ALASKA ENERGY AUTHORITY

FINAL WATER QUALITY MONITORING REPORT

BRADLEY LAKE HYDROLECTRIC PROJECT

FERC LICENSE NUMBER 8221

ARTICLE 33

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BRADLEY LAKE HYDROELECTRIC PROJECT

FINAL WATER QUALITY MONITORING REPORT

SUMMARY

Results of pre- and post-project water quality monitoring programs for the Bradley Lake Hydroelectric Project, as required by the Federal Energy Regulatory Commission (FERC) License Article 33, indicate the following:

- Pre-project sampling detected low concentrations of mercury, cadmium and hydrogen sulfide in a few samples (12 of 36 samples having one or more of these substances present at levels above the minimum level of detection but, in the case of cadmium and mercury, at or below EPA's Maximum Contaminant Levels (MCL) for drinking water).

- One sample out of a total of 5 taken during the post-project monitoring detected cadmium (at an order of magnitude below EPA's MCL for drinking water), and no mercury or hydrogen sulfide was detected in any post-project samples.

- As expected, post-project turbidity in the Bradley River is generally lower than was previously the case. However, no direct evidence has been seen either for benefits or harmful effects to fish, due to changes in turbidity.

- Surface water and intragravel temperatures in the lower Bradley River area important to salmon spawning and rearing have changed slightly, most significantly in autumn when reduced discharge (less thermal inertia) results in the river being more rapidly influenced by declines in air temperature and water temperatures tend to be cooler.

- Stream temperatures during other portions of the open water season also fluctuate more rapidly in response to changes in air temperature, with a resultant increase in the rate of warming in the spring and a wider range of temperature fluctuations in the summer.

- Winter (under ice) temperatures are essentially unchanged, remaining near zero degrees centigrade (^{0}C) under both pre- and post-project conditions.

- Despite a theoretical potential for some impact on salmon production, associated with extreme climatic changes in the fall, no evidence has been seen to date of any deleterious effects on the fish in the lower Bradley River, and it is probable that the beneficial effects of post-project flow regulation will outweigh any negative effects of decreased autumn water temperatures.

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INTRODUCTION

BACKGROUND

Project Description

Bradley Lake is a natural lake located some 21 miles to the west-northwest of Homer, Alaska, at the upper end of Kachemak Bay. The Bradley Lake Hydroelectric Project (FERC License Number 8221), licensed in 1985 and put into commercial operation in 1991, consists of:

* a 125 foot high, concrete faced rockfill dam which raises the elevation of the natural lake by about 100 feet (to normal maximum pool at EL 1,180), and,

* some 19,000 feet of vertical shaft, tunnel and penstock connecting the lake to a powerhouse, equipped with two 63 KVA Pelton turbines, located near tidewater (EL 13.6).

At normal maximum pool EL 1,180, the Bradley Lake Reservoir is some 130 deep at the face of the dam. Figure 1 shows the overall project facility.

As discussed in the final fisheries monitoring report (AEA, 1996), minimum flows are required at the USGS gage in the lower Bradley River, in order to protect populations of salmon which utilize that section of river. The minimum flow requirements stipulated in the License are as follows:

Period	Flow Requirement
May 12 - Sept. 14	100 cfs
Sept. 15 - 23	Decrease flow by 5 cfs per day to 50 cfs
Sept. 24 - Oct. 31	50 cfs
Nov. 1	Decrease flow by 5 cfs per day to 40 cfs
Nov. 2 - Apr. 30	40 cfs
May 1 - 11	Increase flow by 5 cfs per day to 100 cfs

These flows are maintained, in part, by releases from the dam through a fishwater bypass system. In addition, flows from below the point at which the Middle Fork Bradley River is diverted into the reservoir and flows from the North Fork Bradley River contribute to the total flow at the Lower Bradley River gage site. Figure 2 shows the gage sites and drainage relationships for the Project.

Water Quality Issues

During licensing studies, it was recognized that flows in the lower Bradley River would be significantly modified as a result of the Project, creating concern for the effects of associated changes to both instream flow patterns and water temperature in the downstream river, specifically in the lower 4.5 miles of river known to support spawning and rearing of salmon. The fishwater bypass system at the dam takes reservoir water from EL 1,070, some 110 feet below normal maximum pool elevation, for release into the Bradley River below the dam and for much of the year is the main source of flow in the lower river. The volume, temperature and chemical composition of these releases were of concern.

The license application recognized the possibility that project induced changes in the thermal regime of the Lower Bradley River could have an effect on spawning, egg incubation and rearing of salmon, independent of any instream flow related effects.

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Additionally, the perimeter of Bradley Lake was not cleared when the lake level was increased and the vegetation and inorganic and organic soils along this area were inundated. Concerns were expressed for possible water quality effects associated with the decomposition of organic material and/or the possible leaching of toxic metals from the soils in this band of newly inundated material.

Finally, it was recognized that decreasing the flows from Bradley Lake would effect turbidity levels in the lower river, as lower volumes of glacial flow laden water would be present.

The Monitoring Program

To address the above concerns, Article 33 of the FERC License required the Alaska Power Authority, now the Alaska Energy Authority (AEA), to consult with the Alaska Department of Fish and Game, the Alaska Department of Environmental Conservation, the U. S. Fish and Wildlife Service, the National Marine Fisheries Service and the Environmental Protection Agency and to prepare plans for pre- and post- project programs to monitor the water quality of Bradley Lake outflows and the surface water and intragravel temperatures in the lower Bradley River. Based on this consultation process, a water quality monitoring plan was developed for the Project, as detailed in the project mitigation plan (APA, 1985). Provisions were included for pre- and post-operational monitoring for hydrogen sulfide and heavy metals, particularly mercury and cadmium, both in the reservoir and in the river downstream of the dam, as well as for surface water and intragravel temperature monitoring in the section of river known to support salmon spawning and rearing.

Grab samples of water collected from the reservoir were tested for hydrogen sulfide and heavy metals on four occasions during the pre-project phase of the project (three times in 1988, once in 1989). Twice during post-project monitoring, in 1993 and in 1996, samples were taken from the river immediately below the dam site and in the lower river salmon spawning habitat. The 1996 sampling included water taken at the face of the dam at a depth of five meters.

Surface water and intragravel temperature data were collected by the Alaska Energy Authority at three locations in the lower Bradley drainage (Riffle Reach of the Lower Bradley River, Tree Bar Reach of the Lower Bradley River and the North Fork of the Bradley River). These data were obtained using temperature probes and digitally recording data pods, as described in the annual reports submitted to FERC and the resource agencies since 1985. The References Section of this report provides a complete list of the annual reports produced, and details of the data pod placement and servicing are contained therein. The United States Geological Survey (USGS) also collected surface water and intragravel temperatures at their lower river gage site and at their gage located immediately downstream of the lake outlet/dam site.

Turbidity readings were collected in conjunction with the fisheries monitoring program and thus are generally available for the July - August period, when spawning pink salmon are present in the river.

The Scope of This Report

As indicated, annual reports summarizing the results of the temperature monitoring have been prepared and submitted to FERC and the resource agencies from 1985 through 1995. No detailed methodology section is included in this report as the License Application Exhibit E (APA, 1988), project mitigation plan (APA, 1985) and annual water quality monitoring reports (see Attachment A) provide detail on the site selection and sampling methods employed. The extensive data presented in those reports are not reproduced herein. Rather, this report summarizes the results of these studies, using selected portions of

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that data base, combined with other sources of information (USGS temperature data, Homer airport temperature records) to best demonstrate the effects of the Project on water and intragravel temperatures.

As might be expected, given the remote conditions and severe icing/tidal action at the sample sites, significant gaps and inconsistencies exist in the data collected over the ten year monitoring period, due to instrument failure and ice and flood damage to the probes. Consequently, the summary analysis presented below was developed from a selected subset of the available data, representing the information that appeared, based on professional judgment, to be reasonably accurate and internally consistent.

Complete results for the grab samples taken for hydrogen sulfide and heavy metals are presented in Attachment A. Results for mercury, cadmium and hydrogen sulfide, substances identified as being of special concern during the licensing studies, are summarized and discussed in the main body of this report. As in the case of the temperature data, discussion of the methods utilized and selection of sample sites/frequencies is not presented in this report, as both the Project mitigation plan (APA, 1985) and License Application Exhibit E (APA, 1988) provide background on the water quality program undertaken for this Project.

ACKNOWLEDGMENTS

The analysis of temperature effects presented herein has been prepared by Mr. John Morsell of Northern Ecological Services, who has been involved with both the water temperature program and with the fisheries programs conducted for this Project for most of the ten year monitoring period.

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RESULTS

HYDROGEN SULFIDE AND METALS

Table 1. summarizes the results of the pre-and post-project monitoring done for hydrogen sulfide (H2S), mercury and cadmium, three substances of special concern identified during the pre-licensing consultation process. Attachment A presents the complete results of the sampling done for hydrogen sulfide and metals, both in the reservoir (pre-project) and in the reservoir and river below the dam (post-project).

For the most part, during the pre-project sampling program heavy metals were at or below the limits for detection for the methods employed and in no case were levels found to be at high enough concentrations to cause concern for the downstream biota. Five of 36 samples taken had detectable levels of mercury and eight of 36 had levels of cadmium above the minimum level for detection. In all cases, the levels reported were essentially at or below EPA's and Alaska's MCL's for drinking water supplies (40 cfr. § 141; 18 AAC 080.0070).

As seen in Table 1 and Attachment A, neither mercury nor hydrogen sulfide were detected in the samples taken during the post-project period and cadmium was found in only one of five samples, at a level that is an order of magnitude below the above referenced MCL's. Based on these results, it does not appear that inundation of the soils and vegetation along the perimeter of Bradley Lake resulted in any measurable increase in the levels of metals or hydrogen sulfide, either in the reservoir or the river below the dam.

TURBIDITY

Table 2 presents the results of turbidity sampling in the lower Bradley River (Tree Bar Reach) for both pre- and post-project conditions.

As seen, turbidity levels, although a variable from year to year, were higher before the Project became operational. Comparing mean turbidity for all pre-project data with combined post-project data shows a decrease on the order of one-third.

These results are consistent with a reduction in the amount of glacial flour laden flows in the Bradley River following Project completion. However, as shown by the variability of minimum and maximum values from year to year, turbidity will continue to fluctuate over time, in relation to the amount of Bradley Lake water being released vis-a-vis total flow in the lower river.

Theoretically, decreased turbidity might have a number of effects on the lower river. Increased penetration of the water by sunlight could increase primary productivity an/or increase daytime water temperatures. Decreased amount of coarser, suspended material could reduce the risk of mechanical (abrasion) injury to fish, particularly young fish rearing in the area and decreased turbidity might reduce the cover value of turbid water areas for fish. However, no direct evidence for any such effects exists and the continued health of the salmon populations in the lower river is the best indirect evidence that changes in turbidity are either neutral or slightly beneficial.

WATER TEMPERATURE

As stated, results of the surface water and intragravel temperature monitoring programs conducted from 1985 through 1995 have been presented in annual reports previously provided to FERC and the resource

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agencies for review and comment. Because all these data have been previously presented, and because of the extent of data entailed, this final report provides selected summary information only, intended to best illustrate the pre- and post-project temperature regimes in the lower Bradley River salmon spawning areas.

General Characteristics of Lower Bradley River Temperatures

Figure 3 provides an example of the typical annual water temperature regime, based on plotting daily mean temperatures (both surface and intragravel) in the Bradley River during the post-project period. Figure 4 provides the same information for the pre-project period (disregard the missing and/or erroneous segment from December through March). These graphs illustrate the following general trends:

1. During the late November to late March period, both surface and intragravel temperatures are near 0.0 degrees centigrade (°C). Unseasonably warm air temperatures during the winter period can cause temporary surface water temperature increases of 1-2 °C.

2. Breakup of stream ice cover occurs in late March or early April, followed by a period of rapidly warming stream temperature through July or August.

3. During the spring warming period, intragravel temperature mirrors surface water temperature except that the intragravel temperature is about 1 °C cooler and day-to-day fluctuations in the gravel are less extreme.

4. In early September stream temperature begins to cool. The cooling trend continues until the stream begins to freeze in November.

5. During the fall cooling period, intragravel temperatures tend to be slightly warmer than surface water temperatures, until freezing temperatures are reached.

6. Stream water temperatures are clearly closely correlated with air temperatures.

Figures 5 and 6 show typical monthly water temperature variation (surface and intragravel) during the spring and summer period for both the pre- and post-project years. These graphs illustrate the following general trends:

1. A diurnal variation in surface water temperature is clearly shown, with differences of as much as 4 °C between early morning and late afternoon.

2. Intragravel temperatures also exhibit diurnal variation but the range is much less and the changes lag behind the surface temperatures by a few hours, suggesting some ground water influence.

3. Mean intragravel temperatures appear, by inspection, to be 0.5-1.0 °C cooler than mean surface temperatures during the spring and summer.

4. Stream water temperatures in the Lower Bradley River respond quickly to changes in air temperature (hour by hour) as indicated by the diurnal patterns evident in both the pre- and post-project graphs.

Figure 7 presents the monthly temperature regime for September 1994 and illustrates the period of cooling. As shown, mean intragravel temperature was about the same as surface water temperature at the beginning of the month. As cooling progressed, surface water became significantly cooler than intragravel, again indicating some ground water influence.

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Quantitative Difference Between Surface and Intragravel Temperature

Quantitative comparisons between surface and intragravel water temperatures at the same location and during the same time period are difficult because most differences were less than one degree, which is within the error range of the instrumentation. Furthermore, the accuracy of intragravel probes could not be checked with hand thermometers because the probes were buried in the gravel.

Surface and intragravel temperatures collected by USGS at Tree Bar Reach were reviewed and representative data sets were compared. Mean surface and intragravel temperatures for the months May through October, 1989 were 6.7 and 7.0 °C, respectively. For the same period in 1992 the mean surface water temperatures were 5.6 and 6.0 °C. These data suggest that, on the average, intragravel temperatures during the open water season are slightly warmer than surface water temperatures. This contradicts the general conclusions drawn from AEA's annual temperature graphs which suggest that surface water is somewhat warmer than intragravel during the spring and summer. Regardless, differences between surface and intragravel water temperatures were small and probably were dependent on station location and depth of the intragravel probe.

Maximum, Minimum, and Mean Temperature in the Lower Bradley River

Monthly maximum and minimum surface water temperatures at the AEA Riffle Reach recording station, as interpreted from annual report graphs, are presented in Table 3. The operational flow regime began in October 1990 at the start of reservoir filling, consequently the years 1986 through 1990 can be considered pre-operational, and the years 1991 through 1995 post-operational. Although there is question about the quality of some of these data, there do appear to be some real differences between pre- and post-project temperature extremes as shown in Table 3.

1. During the open water period (April to November), post-operational temperatures generally show a greater range between maxima and minima than was the case for the pre-operational period.

2. In 1991-1995 the river warmed more quickly in the spring, cooled more quickly in the fall, and responded more quickly to summer air temperature variations than was the case during the pre-project period.

3. Monthly temperature variation was greater during the post-project period as was the average annual maximum temperature.

4. The above suggested differences make sense in light of the significantly reduced post-project flow during the open water period, as the smaller volume of water would have less thermal momentum, allowing stream temperatures to more rapidly equilibrate to air temperature.

Monthly mean surface water temperature at Tree Bar Reach, as collected by USGS, for the 1986 through 1995 period are presented in Table 4. Considering the range of climatic variation, data gaps, and instrumentation error, few conclusions can be drawn from these data. However, the following general statements may be made:

1. Monthly and annual means appear to be similar during the pre- and post-project years.

2. There is some indication that summer water temperatures might be slightly warmer under the post-project regime and that fall water temperatures might have been higher under the pre-project regime.

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Temperature of Water Released from the Dam

During the initial environmental assessment for the Bradley Lake Hydroelectric Project it was suggested that the post-project temperature regime of the upper Bradley River would differ from the pre-project regime due to thermal stratification in the reservoir and the depth of the fishwater bypass intake. Table 4 presents maximum, minimum, and mean temperatures for the pre-project years, 1986-1990, and post-project years, 1991-1995. The data are from the USGS monitoring station located immediately below the dam (or below the lake outlet during the pre-project years). Because of gaps and inconsistencies, the data were examined and questionable data were discarded. The data for April, May, and June for at least two of the four post-project years appear to be especially suspect. None of the data are corrected for air temperature. General conclusions that can be drawn from Table 5 are as follows:

1. Pre- and post-project temperatures in the upper Bradley River are essentially similar, although there is some suggestion that summer and early fall temperatures are slightly warmer in the post-project years. This information contradicts the expectation that a deep water intake would provide cooler water in the summer than a surface source.

2. It might also be anticipated that post-project winter temperatures would be higher because winter stratification under ice cover usually causes water at lower lake levels to be 3-4 °C. However, in the case of Bradley Lake, the fishwater bypass water is cooler than would be expected (between 0 and 1 °C), making it only slightly warmer than the pre-impoundment lake outlet water.

Relationship of Stream Temperature to Air Temperature

Post-project Flow Regime

The relatively complete 1994 Tree Bar Reach data set was chosen as representative of post-project conditions and is compared to Homer airport 1994 air temperatures (Figure 8). It should be noted that the stream temperatures are daily means whereas the airport air temperatures are daily medians. During winter the temperature of water is obviously limited by ice formation and, therefore, remained near 0 °C. During the open water season water temperatures varied in direct response to air temperature except that the daily amplitude of water temperature changes was less than the amplitude of air temperature changes.

Figure 9 plots air temperature vs. stream water temperature (April through October), providing an indication of the strength of the relationship between air and water temperature during the open water season. The graph suggests that the relationship is strong and nearly linear. Regression analysis yielded a regression coefficient of 0.767, confirming a strong and highly significant relationship.

Pre-project Flow Regime

The 1986 Riffle Reach temperature data set was chosen to represent the pre-project regime because of its completeness and the availability of raw data for this year. Figure 10 compares air and water temperatures for 1986. This graph is similar to that observed for the post-project data, except that the amplitude of daily temperature variation in 1986 was substantially less than seen for 1994, especially during October and November.

Figure 11 plots the relationship between air temperature and stream water temperature for these same data during the open water season. As shown, the relationship between air and water temperature is less pronounced than was the case for the post-project data set. The "tail" of anomalous data points extending to the left near the top of the graph were nearly all data from the late fall period, when high precipitation and high flow tended to overcome the effects of cooler air temperatures. Regression analysis on this data

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set yielded a regression coefficient of 0.445, indicating a substantially weaker relationship between air and water temperature than observed for post-project conditions.

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CONCLUSIONS

OPEN WATER PERIOD

The significantly lower flow volume that characterizes the post-project regime, as compared to pre-project flows, has resulted in the following changes to the stream temperature regime during the open water period:

1. Stream temperatures respond more rapidly to air temperature changes, resulting in higher maximum temperatures and greater range in daily and monthly temperatures.

2. This more rapid response also results in more rapid warming in the spring and more rapid cooling in the fall.

3. In spite of the wider post-project temperature range, it appears that annual and monthly mean temperatures are similar for pre- and post-project years.

4. There is some indication that post-project summer temperature means are somewhat higher than pre-project, whereas pre-project fall means were somewhat higher than post-project. Under pre-project conditions, high precipitation, normally occurring in September and October, would raise the Bradley Lake level, causing lake overflow and a high discharge of moderate temperature water in the Bradley River. Under post-project conditions this moderation of fall water temperature does not occur. Because of lower Project flow releases at this time, rapid cooling of the water in the river below the dam takes place, in response to cooling air temperatures.

5. This rapid fall cooling associated with low air temperatures is probably the most significant temperature change that has occurred as a result of the Bradley Lake Hydroelectric Project.

WINTER ICE COVER CONDITIONS

No significant differences in winter stream temperatures occur as a result of the project. Flows are low in the winter under both pre- and post-project conditions and water temperatures are near 0 °C.

SIGNIFICANCE TO FISH

The rate of development of salmon eggs incubating in stream gravel is determined in large part by water temperature, as measured by cumulative temperature units or degree days over a period of several months. Consequently, relatively small changes in temperature can have a significant impact on the time of emergence of salmon fry in the spring. Emergence time may be critical to the survival of salmon fry, depending on the food supply available at the time of emergence.

Bradley River pink salmon (the key evaluation species) spawn in mid-August and fry probably emerge from the gravel in April or early May. Since pre- and post-project stream temperatures are essentially the same during ice cover (November through March), the critical period for assessing project temperature impacts on pink salmon is from August through October. Under pre-project conditions, fall water temperature was related to both air temperature and to the amount of precipitation and overflow from Bradley Lake. As a result, moderate temperatures were maintained into late fall, especially in years of high flow. Under post-project conditions, with lower releases from the dam, fall water temperature is more

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directly related to air temperature and, therefore, likely will vary more from year to year than previously was the case. It is possible that under the post-project regime, climatic extremes might affect the development rate and, thus, the survival of salmon in some years.

However, salmon escapement studies done before and after project operation indicate that pink salmon (and most other species) likely are benefiting from the moderated post-project flows (AEA, 1996), and, to date, no evidence of temperature changes severe enough to have a measurable impact on fish has been observed. Consequently, temperature changes, if any, have not had any demonstrable detrimental effect on the salmon populations in the river. Over the long term, it is likely that the benefits of a regulated, stable flow regime will overcome potential negative impacts due to altered stream temperature.

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REFERENCES

General References

Alaska Energy Authority. 1996. Final Fisheries Monitoring Report, Bradley Lake Hydroelectric Project. FERC Project Number 8221. Anchorage, Alaska.

Alaska Power Authority. 1988. Application for License for a Major Unconstructed Project, Bradley Lake Hydroelectric Project. Exhibit E. Vol. 1-3.

Alaska Power Authority. 1985. Mitigation Plan, Bradley Lake Hydroelectric Project. FERC Project Number 8221. Anchorage, Alaska.

List of Water Quality Monitoring Reports

Alaska Energy Authority. 1995. Bradley Lake Hydroelectric Project, 1995 Bradley River Water Quality Report. Prepared with Assistance from Northern Ecological Services. Anchorage, Alaska.

Alaska Energy Authority. 1994. Bradley Lake Hydroelectric Project, 1994 Bradley River Water Quality Report. Prepared with Assistance from Northern Ecological Services. Anchorage, Alaska.

Alaska Energy Authority. 1993. Bradley Lake Hydroelectric Project, 1993 Bradley River Water Quality Report. Prepared with Assistance from Northern Ecological Services. Anchorage, Alaska.

Alaska Energy Authority. 1992. Bradley Lake Hydroelectric Project, 1992 Bradley River Water Quality Report. Prepared with Assistance from Northern Ecological Services. Anchorage, Alaska.

Alaska Energy Authority. 1991. Bradley Lake Hydroelectric Project, 1991 Bradley River Water Quality Report. Prepared with Assistance from Northern Ecological Services. Anchorage, Alaska.

Alaska Energy Authority. 1990. Bradley Lake Hydroelectric Project, 1990 Bradley River Water Quality Report. Anchorage, Alaska.

Alaska Energy Authority. 1989. Bradley Lake Hydroelectric Project, 1989 Bradley River Water Quality Report. Anchorage, Alaska.

Alaska Power Authority. 1988. Bradley Lake Hydroelectric Project, 1988 Bradley River Water Quality Report. Anchorage, Alaska.

Alaska Power Authority. 1987. Bradley Lake Hydroelectric Project, 1987 Bradley River Water Quality Report. Anchorage, Alaska.

Alaska Power Authority. 1987. Bradley Lake Hydroelectric Project, 1986 Bradley River Water Quality Report. Prepared by Stone and Webster Engineering Corporation. Anchorage, Alaska.

Alaska Power Authority. 1985. Bradley Lake Hydroelectric Project, 1985 Bradley River Water Quality Report. Prepared by Woodward-Clyde Consultants, Entrix, Inc. and Stone and Webster Engineering Corporation. Anchorage, Alaska.

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TABLE I.

Mercury, Cadmium and Hydrogen Sulfide Levels in the Bradley Lake Reservoir and Bradley River.

PRE - IMPOUNDMENT

JUNE 30 1988											
Site	BL1 S	BL1 M	BL1 B	BL2 S	BL2 M	BL2 B	BL3 S	BL3 M	BL3B	BLO	BRR
H2S	u	u	u	u	u	u	u	u	u	*	*
MERCURY	u	u	u	u	u	0.0002mg/l	u	u	0.0002mg/l	*	*
CADMIUM	u	u	u	u	u	u	u	u	u	*	*

SEPT. 29 1988											
Site	BL1S	BL1 M	BL1 B	BL2 S	BL2 M	BL2 B	BL3 S	BL3 M	BL3B	BLO	BRR
H2S	u	u	u	u	u	u	u	u	u	*	*
MERCURY	u	u	u	u	0.0002 mg/l	u	u	0.0002 mg/l	0.0003 mg/l	*	*
CADMIUM	0.0053 mg/l	0.0048 mg/l	0.0043 mg/l	0.0048 mg/l	0.0047 mg/l	u	0.0050 mg/l	u	u	*	*

DEC. 20 1988											
Site	BL1S	BL1 M	BL1 B	BL2 S	BL2 M	BL2 B	BL3 S	BL3 M	BL3B	BLO	BRR
H2S	u	u	u	u	u	u	*	u	u	*	*
MERCURY	u	u	u	u	u	u	*	u	u	*	*
CADMIUM	u	u	0.0002 mg/l	u	u	0.0005 mg/l	*	u	u	*	*

MARCH 13 1989											
Site	BL1S	BL1 M	BL1 B	BL2 S	BL2 M	BL2 B	BL3 S	BL3 M	BL3B	BLO	BRR
H2S	u	u	u	u	u	u	u	u	u	*	*
MERCURY	u	u	u	u	u	u	u	u	u	*	*
CADMIUM	u	u	u	u	u	u	u	u	u	*	*

POST - IMPOUNDMENT

JAN. 7 1993											
Site	BL1S	BL1 M	BL1 B	BL2 S	BL2 M	BL2 B	BL3 S	BL3 M	BL3B	BLO	BRR
H2S	*	*	*	*	*	*	*	*	*	u	u
MERCURY	*	*	*	*	*	*	*	*	*	u	u
CADMIUM	*	*	*	*	*	*	*	*	*	u	u

JUNE 19 1996											
Site	BL1S	BL1 M	BL1 B	BL2 S	BL2 M	BL2 B	BL3 S	BL3 M	BL3B	BLO	BRR
H2S	u	*	*	*	*	*	*	*	*	u	u
MERCURY	u	*	*	*	*	*	*	*	*	u	u
CADMIUM	u	*	*	*	*	*	*	*	*	0.00035mg/l	u

BL = Reservoir, BLO = Reservoir Outlet, BRR = Bradley River/Riffle Reach
S,M,B = Surface, Mid-water and Bottom
1 = Near Dam
2 = Mid Reservoir
3 = Near Head Waters
u = not detected
* = no sample

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TABLE 2. Turbidity Measurements (NTU) at Tree Bar Reach, Lower Bradley River, for Pre- and Post-Project Conditions.

	1986				1987				1988				1989				1990			
	min	max	mean	n	min	max	mean	n	min	max	mean	n	min	max	mean	n	min	max	mean	n
Jan					246	246	**246**	1									84	84	**84**	1
Feb					224	224	**224**	1												
Mar																				
Apr					45	52	**49**	2												
May					108	588	**268**	4												
Jun																				
Jul					190	192	**191**	2	124	151	**138**	2	40	98	**70**	10	23	32	**27**	7
Aug					155	240	**185**	4	116	186	**137**	11	25	105	**57**	15	26	57	**56**	14
Sep					190	190	**190**	1	142	220	**155**	7	90	200	**128**	3	38	41	**40**	5
Oct																				
Nov	282	776	**564**	5																
Dec	750	750	**750**	1																

Total Pre- project	
n	mean
95	**132**

	1991				1992				1993				1994				1995			
	min	max	mean	n	min	max	mean	n	min	max	mean	n	min	max	mean	n	min	max	mean	n
Jan																				
Feb																				
Mar																				
Apr																				
May																				
Jun																				
Jul	26	41	**34**	6	16	34	**23**	8	14	39	**28**	6	38	70	**47**	8	24	40	**31**	4
Aug	21	47	**36**	8	10	62	**40**	12	31	54	**43**	9	50	82	**70**	14	6	46	**31**	15
Sep	25	35	**30**	2	73	84	**76**	5	38	54	**44**	3	81	92	**87**	4	26	40	**33**	3
Oct																				
Nov																				
Dec																				

Total Post- project	
n	mean
107	**43**

min.= minimum value measured
max. = maximum value measured
mean = mean of all values for the period
n = total number of samples taken for the period

EPA-7609-0013250_00017

TABLE 3. Monthly maximum and minimum surface water temperatures (o C) at the AEA Riffle Reach Recording Station.

PRE-PROJECT

	JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEP		OCT		NOV		DEC		ANNUAL	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1986	1.3	-0.2	1.8	-0.2	0.9	-0.2	2.2	-0.3	3.9	0.7	6.4	2.5	8.2	5.3	8.5	6.9	8.0	5.9	7.0	4.7	5.1	2.1	2.1	0.5	8.5	-0.3
1987	1.4	0.2	1.3	0.4	1.4	0.1	2.8	0.8	3.0	1.7	4.1	2.4	7.6	4.1	10.5	7.1	9.0	6.5	6.7	3.3	4.6	1.9	2.0	1.1	10.5	0.1
1988	2.0	1.0	1.4	1.0	2.4	1.1	3.3	1.4	3.9	2.2	4.8	2.6	8.6	4.6	8.7	-	7.7	6.2	7.0	4.2	4.6	1.3	2.4	1.1	8.7	1.0
1989	1.7	1.1	1.3	1.1	1.6	1.2	3.8	1.3	5.1	2.7	7.2	3.3	9.8	6.9	10.3	8.7	9.6	8.3	8.3	4.7	5.7	2.1	2.9	0.2	10.3	0.2
1990	1.7	(0.0)	1.7	1.3	2.3	1.2	3.5	0.5	4.9	1.0	9.7	3.5	12.5	6.6	9.8	7.6	9.0	6.6	6.7	2.2	3.3	0.4	0.5	0.2	12.5	0.2

POST-PROJECT

	JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEP		OCT		NOV		DEC		ANNUAL	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1991	0.3	0.1	0.3	0.1	0.6	0.0	2.8	0.2	5.0	1.3	9.4	3.2	10.0	7.0	10.7	7.4	9.1	5.8	6.9	-	-	-	0.5	0.2	10.7	0.0
1992	0.9	0.2	1.2	0.2	-	-	2.8*	0.7*	5.0*	2.8*	7.6*	5.1*	10.0	7.7*	9.8*	5.8*	-	-	6.5	0.6	2.8	0.2	1.7	0.1	10.0	0.1
1993	0.7	0.1	1.6	0.0	2.3	0.0	7.5	0.0	8.0	3.6	10.2	3.4	14.0	6.4	13.5	5.2	8.5	5.0	8.4	0.9	4.1	0.3	-	-	14.0	0.0
1994	-	-	1.3	-0.1	2.4	1.0	5.2	1.4	7.7	1.3	11.6	3.2	12.4	6.2	12.8	7.0	9.4	(0.5)	4.7	-	-	-	0.2*	0.1*	12.8	0.1
1995	1.3	0.8	2.4	0.8	1.2	0.9	5.2	1.0	7.0	2.6	10.9	3.8	14.8	7.0	12.1	6.7	10.5	6.7	8.2	3.0	5.6	0.9*	-	-	14.8	0.8

* intragravel temperature substituted for surface water temperature

( ) - possible data inaccuracy

EPA-7609-0013250_00018

TABLE 4. Monthly mean surface water temperature (o C) at Tree Bar Reach, Bradley River (USGS Records).

PRE-PROJECT

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
1986	-	-	-	2.3	4.7	4.7	7.4	-	-	-	-	-	
1987	-	0.6	0.9	1.9	3.3	3.3	6.5	9.1	8.0	5.9	2.4	0.2	
1988	0.7	0.8	0.0	2.0	3.0	3.0	6.3	7.8	6.8	4.6	1.4	0.3	
1989	0.0	0.0	0.0	2.8	5.5	5.5	9.1	9.5	8.3	5.1	1.1	0.9	
1990	0.0	0.0	0.1	2.5	5.9	5.9	9.4	8.8	8.0	4.6	0.2	0.0	Annual Mean
MEAN	0.2	0.4	0.4	2.3	4.5	4.5	7.7	8.8	7.8	5.1	1.3	0.4	= 3.34

POST-PROJECT

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
1991	0.0	0.0	0.1	1.0	2.7	5.8	8.7	8.9	7.6	3.7	2.0	-	
1992	-	-	-	-	2.0	4.8	8.5	9.7	5.9	2.8	1.2	-	
1993	0.0	0.5	0.6	2.0	-	6.5	9.5	10.2	7.4	3.8	1.4	0.7	
1994	0.4	0.3	0.3	2.0	4.0	7.0	9.0	10.7	-	-	-	0.3	
1995	0.2	0.3	0.1	1.6	3.0	5.7	-	-	-	-	-	-	Annual Mean
MEAN	0.2	0.3	0.3	1.7	2.9	6.0	8.9	9.9	7.0	3.4	1.5	0.5	= 3.55

EPA-7609-0013250_00019

TABLE 5. Surface water temperature (oC) in the Upper Bradley River below the dam site (USGS records).

PRE-PROJECT
(1986-1990)

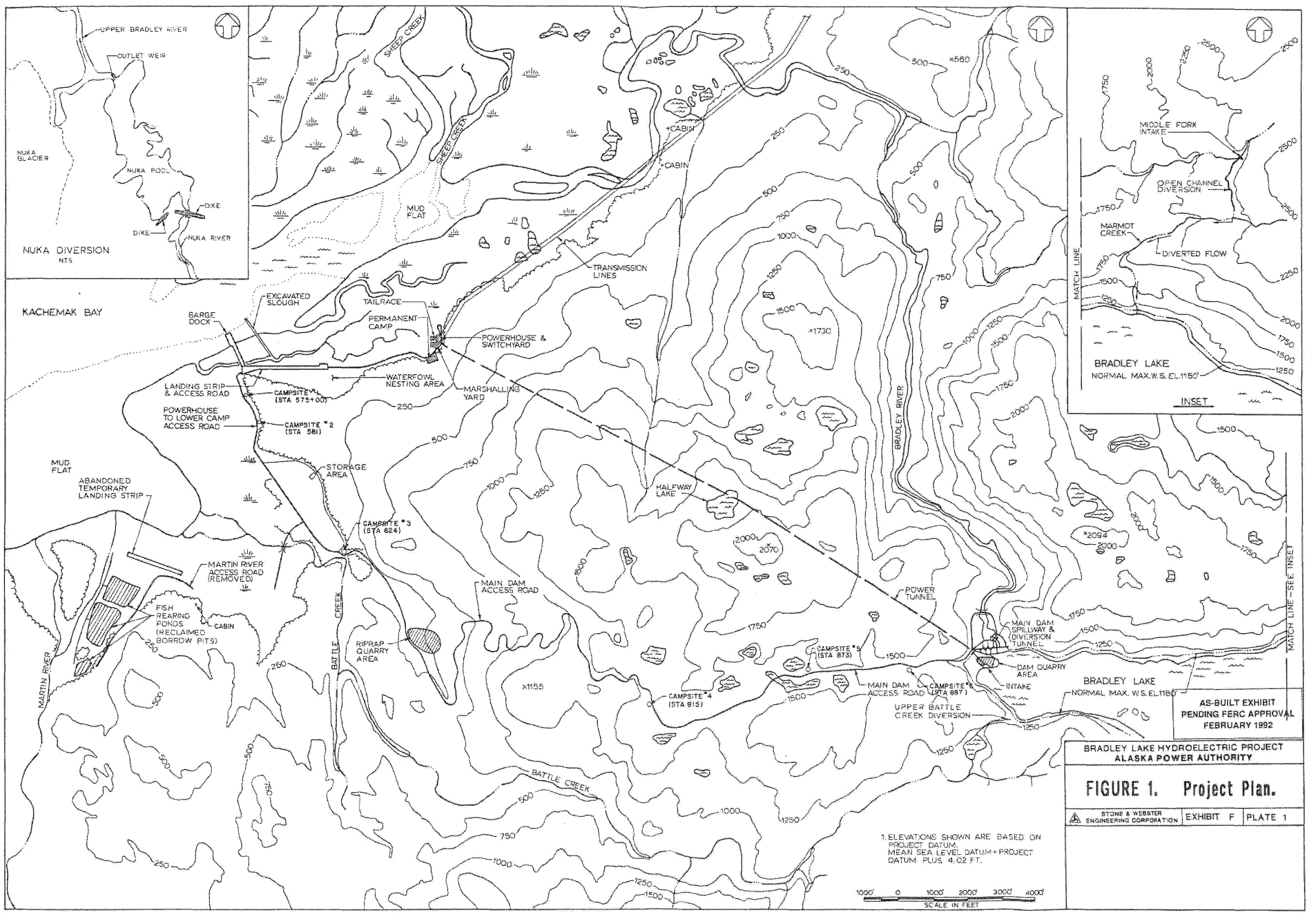
	MAX	MIN	MEAN
JAN	0.5	-0.1	0
FEB	0.0	-0.1	0
MAR	0.5	-0.5	0
APR	3.0	-0.4	1.2
MAY	3.5	0.0	1.4
JUN	8.5	0.0	3.5
JUL	12.5	3.0	6.8
AUG	12.2	6.1	7.8
SEP	8.7	5.0	7.0
NOV	8.0	3.5	6.0
OCT	4.5	0.0	2.0
DEC	1.0	-0.2	0.2

ANNUAL
MEAN = 3.0

POST-PROJECT
(1991-1995)

	MAX	MIN	MEAN
JAN	1.5	0.0	0.5
FEB	1.5	0.0	0.6
MAR	1.5	0.0	0.4
APR	-	0.0	1.2
MAY	-	0.0	3.6
JUN	-	1.5	4.5
JUL	12.5	5.0	7.6
AUG	15.5	4.5	9.1
SEP	11.5	4.5	8.3
NOV	9.0	4.0	5.6
OCT	5.5	0.0	3.2
DEC	3.0	0.0	0.9

ANNUAL
MEAN = 3.8


UPPER BRADLEY RIVER
OUTLET WEIR
NUKA GLACIER
NUKA POOL
DIKE
DIKE
NUKA RIVER
NUKA DIVERSION
NTS.
KACHEMAK BAY
BARGE DOCK
EXCAVATED SLOUGH
TAILRACE
PERMANENT CAMP
POWERHOUSE & SWITCHYARD
WATERFOWL NESTING AREA
MARSHALLING YARD
LANDING STRIP & ACCESS ROAD
CAMPSITE #1 (STA 575+00)
POWERHOUSE TO LOWER CAMP ACCESS ROAD
CAMPSITE #2 (STA 581)
STORAGE AREA
MUD FLAT
ABANDONED TEMPORARY LANDING STRIP
CAMPSITE #3 (STA 624)
MARTIN RIVER ACCESS ROAD (REMOVED)
FISH REARING PONDS (RECLAIMED BORROW PITS)
CABIN
MARTIN RIVER
BATTLE CREEK
RIPRAP QUARRY AREA
MAIN DAM ACCESS ROAD
CAMPSITE #4 (STA 815)
BATTLE CREEK
SHEEP CREEK
SHEEP CREEK
MUD FLAT
CABIN
CABIN
TRANSMISSION LINES
HALFWAY LAKE
BRADLEY RIVER
POWER TUNNEL
CAMPSITE #5 (STA 873)
MAIN DAM ACCESS ROAD
CAMPSITE #6 (STA 887)
UPPER BATTLE CREEK DIVERSION
MAIN DAM SPILLWAY & DIVERSION TUNNEL
DAM QUARRY AREA
INTAKE
BRADLEY LAKE
NORMAL MAX. W.S. EL.1180'
MIDDLE FORK INTAKE
OPEN CHANNEL DIVERSION
MARMOT CREEK
DIVERTED FLOW
MATCH LINE
BRADLEY LAKE
NORMAL MAX.W.S. EL.1180'
INSET
MATCH LINE - SEE INSET
AS-BUILT EXHIBIT
PENDING FERC APPROVAL
FEBRUARY 1992
BRADLEY LAKE HYDROELECTRIC PROJECT
ALASKA POWER AUTHORITY
FIGURE 1. Project Plan.
STONE & WEBSTER ENGINEERING CORPORATION
EXHIBIT F
PLATE 1
1. ELEVATIONS SHOWN ARE BASED ON PROJECT DATUM. MEAN SEA LEVEL DATUM = PROJECT DATUM PLUS 4.02 FT.
1000' 0 1000' 2000' 3000' 4000'
SCALE IN FEET

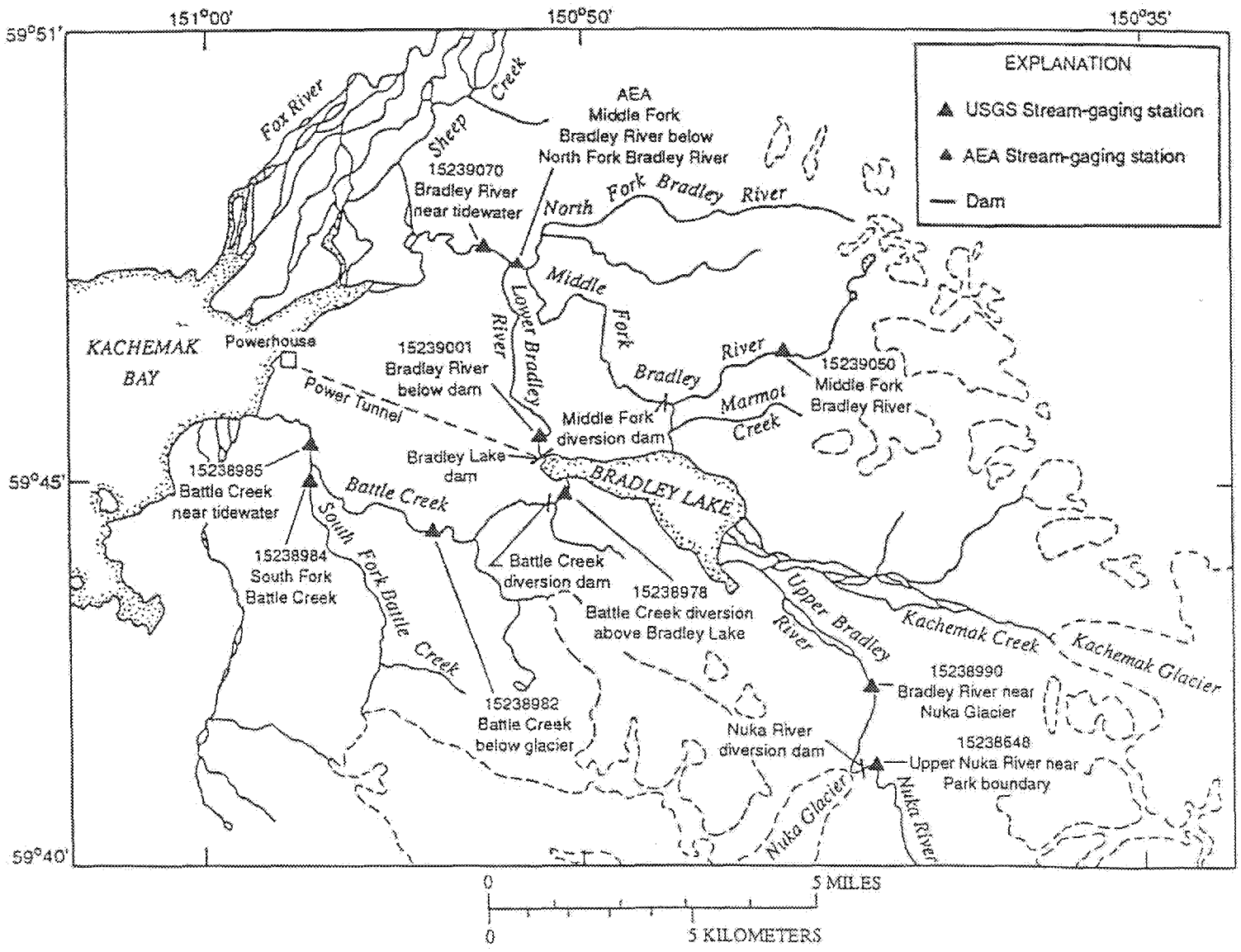
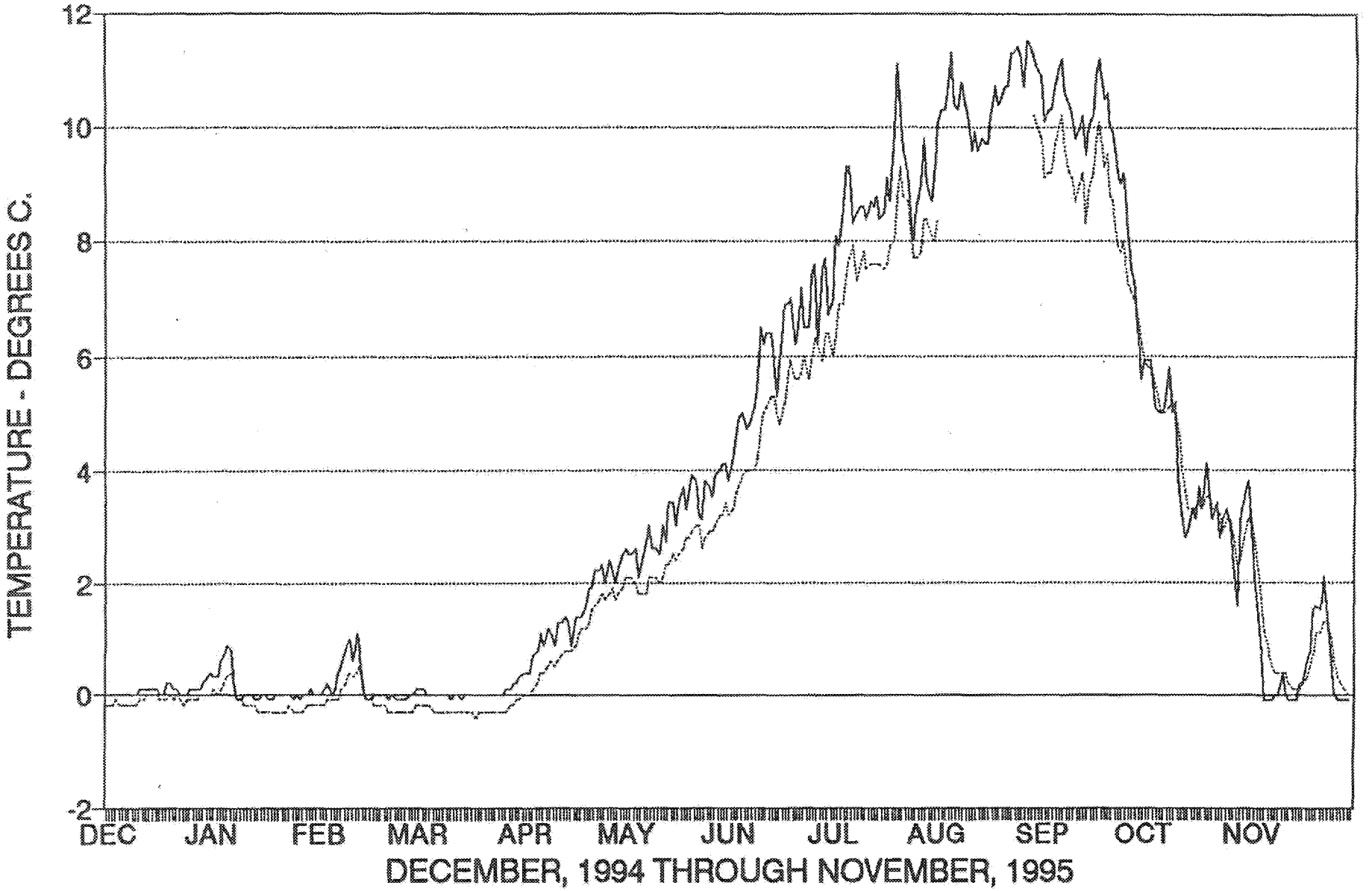


FIGURE 2. Project Area Drainage Relationships and Gaging Stations (From USGS).

FIGURE 3: TREE BAR REACH - 1995
SURFACE & INTRAGRAVEL WATER TEMPERATURE



EPA-7609-0013250_00023

FIGURE 4

SURFACE & INTRAGRAVEL WATER TEMPERATURE

RIFFLE REACH: BRADLEY RIVER 1989 – 1990

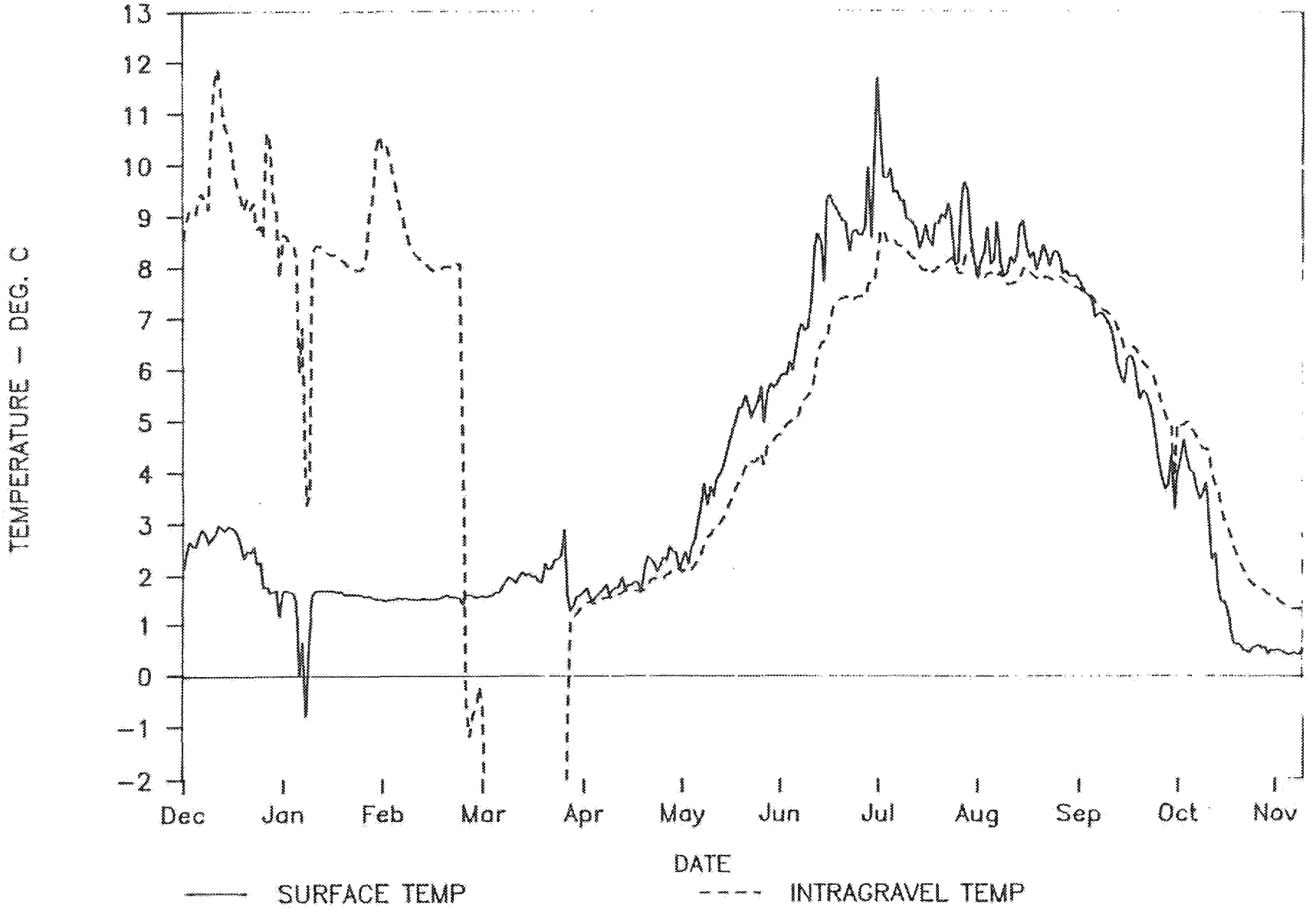
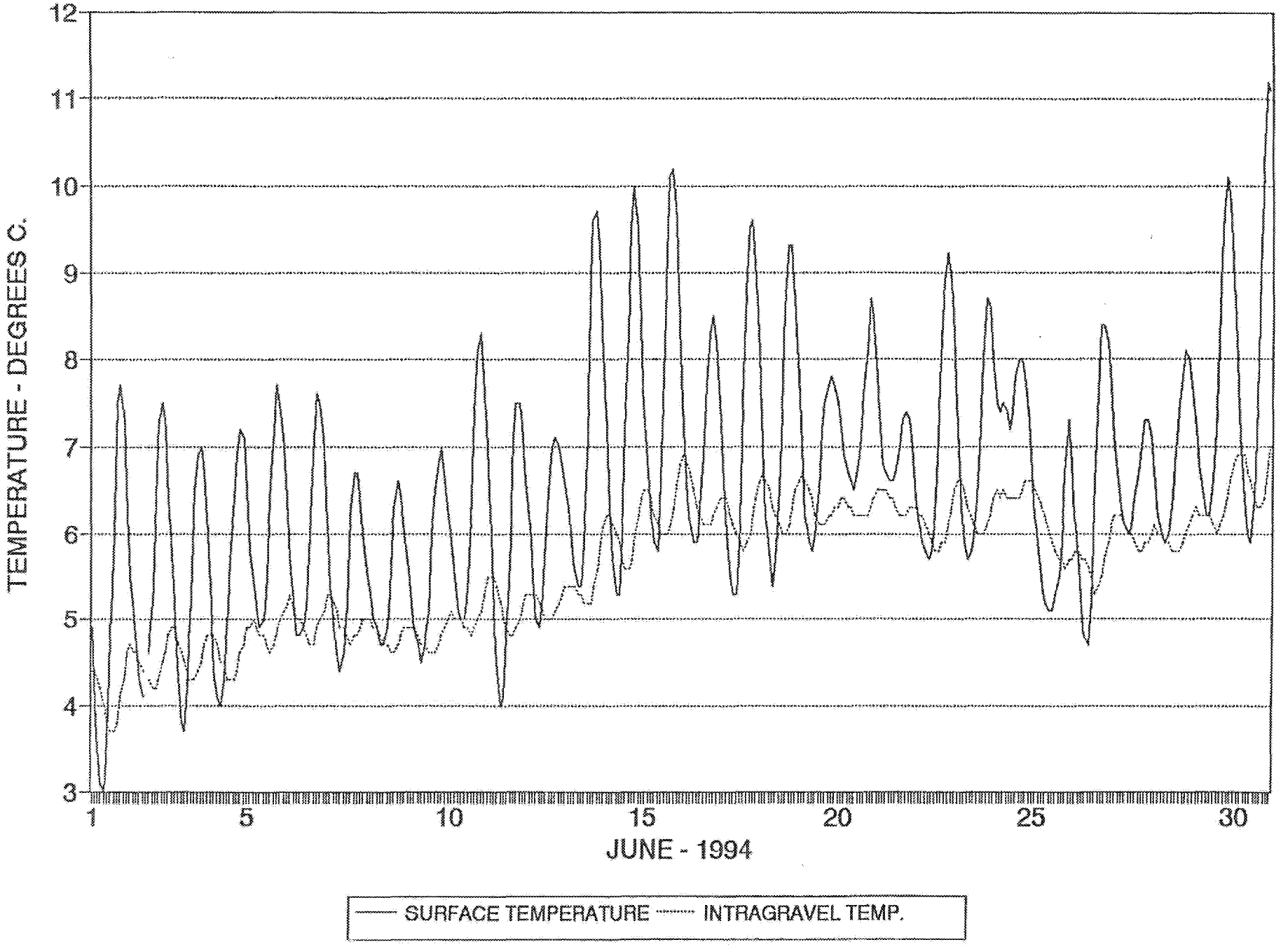


FIGURE 5: TREE BAR REACH-JUNE, 1994

SURFACE & INTRAGRAVEL WATER TEMPERATURE



EPA-7609-0013250_00025

FIGURE 6

SURFACE & INTRAGRAVEL WATER TEMPERATURE

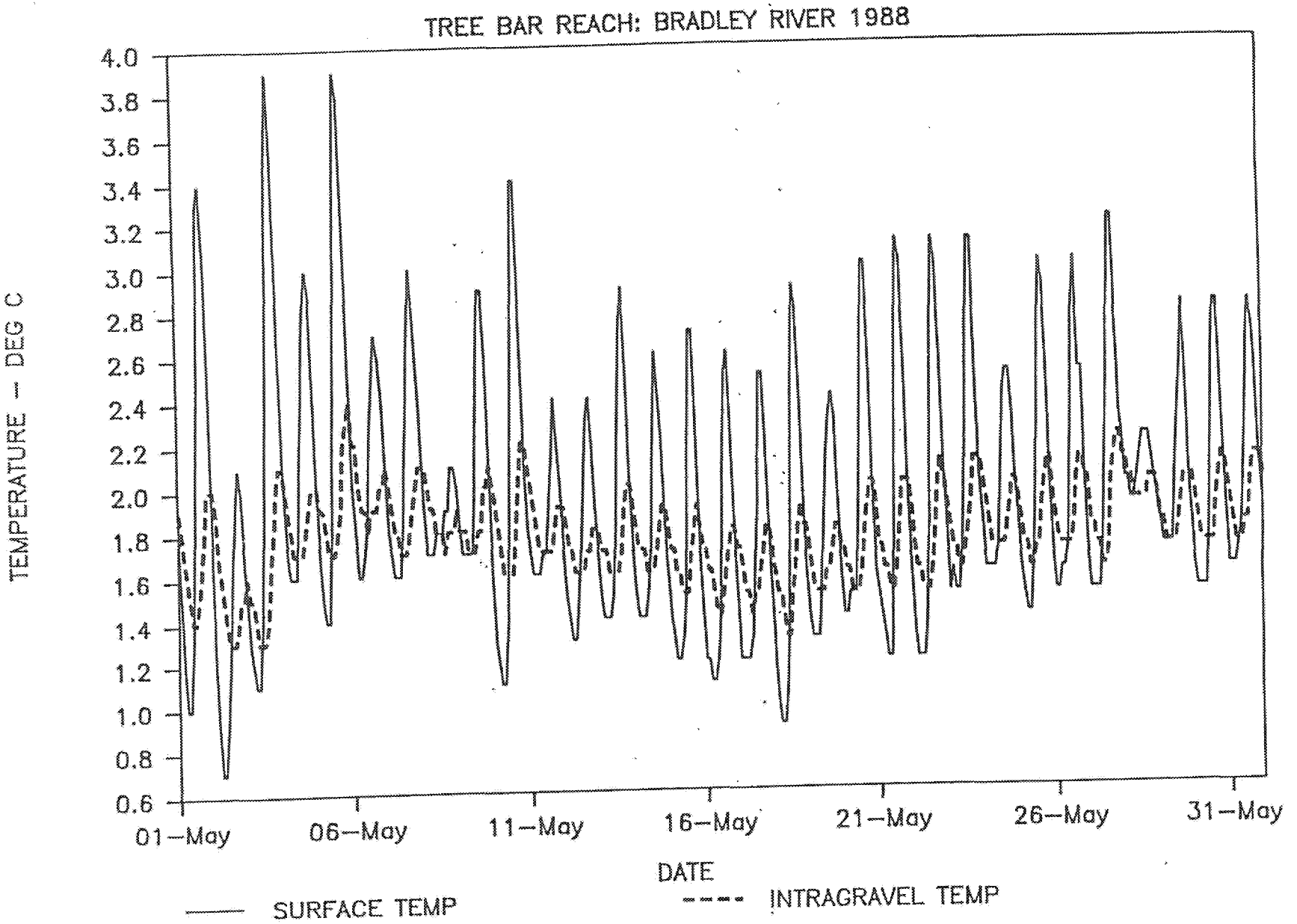
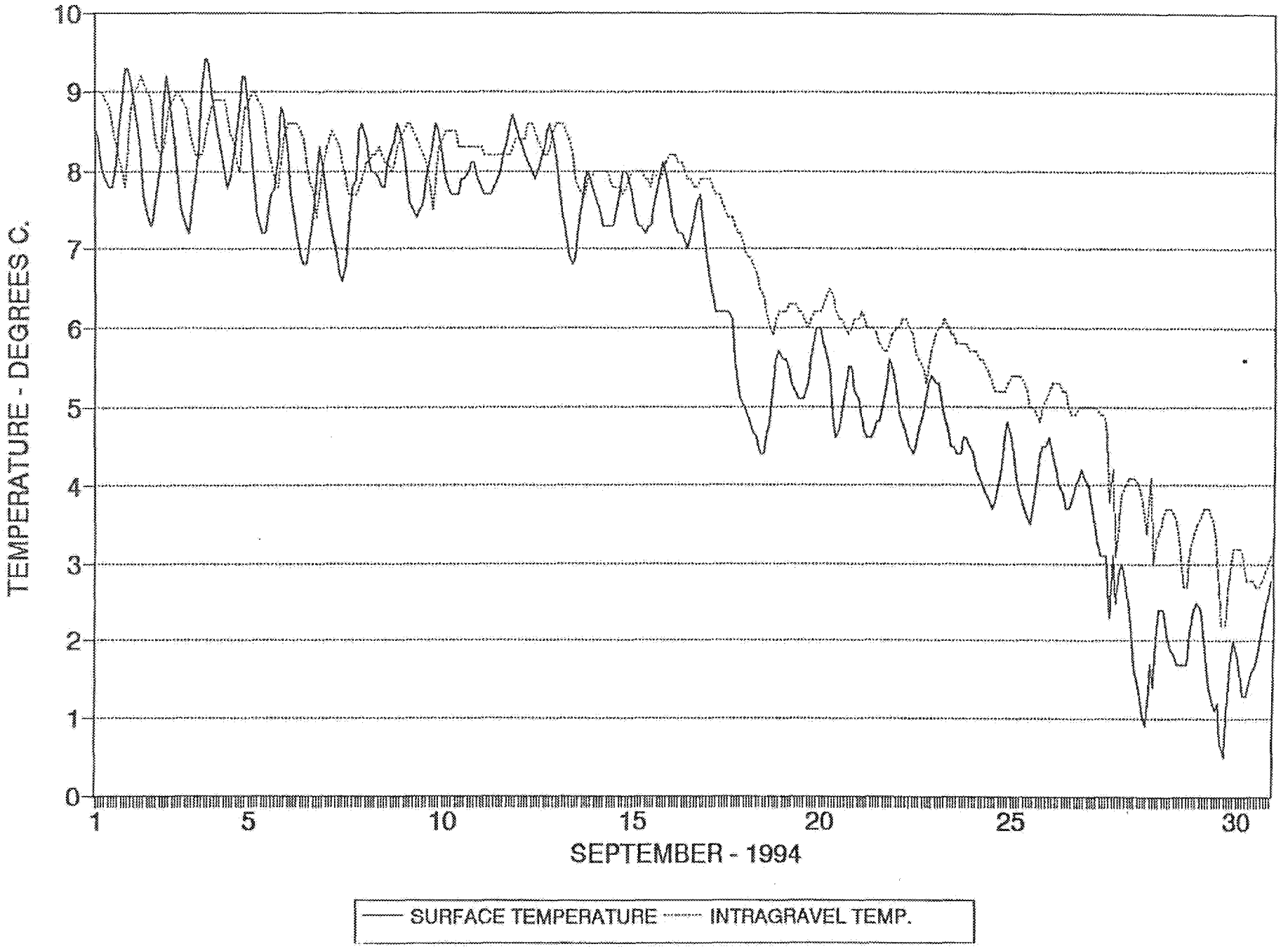


FIGURE 7: RIFFLE REACH-SEPTEMBER, 1994

SURFACE & INTRAGRAVEL WATER TEMPERATURE



EPA-7609-0013250_00027

FIGURE 8: TREE BAR REACH - 1994
STREAM WATER TEMP. VS. HOMER AIR TEMP.

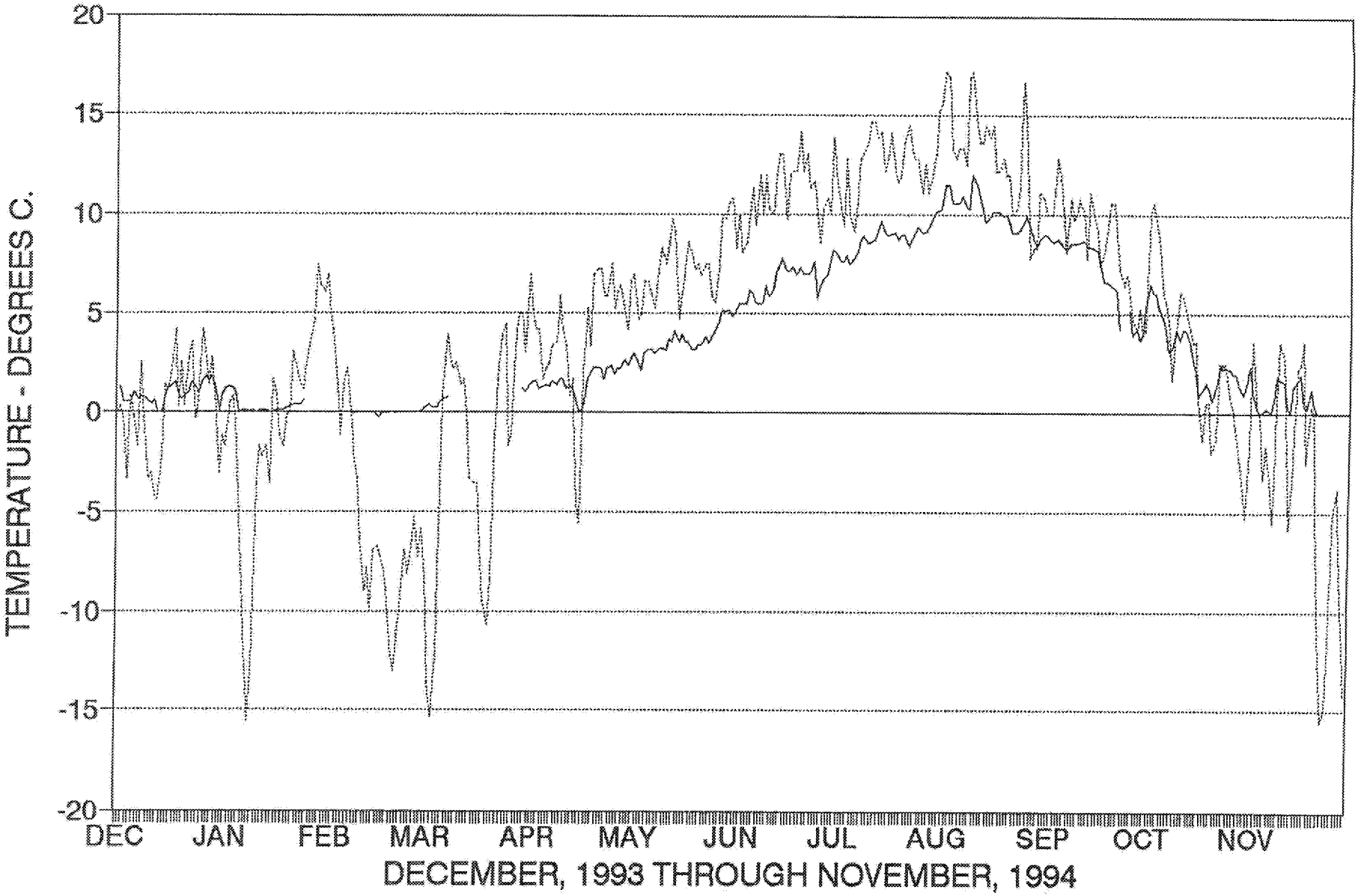


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FIGURE 9 : STREAM TEMP. VS. AIR TEMP
TREE BAR, APRIL THROUGH OCTOBER,1994

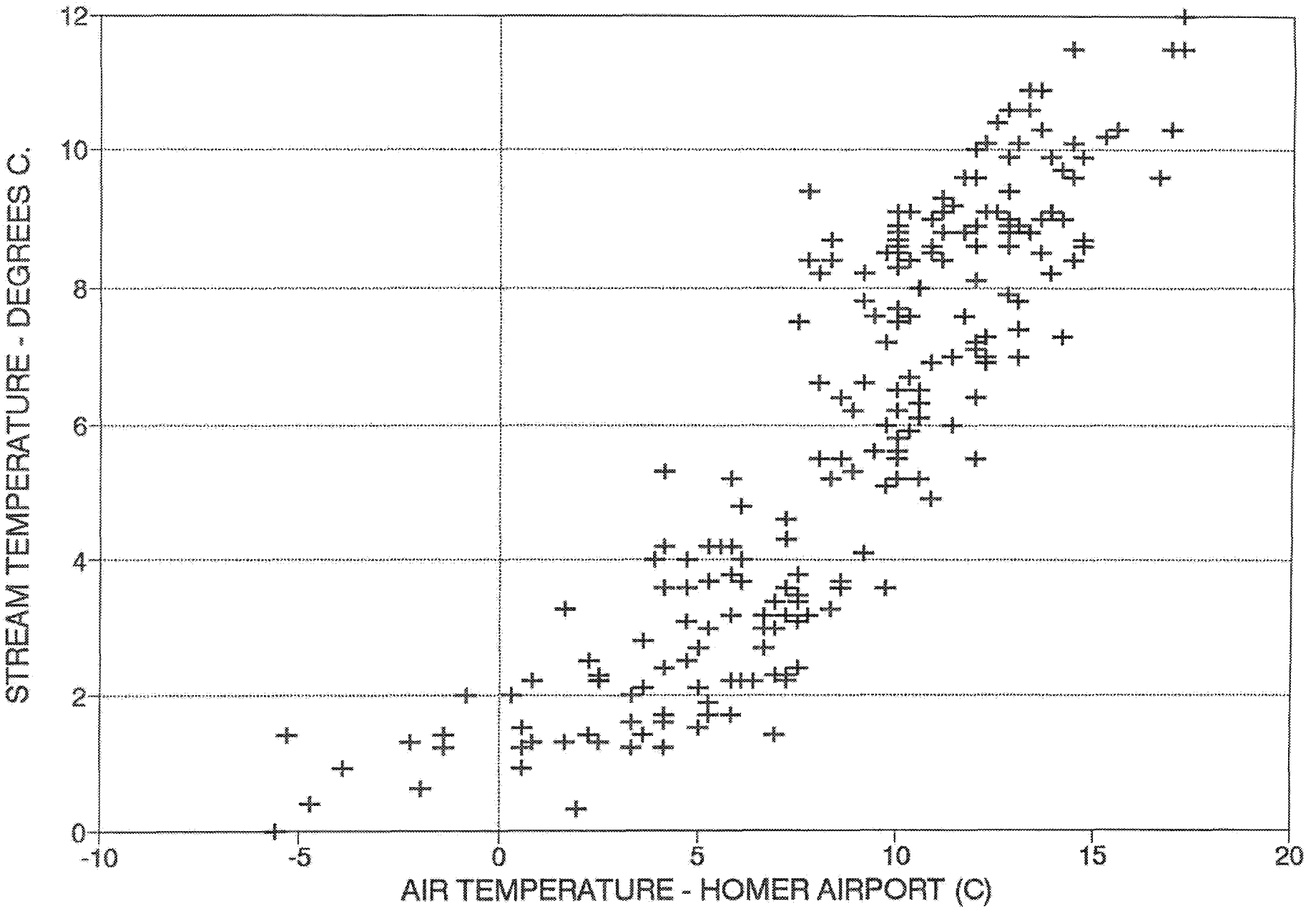
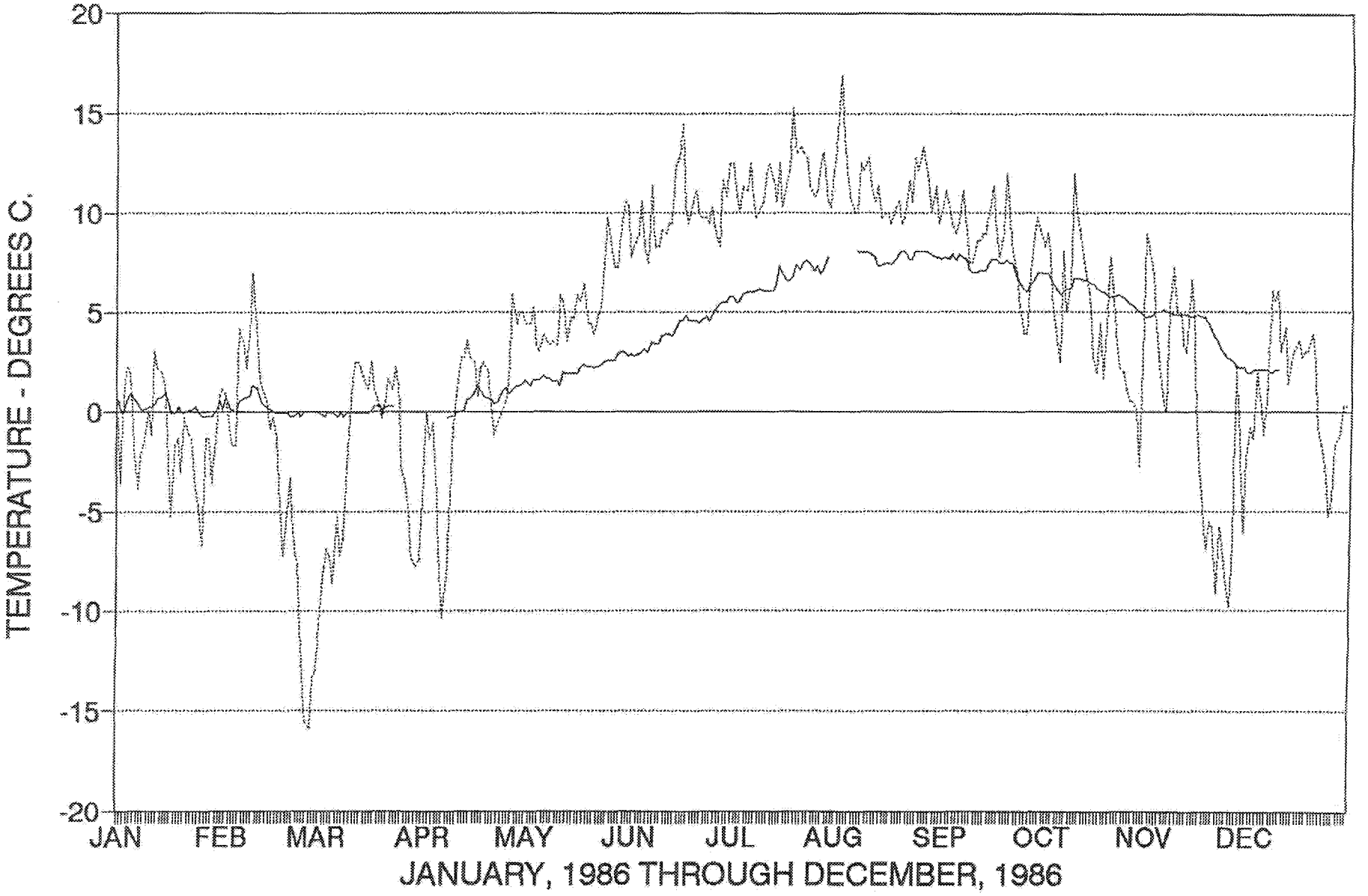
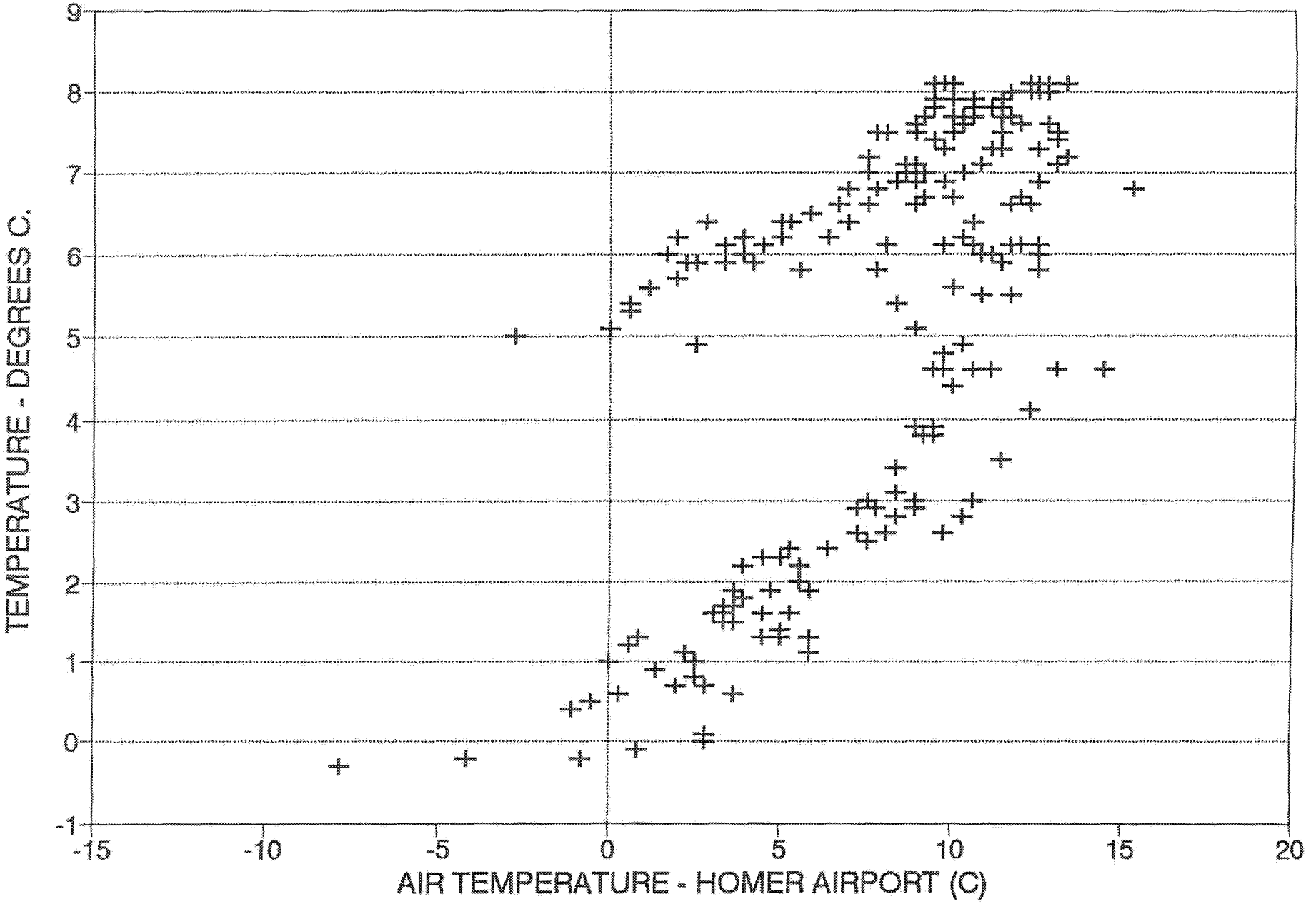


FIGURE 10 : RIFFLE REACH - 1986
STREAM WATER TEMP. VS. HOMER AIR TEMP.



EPA-7609-0013250_00030

FIGURE 11: STREAM TEMP. VS. AIR TEMP.
RIFFLE REACH, APRIL - OCTOBER, 1986



ATTACHMENT A

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 7602
Date Report Printed: JUL 14 88 @ 15:31

Client Sample ID:SITE #1
PWSID :
Collected @ hrs.
Received JUN 30 88 @ 15:00 hrs.
Preserved with :AS REQUIRED

Client Name : AK POWER AUTHORITY
Client Acct : AKPWRAP
P.O.# DAVE TRUDGEN
Req #
Ordered By : TOM ARMINSKI * DAVE TRUDGEN

Analysis Completed :JUL 12 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Send Reports to:
1)AK POWER AUTHORITY
2)

Special BRADLEY LAKE
Instruct:

Chemlab Ref #: 1625 Lab Smpl ID: 1 Matrix: Water

Parameter Tested	Result/Units	Method	Allowable Limits
ICP-25 ELEMENT SCAN	n/a n/a	ICP	
ALUMINUM	1.8 mg/l	ICP	
ARSENIC	ND(0.05) mg/l	ICP	
BARIUM	ND(0.05) mg/l	ICP	
BORON	ND(0.05) mg/l	ICP	
CALCIUM	8.9 mg/l	ICP	
CADMIUM	ND(0.01) mg/l	ICP	
CHROMIUM	ND(0.05) mg/l	ICP	
COPPER	0.055 mg/l	ICP	
IRON	3.5 mg/l	ICP	
LEAD	ND(0.05) mg/l	ICP	
MAGNESIUM	1.8 mg/l	ICP	
MANGANESE	0.089 mg/l	ICP	
MERCURY	ND(0.05) mg/l	ICP	
NICKEL	ND(0.05) mg/l	ICP	
PHOSPHOROUS	0.066 mg/l		
POTASSIUM	0.40 mg/l	ICP	
SELENIUM	ND(0.05) mg/l	ICP	
SILICON	3.1 mg/l	ICP	
SILVER	ND(0.05) mg/l	ICP	
SODIUM	1.3 mg/l	ICP	
STRONTIUM	0.088 mg/l	ICP	
TIN	ND(0.05) mg/l	ICP	
VANADIUM	ND(0.05) mg/l	ICP	
ZINC	0.30 mg/l	ICP	
ZIRCONIUM	ND(0.05) mg/l	ICP	

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.
5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 7602
Date Report Printed: JUL 14 88 @ 15:33

Client Sample ID:SITE #2
PWSID :
Collected @ hrs.
Received JUN 30 88 @ 15:00 hrs.
Preserved with :AS REQUIRED

Client Name : AK POWER AUTHORITY
Client Acct : AKPWRAP
P.O.# DAVE TRUDGEN
Req #
Ordered By : TOM ARMINSKI * DAVE TRUDGEN

Analysis Completed :JUL 12 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Send Reports to:
1)AK POWER AUTHORITY
2)

Special BRADLEY LAKE
Instruct:

Chemlab Ref #: 1625 Lab Smpl ID: 2 Matrix: Water

Parameter Tested	Result/Units	Method	Allowable Limits
ICP-25 ELEMENT SCAN	n/a n/a	ICP	
ALUMINUM	1.8 mg/l	ICP	
ARSENIC	ND(0.05) mg/l	ICP	
BARIUM	ND(0.05) mg/l	ICP	
BORON	ND(0.05) mg/l	ICP	
CALCIUM	8.4 mg/l	ICP	
CADMIUM	ND(0.01) mg/l	ICP	
CHROMIUM	ND(0.05) mg/l	ICP	
COPPER	0.050 mg/l	ICP	
IRON	3.0 mg/l	ICP	
LEAD	ND(0.05) mg/l	ICP	
MAGNESIUM	1.7 mg/l	ICP	
MANGANESE	0.072 mg/l	ICP	
MERCURY	ND(0.05) mg/l	ICP	
NICKEL	ND(0.05) mg/l	ICP	
PHOSPHOROUS	ND(0.05) mg/l		
POTASSIUM	0.21 mg/l	ICP	
SELENIUM	ND(0.05) mg/l	ICP	
SILICON	3.0 mg/l	ICP	
SILVER	ND(0.05) mg/l	ICP	
SODIUM	1.4 mg/l	ICP	
STRONTIUM	0.086 mg/l	ICP	
TIN	ND(0.05) mg/l	ICP	
VANADIUM	ND(0.05) mg/l	ICP	
ZINC	0.085 mg/l	ICP	
ZIRCONIUM	ND(0.05) mg/l	ICP	

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 7602
Date Report Printed: JUL 14 88 @ 15:34

Client Sample ID:SITE #2
PWSID :
Collected @ hrs.
Received JUN 30 88 @ 15:00 hrs.
Preserved with :AS REQUIRED

Analysis Completed :JUL 12 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Client Name : AK POWER AUTHORITY
Client Acct : AKPWRAP
P.O.# DAVE TRUDGEN
Req #
Ordered By : TOM ARMINSKI * DAVE TRUDGEN

Send Reports to:
1)AK POWER AUTHORITY
2)

Special BRADLEY LAKE
Instruct:

Chemlab Ref #: 1625 Lab Smpl ID: 2 Matrix: Water

Parameter Tested	Result/Units	Method	Allowable Limits

Sample
Remarks:

26 Tests Performed
ND- None Detected
NA- Not Analyzed

* See Special Instructions Above
** See Sample Remarks Above
LT-Less Than, GT-Greater Than

UA-Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 7602
Date Report Printed: JUL 14 88 @ 15:34

Client Sample ID:SITE #3
PWSID :
Collected @ hrs.
Received JUN 30 88 @ 15:00 hrs.
Preserved with :AS REQUIRED

Analysis Completed :JUL 12 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Client Name : AK POWER AUTHORITY
Client Acct : AKPWRAP
P.O.# DAVE TRUDGEN
Req #
Ordered By : TOM ARMINSKI * DAVE TRUDGEN

Send Reports to:
1)AK POWER AUTHORITY
2)

Special BRADLEY LAKE
Instruct:

Chemlab Ref #: 1625 Lab Smpl ID: 3 Matrix: Water

Parameter Tested	Result/Units	Method	Allowable Limits
ICP-25 ELEMENT SCAN	n/a n/a	ICP	
ALUMINUM	1.9 mg/l	ICP	
ARSENIC	ND(0.05) mg/l	ICP	
BARIUM	ND(0.05) mg/l	ICP	
BORON	ND(0.05) mg/l	ICP	
CALCIUM	8.1 mg/l	ICP	
CADMIUM	ND(0.01) mg/l	ICP	
CHROMIUM	ND(0.05) mg/l	ICP	
COPPER	0.097 mg/l	ICP	
IRON	2.8 mg/l	ICP	
LEAD	ND(0.05) mg/l	ICP	
MAGNESIUM	1.8 mg/l	ICP	
MANGANESE	0.067 mg/l	ICP	
MERCURY	ND(0.05) mg/l	ICP	
NICKEL	ND(0.05) mg/l	ICP	
PHOSPHOROUS	ND(0.05) mg/l		
POTASSIUM	ND(1.0) mg/l	ICP	
SELENIUM	ND(0.05) mg/l	ICP	
SILICON	3.2 mg/l	ICP	
SILVER	ND(0.05) mg/l	ICP	
SODIUM	1.6 mg/l	ICP	
STRONTIUM	0.082 mg/l	ICP	
TIN	ND(0.05) mg/l	ICP	
VANADIUM	ND(0.05) mg/l	ICP	
ZINC	0.10 mg/l	ICP	
ZIRCONIUM	ND(0.05) mg/l	ICP	

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.
5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 7602
Date Report Printed: JUL 14 88 @ 15:35

Client Sample ID:SITE #3
PWSID :
Collected @ hrs.
Received JUN 30 88 @ 15:00 hrs.
Preserved with :AS REQUIRED

Client Name : AK POWER AUTHORITY
Client Acct : AKPWRAP
P.O.# DAVE TRUDGEN
Req #
Ordered By : TOM ARMINSKI * DAVE TRUDGEN

Analysis Completed :JUL 12 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Send Reports to:
1)AK POWER AUTHORITY
2)

Special BRADLEY LAKE
Instruct:

Chemlab Ref #: 1625 Lab Smpl ID: 3 Matrix: Water

Parameter Tested	Result/Units	Method	Allowable Limits

Sample
Remarks:

26 Tests Performed
ND- None Detected
NA- Not Analyzed
* See Special Instructions Above
** See Sample Remarks Above
LT-Less Than, GT-Greater Than
UA-Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 7602
Date Report Printed: JUL 14 88 @ 15:36

Client Sample ID:SITE #1-SURFACE
PWSID :
Collected @ hrs.
Received JUN 30 88 @ 15:00 hrs.
Preserved with :AS REQUIRED

Client Name : AK POWER AUTHORITY
Client Acct : AEPWRAP
P.O.# DAVE TRUDGEN
Req #
Ordered By : TOM ARMINSKI * DAVE TRUDGEN

Analysis Completed :JUL 11 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Send Reports to:
1)AK POWER AUTHORITY
2)

Special BRADLEY LAKE
Instruct:

Chemlab Ref #: 1625 Lab Smpl ID: 4 Matrix: Water

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	ND(0.002) mg/l	GF	
MERCURY	ND(0.0002) mg/l	AA	
SULFIDE	ND(0.003) mg/l		

Sample
Remarks:

3 Tests Performed
ND- None Detected
NA- Not Analyzed

* See Special Instructions Above
** See Sample Remarks Above
LT-Less Than, GT-Greater Than

UA-Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 7602
Date Report Printed: JUL 14 88 @ 15:37

Client Sample ID:SITE #1-MID COLUMN
PWSID :
Collected @ hrs.
Received JUN 30 88 @ 15:00 hrs.
Preserved with :AS REQUIRED

Client Name : AK POWER AUTHORITY
Client Acct : AKPWRAP
P.O.# DAVE TRUDGEN
Req #
Ordered By : TOM ARMINSKI * DAVE TRUDGEN

Analysis Completed :JUL 11 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Send Reports to:
1)AK POWER AUTHORITY
2)

Special BRADLEY LAKE
Instruct:

Chemlab Ref #: 1625 Lab Smpl ID: 5 Matrix: Water

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	ND(0.002) mg/l	GF	
MERCURY	ND(0.0002) mg/l	AA	
SULFIDE	ND(0.003) mg/l		

Sample
Remarks:

3 Tests Performed
ND- None Detected
NA- Not Analyzed

* See Special Instructions Above
** See Sample Remarks Above
LT-Less Than, GT-Greater Than

UA-Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 7602
Date Report Printed: JUL 14 88 @ 15:37

Client Sample ID:SITE #1-BOTTOM
PWSID :
Collected @ hrs.
Received JUN 30 88 @ 15:00 hrs.
Preserved with :AS REQUIRED

Client Name : AK POWER AUTHORITY
Client Acct : AKPWRAP
P.O.# DAVE TRUDGEN
Req #
Ordered By : TOM ARMINSKI * DAVE TRUDGEN

Analysis Completed :JUL 11 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Send Reports to:
1)AK POWER AUTHORITY
2)

Special BRADLEY LAKE
Instruct:

Chemlab Ref #: 1625 Lab Smpl ID: 6 Matrix: Water

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	ND(0.002) mg/l	GF	
MERCURY	ND(0.0002) mg/l	AA	
SULFIDE	ND(0.003) mg/l		

Sample
Remarks:

---

3 Tests Performed
ND- None Detected
NA- Not Analyzed

* See Special Instructions Above
** See Sample Remarks Above
LT-Less Than, GT-Greater Than

UA-Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.
5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 7602
Date Report Printed: JUL 14 88 @ 15:38

Client Sample ID:SITE #2-SURFACE
PWSID :
Collected @ hrs.
Received JUN 30 88 @ 15:00 hrs.
Preserved with :AS REQUIRED

Client Name : AK POWER AUTHORITY
Client Acct : AKPWRAP
P.O.# DAVE TRUDGEN
Req #
Ordered By : TOM ARMINSKI * DAVE TRUDGEN

Analysis Completed :JUL 11 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Send Reports to:
1)AK POWER AUTHORITY
2)

Special BRADLEY LAKE
Instruct:

Chemlab Ref #: 1625 Lab Smpl ID: 7 Matrix: Water

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	ND(0.002) mg/l	GF	
MERCURY	ND(0.0002) mg/l	AA	
SULFIDE	ND(0.003) mg/l		

Sample
Remarks:

3 Tests Performed
ND= None Detected
NA= Not Analyzed
* See Special Instructions Above
** See Sample Remarks Above
LT=Less Than, GT=Greater Than
UA=Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 7602
Date Report Printed: JUL 14 88 @ 15:39

Client Sample ID:SITE #2-MID COLUMN
PWSID :
Collected @ hrs.
Received JUN 30 88 @ 15:00 hrs.
Preserved with :AS REQUIRED

Client Name : AK POWER AUTHORITY
Client Acct : AKPWRAP
P.O.# DAVE TRUDGEN
Req #
Ordered By : TOM ARMINSKI * DAVE TRUDGEN

Analysis Completed :JUL 11 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Send Reports to:
1)AK POWER AUTHORITY
2)

Special BRADLEY LAKE
Instruct:

Chemlab Ref #: 1625 Lab Smpl ID: 8 Matrix: Water

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	ND(0.002) mg/l	GF	
MERCURY	ND(0.0002) mg/l	AA	
SULFIDE	ND(0.003) mg/l		

Sample
Remarks:

3 Tests Performed
ND- None Detected
NA- Not Analyzed

* See Special Instructions Above
** See Sample Remarks Above
LT-Less Than, GT-Greater Than

UA-Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 7602
Date Report Printed: JUL 14 88 @ 15:39

Client Sample ID:SITE #2-BOTTOM
PWSID :
Collected # hrs.
Received JUN 30 88 @ 15:00 hrs.
Preserved with :AS REQUIRED

Client Name : AK POWER AUTHORITY
Client Acct : AKPWRAP
P.O.# DAVE TRUDGEN
Req #
Ordered By : TOM ARMINSKI * DAVE TRUDGEN

Analysis Completed :JUL 11 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Send Reports to:
1)AK POWER AUTHORITY
2)

Special BRADLEY LAKE
Instruct:

Chemlab Ref #: 1625 Lab Smpl ID: 9 Matrix: Water

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	ND(0.002) mg/l	GF	
MERCURY	0.0002 mg/l	AA	
SULFIDE	ND(0.002) mg/l		

Sample
Remarks:

3 Tests Performed
ND= None Detected
NA= Not Analyzed

* See Special Instructions Above
** See Sample Remarks Above
LT=Less Than, GT=Greater Than

UA=Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 7602
Date Report Printed: JUL 14 88 @ 15:40

Client Sample ID:SITE #3-SURFACE
PWSID :
Collected @ hrs.
Received JUN 30 88 @ 15:00 hrs.
Preserved with :AS REQUIRED

Client Name : AK POWER AUTHORITY
Client Acct : AKPWRAP
P.O.# DAVE TRUDGEN
Req #
Ordered By : TOM ARMINSKI * DAVE TRUDGEN

Analysis Completed :JUL 11 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Send Reports to:
1)AK POWER AUTHORITY
2)

Special BRADLEY LAKE
Instruct:

Chemlab Ref #: 1625 Lab Smpl ID: 10 Matrix: Water

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	ND(0.002) mg/l	GF	
MERCURY	ND(0.0002) mg/l	AA	
SULFIDE	ND(0.002) mg/l		

Sample
Remarks:

---

3 Tests Performed
ND= None Detected
NA= Not Analyzed

* See Special Instructions Above
** See Sample Remarks Above
LT=Less Than, GT=Greater Than

UA=Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.
5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 7602
Date Report Printed: JUL 14 88 @ 15:41

Client Sample ID:SITE #3-MID COLUMN
PWSID :
Collected @ hrs.
Received JUN 30 88 @ 15:00 hrs.
Preserved with :AS REQUIRED

Analysis Completed :JUL 11 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Client Name : AK POWER AUTHORITY
Client Acct : AKPWRAP
P.O.# DAVE TRUDGEN
Req #
Ordered By : TOM ARMINSKI * DAVE TRUDGEN

Send Reports to:
1)AK POWER AUTHORITY
2)

Special BRADLEY LAKE
Instruct:

Chemlab Ref #: 1625 Lab Smpl ID: 11 Matrix: Water

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	ND(0.002) mg/l	GF	
MERCURY	ND(0.0002) mg/l	AA	
SULFIDE	ND(0.002) mg/l		

Sample
Remarks:

3 Tests Performed
ND= None Detected
NA= Not Analyzed
* See Special Instructions Above
** See Sample Remarks Above
LT=Less Than, GT=Greater Than
UA=Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.
5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 7602
Date Report Printed: JUL 14 88 @ 15:42

Client Sample ID:SITE #3-BOTTOM
PWSID :
Collected @ hrs.
Received JUN 30 88 @ 15:00 hrs.
Preserved with :AS REQUIRED

Client Name : AK POWER AUTHORITY
Client Acct : AKPWRAP
P.O.# DAVE TRUDGEN
Req #
Ordered By : TOM ARMINSKI * DAVE TRUDGEN

Analysis Completed :JUL 11 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Send Reports to:
1)AK POWER AUTHORITY
2)

Special BRADLEY LAKE
Instruct:

Chemlab Ref #: 1625 Lab Smpl ID: 12 Matrix: Water

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	ND(0.002) mg/l	GF	
MERCURY	0.0002 mg/l	LA	
SULFIDE	ND(0.002) mg/l		

Sample
Remarks:

3 Tests Performed
ND- None Detected
NA- Not Analyzed

* See Special Instructions Above
** See Sample Remarks Above
LT-Less Than, GT-Greater Than

UA-Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 9573
Data Report Printed: OCT 12 88 @ 17:00

Client Sample ID:SITE #1 TOP
PWSID :UA
Collected SEP 29 88 @ hrs.
Received SEP 30 88 @ 09:00 hrs.
Preserved with :AS REQUIRED

Client Name : AK POWER AUTHORITY
Client Acct : AKPWRAP
P.O.# 099331
Req #
Ordered By : TOM ARMINSKI/DAVE TRUDGEN

Analysis Completed :OCT 11 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Send Reports to:
1)AK POWER AUTHORITY
2)

Special BRADLEY LAKE
Instruct:

Chemlab Ref #: 2841 Lab Smpl ID: 1 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	0.0053 mg/l	GF	
MERCURY	ND(0.0002) mg/l	AA	
SULFIDE	ND(0.002) mg/l		

Sample SAMPLE COLLECTED BY D. TRUDGEN
Remarks:

3 Tests Performed
ND= None Detected
NA= Not Analyzed

* See Special Instructions Above
** See Sample Remarks Above
LT=Less Than, GT=Greater Than

UA=Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.
5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 9573
Date Report Printed: OCT 12 88 @ 17:00

Client Sample ID:SITE #1 MID COLUMN
PWSID :UA
Collected SEP 29 88 @ hrs.
Received SEP 30 88 @ 09:00 hrs.
Preserved with :AS REQUIRED

Client Name : AK POWER AUTHORITY
Client Acct : AKPWRAP
P.O.# 099331
Req #
Ordered By : TOM ARMINSKI/DAVE TRUDGEN

Analysis Completed :OCT 11 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Send Reports to:
1)AK POWER AUTHORITY
2)

Special Instruct: BRADLEY LAKE

Chemlab Ref #: 2841 Lab Sapl ID: 2 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	0.0048 mg/l	GF	
MERCURY	ND(0.0002) mg/l	AA	
SULFIDE	ND(0.002) mg/l		

Sample Remarks: SAMPLE COLLECTED BY D. TRUDGEN

3 Tests Performed
ND= None Detected
NA= Not Analyzed
* See Special Instructions Above
** See Sample Remarks Above
LT=Less Than, GT=Greater Than
UA=Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.
5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 9573
Date Report Printed: OCT 12 88 @ 17:01

Client Sample ID:SITE #1 BOTTOM
PWSID :UA
Collected SEP 29 88 @ hrs.
Received SEP 30 88 @ 09:00 hrs.
Preserved with :AS REQUIRED

Client Name : AK POWER AUTHORITY
Client Acct : AKPWRAP
P.O.# 099331
Req #
Ordered By : TOM ARMINSKI/DAVE TRUDGEN

Analysis Completed :OCT 11 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Send Reports to:
1)AK POWER AUTHORITY
2)

Special BRADLEY LAKE
Instruct:

Chemlab Ref #: 2841 Lab Smpl ID: 3 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	0.0043 mg/l	GF	
MERCURY	ND(0.0002) mg/l	AA	
SULFIDE	ND(0.002) mg/l		

Sample SAMPLE COLLECTED BY D. TRUDGEN
Remarks:

3 Tests Performed
ND- None Detected
NA- Not Analyzed

* See Special Instructions Above
** See Sample Remarks Above
LT-Less Than, GT-Greater Than

UA-Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.
5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 9573
Date Report Printed: OCT 12 88 @ 17:02

Client Sample ID:SITE #2 TOP
PWSID :UA
Collected SEP 29 88 @ hrs.
Received SEP 30 88 @ 09:00 hrs.
Preserved with :AS REQUIRED

Client Name : AK POWER AUTHORITY
Client Acct : AKPWRAP
P.O.# 099331
Req #
Ordered By : TOM ARMINSKI/DAVE TRUDGEN

Analysis Completed :OCT 11 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Send Reports to:
1)AK POWER AUTHORITY
2)

Special BRADLEY LAKE
Instruct:

Chemlab Ref #: 2841 Lab Smpl ID: 4 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	0.0046 mg/l	GF	
MERCURY	ND(0.0002) mg/l	AA	
SULFIDE	ND(0.002) mg/l		

Sample SAMPLE COLLECTED BY D. TRUDGEN
Remarks:

3 Tests Performed
ND= None Detected
NA= Not Analyzed

* See Special Instructions Above
** See Sample Remarks Above
LT=Less Than, GT=Greater Than

UA=Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.
5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 9573
Date Report Printed: OCT 12 88 @ 17:03

Client Sample ID:SITE #2 MID COLUMN
PWSID :UA
Collected SEP 29 88 @ hrs.
Received SEP 30 88 @ 09:00 hrs.
Preserved with :AS REQUIRED

Client Name : AK POWER AUTHORITY
Client Acct : AKPWRAP
P.O.# 099331
Req #
Ordered By : TOM ARMINSKI/DAVE TRUDGEN

Analysis Completed :OCT 11 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Send Reports to:
1)AK POWER AUTHORITY
2)

Special BRADLEY LAKE
Instruct:

Chemlab Ref #: 2841 Lab Smpl ID: 5 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	0.0047 mg/l	GF	
MERCURY	0.0002 mg/l	AA	
SULFIDE	ND(0.002) mg/l		

Sample SAMPLE COLLECTED BY D. TRUDGEN
Remarks:

3 Tests Performed
ND- None Detected
NA- Not Analyzed
* See Special Instructions Above
** See Sample Remarks Above
LT-Less Than, GT-Greater Than
UA-Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.
5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 9573
Date Report Printed: OCT 12 88 @ 17:03

Client Sample ID:SITE #2 BOTTOM
PWSID :UA
Collected SEP 29 88 @ hrs.
Received SEP 30 88 @ 09:00 hrs.
Preserved with :AS REQUIRED

Analysis Completed :OCT 11 88
Laboratory Supervisor :STEPHEN C. EDE
Released By :

Client Name : AK POWER AUTHORITY
Client Acct : AKPWRAP
P.O.# 099331
Req #
Ordered By : TOM ARMINSKI/DAVE TRUDGEN

Send Reports to:
1)AK POWER AUTHORITY
2)

Special BRADLEY LAKE
Instruct:

Chemlab Ref #: 2841 Lab Smpl ID: 6 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	ND(0.002) mg/l	GF	
MERCURY	ND(0.0002) mg/l	AA	
SULFIDE	ND(0.002) mg/l		

Sample SAMPLE COLLECTED BY D. TRUDGEN
Remarks:

3 Tests Performed
ND- None Detected
NA- Not Analyzed
* See Special Instructions Above
** See Sample Remarks Above
LT-Less Than, GT-Greater Than
UA-Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.
5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 9573
Date Report Printed: OCT 12 88 @ 17:04

Client Sample ID:SITE #3 TOP
PWSID :UA
Collected SEP 29 88 @ hrs.
Received SEP 30 88 @ 09:00 hrs.
Preserved with :AS REQUIRED

Client Name : AK POWER AUTHORITY
Client Acct : AKPWRAP
P.O.# 099331
Req #
Ordered By : TOM ARMINSKI/DAVE TRUDGEN

Analysis Completed :OCT 11 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Send Reports to:
1)AK POWER AUTHORITY
2)

Special Instruct: BRADLEY LAKE

Chemlab Ref #: 2841 Lab Smpl ID: 7 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	0.0050 mg/l	GF	
MERCURY	ND(0.0002) mg/l	AA	
SULFIDE	ND(0.002) mg/l		

Sample Remarks: SAMPLE COLLECTED BY D. TRUDGEN

3 Tests Performed
ND= None Detected
NA= Not Analyzed

* See Special Instructions Above
** See Sample Remarks Above
LT=Less Than, GT=Greater Than

UA=Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 9573
Date Report Printed: OCT 12 88 @ 17:05

Client Sample ID:SITE #3 MID COLUMN
PWSID :UA
Collected SEP 29 88 @ hrs.
Received SEP 30 88 @ 09:00 hrs.
Preserved with :AS REQUIRED

Analysis Completed :OCT 11 88
Laboratory Supervisor :STEPHEN C. EDE
Released By :

Client Name : AK POWER AUTHORITY
Client Acct : AKPWRAP
P.O.# 099331
Req #
Ordered By : TOM ARMINSKI/DAVE TRUDGEN

Send Reports to:
1)AK POWER AUTHORITY
2)

Special Instruct: BRADLEY LAKE

Chemlab Ref #: 2841 Lab Sapl ID: 8 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	ND(0.002) mg/l	GF	
MERCURY	0.0002 mg/l	AA	
SULFIDE	ND(0.002) mg/l		

Sample Remarks: SAMPLE COLLECTED BY D. TRUDGEN

3 Tests Performed
ND- None Detected
NA- Not Analyzed

* See Special Instructions Above
** See Sample Remarks Above
LT-Less Than, GT-Greater Than

UA-Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.
5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 9573
Date Report Printed: OCT 12 88 @ 17:05

Client Sample ID:SITE #3 BOTTOM
PWSID :UA
Collected SEP 29 88 @ hrs.
Received SEP 30 88 @ 09:00 hrs.
Preserved with :AS REQUIRED

Client Name : AK POWER AUTHORITY
Client Acct : AEPWRAP
P.O.# 099331
Req #
Ordered By : TOM ARMINSKI/DAVE TRUDGEN

Analysis Completed :OCT 11 88
Laboratory Supervisor :STEPHEN C. EDE
Released By :

Send Reports to:
1)AK POWER AUTHORITY
2)

Special BRADLEY LAKE
Instruct:

Chemlab Ref #: 2841 Lab Smpl ID: 9 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	ND(0.002) mg/l	GF	
MERCURY	0.0003 mg/l	AA	
SULFIDE	ND(0.002) mg/l		

Sample SAMPLE COLLECTED BY D. TRUDGEN
Remarks:

3 Tests Performed
ND= None Detected
NA= Not Analyzed
* See Special Instructions Above
** See Sample Remarks Above
LT-Less Than, GT-Greater Than
UA=Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 11007
Date Report Printed: JAN 5 89 @ 17:46

Client Sample ID:SITE #1 TOP
PWSID :UA
Collected DEC 20 88 @ hrs.
Received DEC 20 88 @ 16:00 hrs.
Preserved with :ZINC ACETATE/ACID

Client Name : AK POWER AUTH
Client Acct : AKPWRAP
P.O.# NONE REC'D
Req #
Ordered By :

Analysis Completed :DEC 28 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Send Reports to:
1)AK POWER AUTH
2)

Special Instruct: BRADLEY LAKE.

Chemlab Ref #: 3780 Lab Smpl ID: 1 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
MERCURY	ND(0.0002) mg/l	AA	
CADMIUM	ND(0.002) mg/l	GF	
HYDROGEN SULFIDE	ND(0.002) mg/l		

Sample Remarks: SAMPLE COLLECTED BY D. TRUDGEN.

3 Tests Performed
ND= None Detected
NA= Not Analyzed
* See Special Instructions Above
** See Sample Remarks Above
LT=Less Than, GT=Greater Than
UA=Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 11007
Date Report Printed: JAN 5 89 @ 17:47

Client Sample ID:SITE #1 MID COLUMN
PWSID :UA
Collected DEC 20 88 @ hrs.
Received DEC 20 88 @ 16:00 hrs.
Preserved with :ZINC ACETATE/ACID

Client Name : AK POWER AUTH
Client Acct : AKPWRAP
P.O.# NONE REC'D
Req #
Ordered By :

Analysis Completed :DEC 28 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Send Reports to:
1)AK POWER AUTH
2)

Special BRADLEY LAKE.
Instruct:

Chemlab Ref #: 3780 Lab Smpl ID: 2 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
MERCURY	ND(0.0002) mg/l	AA	
CADMIUM	ND(0.002) mg/l	GF	
HYDROGEN SULFIDE	ND(0.002) mg/l		

Sample SAMPLE COLLECTED BY D. TRUDGEN.
Remarks:

3 Tests Performed
ND= None Detected
NA- Not Analyzed

* See Special Instructions Above
** See Sample Remarks Above
LT-Less Than, GT-Greater Than

UA-Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 11007
Date Report Printed: JAN 5 89 @ 17:48

Client Sample ID:SITE #1 BOTTOM
PWSID :UA
Collected DEC 20 88 @ hrs.
Received DEC 20 88 @ 16:00 hrs.
Preserved with :ZINC ACETATE/ACID

Client Name : AK POWER AUTH
Client Acct : AKPWRAP
P.O.# NONE REC'D
Req #
Ordered By :

Analysis Completed :DEC 28 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Send Reports to:
1)AK POWER AUTH
2)

Special BRADLEY LAKE.
Instruct:

Chemlab Ref #: 3780 Lab Smpl ID: 3 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
MERCURY	0.0002 mg/l	AA	
CADMIUM	ND(0.002) mg/l	GF	
HYDROGEN SULFIDE	ND(0.002) mg/l		

Sample SAMPLE COLLECTED BY D. TRUDGEN.
Remarks:

3 Tests Performed
ND- None Detected
NA- Not Analyzed

* See Special Instructions Above
** See Sample Remarks Above
LT-Less Than, GT-Greater Than

UA-Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.
5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 11007
Date Report Printed: JAN 5 89 @ 17:48

Client Sample ID:SITE #2 TOP
PWSID :UA
Collected DEC 20 88 @ hrs.
Received DEC 20 88 @ 16:00 hrs.
Preserved with :ZINC ACETATE/ACID

Client Name : AK POWER AUTH
Client Acct : AKPWRAP
P.O.# NONE REC'D
Req #
Ordered By :

Analysis Completed :DEC 28 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Steph C. Ede

Send Reports to:
1)AK POWER AUTH
2)

Special Instruct: BRADLEY LAKE.

Chemlab Ref #: 3780 Lab Smpl ID: 4 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
MERCURY	ND(0.0002) mg/l	AA	
CADMIUM	ND(0.002) mg/l	GF	
HYDROGEN SULFIDE	ND(0.002) mg/l		

Sample Remarks: SAMPLE COLLECTED BY D. TRUDGEN.

3 Tests Performed
ND= None Detected
NA= Not Analyzed
* See Special Instructions Above
** See Sample Remarks Above
LT=Less Than, GT=Greater Than
UA=Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 11007
Date Report Printed: JAN 5 89 @ 17:49

Client Sample ID:SITE #2 MID COLUMN
PWSID :UA
Collected DEC 20 88 @ hrs.
Received DEC 20 88 @ 16:00 hrs.
Preserved with :ZINC ACETATE/ACID

Client Name : AK POWER AUTH
Client Acct : AKPWRAP
P.O.# NONE REC'D
Req #
Ordered By :

Analysis Completed :DEC 28 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Send Reports to:
1)AK POWER AUTH
2)

Special BRADLEY LAKE.
Instruct:

Chemlab Ref #: 3780 Lab Smpl ID: 5 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
MERCURY	ND(0.0002) mg/l	AA	
CADMIUM	ND(0.002) mg/l	GF	
HYDROGEN SULFIDE	ND(0.002) mg/l		

Sample SAMPLE COLLECTED BY D. TRUDGEN.
Remarks:

---

3 Tests Performed
ND- None Detected
NA- Not Analyzed

* See Special Instructions Above
** See Sample Remarks Above
LT-Less Than, GT-Greater Than

UA-Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 11007
Date Report Printed: JAN 5 89 @ 17:50

Client Sample ID:SITE #2 BOTTOM
PWSID :UA
Collected DEC 20 88 @ hrs.
Received DEC 20 88 @ 16:00 hrs.
Preserved with :ZINC ACETATE/ACID

Client Name : AK POWER AUTH
Client Acct : AKPWRAP
P.O.# NONE REC'D
Req #
Ordered By :

Analysis Completed :DEC 28 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Steph C. Ede

Send Reports to:
1)AK POWER AUTH
2)

Special BRADLEY LAKE.
Instruct:

Chemlab Ref #: 3780 Lab Smpl ID: 6 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
MERCURY	0.0005 mg/l	AA	
CADMIUM	ND(0.002) mg/l	GF	
HYDROGEN SULFIDE	ND(0.002) mg/l		

Sample SAMPLE COLLECTED BY D. TRUDGEN.
Remarks:

3 Tests Performed
ND- None Detected
NA- Not Analyzed

* See Special Instructions Above
** See Sample Remarks Above
LT-Less Than, GT-Greater Than

UA-Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 11007
Date Report Printed: JAN 5 89 @ 17:51

Client Sample ID:SITE #3 MID COLUMN
PWSID :UA
Collected DEC 20 88 @ hrs.
Received DEC 20 88 @ 16:00 hrs.
Preserved with :ZINC ACETATE/ACID

Client Name : AK POWER AUTH
Client Acct : AKPWRAP
P.O.# NONE REC'D
Req #
Ordered By :

Analysis Completed :DEC 28 88
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Send Reports to:
1)AK POWER AUTH
2)

Special BRADLEY LAKE.
Instruct:

Chemlab Ref #: 3780 Lab Smpl ID: 8 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
MERCURY	ND(0.0002) mg/l	AA	
CADMIUM	ND(0.002) mg/l	GF	
HYDROGEN SULFIDE	ND(0.002) mg/l		

Sample SAMPLE COLLECTED BY D. TRUDGEN.
Remarks:

3 Tests Performed
ND= None Detected
NA= Not Analyzed

* See Special Instructions Above
** See Sample Remarks Above
LT=Less Than, GT=Greater Than

UA=Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.
5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 11007
Date Report Printed: JAN 5 89 @ 17:52

Client Sample ID:SITE #3 BOTTOM
PWSID :UA
Collected DEC 20 88 @ hrs.
Received DEC 20 88 @ 16:00 hrs.
Preserved with :ZINC ACETATE/ACID

Client Name : AK POWER AUTH
Client Acct : AKPWRAP
P.O.# NONE REC'D
Req #
Ordered By :

Analysis Completed :DEC 28 88
Laboratory Supervisor :STEPHEN C. EDE
Released By :

Send Reports to:
1)AK POWER AUTH
2)

Special BRADLEY LAKE.
Instruct:

Chemlab Ref #: 3780 Lab Smpl ID: 9 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
MERCURY	ND(0.0002) mg/l	AA	
CADMIUM	ND(0.002) mg/l	GF	
HYDROGEN SULFIDE	ND(0.002) mg/l		

Sample SAMPLE COLLECTED BY D. TRUDGEN.
Remarks:

3 Tests Performed
ND- None Detected
NA- Not Analyzed
* See Special Instructions Above
** See Sample Remarks Above
LT-Less Than, GT-Greater Than
UA-Unavailable

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CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

DUPLICATE

ANALYSIS REPORT BY SAMPLE for Work Order # 12147
Date Report Printed: MAR 22 89 @ 10:17

Client Sample ID:SITE #1, TOP
PWSID :UA
Collected MAR 13 89 @ hrs.
Received MAR 14 89 @ 10:00 hrs.
Preserved with :AS REQUIRED

Analysis Completed :MAR 20 89
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

RECEIVED
MAR 24 1989
ALASKA POWER AUTHORITY

Client Name : AK POWER AUTH
Client Acct : AKPWRAP
P.O.# NONE REC'D
Req #
Ordered By : TOM ARMINSKI/DAVE TRUDGEN

Send Reports to:
1)AK POWER AUTH
2)

Special
Instruct:

Chemlab Ref #: 4519 Lab Smpl ID: 1 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	ND(0.002) mg/l	GF	
MERCURY	ND(0.0002) mg/l	ADEC18AAC80	0.0002
HYDROGEN SULFIDE	ND(0.002) mg/l		

Sample SAMPLE COLLECTED BY D.T.
Remarks:

3 Tests Performed
ND= None Detected
NA= Not Analyzed
* See Special Instructions Above
** See Sample Remarks Above
LT=Less Than, GT=Greater Than
UA=Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.
5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 12147
Date Report Printed: MAR 22 89 @ 10:17

Client Sample ID:SITE #1, MIDDLE
PWSID :UA
Collected MAR 13 89 @ hrs.
Received MAR 14 89 @ 10:00 hrs.
Preserved with :AS REQUIRED

Analysis Completed :MAR 20 89
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Client Name : AK POWER AUTH
Client Acct : AKPWRAP
P.O.# NONE REC'D
Req #
Ordered By : TOM ARMINSKI/DAVE TRUDGEN

Send Reports to:
1)AK POWER AUTH
2)

Special
Instruct:

Chemlab Ref #: 4519 Lab Smpl ID: 2 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	ND(0.002) mg/l	GF	
MERCURY	ND(0.0002) mg/l	ADEC18AAC80	0.0002
HYDROGEN SULFIDE	ND(0.002) mg/l	-	

Sample SAMPLE COLLECTED BY D.T.
Remarks:

3 Tests Performed
ND= None Detected
NA= Not Analyzed

* See Special Instructions Above
** See Sample Remarks Above
LT=Less Than, GT=Greater Than

UA-Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

AMALYSIS REPORT BY SAMPLE for Work Order # 12147
Date Report Printed: MAR 22 89 @ 10:18

Client Sample ID:SITE #1, BOTTOM
PWSID :UA
Collected MAR 13 89 @ hrs.
Received MAR 14 89 @ 10:00 hrs.
Preserved with :AS REQUIRED

Analysis Completed :MAR 20 89
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Client Name : AK POWER AUTH
Client Acct : AKPWRAP
P.O.# NONE REC'D
Req #
Ordered By : TOM ARMINSKI/DAVE TRUDGEN

Send Reports to:
1)AK POWER AUTH
2)

Special
Instruct:

Chemlab Ref #: 4519 Lab Smpl ID: 3 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	ND(0.002) mg/l	GF	
MERCURY	ND(0.0002) mg/l	ADEC18AAC80	0.0002
HYDROGEN SULFIDE	ND(0.002) mg/l		

Sample SAMPLE COLLECTED BY D.T.
Remarks:

3 Tests Performed
ND= None Detected
NA= Not Analyzed

* See Special Instructions Above
** See Sample Remarks Above
LT-Less Than, GT-Greater Than

UA=Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 12147
Date Report Printed: MAR 22 89 @ 10:19

Client Sample ID:SITE #2, TOP
SID :UA
llected MAR 13 89 @ hrs.
Received MAR 14 89 @ 10:00 hrs.
eserved with :AS REQUIRED

Analysis Completed :MAR 20 89
Laboratory Supervisor :STEPHEN C. EDE
leased By : Steph C. Ede

Client Name : AK POWER AUTH
Client Acct : AKPWRAP
P.O.# NONE REC'D
Req #
Ordered By : TOM ARMINSKI/DAVE TRUDGEN

Send Reports to:
1)AK POWER AUTH
2)

pecial
nstruct:

Chemlab Ref #: 4519 Lab Smpl ID: 4 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	ND(0.002) mg/l	GF	
MERCURY	ND(0.0002) mg/l	ADEC18AAC80	0.0002
HYDROGEN SULFIDE	ND(0.002) mg/l		

Sample SAMPLE COLLECTED BY D.T.
emarks:

3 Tests Performed * See Special Instructions Above UA-Unavailable
ND- None Detected ** See Sample Remarks Above
NA- Not Analyzed LT-Less Than, GT-Greater Than

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 12147
Date Report Printed: MAR 22 89 @ 10:19

lient Sample ID:SITE #2, MIDDLE
WSID :UA
Collected MAR 13 89 @ hrs.
ecsived MAR 14 89 @ 10:00 hrs.
reserved with :AS REQUIRED

Analysis Completed :MAR 20 89
aboratory Supervisor :STEPHEN C. EDE
eleased By : Stephen C. Ede

Client Name : AK POWER AUTH
Client Acct : AKPWRAP
P.O.# NONE REC'D
Req #
Ordered By : TOM ARMINSKI/DAVE TRUDGEN

Send Reports to:
1)AK POWER AUTH
2)

Special
Instruct:

Chemlab Ref #: 4519 Lab Smpl ID: 5 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	ND(0.002) mg/l	GF	
MERCURY	ND(0.0002) mg/l	ADEC18AAC80	0.0002
HYDROGEN SULFIDE	ND(0.002) mg/l		

Sample SAMPLE COLLECTED BY D.T.
Remarks:

3 Tests Performed * See Special Instructions Above UA-Unavailable
ND- None Detected ** See Sample Remarks Above
NA- Not Analyzed LT-Less Than, GT-Greater Than

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 12147
Date Report Printed: MAR 22 89 @ 10:20

Client Sample ID:SITE #2, BOTTOM
PWSID :UA
Collected MAR 13 89 @ hrs.
Received MAR 14 89 @ 10:00 hrs.
Preserved with :AS REQUIRED

Analysis Completed :MAR 20 89
Laboratory Supervisor :STEPHEN C. EDE
Released By :

Client Name : AK POWER AUTH
Client Acct : AKPWRAP
P.O.# NONE REC'D
Req #
Ordered By : TOM ARMINSKI/DAVE TRUDGEN

Send Reports to:
1)AK POWER AUTH
2)

Special
Instruct:

Chemlab Ref #: 4519 Lab Sampl ID: 6 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	ND(0.002) mg/l	GF	
MERCURY	ND(0.0002) mg/l	ADEC18AAC80	0.0002
HYDROGEN SULFIDE	ND(0.002) mg/l		

Sample Remarks: SAMPLE COLLECTED BY D.T.

3 Tests Performed
ND- None Detected
NA- Not Analyzed

* See Special Instructions Above
** See Sample Remarks Above
LT-Less Than, GT-Greater Than

UA-Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 12147
Date Report Printed: MAR 22 89 @ 10:21

lient Sample ID:SITE #3, TOP
PWSID :UA
ollected MAR 13 89 @ hrs.
eceived MAR 14 89 @ 10:00 hrs.
Preserved with :AS REQUIRED

nalysis Completed :MAR 20 89
aboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Client Name : AK POWER AUTH
Client Acct : AKPWRAP
P.O.# NONE REC'D
Req #
Ordered By : TOM ARMINSKI/DAVE TRUDGEN

Send Reports to:
1)AK POWER AUTH
2)

Special
Instruct:

Chemlab Ref #: 4519 Lab Smpl ID: 7 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	ND(0.002) mg/l	GF	
MERCURY	ND(0.0002) mg/l	ADEC18AAC80	0.0002
HYDROGEN SULFIDE	ND(0.002) mg/l		

ample SAMPLE COLLECTED BY D.T.
emarks:

3 Tests Performed
ND= None Detected
NA= Not Analyzed

* See Special Instructions Above
** See Sample Remarks Above
LT-Less Than, GT-Greater Than

UA=Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.
5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 12147
Date Report Printed: MAR 22 89 @ 10:21

Client Sample ID:SITE #3, MIDDLE
MSID :UA
Collected MAR 13 89 @ hrs.
Received MAR 14 89 @ 10:00 hrs.
Preserved with :AS REQUIRED

Analysis Completed :MAR 20 89
Laboratory Supervisor :STEPHEN C. EDE
Released By : Stephen C. Ede

Client Name : AK POWER AUTH
Client Acct : AKPWRAP
P.O.# NONE REC'D
Req #
Ordered By : TOM ARMINSEI/DAVE TRUDGEN

Send Reports to:
1)AK POWER AUTH
2)

Special Instruct:

Chemlab Ref #: 4519 Lab Smpl ID: 8 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	ND(0.002) mg/l	GF	
MERCURY	ND(0.0002) mg/l	ADEC18AAC80	0.0002
HYDROGEN SULFIDE	ND(0.002) mg/l		

Sample Remarks: SAMPLE COLLECTED BY D.T.

3 Tests Performed
ND- None Detected
NA- Not Analyzed
* See Special Instructions Above
** See Sample Remarks Above
LT-Less Than, GT-Greater Than
UA-Unavailable

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440

ANALYSIS REPORT BY SAMPLE for Work Order # 12147
Date Report Printed: MAR 22 89 @ 10:22

l: ;t Sample ID:SITE #3, BOTTOM
WSID :UA
ol'ected MAR 13 89 @ hrs.
ec .ved MAR 14 89 @ 10:00 hrs.
reserved with :AS REQUIRED

ne ysis Completed :MAR 20 89
sh..atory Supervisor :STEPHEN C. EDE
eleased By : Stephen C. Ede

Client Name : AK POWER AUTH
Client Acct : AKPWRAP
P.O.# NONE REC'D
Req #
Ordered By : TOM ARMINSKI/DAVE TRUDGEN

Send Reports to:
1)AK POWER AUTH
2)

Special
Instruct:

Chemlab Ref #: 4519 Lab Smpl ID: 9 Matrix: WATER

Parameter Tested	Result/Units	Method	Allowable Limits
CADMIUM	ND(0.002) mg/l	GF	
MERCURY	0.00022 mg/l	ADEC18AAC80	0.0002
HYDROGEN SULFIDE	ND(0.002) mg/l		

mq : SAMPLE COLLECTED BY D.T.
marks:

3 Tests Performed * See Special Instructions Above UA-Unavailable
ND- None Detected ** See Sample Remarks Above
NA- Not Analyzed LT-Less Than, GT-Greater Than

CHEMICAL & GEOLOGICAL LABORATORY

A DIVISION OF COMMERCIAL TESTING & ENGINEERING CO.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343 FAX: (907) 561-5301

Chemlab Ref.# :93.0364-2

REPORT of ANALYSIS

Client Sample ID :BRADLEY LAKE - RESERVOIR
Matrix : WATER

Client Name :AK ENERGY AUTHORITY
Ordered By :TOM ARMINSKI
Project Name :BRADLEY LAKE O & M
Project# :
PWSID :UA

Collected :01/07/93 @ 13:30 hrs.
Received :01/08/93 @ 15:40 hrs.
WORK Order :62690
Report Completed :02/01/93
Technical Director :STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: T. ARMINSKI. REFERENCE PREVIOUS WORKORDER # 93.0110. BRADLEY LAKE O & M.

Parameter	Results	QC Qual.	Units	Method	Allowable Limits	Extract Date	Analysis Date	Init
MERCURY	0.0002	U	mg/l	EPA 245.1*AA/CV		02/01/93	02/01/93	BMW

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

CHEMICAL & GEOLOGICAL LABORATORY

A DIVISION OF COMMERCIAL TESTING & ENGINEERING CO.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343 FAX: (907) 561-5301

Chemlab Ref.# :93.0110-2 REPORT of ANALYSIS
Client Sample ID :RESERVOIR RELEASE AT DAM BRADLEY LAKE
Matrix : WATER

Client Name :AK ENERGY AUTHORITY
Ordered By :TOM ARMINSKI
Project Name :
Project# :
PWSID :UA

Collected :01/07/93 @ 13:30 hrs.
Received :01/08/93 @ 15:40 hrs.
WORK Order :62206
Report Completed :01/22/93
Technical Director :STEPHEN C. EDE
Released By :

Sample SAMPLE COLLECTED BY: T. ARMINSKI.
Remarks: IRON EXCEEDS THE RECOMMENDED DRINKING WATER LIMIT OF 0.3 MG/L.
MANGANESE EXCEEDS THE RECOMMENDED DRINKING WATER LIMIT OF 0.05 MG/L.

Parameter	Results	QC Qual.	Units	Method	Allowable Limits	Extract Date	Analysis Date	Init
ICP-25 ELEMENT SCAN	n/a		n/a	EPA 200.7*ICP	n/a			
ALUMINUM	2.3		mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
ARSENIC	0.10	U	mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
BARIUM	0.050	U	mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
BERYLLIUM	0.050	U	mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
BORON	0.10	U	mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
CADMIUM	0.050	U	mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
CALCIUM	7.9		mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
CHROMIUM	0.050	U	mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
COPPER	0.050	U	mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
IRON	2.9		mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
LEAD	0.10	U	mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
MAGNESIUM	1.8		mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
MANGANESE	0.054		mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
NICKEL	0.050	U	mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
PHOSPHORUS	0.28		mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
POTASSIUM	5.6	U	mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
SELENIUM	0.10	U	mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
SILICON	3.8		mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
SILVER	0.050	U	mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
SODIUM	1.2		mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
STRONTIUM	0.075		mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
TIN	0.10	U	mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
VANADIUM	0.050	U	mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
ZINC	0.050	U	mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
ZIRCONIUM	0.050	U	mg/l	EPA 200.7*ICP		01/21/93	01/22/93	KAW
HYDROGEN SULFIDE	0.10	U	mg/l	EPA 376.2		01/14/93	01/14/93	LLH

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

CHEMICAL & GEOLOGICAL LABORATORY

A DIVISION OF COMMERCIAL TESTING & ENGINEERING CO.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343 FAX: (907) 561-5301

Chemlab Ref.# :93.0364-1

REPORT of ANALYSIS

Client Sample ID :BRADLEY RIVER WATER - RIPPLE BEACH

Matrix : WATER

Client Name :AK ENERGY AUTHORITY

Ordered By :TOM ARMINSKI

Project Name :BRADLEY LAKE O & M

Project# :

PWSID :UA

Collected :01/07/93 @ 13:00 hrs.

Received :01/08/93 @ 15:40 hrs.

WORK Order :62690

Report Completed :02/01/93

Technical Director :STEPHEN C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: T. ARMINSKI. REFERENCE PREVIOUS WORKORDER # 93.0110. BRADLEY LAKE O & M.

Parameter	Results	QC Qual.	Units	Method	Allowable Limits	Extract Date	Analysis Date	Init
MERCURY	0.0002	U	mg/l	EPA 245.1*AA/CV		02/01/93	02/01/93	BHW

* See Special Instructions Above

** See Sample Remarks Above

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D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than

GT = Greater Than

DUPLICATE

CHEMICAL & GEOLOGICAL LABORATORY

A DIVISION OF COMMERCIAL TESTING & ENGINEERING CO.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343 FAX: (907) 561-5301

Chemlab Ref.# :93.0110-1

REPORT of ANALYSIS

Client Sample ID :BRADLEY RIVER WATER RIFFLE REACH

Matrix : WATER

Client Name :AK ENERGY AUTHORITY

Ordered By :TOM ARMINSKI

Project Name :

Project# :

PWSID :UA

Collected :01/07/93 @ 13:00 hrs.

Received :01/08/93 @ 15:40 hrs.

WORK Order :62206

Report Completed :01/20/93

Technical Director :STEPHEN C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: T. ARMINSKI. IRON & MANGANESE EXCEED RECOMMENDED DRINKING WATER LIMITS.

Parameter	Results	QC Qual.	Units	Method	Allowable Limits	Extract Date	Analysis Date	Init
ICP-25 ELEMENT SCAN	n/a		n/a	EPA 200.7*ICP	n/a			
ALUMINUM	1.9		mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
ARSENIC	0.1	U	mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
BARIUM	0.05	U	mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
BERYLLIUM	0.05	U	mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
BORON	0.1	U	mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
CADMIUM	0.05	U	mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
CALCIUM	8.9		mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
CHROMIUM	0.05	U	mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
COPPER	0.10		mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
IRON	2.0		mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
LEAD	0.1	U	mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
MAGNESIUM	1.7		mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
MANGANESE	0.05	U	mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
NICKEL	0.05	U	mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
PHOSPHORUS	0.2	U	mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
POTASSIUM	5.[illegible]		mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
SELENIUM	0.1	U	mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
SILICON	4.2		mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
SILVER	0.05	U	mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
SODIUM	2.1		mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
STRONTIUM	0.077		mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
TIN	0.1	U	mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
VANADIUM	0.05	U	mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
ZINC	0.5	U	mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
ZIRCONIUM	0.05	U	mg/l	EPA 200.7*ICP		01/15/93	01/18/93	DFL
HYDROGEN SULFIDE	0.10	U	mg/l	EPA 376.2		01/14/93	01/14/93	LLE

* See Special Instructions Above

** See Sample Remarks Above

U = Undetected. Reported value is the practical quantification limit.

D = Secondary dilution.

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NA = Not Analyzed

LT = Less Than

GT = Greater Than

CT&E Environmental Services Inc.

Laboratory Division

200 W. Potter Drive
Anchorage, AK 99518-1605
Tel (907) 562-2343
Fax: (907) 561-5301

Bradley Lake at dam

CT&E Ref.# 962455.962455001
Client Sample ID 3M Depth off Concrete Blk
Matrix Water (Surface, Eff., Ground)

Collected Date 06/19/96

Technical Director: Stephen C. Ede

Released By

Sample Remarks:

Parameter	Results	QC Qual	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Mercury by Cold Vapor	0.000500	U	0.000500	mg/L	EPA 245.1		06/28/96	06/28/96	WTA
Cadmium	0.000250	U	0.000250	mg/L	EPA 200.9		06/26/96	06/26/96	KGF
Hydrogen Sulfide	0.050	U	0.050	mg/L	EPA 376.2			06/20/96	WEP

U - Undetected
LT - Less than
GT - Greater than
D - Secondary Dilution
J - Below the calibration range

CT&E Environmental Services Inc.

Laboratory Division

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Fax: (907) 561-5301

Bradley River Below Dam

CT&E Ref.# 962455,962455002
Client Sample ID 100 Yd. Left & D.S. of Valves
Matrix Water (Surface, Eff., Ground)

Collected Date 06/19/96

Technical Director: Stephen C. Ede

Released By

Sample Remarks:

Parameter	Results	QC Qual	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Mercury by Cold Vapor	0.000500	U	0.000500	mg/L	EPA 245.1		06/28/96	06/28/96	WTA
Tin	0.100	U	0.100	mg/L	EPA 200.7		07/03/96	07/08/96	GCP
Phosphorus	0.105		0.100	mg/L	EPA 200.7		07/03/96	07/08/96	GCP
Boron	0.0500	U	0.0500	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Metals by ICP									
Aluminum	2.41		0.0500	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Antimony	0.100	U	0.100	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Arsenic	0.0500	U	0.0500	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Barium	0.0270		0.0100	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Beryllium	0.00500	U	0.00500	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Cadmium	0.0200	U	0.0200	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Calcium	9.80		0.100	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Chromium	0.0250	U	0.0250	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Cobalt	0.0250	U	0.0250	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Copper	0.0250	U	0.0250	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Iron	4.40		0.0250	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Lead	0.0500	U	0.0500	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Magnesium	2.25		0.100	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Manganese	0.143		0.0100	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Molybdenum	0.0250	U	0.0250	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Nickel	0.0250	U	0.0250	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Potassium	2.25	U	2.25	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Selenium	0.0500	U	0.0500	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Silicon	2.88		0.250	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Silver	0.0100	U	0.0100	mg/L	EPA 200.7		06/26/96	07/10/96	GCP
Sodium	1.01		0.250	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Strontium	0.0864		0.0150	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Vanadium	0.0250	U	0.0250	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Zinc	0.0521		0.0250	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Zirconium	0.0250	U	0.0250	mg/L	EPA 200.7		07/03/96	07/05/96	GCP

U - Undetected
LT - Less than
GT - Greater than
D - Secondary Dilution
J - Below the calibration range

CT&E Environmental Services Inc.

Laboratory Division

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Fax: (907) 561-5301

Bradley River Below Dam

CT&E Ref.# 962455.962455002
Client Sample ID 100 Yd. Left & D.S. of Valves
Matrix Water (Surface, Eff., Ground)

Sample Remarks:

Parameter	Results	QC Qual	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Cadmium	0.000350		0.000250	mg/L	EPA 200.9		06/26/96	06/26/96	KGF
Hydrogen Sulfide	0.050	U	0.050	mg/L	EPA 376.2			06/20/96	WEP

U - Undetected
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GT - Greater than
D - Secondary Dilution
J - Below the calibration range

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Laboratory Division

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Fax: (907) 561-5301

Bradley River at Fish Camp

CT&E Ref.# 962455,962455003
Client Sample ID Downstream from Camp on Bend
Matrix Water (Surface, Eff., Ground)

Collected Date 06/19/96

Technical Director: Stephen C. Ede

Released By

Sample Remarks:

Parameter	Results	QC Qual	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Mercury by Cold Vapor	0.000500	U	0.000500	mg/L	EPA 245.1		06/28/96	06/28/96	WTA
Tin	0.100	U	0.100	mg/L	EPA 200.7		07/03/96	07/08/96	GCP
Phosphorus	0.100	U	0.100	mg/L	EPA 200.7		07/03/96	07/08/96	GCP
Boron	0.0500	U	0.0500	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Metals by ICP									
Aluminum	2.13		0.0500	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Antimony	0.100	U	0.100	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Arsenic	0.0500	U	0.0500	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Barium	0.0215		0.0100	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Beryllium	0.00500	U	0.00500	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Cadmium	0.0200	U	0.0200	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Calcium	10.6		0.100	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Chromium	0.0250	U	0.0250	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Cobalt	0.0250	U	0.0250	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Copper	0.0250	U	0.0250	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Iron	3.87		0.0250	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Lead	0.0500	U	0.0500	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Magnesium	2.15		0.100	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Manganese	0.102		0.0100	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Molybdenum	0.0250	U	0.0250	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Nickel	0.0250	U	0.0250	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Potassium	2.25	U	2.25	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Selenium	0.0500	U	0.0500	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Silicon	3.10		0.250	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Silver	0.0100	U	0.0100	mg/L	EPA 200.7		06/26/96	07/10/96	GCP
Sodium	1.34		0.250	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Strontium	0.0813		0.0150	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Vanadium	0.0250	U	0.0250	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Zinc	0.0250	U	0.0250	mg/L	EPA 200.7		07/03/96	07/05/96	GCP
Zirconium	0.0250	U	0.0250	mg/L	EPA 200.7		07/03/96	07/05/96	GCP

U - Undetected
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D - Secondary Dilution
J - Below the calibration range

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Tel: (907) 562-2343
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Bradley River at Fish Camp

CT&E Ref.# 962455.962455003
Client Sample ID Downstream from Camp on Bend
Matrix Water (Surface, Eff., Ground)

Sample Remarks:

Parameter	Results	QC Qual	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Cadmium	0.000250	U	0.000250	mg/L	EPA 200.9		06/26/96	06/26/96	KGF
Hydrogen Sulfide	0.050	U	0.050	mg/L	EPA 376.2			06/20/96	WEP

U - Undetected
LT - Less than
GT - Greater than
D - Secondary Dilution
J - Below the calibration range