEAN	0.010	0.060	0.080	34.00	136.0	5.0	4.0	0.11		
EIGHTMILE CR @ BR 1 MI ABV MOUTH													
186.50/ 0.80/ 0.0		74/08/27	1640	0.020	0.100	0.040	42.00	176.0	3.0	2.0	0.07		
#153574	1119C050	STATION	MEAN	0.020	0.100	0.040	42.00	176.0	3.0	2.0	0.07		
BIG CR. @ TROUT FARM													
175.00/ 0.90/ 0.0		74/08/28	0950	0.020	2.800	0.040	1.00	546.0	52.0	108.0	0.25		
#153577	1119C050	74/08/28	0955	0.020	2.900	0.050	3.00	534.0	53.0	110.0	0.26		
		STATION	MEAN	0.020	2.850	0.045	2.00	540.0	52.5	109.0	0.25		
BIG SPR. CR @ WEIR OF TROUT FARM													
175.00/ 0.40/ 0.0		74/08/28	1010	0.230	2.400	0.090	2.00	531.0	45.0	106.0	0.27	20.0	61.00
#153578	1119C050	74/08/28	1015	0.260	2.400	0.100	3.00	524.0	46.0	106.0	0.27	30.0	61.00
		STATION	MEAN	0.245	2.400	0.095	2.50	527.5	45.5	106.0	0.27	25.0	61.00
SODA CREEK .25 MI BLW HOOPER SPR													
174.20/ 3.00/ 0.0		74/08/28	0925	0.100	0.540	0.050	2.00	541.0	5.0	26.0	0.28	20.0	74.00
#153575	1119C050	STATION	MEAN	0.100	0.540	0.050	2.00	541.0	5.0	26.0	0.28	20.0	74.00
SODA CR @ BR .2 MI ABV MOUTH													
174.20/ 0.20/ 0.0		74/08/28	1150	0.070	0.750	0.500	3.00	588.0	3.0	70.0	0.42		
#153579	1119C050	74/08/28	1155	0.080	0.740	0.520	3.00	585.0	1.0	70.0	0.42		
		STATION	MEAN	0.075	0.745	0.510	3.00	586.5	2.0	70.0	0.42		

STATION NAME / RIVER MILES / STORET #	AGENCY #	DATE	SUMMARY	00610 NH3-N TOTAL MG/L	00620 NO3-N TOTAL MG/L	0066 PHOS-T. MG/L P	00680 T ORG C C MG/L	00900 TOT HARD CACO3 MG/L	00940 CHLORIDE CL MG/L	00945 SULFATE SO4-TOT MG/L	00950 FLUORIDE F.DISS MG/L	01092 ZINC ZN.TOT UG/L	00927 MAGNESIUM MG.TOT MG/L
WHISKEY CR AT HWY 34 BRIDGE													
145.60/ 1.10/ 0.0		74/08/28	1315	0.020	2.300	0.110	3.00	366.0	40.0	73.0	0.25		
#153582	1119C050	74/08/28	1320	0.030	2.300	0.110	3.00	374.0	40.0	80.0	0.27		
		STATION	MEAN	0.025	2.300	0.110	3.00	370.0	40.0	76.5	0.26		
TROUT CR @ HWY 34 BR @ THATCHER													
139.90/ 0.80/ 0.0		74/08/28	1345	0.040	1.000	0.090	3.00	306.0	16.0	32.0	0.11		
#153583	1119C050	STATION	MEAN	0.040	1.000	0.090	3.00	306.0	16.0	32.0	0.11		
WILLIAMS CREEK AT HWY 34 BRIDGE													
134.80/ 0.60/ 0.0		74/08/28	1400	0.020	0.120	0.030	4.00	218.0	5.0	2.0	0.07		
#153584	1119C050	STATION	MEAN	0.020	0.120	0.030	4.00	218.0	5.0	2.0	0.07		
MINK CR @ CULVERT .1MI ABV MOUTH													
120.70/ 0.10/ 0.0		74/08/28	1520	0.040	0.600	0.080	5.00	215.0	11.0	12.0	0.24		
#153586	1119C050	STATION	MEAN	0.040	0.600	0.080	5.00	215.0	11.0	12.0	0.24		
DEEP CR @ CULV .2 MI - SOUAW SPR													
105.50/ 0.20/ 0.0		74/08/29	0815	0.090	0.930	0.080	4.00	284.0	126.0	62.0	0.36		
#153548	1119C050	STATION	MEAN	0.090	0.930	0.080	4.00	284.0	126.0	62.0	0.36		
W CACHE CAN @ FLUME E OF PRESTON													
0.0 / 0.0 / 0.0		74/08/29	1200	0.030	0.100	0.060	4.00	329.0	52.0	90.0	0.24		
#153588	1119C050	STATION	MEAN	0.030	0.100	0.060	4.00	329.0	52.0	90.0	0.24		
UPPER CAN @ CULV 2 MI W FAIRVIEW													
0.0 / 0.0 / 0.0		74/08/29	1150	0.080	0.520	0.100	4.00	179.0	2.0	14.0	0.12		
#153589	1119C050	STATION	MEAN	0.080	0.520	0.100	4.00	179.0	2.0	14.0	0.12		
WORM CR ABV PRESTON STP													
77.70/ 7.00/ 9.90		74/08/29	0925	1.300	0.290	0.750	19.00	268.0	11.0	16.0	0.32		
#153590	1119C050	STATION	MEAN	1.300	0.290	0.750	19.00	268.0	11.0	16.0	0.32		
WORM CR @ CUL .8MI BLW PRSST STP													
77.70/ 7.00/ 9.10		74/08/29	0950	1.700	0.640	1.170	16.00	286.0	25.0	20.0	0.31		
#153545	1119C050	74/08/29	0955	1.400	0.630	1.120	16.00	283.0	25.0	24.0	0.32		
		STATION	MEAN	1.550	0.635	1.145	16.00	284.5	25.0	22.0	0.31		

STORET #	STATION NAME / RIVER MILES	AGENCY #	DATE	SUMMARY	00610 NH3-N TOTAL MG/L	00620 NO3-N TOTAL MG/L	006 PHOS-TOT MG/L P	00680 ORG C MG/L	00900 TOT HARD CACO3 MG/L	00940 CHLORIDE CL MG/L	00945 SULFATE SO4-TOT MG/L	00950 FLUORIDE F,DISS MG/L	0109 ZINC ZN,TOT UG/L	00927 MAGNSIUM MG,TOT UG/L
	CUB R @ DIV DAM 4 MI NE FRANKLIN													
7.00/	7.00/ 4.40		74/08/29	1140	0.070	1.170	0.370	7.00	204.0	11.0	28.0	0.32		
#153541		1119C050	STATION	MEAN	0.070	1.170	0.370	7.00	204.0	11.0	28.0	0.32		
	CUB R @ HWY 91 BR ABV DEL MONTE													
0.0 /	0.0 / 0.0		74/08/29	0935	0.020	0.240	0.040	2.00	176.0	2.0	12.0	0.10		
#153544		1119C050	STATION	MEAN	0.020	0.240	0.040	2.00	176.0	2.0	12.0	0.10		
	CUB R @ RD BR .5 MI BL DEL MONTE													
77.70/	20.90/ 0.0		74/08/29	1020	0.020	0.170	0.030	2.00	175.0	1.0	14.0	0.08	20.0	13.00
#153592		1119C050	74/08/29	1025	0.020	0.170	0.030	2.00	173.0	2.0	12.0	0.07	20.0	13.00
			STATION	MEAN	0.020	0.170	0.030	2.00	174.0	1.5	13.0	0.07	20.0	13.00
	WORM CR @ CULV 3 MI W FRANKLIN													
77.70/	16.50/ 0.0		74/08/29	1055	0.030	0.510	0.040	3.00						
#153593		1119C050	74/08/29	1100	0.030	0.520	0.040	3.00						
			STATION	MEAN	0.030	0.515	0.040	3.00						
	CUB CAN @ CULV .5MI W OF WHITNEY													
77.70/	15.10/ 0.0		74/08/29	1115	0.050	0.430	0.250	10.00	212.0	24.0	16.0	0.35	25.0	22.00
#153594		1119C050	74/08/29	1120	0.050	0.450	0.250	8.00	212.0	24.0	18.0	0.35	20.0	22.00
			STATION	MEAN	0.050	0.440	0.250	9.00	212.0	24.0	17.0	0.35	22.5	22.00
	SPRING 1.5 MI W. OF GEORGETOWN													
0.0 /	0.0 / 0.0		74/08/27	1555	0.030	3.400	0.100		306.0	1.0	48.0	0.23	10.0	22.00
#153573		1119C050	74/08/27	1600	0.030	3.400	0.090		305.0	3.0	48.0	0.23	20.0	21.00
			STATION	MEAN	0.030	3.400	0.095		305.5	2.0	48.0	0.23	15.0	21.50
	HOOPER SPR- 1 MI N OF SODA SPR.													
0.0 /	0.0 / 0.0		74/08/28	0915	0.500	0.010	0.300		777.0	1.0	54.0	0.43	10.0	128.00
#153576		1119C050	STATION	MEAN	0.500	0.010	0.300		777.0	1.0	54.0	0.43	10.0	128.00
	SPRING .5 MI E GEM VALLEY CHEESE													
0.0 /	0.0 / 0.0		74/08/28	1250	0.070	2.600	1.840		421.0	53.0	102.0	0.39	15.0	62.00
#153580		1119C050	STATION	MEAN	0.070	2.600	1.840		421.0	53.0	102.0	0.39	15.0	62.00
	SPRING 1 MI SW OF WITER													
0.0 /	0.0 / 0.0		74/08/28	1310	0.030	3.000	0.170		429.0	47.0	92.0	0.27	25.0	63.00
#153581		1119C050	STATION	MEAN	0.030	3.000	0.170		429.0	47.0	92.0	0.27	25.0	63.00

STORET #	AGENCY #	DATE	SUMMARY	00610 NH3-N TOTAL MG/L	00620 NO3-N TOTAL MG/L	00 5 PHOS IT MG/L P	00680 T ORG C C MG/L	00900 TOT HARD CACO3 MG/L	00940 CHLORIDE CL MG/L	00945 SULFATE SO4-TOT MG/L	00950 FLORIDE F,DISS MG/L	010 ZINC ZN,TOT UG/L	00927 MGNSIUM MG,TOT MG/L
MAPLE GROVE HOT SPRINGS													
0.0 / 0.0 / 0.0		74/08/29	1430	1.200	0.090	0.050		333.0	596.0	290.0	1.00	20.0	28.00
#153585	1119C050	STATION	MEAN	1.200	0.090	0.050		333.0	596.0	290.0	1.00	20.0	28.00
SQUAW HOT SPR 3 MI NW OF PRESTON													
0.0 / 0.0 / 0.0		74/08/29	0825	8.600	0.300	0.060	3.00	662.0	6670.0	34.0	4.90	50.0	27.00
#153547	1119C050	74/08/29	0830	7.300	0.010	0.050	1.00	326.0	7430.0	78.0	5.40	50.0	25.00
		STATION	MEAN	7.950	0.155	0.055	2.00	494.0	7050.0	56.0	5.15	50.0	26.00
SPRING 1.5 MI WEST OF PRESTON													
0.0 / 0.0 / 0.0		74/08/29	0900	0.020	4.300	0.080	3.00	251.0	13.0	24.0	0.34	50.0	34.00
#153587	1119C050	STATION	MEAN	0.020	4.300	0.080	3.00	251.0	13.0	24.0	0.34	50.0	34.00

STORET #	ST RIVER MILES	ON NAME AGENCY #	DATE	SUMMARY	00010 WATER TEMP CENT	00070 TURB JKSN JTU	000 CNDUCT FIELD MICROMHO	00300 DO MG/L	00400 PH SU	00410 T ALK CACO3 MG/L	00500 RESIDUE TOTAL MG/L	00505 RESIDUE TOT VOL MG/L	00530 RESIDUE TOT NFLT MG/L	00535 RESIDUE VOL NFLT MG/L
DVID CR @ BR 3 MI NW MONTPELIER														
215.90/	2.70/ 0.0		74/08/27	1325	21.0		360		7.2		180.0	62.0	6.0	3.0
#153559		1119C050	STATION	MEAN	21.0		360		7.2		180.0	62.0	6.0	3.0
FLOWING WELL 1 MI NE OF BERN														
0.0 /	0.0 / 0.0		74/08/27	1300	9.7	2	680	2.8	8.6	280.0	331.0	155.0	2.0	1.0
#153570		1119C050	74/08/27	1305	9.7	2	680	1.5	6.6	248.0	293.0	131.0	2.0	1.0
			STATION	MEAN	9.7	2	680	2.1	6.6	264.0	312.0	143.0	2.0	1.0
GEORGETOWN CR AT RD BR NR MOUTH														
203.50/	0.10/ 0.0		74/08/27	1515	17.8	7	500	7.9	7.6	237.0	295.0	170.0	27.6	4.8
#153571		1119C050	74/08/27	1520	17.5	7	500	7.4	7.4	242.0	401.0	141.0	31.0	2.0
			STATION	MEAN	17.6	7	500	7.6	7.5	239.5	348.0	155.5	29.3	3.4
STAUFFER CR AT BR 2 MI E MOUNAD														
202.50/	0.10/ 0.0		74/08/27	1540	20.5	12	240	10.6	7.8	135.0	224.0	99.0	26.0	4.0
#153572		1119C050	STATION	MEAN	20.5	12	240	10.6	7.8	135.0	224.0	99.0	26.0	4.0
EIGHTMILE CR @ BR 1 MI ABV MOUTH														
196.50/	0.80/ 0.0		74/08/27	1640	17.0	2	360	8.6	7.5	180.0	235.0	84.0	6.0	1.0
#153574		1119C050	STATION	MEAN	17.0	2	360	8.6	7.5	180.0	235.0	84.0	6.0	1.0
BIG CR. @ TROUT FARM														
175.00/	0.90/ 0.0		74/08/28	0950	9.6	0	1200		6.2	465.0	659.0	297.0	1.0	1.0
#153577		1119C050	74/08/28	0955	10.0						674.0	213.0	2.0	1.0
			STATION	MEAN	9.8	0	1200		6.2	465.0	666.5	255.0	1.5	1.0
BIG SPR. CR @ WEIR OF TROUT FARM														
175.00/	0.40/ 0.0		74/08/28	1010	10.4	1	1180		6.6	425.0	641.0	262.0	4.0	1.0
#153578		1119C050	74/08/28	1015	12.0	1	1180		6.7	399.0	350.0	283.0	15.0	4.0
			STATION	MEAN	11.2	1	1180		6.6	412.0	495.5	272.5	9.5	2.5
SODA CREEK .25 MI BLW HOOPER SPR														
174.20/	3.00/ 0.0		74/08/28	0925	14.7	4	1060		6.3	562.0	634.0	252.0	2.0	1.0
#153575		1119C050	STATION	MEAN	14.7	4	1060		6.3	562.0	634.0	252.0	2.0	1.0
SODA CR @ BR .2 MI ABV MOUTH														
174.20/	0.20/ 0.0		74/08/28	1150	15.9	7	1060		6.6	564.0	742.0	231.0	13.0	2.0
#153579		1119C050	74/08/28	1155	16.0	7	1120		6.7	546.0	738.0	196.0	10.0	1.0
			STATION	MEAN	15.9	7	1090		6.6	555.0	740.0	213.5	11.5	1.5

STORET #	AGENCY #	DATE	SUMMARY	00010 WATER TEMP CENT	00070 TURB JKSN JTU	00 CNDUC.,JY FIELD MICROMHO	00300 DO MG/L	00400 PH SU	00410 T ALK CACO3 MG/L	00500 RESIDUE TOTAL MG/L	00505 RESIDUE TOT VOL MG/L	005 RESIDUE TOT NFLT MG/L	00535 RESIDUE VOL NFLT MG/L
CUB R @ DIV DAM 4 MI NE FRANKLIN													
7.00/ 7.00/ 4.40		74/08/29	1140	16.5	65	620		8.1	265.0	569.0	107.0	128.0	12.0
#153591	1119C050	STATION	MEAN	16.5	65	620		8.1	265.0	569.0	107.0	128.0	12.0
CUB R @ HWY 91 BR ABV DEL MONTE													
0.0 / 0.0 / 0.0		74/08/29	0935	13.6	6	400		8.0	176.0	261.0	51.0	3.0	1.0
#153544	1119C050	STATION	MEAN	13.6	6	400		8.0	176.0	261.0	51.0	3.0	1.0
CUB R @ RD BR .5 MI BL DEL MONTE													
77.70/ 20.90/ 0.0		74/08/29	1020	11.6	2	400		8.2	165.0	203.0	32.0	2.0	1.0
#153592	1119C050	74/08/29	1025	11.4	2	380		8.2	165.0	253.0	63.0	10.0	2.0
		STATION	MEAN	11.5	2	390		8.2	165.0	228.0	47.5	6.0	1.5
WORM CR @ CULV 3 MI W FRANKLIN													
77.70/ 16.50/ 0.0		74/08/29	1055	18.0	3	600		8.3	223.0				
#153593	1119C050	74/08/29	1100	18.0	3	600		8.3	225.0				
		STATION	MEAN	18.0	3	600		8.3	224.0				
CUB CAN @ CULV .5MI W OF WHITNEY													
77.70/ 15.10/ 0.0		74/08/29	1115	16.5	11	680		7.8	230.0	366.0	153.0	36.0	6.0
#153594	1119C050	74/08/29	1120	14.0	10	640		7.8	240.0	364.0	156.0	28.0	8.0
		STATION	MEAN	15.2	11	660		7.8	235.0	365.0	154.5	32.0	7.0
SPRING 1.5 MI W. OF GEORGETOWN													
0.0 / 0.0 / 0.0		74/08/27	1555	12.1	4	620	7.3	6.3	252.0	372.0	115.0	20.0	3.0
#153573	1119C050	74/08/27	1600	12.5	5	600	7.2	7.1	253.0	412.0	231.0	19.0	2.0
		STATION	MEAN	12.3	5	610	7.2	6.7	253.5	392.0	173.0	19.5	2.5
HOOPER SPR- 1 MI N OF SODA SPR.													
0.0 / 0.0 / 0.0		74/08/28	0915	11.6	3	1400		5.4	115.0	930.0	386.0	6.0	2.0
#153576	1119C050	STATION	MEAN	11.6	3	1400		5.4	115.0	930.0	386.0	6.0	2.0
SPRING .5 MI E GEM VALLEY CHEESE													
0.0 / 0.0 / 0.0		74/08/28	1250	14.0	2	900		6.6	366.0	708.0	207.0	1.0	1.0
#153580	1119C050	STATION	MEAN	14.0	2	900		6.6	366.0	708.0	207.0	1.0	1.0
SPRING 1 MI SW OF NITER													
0.0 / 0.0 / 0.0		74/08/28	1310	14.0	1	1100		7.0	372.0	659.0	186.0	2.0	2.0
#153581	1119C050	STATION	MEAN	14.0	1	1100		7.0	372.0	659.0	186.0	2.0	2.0

STATION NAME / RIVER MILES / STORET # / AGENCY	DATE	SUMMARY	00010 WATER TEMP CENT	00070 TURB JKSN JTU	00 CNDUCTVY FIELD MICROMHO	00300 DO MG/L	00400 PH SU	00410 T ALK CACO3 MG/L	00500 RESIDUE TOTAL MG/L	00505 RESIDUE TOT VOL MG/L	005 RESIDUE TOT NFLT MG/L	00535 RESIDUE VOL NFLT MG/L
MAPLE GROVE HOT SPRINGS												
0.0 / 0.0 / 0.0	74/08/28	1430	13.0	16	600		15.9	389.0	1834.0	110.0	2.0	2.0
#153585 1119C050	STATION	MEAN	13.0	16	600		15.9	389.0	1834.0	110.0	2.0	2.0
SQUAW HOT SPR 3 MI NW OF PRESTON												
0.0 / 0.0 / 0.0	74/08/29	0825	65.0	3	1000		6.3	585.0	15343.0	3874.0	13.0	3.0
#153547 1119C050	74/08/29	0830	82.0	31	1000		6.2	570.0	16171.0	3450.0	3.0	1.0
	STATION	MEAN	73.5	17	1000		6.2	577.5	15757.0	3662.0	8.0	2.0
SPRING 1.5 MI WEST OF PRESTON												
0.0 / 0.0 / 0.0	74/08/29	0900	11.5	8	1300		7.6	250.0	457.0	151.0	9.0	2.0
#153587 1119C050	STATION	MEAN	11.5	8	1300		7.6	250.0	457.0	151.0	9.0	2.0

STORET #	STATION NAME / RIVER MILES	AGENCY #	DATE	SUMMARY	01002 ARSENIC AS,TOT UG/L	01027 CADMIUM CD,TOT UG/L	01042 COPPER CU,TOT UG/L	01045 IRON FE,TOT UG/L	01051 LEAD PB,TOT UG/L	71900 MERCURY HG,TOTAL UG/L	00929 SODIUM NA,TOT MG/L	00937 POTASSIUM K,TOT MG/L	31710 STAPH AUR CONF /100ML	71220 AEROBIC WATER NO/100ML
HOOPER SPR- 1 MI N OF SODA SPR.														
0.0 / 0.0 / 0.0			74/08/28	0915		5.00	7.00	6700.0	30.0		35.00	13.00		
#153576		1119C050	STATION	MEAN		5.00	7.00	6700.0	30.0		35.00	13.00		
SPRING .5 MI E GEM VALLEY CHEESE														
0.0 / 0.0 / 0.0			74/08/28	1250	1.80	4.00	5.00	40.0	20.0	1.20	67.00	8.00		
#153580		1119C050	STATION	MEAN	1.80	4.00	5.00	40.0	20.0	1.20	67.00	8.00		
SPRING 1 MI SW OF NITER														
0.0 / 0.0 / 0.0			74/08/28	1310	2.20	5.00	7.00	70.0	25.0	1.00	58.00	6.70		
#153581		1119C050	STATION	MEAN	2.20	5.00	7.00	70.0	25.0	1.00	58.00	6.70		
MARLE GROVE HOT SPRINGS														
0.0 / 0.0 / 0.0			74/08/28	1430	70.00	6.00	9.00	960.0	45.0	0.60	560.00	80.00		
#153585		1119C050	STATION	MEAN	70.00	6.00	9.00	960.0	45.0	0.60	560.00	80.00		
SQUAW HOT SPR 3 MI NW OF PRESTON														
0.0 / 0.0 / 0.0			74/08/29	0825	25.00	24.00	47.00	800.0	110.0	0.80				
#153547		1119C050	74/08/29	0830	32.00	25.00	65.00	2350.0	100.0	1.20	5000.00	760.00		
			STATION	MEAN	28.50	24.50	56.00	1575.0	105.0	1.00	5000.00	760.00		
SPRING 1.5 MI WEST OF PRESTON														
0.0 / 0.0 / 0.0			74/08/29	0900	5.60	4.00	8.00	580.0	20.0	0.20	29.00	8.00		
#153587		1119C050	74/08/29	1015									0.0	0.0
			STATION	MEAN	5.60	4.00	8.00	580.0	20.0	0.20	29.00	8.00	0.0	0.0

STORET #	STA IN NAME / RIVER MILES	AGENCY	DATE	SUMMARY	01002 ARSENIC AS,TOT UG/L	01027 CADMIUM CD,TOT UG/L	01042 COPPER CU,TOT UG/L	01045 IRON FE,TOT UG/L	01051 LEAD PB,TOT UG/L	71900 MERCURY HG,TOTAL UG/L	00929 SODIUM NA,TOT MG/L	00937 POTASSIUM K,TOT MG/L	31710 STAPH AUR CONF /100ML	71220 AEROG WATER NO/100ML
TROUT CR @ HWY 34 BR @ THATCHER														
	139.90/ 0.80/ 0.0		74/08/29	1036									800.0	1.0
#153583		1119C050	STATION	MEAN									800.0	1.0
WILLIAMS CREEK AT HWY 34 BRIDGE														
	134.80/ 0.50/ 0.0		74/08/29	1030										0.0
#153584		1119C050	STATION	MEAN										0.0
UPPER CAN @ CULV 2 MI W FAIRVIEW														
	0.0 / 0.0 / 0.0		74/08/29	1145										20.0
#153589		1119C050	STATION	MEAN										20.0
WORM CR @ CUL .8MI BLW PREST STP														
	77.70/ 7.00/ 9.10		74/08/29	1040									0.0	10.0
#153545		1119C050	STATION	MEAN									0.0	10.0
CUB R @ DIV DAM 4 MI NE FRANKLIN														
	7.00/ 7.00/ 4.[illegible]		74/08/29	1140									200.0	40.0
#153541		1119C050	STATION	MEAN									200.0	40.0
CUB R @ RD BR .5 MI BL DEL MONTE														
	77.70/ 20.90/ 0.0		74/08/29	1020	1.00	2.00	4.00	120.0	10.0	0.40	3.00	0.90		
#153592		1119C050	74/08/29	1025	0.70	2.00	4.00	100.0	10.0	1.00	3.00	0.90		
			74/08/29	1120									0.0	
			74/08/29	1125									80.0	0.0
			STATION	MEAN	0.85	2.00	4.00	110.0	10.0	0.70	3.00	0.90	40.0	0.0
WORM CR @ CULV 3 MI W FRANKLIN														
	77.70/ 16.50/ 0.0		74/08/29	1120										0.0
#153593		1119C050	STATION	MEAN										0.0
CUB CAN @ CULV .5MI W OF WHITNEY														
	77.70/ 15.10/ 0.0		74/08/29	1115	5.00	2.00	6.00	710.0	15.0		37.00	7.80		
#153594		1119C050	74/08/29	1120	4.50	2.00	6.00	570.0	15.0		37.00	7.80		
			STATION	MEAN	4.75	2.00	6.00	640.0	15.0		37.00	7.80		
SPRING 1.5 MI W. OF GEORGETOWN														
	0.0 / 0.0 / 0.0		74/08/27	1555	1.20		4.00	520.0	20.0	0.60	6.50	1.30		
#153573		1119C050	74/08/27	1600	2.00		4.00	560.0	20.0	0.60	6.40	1.30		
			STATION	MEAN	1.60		4.00	540.0	20.0	0.60	6.45	1.30		

STORET #	AGENCY #	DATE	SUMMARY	00610 NH3-N TOTAL MG/L	00620 NO3-N TOTAL MG/L	00[illegible] PHOS [illegible]T MG/L P	00680 T ORG C C MG/L	00900 TOT HARD CACO3 MG/L	00940 CHLORIDE CL MG/L	00945 SULFATE SO4-TOT MG/L	00950 FLUORIDE F.DISS MG/L	010[illegible] ZINC ZN.TOT UG/L	00927 MGNSIUM MG.TOT MG/L
BEAR R @ BR .25 MI W ID-WYO BDR.													
274.00/ 0.0 / 0.0		74/08/28	0900			0.060	4.00		22.0				24.00
#153596	1119C050	74/08/29	0825	0.010	0.010	0.060	4.00	252.0	21.0	84.0	0.18	45.0	27.00
		STATION	MEAN	0.010	0.010	0.060	4.00	252.0	21.5	84.0	0.18	45.0	25.50
BEAR R AT BR 1 MI SW OF PEGRAM													
258.20/ 0.0 / 0.0		74/08/27	0945	0.010	0.070	0.050	48.00	266.0	35.0	40.0	0.17		
#153550	1119C050	74/08/28	0930	0.020	0.060	0.060	3.00	257.0	37.0	80.0	0.16		55.00
		74/08/29	0850	0.010	0.060	0.060	3.00	230.0	35.0		0.19		
		STATION	MEAN	0.013	0.063	0.057	18.00	251.0	35.7	60.0	0.17		55.00
BEAR R @ DIV DAM 3 MI ESE DINGLE													
242.70/ 0.0 / 0.0		74/08/27	1140	0.010	0.030	0.070	44.00	256.0	34.0	50.0	0.17		
#153551	1119C050	74/08/28	1035	0.010	0.040	0.070	4.00	258.0	34.0	80.0	0.18		55.00
		74/08/29	0900	0.010	0.040	0.070	4.00	214.0	35.0		0.17		
		STATION	MEAN	0.010	0.037	0.070	17.33	242.7	34.3	65.0	0.17		55.00
BEAR R AT RD BR 1 MI NE DINGLE													
237.90/ 0.0 / 0.0		74/08/27	1050	0.010	0.040	0.070	42.00	254.0	33.0	40.0	0.17		
#153552	1119C050	74/08/28	1005	0.010	0.040	0.160	6.00	254.0	35.0	82.0	0.18		
		74/08/29	0945	0.010	0.040	0.080	4.00	205.0	35.0	88.0	0.16		
		STATION	MEAN	0.010	0.040	0.103	17.33	237.7	34.3	70.0	0.17		
BEAR RIVER AT HWY 89 BRIDGE													
223.50/ 0.0 / 0.0		74/08/28	1200	0.020	0.010	0.140	5.00	270.0	23.0	86.0	0.20		
#153556	1119C050	74/08/28	1205	0.020	0.010	0.130	5.00	276.0	34.0	100.0	0.20		
		STATION	MEAN	0.020	0.010	0.135	5.00	273.0	28.5	93.0	0.20		
BEAR R @ BR 1 MI BLW OUTLET CAN.													
219.30/ 0.0 / 0.0		74/08/27	1530	0.010	0.020	0.070	58.00	301.0	41.0	40.0	0.18	25.0	60.00
#153597	1119C050	74/08/28	1315	0.020	0.010	0.060	5.00	300.0	42.0	86.0	0.18	25.0	55.00
		74/08/29	1120	0.010	0.010	0.090	6.00	298.0	42.0	100.0	0.20	40.0	59.00
		STATION	MEAN	0.013	0.013	0.073	23.00	299.7	41.7	75.3	0.19	30.0	58.00
BEAR R @ BR 2 MI NW BENNINGTON													
209.30/ 0.0 / 0.0		74/08/27	1640	0.010	0.030	0.070	54.00	309.0	39.0	40.0	0.18		
#153557	1119C050	74/08/28	1340	0.020	0.020	0.130	5.00	314.0	41.0	84.0	0.19		
		74/08/29	1145	0.010	0.020	0.070	5.00	298.0	41.0	94.0	0.19		
		STATION	MEAN	0.013	0.023	0.090	21.33	307.0	40.3	72.7	0.19		

STORET #	AGENCY #	DATE	SUMMARY	00610 NH3-N TOTAL MG/L	00620 NO3-N TOTAL MG/L	0 5 PHO.. .OT MG/L P	00680 T ORG C C MG/L	00900 TOT HARD CACO3 MG/L	00940 CHLORIDE CL MG/L	00945 SULFATE SO4-TOT MG/L	00950 FLUORIDE F.DISS MG/L	01C ZINC ZN.TOT UG/L	00927 MGNSIUM MG.TOT MG/L
NEAR R 1.4 MI ABV SKINNER CREEK													
197.20/ 0.0 / 0.0		74/08/28	1510	0.040	0.040	0.160	10.00	301.0	39.0	86.0			
#153558	1119C050	74/08/29	1310	0.010	0.040	0.100	6.00	300.0	39.0	86.0	0.18		
		STATION	MEAN	0.025	0.040	0.130	8.00	300.5	39.0	86.0	0.18		
NEAR R @ BR 1 MI BLW EIGHTMILE C													
185.30/ 0.0 / 0.0		74/08/27	1600	0.010	0.010	0.090	53.00	298.0	41.0	40.0	0.18		
#153595	1119C050	74/08/28	1425	0.040	0.040	0.090	5.00	302.0	39.0	84.0	0.19	15.0	52.00
		74/08/29	1220	0.010	0.040	0.080	5.00	297.0	39.0	88.0	0.19		
		STATION	MEAN	0.020	0.030	0.087	21.00	299.0	39.7	70.7	0.19	15.0	52.00
NEAR R @ BR @ HEAD SODA PT. RES.													
174.30/ 0.0 / 0.0		74/08/27	1540				52.00						
#153598	1119C050	74/08/27	1545	0.010	0.010	0.070	54.00	296.0	39.0	40.0	0.18	20.0	50.00
		74/08/27	1550				48.00						
		74/08/28	1400	0.080	0.340	0.110	8.00	345.0	42.0	98.0		15.0	
		74/08/28	1415	0.020	0.030	0.110	10.00	307.0	40.0	86.0		35.0	
		74/08/28	1420	0.020	0.020	0.090		305.0	39.0	98.0		20.0	51.00
		74/08/29	1235	0.020	0.030	0.080	6.00	297.0	39.0	90.0	0.18	30.0	53.00
		STATION	MEAN	0.030	0.086	0.092	29.67	310.0	39.8	82.4	0.18	24.0	51.33
NEAR R @ GUAGE BLW ALEXANDER DAM													
169.40/ 0.0 / 0.0		74/08/27	1510	0.050	0.100	0.050	58.00	339.0	38.0	60.0	0.18		
#153559	1119C050	74/08/28	1345	0.070	0.100	0.060	8.00	328.0	38.0	86.0			
		74/08/29	1205	0.060	0.100	0.060	4.00	325.0	38.0	90.0	0.19		
		STATION	MEAN	0.060	0.100	0.057	23.33	330.7	38.0	78.7	0.18		
NEAR R .1 MI BLW LAST CHANCE DAM													
155.10/ 0.0 / 0.0		74/08/28	1315	0.040	0.070	0.060	6.00	310.0	38.0	92.0			
#153560	1119C050	74/08/29	1145	0.060	0.070	0.070	5.00	312.0	39.0	92.0	0.20		
		STATION	MEAN	0.050	0.070	0.065	5.50	311.0	38.5	92.0	0.20		
NEAR R @ BR 3 MI BLW GRACE F.P.													
153.10/ 0.0 / 0.0		74/08/27	1345	0.010	0.060	0.080	58.00	340.0	39.0	40.0	0.19		
#153561	1119C050	74/08/28	1215	0.020	0.120	0.080	8.00	337.0	40.0	90.0	0.14		
		74/08/29	1110	0.020	0.100	0.070	6.00	316.0	39.0	86.0	0.20		
		STATION	MEAN	0.017	0.093	0.077	24.00	331.0	39.3	72.7	0.19		
NEAR R @ BR .5 MI W OF THATCHER													
140.30/ 0.0 / 0.0		74/08/28	1150	0.030	0.200	0.100	8.00	328.0	41.0	88.0			
#153562	1119C050	74/08/29	1045	0.020	0.190	0.070	5.00	330.0	40.0	86.0	0.20		
		STATION	MEAN	0.025	0.195	0.085	6.50	329.0	40.5	87.0	0.20		

STORET #	AGENCY #	DATE	SUMMARY	00610 NH3-N TOTAL MG/L	00620 NO3-N TOTAL MG/L	00 PHOS MG/L P	00680 TOT ORG C C MG/L	00900 TOT HARD CACO3 MG/L	00940 CHLORIDE CL MG/L	00945 SULFATE SO4-TOT MG/L	00950 FLUORIDE F,DISS MG/L	010 ZINC ZN,TOT UG/L	00927 MAGNSIUM MG,TOT MG/L
BEAR R @ BR 1 MI BLW ONEIDA DAM													
125.60/ 0.0 / 0.0		74/08/27	0710	0.060	0.230	0.060	6.00	332.0	42.0	40.0	0.20	25.0	48.00
#153563	1119C050	74/08/27	0915	0.020	0.080	0.080	62.00	322.0	38.0	40.0	0.19		
		74/08/28	0700	0.070	0.210	0.060	66.00	338.0	43.0	88.0		15.0	50.00
		74/08/29	0730	0.050	0.240	0.070	5.00	326.0	43.0	96.0	0.22	20.0	53.00
		STATION	MEAN	0.050	0.185	0.067	34.75	329.5	41.5	66.0	0.20	20.0	50.33
BEAR R @ HWY 91 BR N OF PRESTON													
104.00/ 0.0 / 0.0		74/08/27	0815	0.010	0.070	0.050	74.00	330.0	47.0	50.0	0.30		
#153549	1119C050	74/08/27	0820	0.010	0.060	0.050	72.00	328.0	47.0	88.0	0.30		
		74/08/28	0800	0.020	0.130	0.050	68.00	331.0	45.0	86.0			
		74/08/28	0945	0.030	0.130				45.0				
		74/08/28	0945	0.060	0.180	0.060	74.00	331.0	118.0		0.33		
		74/08/29	0815	0.020	0.090	0.040	5.00	332.0	46.0	90.0	0.30		
		74/08/29	0925									20.0	
		STATION	MEAN	0.025	0.110	0.050	58.60	330.4	58.0	78.5	0.31	20.0	
BEAR R AT ROAD BR 2-MI W PRESTON													
104.30/ 0.0 / 0.0		74/08/27	0900	0.060	0.180	0.060	74.00	330.0	40.0	80.0	0.33		
#153545	1119C050	74/08/27	0905		0.180		74.00		118.0				
		74/08/28	0845	0.050	0.170	0.080	6.00	338.0	84.0	84.0	0.27		
		74/08/28	0950	0.010	0.140		72.00		72.0				
		74/08/29	0835	0.080	0.100	0.060	5.00	332.0	112.0	86.0	0.32		
		STATION	MEAN	0.050	0.154	0.067	46.20	333.3	85.2	83.3	0.31		
BEAR R @ RD BR 3 MI E OF PRESTON													
97.30/ 0.0 / 0.0		74/08/26	1830	0.020	0.150	0.110	7.00						
#153599	1119C050	74/08/26	2030	0.020	0.130	0.090	6.00						
		74/08/26	2230	0.020	0.120	0.070	6.00						
		74/08/27	0030	0.020	0.130	0.090	6.00						
		74/08/27	0230	0.040	0.150	0.050	6.00						
		74/08/27	0430	0.030	0.140	0.070	6.00						
		74/08/27	0630	0.030	0.150	0.040	5.00						
		74/08/27	0830	0.040	0.170	0.060	5.00						
		74/08/27	0945	0.010	0.140	0.070	72.00	335.0	72.0	40.0	0.28	20.0	49.00
		74/08/27	0950	0.010	0.140	0.060	72.00	332.0	73.0	86.0	0.26	20.0	49.00
		74/08/27	1030	0.040	0.170	0.060	4.00						
		74/08/27	1230	0.040	0.160	0.050	5.00						
		74/08/27	1430			0.040							
		74/08/27	1430	0.040	0.160		5.00						
		74/08/27	1630			0.050							
		74/08/27	1630	0.050	0.150		5.00						
		74/08/27	1830	0.050		0.080	5.00						
		74/08/27	2030	0.020		0.100	6.00						
		74/08/27	2230	0.010		0.070	6.00						
		74/08/28	0030	0.020		0.070	6.00						
		74/08/28	0230	0.020		0.060	6.00						
		74/08/28	0430	0.030		0.060	5.00						
		74/08/28	0630	0.030		0.050	5.00						
		74/08/28	0830	0.030		0.050	5.00						
		74/08/28	0940	0.030	0.140	0.060	7.00	337.0	65.0	90.0		40.0	53.00
		74/08/28	1000	0.030	0.010	0.060	4.00	259.0	64.0	80.0	0.19	180.0	53.00
		74/08/28	1030	0.030	0.140	0.050	5.00						
		74/08/28	1230	[illegible]	[illegible]	[illegible]	[illegible]						

74/08/28 1630	0.030	0.160	0.040	5.00						
74/08/28 1630			0.07	6.00						
74/08/28 1830			0.08	6.00						
74/08/28 2030			0.080	6.00						
74/08/28 2230			0.080	6.00						
74/08/29 0030			0.070	6.00						
74/08/29 0230			0.060	8.00						
74/08/29 0430			0.060	6.00						
74/08/29 0630			0.060	5.00						
74/08/29 0830			0.060	5.00						
74/08/29 0910	0.020	0.140	0.060	5.00	332.0	71.0	92.0	0.26	35.0	50.00
74/08/29 1030			0.060	6.00						
74/08/29 1230			0.050	6.00						
STATION MEAN	0.028	0.140	0.063	9.00	319.0	69.0	77.6	0.25	59.0	50.80

STORET #	AGENCY #	DATE	SUMMARY	00610 NH3-N TOTAL MG/L	00620 NO3-N TOTAL MG/L	65 PH. TOT MG/L	00680 T ORG C MG/L	00900 TOT HARD CACO3 MG/L	00940 CHLORIDE CL MG/L	00945 SULFATE SO4-TOT MG/L	00950 FLUORIDE F-DISS MG/L	0 2. ZINC ZN.TOT UG/L	00927 MAGNSIUM MG.TOT MG/L
THOMAS FORK AT HWY 30 BR @ MOUTH													
272.00/ 0.01/ 0.0		74/08/27	0955	0.030	0.780	0.060	52.00	263.0	107.0	30.0	0.11		
#153564	1119C050	74/08/27	1000	0.030	0.780	0.050	51.00	282.0	108.0	10.0	0.12		
		STATION	MEAN	0.030	0.780	0.055	51.50	272.5	107.5	20.0	0.11		
SHEEP CR .2 MI ABV MOUTH													
247.40/ 0.20/ 0.0		74/08/27	1100	0.010	0.010	0.030		218.0	8.0	10.0	0.18		
#153565	1119C050	74/08/27	1105	0.010	0.010	0.030		227.0	8.0	30.0	0.18		
		STATION	MEAN	0.010	0.010	0.030		222.5	8.0	20.0	0.18		
CROCKETT CAN @ BR 1 MI S DINGLE													
0.0 / 0.0 / 0.0		74/08/27	1125	0.010	0.010	0.030	50.00	254.0	34.0	78.0	0.16		
#153566	1119C050	STATION	MEAN	0.010	0.010	0.030	50.00	254.0	34.0	78.0	0.16		
MONTPELIER CR @ BR YD SW MONT.													
224.40/ 2.10/ 0.0		74/08/27	1350	0.010	0.040	0.040	45.00	238.0	3.0	66.0	0.13	20.0	17.00
#153568	1119C050	74/08/27	1355	0.010	0.040	0.040	46.00	234.0	3.0	64.0	0.14	20.0	17.00
		STATION	MEAN	0.010	0.040	0.040	45.50	236.0	3.0	65.0	0.13	20.0	17.00
BLOOMINGTON CR 2 MI SE BLOOMING.													
220.40/ 10.20/ 3.00		74/08/27	1210	0.010	0.070	0.070		203.0	1.0	4.0	0.04		
#153567	1119C050	STATION	MEAN	0.010	0.070	0.070		203.0	1.0	4.0	0.04		
RAINBOW CAN @ BR 1.5 MI W DINGLE													
220.40/ 10.20/ 4.70		74/08/27	1210	0.010	0.010	0.070	50.00	257.0	34.0	40.0	0.18	20.0	26.00
#153553	1119C050	74/08/28	1100	0.010	0.010	0.090	5.00	260.0	33.0	46.0	0.18	30.0	25.00
		74/08/29	1025	0.010	0.020	0.080	4.00	208.0	35.0	86.0	0.17	45.0	25.00
		STATION	MEAN	0.010	0.013	0.080	19.67	241.7	34.0	57.3	0.18	31.7	25.33
OUTLET CAN @ BR @ LIFTON PUMP PL													
220.40/ 14.10/ 0.0		74/08/27	1310	0.010	0.010	0.020	61.00	314.0	46.0	40.0	0.18		
#153554	1119C050	STATION	MEAN	0.010	0.010	0.020	61.00	314.0	46.0	40.0	0.18		
BEAR LK. OUTLET AT HWY 89 BRIDGE													
220.40/ 1.10/ 0.0		74/08/27	1450	0.010	0.010	0.070	58.00	297.0	41.0	40.0	0.18		
#153555	1119C050	74/08/28	1135	0.010	0.010	0.060	5.00	298.0	41.0	80.0	0.19		
		74/08/29	1105	0.010	0.010	0.070	5.00	297.0	41.0	88.0	0.18		
		STATION	MEAN	0.010	0.010	0.067	22.67	297.3	41.0	69.3	0.18		

STATION NAME / RIVER MILES / STORET	AGENCY	DATE	SUMMARY	00010 WATER TEMP CENT	00070 TURB JKSN JTU	00095 CONDUCTVY (FIELD) (MICROMHO)	00300 DO MG/L	00400 PH SU	00410 T ALK CACO3 MG/L	00500 RESIDUE TOTAL MG/L	00505 RESIDUE TOT VOL MG/L	00530 RESIDUE TOT NFLT MG/L	00535 RESIDUE VOL NFLT MG/L
WHISKEY CR AT HWY 34 BRIDGE													
134.70/ 1.10/ 0.0		74/08/28	1315	15.0	1	960		7.6	336.0	570.0	254.0	2.0	1.0
#153582	1119C050	74/08/28	1320	17.0	1	960		7.7	319.0	528.0	174.0	3.0	1.0
		STATION	MEAN	16.0	1	960		7.6	326.5	553.0	214.0	2.5	1.0
TROUT CR @ HWY 34 BR @ THATCHER													
134.90/ 0.80/ 0.0		74/08/28	1345	18.0	4	720		7.7	278.0	441.0	208.0	11.0	2.0
#153583	1119C050	STATION	MEAN	18.0	4	720		7.7	278.0	441.0	208.0	11.0	2.0
WILLIAMS CREEK AT HWY 34 BRIDGE													
134.80/ 0.50/ 0.0		74/08/28	1400	16.5	2	480		7.7	218.0	268.0	122.0	3.0	2.0
#153584	1119C050	STATION	MEAN	16.5	2	480		7.7	218.0	268.0	122.0	3.0	2.0
MIRK CR @ CULVERT .1MI ABV MOUTH													
120.70/ 0.10/ 0.0		74/08/05	0830			700							
#153585	1119C050	74/08/12	1000			720							
		74/08/26	0940	16.0	130	680						87.0	6.0
		74/08/28	1520	22.0	3	360		7.9	228.0	352.0	181.0	14.0	3.0
		STATION	MEAN	19.0	67	615		7.9	228.0	352.0	181.0	50.5	4.5
DEEP CR @ CULV .2 MI N SQUAW SPR													
105.60/ 0.20/ 0.0		74/08/29	0815	14.2	7	1080		7.8	299.0	622.0	146.0	7.0	2.0
#153588	1119C050	STATION	MEAN	14.2	7	1080		7.8	299.0	622.0	146.0	7.0	2.0
W CACHE CAN @ FLUME E OF WESTON													
0.0 / 0.0 / 0.0		74/08/29	1200	19.0	14	900		8.1	273.0	548.0	224.0	13.0	1.0
#153588	1119C050	STATION	MEAN	19.0	14	900		8.1	273.0	548.0	224.0	13.0	1.0
UPPER CAN @ CULV 2 MI W FAIRVIEW													
0.0 / 0.0 / 0.0		74/08/29	1150	17.5	11	420		8.1	170.0	244.0	65.0	9.0	4.0
#153589	1119C050	STATION	MEAN	17.5	11	420		8.1	170.0	244.0	65.0	9.0	4.0
WORK CR ABV PRESTON STP													
77.70/ 7.00/ 9.40		74/08/29	0925	14.7	18	760		7.6	285.0	411.0	110.0	39.0	6.0
#153590	1119C050	STATION	MEAN	14.7	18	760		7.6	285.0	411.0	110.0	39.0	6.0
WORK CR @ CUL .8MI BLW PREST STP													
77.70/ 7.00/ 9.10		74/08/29	0950	15.6	11	760		7.7	292.0	497.0	151.0	32.0	5.0
#153545	1119C050	74/08/29	0955	16.0	14	800		7.7	285.0	237.0	143.0	37.0	5.0
		STATION	MEAN	15.8	13	780		7.7	288.5	367.0	147.0	34.5	5.0

STATION NAME / RIVER MILES / STORET	AGENCY	DATE	SUMMARY	00010 WATER TEMP CENT	00070 TURB JKSN JTU	0009 CNDUCT FIELD MICROMHO	00300 DO MG/L	00400 PH SU	00410 T ALK CACO3 MG/L	00500 RESIDUE TOTAL MG/L	00505 RESIDUE TOT VOL MG/L	00530 RESIDUE TOT NFLT MG/L	00535 RESIDUE VOL NFLT MG/L
BEAR R @ BR .25 MI W ID-WYO BDR.													
274.00/ 0.0 / 0.0		74/08/28	0900	14.4	12	550	7.1	7.8	220.0	458.0	173.0		
#153596	1119C050	74/08/29	0825		8	580			215.0	435.0	109.0	15.0	1.0
		STATION	MEAN	14.4	10	565	7.1	7.8	217.5	446.5	141.0	15.0	1.0
BEAR R AT BR 1 MI SW OF PEGRAM													
258.20/ 0.0 / 0.0		74/08/27	0945	15.7	17	600	7.3	7.8		407.0	80.0	33.0	4.0
#153550	1119C050	74/08/28	0930	15.8	17	600	7.2	7.4	240.0	439.0	119.0	21.0	2.0
		74/08/29	0850		10	580			206.0		157.0	15.0	2.0
		STATION	MEAN	15.7	15	593	7.2	7.6	223.0	423.0	118.7	23.0	2.7
BEAR R @ DIV DAM 3 MI ESE DINGLE													
242.70/ 0.0 / 0.0		74/08/27	1140	17.7	19	600	7.4	7.1		445.0	149.0	29.0	4.0
#153551	1119C050	74/08/28	1035	17.6	19	600	7.1	7.5	215.0	464.0	181.0	19.0	1.0
		74/08/29	0900	16.0	17	595			210.0		103.0	24.0	2.0
		STATION	MEAN	17.1	18	598	7.2	7.3	212.5	454.5	144.3	24.0	2.3
BEAR R AT RD BR 1 MI ENE DINGLE													
237.90/ 0.0 / 0.0		74/08/27	1050	16.4		600	7.7	8.0		426.0	118.0	39.0	4.0
#153552	1119C050	74/08/28	1005	16.0	22	600	7.7	7.6	212.0	461.0	135.0	24.0	1.0
		74/08/29	0945	16.0	11	600			228.0	441.0	106.0	35.0	3.0
		STATION	MEAN	16.1	17	600	7.7	7.8	220.0	442.7	119.7	32.7	2.7
BEAR RIVER AT HWY 89 BRIDGE													
223.50/ 0.0 / 0.0		74/08/28	1200	17.8	47	600	5.8	7.3	233.0	476.0	143.0	42.0	4.0
#153556	1119C050	74/08/28	1205	18.0	45	600	6.0	7.3	223.0	510.0	126.0	45.0	4.0
		STATION	MEAN	17.9	46	600	5.9	7.3	228.0	493.0	134.5	43.5	4.0
BEAR R @ BR 1 MI BLW OUTLET CAN.													
219.30/ 0.0 / 0.0		74/09/27	1530	19.9	19	700	7.6	7.9		527.0	212.0	32.0	6.0
#153597	1119C050	74/08/28	1315	19.8	17	700	7.4	7.6	260.0	496.0	177.0	18.0	1.0
		74/08/29	1120	18.0	11	690			266.0	513.0	185.0	30.0	3.0
		STATION	MEAN	19.2	16	697	7.5	7.7	263.0	512.0	191.3	26.7	3.3
BEAR R @ BR 2 MI NW BENNINGTON													
209.30/ 0.0 / 0.0		74/08/27	1640		25	690	7.6	8.0		455.0	150.0	34.0	5.0
#153557	1119C050	74/08/28	1340	19.5	19	700	8.0	7.8	250.0	527.0	205.0	25.0	1.0
		74/08/29	1145	17.5	11	700			251.0	472.0	140.0	34.0	4.0
		STATION	MEAN	18.5	18	697	7.8	7.9	250.5	484.7	165.0	31.0	3.3

STORET #	STATION NAME / RIVER MILES	AGENCY #	DATE	SUMMARY	00010 WATER TEMP CENT	00070 TURB JKSN JTU	00 CONDUCTIVITY FIELD MICROMHO	00300 DO MG/L	00400 PH SU	00410 T ALK CACO3 MG/L	00500 RESIDUE TOTAL MG/L	00505 RESIDUE TOT VOL MG/L	005 RESIDUE TOT NFLT MG/L	00535 RESIDUE VOL NFLT MG/L
BEAR R-1.4 MI ABV SKINNER CREEK														
147.20/	0.0 / 0.0		74/08/28	1510	20.2	24	750	8.6	8.5	265.0	458.0	160.0	36.0	3.0
#153558		1119C050	74/08/29	1310	18.7	21	700			258.0	484.0	141.0	29.0	2.0
			STATION	MEAN	19.4	23	725	8.6	8.5	261.5	471.0	150.5	32.5	2.5
BEAR R @ RR 1 MI BLW EIGHTMILE C.														
185.30/	0.0 / 0.0		74/08/27	1600		23	680	7.7	7.9		515.0	261.0	34.0	4.0
#153595		1119C050	74/08/28	1425	19.8	21	700	6.8	7.8	250.0	518.0	189.0	3.0	1.0
			74/08/29	1220	17.5	16	700			250.0	494.0	160.0	35.0	8.0
			STATION	MEAN	18.6	20	693	7.2	7.8	250.0	509.0	203.3	24.0	4.3
BEAR R @ RR @ HEAD SODA PT. RES.														
174.30/	0.0 / 0.0		74/08/27	1545	21.2	10	800	9.6	8.2	259.0	483.0	133.0	53.0	9.0
#153598		1119C050	74/08/28	1400	18.2	24	830	9.3	8.0	283.0	510.0	164.0	43.0	7.0
			74/08/28	1415	18.9	26	750	9.1	8.4	257.0	486.0	185.0	39.0	4.0
			74/08/28	1420	19.1	28	600	9.2	8.5	261.0	439.0	107.0	49.0	8.0
			74/08/29	1235	18.0	21	750			258.0	512.0	164.0	32.0	4.0
			STATION	MEAN	19.1	22	746	9.3	8.3	263.6	486.0	150.6	43.2	6.4
BEAR R @ GUAGE BLW ALEXANDER DAM														
169.40/	0.0 / 0.0		74/08/27	1510	19.1	9	830	6.9	7.8	307.0	509.0	183.0	9.0	2.0
#153559		1119C050	74/08/28	1345	17.5	12	850	6.9	8.0	270.0	521.0	231.0	5.0	2.0
			74/08/29	1205	17.6	11	800			285.0	499.0	159.0	6.0	3.0
			STATION	MEAN	18.1	11	827	6.9	7.9	287.3	509.7	191.0	6.7	2.3
BEAR R .1 MI BLW LAST CHANCE DAM														
155.10/	0.0 / 0.0		74/08/27	1430	19.4									
#153560		1119C050	74/08/28	1315	18.8	11	720	8.3	8.2	268.0	438.0	125.0	3.0	1.0
			74/08/29	1145	18.3	12	800			264.0	472.0	176.0	8.0	2.0
			STATION	MEAN	18.8	12	760	8.3	8.2	266.0	455.0	150.5	5.5	1.5
BEAR R @ RR 3 MI BLW GRACE P.P.														
153.10/	0.0 / 0.0		74/08/27	1345	21.2	6	820	11.0	8.2	279.0	503.0	192.0	10.0	2.0
#153561		1119C050	74/08/28	1215	18.5	12	810	10.1	7.8	290.0	485.0	170.0	15.0	3.0
			74/08/29	1110	17.9	10	800			269.0	510.0	135.0	11.0	1.0
			STATION	MEAN	19.2	9	810	10.5	8.0	279.3	499.3	165.7	12.0	2.0
BEAR R @ RR .5 MI W OF THATCHER														
140.30/	0.0 / 0.0		74/08/27	1215	18.2									
#153562		1119C050	74/08/28	1150	17.0	14	780	6.6	7.9	280.0	490.0	169.0	18.0	3.0
			74/08/29	1045	16.6		875		7.7	288.0	530.0	134.0	14.0	5.0
			STATION	MEAN	17.3	14	828	6.6	7.8	284.0	510.0	151.5	16.0	4.0

ST. ION NAME / RIVER MILES / STORET #	AGENCY #	DATE	SUMMARY	00010 WATER TEMP CENT	00070 TURB JKSN JTU	00C CNDUC FIELD MICROMHO	00300 DO MG/L	00400 PH SU	00410 T ALK CACO3 MG/L	00500 RESIDUE TOTAL MG/L	00505 RESIDUE TOT VOL MG/L	0053 RESIDUE TOT NFLT MG/L	00535 RESIDUE VOL NFLT MG/L
BEAR R @ BR 1 MI BLW ONEIDA DAM													
124.60/ 0.0 / 0.0		74/08/27	0710	16.4	3	700		7.8	284.0	486.0	166.0	3.6	2.0
#153563	1119C050	74/08/27	0915		8	800	8.5	8.6	252.0	514.0	171.0	11.0	1.0
		74/08/28	0700	17.5	4	720	7.3	7.3	285.0	532.0	199.0	1.0	1.0
		74/08/29	0730	17.5	4	825		7.8	280.0	502.0	189.0	7.0	1.0
		STATION	MEAN	17.1	5	761	7.9	7.9	275.2	508.5	181.2	5.6	1.2
BEAR R @ HWY 91 BR N OF PRESTON													
109.00/ 0.0 / 0.0		74/08/27	0815	15.4	2	900		8.2	305.0	578.0	230.0	5.0	1.0
#153549	1119C050	74/08/27	0820	15.2	2	900		8.3	288.0	548.0	210.0	4.0	1.0
		74/08/28	0800	15.5	4	820	6.8	7.9	308.0	535.0	255.0	2.0	1.0
		74/08/28	0945	15.5	3	1000		8.2	298.0	636.0	146.0	6.0	1.0
		74/08/29	0815	15.1	3	900		9.0	301.0	624.0	201.0	4.0	1.0
		STATION	MEAN	15.3	3	904	6.8	8.3	300.0	584.2	208.4	4.2	1.0
BEAR R AT ROAD BR 2 MI W PRESTON													
104.30/ 0.0 / 0.0		74/08/27	0900	16.2	3	1000	7.3	8.2	31.0	697.0	219.0	13.0	3.0
#153546	1119C050	74/08/27	0905	16.2									1.0
		74/08/28	0845	15.9	7	900	7.3	8.1	300.0	608.0	210.0	8.0	1.0
		74/08/28	0950	16.2	8	890	7.7	8.1	303.0				2.8
		74/08/29	0835	15.9	10	1000		9.0	289.0	652.0	134.0	6.0	1.0
		STATION	MEAN	16.1	7	948	7.4	8.3	230.7	652.3	187.7	9.0	1.8
BEAR R @ RD BR 3 MI E OF WESTON													
97.30/ 0.0 / 0.0		74/08/26	1830		5	880							
#153599	1119C050	74/08/26	2030		5	820							
		74/08/26	2230		6	900							
		74/08/27	0030		4	880							
		74/08/27	0230		5	820							
		74/08/27	0430		3	880							
		74/08/27	0630		7	860							
		74/08/27	0830		5	900							
		74/08/27	0945	17.2	3	800		7.8	298.0	634.0	287.0	14.8	2.8
		74/08/27	0950	17.2	5	950		8.0	30.0	612.0	234.0	10.0	1.0
		74/08/27	1030		6	920							
		74/08/27	1230		5	960							
		74/08/27	1430		7								
		74/08/27	1430		7								
		74/08/27	1630		7								
		74/08/27	1630		7								
		74/08/27	1830		11								
		74/08/27	2030		10								
		74/08/27	2230		9								
		74/08/28	0030		9								
		74/08/28	0230		8								
		74/08/28	0430		7								
		74/08/28	0630		7								
		74/08/28	0830		6								
		74/08/28	0940	16.7	7	950	6.7	8.1	283.0	564.0	201.0	9.0	1.0
		74/08/28	1000	16.8	7	950	7.1	8.1	290.0			13.0	1.0
		74/08/28	1630		6	860							
		74/08/28	1830		8	880							
		74/08/28	2030		13	940							

74/08/29 0030		11	800							
74/08/29 0230		10	10							
74/08/29 0430		10	10							
74/08/29 0630		10	840							
74/08/29 0830		10	840							
74/08/29 0910	16.4	7	850			294.0	682.0	186.0	6.0	1.0
74/08/29 1030		8	920							
74/08/29 1230		9	920							
STATION MEAN	16.9	7	873	6.9	8.0	239.0	623.0	227.0	10.6	1.4

STATION NAME / RIVER MILES / STORET	AGENCY	DATE	SUMMARY	00010 WATER TEMP CENT	00070 TURB JKSN JTU	00095 CNDUCT FIELD MICROMHO	00300 DO MG/L	00400 PH SU	00410 T ALK CACO3 MG/L	00500 RESIDUE TOTAL MG/L	00505 RESIDUE TOT VOL MG/L	00530 RESIDUE TOT NFLT MG/L	00535 RESIDUE VOL NFLT MG/L
THOMAS FORK AT HWY 30 BR @ MOUTH													
272.00/ 0.01/ 0.0		74/08/27	0955	15.8		860		7.7		524.0	110.0	33.0	5.0
#153564	1119C050	74/08/27	1000	15.8		860		7.9		583.0	133.0	25.0	3.0
		STATION	MEAN	15.8		860		7.8		553.5	121.5	29.0	4.0
SHEEP CR .2 MI ABV MOUTH													
247.40/ 0.20/ 0.0		74/08/27	1100	16.0		460		7.6		373.0	154.0	10.0	1.0
#153565	1119C050	74/08/27	1105	16.0		460		7.6		310.0	79.0	12.0	1.0
		STATION	MEAN	16.0		460		7.6		341.5	116.5	11.0	1.0
CRICKETT CAN @ BR 1 MI S DINGLE													
0.0 / 0.0 / 0.0		74/08/27	1125	16.4		500		7.6		392.0	192.0	3.0	1.0
#153566	1119C050	STATION	MEAN	16.4		500		7.6		392.0	192.0	3.0	1.0
MONTPELIER CR @ RR YD SW MONT.													
224.40/ 2.10/ 0.0		74/08/27	1350			560		7.4		354.0	184.0	11.0	1.0
#153568	1119C050	74/08/27	1355			480		7.5		343.0	157.0	13.0	1.0
		STATION	MEAN			520		7.4		348.5	170.5	12.0	1.0
BLOOMINGTON CR 2 MI SE BLOOMING.													
220.40/ 10.20/ 3.00		74/08/27	1210	15.8		420		7.0		270.0	168.0	31.0	6.0
#153567	1119C050	STATION	MEAN	15.8		420		7.0		270.0	168.0	31.0	6.0
RAINBOW CAN @ BR 1.5 MI W DINGLE													
220.40/ 10.20/ 4.70		74/08/27	1210	17.2	22	600		7.6		454.0	89.0	37.0	5.0
#153553	1119C050	74/08/28	1100	16.8	22	600	7.5	7.4	222.0	467.0	195.0	37.0	3.0
		74/08/29	1025	16.0	17	600			220.0	411.0	87.0	30.0	2.0
		STATION	MEAN	16.7	20	600	7.5	7.5	221.0	444.0	123.7	34.7	3.3
OUTLET CAN @ BR @ LIFTON PUMP PL													
220.40/ 14.10/ 0.0		74/08/27	1310	19.3	3	720	7.5	8.2		514.0	203.0	5.0	2.0
#153554	1119C050	STATION	MEAN	19.3	3	720	7.5	8.2		514.0	203.0	5.0	2.0
BEAR LK. OUTLET AT HWY 89 BRIDGE													
220.40/ 1.10/ 0.0		74/08/27	1450	19.7	18	700	8.3	7.9		495.0	181.0	30.0	5.0
#153555	1119C050	74/08/28	1135	19.4	15	700	7.6	7.9	268.0	513.0	162.0	17.0	2.0
		74/08/29	1105	19.5	9	670			248.0	484.0	178.0	6.0	5.0
		STATION	MEAN	19.5	14	690	7.9	7.9	258.0	497.3	173.7	17.7	4.0

STORET	ST UN NAME / RIVER MILES	AGENCY	DATE	SUMMARY	39360 DDD WHL SMPL UG/L	39365 DDE WHL SMPL UG/L	39370 DDT WHL SMPL UG/L	39380 DIELDRIN WHL SMPL UG/L	39390 ENDRIN WHL SMPL UG/L	39400 TOXPHENE WHL SMPL UG/L	39410 HCHLR WHL SMPL UG/L	39420 HCHLR-EPI WHL SMPL UG/L	39500 AROCLOR 1260 WHL SMPL UG/L	39782 LINDANE WHL SMPL UG/L
BEAR RIVER AT HWY 89 BRIDGE														
223.50/	0.0 / 0.0		74/08/28	1205	0.009	0.006	0.007	0.001	0.003	0.060	0.001	0.001	0.030	0.001
#153556		1119C050	STATION	MEAN	0.009	0.006	0.007	0.001	0.003	0.060	0.001	0.001	0.030	0.001
BEAR R @ BR 1 MI BLW OUTLET CAN.														
219.30/	0.0 / 0.0		74/08/29	1120	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.015	0.001
#153597		1119C050	STATION	MEAN	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.015	0.001
BEAR R @ BR 3 MI BLW GRACE P.P.														
153.10/	0.0 / 0.0		74/08/28	1215	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.015	0.001
#153561		1119C050	STATION	MEAN	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.015	0.001
THOMAS FORK AT HWY 30 BR @ MOUTH														
272.00/	0.01/ 0.0		74/08/27	1000	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.015	0.001
#153564		1119C050	STATION	MEAN	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.015	0.001
CONCRETE CAN @ BR 1 MI S DINGLE														
0.0 / 0.0 / 0.0			74/08/27	1125	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.015	0.001
#153565		1119C050	STATION	MEAN	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.015	0.001
MONTPELIER CR @ BR YD SW MONT.														
224.40/	2.10/ 0.0		74/08/27	1350	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.015	0.001
#153568		1119C050	STATION	MEAN	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.015	0.001
OUTLET CAN @ BR @ LIFTON PUMP PL														
220.40/	14.10/ 0.0		74/08/27	1310	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.030	0.001
#153554		1119C050	STATION	MEAN	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.030	0.001
BIG CR. @ TROUT FARM														
175.00/	0.40/ 0.0		74/08/28	0950	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.015	0.001
#153577		1119C050	STATION	MEAN	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.015	0.001
BIG SPR. CR @ WEIR OF TROUT FARM														
175.00/	0.40/ 0.0		74/08/28	1010	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.015	0.001
#153578		1119C050	STATION	MEAN	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.015	0.001
SODA CR @ BR .2 MI ABV MOUTH														
174.20/	0.20/ 0.0		74/08/28	1150	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.015	0.001
#153579		1119C050	STATION	MEAN	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.015	0.001

STATION NAME / RIVER MILES / STORET #	AGENCY #	DATE	SUMMARY	01002 ARSENIC AS,TOT UG/L	01027 CADMIUM CD,TOT UG/L	01034 COPPER CU,TOT UG/L	01045 IRON FE,TOT UG/L	01051 LEAD PB,TOT UG/L	71900 MERCURY HG,TOTAL UG/L	00929 SODIUM NA,TOT MG/L	00937 POTASSIUM K,TOT MG/L	41710 STAPH AUR CONF /100ML	71270 PF AERUG WATER NO/100ML
NEAR R @ RR .25 MI W ID-NYO BDR.													
274.00/ 0.0 / 0.0		74/08/28	0900	1.60			520.0		0.80	27.00	2.20		
#153596	1119C050	74/08/29	0825	2.80	3.00	8.00	470.0	20.0	2.00				
		STATION	MEAN	2.20	3.00	8.00	495.0	20.0	1.40	27.00	2.20		
NEAR RIVER AT HWY 89 BRIDGE													
273.50/ 0.0 / 0.0		74/08/29	1405									0.0	0.0
#153556	1119C050	STATION	MEAN									0.0	0.0
NEAR R @ RR 1 MI BLW OUTLET CAN.													
219.30/ 0.0 / 0.0		74/08/27	1530	3.20	2.00	6.00	720.0	20.0	1.60	44.00	5.40		
#153597	1119C050	74/08/28	1315	3.60	2.00	4.00	640.0	20.0	1.00	44.00	4.70		
		74/08/29	1120	2.80	2.00	6.00	750.0	10.0	1.80	47.00	5.10		
		STATION	MEAN	3.20	2.00	5.33	703.3	16.7	1.47	45.00	5.07		
NEAR R @ RR 1 MI BLW EIGHTMILE C													
185.30/ 0.0 / 0.0		74/08/28	1425	3.40		6.00	230.0	25.0	1.20	44.00	5.60		
#153595	1119C050	STATION	MEAN	3.40		6.00	230.0	25.0	1.20	44.00	5.60		
NEAR R @ RR @ HEAD SODA PT. RES.													
174.30/ 0.0 / 0.0		74/08/27	1545	2.80	2.00	6.00	910.0	20.0	0.80	40.00	4.50		
#153598	1119C050	74/08/28	1400		3.00	6.00	870.0	25.0	2.20	41.00	4.60		
		74/08/28	1415		4.00	8.00	940.0	30.0	0.80	39.00	4.20		
		74/08/28	1420		2.00	7.00	980.0	20.0	1.20				
		74/08/29	1235	2.50	2.00	6.00	860.0	15.0	0.60	42.00	4.90		
		STATION	MEAN	2.65	2.60	6.60	912.0	22.0	1.12	40.50	4.55		
NEAR R @ GUAGE BLW ALEXANDER DAM													
169.40/ 0.0 / 0.0		74/08/28	1345							39.00	4.20		
#153559	1119C050	STATION	MEAN							39.00	4.20		
NEAR R @ RR 3 MI. BLW GRACE P.P.													
153.10/ 0.0 / 0.0		74/08/29	1100									400.0	4.0
#153561	1119C050	STATION	MEAN									400.0	4.0
NEAR R @ RR 1 MI BLW ONEIDA DAM													
126.50/ 0.0 / 0.0		74/08/27	0710	3.20	5.00	6.00	220.0	25.0	0.60	45.00	5.80		
#153563	1119C050	74/08/28	0700		3.00	5.00	160.0	30.0	0.80	44.00	5.60		
		74/08/29	0730	3.60	2.00	4.00	240.0	20.0	1.60	45.00	5.80		
		STATION	MEAN	3.40	3.33	5.00	206.7	25.0	1.00	44.67	5.73		

STORET #	STATION NAME / RIVER MILES	AGENCY #	DATE	SUMMARY	39360 DDD WHL SMPL UG/L	39365 DDE WHL SMPL UG/L	39370 DDT WHL SMPL UG/L	39380 DIELDRIN WHL SMPL UG/L	39390 ENDRIN WHL SMPL UG/L	39400 TOXPHENE WHL SMPL UG/L	39410 HCHLR WHL SMPL UG/L	39420 HCHLR-EP WHL SMPL UG/L	39500 AROCLOR 1260 UG/L	39782 LINDANE WHL SMPL UG/L
MINK CR @ CULVERT .1MI ABV MOUTH														
120.70/	0.10/ 0.0		74/08/28	1520	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.015	0.001
#153586		1119C050	STATION	MEAN	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.015	0.001
UPPER CAN @ CULV 2 MI W FAIRVIEW														
0.0 /	0.0 / 0.0		74/08/29	1150	0.001	0.001	0.006	0.001	0.003	0.060	0.001	0.001	0.015	0.020
#153589		1119C050	STATION	MEAN	0.001	0.001	0.006	0.001	0.003	0.060	0.001	0.001	0.015	0.020
COB CR @ RD BR .5 MI NE DEL MONTE														
77.70/	20.90/ 0.0		74/08/29	1020	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.015	0.001
#153592		1119C050	STATION	MEAN	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.015	0.001
COB CAN @ CULV .5MI W OF WHITNEY														
77.70/	15.10/ 0.0		74/08/29	1115	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.015	0.001
#153594		1119C050	STATION	MEAN	0.001	0.001	0.003	0.001	0.003	0.060	0.001	0.001	0.015	0.001

STORET #	STATION NAME / RIVER MILES / AGENCY #	DATE	SUMMARY	31501 TOT COLI MF MENDO /100ML	31616 FEC COLI MEM-FCBR /100ML	579 FEC STREP MF M-ENT /100ML	00916 CALCIUM CA-TOT MG/L	01097 ANTIMONY SB,TOT UG/L	39330 ALDRIN WHL SMPL UG/L	39340 BHC WHL SMPL UG/L	39350 CHLORDANE WHL SMPL UG/L	3 05 O.P' DDT WHL SMPL UG/L	70300 DISS-IRO RESIDUE TC MG/L
BEAR R @ BR .25 MI W ID-WYO BDR.													
274.00/	0.0 / 0.0	74/08/27	0915	100.0	48.0	560.0							
#153546	1119C050	74/08/28	0900				68.00						
		74/08/29	0825				75.00	0.20					405.00
		STATION	MEAN	100.0	48.0	560.0	71.50	0.20					405.00
BEAR R AT BR 1 MI SW OF PEGRAM													
258.20/	0.0 / 0.0	74/08/27	0945										383.00
#153550	1119C050	74/08/27	1000	200.0	62.0	600.0							
		74/08/28	0930										375.00
		STATION	MEAN	200.0	62.0	600.0							379.00
BEAR R @ DIV DAM 3 MI ESE DINGLE													
242.70/	0.0 / 0.0	74/08/27	1030	800.0	130.0	610.0							
#153551	1119C050	74/08/27	1140										368.00
		74/08/28	1035										340.00
		74/08/29	0900										414.00
		STATION	MEAN	800.0	130.0	610.0							374.00
BEAR R AT RD BR 1 MI NE DINGLE													
237.90/	0.0 / 0.0	74/08/27	1045	110.0	34.0	1100.0							
#153552	1119C050	74/08/27	1050										376.00
		74/08/28	1005										383.00
		74/08/29	0945										391.00
		STATION	MEAN	110.0	34.0	1100.0							383.33
BEAR RIVER AT HWY 89 BRIDGE													
223.60/	0.0 / 0.0	74/08/27	0815	500.0	270.0	1100.0							
#153556	1119C050	74/08/28	1200										458.00
		74/08/28	1205						0.001	0.001	0.005		351.00
		STATION	MEAN	500.0	270.0	1100.0			0.001	0.001	0.005		404.50
BEAR R @ BR 1 MI BLW OUTLET CAN.													
219.30/	0.0 / 0.0	74/08/27	0900	120.0	30.0	130.0							
#153597	1119C050	74/08/27	1530				34.00	0.20					410.00
		74/08/28	1315				36.00	0.20					436.00
		74/08/29	1120				31.00	0.20	0.001	0.012	0.005		463.00
		STATION	MEAN	120.0	30.0	130.0	33.67	0.20	0.001	0.012	0.005		436.33
BEAR R @ BR 2 MI NW BENNINGTON													
209.30/	0.0 / 0.0	74/08/27	1640										406.00
#153557	1119C050	74/08/28	1340										395.00
		74/08/29	1145										452.00
		STATION	MEAN										417.67

STORET	AGENCY	DATE	SUMMARY	31501 TOT COLI MF/100ML	31616 FEC COLI MFM-FCBR /100ML	79 FECSTREP M-ENT /100ML	00916 CALCIUM CA-TOT MG/L	01097 ANTIMONY SB,TOT UG/L	39330 ALDRIN WHL SMPL UG/L	39340 BHC WHL SMPL UG/L	39350 CHLRDANE WHL SMPL UG/L	39[illegible] DDT WHL SMPL UG/L	70300 RESIDUE DISS-180 TC MG/L
STATION NAME / RIVER MILES													
NEAR R 1.4 MI ABV SKINNER CREEK													
147.20/ 0.0 / 0.0		74/08/28	0830	170.0	94.0	1500.0							
#153558	1119C050	74/08/28	1510										406.00
		74/08/29	1310										416.00
		STATION	MEAN	170.0	94.0	1500.0							411.00
NEAR R @ BR 1 MI BLW EIGHTMILE C													
185.30/ 0.0 / 0.0		74/08/27	1600										412.00
#153595	1119C050	74/08/28	1425				40.00	0.20					431.00
		74/08/29	1220										474.00
		STATION	MEAN				40.00	0.20					439.00
NEAR R @ BR @ HEAD SODA PT. RES.													
174.30/ 0.0 / 0.0		74/08/27	1545				33.00	0.20					410.00
#153598	1119C050	74/08/28	1400				52.00	0.20					471.00
		74/08/28	1415				36.00	0.20					451.00
		74/08/28	1420				34.00	0.20					390.00
		74/08/29	1235				34.00	0.20					431.00
		STATION	MEAN				37.80	0.20					430.60
NEAR R @ GUAGE BLW ALEXANDER DAM													
169.40/ 0.0 / 0.0		74/08/27	1510										449.00
#153559	1119C050	74/08/28	0945			180.0							
		74/08/28	1000	60.0	4.0								
		74/08/28	1345										421.00
		74/08/29	1205										469.00
		STATION	MEAN	60.0	4.0	180.0							446.33
NEAR R .1 MI BLW LAST CHANCE DAM													
165.10/ 0.0 / 0.0		74/08/28	1000			980.0							
#153560	1119C050	74/08/28	1015	40.0	10.0								
		74/08/28	1315										444.00
		74/08/29	1145										425.00
		STATION	MEAN	40.0	10.0	980.0							434.50
NEAR R @ BR 3 MI BLW GRACE P.P.													
153.10/ 0.0 / 0.0		74/08/27	1345										445.00
#153561	1119C050	74/08/28	1015			100000							
		74/08/28	1030	1100.0	190.0								
		74/08/28	1215						0.001	0.005	0.005		443.00
		74/08/29	1110										502.00
		STATION	MEAN	1100.0	190.0	100000			0.001	0.005	0.005		463.33

STORET	AGENCY #	DATE	SUMMARY	31501 TOT COLI /100ML	31616 FEC COLI MFEMENDO	3 9 FECSTREP MFEM-FCBR	00916 CALCIUM MF M-ENT CA-TOT MG/L	01097 ANTIMONY SB.TOT UG/L	39330 ALDRIN WHL SMPL UG/L	39340 BHC WHL SMPL UG/L	39350 CHLORDANE WHL SMPL UG/L	39. D.P' DDT WHL SMPL UG/L	70300 RESIDUE DISS-180 C MG/L
BEAR R @ RR .5 MI W OF THATCHER													
140.30/ 0.0 / 0.0		74/08/28	1100	150.0	100.0	160.0							
#153562	1119C050	74/08/28	1150										473.00
		74/08/29	1045										495.00
		STATION	MEAN	150.0	100.0	160.0							484.00
BEAR R @ RR 1 MI BLW ONEIDA DAM													
126.60/ 0.0 / 0.0		74/08/27	0710				43.00	0.20					182.00
#153563	1119C050	74/08/27	0915										463.00
		74/08/27	1200	400.0	2.0	900.0							
		74/08/28	0700				45.00	0.20					472.00
		74/08/29	0730				45.00	0.20					451.00
		STATION	MEAN	400.0	2.0	900.0	44.33	0.20					392.00
BEAR R @ HWY 91 BR N OF PRESTON													
109.00/ 0.0 / 0.0		74/08/27	0815										475.00
#153549	1119C050	74/08/27	0820										455.00
		74/08/27	1230	100.0	48.0	830.0							
		74/08/27	1245	220.0	64.0	120.0							
		74/08/28	0800										497.00
		74/08/28	0945										657.00
		74/08/28	1200	300.0	100.0	2000.0							
		74/08/28	1215	270.0	100.0	510.0							
		74/08/28	1230	150.0	120.0	190.0							
		74/08/29	0815										504.00
		STATION	MEAN	208.0	86.4	730.0							517.60
BEAR R AT ROAD BR 2 MI W PRESTON													
104.30/ 0.0 / 0.0		74/08/27	0900										444.00
#153545	1119C050	74/08/27	0905										657.00
		74/08/28	0845										550.00
		74/08/28	0950					0.20					196.00
		74/08/29	0835				45.00						603.00
		STATION	MEAN				45.00	0.20					490.00
BEAR R @ RD BR 3 MI E OF WESTON													
97.30/ 0.0 / 0.0		74/08/27	0945				43.00	0.20					196.00
#153599	1119C050	74/08/27	0950				48.00	0.20					513.00
		74/08/27	1300	390.0	170.0	350.0							
		74/08/27	1315	320.0	120.0	650.0							
		74/08/28	0940				54.00	0.20					499.00
		74/08/28	1000				56.00	0.20					379.00
		74/08/28	1300	130.0	92.0	56.0							
		74/08/28	1315	140.0	110.0	390.0							
		74/08/29	0910					0.20					554.00
		STATION	MEAN	245.0	123.0	361.5	50.25	0.20					428.20

STORET #	AGENCY #	DATE	SUMMARY	31501 TOT COLIFEC /100ML	31616 COLIFECSTRE /100ML	31673 MEM-FCOR /100ML	00916 CALCIUM CA-TOT MG/L	01097 ANTIMONY SB,TOT UG/L	39330 ALDRIN WHL SMPL UG/L	39340 BHC WHL SMPL UG/L	39350 CHLORDANE WHL SMPL UG/L	39305 D.D.T. WHL SMPL UG/L	70300 RESIDUE DISS-180 MG/L
THOMAS FORK AT HWY 30 BR @ MOUTH													
222.00/ 0.01/ 0.0		74/08/27	0930	200.0	66.0	160.0							
#153556	1119C050	74/08/27	0955										498.00
		74/08/27	1000						0.001	0.006	0.005		498.00
		STATION	MEAN	200.0	66.0	160.0			0.001	0.006	0.005		498.00
SHEEP CR .2 MI ABV MOUTH													
247.00/ 0.20/ 0.0		74/08/27	1015	330.0	54.0	400.0							
#153555	1119C050	74/08/27	1100										291.00
		74/08/27	1105										282.00
		STATION	MEAN	330.0	54.0	400.0							286.50
CROCKETT CAN @ BR 1 MI S DINGLE													
0.0 / 0.0 / 0.0		74/08/27	1115	810.0	110.0	780.0							
#153556	1119C050	74/08/27	1125						0.001	0.003	0.005		374.00
		STATION	MEAN	810.0	110.0	780.0			0.001	0.003	0.005		374.00
MONTPELIER CR @ RR YD SW MONT.													
224.40/ 2.10/ 0.0		74/08/27	0830	4900.0	4800.0	4500.0							
#153558	1119C050	74/08/27	1350				68.00	0.20	0.001	0.005	0.005		282.00
		74/08/27	1355				68.00	0.20					293.00
		STATION	MEAN	4900.0	4800.0	4500.0	68.00	0.20	0.001	0.005	0.005		287.50
BLOOMINGTON CR 2 MI SE BLOOMING.													
220.40/ 10.20/ 3.00		74/08/27	1145	170.0	60.0	1200.0							
#153557	1119C050	74/08/27	1210										215.00
		STATION	MEAN	170.0	60.0	1200.0							215.00
RAINBOW CAN @ BR 1.5 MI W DINGLE													
220.40/ 10.20/ 4.70		74/08/27	1100	220.0	120.0	1000.0							
#153553	1119C050	74/08/27	1210				68.00	0.20					381.00
		74/08/28	1100				68.00	0.20					392.00
		74/08/29	1025				66.00	0.20					422.00
		STATION	MEAN	220.0	120.0	1000.0	67.33	0.20					398.33
OUTLET CAN @ BR @ LIFTON PUMP PL													
220.40/ 14.10/ 0.0		74/08/27	1130	350.0	2.0	2.0							
#153554	1119C050	74/08/27	1310						0.001	0.010	0.005		426.00
		STATION	MEAN	350.0	2.0	2.0			0.001	0.010	0.005		426.00

STORET	AGENCY	RIVER MILES	DATE	SUMMARY	31501 TOT COLI MF /100ML	31616 FEC COLI MEM-FCBR /100ML	9 FEC...4FP MF M-ENT /100ML	00916 CALCIUM CA-TOT MG/L	01097 ANTIMONY SB,TOT UG/L	39330 ALUMIN WHL SMPL UG/L	39340 ARC WHL SMPL UG/L	39350 CHLORDANE WHL SMPL UG/L	39 D,P' DDT WHL SMPL UG/L	70300 RESIDUE DISS-180 IC MG/L
MEAN LK. OUTLET AT HWY 89 BRIDGE														
220.40/		1.10/ 0.0	74/08/27	0800	50.0	20.0	130.0							
#153555		1119C050	74/08/27	1450										397.00
			74/08/28	1135										414.00
			74/08/29	1105										440.00
			STATION	MEAN	50.0	20.0	130.0							417.00
DVID CR @ BR 3 MI NW MONTPELIER														
215.90/		2.70/ 0.0	74/08/27	0845	600.0	110.0	40.0							
#153569		1119C050	74/08/27	1325										64.00
			STATION	MEAN	600.0	110.0	40.0							64.00
FLOWING WELL 1 MI NE OF BERN														
0.0 /		0.0 / 0.0	74/08/27	1300				62.00	0.20					381.00
#153570		1119C050	74/08/27	1305				64.00	0.20					360.00
			STATION	MEAN				63.00	0.20					370.50
GEORGETOWN CR AT RD BR NR MOUTH														
203.60/		0.10/ 0.0	74/08/27	1515				82.00	0.20					133.00
#153571		1119C050	74/08/27	1520				82.00	0.20					313.00
			74/08/28	0800	330.0	170.0	1200.0							
			STATION	MEAN	330.0	170.0	1200.0	82.00	0.20					223.00
STAUFFER CR AT BR 2 MI E NORMAN														
202.50/		0.10/ 0.0	74/08/27	1540										164.00
#153572		1119C050	74/08/28	0815	720.0	570.0	1900.0							
			STATION	MEAN	720.0	570.0	1900.0							164.00
EIGHTMILE CR @ BR 1 MI ABV MOUTH														
185.50/		0.80/ 0.0	74/08/27	1640										196.00
#153574		1119C050	74/08/28	0845	430.0	150.0	550.0							
			STATION	MEAN	430.0	150.0	550.0							196.00
BIG CR. @ TROUT FARM														
175.00/		0.90/ 0.0	74/08/28	0950						0.001	0.001	0.005		668.00
#153577		1119C050	74/08/28	0955										730.00
			STATION	MEAN						0.001	0.001	0.005		699.00
BIG SPR. CR @ WEIR OF TROUT FARM														
175.00/		0.40/ 0.0	74/08/28	0915	620.0	120.0	650.0							
#153578		1119C050	74/08/28	1010				135.00	0.20	0.001	0.001	0.005		649.00
			74/08/28	1015				135.00	0.20					611.00
			STATION	MEAN	620.0	120.0	650.0	135.00	0.20	0.001	0.001	0.005		630.00

STATION NAME / RIVER MILES / STORET #	AGENCY #	DATE	SUMMARY	31501 TOT COLI MPN /100ML	31616 FEC COLI MEM-FCBR /100ML	3167 FECSTRE MEM-ENT /100ML	00916 CALCIUM CA-TOT MG/L	01097 ANTIMONY SB,TOT UG/L	39330 ALDRIN WHL SMPL UG/L	39340 BHC WHL SMPL UG/L	39350 CHLORDANE WHL SMPL UG/L	39305 10,P' DDT WHL SMPL UG/L	70300 RESIDUE DISS-180 IC MG/L
SODA CREEK .25 MI BLW HOOPER SPR													
174.20/ 4.00/ 0.0		74/08/28	0925				95.00	0.20					620.00
#153575	1119C050	STATION	MEAN				95.00	0.20					620.00
SODA CR @ BR .2 MI ABV MOUTH													
174.20/ 0.20/ 0.0		74/08/28	0930			120.0							
#153579	1119C050	74/08/28	0945	600.0	140.0								
		74/08/28	1150						0.001	0.003	0.005		679.00
		74/08/28	1155										685.00
		STATION	MEAN	600.0	140.0	120.0			0.001	0.003	0.005		682.00
WHISKEY CR AT HWY 34 BRIDGE													
145.50/ 1.10/ 0.0		74/08/28	1045	140.0	34.0	92.0							
#153582	1119C050	74/08/28	1315										506.00
		74/08/28	1320										509.00
		STATION	MEAN	140.0	34.0	92.0							507.50
TROUT CR @ HWY 34 BR @ THATCHER													
139.90/ 0.80/ 0.0		74/08/28	1115	360.0	230.0	520.0							
#153583	1119C050	74/08/28	1345										366.00
		STATION	MEAN	360.0	230.0	520.0							366.00
WILLIAMS CREEK AT HWY 34 BRIDGE													
134.50/ 0.50/ 0.0		74/08/28	1130	470.0	180.0	350.0							
#153584	1119C050	74/08/28	1400										287.00
		STATION	MEAN	470.0	180.0	350.0							287.00
MINK CR @ CULVERT .1MI ABV MOUTH													
120.70/ 0.10/ 0.0		74/08/28	1145	800.0	160.0	940.0							
#153586	1119C050	74/08/28	1520						0.001	0.003	0.005		281.00
		STATION	MEAN	800.0	160.0	940.0			0.001	0.003	0.005		281.00
DEER CR @ CULV .2 MI N SODAW SPR													
105.50/ 0.20/ 0.0		74/08/29	0815										654.00
#153548	1119C050	STATION	MEAN										654.00
W CACHE CAN @ FLUME E OF PESTON													
0.0 / 0.0 / 0.0		74/08/29	1200										481.00
#153588	1119C050	STATION	MEAN										481.00

STORET #	ST RIVER MILES	AGENCY #	DATE	SUMMARY	31501 TOT COLI MEM /100ML	31616 FEC COLI MEM-ECHR /100ML	316 FECST MEM-ENT /100ML	00916 CALCIUM CA-TOT MG/L	01097 ANTIMONY SB,TOT UG/L	39330 ALDRIN WHL SMPL UG/L	39340 BHC WHL SMPL UG/L	39350 CHLORDANE WHL SMPL UG/L	39380 DI.P' DL WHL SMPL UG/L	70300 RESIDUE DISS-180 IC MG/L
UPPER CAN @ CULV 2 MI W FAIRVIEW														
0.0 /	0.0 /	0.0	74/08/28	1330	4700.0	1300.0	3800.0							
#153589		1119C050	74/08/29	1150						0.001	0.011	0.005		237.00
			STATION	MEAN	4700.0	1300.0	3800.0			0.001	0.011	0.005		237.00
WORM CR ABV PRESTON STP														
77.70/	7.00/	9.90	74/08/28	1345	520.0	90.0	2000.0							
#153590		1119C050	74/08/29	0925										355.00
			STATION	MEAN	520.0	90.0	2000.0							355.00
WORM CR @ CUL .8MI BLW PREST STP														
77.70/	7.00/	9.10	74/08/29	0950										430.00
#153545		1119C050	74/08/29	0955										399.00
			STATION	MEAN										414.50
CUB R @ DIV DAM 4 MI NE FRANKLIN														
7.00/	7.00/	4.40	74/08/28	1430	5700.0	870.0	3500.0							
#153591		1119C050	74/08/29	1140										199.00
			STATION	MEAN	5700.0	870.0	3500.0							199.00
CUB R @ HWY 91 BR ABV DEL MONTE														
0.0 /	0.0 /	0.0	74/08/28	1415	330.0	60.0	490.0							
#153544		1119C050	74/08/29	0935										193.00
			STATION	MEAN	330.0	60.0	490.0							193.00
CUB R @ RD BR .5 MI BL DEL MONTE														
77.70/	20.90/	0.0	74/08/28	1445	690.0	260.0	620.0							
#153592		1119C050	74/08/29	1020				43.00	0.20	0.001	0.002	0.005		238.00
			74/08/29	1025				44.00	0.20					213.00
			STATION	MEAN	690.0	260.0	620.0	43.50	0.20	0.001	0.002	0.005		225.50
WORM CR @ CULV 3 MI W FRANKLIN														
77.70/	15.50/	0.0	74/08/28	1500	200.0	190.0	1600.0							
#153593		1119C050	STATION	MEAN	200.0	190.0	1600.0							
CUB CAN @ CULV .5MI W OF WHITNEY														
77.70/	15.10/	0.0	74/08/28	1515	430.0	130.0	810.0							
#153594		1119C050	74/08/29	1115				48.00	0.20	0.001	0.001	0.005		341.00
			74/08/29	1120				49.00	0.20					386.00
			STATION	MEAN	430.0	130.0	810.0	48.50	0.20	0.001	0.001	0.005		363.50

STORET #	AGENCY #	DATE	SUMMARY	31501 TOT COLIFEC COLIFECS. /100ML	31616 COLIFECS. FEB-FECOR /100ML	31 SF M-ENT /100ML	00916 CALCIUM CA-TOT MG/L	01097 ANTIMONY SB,TOT UG/L	39330 ALUMIN WHL SMPL UG/L	39340 BHC WHL SMPL UG/L	39350 CHLORDANE WHL SMPL UG/L	3930 D.P' WHL SMPL UG/L	70300 RESIDUE DISS-180 IC. MG/L
SPRING 1.5 MI W. OF GEORGETOWN													
0.0 / 0.0 / 0.0		74/08/27	1555				86.00	0.20					353.00
#153573	1119C050	74/08/27	1600				84.00	0.20					356.00
		STATION	MEAN				85.00	0.20					354.50
HOOPER SPR- 1 MI S OF SODA SPR.													
0.0 / 0.0 / 0.0		74/08/28	0915				115.00	0.20					835.00
#153578	1119C050	STATION	MEAN				115.00	0.20					835.00
SPRING .5 MI E GEM VALLEY CHEESE													
0.0 / 0.0 / 0.0		74/08/28	1250				74.00	0.20					635.00
#153580	1119C050	STATION	MEAN				74.00	0.20					635.00
SPRING 1 MI SW OF NITER													
0.0 / 0.0 / 0.0		74/08/28	1310				74.00	0.20					581.00
#153581	1119C050	STATION	MEAN				74.00	0.20					581.00
MAPLE GROVE HOT SPRINGS													
0.0 / 0.0 / 0.0		74/08/28	1430				105.00	0.20					1889.00
#153585	1119C050	STATION	MEAN				105.00	0.20					1889.00
SODAS HOT SPR 3 MI NW OF PRESTON													
0.0 / 0.0 / 0.0		74/08/29	0825				290.00	0.20					12217.0
#153587	1119C050	74/08/29	0830				280.00	0.20					13508.0
		STATION	MEAN				285.00	0.20					12862.5
SPRING 1.5 MI WEST OF PRESTON													
0.0 / 0.0 / 0.0		74/08/28	1245	10000.0	2700.0	7800.0							
#153587	1119C050	74/08/29	0900				72.00	0.20					464.00
		STATION	MEAN	10000.0	2700.0	7800.0	72.00	0.20					464.00