HYDROLOGICAL OBSERVATIONS, FAIRBANKS TO PRUDHOE BAY AND OTHER ARCTIC SLOPE AREAS, MAY 1969

By

Alaska District, Water Resources Division

Open-File Report
U.S. Department of the Interior
Geological Survey

1969

Summary of Data Collected on April 28 to May 7, 1969 Field Trip to the North Slope Area

Site	Discharge (cfs)	Water Temp. (°C)	Ice Thick. (ft)	On site CQ				Max. effective depth (ft)	Total Iron (mg/l)	Visual Observations
				Spec. Cond. (μ)	Alkalinity (mg/l)	pH	D.O. (mg/l)			
(1) Porcupine R nr Ft Yukon	963	0	2.5	325	160	7.8	10.5	2.1	0.0	Very little snow, no aufeis formation & longtime resident & pilot from Ft. Yukon reports never observing icings on Porcupine River.
(2) Chandalar R nr Venetie	E 200-300	-	+6.5	-	-	-	-	-	-	Little snow in area, aufeis formations noted on maps.
(3) Chandler L nr Anatuvik Pass	-	0-2	6.2	70	20	7.3	14.4 (6 ft) 13.8 (50 ft)	59.1	0.1	Lake bottom material-light brown collodial ooze. Conductivity profile was constant with depth (adjusted for temperature changes). Temp. varied from 0°C near surface to 2°C on bottom.
(4) Colville R nr Umiat	-	+0.4	12	580	280	6.8	3.4	1.6	-	Could not detect any velocity in streamflow, water raises in auger holes to 3 ft of top of ice surface.
(5) Colville R at Umiat	Less than 300	+0.3	5-6	260	110	6.8	7.5	8.8	0.23	Very little snow, cross section of river about 360 ft, area = 1,660 ft, but no measurable velocity. Est. less than 300 cfs. Snow cross section near runway of 300 ft had average snow depth of 1.5 ft.
(6) Sag R nr Sagwon (a/k/a (Lupine R))	E 300-500	-	-	-	-	-	-	-	-	Overflow conditions and soft ice prevented current meter measurement of streamflow (2 weeks late). Looks to have potential for gaging site.

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(7) Sag R at Sagwon	-	-0.2°C	7	850	>400	6.9	1.1	3.1	0.12	Cross section about 150 ft wide, brown colored water flowing on surface of ice, strong organic odor, contains some insects. Water hauled all winter for water supply for Sagwon with cat & 2 water trailers. Water appeared flowing but not measurable.
(8) Sag R nr Prudhoe	-	0.2°C	7.3	1,500	>400	6.7	-	-	0.06	
(9) Kuparuk R nr Sagwon	1.0	1.0°C	Open water	65	28	6.4	8.4	-	0.20	Measured in area of springs, made snow probings in 300 ft cross section with average depth of 1.5 ft.
(10) Lake nr Umiat	-	+0.2°C	5.6	560	336	6.9	-	2.1	5.19	Weed bottom.
Lakes on Kuparuk River:										
(11) small (200' diameter)	-	0.1°C	3.5	160	72	6.6	4.8	2.7	2.1	
(12) 1,500 ft diameter	-	-	3.4	270	200	6.6	-	0.8	-	Snow depth over ice, 1.1 ft; mud & green plants below ice.

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

28W

(1)

WATER ANALYSIS

Location Station 90 County
Source Porcupine River nr Fort Yukon
Point of coll.
Owner Treatment

Use Gage height (ft) Discharge (cfs) 966 Temp (°F) 0.0°C.
Appear. when coll.
Collected 4-26-69 (1600) By
Remarks

	mg/l	ap/l		mg/l	ap/l
Silica (SiO_2)	3.0		Bicarbonate (HCO_3)	214	3.51
Aluminum (Al)			Carbonate (CO_3)	0	0.00
Iron (Fe)	0.0				
			Sulfate (SO_4)	21	0.44
			Chloride (Cl)	5.7	0.16
			Fluoride (F)	0.2	0.01
Calcium (Ca)	60	2.97			
Magnesium (Mg)	12	.99	Nitrate (NO_3)	0.6	0.01
Sodium (Na)	4.8	.21			
Potassium (K)	0.3	.01			
Total		4.18	Total		4.13

	mg/l		
		Specific conductance (micromhos at 25° C)	363
Dissolved solids: Calculated	213	pH	8.2
Residue on evaporation at 180°C		Color	5
Hardness as $CaCO_3$	198		
Noncarbonate	22		
Alk as CaCo3	176		

Lab. No. 12589-69-619 Field No. Project USGS

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GEOLOGICAL SURVEY

28W

(2)

WATER ANALYSIS

Location Chandalar River below G.S. County
Source represents East Fork
Point of coll.
Owner Treatment

Use Gage height (ft) Discharge (cfs) Temp (°F) 0°
Appear. when coll. Air temp = 45°F.
Collected 4-29-69 (1315) By
Remarks

	mg/l	ap/l		mg/l	ap/l
Silica (SiO_2)	3.0		Bicarbonate (HCO_3)	161	2.64
Aluminum (Al)			Carbonate (CO_3)	0	0.00
Iron (Fe)					
			Sulfate (SO_4)	17	0.35
			Chloride (Cl)	0.7	0.02
			Fluoride (F)	0.2	0.01
Calcium (Ca)	48	2.38			
Magnesium (Mg)	6.0	0.50	Nitrate (NO_3)	0.8	0.01
Sodium (Na)	0.8	0.03			
Potassium (K)	0.1	0.00			
Total		2.91	Total		3.03

	mg/l		
		Specific conductance (micromhos at 25° C)	272
Dissolved solids: Calculated	156	pH	8.1
Residue on evaporation at 180°C		Color	0
Hardness as $CaCO_3$	144		
Noncarbonate	12		
Alk as CaCo3	132		

Lab. No.12592-69-622 Field No. Project USGS

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15W

(3)

WATER ANALYSIS

Location Middle of Lake - 50' depth County
Source Chandler Lake
Point of coll.
Owner Treatment
Use Gage height (ft) Discharge (cfs) Temp (°F) 34°(air)
Appear. when coll. Temp. 20C
Collected 4-30-69 By
Remarks

	me/l	ae/l		mg/l	ae/l
Silica (SiO_2)	1.0		Bicarbonate (HCO_3)	24	.39
Aluminum (Al)			Carbonate (CO_3)	0	0.00
Iron (Fe)	0.1				
			Sulfate (SO_4)	4.0	0.08
			Chloride (Cl)	0.7	0.02
			Fluoride (F)	0.1	0.00
Calcium (Ca)	4.6	.23			
Magnesium (Mg)	2.5	.21	Nitrate (NO_3)	0.2	0.00
Sodium (Na)	0.8	.03			
Potassium (K)	0.0	.00			
Total		.47	Total		.49

	mg/l		
		Specific conductance (micromhos at 25° C)	51
Dissolved solids: Calculated	26	pH	7.5
Residue on evaporation at 180°C		Color	5
Hardness as $CaCO_3$	23		
Noncarbonate	4		
Alk as CaCo3	19		

Lab. No. 12591-69-621 Field No. Project USGS

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GEOLOGICAL SURVEY

15W

(4)

WATER ANALYSIS

Location Colville River at Umiat County
Source
Point of coll.
Owner Treatment
Use Gage height (ft) Discharge (cfs) Temp 0.4°C
Appear. when coll. Air Temp. 26°F.
Collected 4-30-69 (1620) By
Remarks

	me/l	ae/l		mg/l	ae/l
Silica (SiO_2)	8		Bicarbonate (HCO_3)	382	6.26
Aluminum (Al)			Carbonate (CO_3)	0	0.00
Iron (Fe)					
			Sulfate (SO_4)	38	0.79
			Chloride (Cl)	0.0	0.00
			Fluoride (F)	0.1	0.00
Calcium (Ca)	83	4.13			
Magnesium (Mg)	27	2.23	Nitrate (NO_3)	0.0	0.00
Sodium (Na)	13	0.56			
Potassium (K)	1.8	0.05			
Total		6.97	Total		7.05

	mg/l		
		Specific conductance (micromhos at 25° C)	537
Dissolved solids: Calculated	369	pH	7.6
Residue on evaporation at 180°C		Color	10
Hardness as $CaCO_3$	318		
Noncarbonate	5		
Alk as CaCo3	313		

Lab. No. 12593-69-623 Field No. Project USGS

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28W

(5)

WATER ANALYSIS

Location Colville R. at Umiat County
Source 1 mile below Umiat - Station 190
Point of coll.
Owner Treatment

Use Gage height (ft) Discharge (cfs) Temp (°F) 0.3
Appear. when coll. Air temp 27°F
Collected 5-1-69 (1100) By
Remarks

	me/l	ap/l		mg/l	ap/l
Silica (SiO_2)	5.2		Bicarbonate (HCO_3)	152	2.49
Aluminum (Al)			Carbonate (CO_3)	0	0.00
Iron (Fe) (total)	.23				
			Sulfate (SO_4)	26	0.54
			Chloride (Cl)	0.0	0.00
			Fluoride (F)	0.1	0.00
Calcium (Ca)	36	1.80			
Magnesium (Mg)	12	0.99	Nitrate (NO_3)	2.2	0.04
Sodium (Na)	5.5	0.23			
Potassium (K)	1.3	0.03			
Total		3.05	Total		3.07

	mg/l		
		Specific conductance (micromhos at 25° C)	283
Dissolved solids: Calculated	164	pH	8.0
Residue on evaporation at 180°C		Color	5
Hardness as $CaCO_3$	140		
Noncarbonate	15		
Alk as CaCo3	125		

Lab. No. 12620-69-650 Field No. Project USGS

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28W

(7)

WATER ANALYSIS

Location Saganavanirktok R. at Sagwon County
Source
Point of coll.
Owner Treatment

Use Gage height (ft) Discharge (cfs) Temp (°F) -0.2°C
Appear. when coll. Air temp 27 F
Collected 5-2-69 (1600) By
Remarks

	me/l	ap/l		mg/l	ap/l
Silica (SiO_2)	8.8		Bicarbonate (HCO_3)	574	9.41
Aluminum (Al)			Carbonate (CO_3)	0	0.00
Iron (Fe) (total)	.12				
			Sulfate (SO_4)	67	1.39
			Chloride (Cl)	0.4	0.01
			Fluoride (F)	0.5	0.03
Calcium (Ca)	172	8.59			
Magnesium (Mg)	24	1.97	Nitrate (NO_3)	0.0	0.00
Sodium (Na)	5.9	0.26			
Potassium (K)	1.5	0.04			
Total		10.86	Total		10.64

	mg/l		
		Specific conductance (micromhos at 25° C)	905
Dissolved solids: Calculated	563	pH	8.0
Residue on evaporation at 180°C		Color	5
Hardness as $CaCO_3$	528		
Noncarbonate	57		
Alk as CaCo3	471		

Lab. No. 12621-69-651 Field No. Project USGS

(5)

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WATER ANALYSIS

ESW

Location Atlantic Rich Co. site - 6½ miles SE of Prudhoe County
Source Sagavanirktok R. nr Prudhoe Bay
Point of coll.
Owner Treatment
Use Gage height (ft) Discharge (cfs) Temp (°F) +.2°C
Appear. when coll.
Collected 5-7-69 (1400) By
Remarks .4'

	mg/l	ap/l		mg/l	ap/l
Silica (SiO_2)	18		Bicarbonate (HCO_3)	1000	16.41
Aluminum (Al)			Carbonate (CO_3)	0	0.00
Iron (Fe) (total)	.06				
			Sulfate (SO_4)	184	3.83
			Chloride (Cl)	10	0.29
			Fluoride (F)	.8	0.04
Calcium (Ca)	280	13.96			
Magnesium (Mg)	74	6.09	Nitrate (NO_3)	5.5	0.09
Sodium (Na)	9.2	0.40			
Potassium (K)	2.3	0.06			
Total		20.51	Total		20.66

	mg/l		
Dissolved solids: Calculated	1077	Specific conductance (micromhos at 25° C)	1604
Residue on evaporation at 180° C		pH	7.7
Hardness as $CaCO_3$	1000	Color	5
Noncarbonate	180		
Alk as CaCo3	820		

Lab. No. 12625-69-655 Field No. Project USGS

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WATER ANALYSIS

ESW

(9)

Location 46 miles E. of Umiat County
Source Kuparuk R. nr Colorado Oil & Gas Site
Point of coll.
Owner Treatment
Use Gage height (ft) Discharge (cfs) Temp (°F) 1°C
Appear. when coll. Air temp. 31°F
Collected 5-6-69 (1530) By
Remarks

	mg/l	ap/l		mg/l	ap/l
Silica (SiO_2)	3.2		Bicarbonate (HCO_3)	28	0.46
Aluminum (Al)			Carbonate (CO_3)	0	0.00
Iron (Fe) (total)	.20				
			Sulfate (SO_4)	0.6	0.01
			Chloride (Cl)	0.4	0.01
			Fluoride (F)	0.1	0.00
Calcium (Ca)	6.4	.32			
Magnesium (Mg)	1.1	0.09	Nitrate (NO_3)	1.4	0.02
Sodium (Na)	2.3	0.10			
Potassium (K)	0.2	0.00			
Total		0.51	Total		0.50

	mg/l		
Dissolved solids: Calculated	30	Specific conductance (micromhos at 25° C)	56
Residue on evaporation at 180° C		pH	7.3
Hardness as $CaCO_3$	20	Color	5
Noncarbonate	0		
Alk as CaCo3	23		

Lab. No. 12622-69-652 Field No. Project USGS

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

28W

(10)

WATER ANALYSIS

Location 29 miles NE of Umiat - M69-44A County
Source Lake at VABM Bowl near Umiat
Point of coll.
Owner Treatment

Use Gage height (ft) Discharge (cfs) Temp (°F) 0.2°C
Appear. when coll.
Collected 5-6-69 (1900) By
Remarks collected near middle - 2.7'

	me/l	ap/l		mg/l	ap/l
Silica (SiO_2)	5.0		Bicarbonate (HCO_3)	355	5.82
Aluminum (Al)			Carbonate (CO_3)	0	0.00
Iron (Fe) (total)	5.19				
			Sulfate (SO_4)	14	0.29
			Chloride (Cl)	9.2	0.26
			Fluoride (F)	0.0	0.00
Calcium (Ca)	108	5.23			
Magnesium (Mg)	12	0.99	Nitrate (NO_3)	2.5	0.04
Sodium (Na)	5.0	0.22			
Potassium (K)	1.5	0.04			
Total		6.48	Total		6.41

	mg/l		
		Specific conductance (micromhos at 25° C)	558
Dissolved solids: Calculated	334	pH	7.8
Residue on evaporation at 180° C		Color	5
Hardness as $CaCO_3$	311		
Noncarbonate	20		
Alk as CaCo3	291		

Lab. No. 12624-69-654 Field No. Project USGS

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

28W

(11)

WATER ANALYSIS

Location near Kuparuk R. (46 mi E of Umiat) County
Source lake at East Kuparuk Oil Rig (lake nearest oil rig)
Point of coll.
Owner Treatment

Use Gage height (ft) Discharge (cfs) Temp (°F) ±.1°C
Appear. when coll.
Collected 5-6-69 (1200) By
Remarks near middle of lake - depth 2.7'

	mg/l	ap/l		mg/l	ap/l
Silica (SiO_2)	2.1		Bicarbonate (HCO_3)	78	1.28
Aluminum (Al)			Carbonate (CO_3)	0	0.00
Iron (Fe) (total)	2.1				
			Sulfate (SO_4)	0.4	0.01
			Chloride (Cl)	0.4	0.01
			Fluoride (F)	0.1	0.00
Calcium (Ca)	19	0.95			
Magnesium (Mg)	4.2	0.34	Nitrate (NO_3)	1.9	0.03
Sodium (Na)	1.3	0.06			
Potassium (K)	0.7	0.02			
Total		1.37	Total		1.33

	mg/l		
		Specific conductance (micromhos at 25° C)	136
Dissolved solids: Calculated	70	pH	7.2
Residue on evaporation at 180° C		Color	120
Hardness as $CaCO_3$	64		
Noncarbonate	0		
Alk as CaCo3	64		

Lab. No. 12623-69-653 Field No. Project USGS