

## STATE OF ALASKA

## DEPARTMENT OF NATURAL RESOURCES

DIVISION OF MINING, LAND AND WATER

Alaska Hydrologic Survey

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July 27, 2004

**Tuluksak River Stream Gaging Project  
Trip Report, June 22, 2004**

Alaska Hydrologic Survey (AHS) hydrologists traveled to Tuluksak on June 22 to install stream gaging equipment and commence discharge measurements to determine streamflow. In addition, water quality samples were collected and analyzed. Joseph Sallaffie met the field party at 9 a.m. and stayed with the group the entire day. Mr. Sallaffie was very helpful and we hope to continue our working relationship with him on future field trips.

The stream gage is installed on the north bank (right side looking downstream) approximately 0.9 mi upstream from the village (see attached map and photo). There are two data recorders attached to a steel post set in concrete. Wires run underground from the data recorders to a pair of pressure transducers and thermistors sitting on the river bed approximately 30 ft from shore. Stream stage (depth) and temperature are recorded every six hours and stored on the recorders. AHS hydrologists will make monthly trips to Tuluksak to service the gaging instruments and measure discharge of the river. The stream gaging equipment will not interfere with river travel or fish & wildlife movement.

Tuluksak River streamflow data, 6/22/04

stream width: 214 feet (ft)  
 average depth: 5.37 feet (ft)  
 maximum depth: 7.9 feet (ft)  
 average velocity: 0.62 feet/second (fps)  
 maximum velocity: 0.88 feet/second (fps)  
 stream cross-section area: 1246.8 square feet (sq ft)  
 stream discharge (flow): 834.8 cubic feet/second (cfs) or 374,686 gallons/minute (gpm)

Water quality measurements were made at the stream discharge measurement site with a Hydrolab QUANTA instrument.

Tuluksak River water quality data, 6/22/04

water temperature: 55° F  
 dissolved oxygen concentration: 8.9 milligram/liter (mg/L) represents 83% dissolved oxygen saturation  
 specific conductance: 90 microsiemen/centimeter ( $\mu\text{S}/\text{cm}$ )  
 pH: 7.1

These values are indicative of good water quality. Mid-depth water quality cross-section profile measurements were made with a Hydrolab QUANTA instrument at 20 ft intervals across the

stream channel. The results show that water temperature, dissolved oxygen, pH, and specific conductance show very little variability along the horizontal cross-section, which indicate that this section of the Tuluksak River is well mixed.

AHS hydrologists also obtained water quality samples at the stream gage site and these samples were analyzed for fecal coliform and metals. A total of three samples were collected at this site. Sample #1 was collected for total metal analysis, sample #2 was collected for dissolved metal analysis, and sample #3 was collected for fecal coliform analysis. Sample #4 was collected at the boat launch site downstream of the village. Sample #4 was collected for fecal coliform analysis only.

Non-trace metals (aluminum, calcium, iron, manganese, sodium, and silicon) showed higher total concentrations than dissolved concentrations. This difference can be attributed to the fine sediment or particulate matter present in the total metal sample. The 0.45-micron membrane filter shows the fine, reddish-brown particulate material present in the water (see filter which is attached to this report).

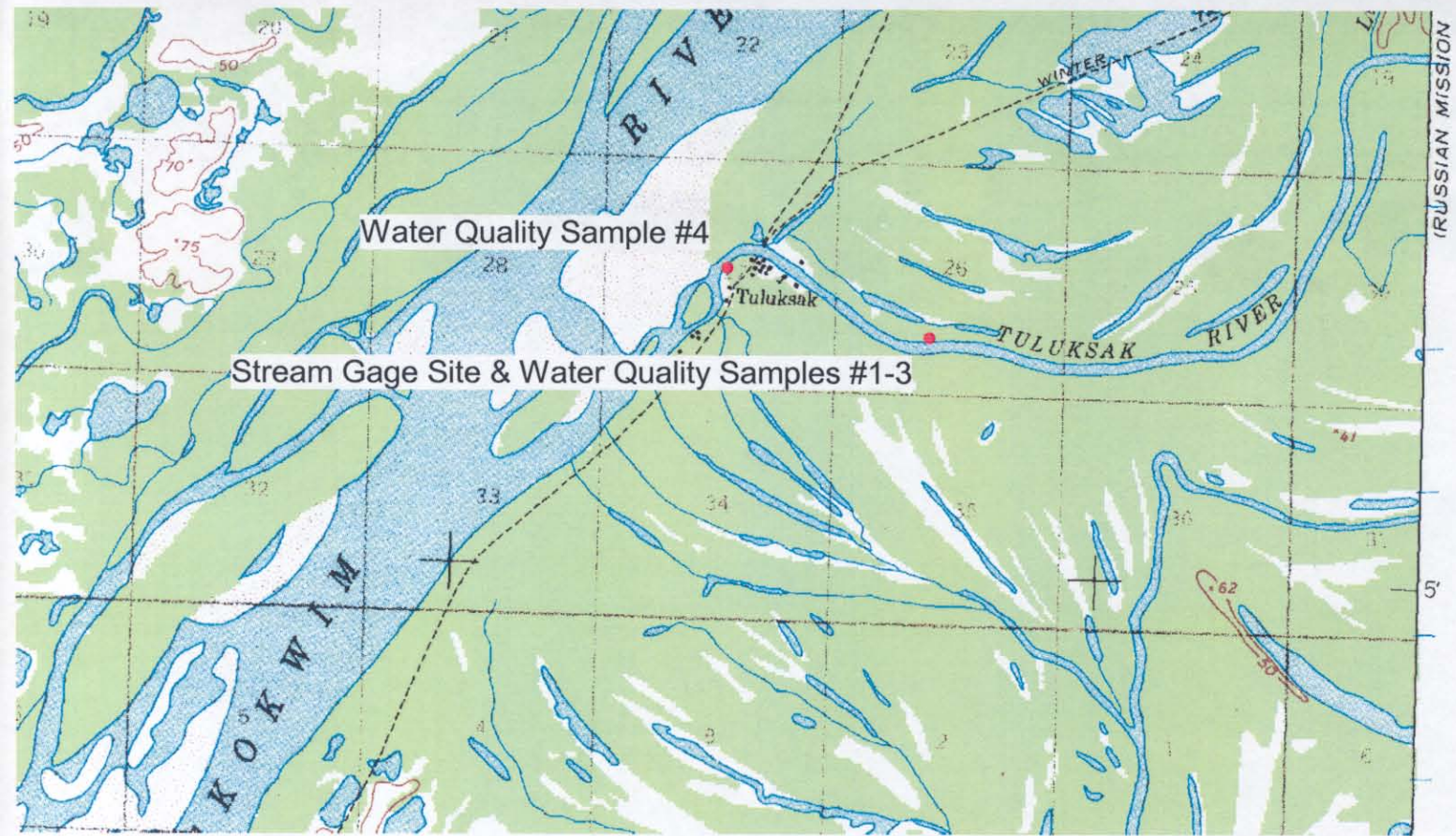
Total aluminum, total iron, total manganese, and dissolved manganese exceeded water quality standards. These metals are common constituents in Alaska waters and concentrations frequently exceed water quality standards.

Trace metals showed no discernable difference between total and dissolved concentrations. All trace metal concentrations were either not detected or present in very low concentrations. No trace metals exceeded water quality standards.

Fecal coliform bacteria (FC) samples showed virtually the same number of colonies per 100 ml upstream and downstream of the village. The sample collected upstream of the village contained 4 FC/100 ml, and the sample collected downstream of the village contained 5 FC/100 ml. The number of FC colonies is not comparable to the water quality standard because only a single sample was collected. Single samples may not be representative of fecal coliform colonies present in the Tuluksak River. The water quality standard for FC colonies in drinking water supplies reads, "in a 30-day period, the geometric mean may not exceed 20 FC/100 ml, and not more than 10% of the samples may exceed 40 FC/100 ml."

Copies of the water quality analyses are attached.

IF you have questions concerning the streamflow measurements or the stream gage, please contact Mark Inghram at 269-8638. For questions about water quality, please call Mary Maurer at 269-8640.





**Stream Gage Instrument Installation**



Gage Site Looking from Right Bank to Left Bank, 6/22/04



## Laboratory Analysis Report

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Mary Maurer  
 AK Dept. of Natural Resources  
 550 West 7th Ave. Suite 1020  
 Anchorage, AK 99501

**Work Order:** 1043621  
 Tuluksak River

**Client:** AK Dept. of Natural Resources

**Report Date:** July 08, 2004

Enclosed are the analytical results associated with the above workorder.

As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintained by SGS. A copy of our Quality Control Manual that outlines this program is available at your request. The laboratory ADEC certification numbers are AK08-03 (DW), UST-005 (CS) and AK00971 (Micro);

Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS Quality Assurance Program Plan and the National Environmental Laboratory Accreditation Conference.

If you have any questions regarding this report or if we can be of any other assistance, please call your SGS Project Manager at (907) 562-2343.

The following descriptors may be found on your report which will serve to further qualify the data.

- PQL Practical Quantitation Limit (reporting limit).
- U Indicates the analyte was analyzed for but not detected.
- F Indicates an estimated value that falls below PQL, but is greater than the MDL.
- J The quantitation is an estimation.
- B Indicates the analyte is found in a blank associated with the sample.
- \* The analyte has exceeded allowable regulatory or control limits.
- GT Greater Than
- D The analyte concentration is the result of a dilution.
- LT Less Than
- I Surrogate out of control limits.
- Q QC parameter out of acceptance range.
- M A matrix effect was present.
- JL The analyte was positively identified, but the quantitation is a low estimation.
- E The analyte result is high outside of calibrated range.

Note: Soil samples are reported on a dry weight basis unless otherwise specified.



# Laboratory Analysis Report

SGS Ref.# 1043621001  
 Client Name AK Dept. of Natural Resources  
 Project Name/# Tuluksak River  
 Client Sample ID #1 Upstream of Village  
 Matrix Water (Surface, Eff., Ground)

All Dates/Times are Alaska Standard Time  
 Printed Date/Time 07/08/2004 14:28  
 Collected Date/Time 06/22/2004 15:15  
 Received Date/Time 06/23/2004 8:05  
 Technical Director Stephen C. Ede

Released By

Sample Remarks:

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b>Metals by ICP/MS</b>									
Aluminum	91.1	20.0	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Antimony	1.00 U	1.00	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Arsenic	5.00 U	5.00	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Barium	19.7	3.00	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Beryllium	0.400 U	0.400	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Cadmium	0.500 U	0.500	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Calcium	8550	500	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Chromium	1.00 U	1.00	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Cobalt	4.00 U	4.00	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Copper	1.00 U	1.00	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Iron	1910	250	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Lead	0.200 U	0.200	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Magnesium	3160	50.0	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Manganese	142	1.00	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Molybdenum	10.0 U	10.0	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Nickel	2.00 U	2.00	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Phosphorus	200 U	200	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Potassium	500 U	500	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Selenium	5.00 U	5.00	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Silicon	4270	200	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Silver	1.00 U	1.00	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Sodium	3230	500	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Thallium	1.00 U	1.00	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Tin	1.00 U	1.00	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Titanium	8.79	5.00	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Vanadium	20.0 U	20.0	ug/L	EP200.8	A		06/25/04	07/02/04	SCL
Zinc	5.00 U	5.00	ug/L	EP200.8	A		06/25/04	07/02/04	SCL



# Laboratory Analysis Report

SGS Ref.# 1043621002  
 Client Name AK Dept. of Natural Resources  
 Project Name/# Tuluksak River  
 Client Sample ID #2 Upstream of Village  
 Matrix Water (Surface, Eff., Ground)

All Dates/Times are Alaska Standard Time

Printed Date/Time 07/08/2004 14:28  
 Collected Date/Time 06/22/2004 15:20  
 Received Date/Time 06/23/2004 8:05  
 Technical Director Stephen C. Ede

Released By 

Sample Remarks:

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b>Metals by ICP/MS</b>									
Aluminum	20.0 U	20.0	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Antimony	1.00 U	1.00	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Arsenic	5.00 U	5.00	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Barium	17.3	3.00	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Beryllium	0.400 U	0.400	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Cadmium	0.500 U	0.500	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Calcium	8380	500	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Chromium	1.00 U	1.00	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Cobalt	4.00 U	4.00	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Copper	1.87	1.00	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Iron	628	250	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Lead	0.432	0.200	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Magnesium	3030	50.0	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Manganese	130	1.00	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Molybdenum	10.0 U	10.0	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Nickel	2.00 U	2.00	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Potassium	500 U	500	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Selenium	5.00 U	5.00	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Silver	1.00 U	1.00	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Sodium	3110	500	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Vanadium	20.0 U	20.0	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Silicon	3730	200	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Thallium	1.00 U	1.00	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Tin	1.00 U	1.00	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Titanium	5.89	5.00	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
Zinc	13.1	5.00	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL

## Metals by ICP/MS

Phosphorus	200 U	200	ug/L	EP200.8 Dissolved	A		06/22/04	07/02/04	SCL
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# Laboratory Analysis Report

**SGS Ref.#** 1043621003  
**Client Name** AK Dept. of Natural Resources  
**Project Name/#** Tuluksak River  
**Client Sample ID** #3 Upstream of Village  
**Matrix** Water (Surface, Eff., Ground)

**All Dates/Times are Alaska Standard Time**  
**Printed Date/Time** 07/08/2004 14:28  
**Collected Date/Time** 06/22/2004 15:25  
**Received Date/Time** 06/23/2004 8:05  
**Technical Director** Stephen C. Ede

Released By: *Janet Taylor*

**Sample Remarks:**

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b>Microbiology Laboratory</b>									
Fecal Coliform	4		col/100mL	SM20 9222D	A			06/23/04	DKC



# Laboratory Analysis Report

**SGS Ref.#** 1043621004  
**Client Name** AK Dept. of Natural Resources  
**Project Name/#** Tuluksak River  
**Client Sample ID** #4 Downstream of Village  
**Matrix** Water (Surface, Eff., Ground)

All Dates/Times are Alaska Standard Time

**Printed Date/Time** 07/08/2004 14:28  
**Collected Date/Time** 06/22/2004 15:45  
**Received Date/Time** 06/23/2004 8:05  
**Technical Director** Stephen C. Ede

Released By 

Sample Remarks:

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b>Microbiology Laboratory</b>									
Fecal Coliform	5		col/100mL	SM20 9222D	A			06/23/04	DKC