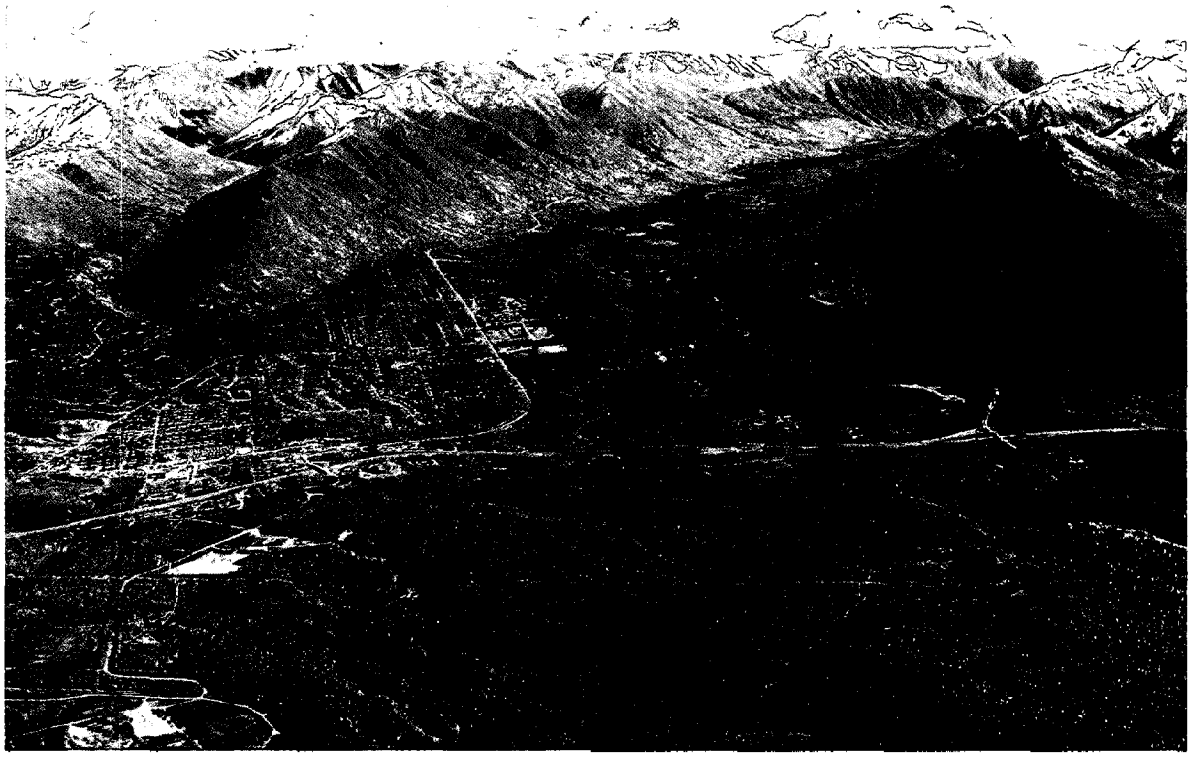
# TASK 3
# FLOUR WATER TREATMENT STUDY

Appendix

III

## Eagle River Water Resource Study



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# TASK 3
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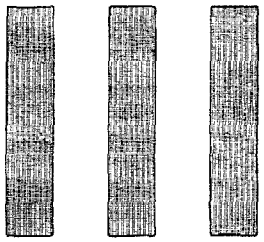
Appendix



Eagle River Water Resource Study

Municipality of Anchorage
Water and Sewer Utilities

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CH2M HILL

December 1981

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# PREFACE

To pursue the recommendations for further study that were prescribed in the Metropolitan Anchorage Urban Study, completed by the U.S. Corps of Engineers in 1979, the Municipality of Anchorage engaged CH2M HILL to conduct the Eagle River Water Resource Study. The purpose of the study is to investigate the potential sources of water supply from the Eagle River Valley. The original scope of the study comprised four tasks:

| | |
|---|---|
| Task 1 | Well Drilling Program |
| Task 2 | Preliminary Damsite Investigation |
| Task 3 | Flour Water Treatment Study |
| Task 4 | Transmission Main Design |

Task 5, Eklutna Lake Alternative Water Source Evaluation, was added to the scope after the completion of the first four tasks.

The report for each task is bound separately and is an appendix to the Executive Summary of the entire study. This Appendix III is the report for Task 3, Flour Water Treatment Study.

## ACKNOWLEDGMENTS

We wish to express our appreciation to the Anchorage Water and Sewer Utilities staff for their contributions at the weekly meetings, updating of task scopes, and overall administrative assistance.

Also, we thank Eklutna, Inc., for providing pertinent information at the weekly meetings and ready access to its property.

# SUMMARY AND CONCLUSIONS

The objectives of Task 3 are to (1) determine whether surface water from the Eagle River can be treated by conventional processes to remove glacial rock flour in order to meet current drinking water standards and (2) estimate costs for such treatment.

Field and laboratory testing indicated that Eagle River water is treatable. Treatment facilities will require two different seasonal treatment processes that can be provided in a single water treatment plant. Transition between processes would occur in June and September correlating with melting of the glaciers at the river's headwaters.

The recommended treatment processes are: (1) flocculation, sedimentation, high-rate filtration, and disinfection for the high-turbidity, glacial melt period; and (2) coagulation, high-rate filtration, and disinfection for the low-turbidity period during the colder months.

To provide flexibility and to meet increasing water demands, the treatment plant could be constructed in three equal increments of 23.33 mgd each until the full capacity of 70 mgd was reached. Additions could be made when needed with little disruption to continuing operation of existing facilities. Capital costs and annual operation and maintenance costs were estimated in January 1981 dollars for a 23.33-mgd and a 70-mgd plant. These estimated costs are $17.4 million (capital) and $1 million (operation and maintenance) for a 23.33-mgd plant and $41.4 million (capital) and $2.7 million (operation and maintenance) for a 70-mgd plant.

Prior to starting final design but after selection of Eagle River surface water as the source for additional water supply, we recommend the following:

- Pilot treatment plant tests for a full year, using at least a 1-mgd plant, to determine applicable process design criteria. This testing program should address iron, color, and turbidity removal; chemical dosages required over the full range of raw water parameters; filtration rates and media selection; and effectiveness of the recommended treatment processes.

- Investigation of disinfection alternatives to identify their trihalomethane formation potential (formation of potentially carcinogenic substances during the disinfection process).

- Identification of sludge disposal alternatives and the associated cost research.
- Selection of a treatment plant site.
- Groundwater quality analysis and monitoring program for the old Eagle River dump.

## DEFINITION OF TERMS

| | |
|---|---|
| Alum | Metallic salt, aluminum sulfate, coagulant used in removal of turbidity from water |
| Coagulation | A chemical process for combining particles into larger aggregates |
| Degrees C | Degrees centigrade<br>7° C = 45° F (Fahrenheit) and 20° C = 68° F |
| EPA | United States Environmental Protection Agency |
| Flocculation | The process of gentle mixing following coagulation so that particles come in contact with one another, aggregating or growing into larger more dense particles that settle readily |
| Flour | Material ground by glaciers |
| Jar Testing | A bench-scale procedure using multiple stirrers to compare coagulation and settling results in beakers having varying coagulant dosages |
| mgd | million gallons per day |
| mg/l | milligrams per liter |
| Micron | Unit of measure equalling one thousandth of a millimeter |
| NTU | Nephelometric Turbidity Unit - unit for measuring turbidity |
| Sedimentation | Process by which coagulated or suspended matter separates from the water by subsidence and deposition |
| THM (trihalomethane) | Organic compounds formed when certain natural organic compounds (particularly humic acids) come in contact with chlorine. These compounds are thought to cause cancer in animals. |
| Turbidity | A measurement of water clarity by the amount of particulate matter in the sample |

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# Chapter 1
# INTRODUCTION

## BACKGROUND

The population and, thus, the water supply needs of the metropolitan Anchorage area are growing rapidly. Presently, surface water from Ship Creek and groundwater wells in the Anchorage Bowl supply most of the municipality's water. However, if present growth trends continue, these sources will not meet future needs.

In 1974 the United States Congress authorized the U.S. Army Corps of Engineers to perform the Metropolitan Anchorage Urban Study (MAUS), which was completed in 1979. The purpose of the MAUS was "to evaluate the adequacy of the developed water supply in the metropolitan Anchorage area, to determine future water demands, to assess sources for water supply development, and to formulate water supply plans to meet the increased future demand" (U.S. Army Corps of Engineers, 1979). The MAUS study area comprised the Anchorage Bowl and the area northeast to the town of Eklutna (Figure 1-1).

The projected future water demand increases, determined in the MAUS, are shown in Figure 1-2. It is expected that by the year 2025 an additional 81.5 million gallons per day (mgd) of water will be needed to meet the increased demands in the area.

The MAUS report identified many potential sources of supply: Eagle River Valley groundwater; Anchorage Bowl groundwater; and surface water from Campbell Creek, Ship Creek, Eagle River, and Eklutna Lake. Two plans were recommended by MAUS for future study. Plan IV, which ranked first environmentally and socially, included a combination of supply from Ship Creek, Anchorage Bowl groundwater, and Eklutna Lake. Plan VI, which ranked first on an economic basis, included an increased supply from Ship Creek, winter diversion from Eagle River, further development of Anchorage Bowl groundwater, and exploration for Eagle River Valley groundwater.

To implement portions of these plans, the Municipality increased the water supply from within the Anchorage Bowl by recently constructing a 36-inch supply main to its water treatment plant from the military diversion facility on Ship Creek. Future developments are expected to include new wells to increase groundwater supply and the expansion of the capabilities of the plant that treats Ship Creek water. However, rapidly growing demands in Anchorage will require development of a new source outside the Anchorage Bowl within the next 10 years. The Eagle River-Chugiak-Eklutna area, northeast of Anchorage, needs a new source now.

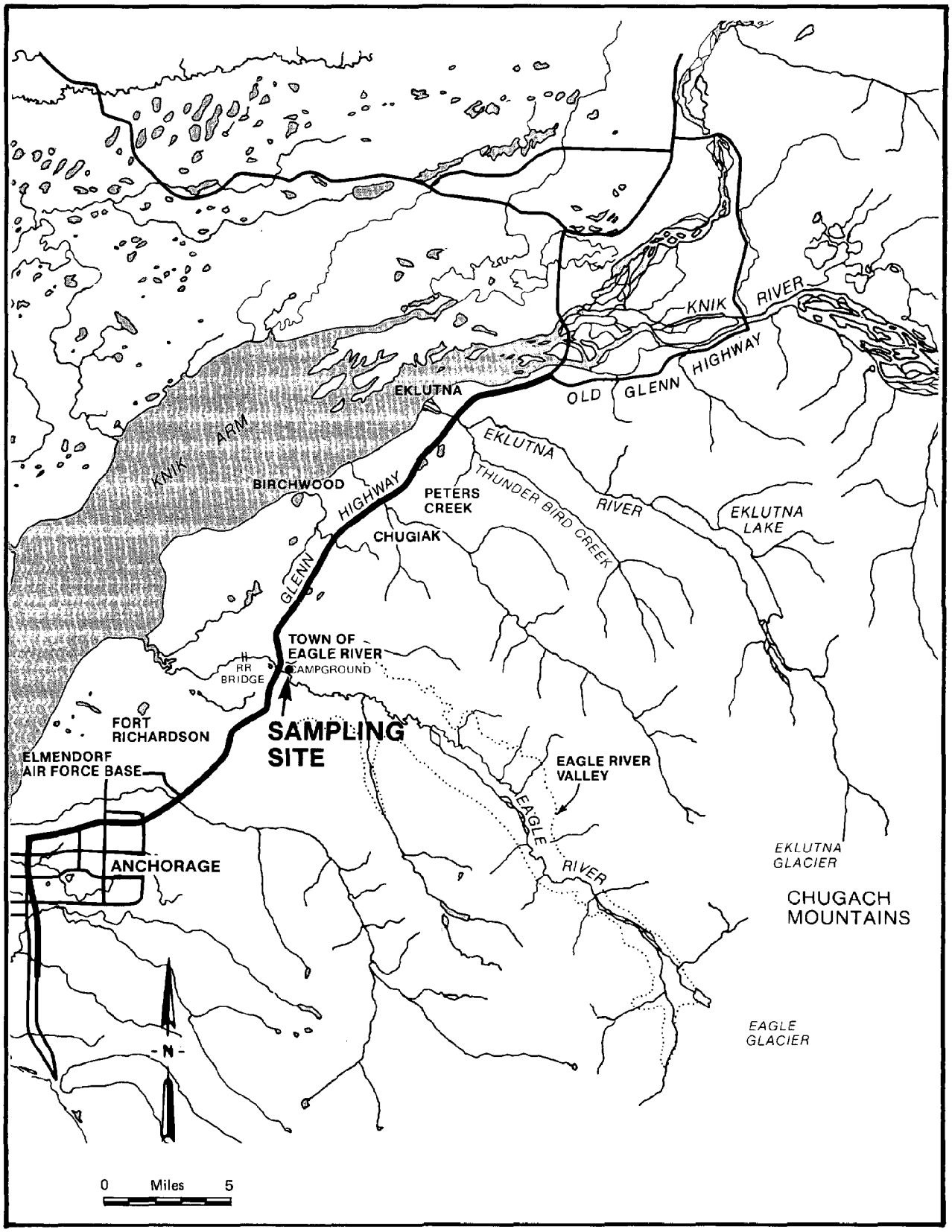
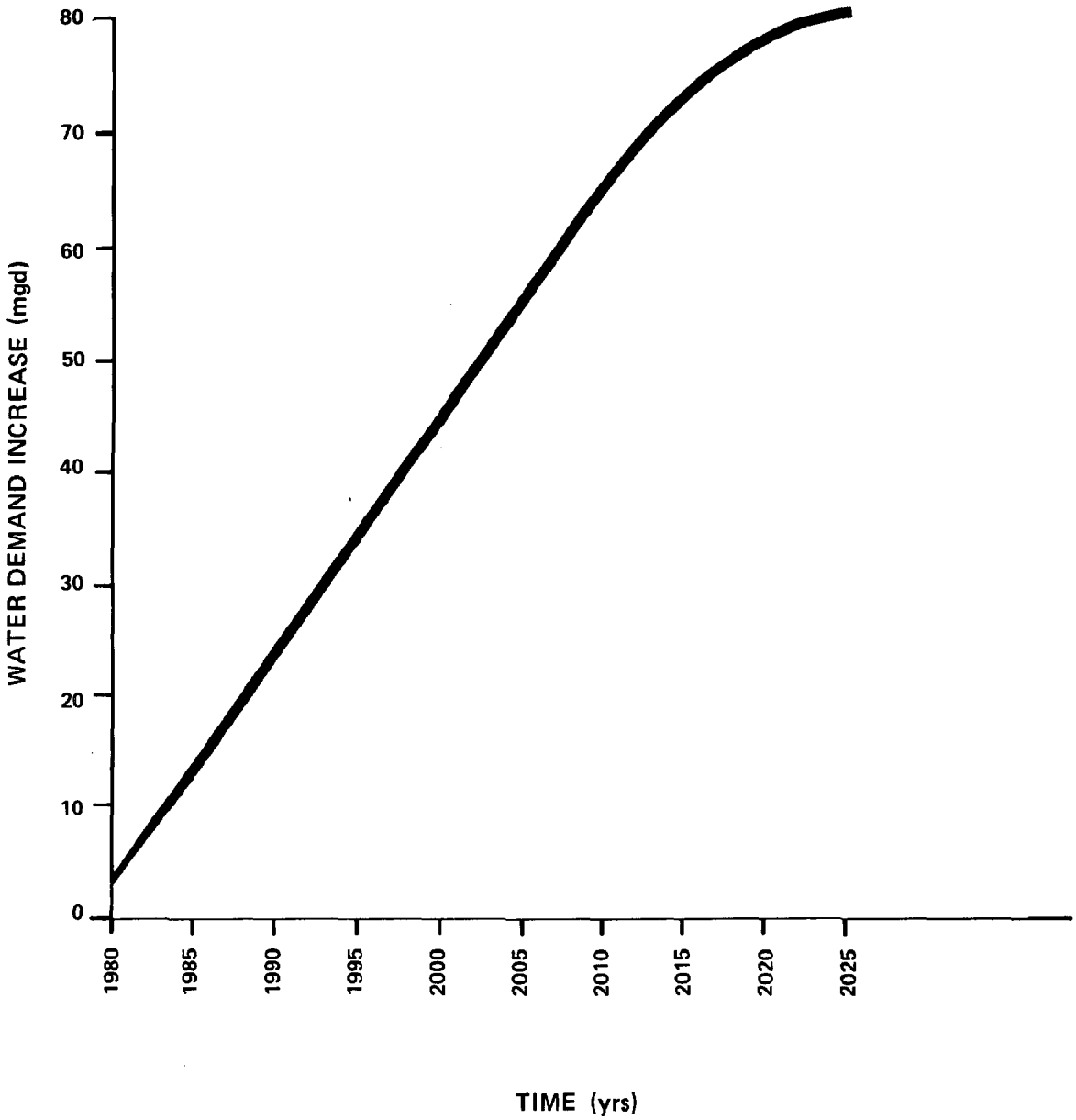



**Figure 1-1**
**Vicinity Map**




NOTE: Increase Based on 1977 Total Demand.

SOURCE: U.S. Corps of Engineers. 1979.

**Figure 1-2**
**Projected Water Demand Increase 1980-2025**

As a result of the MAUS findings, the Municipality decided to investigate potential sources outside the Anchorage Bowl that could supply 70 mgd of water. On the basis of the MAUS population projection, this diversion would satisfy the demands of the entire study area through the year 2012. The future increases in water supply capacity that are expected to be developed within the Anchorage Bowl will delay the need for the full 70-mgd capacity of the new water source outside the Bowl until approximately the year 2020 or later.

The Eagle River Valley is one possible source of water from outside the Anchorage Bowl that was suggested in the MAUS, Plan VI. To investigate the potential of this valley to supply the 70-mgd requirement, the Municipality engaged CH2M HILL to conduct the Eagle River Water Resource Study. The original scope of the study comprised four separate tasks:

- Task 1, a well drilling program to study the feasibility of developing the Eagle River Valley as a groundwater source
- Task 2, a preliminary damsite investigation to determine the feasibility of developing the Eagle River as a surface water source
- Task 3, an investigation of the suitability of conventional treatment processes for removal of glacial rock flour from the Eagle River water
- Task 4, a preliminary design of a pipeline to transport groundwater or surface water from the Eagle River Valley to Anchorage

Each task was conducted independently.

The results of the first four tasks clearly indicate that a substantial dam and reservoir are required to develop Eagle River as a water source. Before committing itself to this dam and reservoir project, the Municipality of Anchorage increased the study scope to include Task 5, Eklutna Lake Alternative Water Source Evaluation. The purpose of Task 5 was to analyze the capability of Eklutna Lake to supply the 70 mgd of water to the area. Eklutna Lake is included in Plan IV of the MAUS. The lake is 30 miles northeast of downtown Anchorage and 16 miles northeast of the Eagle River (Figure 1-1).

The report for each task appears as an appendix to the Executive Summary of the entire study. This Appendix III is the report for Task 3, Flour Water Treatment Study.

## PURPOSE AND SCOPE

The objective of Task 3 is to investigate the suitability of the Eagle River as a potable water supply source, especially during the summer glacial melt period. It is intended to complement the MAUS and to augment water quality data collected by the United States Geological Survey (USGS) between 1948 and 1973.

If the 70-mgd source of water for the Municipality of Anchorage is to come from Eagle River surface water (assuming it can be made potable), a plant to treat this water should be located near the river. This will allow potable water to be pumped south to the Anchorage Bowl and north to various communities as far away as Eklutna (Eagle River, Chugiak, Birchwood, Peters Creek, and Eklutna). Initially, when demands are still low, untreated water could be pumped to the existing Municipal Water Treatment Plant. However, it is likely that the Eagle River treatment plant would be constructed when the dam (Appendix II of this study) is constructed so the areas north can be served. To provide flexibility and to meet increasing demands, the treatment plant could be constructed in stages.

This appendix contains the following:

- Results and evaluations of field and laboratory tests
- Identification of treatment criteria and the best treatment processes for both the summer glacial melt period and the winter clear water periods
- Estimated project and annual operation and maintenance costs for a treatment plant suitable for operation of the recommended processes

The Municipality of Anchorage suggested that we study flour concentration, exchange capacity, particle size, mineral concentration, solution characteristics, and treatment agents and methods. These suggested areas of the study, except for the exchange capacity and particle size, influence the treatment required to produce potable water and were considered throughout this task. Exchange capacity relates to ion exchange, which is a common process in water softening. Eagle River water is naturally soft and does not require softening. Particle size, though of interest, does not relate directly to its removal. Particle size distribution was measured but is not considered as having a direct bearing on either the jar tests performed or the treatment conclusions resulting from these tests.

Data were collected during the entire glacial melt period, June through September 1980. During this period, data were gathered regularly, and observations were made of variations in river water quality.

## SITE DESCRIPTION

The Eagle River, situated about 10 miles northeast of Anchorage, is fed primarily by the Eagle Glacier at the upper end of the Eagle River Valley (Figure 1-1). During the summer, melt water from the glacier contributes to high flows. This melt water contains glacial rock flour, which produces high turbidity in the water. In the winter months when the glacier is frozen, streamflow and turbidity are low. Its turbidity makes the Eagle River water unsuitable for drinking. A method for reduction of turbidity must be determined before the Eagle River can be identified as a potential drinking water source.

## LIMITATIONS

This report was prepared for the use of the Anchorage Water and Sewer Utilities for specific application to the Eagle River Water Resource Study, Flour Water Treatment Study, in accordance with generally accepted engineering practice. No other warranty, expressed or implied, is made. In the event of any changes to the conditions considered under this study, the conclusions and recommendations contained in this report will not be considered valid unless the changes are reviewed and the conclusions or recommendations are modified or verified in writing by CH2M HILL.

The purpose of this task is to investigate whether conventional treatment processes can remove glacial rock flour from Eagle River water. No design criteria were developed. The treatment concepts presented in this report are believed to be workable but are not refined enough for incorporation into a final design. Additional investigations, such as pilot testing, will be required prior to final design.

# Chapter 2
# DATA COLLECTION AND EVALUATION

## SAMPLING SITE

All samples for testing were collected from the right bank of the Eagle River immediately upstream of both the Glenn Highway bridge and the confluence of Meadow Creek with the Eagle River (Figure 1-1). This site was readily accessible during all weather conditions and permitted an undisturbed location to park the mobile laboratory. Because the river at this location is extremely turbulent; grab sampling from the river bank was considered as representative of the entire river. This was confirmed by taking samples upstream, near the center of the river, and measuring turbidity.

Other sites further upstream were considered for regular sampling but were eliminated because they were less convenient and required permits for access. No significant tributaries enter the river between the sampling site and either of the two prospective damsites, identified in Appendix II of this study.

## EQUIPMENT

The mobile laboratory was equipped with a four-paddle stirrer, a Hach Model DREL turbidimeter, a pH meter, and miscellaneous other glassware and equipment for titrating.

## TESTS

The testing started on June 11, 1980, and continued into September, covering the entire rock flour, glacial melt period.

Temperature, pH, hardness, alkalinity, and turbidity tests were performed at the sampling point. Also, jar testing was used to determine optimum coagulant dosage, effects of rapid and slow mixing, and floc settling rate. These tests were conducted daily until repeatable results to primary variables were established. Testing frequency was then reduced to 3 days per week unless significant changes in weather or stream condition occurred.

In addition to on-site testing, samples were collected and transported to an off-site laboratory for particle size analysis and other routine chemical and physical analyses. These tests were performed bimonthly throughout the testing period.

Results of the on-site and off-site tests are shown on Table 2-1. Additional Eagle River raw water quality data, obtained between January and June 1981, is contained in Exhibit B at the end of this appendix.

Table 2-1
CHEMICAL AND PHYSICAL ANALYSES
SUMMER 1980

| | Dates | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 7-23 | 7-28 | 8-8 | 8-15 | 8-25 | 8-29 | 9-5 | 9-16 |
| Ca (mg/l) | 12 | 11 | 12 | 13 | 19 | 19 | 21 | 12 |
| Fe (mg/l) | 4.4 | 4.6 | 1.6 | 1.0 | 0.5 | 1.3 | 0.4 | 4.2 |
| Mn (mg/l) | 0.07 | 0.08 | 0.04 | <0.05 | <0.05 | 0.06 | <0.05 | 0.07 |
| Si (mg/l) | 13.2 | 14.4 | - | - | - | - | 2.8 | 10.4 |
| $SiO_2$ (mg/l) | 28 | 30.9 | 8.8 | 6.8 | 5.1 | 2.7 | - | 22.3 |
| Nitrate (mg/l) | 0.26 | <0.10 | 0.18 | 0.26 | 0.17 | 0.19 | 0.21 | 0.67 |
| Sulfate (mg/l) | 8.4 | <1 | 4.5 | 0.5 | 7.5 | 9.5 | 9.0 | 3.5 |
| Total Dissolved Solids (mg/l) | 137 | 79 | 99 | 71 | 92 | 110 | 105 | 85 |
| Turbidity (NTU) | 160 | 300 | 180 | 80 | 35 | 26 | 12 | - |
| Suspended Solids (mg/l) | 242 | 400 | 232 | 99 | 44 | 18 | 6.4 | 361 |
| Hd $CACO_3$ (mg/l) | 44 | - | 43 | 55 | 64 | 70 | 78 | 52 |
| Alkalinity as $CaCO_3$ | | | | | | | | |
| Bicarb. $HCO_3$ (mg/l) | 52 | 60 | 51 | 97 | 110 | 84 | 88 | 55 |
| Carb. $CO_3$ (mg/l) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Conductivity (umhos) | 100 | 84 | 92 | 96 | 120 | 140 | 165 | 100 |
| Color (cu) | 10 | 30 | >70 | 50 | 45 | 35 | 30 | 30 |
| Chloride (mg/l) | 2 | 30 | 8 | 5 | 2 | 2 | <1 | <1 |

## Temperature

Figure 2-1 shows a plot of both air and river water temperatures throughout the test period. While air temperatures were generally in the 15-degree- to 20-degree-C range, water temperatures held fairly constant at 6 degrees to 7 degrees C.

During the test period there was a general relationship between air and water temperature. This is illustrated by the drop in both air and water temperature between August 29 and September 8.

## Turbidity

Turbidity ranged from 30 to 400 NTU, with the normal at about 150 NTU (Figure 2-2). Turbidity in the Eagle River is directly

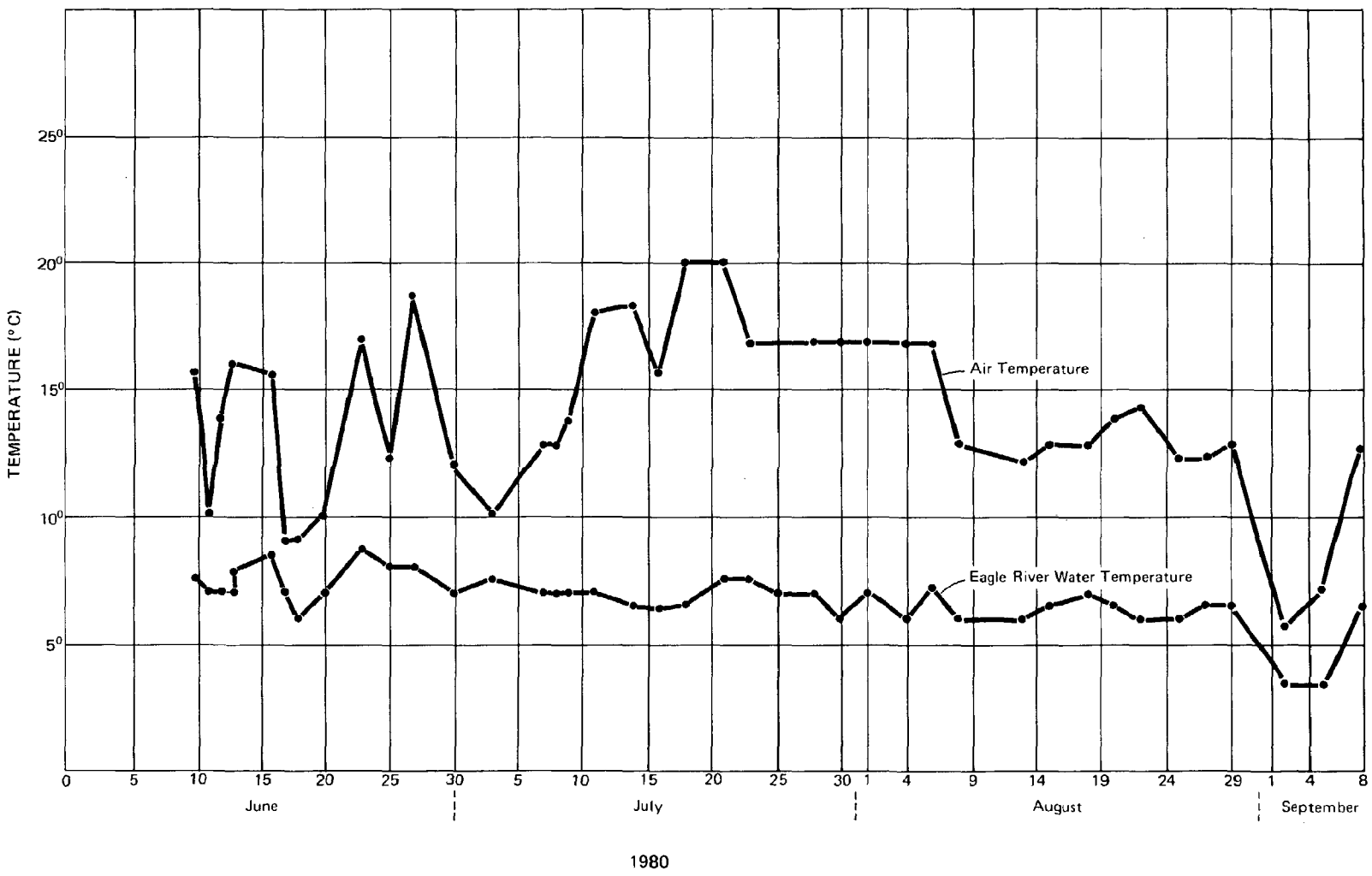



**Figure 2-1**
**Air and Water Temperature**

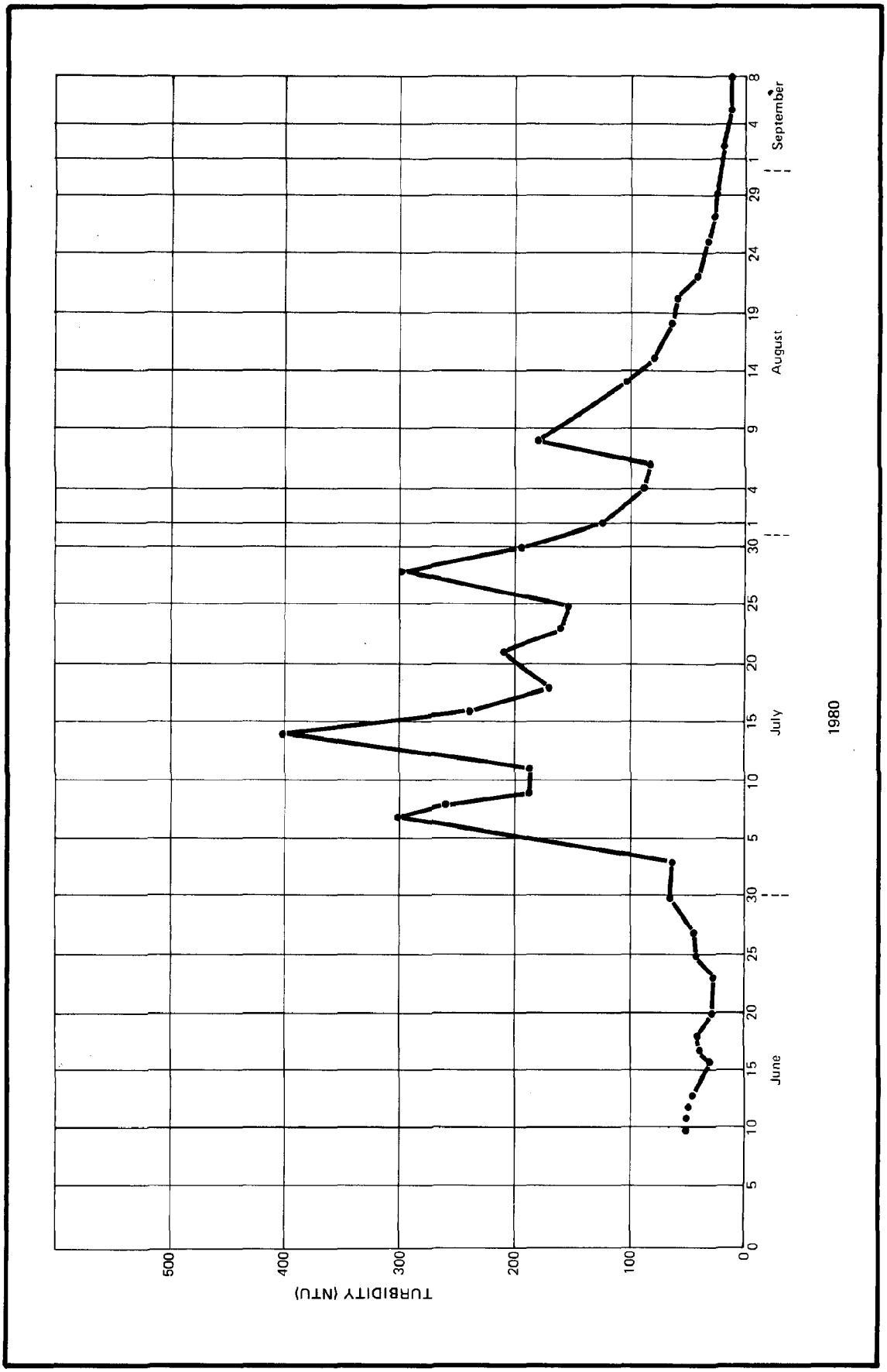



**Figure 2-2**
**Turbidity**

linked to air temperature and rate of melt of the glaciers feeding the river. The river appears greyish in color, which is typical of the rock flour solids that create the turbidity.

Periodically, samples were analyzed for both dissolved and suspended solids. Occurrence of these solids was plotted against turbidity (Figure 2-3). This plot indicates a rough correlation between turbidity and suspended solids, a turbidity of 75 NTU equaling approximately 100 mg/l of suspended solids. Dissolved solids remain more or less constant regardless of turbidity or suspended solids.

Suspended solids particles that cause turbidity were analyzed for size distribution. The six samples analyzed showed that 90 percent of the particles were smaller than 2 microns, and 87 percent were larger than 0.5 micron. The particle count mean averaged 0.86 micron.

The data from tests taken during the summer of 1980 closely resemble water quality data gathered by the USGS during the period 1948 to 1973. (The USGS data are included as Exhibit A at the end of this report.) Suspended solids measurements and turbidity generally agree with historic data; however, the previous high suspended solids loadings of 1,200 to 1,400 mg/l were not observed. Our maximum observation was 400 mg/l. Either the high loadings did not occur this year or they were missed, even though a conscious effort was made throughout the summer to take samples when changes in temperature, runoff, and rainfall were observed.

## pH

The pH of Eagle River water was fairly constant, generally between 7.3 and 7.5. This information is plotted in Figure 2-4.

## Alkalinity and Hardness

Alkalinity and hardness vary seasonally and seem to correlate with turbidity. Both alkalinity and hardness decrease during the summer months, which are associated with higher streamflow and turbidity. Alkalinity varies from 50 to 60 mg/l in the winter to 30 to 45 mg/l in the summer. Similarly, hardness varies from 70 to 80 mg/l during the winter to 40 to 50 mg/l in the summer. Both the alkalinity and hardness of the Eagle River water during the sampling period are expressed in milligrams per liter as $CaCO_3$ in Figure 2-5.

## Jar Testing

Jar testing is a bench-scale test that gives insight into full-scale coagulation and settling processes. The primary purpose for jar testing in this task was to determine how different coagulant

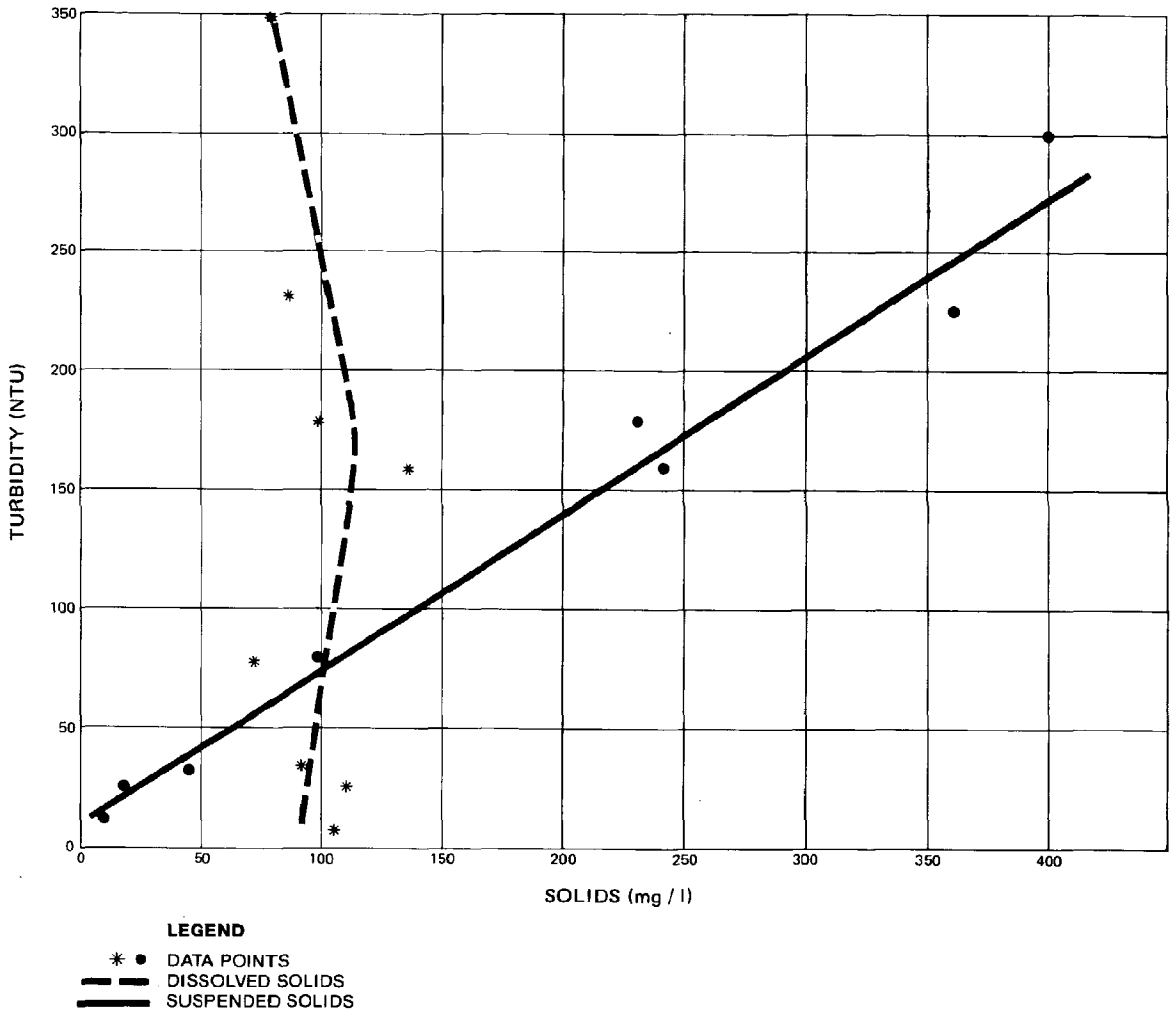



**Figure 2-3**
**Turbidity vs Dissolved and Suspended Solids**

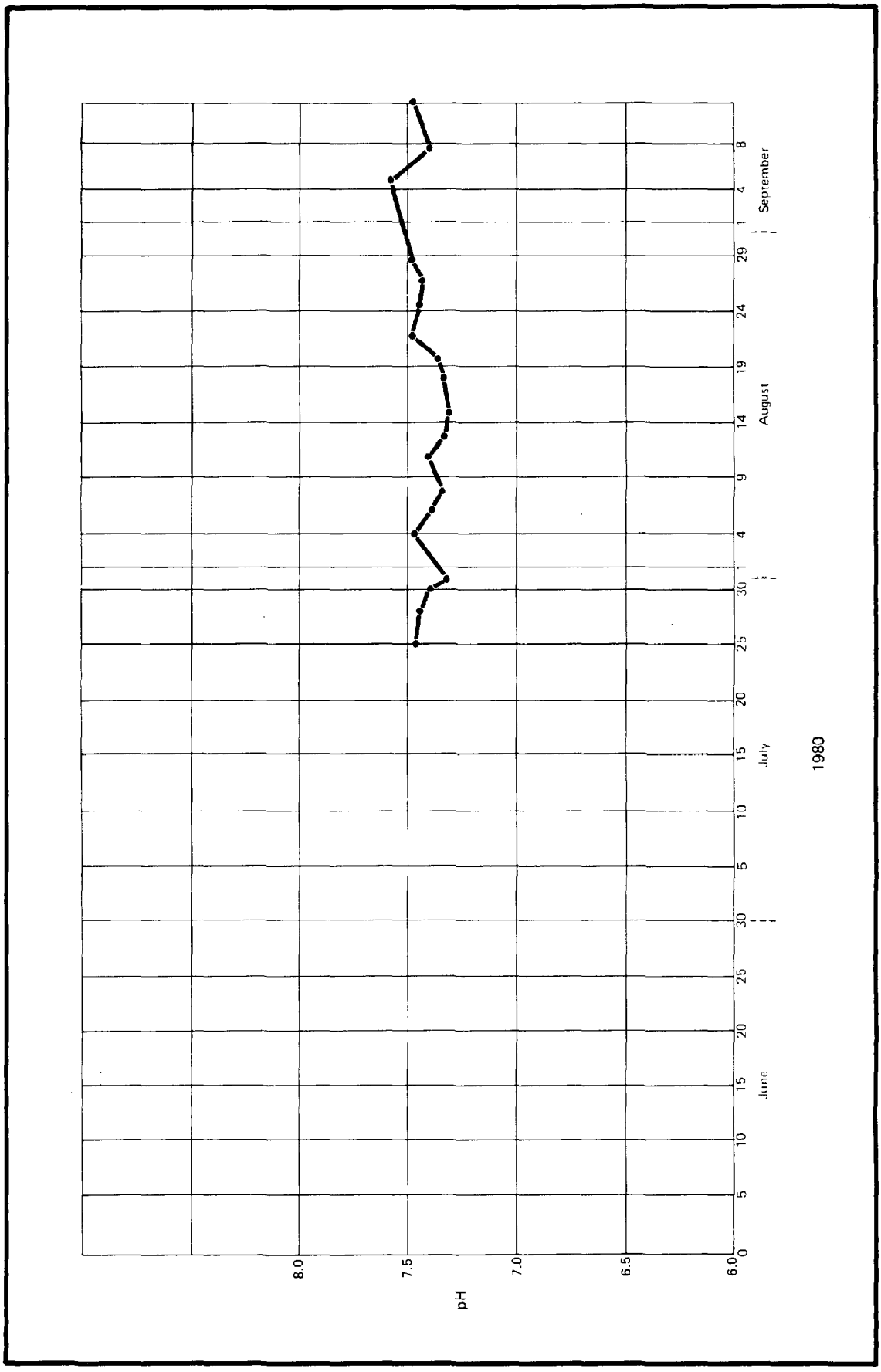

pH
8.0
7.5
7.0
6.5
6.0
0
5
10
15
20
25
30
June
1
5
10
15
20
25
30
July
1
4
9
14
19
24
29
August
1
4
8
September
1980

**Figure 2-4**
**pH**

**Figure 2-5**
**Hardness and Alkalinity**

(alum) dosages reacted with the range of raw water quality during the highly turbid glacial melt period. The effects of changing water temperatures, rapid and slow mixing rates, and rapid and slow mixing durations were then investigated to refine the treatment requirements of the Eagle River water.

Initial jar testing showed that two separate alum dosage ranges achieved coagulation and clarification within a broad range of alum dosage. Figure 2-6 shows alum dosage plotted against turbidity after mixing and settling. The plot shows four distinct zones that occur frequently in treating highly turbid river water. When proceeding from left to right the zones can be described as follows: (1) insufficient alum, thus no coagulation, (2) effective alum dosage that achieves coagulation-clarification through destabilization of turbidity particles, (3) another zone of ineffective coagulation, and (4) a second zone of effective coagulation-clarification, this time resulting by adsorption and enmeshment of turbidity particles.

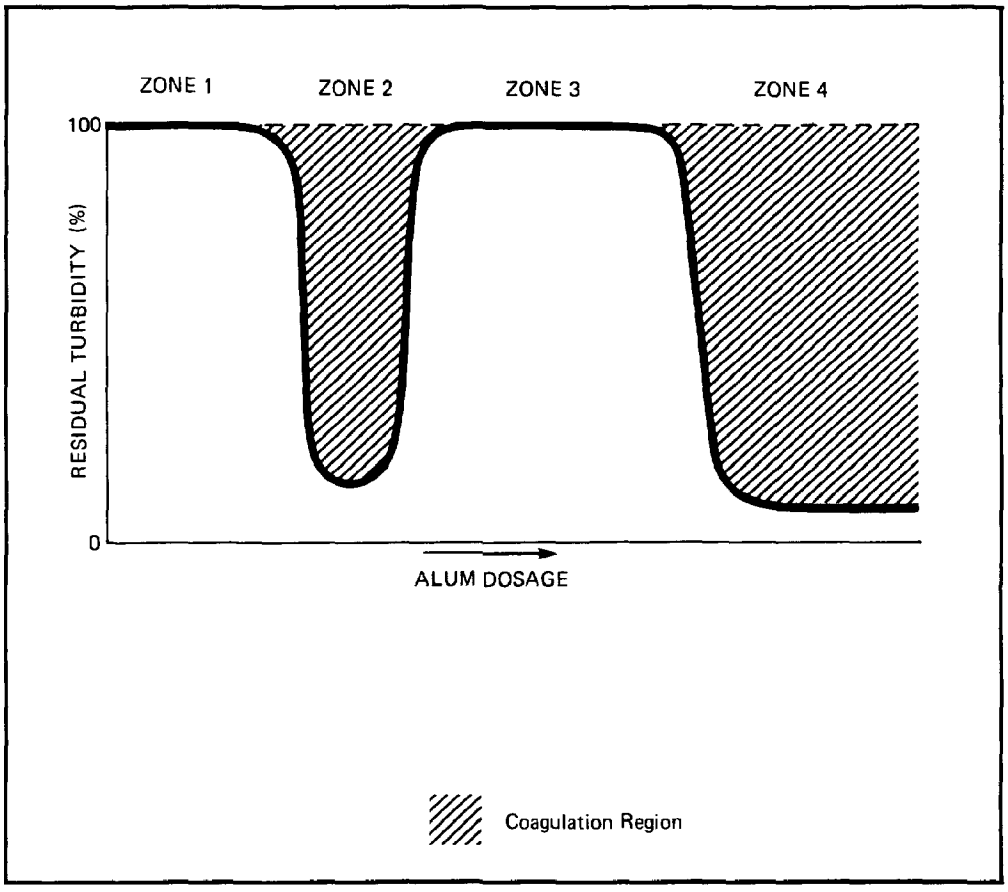



**Figure 2-6**
**Coagulation of Water With High Turbidity**

Plant-scale operation would use Zone 2 rather than Zone 4 because less alum is used and a reduced volume of sludge is produced. Subsequent testing focused on this lower dosage zone to establish how dosage requirements varied with changing river turbidity and temperature. The optimum alum dosage for the summer's test program was between 10 and 15 mg/l.

The jar testing results showed that turbidity can be removed effectively through use of coagulation, flocculation, and sedimentation. The settled water produced from these procedures has a turbidity of 10 NTU or less for raw river water temperatures between 3 degrees and 7 degrees C regardless of turbidity. Figure 2-7 shows a typical plot of alum dosage against turbidity after settling.

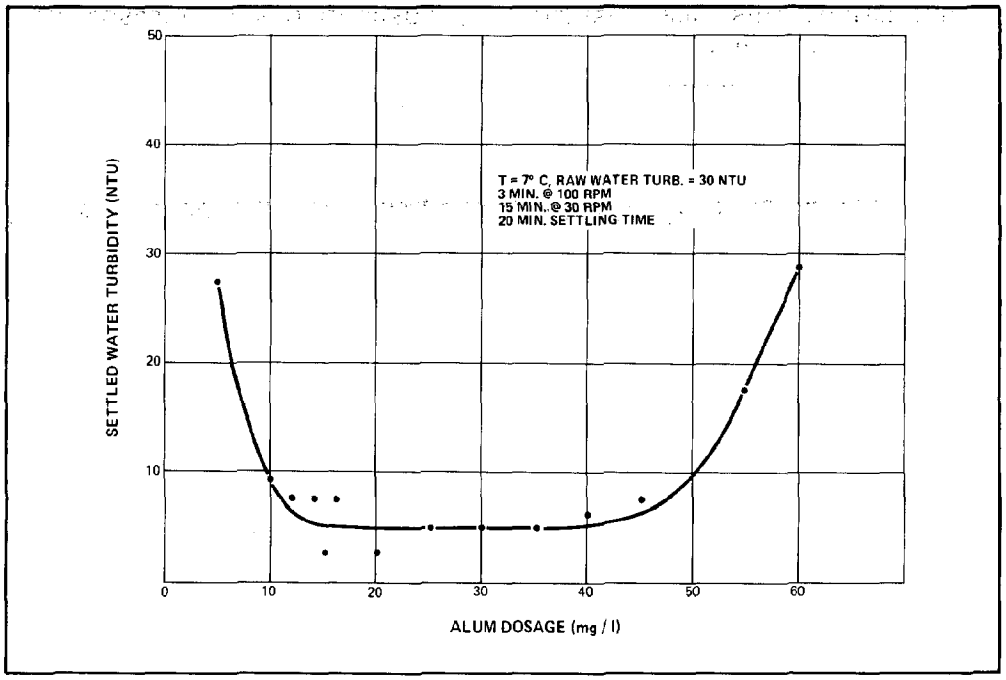



**Figure 2-7**
**Settled Water Turbidity vs Alum Dosage**

Once the optimum dosage of 10 to 15 mg/l of alum was established, testing then turned to identifying whether an increase in water temperature above the natural river temperature would have a significant effect on coagulation, flocculation, and sedimentation (Figures 2-8, 2-9, and 2-10). In general, settling occurred more rapidly as the water temperature increased; however, the end

turbidity was the same. There is a possibility that river water could be preheated as it enters the treatment plant by waste heat energy from a future fossil-fuel-fired electric power plant being considered.

Additional testing established, in a general sense, the effect of varying either or both rapid mixing and slow mixing on floc formation and settling characteristics. Rapid mixing performed best with the stirrer set at 90 rpm for 3 to 5 minutes, and the slow mixing appeared to be most effective at 30 rpm for 12 to 15 minutes. Using optimum rapid and slow mixing, the best observed settled water characteristics resulted after 20 to 25 minutes. No attempt was made to correlate the jar stirrer with plant-scale mixing equipment.

Because the alum dosage requirement was so low, little subsequent testing was done using polymers as a substitute coagulant or as a coagulant aid.

Use of alum as a coagulant has a side effect of lowering the pH of the water, which often increases the corrosiveness of the water to piping systems and household plumbing. Because the decrease of the pH using 10 to 15 mg/l of alum was observed to be small (from 7.5 to 7.2), it may not be necessary to add lime to raise the pH after coagulation to reduce corrosion. Lime systems are typically a nuisance to both operate and maintain. Further investigation of this matter should be conducted during pilot plant testing.

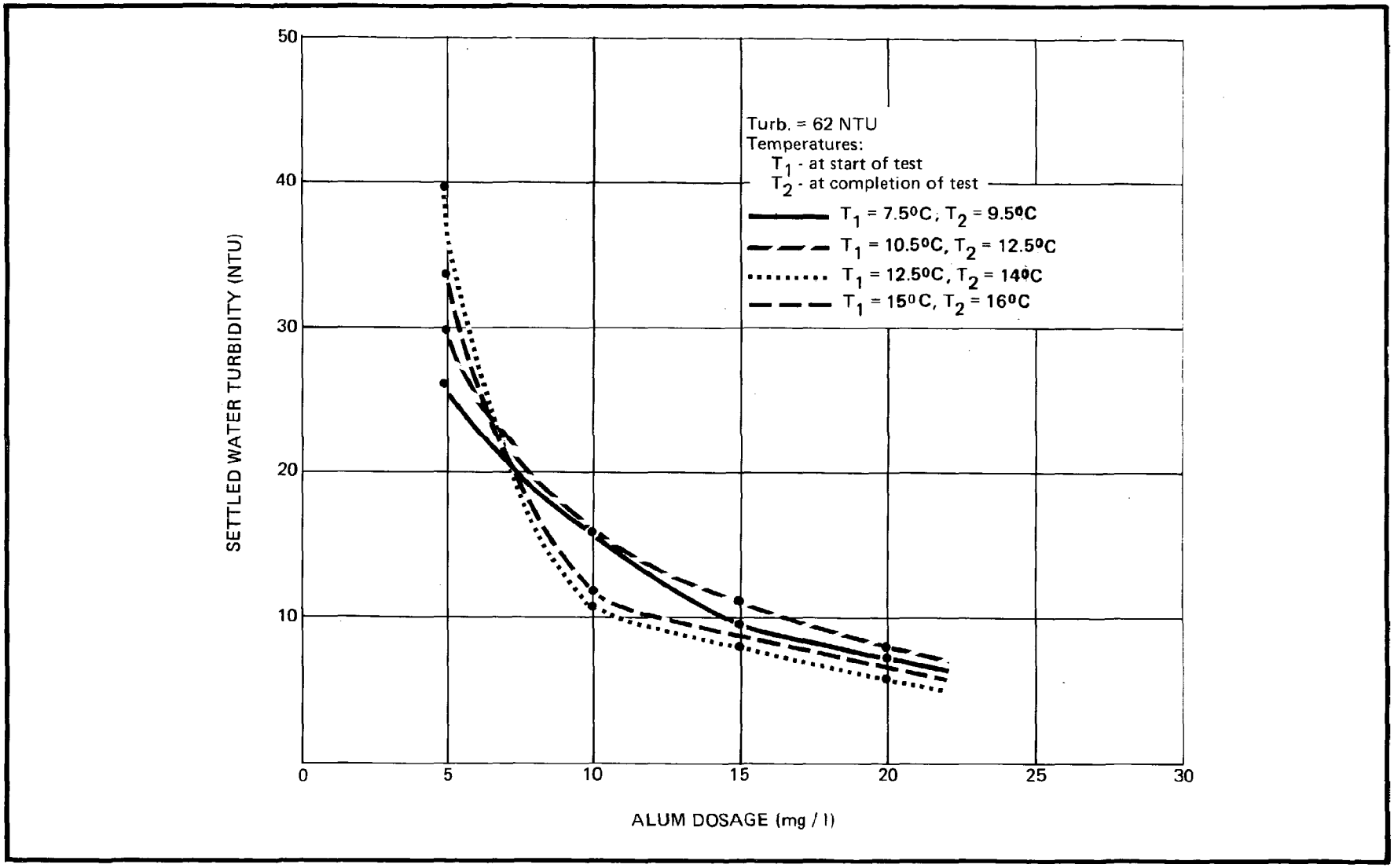



**Figure 2-8**
**Settled Water Turbidity vs Alum Dosage at Various Water Temperatures**

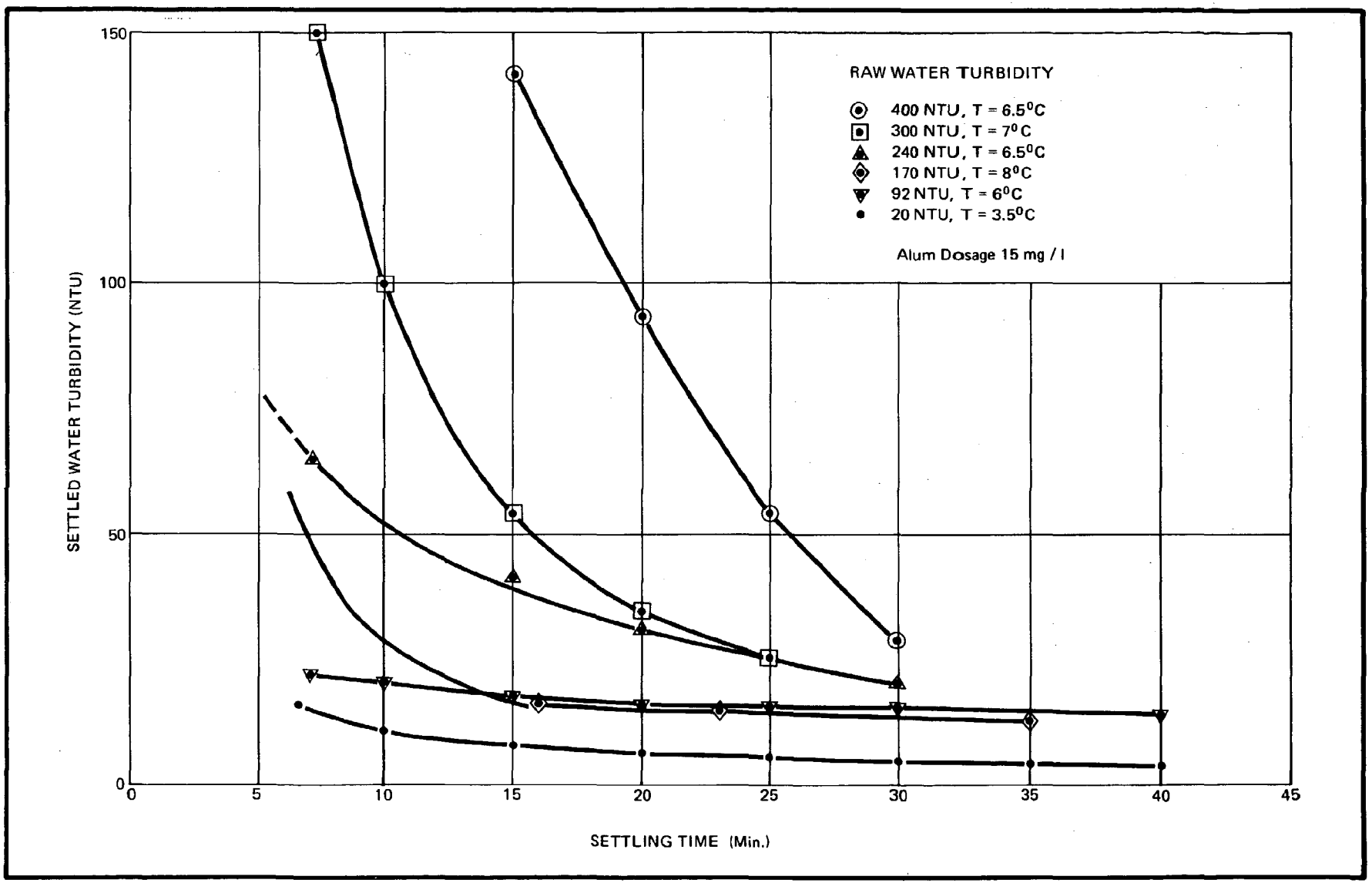



**Figure 2-9**
**Settled Water Turbidity vs Settling Time at Various Water Temperatures**

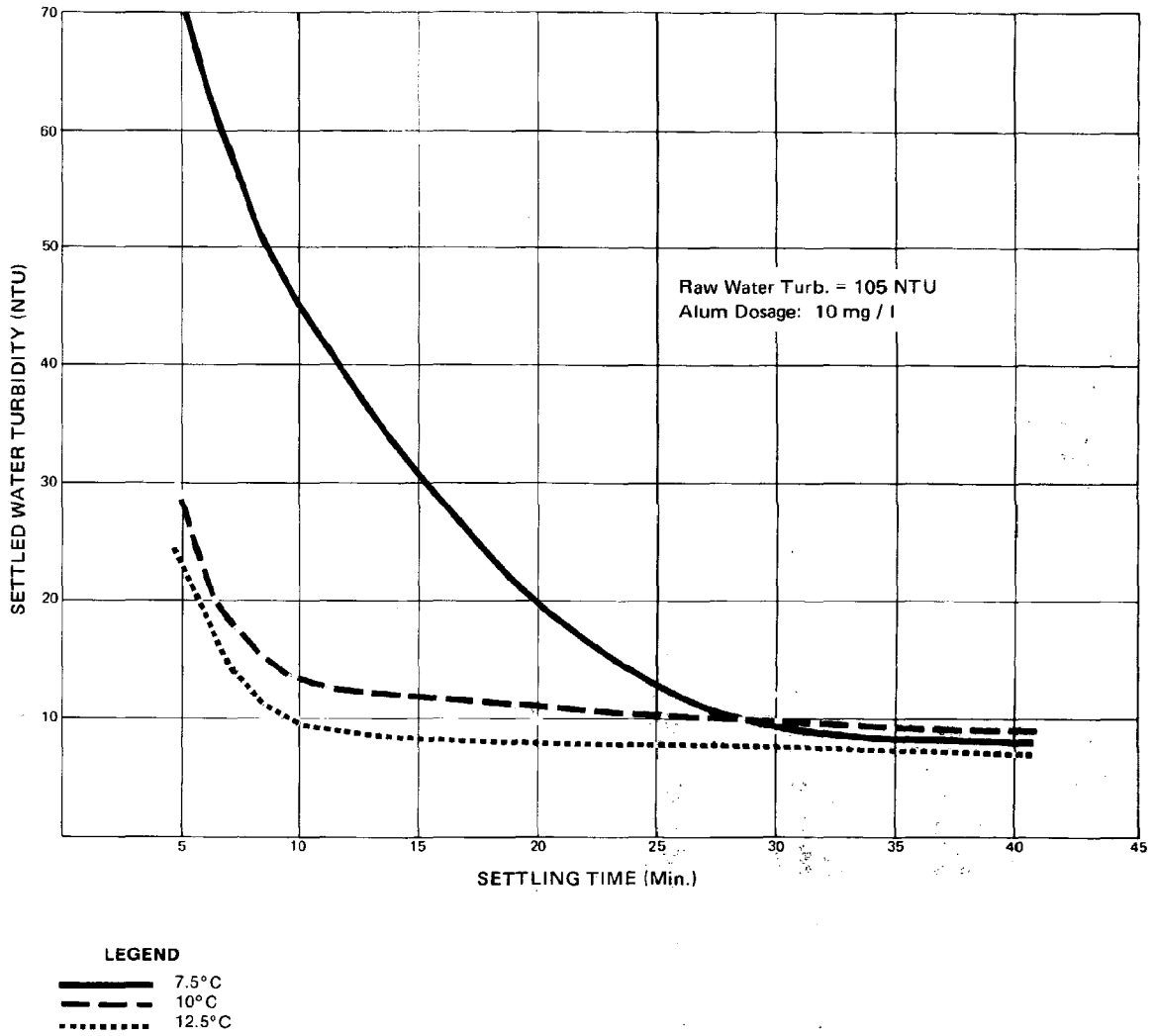



**Figure 2-10**
**Settled Water Turbidity vs Temperature and Settling Time**

# Chapter 3
# TREATMENT REQUIREMENTS AND RECOMMENDATIONS

## TREATMENT REQUIREMENTS

Treatment goals should achieve or exceed the State of Alaska drinking water regulations and the EPA standards as set forth in the National Interim and Secondary Drinking Water Regulations. Table 3-1 lists several of the more common water quality parameters and shows both EPA Maximum Contaminant Level (MCL) requirements and natural levels of these parameters in the Eagle River. The Eagle River water exceeds MCL requirements in only turbidity, color, iron, and manganese.

Table 3-1
WATER QUALITY STANDARDS AND RAW EAGLE RIVER QUALITY

| | EPA (MCL)[a] | Raw Eagle River |
|---|---|---|
| **Physical Factors** | | |
| Color (platinum cobalt units) | 15 | 10-70[b] |
| Odor (threshold odor No.) | 3 | - |
| Turbidity (NTU) | 1 | 5-400 |
| **Chemical Factors (mg/l)** | | |
| Iron | 0.3 | 4.6 |
| Manganese | 0.05 | 0.1 |
| Chloride | 250 | 0.3-30 |
| Sulfate | 250 | 0.5-38 |
| Nitrate-N | | 0.26 |
| Fluoride | 2.4[c] | 0.3 |
| Hardness | | 34-134 |
| Dissolved Solids | 500 | 41-167 |
| pH | 6.5-8.5 | 6.4-8.1 (avg. 7.5) |
| THM | 0.10[c] | |

[a] Maximum contaminant level.

[b] Raw water color is influenced by turbidity; raw water samples were not centrifuged or filtered before color was measured.

[c] Maximum for annual average maximum daily air temperature 50 degrees F.

After it was found in Task 1, Well Drilling Program, that the Eagle River Valley does not contain enough groundwater to fulfill the Anchorage area water needs, the Municipality requested that additional testing of Eagle River surface water be conducted for biological quality and for heavy metal and organic chemical content. The results of these analyses (conducted from January to June 1981) are documented in Exhibit B of this report. These results also indicate an excess of color in Eagle River water.

During the eight coldest months when glacial melt ceases, the river is cold (zero to 4 degrees C) with low turbidity (2 to 40 NTU). During the summer, streamflow swells considerably, reflecting glacial melting. In the summer, the river exhibits temperatures ranging from 6 to 8 degrees C and turbidities ranging from 50 to over 400 NTU. The high turbidity caused by glacial flour may seem to present a treatment problem, but highly turbid water actually is more readily treatable. It is cold, low-turbidity water that generally presents the greatest treatment problems.

Experience with Ship Creek water at the Municipal Water Treatment Plant indicates that removal of color and turbidity during periods of low raw water turbidity requires special treatment beyond the addition of 10 to 15 mg/l of alum. The same may be true of Eagle River water. To enhance the coagulation, sedimentation, and filtration processes for effective color and low turbidity removal, lime addition at the headworks or other treatment methods might be required.

In general, Eagle River raw water should be an excellent source of potable water but, prior to final design, it is strongly recommended that a full 1-year pilot plant testing program, using at least a 1-mgd plant, be conducted to establish process design criteria. This testing program should address iron, color, and turbidity removal; chemical dosages required over the full range of raw water parameters; filtration rates and media selection; and effectiveness of the recommended treatment processes.

## TREATMENT PROCESSES

To satisfy the water treatment requirements most efficiently, the plant will require different operational modes to accommodate summer and winter variations. Figure 3-1 illustrates three possible operational modes: conventional treatment, direct filtration, and in-line filtration. Conventional treatment uses flash-mixing of coagulants, flocculation, sedimentation, and filtration processes. This mode would be applicable during the summer months when the river turbidity is high--over 50 NTU.

Direct filtration uses most of the above processes but would bypass the sedimentation basins. In-line filtration would bypass the flocculation and sedimentation basins but would move the coagulant application point closer to the filters. Both direct and

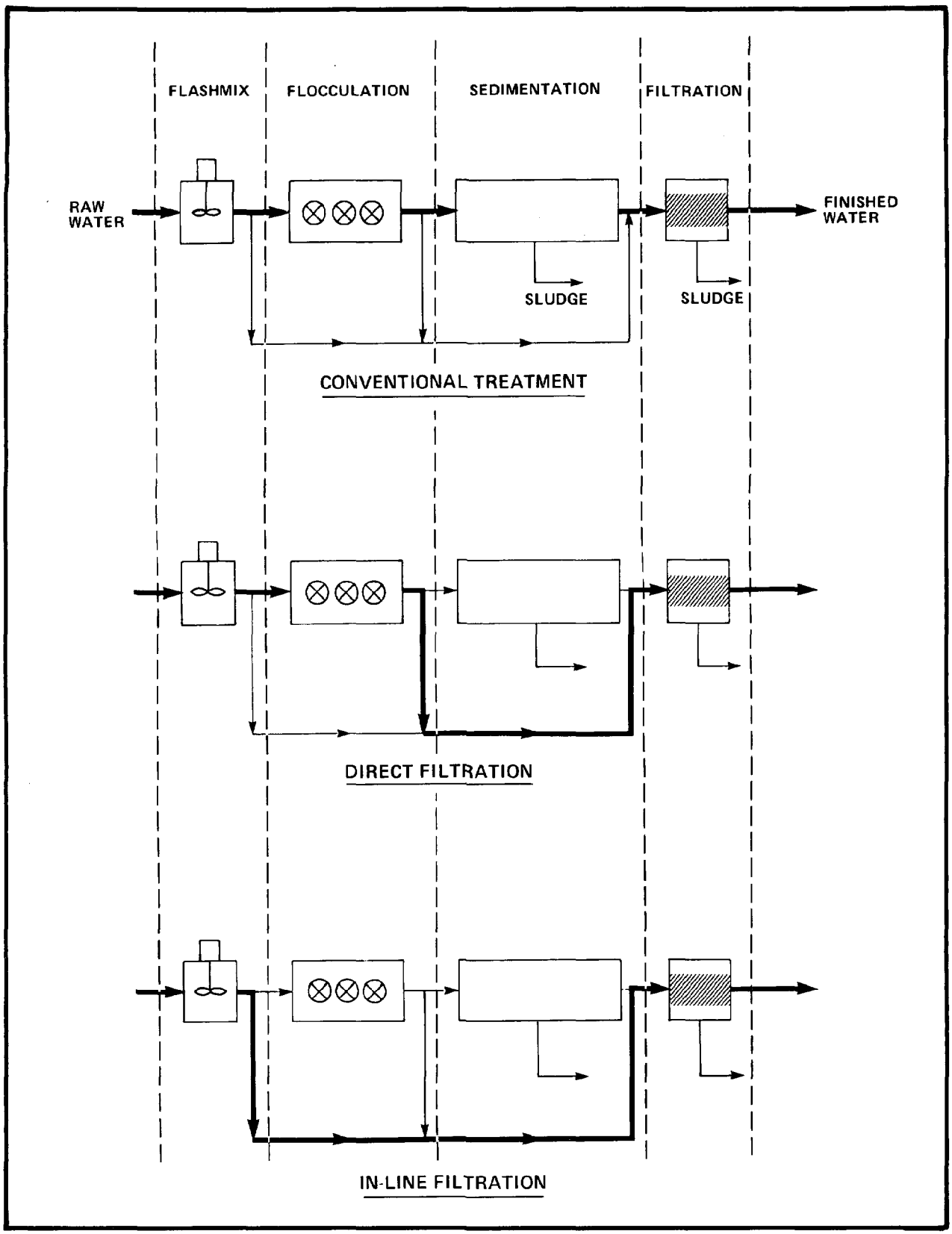



**Figure 3-1**
**Treatment Process Options**

in-line filtration should be applicable for Eagle River water treatment during the fall, winter, and spring months when glacial melt is at a minimum and, therefore, raw water turbidity is less than 50 NTU. The feasibility of using direct and in-line filtration should be confirmed by the pilot testing program.

Conventional treatment is compatible with either the direct or in-line process. The transition, seasonally, from one process to the other would be easy. Bypass channels or piping is all that is needed to achieve operational flexibility. As might be expected, operational cost for either direct or in-line filtration will be substantially lower than for conventional treatment because of lower chemical dosages, reduced sludge production, and less equipment maintenance.

## TREATMENT PLANT

Figure 3-2 shows a typical filtration plant flow schematic, and Figure 3-3 shows a preliminary layout for a 70-million-gallon-a-day plant. The plant could be constructed in increments with basins and filters added when needed with little disruption to continuing operation of existing facilities. From the layout, it can be seen that a 7-acre site will be required.

Although plant site selection is beyond the scope of this task, desirable sites would be those that provide easy access during all weather conditions, minimize pumping requirements through careful site selection at the proper elevation, and eliminate the need for either raw or finished water pumping. Elimination of raw water pumping is more desirable, providing construction cost savings and reduced equipment wear. Finished water pumping can facilitate customer service along the transmission pipeline.

### Headworks

The headworks contains facilities for application and mixing of chemicals plus a metering device to measure raw water flow into the plant. Chemicals can be mixed by using either an "in-channel rapid mixer" or a metering device such as a Parshall flume.

### Flocculation

Floc nuclei (aluminum hydroxide) resulting from coagulation join together through numerous contacts and envelop suspended particles in the process. Upon sufficient mixing, the floc grows to a size and density that settle readily.

It is important in both the flash-mixing and flocculation zones that equipment be furnished with variable-speed drives to allow variation in energy inputs. Because optimum mixing requirements vary from season to season, chemicals may be wasted if proper adjustments cannot be made.

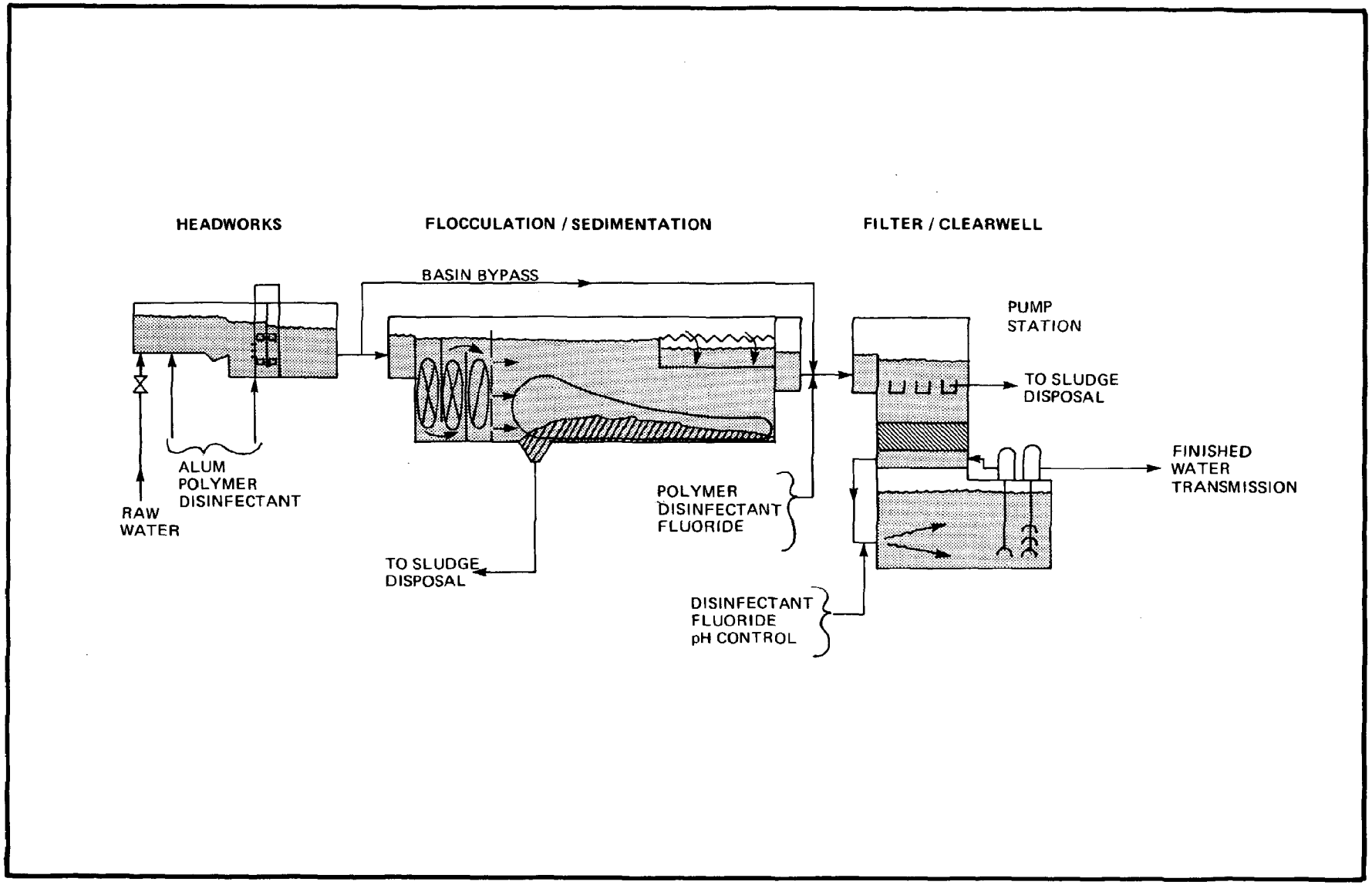
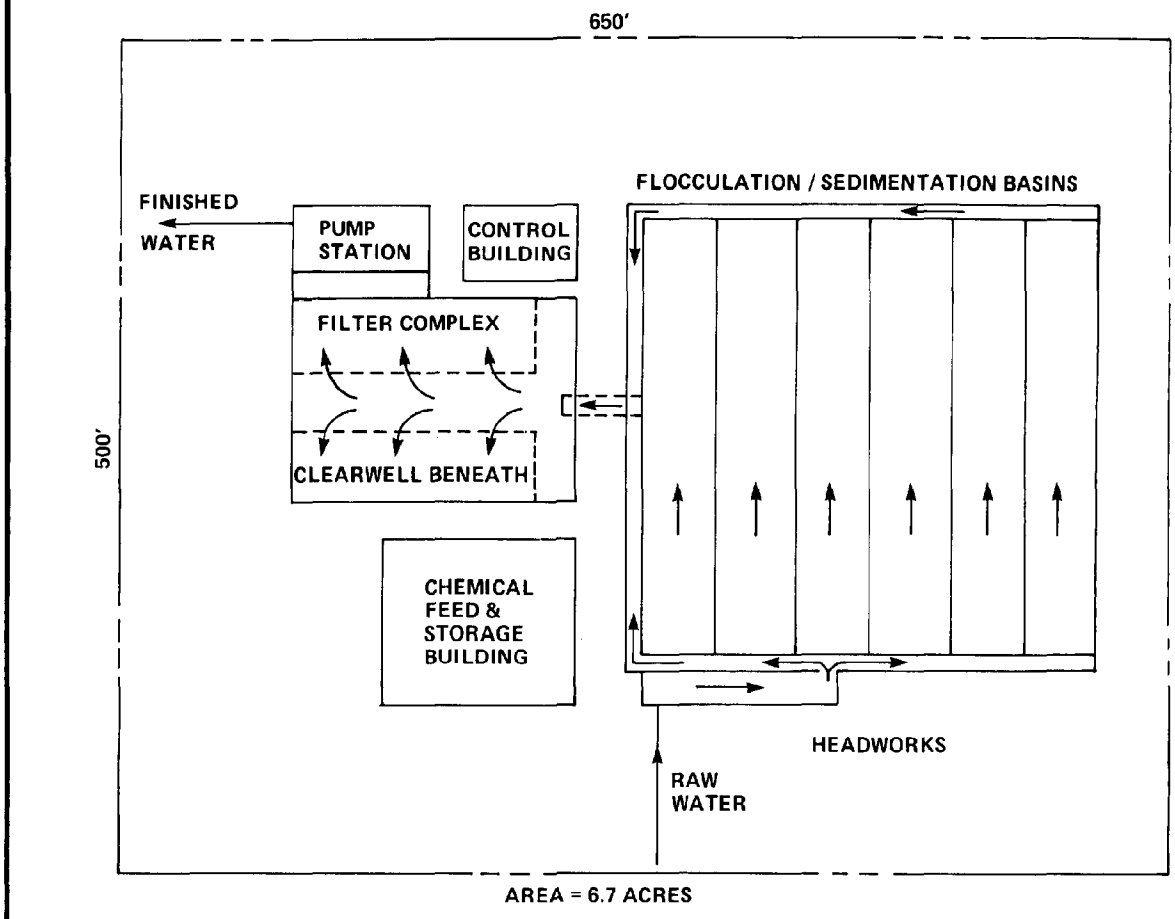



**Figure 3-2**
**Typical Plant Flow Schematic**




Scale 1"=100'

**Figure 3-3**
**Preliminary Plant Layout**

## Sedimentation

Dense floc particles, including suspended solids, settle out in the sedimentation area leaving comparatively clear water containing a minimum of floc. Because of the heavy rock flour load, the sedimentation basins should be equipped with mechanical sludge removal equipment. It is anticipated that between 50 and 150 tons of dry solids sludge will be produced daily during the summer.

## Filtration System

The settled water from the sedimentation area, containing a small amount of unsettled floc, proceeds to the filters. The filters remove the remaining floc. Granular media filters consist of either two or three layers, each exhibiting a different size and specific gravity. The largest grain media having the lowest specific gravity is located at the top of the filter with progressively smaller and heavier sizes toward the bottom. This arrangement permits floc and sediment particles to be removed throughout the entire filter rather than mostly at the surface as typically occurs in single-grain-media filters. The addition of polymer as a filter aid immediately ahead of filtration improves floc removal within a filter, even at higher filtration rates. A nominal filtration rate of 6 gallons per minute per square foot is suggested for an Eagle River filtration plant. Pilot filter testing is needed to (1) verify the design filter rates, both summer and winter; (2) select filtering media specifically for local conditions; and (3) identify which chemicals are needed to aid filtration and in what quantity.

## Wastewater Disposal

Sludge containing rock flour and sediment from the river is produced in two locations in the plant: the sedimentation basin underflow and the filter backwash water. At a plant flow rate of 70 mgd and a raw water turbidity of 150 NTU, the quantity of sludge produced would equal 55 tons per day of dry solids, which would equal approximately 730 cubic feet per day of solids. Removal of solids from sludge for ultimate disposal is often the most complex problem to be solved in the design of a water treatment plant.

Generally, there are two means for dewatering sludge solids, either by natural means such as evaporation, percolation, and freezing or by mechanical means using such devices as vaccum filters, filter presses, and centrifuges. The cost for mechanical dewatering is usually three to ten times the cost for natural drying.

Natural drying in drying beds or lagoons is the practical choice where climatic conditions permit drying to the degree that the sludge exhibits the characteristics of a solid that can be readily loaded for landfill disposal. Usually two or more beds or lagoons are provided to permit use of one while the other is drying.

More thorough evaluation of the local climatic and geologic conditions is required before a decision can be made regarding sludge disposal.

### Disinfection

With the addition of disinfection, the water leaving the filters is of potable quality and ready for transmission and distribution to the public. Although chlorine has been the universal disinfectant in public water works, further consideration should be given to the use of other disinfectants for preliminary disinfecting while continued use of chlorine or hypochlorite will likely remain the choice for post disinfection as the water enters the transmission and distribution systems. Further investigation is required prior to selecting disinfectants and their application points within the plant. Trihalomethane formation potential needs to be determined upon selection of Eagle River surface water as supply source.

## ALTERNATIVE TREATMENT METHODS

Alternative treatment methods were considered, some of which were reported by others in previous studies. These methods include hydroclone separators, screening with microstrainers, and precoat filters. Only precoat filtration is applicable for the Eagle River conditions and could be considered an alternative to granular media filtration. Historically, granular media filtration is the choice for public water supplies, especially installations over 5 mgd. The disadvantage of precoat filtration is the possibility of loss of the precoat from the filtering septum, allowing raw water to short circuit through the filter. Loss of precoat can be caused by hydraulic surges, changing flow rate, power failure, and operator error. Granular media filters are subject to operator error only. Further consideration of the precoat filtration is not considered worthwhile.

# Chapter 4
# COST ESTIMATE

Table 4-1 shows the total project costs for a 70-mgd plant as well as a 23.33-mgd plant, which provides for ultimate plant development in three equal increments.

Table 4-1
ESTIMATED PROJECT COSTS[a]

| | Plant Capacity | |
|---|---|---|
| | 23-1/3 mgd | 70 mgd |
| Capital | | |
| Construction (Anchorage) | $10,900,000 | $26,000,000 |
| Contingency, Bonds and Insurance, and Technical, Adm., and Legal Services (Anchorage) | 6,459,000 | 15,400,000 |
| TOTAL Capital Costs[b] | $17,359,000 | $41,400,000 |
| Annual O&M | | |
| Labor | 443,000 | 895,000 |
| Chemicals | 335,000 | 1,006,000 |
| Power | 193,000 | 580,000 |
| Maintenance Materials | 98,000 | 212,000 |
| Miscellaneous | 6,000 | 17,000 |
| TOTAL Annual O&M Costs | $ 1,075,000 | $ 2,710,000 |

[a] In January 1981 dollars.

[b] Land costs are not included.

The estimated construction costs and operation and maintenance costs are based on actual experience for plants constructed and operated in the Pacific Northwest and have been adjusted to reflect costs for Alaska. They are also based on the EPA Estimating Water Treatment Costs, Volumes 1 and 2, and on the MAUS, Volume 2. These estimates are considered as order of-magnitude estimates with a -30 to +50 percent reliability range.

Construction costs reflect the use of reinforced concrete construction with all basins and filters being enclosed. The estimates

include finished water pumping (without standby power) but exclude both raw water and finished water transmission piping and raw water pumping.

Construction costs are in January 1981 dollars using an Engineering News Record Construction Cost Index of 347. Although land costs are not included in the estimates, the site requirements are 7 acres for the plant and 23 acres for the lagoons--a total of 30 acres.

# Chapter 5
# BIBLIOGRAPHY

U.S. Army Corps of Engineers, Alaska District, in conjunction with the Municipality of Anchorage. Metropolitan Anchorage Urban Study, Volume 2, Water Supply. 1979.

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———————. Estimating Water Treatment Costs, Volume 2, Cost Curves Applicable to 200 MGD Treatment Plants. EPA-600/2-79-162B. Municipal Environmental Research Laboratory, Office of Research and Development. Prepared by Culp/Wesner/Culp Consulting Engineers, Santa Ana, California. August 1979.

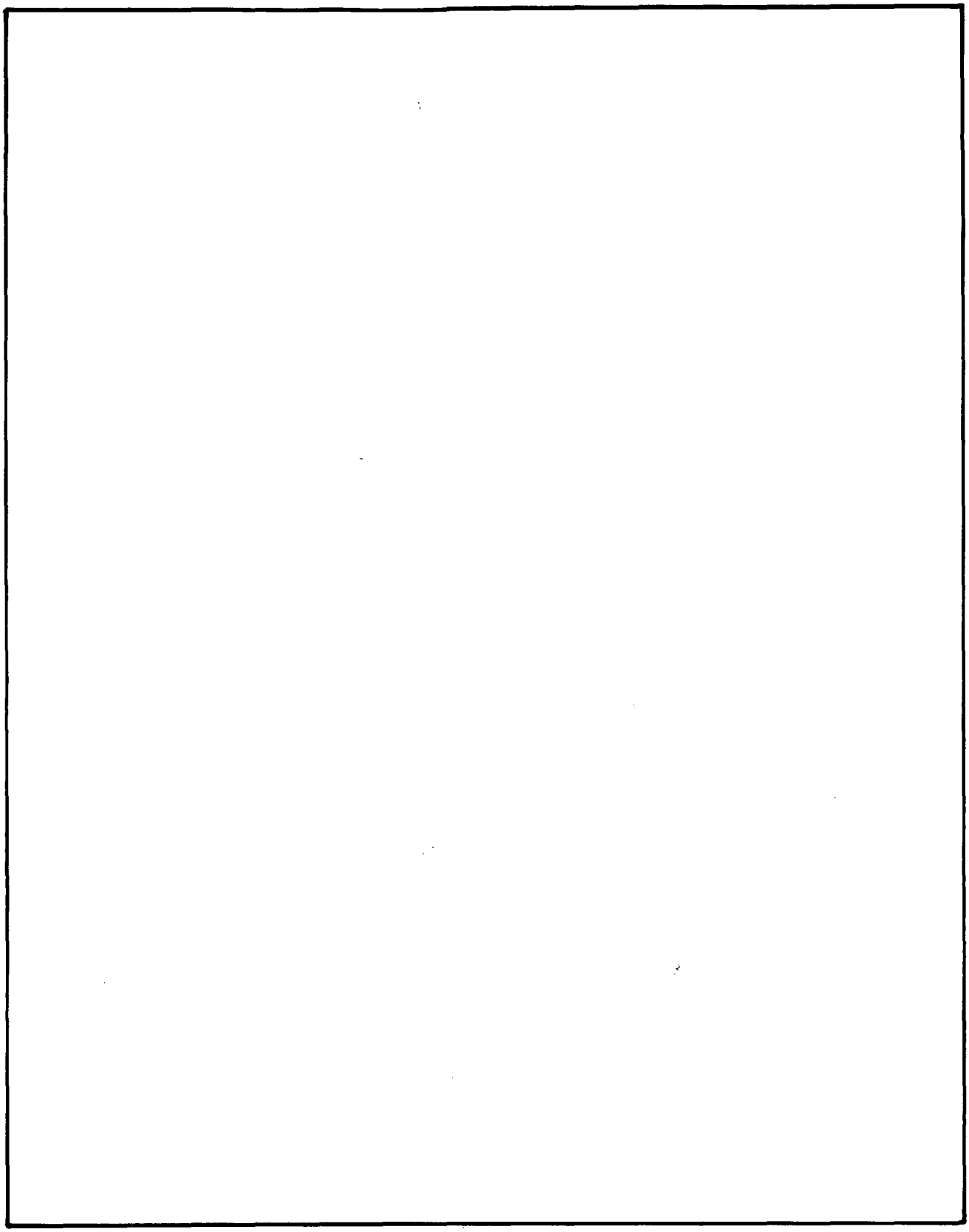

**Exhibit A**
**USGS Water Quality Data**

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
15277100 - EAGLE R AT EAGLE RIVER AK

PROCESS DATE 12/02/81
DISTRICT CODE 02

WATER QUALITY DATA

| DATE | TIME | TEMPERATURE (DEG C) (00010) | SURFACE AREA / (SQ MI) (00049) | COLOR (PLATINUM-COBALT UNITS) (00080) | SPECIFIC CONDUCTANCE (UMHOS) (00095) | PH (UNITS) (00400) | CARBON DIOXIDE DISSOLVED (MG/L AS CO2) (00405) | ALKALINITY FIELD (MG/L AS CACO3) (00410) | BICARBONATE (MG/L AS HCO3) (00440) | CARBONATE (MG/L AS CO3) (00445) | NITROGEN, NITRATE DISSOLVED (MG/L AS N) (00618) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT , 1948 | | | | | | | | | | | |
| 19... | -- | -- | 192 | -- | 174 | -- | -- | 67 | 82 | -- | .36 |
| 19... | 0845 | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- |
| APR , 1949 | | | | | | | | | | | |
| 28... | 1620 | 1.5 | -- | -- | 198 | -- | -- | 81 | 99 | 0 | -- |
| JUN | | | | | | | | | | | |
| 24... | 1820 | 9.0 | 192 | -- | 133 | 6.7 | 19 | 48 | 58 | 0 | .27 |
| APR , 1951 | | | | | | | | | | | |
| 19... | -- | -- | 192 | 10 | 146 | 7.5 | 3.4 | 55 | 67 | 0 | .23 |
| JUN | | | | | | | | | | | |
| 06... | -- | 9.5 | 192 | 5 | 113 | 7.0 | 8.5 | 43 | 53 | 0 | .16 |
| FEB , 1952 | | | | | | | | | | | |
| 21... | 1000 | .0 | 192 | 5 | 209 | 7.0 | 16 | 83 | 101 | 0 | .27 |
| MAR | | | | | | | | | | | |
| 12... | 0900 | .5 | 192 | 5 | 211 | 7.5 | 5.1 | 82 | 100 | 0 | .27 |
| APR | | | | | | | | | | | |
| 16... | 1200 | 1.0 | 192 | 5 | 194 | 7.4 | 5.9 | 76 | 93 | 0 | .25 |
| MAY | | | | | | | | | | | |
| 08... | 1300 | 7.0 | 192 | 5 | 203 | 7.5 | 5.1 | 82 | 100 | 0 | .23 |
| JUN | | | | | | | | | | | |
| 12... | 1600 | 10.0 | 192 | 5 | 152 | 7.2 | 7.5 | 61 | 74 | 0 | .32 |
| JUL | | | | | | | | | | | |
| 14... | 1430 | 9.0 | 192 | 5 | 92 | 6.8 | 11 | 36 | 44 | 0 | .16 |
| AUG | | | | | | | | | | | |
| 22... | 1800 | 10.0 | 192 | 5 | 98 | 7.1 | 6.1 | 39 | 48 | 0 | .14 |
| MAY , 1956 | | | | | | | | | | | |
| 03... | -- | -- | 192 | 10 | 190 | 7.5 | 4.4 | 71 | 86 | 0 | .29 |
| JUL | | | | | | | | | | | |
| 04... | -- | -- | 192 | 5 | 107 | 7.6 | 1.9 | 39 | 47 | 0 | .11 |
| OCT , 1957 | | | | | | | | | | | |
| 02... | 1055 | 1.5 | 192 | 5 | 166 | 7.6 | 2.7 | 55 | 67 | 0 | .07 |
| NOV | | | | | | | | | | | |
| 05... | 1030 | 3.0 | 192 | 5 | 192 | 7.6 | 3.4 | 69 | 84 | 0 | .27 |
| DEC | | | | | | | | | | | |
| 10... | -- | .5 | 192 | 0 | 187 | 7.4 | 6.2 | 80 | 97 | 0 | .38 |
| FEB , 1958 | | | | | | | | | | | |
| 21... | 1500 | -- | 192 | 0 | 228 | 7.4 | 6.9 | 89 | 108 | 0 | .27 |
| MAY | | | | | | | | | | | |
| 21... | 1700 | 9.5 | 192 | 0 | 207 | 7.3 | 7.5 | 77 | 94 | 0 | .66 |
| JUL | | | | | | | | | | | |
| 16... | 1800 | -- | 192 | 20 | 91 | 6.4 | 24 | 31 | 38 | 0 | .05 |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
15277100 - EAGLE R AT EAGLE RIVER AK

PROCESS DATE 12/02/81
DISTRICT CODE 02

WATER QUALITY DATA

| DATE | HARDNESS (MG/L AS CACO3) (00900) | HARDNESS, NONCARBONATE (MG/L CACO3) (00902) | CALCIUM DISSOLVED (MG/L AS CA) (00915) | MAGNESIUM, DISSOLVED (MG/L AS MG) (00925) | SODIUM, DISSOLVED (MG/L AS NA) (00930) | SODIUM ADSORPTION RATIO (00931) | PERCENT SODIUM (00932) | SODIUM+POTASSIUM DISSOLVED (MG/L AS NA) (00933) | POTASSIUM, DISSOLVED (MG/L AS K) (00935) | CHLORIDE, DISSOLVED (MG/L AS CL) (00940) |
|---|---|---|---|---|---|---|---|---|---|---|
| OCT , 1948 | | | | | | | | | | |
| 19... | 86 | 18 | 27 | 4.4 | -- | -- | -- | 3.2 | -- | 2.0 |
| 19... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| APR , 1949 | | | | | | | | | | |
| 28... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.0 |
| JUN | | | | | | | | | | |
| 24... | 64 | 16 | 20 | 3.4 | -- | -- | -- | 2.3 | -- | .5 |
| APR , 1951 | | | | | | | | | | |
| 19... | 67 | 12 | 21 | 3.5 | -- | -- | -- | 2.7 | -- | 1.2 |
| JUN | | | | | | | | | | |
| 06... | 53 | 10 | 17 | 2.6 | -- | -- | -- | 3.5 | -- | 1.5 |
| FEB , 1952 | | | | | | | | | | |
| 21... | 105 | 22 | 33 | 5.5 | -- | -- | -- | 8.3 | -- | 1.2 |
| MAR | | | | | | | | | | |
| 12... | 106 | 24 | 33 | 5.7 | -- | -- | -- | 4.1 | -- | 4.8 |
| APR | | | | | | | | | | |
| 16... | 96 | 20 | 30 | 5.1 | -- | -- | -- | 2.3 | -- | 2.5 |
| MAY | | | | | | | | | | |
| 08... | 105 | 23 | 32 | 6.1 | -- | -- | -- | 4.0 | -- | 2.5 |
| JUN | | | | | | | | | | |
| 12... | 75 | 14 | 23 | 4.3 | -- | -- | -- | 4.7 | -- | 2.5 |
| JUL | | | | | | | | | | |
| 14... | 46 | 10 | 14 | 2.6 | -- | -- | -- | 2.2 | -- | 1.0 |
| AUG | | | | | | | | | | |
| 22... | 50 | 11 | 15 | 3.0 | -- | -- | -- | 3.1 | -- | .8 |
| MAY , 1956 | | | | | | | | | | |
| 03... | 91 | 20 | 28 | 5.1 | 3.0 | .1 | 7 | -- | 1.0 | 1.8 |
| JUL | | | | | | | | | | |
| 04... | 49 | 10 | 17 | 1.5 | 3.5 | .2 | 13 | -- | 1.4 | .5 |
| OCT , 1957 | | | | | | | | | | |
| 02... | 81 | 26 | 24 | 5.1 | 1.9 | .1 | 5 | -- | .4 | .5 |
| NOV | | | | | | | | | | |
| 05... | 90 | 21 | 28 | 4.8 | 2.9 | .1 | 7 | -- | .5 | 1.0 |
| DEC | | | | | | | | | | |
| 10... | 91 | 11 | 26 | 6.3 | 3.2 | .1 | 7 | -- | .5 | 2.0 |
| FEB , 1958 | | | | | | | | | | |
| 21... | 114 | 25 | 32 | 8.4 | 3.6 | .1 | 6 | -- | .6 | 2.5 |
| MAY | | | | | | | | | | |
| 21... | 101 | 24 | 31 | 5.7 | 2.6 | .1 | 5 | -- | .4 | 1.0 |
| JUL | | | | | | | | | | |
| 16... | 44 | 13 | 13 | 2.9 | .9 | .1 | 4 | -- | .6 | 1.5 |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
15277100 - EAGLE R AT EAGLE RIVER AK

PROCESS DATE 12/02/81
DISTRICT CODE 02

WATER QUALITY DATA

| DATE | SULFATE DIS-SOLVED (MG/L AS SO4) (00945) | FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950) | SILICA, DIS-SOLVED (MG/L AS SIO2) (00955) | SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300) | SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301) | SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303) | NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS NO3) (71851) | MANGA-NESE (UG/L AS MN) (71883) | IRON (UG/L AS FE) (71885) | ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000) |
|---|---|---|---|---|---|---|---|---|---|---|
| OCT , 1948 | | | | | | | | | | |
| 19... | 20 | -- | 3.9 | -- | 102 | .14 | 1.6 | -- | -- | 250.00 |
| 19... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| APR , 1949 | | | | | | | | | | |
| 28... | 24 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUN | | | | | | | | | | |
| 24... | 19 | -- | 4.2 | -- | 79 | .11 | 1.2 | -- | -- | 250.00 |
| APR , 1951 | | | | | | | | | | |
| 19... | 14 | .3 | 5.5 | -- | 82 | .11 | 1.0 | -- | 20 | 250.00 |
| JUN | | | | | | | | | | |
| 06... | 13 | -- | 3.0 | -- | 68 | .09 | .70 | -- | 30 | 250.00 |
| FEB , 1952 | | | | | | | | | | |
| 21... | 36 | .1 | 6.4 | 129 | 142 | .18 | 1.2 | -- | 40 | 250.00 |
| MAR | | | | | | | | | | |
| 12... | 24 | .0 | 7.1 | 130 | 129 | .18 | 1.2 | -- | 40 | 250.00 |
| APR | | | | | | | | | | |
| 16... | 19 | .1 | 6.3 | 118 | 112 | .16 | 1.1 | -- | 140 | 250.00 |
| MAY | | | | | | | | | | |
| 08... | 26 | .1 | 6.6 | -- | 128 | .17 | 1.0 | -- | 140 | 250.00 |
| JUN | | | | | | | | | | |
| 12... | 19 | .1 | 5.2 | -- | 97 | .13 | 1.4 | -- | 30 | 250.00 |
| JUL | | | | | | | | | | |
| 14... | 12 | .0 | 3.4 | -- | 58 | .08 | .70 | -- | 130 | 250.00 |
| AUG | | | | | | | | | | |
| 22... | 15 | -- | 4.1 | -- | 65 | .09 | .60 | -- | 240 | 250.00 |
| MAY , 1956 | | | | | | | | | | |
| 03... | 22 | .0 | 5.0 | -- | 110 | .15 | 1.3 | 10 | 0 | 250.00 |
| JUL | | | | | | | | | | |
| 04... | 15 | .0 | 2.6 | -- | 65 | .09 | .50 | 0 | 0 | 250.00 |
| OCT , 1957 | | | | | | | | | | |
| 02... | 28 | .0 | 3.2 | -- | 96 | .13 | .30 | 0 | 40 | 250.00 |
| NOV | | | | | | | | | | |
| 05... | 24 | .0 | 7.2 | -- | 111 | .15 | 1.2 | 0 | 20 | 250.00 |
| DEC | | | | | | | | | | |
| 10... | 17 | .1 | 9.0 | -- | 114 | .16 | 1.7 | 0 | 0 | 250.00 |
| FEB , 1958 | | | | | | | | | | |
| 21... | 27 | .0 | 8.9 | -- | 137 | .19 | 1.2 | 0 | 0 | 250.00 |
| MAY | | | | | | | | | | |
| 21... | 26 | .1 | 4.4 | -- | 120 | .16 | 2.9 | 10 | 20 | 250.00 |
| JUL | | | | | | | | | | |
| 16... | 13 | .0 | 2.3 | -- | 53 | .07 | .20 | -- | 100 | 250.00 |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
15277100 - EAGLE R AT EAGLE RIVER AK

PROCESS DATE 12/02/81
DISTRICT CODE 02

WATER QUALITY DATA

| DATE | TIME | TEMPERATURE (DEG C) (00010) | SURFACE AREA (SQ MI) (00049) | DISCHARGE, IN CUBIC FEET PER SECOND (00060) | STREAMFLOW, INSTANTANEOUS (CFS) (00061) | COLOR (PLATINUM-COBALT UNITS) (00080) | SPECIFIC CONDUCTANCE (UMHOS) (00095) | PH (UNITS) (00400) | CARBON DIOXIDE DISSOLVED (MG/L AS CO2) (00405) | ALKALINITY FIELD (MG/L AS CACO3) (00410) | BICARBONATE (MG/L AS HCO3) (00440) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AUG , 1958 | | | | | | | | | | | |
| 12... | 1145 | 6.0 | 192 | -- | -- | 30 | 76 | 6.5 | 16 | 26 | 32 |
| SEP , 1966 | | | | | | | | | | | |
| 13... | 1300 | 6.0 | -- | -- | 1160 | -- | -- | -- | -- | -- | -- |
| OCT | | | | | | | | | | | |
| 26... | 1200 | .5 | -- | -- | -- | 5 | 243 | 7.8 | 2.6 | 85 | 104 |
| NOV | | | | | | | | | | | |
| 16... | 1200 | .0 | -- | -- | 85 | -- | 222 | -- | -- | -- | -- |
| MAR , 1967 | | | | | | | | | | | |
| 20... | -- | .0 | -- | -- | 54 | 5 | 286 | 7.5 | 5.8 | 94 | 114 |
| 20... | 1130 | .0 | -- | -- | 54 | -- | 286 | -- | -- | -- | -- |
| MAY | | | | | | | | | | | |
| 04... | 1100 | 4.0 | 192 | -- | 155 | 5 | 197 | 7.6 | 3.6 | 74 | 90 |
| 12... | 1330 | 9.5 | -- | -- | 193 | 5 | 206 | 7.7 | 3.2 | 82 | 100 |
| JUN | | | | | | | | | | | |
| 05... | 1045 | 7.0 | -- | -- | 742 | -- | 151 | -- | -- | -- | -- |
| 05... | 1115 | 7.0 | -- | -- | 742 | 5 | 151 | 7.7 | 2.2 | 56 | 68 |
| 29... | 1340 | 6.5 | 192 | -- | 1650 | 5 | 94 | 7.6 | 1.6 | 33 | 40 |
| 29... | 1400 | 6.5 | -- | -- | 1650 | -- | 94 | -- | -- | -- | -- |
| 29... | 1715 | 6.5 | -- | 2000 | -- | -- | 94 | -- | -- | -- | -- |
| 30... | 1730 | 7.0 | -- | 2140 | -- | -- | 87 | -- | -- | -- | -- |
| JUL | | | | | | | | | | | |
| 01... | 1745 | 9.0 | -- | 1500 | -- | -- | 95 | -- | -- | -- | -- |
| 04... | 1730 | 8.0 | -- | 1670 | -- | -- | 95 | -- | -- | -- | -- |
| 05... | 1730 | 8.0 | -- | 1450 | -- | -- | 95 | -- | -- | -- | -- |
| 06... | 1800 | 8.5 | -- | 1580 | -- | -- | 95 | -- | -- | -- | -- |
| 08... | 1745 | 8.5 | -- | 1470 | -- | -- | 95 | -- | -- | -- | -- |
| 09... | 1745 | 8.5 | -- | 1410 | -- | -- | 95 | -- | -- | -- | -- |
| 10... | 1730 | 11.5 | -- | 1510 | -- | -- | 95 | -- | -- | -- | -- |
| 11... | 1730 | 12.0 | -- | 1860 | -- | -- | 83 | -- | -- | -- | -- |
| 12... | 1730 | 12.0 | -- | 2180 | -- | -- | 83 | -- | -- | -- | -- |
| 13... | 1800 | 11.5 | -- | 2130 | -- | -- | 83 | -- | -- | -- | -- |
| 14... | 1800 | 12.0 | -- | 2410 | -- | -- | 80 | -- | -- | -- | -- |
| 15... | 1730 | 7.0 | -- | 2580 | -- | -- | 77 | -- | -- | -- | -- |
| 19... | 1730 | 7.0 | -- | 1790 | -- | -- | 77 | -- | -- | -- | -- |
| 20... | 1800 | 6.5 | -- | 2980 | -- | -- | 77 | -- | -- | -- | -- |
| 21... | 1800 | 10.0 | -- | 2830 | -- | -- | 77 | -- | -- | -- | -- |
| 22... | 1800 | 9.5 | -- | 2310 | -- | -- | 77 | -- | -- | -- | -- |
| 23... | 1730 | 8.5 | -- | 2180 | -- | -- | 74 | -- | -- | -- | -- |
| 24... | 1800 | 8.5 | -- | 2300 | -- | -- | 71 | -- | -- | -- | -- |
| 25... | 1830 | 9.0 | -- | 2510 | -- | -- | 71 | -- | -- | -- | -- |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
15277100 - EAGLE R AT EAGLE RIVER AK

PROCESS DATE 12/02/81
DISTRICT CODE 02

WATER QUALITY DATA

| DATE | CARBONATE (MG/L AS CO3) (00445) | NITROGEN, NITRATE DISSOLVED (MG/L AS N) (00618) | HARDNESS (MG/L AS CACO3) (00900) | HARDNESS, NONCARBONATE (MG/L CACO3) (00902) | CALCIUM DISSOLVED (MG/L AS CA) (00915) | MAGNESIUM, DISSOLVED (MG/L AS MG) (00925) | SODIUM, DISSOLVED (MG/L AS NA) (00930) | SODIUM ADSORPTION RATIO (00931) | PERCENT SODIUM (00932) | POTASSIUM, DISSOLVED (MG/L AS K) (00935) | CHLORIDE, DISSOLVED (MG/L AS CL) (00940) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AUG , 1958 | | | | | | | | | | | |
| 12... | 0 | .05 | 34 | 8 | 9.9 | 2.4 | .8 | .1 | 5 | 1.2 | 3.0 |
| SEP , 1966 | | | | | | | | | | | |
| 13... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT | | | | | | | | | | | |
| 26... | 0 | .18 | 108 | 23 | 36 | 4.4 | 2.7 | .1 | 5 | .3 | 1.4 |
| NOV | | | | | | | | | | | |
| 16... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAR , 1967 | | | | | | | | | | | |
| 20... | 0 | .25 | 134 | 40 | 45 | 5.2 | 3.1 | .1 | 5 | .8 | 17 |
| 20... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | | | | | | | | | | | |
| 04... | 0 | .23 | 54 | 0 | 32 | 3.4 | 3.2 | .1 | 7 | .5 | 1.4 |
| 12... | 0 | .25 | 99 | 17 | 31 | 5.2 | 3.8 | .2 | 8 | .3 | 1.1 |
| JUN | | | | | | | | | | | |
| 05... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 05... | 0 | .07 | 63 | 7 | 19 | 3.8 | 2.7 | .1 | 8 | .6 | .4 |
| 29... | 0 | .23 | 44 | 11 | 14 | 2.0 | 1.6 | .1 | 7 | .4 | .4 |
| 29... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 29... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 30... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUL | | | | | | | | | | | |
| 01... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 04... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 05... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 06... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 08... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 09... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 10... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 11... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 12... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 13... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 14... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 15... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 19... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 20... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 21... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 22... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 23... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 24... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 25... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
15277100 - EAGLE R AT EAGLE RIVER AK

PROCESS DATE 12/02/81
DISTRICT CODE 02

WATER QUALITY DATA

| DATE | SULFATE DIS-SOLVED (MG/L AS SO4) (00945) | FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950) | SILICA, DIS-SOLVED (MG/L AS SIO2) (00955) | SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301) | SOLIDS, DIS-SOLVED (TONS PER DAY) (70302) | SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303) | SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337) | SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338) | SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339) | SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340) | SED. SUSP. FALL DIAM. % FINER THAN .031 MM (70341) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AUG , 1958 | | | | | | | | | | | |
| 12... | 10 | .0 | 2.0 | 45 | -- | .06 | -- | -- | -- | -- | -- |
| SEP , 1966 | | | | | | | | | | | |
| 13... | -- | -- | -- | -- | -- | -- | 30 | 40 | 52 | 62 | 69 |
| OCT | | | | | | | | | | | |
| 26... | 24 | .1 | 5.9 | 127 | -- | .17 | -- | -- | -- | -- | -- |
| NOV | | | | | | | | | | | |
| 16... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAR , 1967 | | | | | | | | | | | |
| 20... | 31 | .0 | 7.2 | 167 | 24.3 | .23 | -- | -- | -- | -- | -- |
| 20... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | | | | | | | | | | | |
| 04... | 26 | .3 | 4.4 | 117 | 49.0 | .16 | -- | -- | -- | -- | -- |
| 12... | 25 | .4 | 4.5 | 122 | 63.6 | .17 | -- | -- | -- | -- | -- |
| JUN | | | | | | | | | | | |
| 05... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 05... | 16 | .0 | 3.5 | 80 | 160 | .11 | -- | -- | -- | -- | -- |
| 29... | 12 | .0 | 3.2 | 54 | 241 | .07 | -- | -- | -- | -- | -- |
| 29... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 29... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 30... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUL | | | | | | | | | | | |
| 01... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 04... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 05... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 06... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 08... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 09... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 10... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 11... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 12... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 13... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 14... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 15... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 19... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 20... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 21... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 22... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 23... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 24... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 25... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
15277100 - EAGLE R AT EAGLE RIVER AK

PROCESS DATE 12/02/81
DISTRICT CODE 02

WATER QUALITY DATA

| DATE | SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342) | SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343) | SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344) | SED. SUSP. FALL DIAM. % FINER THAN .500 MM (70345) | SED. SUSP. FALL DIAM. % FINER THAN 1.00 MM (70346) | NITROGEN, NITRATE DISSOLVED (MG/L AS NO3) (71851) | MANGANESE (UG/L AS MN) (71883) | IRON (UG/L AS FE) (71885) | ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000) | SEDIMENT, SUSPENDED (MG/L) (80154) | SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AUG , 1958 | | | | | | | | | | | |
| 12... | -- | -- | -- | -- | -- | .20 | 20 | 20 | 250.00 | -- | -- |
| SEP , 1966 | | | | | | | | | | | |
| 13... | 75 | 84 | 94 | 99 | 100 | -- | -- | -- | -- | 318 | 996 |
| OCT | | | | | | | | | | | |
| 26... | -- | -- | -- | -- | -- | .80 | -- | 40 | -- | -- | -- |
| NOV | | | | | | | | | | | |
| 16... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 16 | 3.7 |
| MAR , 1967 | | | | | | | | | | | |
| 20... | -- | -- | -- | -- | -- | 1.1 | -- | 320 | -- | -- | -- |
| 20... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 13 | 1.9 |
| MAY | | | | | | | | | | | |
| 04... | -- | -- | -- | -- | -- | 1.0 | -- | 1300 | 250.00 | 50 | 21 |
| 12... | -- | -- | -- | -- | -- | 1.1 | -- | 400 | -- | 33 | 17 |
| JUN | | | | | | | | | | | |
| 05... | 68 | 77 | 85 | 99 | 100 | -- | -- | -- | -- | 176 | 353 |
| 05... | -- | -- | -- | -- | -- | .30 | -- | 1150 | -- | -- | -- |
| 29... | -- | -- | -- | -- | -- | 1.0 | -- | 2300 | 250.00 | -- | -- |
| 29... | 68 | 76 | 91 | 100 | -- | -- | -- | -- | -- | 145 | 646 |
| 29... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 255 | 1380 |
| 30... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 532 | 3080 |
| JUL | | | | | | | | | | | |
| 01... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 152 | 616 |
| 04... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 132 | 595 |
| 05... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 92 | 360 |
| 06... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 212 | 905 |
| 08... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 72 | 286 |
| 09... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 85 | 324 |
| 10... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 93 | 379 |
| 11... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 192 | 964 |
| 12... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 160 | 942 |
| 13... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 149 | 857 |
| 14... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 236 | 1540 |
| 15... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 152 | 1060 |
| 19... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 117 | 566 |
| 20... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1200 | 9660 |
| 21... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 393 | 3000 |
| 22... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 283 | 1770 |
| 23... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 139 | 818 |
| 24... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 292 | 1810 |
| 25... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 292 | 1980 |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
15277100 - EAGLE R AT EAGLE RIVER AK

PROCESS DATE 12/02/81
DISTRICT CODE 02

WATER QUALITY DATA

| DATE | TIME | TEMPERATURE (DEG C) (00010) | SURFACE AREA (SQ MI) (00049) | DISCHARGE, IN CUBIC FEET PER SECOND (00060) | STREAMFLOW, INSTANTANEOUS (CFS) (00061) | COLOR (PLATINUM-COBALT UNITS) (00080) | SPECIFIC CONDUCTANCE (UMHOS) (00095) | PH (UNITS) (00400) | CARBON DIOXIDE DISSOLVED (MG/L AS CO2) (00405) | ALKALINITY FIELD (MG/L AS CACO3) (00410) | BICARBONATE (MG/L AS HCO3) (00440) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JUL , 1967 | | | | | | | | | | | |
| 26... | 1830 | 6.5 | -- | 2480 | -- | -- | 71 | -- | -- | -- | -- |
| 27... | 1730 | 10.5 | -- | 1930 | -- | -- | 80 | -- | -- | -- | -- |
| 28... | 1830 | 10.0 | -- | 1890 | -- | -- | 111 | -- | -- | -- | -- |
| 29... | 1800 | 10.0 | -- | 1860 | -- | -- | 80 | -- | -- | -- | -- |
| 30... | 1800 | 7.0 | -- | 1900 | -- | -- | 77 | -- | -- | -- | -- |
| 31... | 1830 | 8.5 | -- | 2000 | -- | -- | 74 | -- | -- | -- | -- |
| AUG | | | | | | | | | | | |
| 01... | 1830 | 4.5 | -- | 2770 | -- | -- | 71 | -- | -- | -- | -- |
| 02... | 1900 | 8.5 | -- | 2280 | -- | -- | 80 | -- | -- | -- | -- |
| 03... | 1830 | 9.5 | -- | 2090 | -- | -- | 80 | -- | -- | -- | -- |
| 04... | 1830 | 15.0 | -- | 2170 | -- | -- | 80 | -- | -- | -- | -- |
| 05... | 1800 | 8.5 | -- | 2410 | -- | -- | 71 | -- | -- | -- | -- |
| 06... | 1830 | 9.5 | -- | 2370 | -- | -- | 71 | -- | -- | -- | -- |
| 07... | 1900 | 7.0 | -- | 2910 | -- | -- | 69 | -- | -- | -- | -- |
| 08... | 1800 | 8.0 | -- | 2970 | -- | -- | 69 | -- | -- | -- | -- |
| 09... | 1900 | 8.0 | -- | 2280 | -- | -- | 77 | -- | -- | -- | -- |
| 11... | 1900 | 8.0 | -- | 1950 | -- | -- | 80 | -- | -- | -- | -- |
| 14... | 1830 | 9.5 | -- | 3150 | -- | -- | 71 | -- | -- | -- | -- |
| 15... | 1830 | 8.5 | -- | 3020 | -- | -- | 71 | -- | -- | -- | -- |
| 17... | 1100 | 9.0 | -- | -- | 3110 | -- | 64 | -- | -- | -- | -- |
| 22... | 1800 | 8.5 | -- | 1360 | -- | -- | 87 | -- | -- | -- | -- |
| SEP | | | | | | | | | | | |
| 19... | -- | -- | -- | -- | 4090 | 10 | 124 | 7.2 | 6.0 | 48 | 59 |
| 19... | 1250 | 4.5 | -- | -- | 4090 | -- | 124 | -- | -- | -- | -- |
| 21... | 1500 | 4.5 | -- | -- | 1520 | -- | 133 | -- | -- | -- | -- |
| OCT | | | | | | | | | | | |
| 04... | 1200 | 2.0 | -- | -- | 444 | -- | -- | -- | -- | -- | -- |
| MAY , 1968 | | | | | | | | | | | |
| 06... | 0900 | 4.0 | -- | -- | 95 | 0 | 223 | 7.4 | 6.9 | 89 | 108 |
| 06... | 1100 | 4.0 | -- | -- | 95 | -- | -- | -- | -- | -- | -- |
| JUL | | | | | | | | | | | |
| 03... | 1500 | 8.0 | 192 | -- | 1520 | 5 | 113 | 7.6 | 2.1 | 43 | 52 |
| AUG | | | | | | | | | | | |
| 13... | 1300 | 7.0 | 192 | -- | 1650 | 5 | 74 | 7.5 | 1.5 | 25 | 30 |
| OCT | | | | | | | | | | | |
| 03... | 1400 | 4.0 | -- | -- | 194 | -- | 175 | -- | -- | -- | -- |
| NOV | | | | | | | | | | | |
| 27... | 1430 | .0 | -- | -- | 100 | -- | 225 | -- | -- | -- | -- |
| MAR , 1969 | | | | | | | | | | | |
| 26... | 1100 | .0 | -- | -- | 55 | -- | 233 | -- | -- | -- | -- |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
15277100 - EAGLE R AT EAGLE RIVER AK

PROCESS DATE 12/02/81
DISTRICT CODE 02

WATER QUALITY DATA

| DATE | CARBONATE (MG/L AS CO3) (00445) | NITROGEN, NITRATE DISSOLVED (MG/L AS N) (00618) | HARDNESS (MG/L AS CACO3) (00900) | HARDNESS, NONCARBONATE (MG/L CACO3) (00902) | CALCIUM DISSOLVED (MG/L AS CA) (00915) | MAGNESIUM, DISSOLVED (MG/L AS MG) (00925) | SODIUM, DISSOLVED (MG/L AS NA) (00930) | SODIUM ADSORPTION RATIO (00931) | PERCENT SODIUM (00932) | POTASSIUM, DISSOLVED (MG/L AS K) (00935) | CHLORIDE, DISSOLVED (MG/L AS CL) (00940) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JUL , 1967 | | | | | | | | | | | |
| 26... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 27... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 28... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 29... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 30... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 31... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG | | | | | | | | | | | |
| 01... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 02... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 03... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 04... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 05... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 06... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 07... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 08... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 09... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 11... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 14... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 15... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 17... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 22... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SEP | | | | | | | | | | | |
| 19... | 0 | .23 | 58 | 10 | 17 | 3.5 | 1.6 | .1 | 6 | 1.4 | .7 |
| 19... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 21... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT | | | | | | | | | | | |
| 04... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY , 1968 | | | | | | | | | | | |
| 06... | 0 | .18 | 120 | 29 | 38 | 5.5 | 3.8 | .2 | 7 | .4 | 1.8 |
| 06... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUL | | | | | | | | | | | |
| 03... | 0 | .02 | 50 | 7 | 16 | 2.6 | 1.7 | .1 | 7 | .3 | .6 |
| AUG | | | | | | | | | | | |
| 13... | 0 | .05 | 34 | 9 | 11 | 1.7 | .9 | .1 | 5 | .6 | .8 |
| OCT | | | | | | | | | | | |
| 03... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| NOV | | | | | | | | | | | |
| 27... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAR , 1969 | | | | | | | | | | | |
| 26... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
15277100 - EAGLE R AT EAGLE RIVER AK

PROCESS DATE 12/02/81
DISTRICT CODE 02

WATER QUALITY DATA

| DATE | SULFATE DIS-SOLVED (MG/L AS SO4) (00945) | FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950) | SILICA, DIS-SOLVED (MG/L AS SIO2) (00955) | IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045) | SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301) | SOLIDS, DIS-SOLVED (TONS PER DAY) (70302) | SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303) | SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337) | SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338) | SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339) | SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JUL , 1967 | | | | | | | | | | | |
| 26... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 27... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 28... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 29... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 30... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 31... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG | | | | | | | | | | | |
| 01... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 02... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 03... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 04... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 05... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 06... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 07... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 08... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 09... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 11... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 14... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 15... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 17... | -- | -- | -- | -- | -- | -- | -- | 32 | 40 | 49 | 60 |
| 22... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SEP | | | | | | | | | | | |
| 19... | 14 | .0 | 7.3 | -- | 76 | 839 | .10 | -- | -- | -- | -- |
| 19... | -- | -- | -- | -- | -- | -- | -- | 47 | 53 | 64 | 70 |
| 21... | -- | -- | -- | -- | -- | -- | -- | 45 | 52 | 61 | 68 |
| OCT | | | | | | | | | | | |
| 04... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY , 1968 | | | | | | | | | | | |
| 06... | 24 | .1 | 6.0 | -- | 134 | 34.4 | .18 | -- | -- | -- | -- |
| 06... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUL | | | | | | | | | | | |
| 03... | 13 | .1 | 2.9 | 1600 | 65 | 267 | .09 | 31 | 40 | 52 | 64 |
| AUG | | | | | | | | | | | |
| 17... | 7.5 | .0 | 1.8 | 1100 | 41 | 183 | .06 | 27 | 42 | 53 | 61 |
| OCT | | | | | | | | | | | |
| 03... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| NOV | | | | | | | | | | | |
| 27... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAR , 1969 | | | | | | | | | | | |
| 26... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY — PROCESS DATE 12/02/81
15277100 - EAGLE R AT EAGLE RIVER AK — DISTRICT CODE 02

WATER QUALITY DATA

| DATE | SED. SUSP. FALL DIAM. % FINER THAN .031 MM (70341) | SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342) | SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343) | SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344) | SED. SUSP. FALL DIAM. % FINER THAN .500 MM (70345) | SED. SUSP. FALL DIAM. % FINER THAN 1.00 MM (70346) | NITROGEN, NITRATE DISSOLVED (MG/L AS NO3) (71851) | IRON (UG/L AS FE) (71885) | ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000) | SEDIMENT, SUSPENDED (MG/L) (80154) | SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JUL , 1967 | | | | | | | | | | | |
| 26... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 243 | 1630 |
| 27... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 200 | 1040 |
| 28... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 150 | 766 |
| 29... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 172 | 864 |
| 30... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 169 | 867 |
| 31... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 158 | 853 |
| AUG | | | | | | | | | | | |
| 01... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 775 | 5800 |
| 02... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 173 | 1070 |
| 03... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 179 | 1010 |
| 04... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 198 | 1160 |
| 05... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 232 | 1510 |
| 06... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 215 | 1380 |
| 07... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 280 | 2200 |
| 08... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 337 | 2700 |
| 09... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 233 | 1440 |
| 11... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 168 | 885 |
| 14... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 523 | 4450 |
| 15... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 354 | 2890 |
| 17... | 68 | 77 | 86 | 94 | 99 | 100 | -- | -- | -- | 494 | 4150 |
| 22... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 172 | 632 |
| SEP | | | | | | | | | | | |
| 19... | -- | -- | -- | -- | -- | -- | 1.0 | 1660 | -- | -- | -- |
| 19... | 77 | 85 | 92 | 96 | 98 | 100 | -- | -- | -- | 1120 | 12400 |
| 21... | 76 | 85 | 92 | 96 | 97 | 100 | -- | -- | -- | 399 | 1640 |
| OCT | | | | | | | | | | | |
| 04... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 44 | 53 |
| MAY , 1968 | | | | | | | | | | | |
| 06... | -- | -- | -- | -- | -- | -- | .80 | 110 | -- | -- | -- |
| 06... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 26 | 6.7 |
| JUL | | | | | | | | | | | |
| 03... | 75 | 85 | 92 | 99 | 100 | -- | .10 | 410 | 250.00 | 134 | 550 |
| AUG | | | | | | | | | | | |
| 13... | 71 | 80 | 89 | 98 | 100 | -- | .20 | 1100 | 250.00 | 138 | 615 |
| OCT | | | | | | | | | | | |
| 03... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8 | 4.2 |
| NOV | | | | | | | | | | | |
| 27... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 12 | 3.2 |
| MAR , 1969 | | | | | | | | | | | |
| 26... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4 | .59 |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
15277100 - EAGLE R AT EAGLE RIVER AK

PROCESS DATE 12/02/81
DISTRICT CODE 02

WATER QUALITY DATA

| DATE | TIME | TEMPERATURE (DEG C) (00010) | STREAMFLOW, INSTANTANEOUS (CFS) (00061) | STREAM STAGE (FT ABOVE DATUM) (00065) | COLOR (PLATINUM-COBALT UNITS) (00080) | SPECIFIC CONDUCTANCE (UMHOS) (00095) | PH (UNITS) (00400) | CARBON DIOXIDE DISSOLVED (MG/L AS CO2) (00405) | ALKALINITY FIELD (MG/L AS CACO3) (00410) | BICARBONATE (MG/L AS HCO3) (00440) |
|---|---|---|---|---|---|---|---|---|---|---|
| MAR , 1969 | | | | | | | | | | |
| 26... | 1200 | .0 | 55 | -- | 0 | 233 | 7.9 | 2.1 | 85 | 104 |
| APR | | | | | | | | | | |
| 29... | 1230 | 1.0 | 106 | -- | -- | 217 | -- | -- | -- | -- |
| MAY | | | | | | | | | | |
| 27... | 1245 | 7.0 | 992 | -- | -- | 146 | -- | -- | -- | -- |
| JUL | | | | | | | | | | |
| 15... | 1130 | 6.0 | 1660 | -- | -- | 81 | -- | -- | -- | -- |
| AUG | | | | | | | | | | |
| 20... | 1530 | 7.0 | 662 | -- | -- | 109 | -- | -- | -- | -- |
| OCT | | | | | | | | | | |
| 07... | 1430 | 4.0 | 2940 | 7.34 | 10 | 113 | 7.7 | 1.5 | 38 | 46 |
| 26... | 1515 | .0 | -- | -- | -- | 120 | -- | -- | -- | -- |
| DEC | | | | | | | | | | |
| 16... | 1500 | .0 | 121 | -- | -- | 209 | -- | -- | -- | -- |
| MAR , 1970 | | | | | | | | | | |
| 03... | 1200 | .0 | 90 | -- | 0 | 233 | 7.9 | 2.2 | 89 | 109 |
| APR | | | | | | | | | | |
| 29... | 1000 | 4.5 | 78 | -- | -- | 172 | -- | -- | -- | -- |
| 29... | 1015 | 4.5 | 78 | -- | -- | 172 | -- | -- | -- | -- |
| MAY | | | | | | | | | | |
| 21... | 1030 | 8.0 | 279 | -- | -- | 212 | -- | -- | -- | -- |
| 21... | 1100 | 8.0 | 279 | -- | 0 | 212 | 8.1 | 1.3 | 82 | 100 |
| JUN | | | | | | | | | | |
| 16... | 1445 | 8.0 | 670 | -- | -- | 157 | -- | -- | -- | -- |
| 16... | 1450 | 8.0 | 670 | -- | 0 | 157 | 8.1 | .9 | 59 | 72 |
| JUL | | | | | | | | | | |
| 22... | 1400 | 8.0 | 998 | -- | 5 | 121 | 7.8 | 1.3 | 43 | 53 |
| 22... | 1430 | 8.0 | 998 | -- | -- | 121 | -- | -- | -- | -- |
| AUG | | | | | | | | | | |
| 28... | 1030 | 6.0 | 784 | -- | 5 | 112 | 8.0 | .8 | 39 | 48 |
| 28... | 1400 | 6.0 | 793 | -- | -- | 117 | -- | -- | -- | -- |
| OCT | | | | | | | | | | |
| 15... | 1115 | .5 | 168 | -- | 5 | 186 | 8.0 | 1.3 | 66 | 81 |
| 15... | 1130 | .5 | 168 | -- | -- | 186 | -- | -- | -- | -- |
| MAR , 1971 | | | | | | | | | | |
| 10... | 1230 | .0 | 42 | -- | -- | 228 | 7.9 | 2.1 | 84 | 102 |
| MAY | | | | | | | | | | |
| 19... | 1030 | 4.0 | 120 | -- | 5 | 195 | 7.8 | 2.3 | 75 | 91 |
| 19... | 1300 | 4.0 | 120 | -- | -- | 195 | -- | -- | -- | -- |
| JUN | | | | | | | | | | |
| 21... | 1330 | 6.5 | 715 | -- | -- | 133 | -- | -- | -- | -- |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
15277100 - EAGLE R AT EAGLE RIVER AK

PROCESS DATE 12/02/81
DISTRICT CODE 02

WATER QUALITY DATA

| DATE | CARBONATE (MG/L AS CO3) (00445) | NITROGEN, ORGANIC TOTAL (MG/L AS N) (00605) | NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608) | NITROGEN, NITRATE DISSOLVED (MG/L AS N) (00618) | PHOSPHATE, TOTAL (MG/L AS PO4) (00650) | PHOSPHATE, ORTHO, DISSOLVED (MG/L AS PO4) (00660) | HARDNESS (MG/L AS CACO3) (00900) | HARDNESS, NONCARBONATE (MG/L CACO3) (00902) | CALCIUM DISSOLVED (MG/L AS CA) (00915) | MAGNESIUM, DISSOLVED (MG/L AS MG) (00925) |
|---|---|---|---|---|---|---|---|---|---|---|
| MAR , 1969 | | | | | | | | | | |
| 26... | 0 | -- | -- | .36 | -- | -- | 106 | 21 | 32 | 6.1 |
| APR | | | | | | | | | | |
| 29... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | | | | | | | | | | |
| 27... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUL | | | | | | | | | | |
| 15... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG | | | | | | | | | | |
| 20... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT | | | | | | | | | | |
| 07... | 0 | -- | -- | .18 | -- | -- | 51 | 13 | 15 | 3.2 |
| 26... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC | | | | | | | | | | |
| 16... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAR , 1970 | | | | | | | | | | |
| 03... | 0 | -- | -- | .32 | -- | -- | 114 | 24 | 37 | 5.0 |
| APR | | | | | | | | | | |
| 29... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 29... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | | | | | | | | | | |
| 21... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 21... | 0 | 1.1 | .000 | .63 | .15 | .00 | 102 | 20 | 32 | 5.1 |
| JUN | | | | | | | | | | |
| 16... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 16... | 0 | -- | -- | .23 | -- | -- | 76 | 17 | 24 | 3.8 |
| JUL | | | | | | | | | | |
| 22... | 0 | -- | -- | .16 | -- | -- | 55 | 12 | 18 | 2.8 |
| 22... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG | | | | | | | | | | |
| 28... | 0 | -- | -- | .07 | -- | -- | 53 | 14 | 17 | 2.6 |
| 28... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT | | | | | | | | | | |
| 15... | 0 | -- | -- | .27 | -- | -- | 92 | 26 | 29 | 4.5 |
| 15... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAR , 1971 | | | | | | | | | | |
| 10... | 0 | -- | -- | -- | -- | -- | 113 | 29 | -- | -- |
| MAY | | | | | | | | | | |
| 19... | -- | -- | -- | .36 | -- | -- | 98 | 23 | 31 | 4.8 |
| 19... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUN | | | | | | | | | | |
| 21... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
15277100 - EAGLE R AT EAGLE RIVER AK

PROCESS DATE 12/02/81
DISTRICT CODE 02

WATER QUALITY DATA

| DATE | SODIUM, DIS-SOLVED (MG/L AS NA) (00930) | SODIUM AD-SORP-TION RATIO (00931) | PERCENT SODIUM (00932) | POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935) | CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940) | SULFATE DIS-SOLVED (MG/L AS SO4) (00945) | FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950) | SILICA, DIS-SOLVED (MG/L AS SIO2) (00955) | IRON, DIS-SOLVED (UG/L AS FE) (01046) | MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056) |
|---|---|---|---|---|---|---|---|---|---|---|
| MAR , 1969 | | | | | | | | | | |
| 26... | 3.5 | .1 | 7 | 1.4 | 3.2 | 26 | .1 | 6.4 | -- | -- |
| APR | | | | | | | | | | |
| 29... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | | | | | | | | | | |
| 27... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUL | | | | | | | | | | |
| 15... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG | | | | | | | | | | |
| 20... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT | | | | | | | | | | |
| 07... | 1.7 | .1 | 6 | 2.2 | .7 | 18 | .0 | 3.3 | -- | -- |
| 26... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC | | | | | | | | | | |
| 16... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAR , 1970 | | | | | | | | | | |
| 03... | 3.6 | .1 | 6 | .5 | 1.4 | 28 | .0 | 3.5 | -- | -- |
| APR | | | | | | | | | | |
| 29... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 29... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | | | | | | | | | | |
| 21... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 21... | 3.6 | .2 | 7 | .5 | .4 | 23 | .1 | 4.3 | -- | -- |
| JUN | | | | | | | | | | |
| 16... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 16... | 2.6 | .1 | 7 | .4 | .4 | 20 | .1 | 3.1 | -- | -- |
| JUL | | | | | | | | | | |
| 22... | 1.8 | .1 | 6 | .4 | .3 | 16 | .1 | 3.3 | -- | -- |
| 22... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG | | | | | | | | | | |
| 28... | 1.8 | .1 | 0 | .4 | 1.5 | 15 | .0 | 2.8 | -- | -- |
| 28... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT | | | | | | | | | | |
| 15... | 2.9 | .1 | 6 | .4 | 1.5 | 21 | .0 | 4.1 | 40 | 100 |
| 15... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAR , 1971 | | | | | | | | | | |
| 10... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | | | | | | | | | | |
| 19... | 3.5 | .2 | 7 | .7 | 1.8 | 25 | .1 | 4.5 | 100 | 110 |
| 19... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUN | | | | | | | | | | |
| 21... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
15277100 - EAGLE R AT EAGLE RIVER AK

PROCESS DATE 12/02/81
DISTRICT CODE 02

WATER QUALITY DATA

| DATE | SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301) | SOLIDS, DIS-SOLVED (TONS PER DAY) (70302) | SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303) | SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337) | SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338) | SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339) | SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340) | SED. SUSP. FALL DIAM. % FINER THAN .031 MM (70341) | SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342) | SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343) |
|---|---|---|---|---|---|---|---|---|---|---|
| MAR , 1969 | | | | | | | | | | |
| 26... | 132 | 19.6 | .18 | -- | -- | -- | -- | -- | -- | -- |
| APR | | | | | | | | | | |
| 29... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | | | | | | | | | | |
| 27... | -- | -- | -- | 16 | 25 | 35 | 46 | 59 | 73 | 83 |
| JUL | | | | | | | | | | |
| 15... | -- | -- | -- | 39 | 50 | -- | 66 | -- | 82 | 85 |
| AUG | | | | | | | | | | |
| 20... | -- | -- | -- | -- | -- | -- | -- | -- | 89 | 97 |
| OCT | | | | | | | | | | |
| 07... | 68 | 540 | .09 | 36 | 47 | -- | 65 | -- | 81 | 89 |
| 26... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC | | | | | | | | | | |
| 16... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAR , 1970 | | | | | | | | | | |
| 03... | 134 | 32.6 | .18 | -- | -- | -- | -- | -- | -- | -- |
| APR | | | | | | | | | | |
| 29... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 29... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | | | | | | | | | | |
| 21... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 21... | 121 | 91.1 | .16 | -- | -- | -- | -- | -- | -- | -- |
| JUN | | | | | | | | | | |
| 16... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 16... | 90 | 163 | .12 | -- | -- | -- | -- | -- | -- | -- |
| JUL | | | | | | | | | | |
| 22... | 68 | 183 | .09 | -- | -- | -- | -- | -- | -- | -- |
| 22... | -- | -- | -- | -- | -- | -- | -- | -- | 73 | 84 |
| AUG | | | | | | | | | | |
| 28... | 65 | 138 | .09 | -- | -- | -- | -- | -- | -- | -- |
| 28... | -- | -- | -- | -- | -- | -- | -- | -- | 80 | 90 |
| OCT | | | | | | | | | | |
| 15... | 105 | 47.6 | .14 | -- | -- | -- | -- | -- | -- | -- |
| 15... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAR , 1971 | | | | | | | | | | |
| 10... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | | | | | | | | | | |
| 19... | 118 | 38.2 | .16 | -- | -- | -- | -- | -- | -- | -- |
| 19... | -- | -- | -- | 27 | 37 | -- | 60 | -- | 88 | 97 |
| JUN | | | | | | | | | | |
| 21... | -- | -- | -- | -- | -- | -- | -- | -- | 77 | 88 |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
15277100 - EAGLE R AT EAGLE RIVER AK

PROCESS DATE 12/02/81
DISTRICT CODE 02

WATER QUALITY DATA

| DATE | SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344) | SED. SUSP. FALL DIAM. % FINER THAN .500 MM (70345) | SED. SUSP. FALL DIAM. % FINER THAN 1.00 MM (70346) | SED. SUSP. FALL DIAM. % FINER THAN 2.00 MM (70347) | NITROGEN, AMMONIA DISSOLVED (MG/L AS NH4) (71846) | NITROGEN, NITRATE DISSOLVED (MG/L AS NO3) (71851) | MANGANESE (UG/L AS MN) (71883) | IRON (UG/L AS FE) (71885) | SEDIMENT, SUSPENDED (MG/L) (80154) | SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155) |
|---|---|---|---|---|---|---|---|---|---|---|
| MAR , 1969 | | | | | | | | | | |
| 26... | -- | -- | -- | -- | -- | 1.6 | -- | 370 | -- | -- |
| APR | | | | | | | | | | |
| 29... | -- | -- | -- | -- | -- | -- | -- | -- | 24 | 6.9 |
| MAY | | | | | | | | | | |
| 27... | 96 | 100 | -- | -- | -- | -- | -- | -- | 272 | 729 |
| JUL | | | | | | | | | | |
| 15... | 95 | 100 | -- | -- | -- | -- | -- | -- | 150 | 672 |
| AUG | | | | | | | | | | |
| 20... | 100 | -- | -- | -- | -- | -- | -- | -- | 56 | 100 |
| OCT | | | | | | | | | | |
| 07... | 97 | 99 | 100 | 100 | -- | .80 | 0 | 160 | 1002 | 7950 |
| 26... | -- | -- | -- | -- | -- | -- | -- | -- | 13 | -- |
| DEC | | | | | | | | | | |
| 16... | -- | -- | -- | -- | -- | -- | -- | -- | 10 | 3.3 |
| MAR , 1970 | | | | | | | | | | |
| 03... | -- | -- | -- | -- | -- | 1.4 | 50 | 10 | -- | -- |
| APR | | | | | | | | | | |
| 29... | -- | -- | -- | -- | -- | -- | -- | -- | 16 | 3.4 |
| 29... | -- | -- | -- | -- | -- | -- | -- | -- | 18 | 3.8 |
| MAY | | | | | | | | | | |
| 21... | -- | -- | -- | -- | -- | -- | -- | -- | 21 | 16 |
| 21... | -- | -- | -- | -- | .00 | 2.8 | 0 | 70 | -- | -- |
| JUN | | | | | | | | | | |
| 16... | -- | -- | -- | -- | -- | -- | -- | -- | 34 | 62 |
| 16... | -- | -- | -- | -- | -- | 1.0 | 20 | 250 | -- | -- |
| JUL | | | | | | | | | | |
| 22... | -- | -- | -- | -- | -- | .70 | 0 | 40 | -- | -- |
| 22... | 95 | 100 | -- | -- | -- | -- | -- | -- | 42 | 113 |
| AUG | | | | | | | | | | |
| 28... | -- | -- | -- | -- | -- | .30 | 0 | 0 | -- | -- |
| 28... | 98 | 100 | -- | -- | -- | -- | -- | -- | 46 | 98 |
| OCT | | | | | | | | | | |
| 15... | -- | -- | -- | -- | -- | 1.2 | -- | -- | -- | -- |
| 15... | -- | -- | -- | -- | -- | -- | -- | -- | 6 | 2.7 |
| MAR , 1971 | | | | | | | | | | |
| 10... | -- | -- | -- | -- | -- | -- | -- | -- | 9 | 1.0 |
| MAY | | | | | | | | | | |
| 19... | -- | -- | -- | -- | -- | 1.6 | -- | -- | -- | -- |
| 19... | 98 | 100 | -- | -- | -- | -- | -- | -- | 193 | 63 |
| JUN | | | | | | | | | | |
| 21... | 99 | 100 | -- | -- | -- | -- | -- | -- | 145 | 280 |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
15277100 - EAGLE R AT EAGLE RIVER AK

PROCESS DATE 12/02/81
DISTRICT CODE 02

WATER QUALITY DATA

| DATE | TIME | TEMPERATURE (DEG C) (00010) | SURFACE AREA (SQ MI) (00049) | STREAMFLOW, INSTANTANEOUS (CFS) (00061) | STREAM STAGE (FT ABOVE DATUM) (00065) | TURBIDITY (JTU) (00070) | COLOR (PLATINUM-COBALT UNITS) (00080) | SPECIFIC CONDUCTANCE (UMHOS) (00095) | OXYGEN, DISSOLVED (MG/L) (00300) | PH (UNITS) (00400) | CARBON DIOXIDE DISSOLVED (MG/L AS CO2) (00405) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JUN , 1971 | | | | | | | | | | | |
| 21... | 1400 | 6.5 | -- | 715 | -- | -- | -- | 133 | -- | 8.0 | 1.0 |
| JUL | | | | | | | | | | | |
| 14... | 1130 | 6.0 | -- | 3500 | -- | -- | -- | 103 | -- | -- | -- |
| AUG | | | | | | | | | | | |
| 14... | 1130 | 6.0 | -- | 3050 | -- | -- | -- | 97 | -- | -- | -- |
| OCT | | | | | | | | | | | |
| 04... | 1000 | 3.0 | 192 | 304 | -- | -- | -- | 173 | -- | 8.0 | 1.3 |
| MAR , 1972 | | | | | | | | | | | |
| 30... | 1100 | .0 | 192 | 47 | -- | -- | 5 | 231 | -- | 7.7 | 3.4 |
| JUN | | | | | | | | | | | |
| 09... | 1100 | 9.0 | 192 | 373 | -- | -- | 0 | 183 | -- | 8.0 | 1.4 |
| AUG | | | | | | | | | | | |
| 03... | 1200 | 6.5 | 192 | 1620 | -- | -- | 22 | 77 | -- | 6.6 | 15 |
| OCT | | | | | | | | | | | |
| 04... | 1100 | -- | 192 | 346 | -- | 6 | -- | 162 | -- | -- | -- |
| FEB , 1973 | | | | | | | | | | | |
| 05... | 1130 | .0 | 192 | 51 | -- | -- | 2 | 227 | -- | 7.6 | 4.2 |
| MAY | | | | | | | | | | | |
| 08... | 1115 | 7.0 | 192 | 94 | -- | 5 | -- | 215 | -- | -- | -- |
| JUL , 1974 | | | | | | | | | | | |
| 12... | 1630 | 8.0 | 192 | 1290 | 6.04 | -- | -- | 101 | -- | 7.1 | -- |
| MAY , 1981 | | | | | | | | | | | |
| 12... | 1000 | 7.0 | -- | 378 | -- | -- | -- | 170 | 11.8 | 7.4 | -- |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
15277100 - EAGLE R AT EAGLE RIVER AK

PROCESS DATE 12/02/81
DISTRICT CODE 02

WATER QUALITY DATA

| DATE | ALKALINITY FIELD (MG/L AS CACO3) (00410) | BICARBONATE (MG/L AS HCO3) (00440) | CARBONATE (MG/L AS CO3) (00445) | NITROGEN, NITRATE DISSOLVED (MG/L AS N) (00618) | NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631) | PHOSPHATE, ORTHO, DISSOLVED (MG/L AS PO4) (00660) | PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671) | HARDNESS (MG/L AS CACO3) (00900) | HARDNESS, NONCARBONATE (MG/L CACO3) (00902) | CALCIUM DISSOLVED (MG/L AS CA) (00915) | MAGNESIUM, DISSOLVED (MG/L AS MG) (00925) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JUN , 1971 | | | | | | | | | | | |
| 21... | 52 | 63 | 0 | -- | -- | -- | -- | 64 | 12 | -- | -- |
| JUL | | | | | | | | | | | |
| 14... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG | | | | | | | | | | | |
| 14... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT | | | | | | | | | | | |
| 04... | 65 | 79 | 0 | -- | -- | -- | -- | 85 | 20 | -- | -- |
| MAR , 1972 | | | | | | | | | | | |
| 30... | 88 | 107 | 0 | .20 | -- | -- | -- | 112 | 24 | 36 | 5.4 |
| JUN | | | | | | | | | | | |
| 09... | 70 | 85 | 0 | .25 | -- | -- | -- | 88 | 18 | 27 | 5.0 |
| AUG | | | | | | | | | | | |
| 03... | 30 | 37 | 0 | -- | .02 | .15 | .050 | 37 | 7 | 12 | 1.8 |
| OCT | | | | | | | | | | | |
| 04... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB , 1973 | | | | | | | | | | | |
| 05... | 86 | 105 | 0 | -- | .18 | .00 | <.010 | 110 | 20 | 34 | 5.2 |
| MAY | | | | | | | | | | | |
| 08... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUL , 1974 | | | | | | | | | | | |
| 12... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY , 1981 | | | | | | | | | | | |
| 12... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
15277100 - EAGLE R AT EAGLE RIVER AK

PROCESS DATE 12/02/81
DISTRICT CODE 02

WATER QUALITY DATA

| DATE | SODIUM, DIS-SOLVED (MG/L AS NA) (00930) | SODIUM AD-SORP-TION RATIO (00931) | PERCENT SODIUM (00932) | POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935) | CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940) | SULFATE DIS-SOLVED (MG/L AS SO4) (00945) | FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950) | SILICA, DIS-SOLVED (MG/L AS SIO2) (00955) | COPPER, DIS-SOLVED (UG/L AS CU) (01040) | IRON, DIS-SOLVED (UG/L AS FE) (01046) | MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JUN , 1971 | | | | | | | | | | | |
| 21... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUL | | | | | | | | | | | |
| 14... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG | | | | | | | | | | | |
| 14... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT | | | | | | | | | | | |
| 04... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAR , 1972 | | | | | | | | | | | |
| 30... | 3.3 | .1 | 6 | .5 | 2.5 | 26 | .1 | 8.1 | 0 | 30 | 50 |
| JUN | | | | | | | | | | | |
| 09... | 3.5 | .2 | 8 | .5 | 1.8 | 19 | .3 | 2.7 | -- | 70 | 10 |
| AUG | | | | | | | | | | | |
| 03... | 1.2 | .1 | 7 | .2 | 1.4 | 8.9 | .0 | 2.1 | -- | 90 | 30 |
| OCT | | | | | | | | | | | |
| 04... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB , 1973 | | | | | | | | | | | |
| 05... | 3.6 | .2 | 7 | .4 | 1.7 | 28 | .1 | 6.3 | -- | 40 | 50 |
| MAY | | | | | | | | | | | |
| 08... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUL , 1974 | | | | | | | | | | | |
| 12... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY , 1981 | | | | | | | | | | | |
| 12... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
15277100 - EAGLE R AT EAGLE RIVER AK

PROCESS DATE 12/02/81
DISTRICT CODE 02

WATER QUALITY DATA

| DATE | STRONTIUM, DISSOLVED (UG/L AS SR) (01080) | ZINC, DISSOLVED (UG/L AS ZN) (01090) | LITHIUM DISSOLVED (UG/L AS LI) (01130) | SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301) | SOLIDS, DISSOLVED (TONS PER DAY) (70302) | SOLIDS, DISSOLVED (TONS PER AC-FT) (70303) | SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337) | SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338) | SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339) | SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340) |
|---|---|---|---|---|---|---|---|---|---|---|
| JUN , 1971 | | | | | | | | | | |
| 21... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUL | | | | | | | | | | |
| 14... | -- | -- | -- | -- | -- | -- | 33 | 43 | 48 | 58 |
| AUG | | | | | | | | | | |
| 14... | -- | -- | -- | -- | -- | -- | 32 | 39 | 46 | 60 |
| OCT | | | | | | | | | | |
| 04... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAR , 1972 | | | | | | | | | | |
| 30... | 290 | 0 | 0 | 136 | 17.3 | .18 | -- | -- | -- | -- |
| JUN | | | | | | | | | | |
| 09... | -- | -- | -- | 103 | 104 | .14 | -- | -- | -- | -- |
| AUG | | | | | | | | | | |
| 03... | -- | -- | -- | 46 | 201 | .06 | 24 | 38 | -- | 56 |
| OCT | | | | | | | | | | |
| 04... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB , 1973 | | | | | | | | | | |
| 05... | -- | -- | -- | 132 | 18.2 | .18 | -- | -- | -- | -- |
| MAY | | | | | | | | | | |
| 08... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUL , 1974 | | | | | | | | | | |
| 12... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY , 1981 | | | | | | | | | | |
| 12... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
15277100 - EAGLE R AT EAGLE RIVER AK

PROCESS DATE 12/02/81
DISTRICT CODE 02

WATER QUALITY DATA

| DATE | SED. SUSP. FALL DIAM. % FINER THAN .031 MM (70341) | SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342) | SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343) | SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344) | SED. SUSP. FALL DIAM. % FINER THAN .500 MM (70345) | SED. SUSP. FALL DIAM. % FINER THAN 1.00 MM (70346) | NITROGEN, NITRATE DISSOLVED (MG/L AS NO3) (71851) | ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000) | SEDIMENT, SUSPENDED (MG/L) (80154) | SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155) |
|---|---|---|---|---|---|---|---|---|---|---|
| JUN , 1971 | | | | | | | | | | |
| 21... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUL | | | | | | | | | | |
| 14... | 68 | 81 | 91 | 97 | 100 | -- | -- | -- | 1440 | 13600 |
| AUG | | | | | | | | | | |
| 14... | 70 | 85 | 93 | 97 | 99 | 100 | -- | -- | 495 | 4080 |
| OCT | | | | | | | | | | |
| 04... | -- | -- | -- | -- | -- | -- | -- | 250.00 | 15 | 12 |
| MAR , 1972 | | | | | | | | | | |
| 30... | -- | -- | -- | -- | -- | -- | .90 | 250.00 | -- | -- |
| JUN | | | | | | | | | | |
| 09... | -- | 86 | 95 | 99 | 100 | -- | 1.1 | 250.00 | 41 | 41 |
| AUG | | | | | | | | | | |
| 03... | -- | 77 | 88 | 98 | 100 | -- | -- | 250.00 | 99 | 433 |
| OCT | | | | | | | | | | |
| 04... | -- | -- | -- | -- | -- | -- | -- | 250.00 | 20 | 19 |
| FEB , 1973 | | | | | | | | | | |
| 05... | -- | -- | -- | -- | -- | -- | -- | 250.00 | -- | -- |
| MAY | | | | | | | | | | |
| 08... | -- | -- | -- | -- | -- | -- | -- | 250.00 | 5 | 1.3 |
| JUL , 1974 | | | | | | | | | | |
| 12... | -- | -- | -- | -- | -- | -- | -- | 250.00 | -- | -- |
| MAY , 1981 | | | | | | | | | | |
| 12... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE IS 12-03-81

STATION NUMBER 15277100 EAGLE R AT EAGLE RIVER AK STREAM SOURCE AGENCY USGS
LATITUDE 611828 LONGITUDE 1493332 DRAINAGE AREA 192.00 DATUM 250.00 STATE 02 COUNTY 020

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
|---|---|---|---|---|---|---|---|---|---|
| | | OCTOBER | | | NOVEMBER | | | DECEMBER | |
| 1 | 532 | --- | 100 | 334 | | 40 | 80 | | 3.0 |
| 2 | 487 | --- | 90 | 273 | | 30 | 75 | | 3.0 |
| 3 | 449 | --- | 70 | 208 | | 20 | 75 | | 3.0 |
| 4 | 419 | 44 | 50 | 197 | | 20 | 75 | | 3.0 |
| 5 | 393 | --- | 50 | 187 | | 10 | 75 | | 3.0 |
| 6 | 367 | --- | 40 | 115 | | 8.0 | 75 | | 3.0 |
| 7 | 352 | --- | 40 | 85 | | 5.0 | 70 | | 3.0 |
| 8 | 340 | --- | 40 | 75 | | 4.0 | 70 | | 3.0 |
| 9 | 326 | --- | 30 | 70 | | 3.0 | 70 | | 3.0 |
| 10 | 316 | --- | 30 | 70 | | 3.0 | 70 | | 3.0 |
| 11 | 302 | --- | 30 | 70 | | 3.0 | 70 | | 3.0 |
| 12 | 288 | --- | 20 | 70 | | 3.0 | 70 | | 3.0 |
| 13 | 284 | --- | 30 | 80 | | 4.0 | 70 | | 3.0 |
| 14 | 277 | --- | 20 | 100 | | 6.0 | 90 | | 5.0 |
| 15 | 281 | --- | 30 | 110 | | 5.0 | 110 | | 9.0 |
| 16 | 260 | --- | 20 | 115 | | 6.0 | 100 | | 7.0 |
| 17 | 248 | --- | 20 | 120 | | 7.0 | 85 | | 5.0 |
| 18 | 226 | --- | 20 | 130 | | 8.0 | 80 | | 4.0 |
| 19 | 225 | --- | 20 | 150 | | 10 | 80 | | 4.0 |
| 20 | 219 | --- | 20 | 170 | | 10 | 75 | | 3.0 |
| 21 | 229 | --- | 20 | 216 | | 20 | 75 | | 3.0 |
| 22 | 226 | --- | 20 | 208 | | 20 | 70 | | 3.0 |
| 23 | 213 | --- | 20 | 186 | | 10 | 70 | | 3.0 |
| 24 | 189 | --- | 10 | 117 | | 7.0 | 70 | | 3.0 |
| 25 | 157 | --- | 10 | 100 | | 6.0 | 70 | | 3.0 |
| 26 | 254 | --- | 30 | 95 | | 5.0 | 70 | | 3.0 |
| 27 | 227 | --- | 20 | 90 | | 5.0 | 70 | | 3.0 |
| 28 | 208 | --- | 20 | 85 | | 4.0 | 70 | | 3.0 |
| 29 | 190 | --- | 20 | 85 | | 4.0 | 100 | | 6.0 |
| 30 | 222 | --- | 20 | 80 | | 3.0 | 170 | | 20 |
| 31 | 227 | --- | 20 | --- | | | 140 | | 10 |
| TOTAL | 8933 | --- | 980 | 3991 | | 289.0 | 2540 | | 136.0 |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE IS 12-03-81

STATION NUMBE 15277100 EAGLE R AT EAGLE RIVER AK STREAM SOURCE AGENCY USGS
LATITUDE 611828 LONGITUDE 1493332 DRAINAGE AREA 192.00 DATUM 250.00 STATE 02 COUNTY 020

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
|---|---|---|---|---|---|---|---|---|---|
| | | JANUARY | | | FEBRUARY | | | MARCH | |
| 1 | 110 | | 8.0 | 65 | | 2.0 | 62 | | 1.0 |
| 2 | 95 | | 6.0 | 65 | | 2.0 | 62 | | 1.0 |
| 3 | 90 | | 5.0 | 65 | | 2.0 | 62 | | 1.0 |
| 4 | 85 | | 4.0 | 65 | | 2.0 | 62 | | 1.0 |
| 5 | 80 | | 4.0 | 65 | | 2.0 | 62 | | 1.0 |
| 6 | 80 | | 3.0 | 65 | | 2.0 | 62 | | 1.0 |
| 7 | 75 | | 3.0 | 65 | | 2.0 | 62 | | 1.0 |
| 8 | 75 | | 3.0 | 65 | | 2.0 | 62 | | 1.0 |
| 9 | 75 | | 3.0 | 65 | | 2.0 | 62 | | 1.0 |
| 10 | 70 | | 2.0 | 65 | | 2.0 | 62 | | 1.0 |
| 11 | 70 | | 2.0 | 65 | | 2.0 | 60 | | 1.0 |
| 12 | 70 | | 2.0 | 65 | | 2.0 | 60 | | 1.0 |
| 13 | 70 | | 2.0 | 65 | | 2.0 | 60 | | 1.0 |
| 14 | 70 | | 2.0 | 65 | | 2.0 | 60 | | 1.0 |
| 15 | 65 | | 2.0 | 65 | | 2.0 | 60 | | 1.0 |
| 16 | 65 | | 2.0 | 62 | | 1.0 | 60 | | 1.0 |
| 17 | 65 | | 2.0 | 62 | | 1.0 | 60 | | 1.0 |
| 18 | 65 | | 2.0 | 62 | | 1.0 | 60 | | 1.0 |
| 19 | 65 | | 2.0 | 62 | | 1.0 | 60 | | 1.0 |
| 20 | 65 | | 2.0 | 62 | | 1.0 | 60 | | 1.0 |
| 21 | 65 | | 2.0 | 62 | | 1.0 | 60 | | 1.0 |
| 22 | 65 | | 2.0 | 62 | | 1.0 | 60 | | 1.0 |
| 23 | 65 | | 2.0 | 62 | | 1.0 | 60 | | 1.0 |
| 24 | 65 | | 2.0 | 62 | | 1.0 | 60 | | 1.0 |
| 25 | 65 | | 2.0 | 62 | | 1.0 | 60 | | 1.0 |
| 26 | 65 | | 2.0 | 62 | | 1.0 | 60 | | 1.0 |
| 27 | 65 | | 2.0 | 62 | | 1.0 | 60 | | 1.0 |
| 28 | 65 | | 2.0 | 62 | | 1.0 | 60 | | 1.0 |
| 29 | 65 | | 2.0 | 62 | | 1.0 | 60 | | 1.0 |
| 30 | 65 | | 2.0 | --- | | | 60 | | 1.0 |
| 31 | 65 | | 2.0 | --- | | | 60 | | 1.0 |
| TOTAL | 2220 | | 83.0 | 1843 | | 44.0 | 1880 | | 31.0 |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE IS 12-03-81

STATION NUMBER 15277100 EAGLE R AT EAGLE RIVER AK STREAM SOURCE AGENCY USGS
LATITUDE 611828 LONGITUDE 1493332 DRAINAGE AREA 192.00 DATUM 250.00 STATE 02 COUNTY 020

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
|---|---|---|---|---|---|---|---|---|---|
| | | APRIL | | | MAY | | | JUNE | |
| 1 | 60 | | 1.0 | 80 | --- | 4.0 | 698 | 50 | 94 |
| 2 | 60 | | 1.0 | 80 | --- | 4.0 | 638 | 40 | 69 |
| 3 | 60 | | 1.0 | 85 | --- | 5.0 | 621 | 33 | 55 |
| 4 | 60 | | 1.0 | 85 | --- | 5.0 | 590 | 25 | 40 |
| 5 | 60 | | 1.0 | 90 | --- | 6.0 | 579 | 15 | 23 |
| 6 | 60 | | 1.0 | 95 | 26 | 7.0 | 579 | 17 | 27 |
| 7 | 60 | | 1.0 | 100 | --- | 7.0 | 570 | 17 | 26 |
| 8 | 60 | | 1.0 | 105 | --- | 8.0 | 560 | 15 | 23 |
| 9 | 60 | | 1.0 | 110 | --- | 8.0 | 585 | 20 | 32 |
| 10 | 60 | | 1.0 | 115 | --- | 10 | 656 | 27 | 48 |
| 11 | 60 | | 1.0 | 120 | --- | 10 | 773 | 53 | 111 |
| 12 | 60 | | 1.0 | 138 | --- | 10 | 906 | 105 | 257 |
| 13 | 60 | | 1.0 | 169 | --- | 20 | 1170 | 215 | 679 |
| 14 | 60 | | 1.0 | 205 | --- | 40 | 1300 | 220 | 772 |
| 15 | 60 | | 1.0 | 224 | --- | 40 | 1410 | 185 | 704 |
| 16 | 60 | | 1.0 | 225 | --- | 30 | 1450 | 175 | 685 |
| 17 | 60 | | 1.0 | 224 | --- | 30 | 1290 | 130 | 453 |
| 18 | 60 | | 1.0 | 247 | --- | 40 | 1170 | 90 | 284 |
| 19 | 60 | | 1.0 | 282 | --- | 50 | 1120 | 84 | 254 |
| 20 | 60 | | 1.0 | 370 | --- | 100 | 1200 | 80 | 259 |
| 21 | 65 | | 2.0 | 500 | --- | 230 | 1180 | 75 | 239 |
| 22 | 65 | | 2.0 | 615 | 242 | 402 | 1070 | 65 | 188 |
| 23 | 65 | | 2.0 | 700 | 175 | 331 | 970 | 60 | 157 |
| 24 | 65 | | 2.0 | 720 | 130 | 253 | 866 | 55 | 129 |
| 25 | 70 | | 3.0 | 730 | 96 | 189 | 843 | 50 | 114 |
| 26 | 70 | | 3.0 | 736 | 80 | 159 | 986 | 55 | 146 |
| 27 | 70 | | 3.0 | 698 | 65 | 122 | 978 | 48 | 127 |
| 28 | 70 | | 3.0 | 686 | 55 | 102 | 1090 | 63 | 185 |
| 29 | 75 | | 4.0 | 835 | 140 | 316 | 1380 | 120 | 447 |
| 30 | 75 | | 4.0 | 823 | 207 | 460 | 1590 | 180 | 773 |
| 31 | --- | | | 855 | 95 | 219 | --- | --- | --- |
| TOTAL | 1896 | | 48.0 | 11047 | --- | 3217.0 | 28818 | --- | 7400 |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE IS 12-03-81

STATION NUMBER 15277100 EAGLE R AT EAGLE RIVER AK STREAM SOURCE AGENCY USGS
LATITUDE 611828 LONGITUDE 1493332 DRAINAGE AREA 192.00 DATUM 250.00 STATE 02 COUNTY 020

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
|---|---|---|---|---|---|---|---|---|---|
| | | JULY | | | AUGUST | | | SEPTEMBER | |
| 1 | 1690 | 198 | 903 | 1580 | 150 | 640 | 773 | 73 | 150 |
| 2 | 1630 | 180 | 792 | 1480 | 130 | 519 | 704 | 64 | 120 |
| 3 | 1550 | 143 | 598 | 1340 | 106 | 384 | 668 | 64 | 120 |
| 4 | 1430 | 125 | 483 | 1380 | 107 | 399 | 650 | 57 | 100 |
| 5 | 1540 | 125 | 520 | 1550 | 109 | 456 | 780 | 92 | 190 |
| 6 | 1700 | 150 | 688 | 1950 | 240 | 1260 | 898 | 90 | 220 |
| 7 | 1850 | 175 | 874 | 2310 | 298 | 1860 | 962 | 78 | 200 |
| 8 | 2060 | 320 | 1780 | 2290 | 268 | 1660 | 914 | 65 | 160 |
| 9 | 2260 | 417 | 2540 | 2270 | 230 | 1410 | 829 | 45 | 100 |
| 10 | 2030 | 315 | 1730 | 2130 | 175 | 1010 | 710 | 30 | 58 |
| 11 | 1670 | 215 | 969 | 1730 | 172 | 803 | 590 | 34 | 54 |
| 12 | 1630 | 149 | 656 | 1560 | 155 | 653 | 530 | 29 | 41 |
| 13 | 1590 | 122 | 524 | 1660 | 151 | 677 | 470 | 30 | 38 |
| 14 | 1650 | 121 | 539 | 1520 | 148 | 607 | 436 | 31 | 36 |
| 15 | 1620 | 127 | 555 | 1320 | 132 | 470 | 404 | 33 | 36 |
| 16 | 1550 | 138 | 578 | 1320 | 108 | 385 | 376 | 30 | 30 |
| 17 | 1610 | 152 | 661 | 1200 | 100 | 324 | 336 | 25 | 23 |
| 18 | 1630 | 140 | 616 | 1120 | 100 | 302 | 317 | 24 | 21 |
| 19 | 1500 | 130 | 526 | 1260 | 101 | 344 | 303 | 20 | 16 |
| 20 | 1650 | 130 | 579 | 1510 | 111 | 453 | 282 | 22 | 17 |
| 21 | 1760 | 135 | 642 | 1750 | 172 | 813 | 270 | 15 | 11 |
| 22 | 1750 | 150 | 709 | 1370 | 105 | 388 | 255 | 15 | 10 |
| 23 | 1910 | 190 | 980 | 1190 | 70 | 220 | 243 | 12 | 7.9 |
| 24 | 1770 | 230 | 1100 | 1220 | 85 | 280 | 233 | 12 | 7.5 |
| 25 | 1910 | 260 | 1340 | 1120 | 155 | 469 | 230 | 14 | 8.7 |
| 26 | 2200 | 285 | 1690 | 1100 | 95 | 280 | 226 | 8 | 4.9 |
| 27 | 2110 | 325 | 1850 | 1010 | 88 | 240 | 220 | 10 | 5.9 |
| 28 | 1870 | 295 | 1490 | 970 | 120 | 314 | 220 | 8 | 4.8 |
| 29 | 2000 | 250 | 1350 | 954 | 95 | 240 | 222 | 6 | 3.6 |
| 30 | 2110 | 182 | 1040 | 914 | 74 | 180 | 220 | 12 | 7.1 |
| 31 | 1810 | 158 | 772 | 858 | 72 | 170 | --- | --- | --- |
| TOTAL | 55040 | --- | 30074 | 44936 | --- | 18210 | 14271 | --- | 1801.4 |
| YEAR | 177409 | | 62313.4 | | | | | | |

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE IS 12-03-81

STATION NUMBER 15277100 EAGLE R AT EAGLE RIVER AK STREAM SOURCE AGENCY USGS
LATITUDE 611828 LONGITUDE 1493332 DRAINAGE AREA 192.00 DATUM 250.00 STATE 02 COUNTY 020

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
|---|---|---|---|---|---|---|---|---|---|
| | | OCTOBER | | | NOVEMBER | | | DECEMBER | |
| 1 | 201 | 10 | 5.4 | 120 | 15 | 4.9 | 95 | 9 | 2.3 |
| 2 | 192 | 11 | 5.7 | 120 | 15 | 4.9 | 90 | 9 | 2.2 |
| 3 | 194 | 14 | 7.3 | 120 | 15 | 4.9 | 90 | 9 | 2.2 |
| 4 | 189 | 10 | 5.1 | 120 | 15 | 4.9 | 85 | 9 | 2.1 |
| 5 | 183 | 10 | 4.9 | 120 | 15 | 4.9 | 85 | 9 | 2.1 |
| 6 | 173 | 19 | 8.9 | 110 | 15 | 4.5 | 80 | 9 | 1.9 |
| 7 | 173 | 30 | 14 | 110 | 15 | 4.5 | 75 | 9 | 1.8 |
| 8 | 170 | 52 | 24 | 110 | 15 | 4.5 | 70 | 9 | 1.7 |
| 9 | 170 | 52 | 24 | 110 | 15 | 4.5 | 65 | 9 | 1.6 |
| 10 | 173 | 37 | 17 | 110 | 15 | 4.5 | 60 | 9 | 1.5 |
| 11 | 168 | 65 | 29 | 110 | 15 | 4.5 | 60 | 7 | 1.1 |
| 12 | 164 | 58 | 26 | 110 | 15 | 4.5 | 65 | 7 | 1.2 |
| 13 | 161 | 32 | 14 | 110 | 15 | 4.5 | 70 | 7 | 1.3 |
| 14 | 164 | 20 | 8.9 | 110 | 15 | 4.5 | 75 | 7 | 1.4 |
| 15 | 162 | 19 | 8.3 | 110 | 15 | 4.5 | 75 | 7 | 1.4 |
| 16 | 158 | 27 | 12 | 100 | 12 | 3.2 | 70 | 7 | 1.3 |
| 17 | 152 | 30 | 12 | 100 | 12 | 3.2 | 70 | 7 | 1.3 |
| 18 | 149 | 20 | 8.0 | 100 | 12 | 3.2 | 70 | 7 | 1.3 |
| 19 | 119 | 20 | 6.4 | 100 | 12 | 3.2 | 70 | 7 | 1.3 |
| 20 | 115 | 20 | 6.2 | 100 | 12 | 3.2 | 70 | 7 | 1.3 |
| 21 | 130 | 20 | 7.0 | 100 | 12 | 3.2 | 65 | 5 | .88 |
| 22 | 125 | 20 | 6.8 | 100 | 12 | 3.2 | 65 | 5 | .88 |
| 23 | 140 | 20 | 7.6 | 100 | 12 | 3.2 | 65 | 5 | .88 |
| 24 | 150 | 20 | 8.1 | 100 | 12 | 3.2 | 65 | 5 | .88 |
| 25 | 150 | 20 | 8.1 | 100 | 12 | 3.2 | 65 | 5 | .88 |
| 26 | 140 | 15 | 5.7 | 100 | 12 | 3.2 | 60 | 5 | .81 |
| 27 | 135 | 15 | 5.5 | 100 | 12 | 3.2 | 60 | 5 | .81 |
| 28 | 130 | 15 | 5.3 | 100 | 12 | 3.2 | 60 | 5 | .81 |
| 29 | 130 | 15 | 5.3 | 100 | 12 | 3.2 | 60 | 5 | .81 |
| 30 | 125 | 15 | 5.1 | 95 | 12 | 3.1 | 60 | 5 | .81 |
| 31 | 125 | 15 | 5.1 | --- | --- | --- | 55 | 5 | .74 |
| TOTAL | 4810 | --- | 316.7 | 3195 | --- | 117.4 | 2170 | --- | 41.49 |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE IS 12-03-81

STATION NUMBER 15277100 EAGLE R AT EAGLE RIVER AK STREAM SOURCE AGENCY USGS
LATITUDE 611828 LONGITUDE 1493332 DRAINAGE AREA 192.00 DATUM 250.00 STATE 02 COUNTY 020

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
|---|---|---|---|---|---|---|---|---|---|
| | | JANUARY | | | FEBRUARY | | | MARCH | |
| 1 | 55 | 4 | .59 | 30 | 3 | .24 | 36 | 3 | .29 |
| 2 | 50 | 4 | .54 | 30 | 3 | .24 | 36 | 3 | .29 |
| 3 | 46 | 4 | .50 | 30 | 3 | .24 | 36 | 3 | .29 |
| 4 | 46 | 4 | .50 | 30 | 3 | .24 | 36 | 3 | .29 |
| 5 | 44 | 4 | .48 | 30 | 3 | .24 | 36 | 3 | .29 |
| 6 | 44 | 3 | .36 | 30 | 3 | .24 | 36 | 3 | .29 |
| 7 | 44 | 3 | .36 | 30 | 3 | .24 | 36 | 3 | .29 |
| 8 | 42 | 3 | .34 | 30 | 3 | .24 | 38 | 3 | .31 |
| 9 | 42 | 3 | .34 | 30 | 3 | .24 | 38 | 3 | .31 |
| 10 | 42 | 3 | .34 | 30 | 3 | .24 | 38 | 3 | .31 |
| 11 | 40 | 3 | .32 | 32 | 3 | .26 | 38 | 3 | .31 |
| 12 | 40 | 3 | .32 | 32 | 3 | .26 | 38 | 3 | .31 |
| 13 | 40 | 3 | .32 | 32 | 3 | .26 | 38 | 3 | .31 |
| 14 | 40 | 3 | .32 | 32 | 3 | .26 | 38 | 3 | .31 |
| 15 | 38 | 3 | .31 | 32 | 3 | .26 | 38 | 3 | .31 |
| 16 | 38 | 3 | .31 | 32 | 3 | .26 | 38 | 3 | .31 |
| 17 | 38 | 3 | .31 | 32 | 3 | .26 | 38 | 3 | .31 |
| 18 | 38 | 3 | .31 | 32 | 3 | .26 | 38 | 3 | .31 |
| 19 | 36 | 3 | .29 | 32 | 3 | .26 | 40 | 3 | .32 |
| 20 | 36 | 3 | .29 | 32 | 3 | .26 | 40 | 3 | .32 |
| 21 | 36 | 3 | .29 | 34 | 3 | .28 | 42 | 4 | .45 |
| 22 | 36 | 3 | .29 | 34 | 3 | .28 | 44 | 4 | .48 |
| 23 | 34 | 3 | .28 | 34 | 3 | .28 | 44 | 4 | .48 |
| 24 | 34 | 3 | .28 | 34 | 3 | .28 | 46 | 4 | .50 |
| 25 | 34 | 3 | .28 | 34 | 3 | .28 | 48 | 4 | .52 |
| 26 | 32 | 3 | .26 | 34 | 3 | .28 | 50 | 4 | .54 |
| 27 | 32 | 3 | .26 | 34 | 3 | .28 | 50 | 4 | .54 |
| 28 | 32 | 3 | .26 | 34 | 3 | .28 | 50 | 4 | .54 |
| 29 | 30 | 3 | .24 | --- | --- | --- | 55 | 4 | .59 |
| 30 | 30 | 3 | .24 | --- | --- | --- | 55 | 4 | .59 |
| 31 | 30 | 3 | .24 | --- | --- | --- | 55 | 4 | .59 |
| TOTAL | 1199 | --- | 10.37 | 892 | --- | 7.24 | 1289 | --- | 11.90 |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE IS 12-03-81

STATION NUMBER 15277100 EAGLE R AT EAGLE RIVER AK STREAM SOURCE AGENCY USGS
LATITUDE 611828 LONGITUDE 1493332 DRAINAGE AREA 192.00 DATUM 250.00 STATE 02 COUNTY 020

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
|---|---|---|---|---|---|---|---|---|---|
| | | APRIL | | | MAY | | | JUNE | |
| 1 | 55 | 5 | .74 | 110 | 20 | 5.9 | 495 | 62 | 83 |
| 2 | 60 | 5 | .81 | 110 | 20 | 5.9 | 465 | 35 | 44 |
| 3 | 60 | 5 | .81 | 120 | 20 | 6.5 | 495 | 35 | 47 |
| 4 | 60 | 5 | .81 | 120 | 20 | 6.5 | 560 | 38 | 57 |
| 5 | 60 | 5 | .81 | 130 | 20 | 7.0 | 565 | 36 | 55 |
| 6 | 65 | 6 | 1.1 | 130 | 20 | 7.0 | 520 | 24 | 34 |
| 7 | 65 | 6 | 1.1 | 140 | 20 | 7.6 | 535 | 32 | 46 |
| 8 | 65 | 6 | 1.1 | 140 | 20 | 7.6 | 632 | 42 | 72 |
| 9 | 65 | 6 | 1.1 | 150 | 20 | 8.1 | 773 | 85 | 177 |
| 10 | 70 | 6 | 1.1 | 150 | 20 | 8.1 | 882 | 68 | 162 |
| 11 | 70 | 8 | 1.5 | 160 | 20 | 8.6 | 898 | 46 | 112 |
| 12 | 70 | 8 | 1.5 | 160 | 20 | 8.6 | 1050 | 72 | 204 |
| 13 | 75 | 8 | 1.6 | 170 | 15 | 6.9 | 1200 | 103 | 334 |
| 14 | 75 | 8 | 1.6 | 170 | 20 | 9.2 | 1310 | 138 | 488 |
| 15 | 75 | 8 | 1.6 | 170 | 20 | 9.2 | 1630 | 165 | 726 |
| 16 | 80 | 10 | 2.2 | 172 | 33 | 15 | 2210 | 668 | 4070 |
| 17 | 80 | 10 | 2.2 | 175 | 32 | 15 | 2350 | 660 | 4190 |
| 18 | 80 | 10 | 2.2 | 186 | 63 | 32 | 1890 | 387 | 1970 |
| 19 | 85 | 10 | 2.3 | 212 | 106 | 61 | 1620 | 298 | 1300 |
| 20 | 85 | 10 | 2.3 | 261 | 72 | 51 | 1470 | 233 | 925 |
| 21 | 85 | 15 | 3.4 | 276 | 52 | 39 | 1410 | 200 | 761 |
| 22 | 90 | 15 | 3.6 | 416 | 249 | 334 | 1400 | 185 | 699 |
| 23 | 90 | 15 | 3.6 | 515 | 280 | 389 | 1430 | 149 | 575 |
| 24 | 90 | 15 | 3.6 | 510 | 150 | 207 | 1340 | 110 | 398 |
| 25 | 95 | 15 | 3.8 | 644 | 170 | 296 | 1490 | 136 | 547 |
| 26 | 95 | 20 | 5.1 | 922 | 190 | 473 | 1590 | 217 | 932 |
| 27 | 100 | 30 | 8.1 | 1060 | 232 | 664 | 1760 | 242 | 1150 |
| 28 | 100 | 35 | 9.5 | 808 | 115 | 251 | 1890 | 252 | 1290 |
| 29 | 105 | 24 | 6.8 | 614 | 75 | 124 | 1830 | 247 | 1220 |
| 30 | 105 | 20 | 5.7 | 575 | 80 | 124 | 1860 | 226 | 1130 |
| 31 | --- | --- | --- | 520 | 100 | 140 | --- | --- | --- |
| TOTAL | 2355 | --- | 81.68 | 9996 | --- | 3327.7 | 37550 | --- | 23798 |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE IS 12-03-81

STATION NUMBER 15277100 EAGLE R AT EAGLE RIVER AK STREAM SOURCE AGENCY USGS
LATITUDE 611828 LONGITUDE 1493332 DRAINAGE AREA 192.00 DATUM 250.00 STATE 02 COUNTY 020

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
|---|---|---|---|---|---|---|---|---|---|
| | | JULY | | | AUGUST | | | SEPTEMBER | |
| 1 | 1790 | 191 | 923 | 1310 | 84 | 297 | 626 | 39 | 66 |
| 2 | 1690 | 168 | 767 | 1370 | 79 | 292 | 668 | 40 | 72 |
| 3 | 1690 | 178 | 812 | 1520 | 128 | 525 | 644 | 37 | 64 |
| 4 | 1890 | 200 | 1020 | 1560 | 154 | 649 | 602 | 37 | 60 |
| 5 | 1790 | 200 | 967 | 2000 | 173 | 934 | 495 | 32 | 43 |
| 6 | 1730 | 194 | 906 | 1730 | 168 | 785 | 432 | 26 | 30 |
| 7 | 1760 | 184 | 874 | 1390 | 158 | 593 | 404 | 26 | 28 |
| 8 | 1630 | 161 | 709 | 1190 | 136 | 437 | 404 | 26 | 28 |
| 9 | 1580 | 145 | 619 | 1010 | 110 | 300 | 388 | 26 | 27 |
| 10 | 1530 | 129 | 533 | 954 | 100 | 258 | 500 | 42 | 57 |
| 11 | 1520 | 116 | 476 | 978 | 87 | 230 | 808 | 95 | 207 |
| 12 | 1670 | 110 | 496 | 850 | 67 | 154 | 780 | 76 | 160 |
| 13 | 1670 | 123 | 555 | 698 | 61 | 115 | 585 | 42 | 66 |
| 14 | 1750 | 147 | 695 | 550 | 53 | 79 | 510 | 40 | 55 |
| 15 | 1670 | 147 | 663 | 545 | 48 | 71 | 475 | 37 | 47 |
| 16 | 1580 | 121 | 516 | 545 | 46 | 68 | 450 | 32 | 39 |
| 17 | 1430 | 116 | 448 | 575 | 42 | 65 | 408 | 26 | 29 |
| 18 | 1470 | 112 | 445 | 656 | 48 | 85 | 384 | 26 | 27 |
| 19 | 1410 | 105 | 400 | 638 | 48 | 83 | 372 | 25 | 25 |
| 20 | 1330 | 102 | 366 | 638 | 56 | 96 | 356 | 21 | 20 |
| 21 | 1360 | 94 | 345 | 632 | 32 | 55 | 372 | 26 | 26 |
| 22 | 1310 | 92 | 325 | 608 | 37 | 61 | 412 | 28 | 31 |
| 23 | 1410 | 94 | 358 | 575 | 34 | 53 | 408 | 28 | 31 |
| 24 | 1510 | 147 | 599 | 480 | 28 | 36 | 364 | 26 | 26 |
| 25 | 1860 | 220 | 1100 | 465 | 46 | 58 | 324 | 21 | 18 |
| 26 | 1470 | 187 | 742 | 515 | 55 | 76 | 296 | 20 | 16 |
| 27 | 1310 | 150 | 531 | 570 | 42 | 65 | 273 | 10 | 7.4 |
| 28 | 1390 | 147 | 552 | 614 | 42 | 70 | 267 | 10 | 7.2 |
| 29 | 1570 | 131 | 555 | 620 | 37 | 62 | 356 | 14 | 13 |
| 30 | 1410 | 84 | 320 | 674 | 42 | 76 | 348 | 12 | 11 |
| 31 | 1300 | 89 | 312 | 632 | 45 | 77 | --- | --- | --- |
| TOTAL | 48480 | --- | 18929 | 27092 | --- | 6805 | 13711 | --- | 1336.6 |
| YEAR | 152739 | | 54783.08 | | | | | | |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE IS 12-03-81

STATION NUMBER 15277100 EAGLE R AT EAGLE RIVER AK STREAM SOURCE AGENCY USGS
LATITUDE 611828 LONGITUDE 1493332 DRAINAGE AREA 192.00 DATUM 250.00 STATE 02 COUNTY 020

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
|---|---|---|---|---|---|---|---|---|---|
| | | OCTOBER | | | NOVEMBER | | | DECEMBER | |
| 1 | 309 | | | 320 | | | 120 | | |
| 2 | 276 | | | 340 | | | 120 | | |
| 3 | 267 | | | 300 | | | 120 | | |
| 4 | 312 | | | 270 | | | 120 | | |
| 5 | 366 | | | 250 | | | 120 | | |
| 6 | 784 | | | 230 | | | 120 | | |
| 7 | 2740 | | | 210 | | | 120 | | |
| 8 | 1460 | | | 200 | | | 120 | | |
| 9 | 1460 | | | 190 | | | 120 | | |
| 10 | 1040 | | | 180 | | | 120 | | |
| 11 | 1170 | | | 170 | | | 120 | | |
| 12 | 1370 | | | 160 | | | 120 | | |
| 13 | 1850 | | | 150 | | | 120 | | |
| 14 | 1340 | | | 150 | | | 120 | | |
| 15 | 943 | | | 140 | | | 120 | | |
| 16 | 754 | | | 140 | | | 120 | | |
| 17 | 656 | | | 140 | | | 120 | | |
| 18 | 644 | | | 140 | | | 120 | | |
| 19 | 570 | | | 130 | | | 130 | | |
| 20 | 485 | | | 130 | | | 130 | | |
| 21 | 438 | | | 130 | | | 130 | | |
| 22 | 382 | | | 130 | | | 120 | | |
| 23 | 326 | | | 130 | | | 120 | | |
| 24 | 303 | | | 130 | | | 120 | | |
| 25 | 285 | | | 130 | | | 120 | | |
| 26 | 258 | | | 130 | | | 110 | | |
| 27 | 230 | | | 130 | | | 110 | | |
| 28 | 210 | | | 120 | | | 110 | | |
| 29 | 200 | | | 120 | | | 110 | | |
| 30 | 220 | | | 120 | | | 110 | | |
| 31 | 280 | | | --- | | | 120 | | |
| TOTAL | 21928 | | | 5210 | | | 3700 | | |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE IS 12-03-81

STATION NUMBER 15277100 EAGLE R AT EAGLE RIVER AK STREAM SOURCE AGENCY USGS
LATITUDE 611828 LONGITUDE 1493332 DRAINAGE AREA 192.00 DATUM 250.00 STATE 02 COUNTY 020

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
|---|---|---|---|---|---|---|---|---|---|
| | | JANUARY | | | FEBRUARY | | | MARCH | |
| 1 | 120 | | | 90 | | | 90 | | |
| 2 | 110 | | | 90 | | | 90 | | |
| 3 | 110 | | | 90 | | | 90 | | |
| 4 | 110 | | | 90 | | | 90 | | |
| 5 | 110 | | | 90 | | | 90 | | |
| 6 | 100 | | | 90 | | | 85 | | |
| 7 | 100 | | | 90 | | | 85 | | |
| 8 | 100 | | | 90 | | | 85 | | |
| 9 | 100 | | | 90 | | | 85 | | |
| 10 | 100 | | | 90 | | | 85 | | |
| 11 | 100 | | | 90 | | | 85 | | |
| 12 | 100 | | | 90 | | | 85 | | |
| 13 | 100 | | | 90 | | | 85 | | |
| 14 | 100 | | | 90 | | | 85 | | |
| 15 | 100 | | | 90 | | | 85 | | |
| 16 | 95 | | | 90 | | | 85 | | |
| 17 | 95 | | | 90 | | | 85 | | |
| 18 | 95 | | | 90 | | | 85 | | |
| 19 | 95 | | | 90 | | | 85 | | |
| 20 | 95 | | | 90 | | | 85 | | |
| 21 | 95 | | | 90 | | | 85 | | |
| 22 | 95 | | | 90 | | | 85 | | |
| 23 | 95 | | | 90 | | | 85 | | |
| 24 | 95 | | | 90 | | | 85 | | |
| 25 | 95 | | | 90 | | | 85 | | |
| 26 | 95 | | | 90 | | | 80 | | |
| 27 | 95 | | | 90 | | | 80 | | |
| 28 | 95 | | | 90 | | | 80 | | |
| 29 | 95 | | | --- | | | 80 | | |
| 30 | 95 | | | --- | | | 80 | | |
| 31 | 95 | | | --- | | | 80 | | |
| TOTAL | 3080 | | | 2520 | | | 2630 | | |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE IS 12-03-81

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LATITUDE 611828 LONGITUDE 1493332 DRAINAGE AREA 192.00 DATUM 250.00 STATE 02 COUNTY 020

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
|---|---|---|---|---|---|---|---|---|---|
| | | APRIL | | | MAY | | | JUNE | |
| 1 | 80 | | | 84 | | | 360 | | |
| 2 | 80 | | | 84 | | | 370 | | |
| 3 | 80 | | | 84 | | | 400 | | |
| 4 | 80 | | | 84 | | | 450 | | |
| 5 | 80 | | | 84 | | | 430 | | |
| 6 | 80 | | | 86 | | | 410 | | |
| 7 | 80 | | | 94 | | | 500 | | |
| 8 | 80 | | | 96 | | | 800 | | |
| 9 | 80 | | | 98 | | | 700 | | |
| 10 | 80 | | | 106 | | | 600 | | |
| 11 | 80 | | | 127 | | | 700 | | |
| 12 | 80 | | | 165 | | | 800 | | |
| 13 | 80 | | | 202 | | | 1000 | | |
| 14 | 80 | | | 267 | | | 800 | | |
| 15 | 80 | | | 288 | | | 700 | | |
| 16 | 75 | | | 276 | | | 662 | | |
| 17 | 75 | | | 267 | | | 632 | | |
| 18 | 75 | | | 255 | | | 698 | | |
| 19 | 75 | | | 255 | | | 698 | | |
| 20 | 75 | | | 264 | | | 728 | | |
| 21 | 75 | | | 279 | | | 754 | | |
| 22 | 75 | | | 291 | | | 775 | | |
| 23 | 75 | | | 291 | | | 845 | | |
| 24 | 75 | | | 294 | | | 929 | | |
| 25 | 75 | | | 285 | | | 1010 | | |
| 26 | 77 | | | 288 | | | 964 | | |
| 27 | 79 | | | 329 | | | 985 | | |
| 28 | 81 | | | 358 | | | 1120 | | |
| 29 | 82 | | | 366 | | | 1210 | | |
| 30 | 82 | | | 360 | | | 1150 | | |
| 31 | --- | | | 350 | | | --- | | |
| TOTAL | 2351 | | | 6757 | | | 22180 | | |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE IS 12-03-81

STATION NUMBER 15277100 EAGLE R AT EAGLE RIVER AK STREAM SOURCE AGENCY USGS
LATITUDE 611928 LONGITUDE 1493332 DRAINAGE AREA 192.00 DATUM 250.00 STATE 02 COUNTY 020

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
|---|---|---|---|---|---|---|---|---|---|
| | | JULY | | | AUGUST | | | SEPTEMBER | |
| 1 | 1180 | | | 2090 | | | 803 | | |
| 2 | 1240 | | | 1820 | | | 796 | | |
| 3 | 1310 | | | 1700 | | | 775 | | |
| 4 | 1340 | | | 1450 | | | 957 | | |
| 5 | 1310 | | | 1410 | | | 852 | | |
| 6 | 1180 | | | 1590 | | | 728 | | |
| 7 | 1080 | | | 1740 | | | 632 | | |
| 8 | 1160 | | | 1640 | | | 530 | | |
| 9 | 1300 | | | 1330 | | | 458 | | |
| 10 | 1310 | | | 1180 | | | 430 | | |
| 11 | 1280 | | | 1150 | | | 426 | | |
| 12 | 1230 | | | 1280 | | | 638 | | |
| 13 | 1200 | | | 1440 | | | 859 | | |
| 14 | 1140 | | | 1350 | | | 894 | | |
| 15 | 1040 | | | 1280 | | | 845 | | |
| 16 | 971 | | | 1290 | | | 761 | | |
| 17 | 936 | | | 1210 | | | 698 | | |
| 18 | 1040 | | | 1250 | | | 686 | | |
| 19 | 1050 | | | 1310 | | | 620 | | |
| 20 | 971 | | | 1200 | | | 535 | | |
| 21 | 1010 | | | 1210 | | | 470 | | |
| 22 | 1010 | | | 1090 | | | 418 | | |
| 23 | 971 | | | 985 | | | 390 | | |
| 24 | 999 | | | 866 | | | 362 | | |
| 25 | 1150 | | | 782 | | | 350 | | |
| 26 | 1390 | | | 761 | | | 343 | | |
| 27 | 1750 | | | 782 | | | 346 | | |
| 28 | 2060 | | | 789 | | | 358 | | |
| 29 | 2110 | | | 810 | | | 350 | | |
| 30 | 2370 | | | 838 | | | 326 | | |
| 31 | 2300 | | | 845 | | | --- | | |
| TOTAL | 40378 | | | 38468 | | | 17636 | | |
| YEAR | 166838 | | 166838 | | | | | | |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE IS 12-03-81

STATION NUMBER 15277100 EAGLE R AT EAGLE RIVER AK STREAM SOURCE AGENCY USGS
LATITUDE 611828 LONGITUDE 1493332 DRAINAGE AREA 192.00 DATUM 250.00 STATE 02 COUNTY 020

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
|---|---|---|---|---|---|---|---|---|---|
| | | OCTOBER | | | NOVEMBER | | | DECEMBER | |
| 1 | 309 | | | 160 | | | 82 | | |
| 2 | 300 | | | 120 | | | 82 | | |
| 3 | 297 | | | 110 | | | 80 | | |
| 4 | 264 | | | 130 | | | 80 | | |
| 5 | 231 | | | 170 | | | 80 | | |
| 6 | 255 | | | 140 | | | 80 | | |
| 7 | 249 | | | 130 | | | 80 | | |
| 8 | 230 | | | 120 | | | 80 | | |
| 9 | 220 | | | 115 | | | 80 | | |
| 10 | 210 | | | 110 | | | 80 | | |
| 11 | 200 | | | 105 | | | 78 | | |
| 12 | 190 | | | 100 | | | 78 | | |
| 13 | 180 | | | 98 | | | 78 | | |
| 14 | 170 | | | 96 | | | 78 | | |
| 15 | 173 | | | 94 | | | 78 | | |
| 16 | 153 | | | 92 | | | 76 | | |
| 17 | 151 | | | 90 | | | 76 | | |
| 18 | 155 | | | 90 | | | 76 | | |
| 19 | 137 | | | 88 | | | 76 | | |
| 20 | 80 | | | 88 | | | 76 | | |
| 21 | 110 | | | 86 | | | 74 | | |
| 22 | 120 | | | 86 | | | 74 | | |
| 23 | 110 | | | 86 | | | 74 | | |
| 24 | 105 | | | 84 | | | 74 | | |
| 25 | 100 | | | 84 | | | 70 | | |
| 26 | 100 | | | 84 | | | 66 | | |
| 27 | 110 | | | 84 | | | 64 | | |
| 28 | 130 | | | 82 | | | 64 | | |
| 29 | 160 | | | 82 | | | 62 | | |
| 30 | 180 | | | 82 | | | 62 | | |
| 31 | 220 | | | --- | | | 62 | | |
| TOTAL | 5599 | | | 3086 | | | 2320 | | |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE IS 12-03-81

STATION NUMBER 15277100 EAGLE R AT EAGLE RIVER AK STREAM SOURCE AGENCY USGS
LATITUDE 611828 LONGITUDE 1493332 DRAINAGE AREA 192.00 DATUM 250.00 STATE 02 COUNTY 020

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
|---|---|---|---|---|---|---|---|---|---|
| | | JANUARY | | | FEBRUARY | | | MARCH | |
| 1 | 62 | | | 50 | | | 46 | | |
| 2 | 62 | | | 50 | | | 45 | | |
| 3 | 64 | | | 50 | | | 45 | | |
| 4 | 66 | | | 50 | | | 44 | | |
| 5 | 66 | | | 50 | | | 44 | | |
| 6 | 66 | | | 52 | | | 43 | | |
| 7 | 64 | | | 54 | | | 43 | | |
| 8 | 62 | | | 60 | | | 42 | | |
| 9 | 62 | | | 65 | | | 42 | | |
| 10 | 60 | | | 62 | | | 42 | | |
| 11 | 60 | | | 59 | | | 41 | | |
| 12 | 60 | | | 56 | | | 41 | | |
| 13 | 58 | | | 54 | | | 40 | | |
| 14 | 58 | | | 54 | | | 40 | | |
| 15 | 58 | | | 52 | | | 39 | | |
| 16 | 56 | | | 52 | | | 39 | | |
| 17 | 56 | | | 52 | | | 39 | | |
| 18 | 56 | | | 50 | | | 39 | | |
| 19 | 54 | | | 50 | | | 39 | | |
| 20 | 54 | | | 50 | | | 39 | | |
| 21 | 54 | | | 50 | | | 38 | | |
| 22 | 54 | | | 49 | | | 38 | | |
| 23 | 52 | | | 49 | | | 38 | | |
| 24 | 52 | | | 48 | | | 38 | | |
| 25 | 52 | | | 48 | | | 38 | | |
| 26 | 52 | | | 47 | | | 37 | | |
| 27 | 52 | | | 47 | | | 37 | | |
| 28 | 52 | | | 46 | | | 37 | | |
| 29 | 50 | | | --- | | | 37 | | |
| 30 | 50 | | | --- | | | 37 | | |
| 31 | 50 | | | --- | | | 37 | | |
| TOTAL | 1774 | | | 1456 | | | 1244 | | |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE IS 12-03-81

STATION NUMBER 15277100 EAGLE R AT EAGLE RIVER AK STREAM SOURCE AGENCY USGS
LATITUDE 611829 LONGITUDE 1493332 DRAINAGE AREA 192.00 DATUM 250.00 STATE 02 COUNTY 020

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
|---|---|---|---|---|---|---|---|---|---|
| | | APRIL | | | MAY | | | JUNE | |
| 1 | 37 | | | 36 | | | 143 | --- | --- |
| 2 | 37 | | | 36 | | | 139 | 36 | 14 |
| 3 | 37 | | | 36 | | | 129 | 38 | 13 |
| 4 | 37 | | | 36 | | | 143 | 45 | 17 |
| 5 | 37 | | | 37 | | | 169 | 140 | 64 |
| 6 | 36 | | | 37 | | | 243 | 325 | 213 |
| 7 | 36 | | | 37 | | | 312 | 295 | 249 |
| 8 | 36 | | | 38 | | | 382 | 325 | 335 |
| 9 | 36 | | | 39 | | | 462 | 365 | 455 |
| 10 | 36 | | | 40 | | | 656 | 400 | 708 |
| 11 | 36 | | | 42 | | | 680 | 268 | 492 |
| 12 | 36 | | | 45 | | | 638 | 158 | 272 |
| 13 | 36 | | | 55 | | | 674 | 155 | 282 |
| 14 | 36 | | | 60 | | | 740 | 200 | 400 |
| 15 | 36 | | | 60 | | | 838 | 174 | 394 |
| 16 | 35 | | | 55 | | | 734 | 110 | 218 |
| 17 | 35 | | | 60 | | | 626 | 87 | 147 |
| 18 | 35 | | | 80 | | | 535 | 71 | 103 |
| 19 | 35 | | | 120 | | | 520 | 72 | 101 |
| 20 | 35 | | | 130 | | | 545 | 100 | 147 |
| 21 | 35 | | | 140 | | | 674 | 136 | 247 |
| 22 | 35 | | | 130 | | | 686 | 90 | 167 |
| 23 | 35 | | | 120 | | | 728 | 110 | 216 |
| 24 | 35 | | | 120 | | | 971 | 140 | 367 |
| 25 | 35 | | | 130 | | | 1400 | 190 | 718 |
| 26 | 35 | | | 140 | | | 1640 | 300 | 1330 |
| 27 | 35 | | | 133 | | | 1820 | 260 | 1280 |
| 28 | 35 | | | 137 | | | 1670 | 240 | 1080 |
| 29 | 35 | | | 143 | | | 1470 | 220 | 873 |
| 30 | 35 | | | 139 | | | 1370 | 198 | 732 |
| 31 | --- | | | 135 | | | --- | --- | --- |
| TOTAL | 1070 | | | 2546 | | | 21737 | --- | 11634 |

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE IS 12-03-81

STATION NUMBER 15277100 EAGLE R AT EAGLE RIVER AK STREAM SOURCE AGENCY USGS
LATITUDE 611828 LONGITUDE 1493332 DRAINAGE AREA 192.00 DATUM 250.00 STATE 02 COUNTY 020

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
|---|---|---|---|---|---|---|---|---|---|
| | | JULY | | | AUGUST | | | SEPTEMBER | |
| 1 | 1150 | 168 | 522 | 1800 | | | 1290 | | |
| 2 | 1010 | 148 | 404 | 1900 | | | 1220 | | |
| 3 | 922 | 128 | 319 | 1700 | | | 1050 | | |
| 4 | 901 | 120 | 292 | 1400 | | | 898 | | |
| 5 | 1030 | 120 | 334 | 1200 | | | 881 | | |
| 6 | 1210 | 130 | 425 | 1500 | | | 804 | | |
| 7 | 1390 | 175 | 657 | 2000 | | | 662 | | |
| 8 | 1500 | 318 | 1290 | 3000 | | | 601 | | |
| 9 | 1650 | 405 | 1800 | 4500 | | | 564 | | |
| 10 | 1920 | 655 | 3400 | 4000 | | | 531 | | |
| 11 | 2180 | 820 | 4830 | 3500 | | | 495 | | |
| 12 | 2410 | 725 | 4720 | 2800 | | | 471 | | |
| 13 | 2950 | 1810 | 14400 | 2800 | | | 461 | | |
| 14 | 3430 | 1650 | 15300 | 2940 | | | 468 | | |
| 15 | 2940 | 950 | 7540 | 2560 | | | 447 | | |
| 16 | 2450 | 640 | 4230 | 2200 | | | 439 | | |
| 17 | 2090 | 500 | 2820 | 1990 | | | 456 | | |
| 18 | 1950 | 400 | 2110 | 2050 | | | 405 | | |
| 19 | 1780 | 325 | 1560 | 1870 | | | 372 | | |
| 20 | 2090 | 365 | 2060 | 1670 | | | 402 | | |
| 21 | 2030 | 350 | 1920 | 1590 | | | 502 | | |
| 22 | 1700 | --- | --- | 1650 | | | 502 | | |
| 23 | 1500 | --- | --- | 1580 | | | 427 | | |
| 24 | 1150 | --- | --- | 1450 | | | 380 | | |
| 25 | 1300 | --- | --- | 1390 | | | 354 | | |
| 26 | 1500 | --- | --- | 1350 | | | 330 | | |
| 27 | 1800 | --- | --- | 1240 | | | 307 | | |
| 28 | 2100 | --- | --- | 1070 | | | 290 | | |
| 29 | 1800 | --- | --- | 1030 | | | 284 | | |
| 30 | 1500 | --- | --- | 1110 | | | 277 | | |
| 31 | 1600 | --- | --- | 1210 | | | --- | | |
| TOTAL | 54933 | --- | 70933 | 62050 | | | 16570 | | |
| YEAR | 174385 | | 82567 | | | | | | |

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

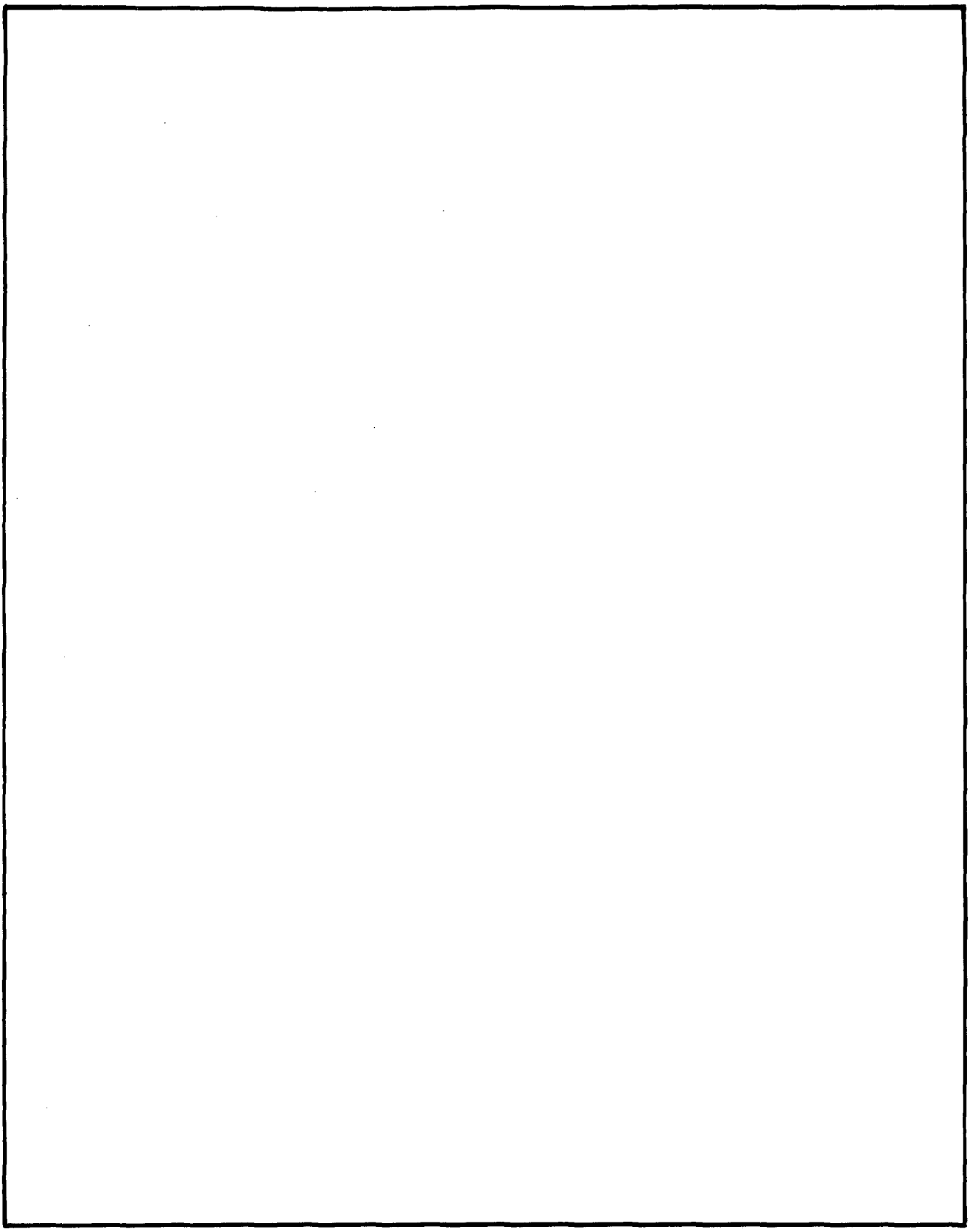

**Exhibit B**
**Additional Testing**

## Exhibit B
## ADDITIONAL TESTING

It was concluded from Task 1, Well Drilling Program, that no significant groundwater supply exists in the Eagle River Valley. Emphasis was then placed on the study of Eagle River surface water as a potential means to meet the growing water demands of the Municipality of Anchorage. To supplement the data presented in this report for Task 3, Flour Water Treatment Study, samples of water were taken from eight sites along the Eagle River between January and June 1981 and were tested for quality. This Exhibit contains the data from this supplemental testing.

The water sampling sites are shown on Figure B-1. Site A, Eagle River 200 Feet Upstream of Glenn Highway, Right Bank, corresponds to the Task 3 testing site. Other sites were chosen at various points to identify potential contamination sources.

Coliform tests were performed on samples from all the sites; however samples from Sites C and E were not tested on a regular basis. The results of these tests are shown in Table B-1.

Complete State of Alaska drinking water standard tests were performed on water from Sites A and D on a regular basis, and from Sites E and H less frequently. The results of these tests are summarized in Tables B-2 and B-3.

Analysis of the results of the additional testing indicates that the Eagle River surface water should be suitable for human consumption if the proper treatment is applied to it. If this water is selected as a future drinking water source, it is recommended that further, more detailed water quality tests be conducted.

Additionally, there are indications that groundwater is moving from the vicinity of the old Eagle River dump to the river. If the lower damsite (see Appendix II) is chosen for development, the potential impacts of the old dump on the river should be thoroughly analyzed.

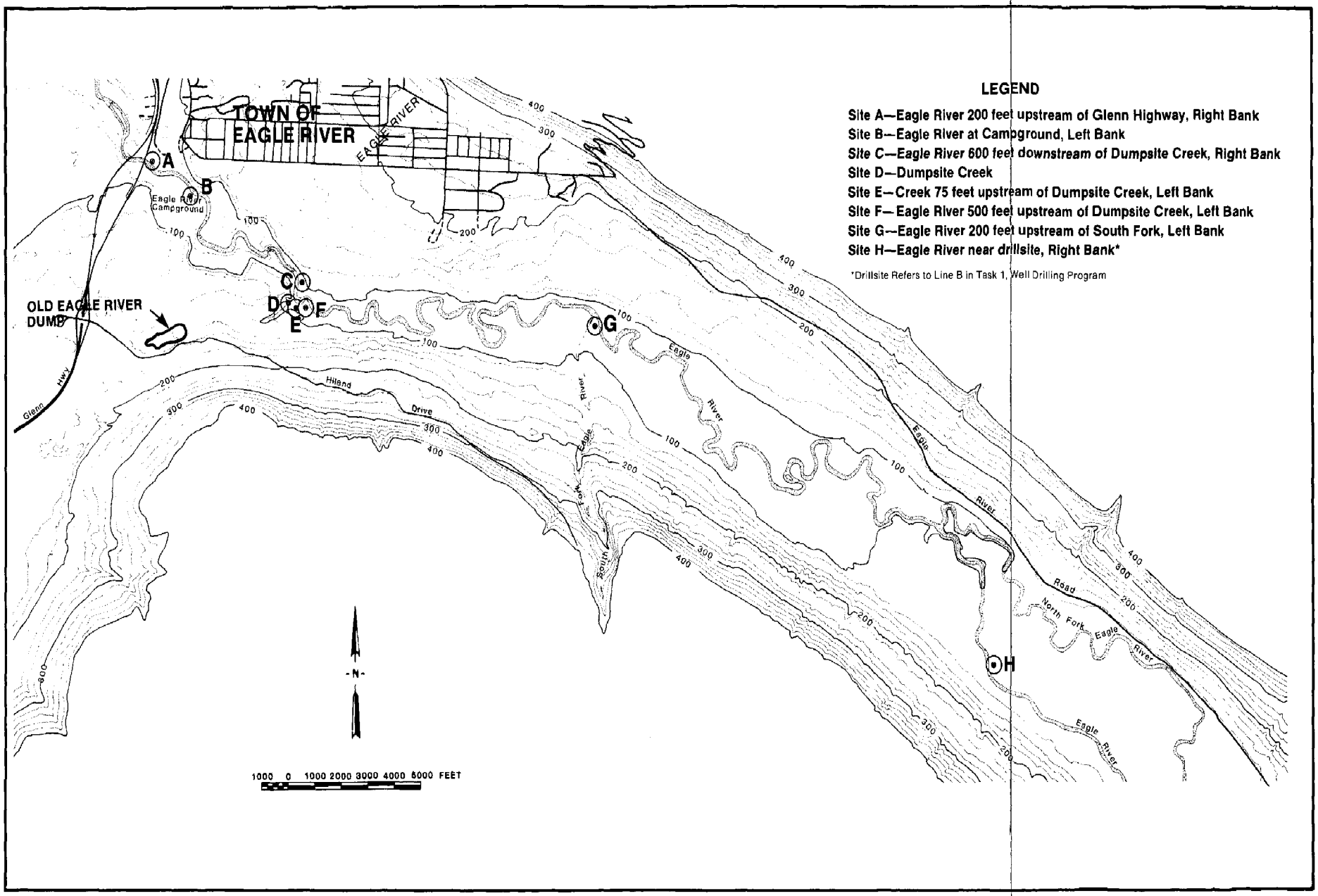


**Figure B-1**
**Sampling Sites for Additional Tests**

Table B-1
COLIFORM ANALYSIS
JANUARY THROUGH JUNE 1981

| Site[a] | Date | Fecal Coliform | Total Coliform |
|---|---|---|---|
| Site A | 01/22/81 | | 9 |
| | 02/24/81 | | 33 |
| | 03/19/81 | | TNTC[b] |
| | 04/01/81 | 0 | 2 |
| | 04/08/81 | 2 | 6 |
| | 04/22/81 | 0 | TNTC |
| | 05/15/81 | 0 | 2 |
| | 06/23/81 | 11 | TNTC |
| Site B | 04/01/81 | 2 | 3 |
| | 04/08/81 | 1 | 17 |
| | 04/22/81 | 3 | 11 |
| | 05/15/81 | 1 | 0 |
| | 06/23/81 | 25 | TNTC |
| Site C | 03/19/81 | | 52 |
| Site D | 03/19/81 | | TNTC |
| | 04/08/81 | 0 | 5 |
| | 04/22/81 | 17 | TNTC |
| | 05/15/81 | 0 | TNTC |
| | 06/23/81 | 400 | TNTC |
| Site E | 02/24/81 | | 4 |
| | 04/01/81 | 0 | 0 |
| Site F | 04/01/81 | 1 | 4 |
| | 04/08/81 | 1 | 18 |
| | 05/15/81 | 0 | 2 |
| | 06/23/81 | 28 | TNTC |
| Site G | 04/01/81 | 32 | 35 |
| | 04/08/81 | 1 | 0 |
| | 04/22/81 | 3 | TNTC |
| | 05/15/81 | 0 | 10 |
| | 06/23/81 | 54 | TNTC |
| Site H | 04/01/81 | 8 | 22 |
| | 04/08/81 | 2 | 31 |
| | 04/22/81 | 0 | 3 |
| | 05/15/81 | 0 | 8 |

[a] Refer to Figure B-1 for description of sites.
[b] Too numerous to count.

## Table B-2
## INORGANICS
## JANUARY THROUGH JUNE 1981

| Site[a] | Date | As | Ba | Cd | Cr | F | Fe | Pb | Mn | Hg | Nitrate-N | Se | Ag | Na |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Site A | 01/22/81 | <0.01 | <0.5 | <0.010 | <0.01 | <0.1 | 0.11 | <0.01 | 0.03 | <0.001 | 0.86 | <0.01 | <0.01 | 2.7 |
| | 02/24/81 | <0.01 | <0.5 | <0.010 | <0.01 | <0.1 | 0.12 | <0.01 | 0.03 | <0.001 | 0.62 | <0.01 | <0.01 | 2.9 |
| | 03/19/81 | <0.01 | <0.5 | <0.010 | <0.01 | <0.1 | 0.50 | <0.01 | 0.04 | <0.001 | 0.38 | <0.01 | <0.01 | 2.5 |
| | 04/22/81 | <0.01 | <0.5 | <0.010 | <0.01 | <0.1 | 0.68 | <0.01 | 0.07 | <0.001 | 0.86 | <0.01 | <0.01 | 2.9 |
| | 05/15/81 | <0.01 | 0.013 | <0.010 | <0.01 | <0.1 | 0.21 | <0.01 | 0.02 | <0.001 | 0.90 | <0.01 | <0.01 | 2.9 |
| | 06/23/81 | <0.01 | <0.5 | <0.010 | <0.05 | <0.1 | 1.6 | <0.01 | 0.04 | <0.001 | 0.21 | <0.01 | <0.01 | 1.7 |
| Site D | 03/19/81 | <0.01 | <0.5 | <0.010 | <0.01 | 0.23 | 8.9 | <0.01 | 1.0 | <0.001 | 0.15 | <0.01 | <0.01 | 2.9 |
| | 04/22/81 | <0.01 | <0.5 | <0.010 | <0.01 | <0.1 | 2.5 | <0.01 | 0.20 | <0.001 | 0.17 | <0.01 | <0.01 | 3.0 |
| | 05/15/81 | <0.01 | <0.5 | <0.010 | <0.01 | <0.1 | 0.88 | <0.01 | 0.06 | <0.001 | 0.29 | <0.01 | <0.01 | 3.7 |
| | 06/23/81 | <0.01 | <0.5 | <0.010 | <0.01 | <0.1 | 0.1 | <0.01 | <0.01 | <0.001 | 0.17 | <0.01 | <0.01 | 4.2 |
| Site E | 02/24/81 | <0.01 | <0.5 | <0.010 | <0.01 | <0.1 | 0.13 | <0.01 | 0.03 | <0.001 | 0.60 | <0.01 | <0.01 | 3.3 |
| Site H | 04/22/81 | <0.01 | <0.5 | <0.010 | <0.01 | <0.1 | 0.34 | <0.01 | 0.02 | <0.001 | 0.42 | <0.01 | <0.01 | 3.0 |

[a]Refer to Figure B-1 for site descriptions.

## Table B-3
## COLOR, TURBIDITY, ORGANICS, AND RADIOACTIVITY
## JANUARY THROUGH JUNE 1981

| | | | | Organics | | | | | | Radioactivity | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Site[a] | Date | Color | Turbidity | Endrin | Lindane | Methoxychlor | Toxaphene | 2,4D | 2,4,5-TP Silvex | Gross A | Gross B | Lab[b] |
| Site A | 01/22/81 | 5.0 | 0.55 | <0.0002 | <0.004 | <0.1 | <0.005 | <0.1 | <0.01 | 9.0 ± 1.0 | 4.5 ± 1.1 | Chem. & Geo. |
| | 02/24/81 | 10.0 | 0.44 | <0.0002 | <0.004 | <0.01 | <0.005 | <0.01 | <0.01 | 7.2 ± 1.0 | 8.1 ± 1.3 | Chem. & Geo. |
| | 03/19/81 | 20.0 | 4.2 | <0.0002 | <0.004 | <0.1 | <0.005 | <0.1 | <0.01 | 6.2 ± 1.3 | | Chem. & Geo. |
| | 04/22/81 | 15.0 | 4.8 | <0.0002 | <0.004 | <0.1 | <0.005 | <0.1 | <0.01 | 0.2 ± 1.2 | 1.8 ± 4.7 | CH2M HILL |
| | 05/15/81 | 20.0 | 2.3 | <0.0002 | <0.004 | <0.1 | <0.005 | <0.1 | <0.01 | 7.5 ± 2.3 | | Chem. & Geo. |
| | 06/23/81 | 20.0 | 18.0 | <0.0002 | <0.004 | <0.1 | <0.005 | <0.1 | <0.001 | 0.0 ± 0.9 | 2.9 ± 4.3 | CH2M HILL |
| Site D | 03/19/81 | 150.0 | 64.0 | <0.0002 | <0.004 | <0.1 | <0.005 | <0.1 | <0.01 | 1.8 ± 0.6 | | Chem. & Geo. |
| | 04/22/81 | 15.0 | 26.0 | <0.0002 | <0.004 | <0.1 | <0.005 | <0.1 | <0.01 | 6.4 ± 0.9 | | Chem. & Geo. |
| | 05/15/81 | 70.0 | 39.0 | <0.0002 | <0.004 | <0.1 | <0.005 | <0.1 | <0.01 | 4.5 ± 2.1 | | Chem. & Geo. |
| | 06/23/81 | 10.0 | 0.6 | <0.0002 | <0.004 | <0.1 | <0.005 | <0.1 | <0.01 | 0.0 ± 1.3 | 2.1 ± 5.3 | CH2M HILL |
| Site E | 02/24/81 | 10.0 | 2.5 | <0.0002 | <0.004 | <0.1 | <0.005 | <0.1 | <0.01 | 8.1 ± 1.3 | 11.7 ± 1.5 | Chem. & Geo. |
| Site H | 04/22/81 | 5.0 | 2.3 | <0.0002 | <0.004 | <0.1 | <0.005 | <0.1 | <0.01 | -0.9 ± 2 | 4.5 ± 5.0 | CH2M HILL |
| | 05/15/81 | | | | | | | | | -0.1 ± 0.8 | -0.5 ± 3.6 | CH2M HILL |

[a]Refer to Figure B-1 for site descriptions.

[b]The reliability of the tests performed by a laboratory in Wyoming for Chemical and Geological Laboratories of Alaska, Inc., is questionable.

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