

APPENDIX A. WATER QUALITY FIELD SAMPLING FORMS

The following forms report the data collected with the water quality meters during field sampling.

University of Alaska Fairbanks, Water and Environmental Research Center

Form F-004a: Water Quality Field-Sampling General

Project ID: North Slope Lakes Site Location/Lake ID: KDA1A
 Sample Purpose: Lake Water Quality Date: 1/8/08 Time: nr

FIELD MEASUREMENTS

GPS Coord. Northing: N70° 19.868' Easting: W148° 56.768' Datum: NAD83
 Measurements By: White Time: 12:21
 Water Depth (ft): 14.3 Ice Thickness (ft): 3.55
 Freeboard (ft): 0.26 Snow Depth (ft): 0.04
 Elev. (BPMSL +/- .02): 7.96 Survey By: Chad/Horacio Date: 1/8/08 Time: 12:30
 Water Sampling By: n/a Sample Depths BWS (ft): 1 n/a Date: n/a Time: n/a
 2 _____
 3 _____

WATER QUALITY METER INFORMATION

Calibration Information

Parameter (s)	Owner	Meter Make/Model	Serial No.	Pre-Sampling QAQC Check	Post-Sampling QAQC Check					
DO, Temp	BLM	Hach LDO	3625	PASS	PASS					
Parameters										
Field Measurements										
Time:										
Depth BWS (ft):	4	5	6	8	10	11	12	13	14	BOT
Temp (°C):	0.50	0.80	1.00	1.20	1.30	1.40	1.40	1.50	1.50	1.50
pH:										
Barometric (mmHg):										
Pressure (mmHg):	776.00	776.00	770.00	770.00	770.00	770.00	770.00	770.00	769.00	769.00
Conductivity (µS/cm):										
RDO (ppm): (mg/L)	15.60	15.60	15.60	15.50	15.40	15.20	14.90	14.70	14.20	13.90
Turbidity (NTU):										
ORP										

FIELD TESTING OF WATER SAMPLES (if small probe is used)

Probe:					
Depth (ft)					
Temp (°C)					
pH					
Eh					

NORTH SLOPE LAB CHEMISTRY ANALYSIS

Parameter	Depth BWS (ft): _____			Depth BWS (ft): _____			Depth BWS (ft): _____			Method
	rep 1	rep 2	rep 3	rep 1	rep 2	rep 3	rep 1	rep 2	rep 3	
Oxygen (mg/L)										Hach spec 0.3-15 mg/L
Alkalinity (mg/L as CaCO ₃)										Digital titrator 10-4000 mg/L as CaCO ₃
Total iron--UF (mg/L)										Hach spec 0.02-3.00 mg/L
Filtered Iron--F tot Fe (mg/L)										Hach spec 0.02-3.00 mg/L
Ammonia (mg/L NH ₃ -N)****										0.01-0.50 mg/L NH ₃ -N
Ammonia/ Iron dilution										

Remarks: _____

Field-Form Filled Out By: Cormack Date: 1/15/08
 QAQC Check By: JED Date: 1/15/08

University of Alaska Fairbanks, Water and Environmental Research Center

Form F-004a: Water Quality Field-Sampling General

Project ID: North Slope Lakes Site Location/Lake ID: KDA2MT
 Sample Purpose: Lake Water Quality Date: 1/8/08 Time: nr

FIELD MEASUREMENTS

GPS Coord. Northing: N70° 19.948' Easting: W148° 56.368' Datum: NAD83
 Measurements By: White Time: 12:21
 Water Depth (ft): 12.95 Ice Thickness (ft): 3.62
 Freeboard (ft): 0.12 Snow Depth (ft): 0.12
 Elev. (BPMSL +/- .02): 6.7 Survey By: Chad/Horacio Date: 1/8/08 Time: 12:30
 Water Sampling By: n/a Sample Depths BWS (ft): 1 n/a Date: n/a Time: n/a
 2 _____
 3 _____

WATER QUALITY METER INFORMATION

Calibration Information

Parameter (s)	Owner	Meter Make/Model	Serial No.	Pre-Sampling QAQC Check	Post-Sampling QAQC Check				
DO, Temp	BLM	Hach LDO	3625	PASS	PASS				
Parameters									
Field Measurements									
Time:									
Depth BWS (ft):	3	4	5	6	8	10	11	12	BOT
Temp (°C):	0.00	0.00	0.20	0.40	0.60	0.80	0.90	1.00	1.10
pH:									
Barometric (mmHg):									
Pressure (mmHg):	770.00	770.00	770.00	770.00	770.00	770.00	771.00	771.00	771.00
Conductivity (µS/cm):									
RDO (ppm): (mg/L)	14.00	14.70	14.90	14.90	15.10	15.10	15.00	14.80	14.60
Turbidity (NTU):									
ORP									

FIELD TESTING OF WATER SAMPLES (if small probe is used)

Probe:					
Depth (ft)					
Temp (°C)					
pH					
Eh					

NORTH SLOPE LAB CHEMISTRY ANALYSIS

Parameter	Depth BWS (ft): _____			Depth BWS (ft): _____			Depth BWS (ft): _____			Method
	rep 1	rep 2	rep 3	rep 1	rep 2	rep 3	rep 1	rep 2	rep 3	
Oxygen (mg/L)										Hach spec 0.3-15 mg/L
Alkalinity (mg/L as CaCO ₃)										Digital titrator 10-4000 mg/L as CaCO ₃
Total iron--UF (mg/L)										Hach spec 0.02-3.00 mg/L
Filtered Iron--F tot Fe (mg/L)										Hach spec 0.02-3.00 mg/L
Ammonia (mg/L NH ₃ -N)****										0.01-0.50 mg/L NH ₃ -N
Ammonia/ Iron dilution										

Remarks: _____

Field-Form Filled Out By: Cormack Date: 1/15/08
 QAQC Check By: JED Date: 1/15/08

University of Alaska Fairbanks, Water and Environmental Research Center

Form F-004a: Water Quality Field-Sampling General

Project ID: North Slope Lakes Site Location/Lake ID: KDA2NT
 Sample Purpose: Lake Water Quality Date: 1/8/08 Time: nr

FIELD MEASUREMENTS

GPS Coord. Northing: N70° 19.960' Easting: W148° 56.317' Datum: NAD83
 Measurements By: White Time: 12:21
 Water Depth (ft): 16.6 Ice Thickness (ft): 3.52
 Freeboard (ft): 0.05 Snow Depth (ft): 0.33
 Elev. (BPMSL +/- .02): 6.7 Survey By: Chad/Horacio Date: 1/8/08 Time: 12:30
 Water Sampling By: n/a Sample Depths BWS (ft): 1 n/a Date: n/a Time: n/a
 2 _____
 3 _____

WATER QUALITY METER INFORMATION

Calibration Information

Parameter (s)	Owner	Meter Make/Model	Serial No.	Pre-Sampling QAQC Check	Post-Sampling QAQC Check					
DO, Temp	BLM	Hach LDO	3625	PASS	PASS					
Parameters		Field Measurements								
Time:										
Depth BWS (ft):	4	5	6	8	10	12	14	15	16	BOT
Temp (°C):	0.00	0.00	0.00	0.00	0.60	1.10	1.20	1.30	1.30	1.60
pH:										
Barometric (mmHg):										
Pressure (mmHg):	772.00	772.00	772.00	772.00	772.00	772.00	772.00	772.00	770.00	770.00
Conductivity (µS/cm):										
RDO (ppm): (mg/L)	15.10	15.00	15.10	15.20	14.40	15.10	14.90	14.70	10.40	8.10
Turbidity (NTU):										
ORP										

FIELD TESTING OF WATER SAMPLES (if small probe is used)

Probe:					
Depth (ft)					
Temp (°C)					
pH					
Eh					

NORTH SLOPE LAB CHEMISTRY ANALYSIS

Parameter	Depth BWS (ft): _____			Depth BWS (ft): _____			Depth BWS (ft): _____			Method
	rep 1	rep 2	rep 3	rep 1	rep 2	rep 3	rep 1	rep 2	rep 3	
Oxygen (mg/L)										Hach spec 0.3-15 mg/L
Alkalinity (mg/L as CaCO ₃)										Digital titrator 10-4000 mg/L as CaCO ₃
Total iron--UF (mg/L)										Hach spec 0.02-3.00 mg/L
Filtered Iron--F tot Fe (mg/L)										Hach spec 0.02-3.00 mg/L
Ammonia (mg/L NH ₃ -N)****										0.01-0.50 mg/L NH ₃ -N
Ammonia/ Iron dilution										

Remarks: _____

Field-Form Filled Out By: Cormack Date: 1/15/08
 QAQC Check By: JED Date: 1/15/08

University of Alaska Fairbanks, Water and Environmental Research Center

Form F-004a: Water Quality Field-Sampling General

Project ID: North Slope Lakes Site Location/Lake ID: KDA2NS
 Sample Purpose: Lake Water Quality Date: 1/8/08 Time: nr

FIELD MEASUREMENTS

GPS Coord. Northing: N70° 20.020' Easting: W148° 56.372' Datum: NAD83
 Measurements By: White Time: 12:21
 Water Depth (ft): 12.85 Ice Thickness (ft): 3.47
 Freeboard (ft): 0.2 Snow Depth (ft): 0.28
 Elev. (BPMSL +/- .02): 6.7 Survey By: Chad/Horacio Date: 1/8/08 Time: 12:30
 Water Sampling By: n/a Sample Depths BWS (ft): 1 n/a Date: n/a Time: n/a
 2 _____
 3 _____

WATER QUALITY METER INFORMATION

Calibration Information

Parameter (s)	Owner	Meter Make/Model	Serial No.	Pre-Sampling QAQC Check	Post-Sampling QAQC Check
DO, Temp	BLM	Hach LDO	3625	PASS	PASS
Parameters					
Field Measurements					
Time:					
Depth BWS (ft):	4	5	6	8	10 11 12 BOT
Temp (°C):	0.10	0.10	0.20	0.40	0.50 0.80 0.80 0.90
pH:					
Barometric (mmHg):					
Pressure (mmHg):	770.00	770.00	770.00	770.00	770.00 770.00 770.00 771.00
Conductivity (µS/cm):					
RDO (ppm): (mg/L)	15.60	15.50	15.50	15.40	15.10 15.00 14.80 14.70
Turbidity (NTU):					
ORP					

FIELD TESTING OF WATER SAMPLES (if small probe is used)

Probe:				
Depth (ft)				
Temp (°C)				
pH				
Eh				

NORTH SLOPE LAB CHEMISTRY ANALYSIS

Parameter	Depth BWS (ft): _____			Depth BWS (ft): _____			Depth BWS (ft): _____			Method
	rep 1	rep 2	rep 3	rep 1	rep 2	rep 3	rep 1	rep 2	rep 3	
Oxygen (mg/L)										Hach spec 0.3-15 mg/L
Alkalinity (mg/L as CaCO ₃)										Digital titrator 10-4000 mg/L as CaCO ₃
Total iron--UF (mg/L)										Hach spec 0.02-3.00 mg/L
Filtered Iron--F tot Fe (mg/L)										Hach spec 0.02-3.00 mg/L
Ammonia (mg/L NH ₃ -N)****										0.01-0.50 mg/L NH ₃ -N
Ammonia/ Iron dilution										

Remarks: _____

Field-Form Filled Out By: Cormack Date: 1/15/08
 QAQC Check By: JED Date: 1/15/08

University of Alaska Fairbanks, Water and Environmental Research Center

Form F-004a: Water Quality Field-Sampling General

Project ID: North Slope Lakes Site Location/Lake ID: MSBN-CT
 Sample Purpose: Lake Water Quality Date: 1/9/08 Time: 12:05

FIELD MEASUREMENTS

GPS Coord. Northing: N70°19.280' Easting: W149°24.009' Datum: NAD83
 Measurements By: GMM/ DMS Time: 12:05
 Water Depth (ft): 34.33 Ice Thickness (ft): 3.48
 Freeboard (ft): 0.25 Snow Depth (ft): 0.08
 Elev. (BPMSL +/- .02): 94.6 Survey By: Chad/Horacio Date: 1/9/08 Time: 13:00
 Water Sampling By: n/a Sample Depths BWS (ft): 1 n/a Date: n/a Time: n/a
 2 _____
 3 _____

WATER QUALITY METER INFORMATION

Calibration Information

Parameter (s)	Owner	Meter Make/Model	Serial No.	Pre-Sampling QAQC Check	Post-Sampling QAQC Check				
Multi	GWS	INSITU/ Troll 9000	33033	PASS	PASS				
Parameters									
Field Measurements									
Time:	12:41	12:42	12:45	12:47	12:51	12:56	13:02	13:05	13:06
Depth BWS (ft):	21	23	25	27	29	31	32	33	34
Temp (°C):	1.79	1.86	1.95	2.03	2.15	2.30	2.40	2.44	2.41
pH:	7.68	7.69	7.66	7.60	7.32	7.14	7.15	7.21	7.56
Barometric (mmHg):	765.2	765.3	765.4	765.4	765.4	765.4	765.5	765.5	765.6
Pressure (kPa):	60.913	66.976	72.792	78.840	85.041	90.939	93.742	96.767	99.608
Conductivity (µS/cm):	149.2	149.1	149.1	149.3	155.1	171.9	191.1	210.2	260.9
RDO (ppm): (mg/L)	12.61	12.48	12.21	11.46	8.52	4.41	1.71	0.87	0.48
Turbidity (NTU):	0.0	0.0	0.0	0.0	0.5	1.6	1.9	2.0	1.5
ORP	313	312	313	314	322	329	325	311	274

FIELD TESTING OF WATER SAMPLES (if small probe is used)

Probe:					
Depth (ft)					
Temp (°C)					
pH					
Eh					

NORTH SLOPE LAB CHEMISTRY ANALYSIS

Parameter	Depth BWS (ft): _____			Depth BWS (ft): _____			Depth BWS (ft): _____			Method
	rep 1	rep 2	rep 3	rep 1	rep 2	rep 3	rep 1	rep 2	rep 3	
Oxygen (mg/L)										Hach spec 0.3-15 mg/L
Alkalinity (mg/L as CaCO ₃)										Digital titrator 10-4000 mg/L as CaCO ₃
Total iron--UF (mg/L)										Hach spec 0.02-3.00 mg/L
Filtered Iron--F tot Fe (mg/L)										Hach spec 0.02-3.00 mg/L
Ammonia (mg/L NH ₃ -N)****										0.01-0.50 mg/L NH ₃ -N
Ammonia/ Iron dilution										

Remarks: Sheet 2 of 2

Field-Form Filled Out By: G. Myerchin Date: 1/10/08
 QAQC Check By: JED Date: 1/11/08

University of Alaska Fairbanks, Water and Environmental Research Center

Form F-004a: Water Quality Field-Sampling General

Project ID: North Slope Lakes
 Sample Purpose: Lake Water Quality

Site Location/Lake ID: L9312 SH_SHORE_MID
 Date: 1/13/08 Time: 12:50

FIELD MEASUREMENTS

GPS Coord. Northing: N70°20.017' Easting: W150°57.101' Datum: NAD83
 Measurements By: GMM Time: 12:50
 Water Depth (ft): 8.4 Ice Thickness (ft): 3.10
 Freeboard (ft): 0.1 Snow Depth (ft): nr
 Elev. (BPMSL +/- .02): 7.3 Survey By: Chad/Horacio Date: 1/13/08 Time: 12:00
 Water Sampling By: n/a Sample Depths BWS (ft): 1 n/a Date: n/a Time: n/a
 2 _____
 3 _____

WATER QUALITY METER INFORMATION

Calibration Information

Parameter (s)	Owner	Meter Make/Model	Serial No.	Pre-Sampling QAQC Check	Post-Sampling QAQC Check
MULTI	GWS	IN-SITU Troll 9000	33033	PASS	PASS
Parameters					
Field Measurements					
Time:	12:55	12:58	1:01	1:07	1:12
Depth BWS (ft):	4	5	6	7	8
Temp (°C):	0.08	0.49	0.88	1.20	1.48
pH:	6.84	6.78	6.68	6.61	6.58
Barometric (mmHg):	765.7	765.6	765.6	765.7	765.6
Pressure (kPa):	10.400	13.574	16.199	19.593	22.281
Conductivity (µS/cm):	91.43	71.01	74.19	74.37	75.20
RDO (ppm): (mg/L)	2.00	3.30	1.30	1.90	2.20
Turbidity (NTU):	479.0	481.0	481.0	483.0	483.0
ORP					

FIELD TESTING OF WATER SAMPLES (if small probe is used)

Probe:					
Depth (ft)					
Temp (°C)					
pH					
Eh					

NORTH SLOPE LAB CHEMISTRY ANALYSIS

Parameter	Depth BWS (ft): _____			Depth BWS (ft): _____			Depth BWS (ft): _____			Method
	rep 1	rep 2	rep 3	rep 1	rep 2	rep 3	rep 1	rep 2	rep 3	
Oxygen (mg/L)										Hach spec 0.3-15 mg/L
Alkalinity (mg/L as CaCO ₃)										Digital titrator 10-4000 mg/L as CaCO ₃
Total iron--UF (mg/L)										Hach spec 0.02-3.00 mg/L
Filtered Iron--F tot Fe (mg/L)										Hach spec 0.02-3.00 mg/L
Ammonia (mg/L NH ₃ -N)****										0.01-0.50 mg/L NH ₃ -N
Ammonia/ Iron dilution										

Remarks: _____

Field-Form Filled Out By: Cormack Date: 1/15/08
 QAQC Check By: JED Date: 1/15/08

University of Alaska Fairbanks, Water and Environmental Research Center

Form F-004a: Water Quality Field-Sampling General

Project ID: North Slope Lakes Site Location/Lake ID: L9312 #1
 Sample Purpose: Lake Water Quality Date: 1/13/08 Time: nr

FIELD MEASUREMENTS

GPS Coord. Northing: N70 19.872 Easting: W150 56.803 Datum: NAD83
 Measurements By: JED Time: nr
 Water Depth (ft): 12.9 Ice Thickness (ft): 3.30
 Freeboard (ft): 0.3 Snow Depth (ft): 0.50
 Elev. (BPMSL +/- .02): 7.3 Survey By: Chad/Horacio Date: 1/13/08 Time: 12:00
 Water Sampling By: n/a Sample Depths BWS (ft): 1 n/a Date: n/a Time: n/a
 2 _____
 3 _____

WATER QUALITY METER INFORMATION

Calibration Information

Parameter (s)	Owner	Meter Make/Model	Serial No.	Pre-Sampling QAQC Check	Post-Sampling QAQC Check				
DO, Temp	BLD	Hach LDO	3625	PASS	PASS				
Parameters									
Field Measurements									
Time:									
Depth BWS (ft):	4.0	5.0	7.0	9.0	11.0	12.0	12.5	BOT	
Temp (°C):	0.30	1.10	1.50	2.10	3.30	3.20	3.20	3.30	
pH:									
Barometric (mmHg):									
Pressure (kPa):	764.00	764.00	764.00	764.00	764.00	764.00	764.00	764.00	
Conductivity (µS/cm):									
RDO (ppm): (mg/L)	14.60	13.90	13.80	12.20	1.72	0.24	0.21	0.19	
Turbidity (NTU):									
ORP									

FIELD TESTING OF WATER SAMPLES (if small probe is used)

Probe:					
Depth (ft)					
Temp (°C)					
pH					
Eh					

NORTH SLOPE LAB CHEMISTRY ANALYSIS

Parameter	Depth BWS (ft): _____			Depth BWS (ft): _____			Depth BWS (ft): _____			Method
	rep 1	rep 2	rep 3	rep 1	rep 2	rep 3	rep 1	rep 2	rep 3	
Oxygen (mg/L)										Hach spec 0.3-15 mg/L
Alkalinity (mg/L as CaCO ₃)										Digital titrator 10-4000 mg/L as CaCO ₃
Total iron--UF (mg/L)										Hach spec 0.02-3.00 mg/L
Filtered Iron--F tot Fe (mg/L)										Hach spec 0.02-3.00 mg/L
Ammonia (mg/L NH ₃ -N)****										0.01-0.50 mg/L NH ₃ -N
Ammonia/ Iron dilution										

Remarks: _____

Field-Form Filled Out By: Cormack Date: 1/15/08
 QAQC Check By: JED Date: 1/15/08

University of Alaska Fairbanks, Water and Environmental Research Center

Form F-004a: Water Quality Field-Sampling General

Project ID: North Slope Lakes Site Location/Lake ID: L9312 #4
 Sample Purpose: Lake Water Quality Date: 1/13/08 Time: nr

FIELD MEASUREMENTS

GPS Coord. Northing: N70 19.790 Easting: W150 57.347 Datum: NAD83
 Measurements By: JED Time: nr
 Water Depth (ft): 8.5 Ice Thickness (ft): 2.60
 Freeboard (ft): 0.3 Snow Depth (ft): 0.50
 Elev. (BPMSL +/- .02): 7.3 Survey By: Chad/Horacio Date: 1/13/08 Time: 12:00
 Water Sampling By: n/a Sample Depths BWS (ft): 1 n/a Date: n/a Time: n/a
 2 _____
 3 _____

WATER QUALITY METER INFORMATION

Calibration Information

Parameter (s)	Owner	Meter Make/Model	Serial No.	Pre-Sampling QAQC Check	Post-Sampling QAQC Check	
DO, Temp	BLD	Hach LDO	3625	PASS	PASS	
Parameters		Field Measurements				
Time:						
Depth BWS (ft):	4.0	5.0	6.0	7.0	8.0 BOT	
Temp (°C):	0.20	0.90	1.20	1.60	2.20 2.30	
pH:						
Barometric (mmHg):						
Pressure (kPa):						
Conductivity (µS/cm):						
RDO (ppm): (mg/L)	15.30	15.10	15.10	14.50	2.45 1.50	
Turbidity (NTU):						
ORP						

FIELD TESTING OF WATER SAMPLES (if small probe is used)

Probe:					
Depth (ft)					
Temp (°C)					
pH					
Eh					

NORTH SLOPE LAB CHEMISTRY ANALYSIS

Parameter	Depth BWS (ft): _____			Depth BWS (ft): _____			Depth BWS (ft): _____			Method
	rep 1	rep 2	rep 3	rep 1	rep 2	rep 3	rep 1	rep 2	rep 3	
Oxygen (mg/L)										Hach spec 0.3-15 mg/L
Alkalinity (mg/L as CaCO ₃)										Digital titrator 10-4000 mg/L as CaCO ₃
Total iron--UF (mg/L)										Hach spec 0.02-3.00 mg/L
Filtered Iron--F tot Fe (mg/L)										Hach spec 0.02-3.00 mg/L
Ammonia (mg/L NH ₃ -N)****										0.01-0.50 mg/L NH ₃ -N
Ammonia/ Iron dilution										

Remarks: _____

Field-Form Filled Out By: Cormack Date: 1/15/08
 QAQC Check By: JED Date: 1/15/08

APPENDIX B. WATER QUALITY METER CALIBRATION FORMS

The following forms report the pre- and post-calibration checks for the water quality meters used during field sampling.

University of Alaska Fairbanks, Water and Environmental Research Center

Form F-004e: Water Quality Meter Calibration Form

Project ID: North Slope Lakes Site Location/Lake ID: Mine Site B
 Sample Purpose: Lake Water Quality

WATER QUALITY METER INFORMATION

Meter Make: InSitu Make: Troll 9000
 Owner: GW Scientific S/N: 33033

CALIBRATION AND QUALITY ASSURANCE INFORMATION

Pre-Sampling QA

Parameter	Date	Time	Standard	Lot No.	Exp.	Meter Reading	Pass/Fail
pH 4.01	1/8/08	7:49	Oakton 4.01	2709256	Aug-09	3.92	pass
ph 7.00	1/8/08	7:51	Oakton 7.00	2612531	Dec-08	7.06	pass
ph 10.00	1/8/08	7:56	Oakton 10.00	2612532	Jun-08	9.99	pass
Conductivity 447 µS/cm	1/8/08	7:59	Oakton 447	2707012	Jul-08	421.0	pass
Conductivity 84 µS/cm	1/8/08	8:02	Oakton	2706156	Jun-08	83.2	pass
ORP	1/8/08	8:06	Zobell's	2709340	Aug-07	228	pass
Saturated O ₂	1/8/08	8:14	Bubbled Nanopure	--	--	101.3% satur.	pass
Zero O ₂	1/8/08	8:25	Oakton	270638	Jun-08	0.02	pass

Post-Sampling QA

Parameter	Date	Time	Standard	Lot No.	Exp.	Meter Reading	Pass/Fail
pH 4.01	11/17/07	17:00	Oakton 4.01	2709256	Aug-09	4.10	Pass
ph 7.00	11/17/07	17:06	Oakton 7.00	2612531	Dec-08	7.15	Pass
ph 10.00	11/17/07	17:08	Oakton 10.00	2612532	Jun-08	10.06	Pass
Conductivity 447 µS/cm	11/17/07	16:50	Oakton 447	2707012	Jul-08	412.8	Pass
Conductivity 84 µS/cm	11/17/07	16:53	Oakton	2706156	Jun-08	81.110	Pass
ORP	11/17/07	17:13	Zobell's	2709340	Aug-07	233.0	Pass
Saturated O ₂	11/17/07	17:19	Bubbled Nanopure	--	--	108.90	Pass
Zero O ₂	11/17/07	17:22	Oakton	270638	Jun-08	0.040	Pass

Remarks: ph/ORP probe SN:PP10242 (GWS)

Field-Form Filled Out By: JED Date: 1/11/2008
 QAQC Check By: CMC Date: 1/12/2008

University of Alaska Fairbanks, Water and Environmental Research Center

Form F-004e: Water Quality Meter Calibration Form

Project ID: North Slope Lakes
 Sample Purpose: Lake Water Quality

Site Location/Lake ID: Kuparuk Deadarm Lakes

WATER QUALITY METER INFORMATION

Meter Make: InSitu
 Owner: GW Scientific

Make: Troll 9000
 S/N: 33033

CALIBRATION AND QUALITY ASSURANCE INFORMATION

Pre-Sampling QA

Parameter	Date	Time	Standard	Lot No.	Exp.	Meter Reading	Pass/Fail
pH 4.01	1/7/08	5:00	Oakton 4.01	2612530	Dec-08	3.88	pass
ph 7.00	1/7/08	5:04	Oakton 7.00	2612531	Dec-08	7.05	pass
ph 10.00	1/7/08	5:08	Oakton 10.00	2612532	Jun-08	10.14	pass
Conductivity 447 µS/cm	1/7/08	5:15	Oakton 447	2707012	Jul-08	353.6	pass
Conductivity 84 µS/cm	1/7/08	5:22	Oakton	2706156	Jun-08	67.1	pass
ORP	1/7/08	5:39	Zobell's	2709340	Aug-07	241	pass
Saturated O ₂	1/7/08	7:45	Bubbled Nanopure	--	--	93.0% satur.	pass
Zero O ₂	1/7/08	18:07	Oakton	270638	Jun-08	0.10	pass

Post-Sampling QA

Parameter	Date	Time	Standard	Lot No.	Exp.	Meter Reading	Pass/Fail
pH 4.01	1/8/08	7:49	Oakton 4.01	2709256	Aug-09	3.92	pass
ph 7.00	1/8/08	7:51	Oakton 7.00	2612531	Dec-08	7.06	pass
ph 10.00	1/8/08	7:56	Oakton 10.00	2612532	Jun-08	9.99	pass
Conductivity 447 µS/cm	1/8/08	7:59	Oakton 447	2707012	Jul-08	421.0	pass
Conductivity 84 µS/cm	1/8/08	8:02	Oakton	2706156	Jun-08	83.2	pass
ORP	1/8/08	8:06	Zobell's	2709340	Aug-07	228	pass
Saturated O ₂	1/8/08	8:14	Bubbled Nanopure	--	--	101.3% satur.	pass
Zero O ₂	1/8/08	8:25	Oakton	270638	Jun-08	0.02	pass

Remarks: ph/ORP probe SN:PP10242 (GWS)

Field-Form Filled Out By: JED
 QAQC Check By: CMC

Date: 1/11/2008
 Date: 1/12/2008

University of Alaska Fairbanks, Water and Environmental Research Center

Form F-004e: Water Quality Meter Calibration Form

Project ID: North Slope Lakes Site Location/Lake ID: L9312
 Sample Purpose: Lake Water Quality

WATER QUALITY METER INFORMATION

Meter Make: InSitu Make: Troll 9000
 Owner: GW Scientific S/N: 33033

CALIBRATION AND QUALITY ASSURANCE INFORMATION

Pre-Sampling QA

Parameter	Date	Time	Standard	Lot No.	Exp.	Meter Reading	Pass/Fail
pH 4.01	1/11/08	19:30	Oakton 4.01	2709256	Aug-09	3.97	Pass
ph 7.00	1/11/08	19:35	Oakton 7.00	2709203	Aug-09	7.00	Pass
ph 10.00	1/11/08	19:37	Oakton 10.00	2707084	Jan-09	10.20	Pass
Conductivity 447 µS/cm	1/11/08	19:43	Oakton 447	270712	Jul-08	357.4	Pass
Conductivity 84 µS/cm	1/11/08	19:55	Oakton	2706156	Jun-08	68.890	Pass
ORP	1/11/08	20:09	Zobell's	2709340	Jun-08	246.0	Pass
Saturated O ₂	1/11/08	20:15	Bubbled Nanopure	--	--	93.3 % satur.	Pass
Zero O ₂	1/11/08	nr	Oakton	2706384	Jun-08	0.00	Pass

Post-Sampling QA

Parameter	Date	Time	Standard	Lot No.	Exp.	Meter Reading	Pass/Fail
pH 4.01	1/13/08	16:04	Oakton 4.01	2709256	Aug-09	4.15	Pass
ph 7.00	1/13/08	16:08	Oakton 7.00	2709203	Aug-09	7.18	Pass
ph 10.00	1/13/08	16:09	Oakton 10.00	2707084	Jan-09	10.05	Pass
Conductivity 447 µS/cm	1/13/08	16:01	Oakton 447	270712	Jul-08	387.1	Pass
Conductivity 84 µS/cm	1/13/08	15:58	Oakton	2706156	Jun-08	75.640	Pass
ORP	1/13/08	16:13	Zobell's	2709340	Jun-08	238.0	Pass
Saturated O ₂	1/13/08	16:16	Bubbled Nanopure	--	--	105.8	Pass
Zero O ₂	1/13/08	nr	Oakton	2706384	Jun-08	0.04	Pass

Remarks: _____
 ph/ORP probe SN:PP10242 (GWS)

Field-Form Filled Out By: GMM Date: 1/13/2008
 QAQC Check By: JED Date: 1/15/2008

APPENDIX C. ELEVATION SURVEY FORMS

The following form reports the elevation survey information obtained during field sampling.

University of Alaska Fairbanks, Water and Environmental Research Center

Form F-011: Elevation Survey Form

Project ID: North Slope Lakes Site Location/Lake ID: KDA 1,2,3
 Survey Purpose: Water-Level Elevations Date: 1/8/2008 Time: 12:30

Location: Kuparuk Deadarm Lakes, east of the Spine Road Kuparuk bridge.								
Survey objective: Determine FWS Elevation of cell 1, cell 2 and cell 3.					Weather Observations:			
Instrument Type:	Leica NA720	Instrument ID:	5482727 (GWS owned)					
Rod Type:	Fiberglass	Rod ID:	Sokkia Fiber Glass					
Bench Mark Information:					Survey Team Names			
Name	Agency Responsible	Elevation (ft)	Latitude (dd-mm.mmm)	Longitude (ddd-mm.mmm)	Horacio Toniolo, Chad Cormack			
BM1	BP	19.32	nr	nr				
Station	BS (ft)	HI (ft)	FS (ft)	Elevation (fasl)	Distance (ft)	Horizontal Angle	Vertical Angle	Remarks
BM1	0.240	19.560		19.320				
KDA3-SH		19.560	12.860	6.700				
KDA2-SH		19.560	12.860	6.700				
Turn on KDA2-Ice. Move to Inst.2								
KDA2-SH	13.140	19.840		6.700				KDA2 WL=6.70'
KDA3-SH		19.840	13.130	6.710				KDA3 WL=6.71'
BM1		19.840	0.510	19.330				close survey to 0.01
Move to Inst.3								
KDA2-SH'	9.090	15.790		6.700				
KDA1-SH		15.790	7.830	7.960				KDA1 WL=7.96
Turn on KDA3-ICE. Move to Inst.4								
KDA1-SH	7.610	15.570		7.960				
KDA2-SH'		15.570	8.860	6.710				close survey to 0.01

Abbreviations: backsight, BS; degrees, dd; feet, ft; feet above mean sea level, fasm; foresight, FS; height of instrument, HI; minutes, mm; seconds, ss; BP Mean Sea Level, BPMSL

University of Alaska Fairbanks, Water and Environmental Research Center

Form F-011: Elevation Survey Form

Project ID: North Slope Lakes Site Location/Lake ID: KDA 4,5
 Survey Purpose: Water-Level Elevations Date: 1/8/2008 Time: 3:00

Location: Kuparuk Deadarm Lakes, east of the Spine Road Kuparuk bridge.								
Survey objective: Determine FWS Elevation of cells 4 and 5.					Weather Observations:			
Instrument Type: T-Handle Probe		Instrument ID:			-35°F, 5 mph wind, clear			
Rod Type:		Rod ID:						
Bench Mark Information:						Survey Team Names		
Name	Agency Responsible	Elevation (ft)	Latitude (dd-mm.mmm)	Longitude (ddd-mm.mmm)		Horacio Toniolo, Chad Cormack		
TBM3		18.90	nr	nr				
Station	BS (ft)	HI (ft)	FS (ft)	Elevation (fasi)	Distance (ft)	Horizontal Angle	Vertical Angle	Remarks
Distance from West Culvert between KDA 4 and KDA5 to Water Level was measured. Elev. of TOC4-H from Nov'07 Survey								
TBM3	2.360	21.260		18.900				
TP1		21.260	14.100	7.160				
Turned on TP1 to close loop and find elevation.								
TP1	13.940	21.100		7.160				
TBM3		21.100	2.220	18.880				Closed within 0.02
Used TP1 to get elevations of KDA-4 and KDA-5								
TP1	4.890	12.050		7.160				
KDA-5		12.050	7.300	4.750				
KDA-4		12.050	7.300	4.750				
Turned on KDA4 and moved instrument								
KDA-4	7.340	12.090		4.750				KDA4 WL = 4.75'
KDA-5		12.090	7.340	4.750				KDA5 WL = 4.75'
TP1		12.090	4.930	7.160				Closed within 0.02

Abbreviations: backsight, BS; degrees, dd; feet, ft; feet above mean sea level, fasm; foresight, FS; height of instrument, HI; minutes, mm; seconds, ss; BP Mean Sea Level, BPMSL

University of Alaska Fairbanks, Water and Environmental Research Center

Form F-011: Elevation Survey Form

Project ID: North Slope Lakes Site Location/Lake ID: Mine Site B
 Survey Purpose: Water-Level Elevations Date: 1/9/2008 Time: 13:00

Location:	Mine Site B aka 6 mile Lake							
Survey objective:	Determine lake water elevation in North and South Cells					Weather Observations:		
Instrument Type:	Leica NA720	Instrument ID:	5482372 (GWS owned)		-35°F, 5 mph wind, clear			
Rod Type:	Craine fiberglass 20'	Rod ID:	GWS owned					
Bench Mark Information:					Survey Team Names			
Name	Agency Responsible	Elevation (ft)	Latitude (dd-mm.mmm)	Longitude (ddd-mm.mmm)	Toniolo, Cormack			
TBM_1	nr	100.00 Arbitrary	N70°19.308'	W149°23.882'				
Station	BS (ft)	HI (ft)	FS (ft)	Elevation (fasl)	Distance (ft)	Horizontal Angle	Vertical Angle	Remarks
TBM_1	5.630	105.630		100.000				
MSBN-SH		105.630	11.030	94.600				WL MSBN=94.60'
TBM 2		105.630	1.820	103.810				
TBM 3		105.630	2.190	103.440				
TBM 4		105.630	4.270	101.360				
Move instrument to ^2, turn on TBM 4								
TBM 4	4.000	105.360		101.360				
TBM 3		105.360	1.910	103.450				
TBM 2		105.360	1.540	103.820				
MSBN-SH		105.360	10.760	94.600				
TBM_1		105.360	5.350	100.010				Survey leg closes within ±0.01
Move instrument to ^3 on island, turn on MSBN Water Level								
MSBN-SH'	8.170	102.770		94.600				
MSBS-SH		102.770	8.170	94.600				WL MSBS=94.60'
Move instrument to ^4, turn on MSBS-SH. Water Surface has frozen in hole.								
MSBS-SH	8.250	102.850		94.600				
MSBN-SH'		102.850	8.250	94.600				Survey leg closes within ±0.00

Abbreviations: backsight, BS; degrees, dd; feet, ft; feet above mean sea level, fasm!; foresight, FS; height of instrument, HI; minutes, mm; seconds, ss; BP Mean Sea Level, BPMSL

University of Alaska Fairbanks, Water and Environmental Research Center

Form F-011: Elevation Survey Form

Project ID: North Slope Lakes Site Location/Lake ID: L9312
 Survey Purpose: Water-Level Elevations Date: 1/13/2008 Time: 12:00

Location:	Lake L9312, located southeast of Alpine pad, survey by pump house benchmarks							
Survey objective:	Determine FWS Elevation.					Weather Observations:		
Instrument Type:	Leica NA720	Instrument ID:	5482372 (GWS owned)					
Rod Type:	Fiberglass	Rod ID:	Sokkia Fiber Glass					
Bench Mark Information:						-50°F, Light Wind. Clear with light haze		
Survey Team Names						Toniolo, Cormack		
Name	Agency Responsible	Elevation (ft)	Latitude (dd-mm.mmm)	Longitude (ddd-mm.mmm)				
L9312"P"	CP	11.73	N70°20.053'	W150°56.600'				
Station	BS (ft)	HI (ft)	FS (ft)	Elevation (fasl)	Distance (ft)	Horizontal Angle	Vertical Angle	Remarks
TBM "P"	2.290	14.020		11.730				Top of inlet pipe support
TBM "O"		14.020	2.520	11.500				Top of inlet pipe support. BM Elev=11.46'
99-32-59		14.020	0.570	14.590				Top of Pumphouse SE VSM. BM Elev = 14.57
L9312 WL		14.020	6.720	7.300				Water Surface Level
Turn on L9312 WL								
L9312 WL	6.830	14.130		7.300				
99-32-59		14.130	0.460	14.590				
TBM"O"		14.130	2.640	11.490				
TBM"P"		14.130	2.400	11.730				close survey to 0.00

Abbreviations: backsight, BS; degrees, dd; feet, ft; feet above mean sea level, fasl; foresight, FS; height of instrument, HI; minutes, mm; seconds, ss; BP Mean Sea Level, BPMSL

APPENDIX D. SNOW SURVEY FORMS

The following forms report the snow survey information obtained during field sampling.

University of Alaska Fairbanks, Water and Environmental Research Center
Form F-012: Snow Depth and Water Content Survey Form

Project ID: North Slope Lakes Site Location/Lake ID: KDA2-CT
 Survey Purpose: Determine snow water equivalent Date: 1/8/2008 Time: 15:30

Location Description:	At KDA2-CT snow course bears North 25 meters, then West 25 meters.				
Survey objective:	Determine Snow Water Equivalent			Weather Observations:	-35°F, 5 mph wind, clear
Latitude:	N70°19.966'	Longitude:	W14°856.429'	Datum:	NAD83
Elevation:	Approximately 10 ft	Elevation Datum:	BPMSL	Reference Markers:	KDA-CT Lathe
Drainage Basin:	Kuparuk River	Slope Direction:	flat	Vegetation Type:	Ice
Slope Angle:	flat	Access Notes:	Highway vehicle	Other:	
Snow Depth Probe Type:	T-handle probe			Snow-Survey Team Names	
Snow Tube Type:	n/a			Chad Cormack, Horacio Toniolo	

Snow Course Depths, in cm.

	1	2	3	4	5
1	1.0	0.0	0.0	1.0	0.0
2	0.0	0.0	0.0	1.0	1.0
3	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	2.0	0.0	0.0
5	1.0	2.0	2.0	0.0	0.0
6	1.0	2.0	2.0	1.0	0.0
7	0.0	1.0	0.0	1.0	0.0
8	1.0	0.0	2.0	1.0	0.0
9	1.0	0.0	3.0	0.0	0.0
10	1.0	1.0	2.0	1.0	0.0

(cm)
 Average snow depth = 0.6
 Maximum snow depth = 3.0
 Minimum snow depth = 0.0
 Standard variation = 0.8

Snow Sample Depths and Weights

Bag #	Depth (cm)	Weight (gr)	Volume (cm ³)	Density (gr/cm ³)
* Insufficient snow depth for densities				

Average Density = _____
 Average Snow Water Equivalent (SWE) = _____ cm H2O
 Average Snow Water Equivalent = _____ inches H2O
 Average Snow Water Equivalent = _____ feet H2O

SWE = avg. snow depth*(density snow/density water)

University of Alaska Fairbanks, Water and Environmental Research Center
Form F-012: Snow Depth and Water Content Survey Form

Project ID: North Slope Lakes Site Location/Lake ID: MSB-CT
 Survey Purpose: Determine snow water equivalent Date: 1/9/2008 Time: 13:00

Location Description:	At MSBN-CT snow course bears West 25 meters, then South 25 meters.				
Survey objective:	Determine Snow Water Equivalent			Weather Observations:	-35°F, 5 mph E wind, mostly clear. Dark.
Latitude:	N70°19.280'	Longitude:	W149°24.009'	Datum:	NAD83
Elevation:	Approximately 50 ft BPMSL.	Elevation Datum:	BPMSL	Reference Markers:	Lathe is at MSBN-CT
Drainage Basin:	Milne Creek	Slope Direction:	Flat	Vegetation Type:	Ice
Slope Angle:	flat	Access Notes:	Highway Vehicle	Other:	glaze lake ice. No or little snow on surface.
Snow Depth Probe Type:	T-handle probe			Snow-Survey Team Names	
Snow Tube Type:	Arinodack snow tube			Dan White, Matt Whitman	

Snow Course Depths, in cm.

	1	2	3	4	5
1	0.0	0.0	0.0	0.0	1.0
2	0.0	1.0	0.0	0.0	2.0
3	0.0	1.0	2.0	0.0	1.0
4	0.0	0.0	4.0	1.0	0.0
5	2.5	0.0	3.0	0.0	0.0
6	2.0	1.0	1.0	0.0	3.5
7	2.0	0.0	0.0	0.0	0.0
8	1.0	0.0	0.0	1.0	0.0
9	1.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0

(cm)
 Average snow depth = 0.6
 Maximum snow depth = 4.0
 Minimum snow depth = 0.0
 Standard variation = 1.0

Snow Sample Depths and Weights

Bag #	Depth (cm)	Weight (gr)	Volume (cm ³)	Density (gr/cm ³)
Insufficient snow depth for densities				

Average Density = _____
 Average Snow Water Equivalent (SWE) = _____ cm H2O
 Average Snow Water Equivalent = _____ inches H2O
 Average Snow Water Equivalent = _____ feet H2O

SWE = avg. snow depth*(density snow/density water)

University of Alaska Fairbanks, Water and Environmental Research Center
Form F-012: Snow Depth and Water Content Survey Form

Project ID: North Slope Lakes Site Location/Lake ID: MSB-SNOTUN
 Survey Purpose: Determine snow water equivalent Date: 1/9/2008 Time: 14:00

Location Description:	At MSBN-SNOTUN snow course bears West 25 meters, then South 25 meters.				
Survey objective:	Determine Snow Water Equivalent			Weather Observations:	-35°F, 5 mph E wind, mostly clear. Dark.
Latitude:	N70°19.256'	Longitude:	W149°24.242'	Datum:	NAD83
Elevation:	Approximately 50 ft BPMSL.	Elevation Datum:	BPMSL	Reference Markers:	Lathe is at MSBN-SNOTUN in tundra west of Lake
Drainage Basin:	Milne Creek	Slope Direction:	Flat	Vegetation Type:	Tussock Tundra
Slope Angle:	flat	Access Notes:	Highway Vehicle	Other:	Very thin crust, snow in depressions.
Snow Depth Probe Type:	T-handle probe			Snow-Survey Team Names	
Snow Tube Type:	Arinodack snow tube			Dan White, Matt Whitman	

Snow Course Depths, in cm.

	1	2	3	4	5
1	13.0	14.0	10.5	10.5	12.0
2	15.0	14.0	20.0	12.0	33.0
3	14.5	17.0	11.0	20.5	30.0
4	9.0	14.5	11.5	16.0	13.0
5	11.0	13.5	12.0	12.0	12.0
6	11.5	11.5	11.0	17.5	13.0
7	31.0	13.0	8.5	14.5	15.0
8	13.5	14.5	20.0	9.0	33.5
9	19.5	11.0	12.0	14.5	26.0
10	20.0	11.0	12.5	25.0	27.5

(cm)
 Average snow depth = 15.8
 Maximum snow depth = 33.5
 Minimum snow depth = 8.5
 Standard variation = 6.4

Snow Sample Depths and Weights

Bag #	Depth (cm)	Weight (gr)	Volume (cm ³)	Density (gr/cm ³)
T1	27	235.7	963.9	0.24
T2	12	73.9	428.4	0.17
T3	20	142.8	714.0	0.20
T4	16	94.0	571.2	0.16
T5	8	32.7	285.6	0.11

Average Density = 0.18
 Average Snow Water Equivalent (SWE) = 2.8 cm H2O
 Average Snow Water Equivalent = 1.11 inches H2O
 Average Snow Water Equivalent = 0.09 feet H2O

SWE = avg. snow depth*(density snow/density water)

University of Alaska Fairbanks, Water and Environmental Research Center
Form F-012: Snow Depth and Water Content Survey Form

Project ID: North Slope Lakes Site Location/Lake ID: L9312_Raft_B
 Survey Purpose: Determine snow water equivalent Date: 1/13/2008 Time: 2:00

Location Description:	Started 5 meters north of "Raft B" on L9312. Travelled 25 meters northerly towards Raft A. Turned left 90° and travelled 25 meters west to end point.				
Survey objective:	Determine Snow Water Equivalent			Weather Observations:	-50°F, Light Wind. Mostly clear with light haze.
Latitude:	N 70° 19.995'	Longitude:	W 150° 56.918'	Datum:	NAD 83
Elevation:	7 ft	Elevation Datum:	BPMSL	Reference Markers:	Raft B is marked with lathe
Drainage Basin:	Lake L9312	Slope Direction:	Flat	Vegetation Type:	Ice
Slope Angle:	Flat	Access Notes:	Snowmobile	Other:	
Snow Depth Probe Type:	T-handle probe			Snow-Survey Team Names	
Snow Tube Type:	Arinodack snow tube			Chad Cormack, Horacio Toniolo	

Snow Course Depths, in cm.

	1	2	3	4	5
1	13.0	7.0	13.0	12.0	11.0
2	11.0	8.0	10.0	10.0	11.0
3	14.0	6.0	8.0	9.0	9.0
4	8.0	6.0	7.0	15.0	9.0
5	10.0	9.0	6.0	17.0	9.0
6	11.0	11.0	7.0	20.0	9.0
7	11.0	14.0	6.0	18.0	11.0
8	12.0	15.0	10.0	15.0	6.0
9	7.0	15.0	13.0	9.0	4.0
10	7.0	15.0	13.0	10.0	8.0

(cm)
 Average snow depth = 10.5
 Maximum snow depth = 20.0
 Minimum snow depth = 4.0
 Standard variation = 3.5

Snow Sample Depths and Weights

Bag #	Depth (cm)	Weight (gr)	Volume (cm ³)	Density (gr/cm ³)
DW4-1	10.16	124.8	362.7	0.34
DW4-2	6.35	54.9	226.7	0.24
DW4-3	12.7	146.2	453.4	0.32
DW4-4	6.35	48.2	226.7	0.21
DW4-5	5.08	51.1	181.4	0.28

Average Density = 0.28
 Average Snow Water Equivalent (SWE) = 2.9 cm H2O
 Average Snow Water Equivalent = 1.16 inches H2O
 Average Snow Water Equivalent = 0.10 feet H2O

SWE = avg. snow depth*(density snow/density water)

University of Alaska Fairbanks, Water and Environmental Research Center
Form F-012: Snow Depth and Water Content Survey Form

Project ID: North Slope Lakes Site Location/Lake ID: L9312-WxStation
 Survey Purpose: Determine snow water equivalent Date: 1/13/2008 Time: 11:00

Location Description:	North of weather station at L9312. Start at east snow pole, transect goes 25 m west x 25 m North. See L9312 WxSta Snow 070922.JPG for layout.				
Survey objective:	Determine Snow Water Equivalent			Weather Observations:	-50°F, Light Wind. Mostly clear with light haze.
Latitude:	N70°20.019'	Longitude:	W150°57.134'	Datum:	NAD83
Elevation:	Approximately 10 ft	Elevation Datum:	BPMSL	Reference Markers:	Orange snow poles
Drainage Basin:	Lake L9312	Slope Direction:	East	Vegetation Type:	Tussuck tundra
Slope Angle:	2°	Access Notes:		Other:	
Snow Depth Probe Type:	T-handle probe			Snow-Survey Team Names	
Snow Tube Type:	Arinodack snow tube			Derry, Cormack, Toniolo	

Snow Course Depths, in cm.

	1	2	3	4	5
1	19.0	20.0	22.0	50.0	30.0
2	15.0	18.0	25.0	36.0	36.0
3	17.0	15.0	24.0	18.0	48.0
4	16.0	21.0	22.0	15.0	64.0
5	22.0	44.0	13.0	23.0	62.0
6	21.0	38.0	14.0	44.0	59.0
7	20.0	25.0	18.0	42.0	44.0
8	20.0	12.0	23.0	41.0	39.0
9	22.0	20.0	51.0	32.0	18.0
10	19.0	17.0	64.0	14.0	23.0

(cm)
 Average snow depth = 28.7
 Maximum snow depth = 64.0
 Minimum snow depth = 12.0
 Standard variation = 14.7

Snow Sample Depths and Weights

Bag #	Depth (cm)	Weight (gr)	Volume (cm ³)	Density (gr/cm ³)
DW4-1	16	113.5	571.2	0.20
DW4-2	26	189.2	928.2	0.20
DW4-3	10	76.1	357.0	0.21
DW4-4	12	60.3	428.4	0.14
DW4-5	12	120.6	428.4	0.28

Average Density = 0.21
 Average Snow Water Equivalent (SWE) = 6.0 cm H2O
 Average Snow Water Equivalent = 2.35 inches H2O
 Average Snow Water Equivalent = 0.20 feet H2O

SWE = avg. snow depth*(density snow/density water)

University of Alaska Fairbanks, Water and Environmental Research Center
Form F-012: Snow Depth and Water Content Survey Form

Project ID: North Slope Lakes Site Location/Lake ID: Betty Pingo
 Survey Purpose: Determine snow water equivalent Date: 1/16/2008 Time: 16:00

Location Description:	Near Wyoming gage. At staked snow site. Started east and then went north. Point of beginning is flagged rebar.				
Survey objective:	Determine Snow Water Equivalent			Weather Observations:	-30 F, 10 mph Wind
Latitude:	N70°16.772'	Longitude:	W148°53.741'	Datum:	NAD83
Elevation:	Approximately 10 ft	Elevation Datum:	BPMSL	Reference Markers:	Re-bar and lathe
Drainage Basin:	Kuparuk River	Slope Direction:	flat	Vegetation Type:	Tussock Tundra
Slope Angle:	flat	Access Notes:	Highway vehicle	Other:	
Snow Depth Probe Type:	T-handle probe			Snow-Survey Team Names	
Snow Tube Type:	Arinodack snow tube			Cormack, Derry	

Snow Course Depths, in cm.

	1	2	3	4	5
1	45.0	25.0	31.0	9.0	30.0
2	23.0	10.0	14.0	14.0	32.0
3	16.0	15.0	15.0	17.0	35.0
4	15.0	23.0	8.0	16.0	19.0
5	14.0	30.0	17.0	31.0	16.0
6	13.0	30.0	10.0	38.0	11.0
7	14.0	30.0	11.0	20.0	10.0
8	16.0	23.0	11.0	21.0	14.0
9	23.0	25.0	9.0	26.0	14.0
10	15.0	25.0	10.0	27.0	32.0

(cm)
 Average snow depth = 20.0
 Maximum snow depth = 45.0
 Minimum snow depth = 8.0
 Standard variation = 8.8

Snow Sample Depths and Weights

Bag #	Depth (cm)	Weight (gr)	Volume (cm ³)	Density (gr/cm ³)
T1	35.56	420.8	1269.5	0.33
H2	11.43	52.0	408.1	0.13
H1	15.24	97.7	544.1	0.18
H4	25.4	181.5	906.8	0.20
K2	15.24	190.3	544.1	0.35

Average Density = 0.24
 Average Snow Water Equivalent (SWE) = 4.7 cm H2O
 Average Snow Water Equivalent = 1.87 inches H2O
 Average Snow Water Equivalent = 0.16 feet H2O

SWE = avg. snow depth*(density snow/density water)