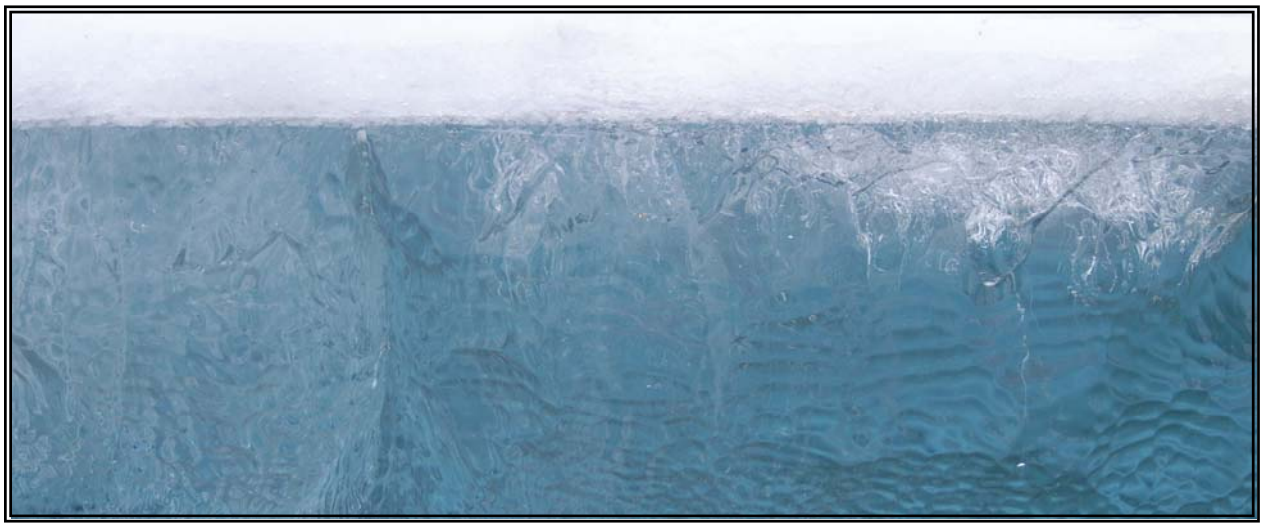
2008 Colville River Delta Lakes Recharge Monitoring and Analysis



Submitted to

ConocoPhillips

Submitted by

Michael Baker Jr., Inc.
1400 W. Benson Blvd., Suite 200
Anchorage, Alaska 99503

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Contents

Tables

Graphs

Figures

Appendices

1.0 Introduction

Ongoing operations in the Colville River Delta (CRD) use ice roads and pads for access and transportation during the winter months. Each season, millions of gallons of fresh water are withdrawn to meet winter construction and operation requirements. Removal of grounded ice aggregate can supplement water withdrawal without impacting overwintering fish habitat. Water withdrawal for construction and operations may begin as early as December and continue into May. Recharge of water use lakes is highly dependent on spring snowmelt and overbank flooding.

This report summarizes snow survey measurements and calculations of potential lake recharge performed during the 2008 CRD Lakes Recharge Monitoring Project. The study was performed at the request of ConocoPhillips Alaska, Inc. (CPAI) by Michael Baker Jr., Inc. (Baker). Tasks consisted of estimating average snow water equivalent (SWE) across the CRD based on snow surveys of two representative lakes (L9312 and L9327) prior to spring breakup. Snow water equivalent refers to the liquid-water equivalent of the snowpack, expressed in terms of depth. Three snow sampling events were performed prior to February 15, 2008, with one additional sampling immediately before spring breakup. Resulting spring SWE estimates were used to approximate potential snowmelt recharge of 30 permitted water use lakes.

1.1 Study Overview and Purpose

Authorization of water withdrawal from a specific lake is contingent on stipulations outlined in Amendment 2 of the Fish Habitat Permits FH05-III-0330 (Lake M9608), FH05-III-0329 (Lake M9606), FH05-III-0323 (Lake L9327), and FH05-III-0338 (Lake M9603).[1] The stipulations state:

> *1. ConocoPhillips Alaska, Inc. (CPAI), shall conduct snow surveys at two or more locations within the Colville River delta with adequate frequency to allow for some determination as to the relative snow pack of the winter season by February 15 of each year of the permit. Data shall be used consistent with the methodology used in the report entitled "2007 Colville River Delta Lakes Recharge Monitoring and Analysis" completed in October, 2007, to produce a projection of recharge vs. permitted withdrawal potential by the end of the season.*

[1] The State of Alaska Department of Natural Resources (DNR) Office of Habitat Management and Permitting (OHMP) issued these fish habitat permits. The OHMP of the Alaska Department of Natural Resources became the Division of Habitat, a part of the Alaska Department of Fish and Game (ADF&G), effective July 1, 2008, as a result of Executive Order 114. As part of this reorganization, special area planning and permitting functions, and staff, became part of the Division of Habitat.

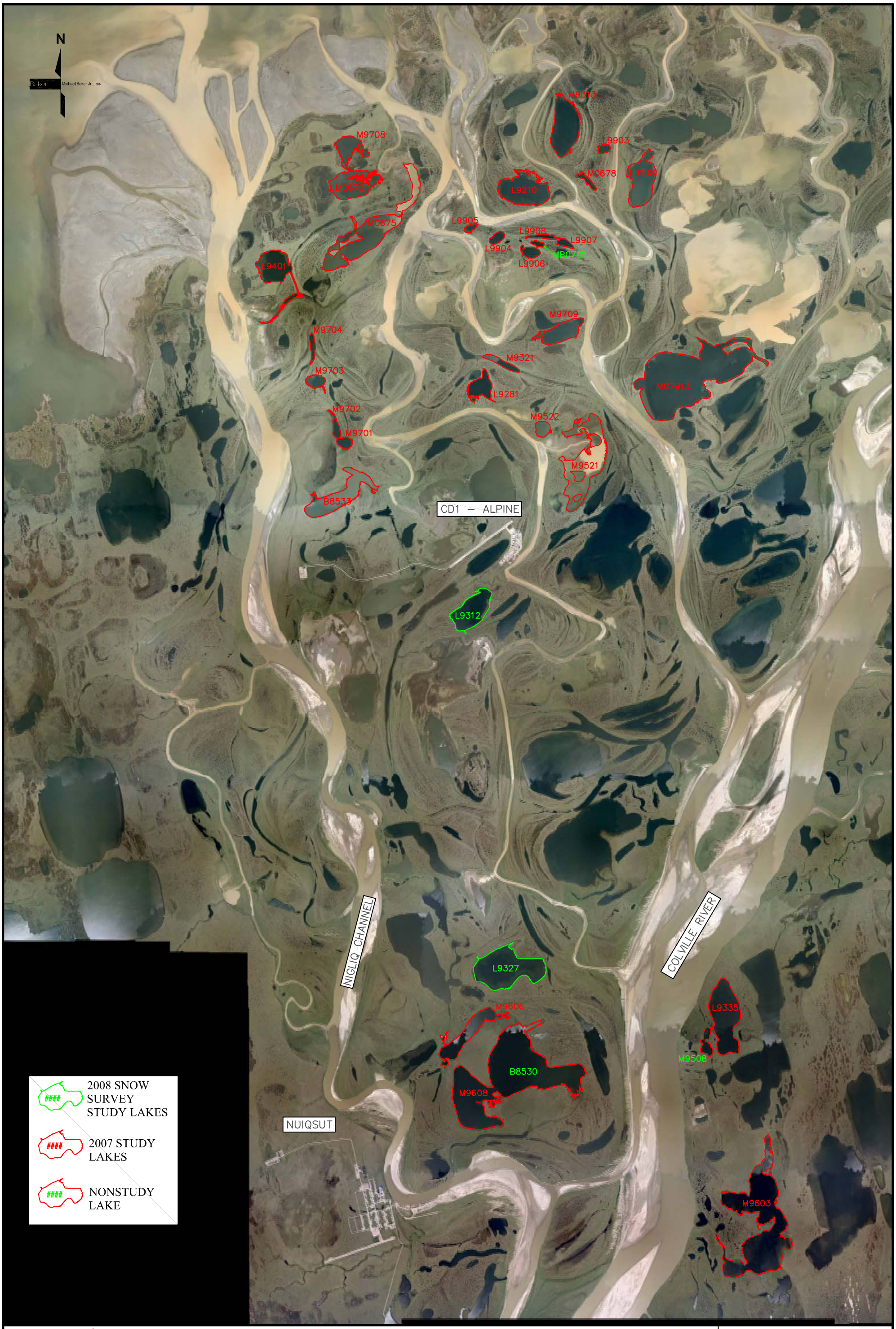
> *2. CPAI shall conduct snow surveys as late in the ice road season as possible to produce a final, end of season, estimate of recharge potential for each lake. A comparison of recharge potential vs. permitted volume shall be prepared and submitted. Snow surveys can be conducted at the same locations as in Stipulation #1.*

The purpose of this project was to conduct snow water equivalent surveys for two lakes in the Alpine vicinity and provide estimates of potential recharge for the four permitted lakes to satisfy the permit requirements. In addition, the lake recharge potential was estimated for the additional lakes that were included in *2007 Colville River Delta Lakes Recharge Monitoring and Analysis* (Baker 2007). Figure 1-1 presents the study lakes.

1.2 Background

The three primary mechanisms which contribute to the annual recharge of lakes in the CRD are spring breakup flooding from the Colville River and its distributaries, meteorological precipitation, and spring snowmelt. Floodwater recharge is dependent on the magnitude and distribution of floodwaters during spring breakup and the topography of the tundra surrounding each lake. From past observations, it is clear that not all lakes are recharged by floodwaters in an average year; however, during large flood events, the majority of CRD lakes are recharged by floodwaters. Local ice jams during spring breakup can also increase the number of lakes that are recharged, even during a low magnitude flood.

Lakes are recharged solely from snowmelt and summer precipitation in the absence of floodwater recharge. The magnitude of recharge due to snow melt is variable between lakes; dependent upon total catchment basin area and relative proportions of terrain types (e.g., lake and tundra) within a catchment basin, as well as local and surrounding topography. In general, snow cover on lake ice is thinner, denser, and comprises less SWE than snow cover on tundra. Snow depth also tends to increase on lake ice towards the west due to prevailing wind patterns and where steep banks are found. In addition to the spatial fluctuations in SWE, annual and seasonal variations also occur. The maximum SWE is generally measured in May prior to breakup on the North Slope (Keffries 2007).



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Baker
Michael Baker Jr., Inc.
A Unit of Michael Baker Corporation
1400 West Benson Blvd., Suite 200
Anchorage, Alaska 99503
Phone: (907) 273-1600
Fax: (907) 273-1699

COLVILLE RIVER DELTA
LAKE RECHARGE
STUDY LAKES

FIGURE 1-1
(SHEET 1 OF 1)

2.0 Study Methods

2.1 Catchment Basin Area Delineation

Catchment basin area delineation was performed for and presented in *2007 CRD Lakes Recharge Monitoring and Analysis* (Baker 2007). Lake water and catchment perimeters were determined for each study lake using aerial photography, topographic contours, and spot elevations. No changes were made to catchment basin areas for this study.

2.2 Snow Water Equivalent Surveys

Snow survey transects and sampling points were identified, based on the delineated basin and lake geometries. Sample location coordinates were stored in two Garmin GPSmap60 units to ensure valid field sampling. Sampling was conducted via snow machines using the double sampling method on December 28, 2007, and January 21, February 13, and May 16, 2008.

2.2.1 Double Sampling Method

The double sampling method was selected based on the limited depth of snow cover characteristic of the arctic. Goodison, Ferguson, and McKay (1981) suggest that in shallow snowpacks (less than 1 meter), depth and density have been found to be essentially independent with typically less temporal and spatial variability in density than in depth. Additionally, Rovansek, Kane, and Hinzman (1993) found that SWE estimates resulting from double sampling methods have less variance than when measuring snow mass and depth at every location. The double sampling method can also accelerate the execution of the sampling program, with depth measurements taking a fraction of the time required for measuring both depth and sample weight.

2.2.2 Sampling

Density measurements were conducted according to procedures outlined in *NRCS Snow Survey Sampling Guide* (NRCS 2006) and *British Columbia Snow Survey Manual* (BC Ministry of Environment 1981), using a $1^{5}/_{8}$-inch ID Model 3600 Mt. Rose (Standard Federal) snow sampling tube and scale. This particular sampler was chosen based on its common acceptance and use by the NRCS. Snow depth was sampled using a graduated snow pole. In addition, if shallow snow was encountered having a SWE of less than 2 inches, a bulk sampling was conducted (NRCS 2006). A bulk sampling is a grouping of multiple snow cores collected in the immediate area of the sample point, recording sample depth of each snow

core, and weighing of pooled core samples. From the bulk sampling an average snow depth, snow density, and SWE are calculated.

2.2.3 Snow Water Equivalent Calculations

Two primary terrain types comprise the catchment basins delineated within the CRD: lake and tundra. Terrain specific snow depths, densities, and SWE were calculated using equations presented in *2007 CRD Lakes Recharge Monitoring and Analysis* (Baker 2007) for each catchment basin and as an area-weighted average of the two terrain types. An area-weighted average of the two catchments was also calculated to represent delta wide snow depths, density, and SWE for each terrain type and an overall delta average.

3.0 Results

3.1 Catchment Basin Delineation

Lake and catchment perimeters were determined in 2007 for each of the 30 lakes, including L9327 (Baker 2007). Lake L9312 was also delineated for the 2007 study, but was not part of the 30 study lakes. Figure 3-1 and Figure 3-2 identify lake and catchment basin boundaries for the two surveyed lakes; L9312 and L9327 respectively. Terrain specific and total catchment basin areas for the two lakes are presented in Table 3-1.

Table 3-1 Terrain and Catchment Basin Areas

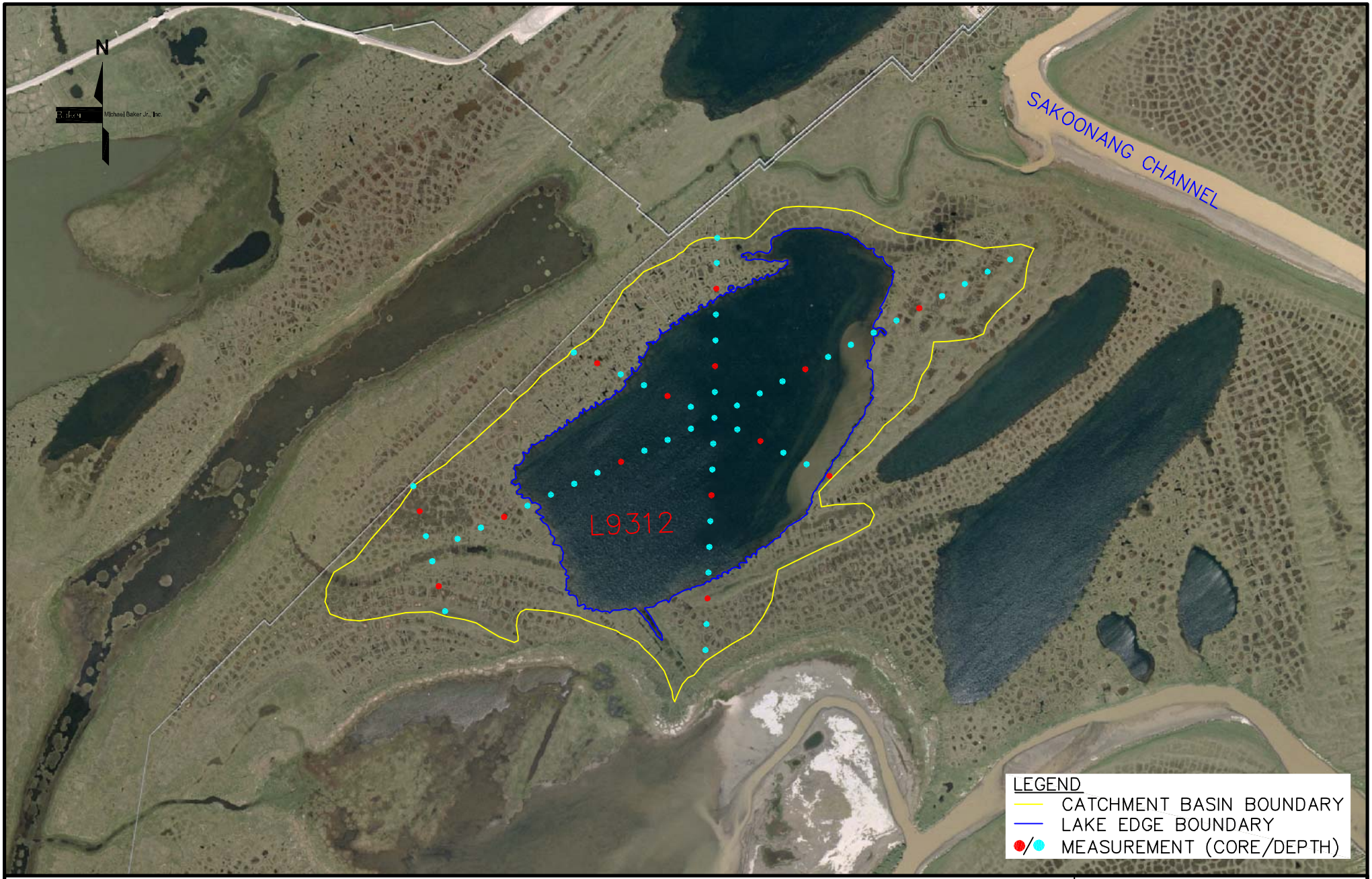
Lake	Area (ft^2)		
	Lake	Tundra	Catchment
L9312	4,861,000	4,943,500	9,804,500
L9327	9,710,000	8,900,300	18,610,300

The two representative sample lakes are hydraulically isolated in the absence of floodwaters. Persistent and seasonal hydraulic connectivity of neighboring lakes was evident from aerial and ground observations. This connectivity is described in more detail in Section 5.1 of Baker 2007 and is noted for those lakes in Table 4-2 and Table 4-3 in this report.

3.2 Snow Survey and Snow Water Equivalent

Snow surveys were conducted at the two representative lakes (L9312 and L9327) on four occasions between December 2007 and May 2008. Snow survey data sheets, including a list of sampling point locations, for each lake are presented in Appendix A. Sampling point locations are also presented in Figure 3-1 and Figure 3-2 for each lake and respective catchment basin.

Terrain specific values of density, snow depth, and SWE were calculated for each sample lake and are presented in Table 3-2 (Lake L9312) and Table 3-3 (Lake L9327). Similarly, area-weighted catchment basin and delta wide average SWE were calculated with results presented in Table 3-4 (CRD Average). Estimated delta wide values were determined using terrain specific density and snow depth values of the two sample lakes. Average terrain specific snow depth, density, and SWE are also presented relative to sample variability in Graph 3-1, Graph 3-2, and Graph 3-3.



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Baker

Michael Baker Jr., Inc.
A Unit of Michael Baker Corporation
1400 West Benson Blvd., Suite 200
Anchorage, Alaska 99503
Phone: (907) 273-1600
Fax: (907) 273-1699

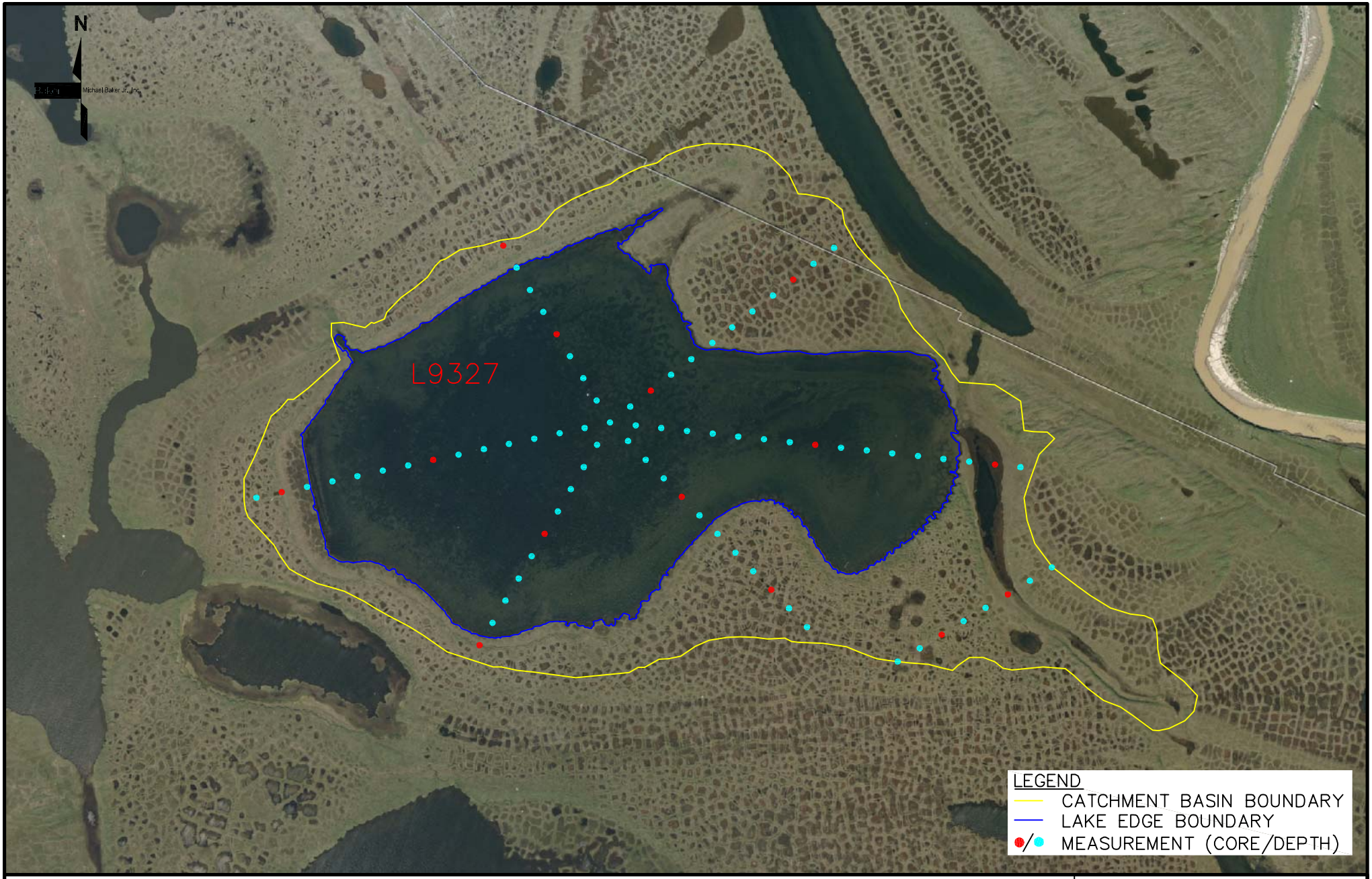
LAKE L9312

CATCHMENT BASIN AND

SNOW SURVEY POINTS

FIGURE 3-1

(SHEET1 OF1)



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Baker

Michael Baker Jr., Inc.
A Unit of Michael Baker Corporation
1400 West Benson Blvd., Suite 200
Anchorage, Alaska 99503
Phone: (907) 273-1600
Fax: (907) 273-1699

LAKE L9327

CATCHMENT BASIN AND SNOW SURVEY POINTS

FIGURE 3-2

(SHEET1 OF 1)

Table 3-2 Lake L9312 Snow Survey Results

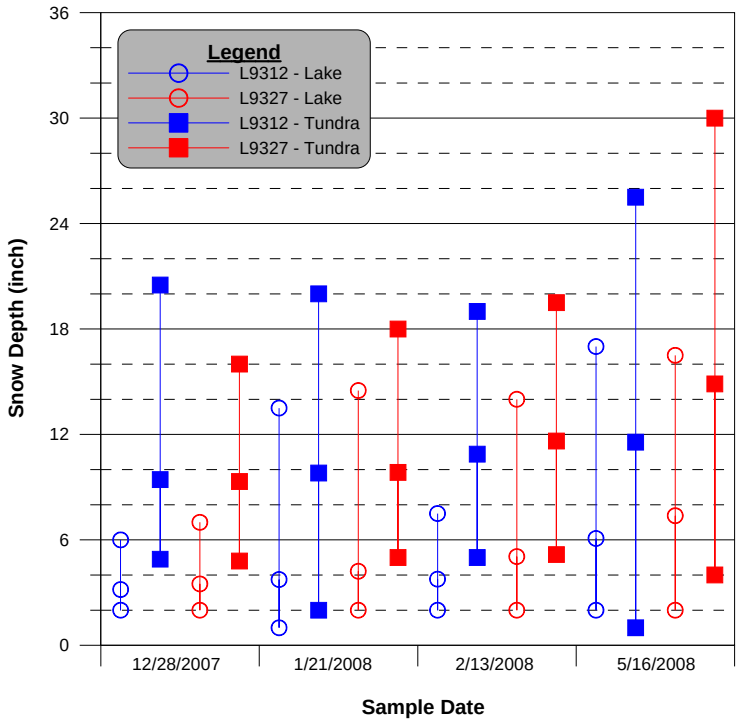
Date	Snow Depth		Snow Density		Snow Water Equivalent		Snow Water Equivalent
	Lake (in)	Tundra (in)	Lake (lb/in^3)	Tundra (lb/in^3)	Lake (in)	Tundra (in)	Catchment Basin (in)
12/28/2007	3.20	9.40	0.010	0.008	0.89	2.02	1.46
1/21/2008	3.74	9.80	0.009	0.009	0.93	2.31	1.63
2/13/2008	3.77	10.88	0.009	0.009	0.91	2.78	1.85
5/16/2008	6.08	11.56	0.011	0.010	1.87	3.20	2.54

Table 3-3 Lake L9327 Snow Survey Results

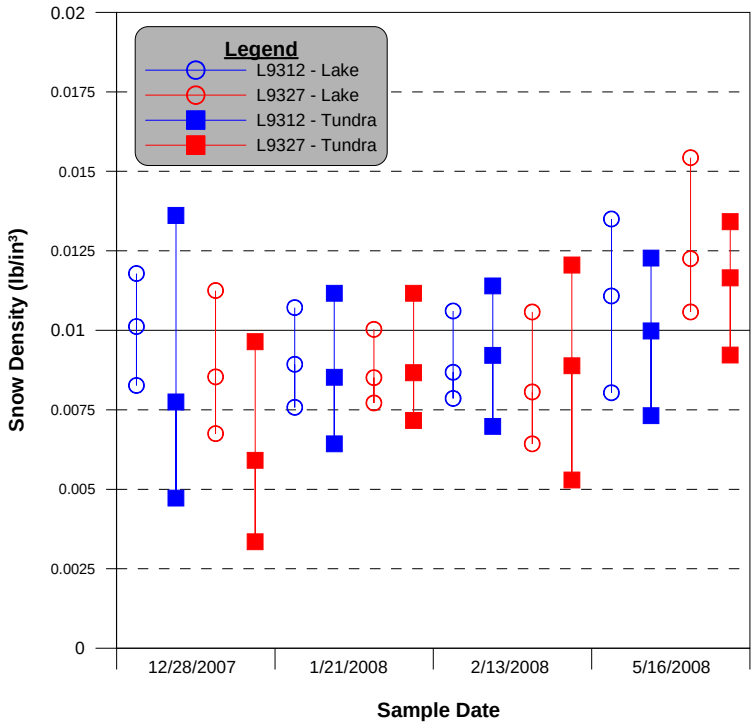
Date	Snow Depth		Snow Density		Snow Water Equivalent		Snow Water Equivalent
	Lake (in)	Tundra (in)	Lake (lb/in^3)	Tundra (lb/in^3)	Lake (in)	Tundra (in)	Catchment Basin (in)
12/28/2007	3.50	9.32	0.009	0.006	0.83	1.53	1.16
1/21/2008	4.22	9.84	0.009	0.009	0.99	2.36	1.65
2/13/2008	5.05	11.63	0.008	0.009	1.13	2.86	1.96
5/16/2008	7.38	14.88	0.012	0.012	2.50	4.80	3.60

Table 3-4 Colville River Delta Area-Weighted Average Snow Water Equivalent

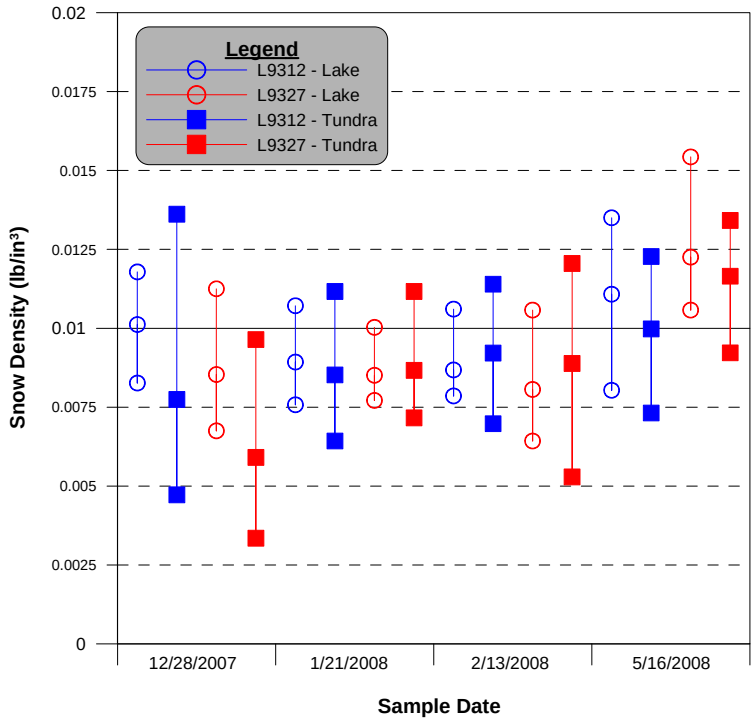
Date	Snow Depth		Snow Density		Snow Water Equivalent		Snow Water Equivalent
	Lake (in)	Tundra (in)	Lake (lb/in^3)	Tundra (lb/in^3)	Lake (in)	Tundra (in)	Delta Wide (in)
12/28/2007	3.40	9.35	0.009	0.007	0.85	1.70	1.27
1/21/2008	4.06	9.83	0.009	0.009	0.97	2.35	1.64
2/13/2008	4.62	11.36	0.008	0.009	1.05	2.83	1.92
5/16/2008	6.94	13.69	0.012	0.011	2.29	4.23	3.23



Graph 3-1 Minimum, Maximum, and Average Snow Depth



Graph 3-2 Minimum, Maximum, and Average Snow Density



Graph 3-3 Minimum, Maximum, and Average Snow Water Equivalent

4.0 Discussion

4.1 2008 Trends in Snow Water Equivalent

Overall snow cover on the lakes was thinner, denser, and comprised less SWE than on nearby tundra. As the season progressed, average values of depth, density, and SWE increased although maximum and minimum values varied without any significant trend. An area-weighted average of the two lakes generated similar increasing trends in depth, density, and SWE as the season progressed. Treating these values as representative estimates of snow pack conditions throughout the CRD, linear trend lines were applied to early season terrain specific and delta average SWE to predict end of season SWE. Resulting trend line equations, projected SWE, and end of season SWE are presented in Table 4-1.

Table 4-1 2008 Projected and End of Season Snow Water Equivalent

Type	Trend Line[1]	R^2 [2]	SWE (in)	
			Projected [3]	End of Season [4]
Tundra Average	SWE = 0.0241(ΔDAY) + 1.7237	0.9954	5.10	4.23
Lake Average	SWE = 0.0044(ΔDAY) + 0.8539	0.9892	1.47	2.29
Delta Average	SWE = 0.0137(ΔDAY) + 1.2864	0.9956	3.20	3.23

Notes:
1. Snow water equivalent (SWE) calculated from the number of days (ΔDAY) following December 28, 2007.
2. R^2 is the coefficient of determination for the trend line.
3. Projected SWE is predicted for May 16, 2008 using trend line equation.
4. End of Season SWE is calculated from snow survey data collected on May 16, 2008.

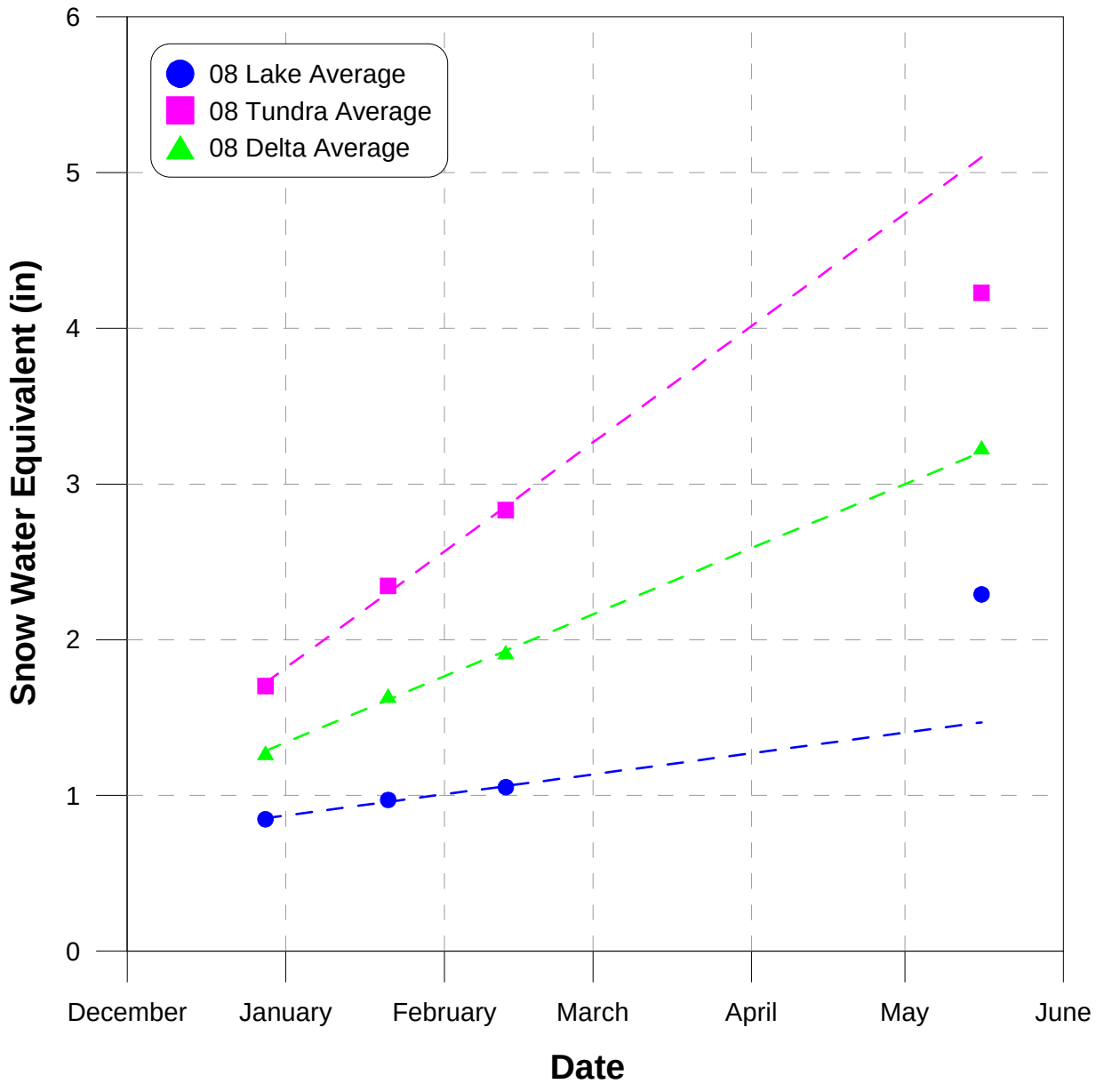
A graphical comparison of projected and end of season SWE across the CRD is presented in Graph 4-1. Early season terrain specific and delta wide averages suggest a linear trend of increasing SWE over the six week study period. End of season averages reveal an over estimate of tundra specific and an under estimate of lake specific predicted end of season SWE. However, the end of season delta wide average falls within 1% of that predicted by the early season trend line.

4.2 Potential Lake Water Recharge

Early season projected and end of season potential recharge volumes of the study lakes were calculated and compared to permitted withdrawal volumes, Table 4-2 and Table 4-3, respectively. In these tables, the last column presents the ratio of potential recharge volume to total permitted withdrawal volumes (water and ice). A value greater than one indicates the lake would potentially recharge to a volume exceeding the total permitted withdrawal. This suggests that an additional volume of ice aggregate,

greater than the current permitted volume, could be removed from the lake surface without affecting lake recharge and therefore not impacting fish habitat or water resource availability.

No significant change in the ratio of potential recharge to permit withdrawal volumes was observed between ratios calculated for projected and end of season SWE. Predictions for end of season recharge volumes appear reasonable based on this study. However, the delta wide average in this study is based only on two lakes and there is not enough data to develop conclusive answers about end of season predictions based on early season measurements. Beyond the data provided here, no long term trend has been established to justify the use of early season projected SWE in estimating potential lake recharge within the Delta.



Graph 4-1 2008 Trends in Colville River Delta Snow Water Equivalent

Table 4-2 Early Season Projected Recharge and Permitted Withdrawal Volumes

Lake Name	Permit Number	Current Permit Volume[1] (million gal.)			Total Basin Area (ft^2)	Lake Surface Area (ft^2)	Lake Recharge Volume Based on SWE (million gal.)[3,4]	Recharge: Permit Volume Ratio
		Water Withdrawal	Ice Aggregate Removal[2]	Total Permitted Withdrawal				
B8533/L9315	A2006-125	32.22	1.83	34.05	16,333,000	5,895,000	27.64	0.8
M9603	A2006-128	8.72	14.53	23.25	45,213,000	20,327,000	71.64	3.1
L9281	A2006-125	10.60	0.55	11.15	5,276,000	2,224,000	8.54	0.8
L9335	A2006-125	3.43	1.14	4.57	17,086,000	9,053,000	25.41	5.6
L9401	A2006-126	3.04	2.85	5.89	10,711,000	4,858,000	16.92	2.9
L9904	A2006-126	3.29	0.06	3.35	1,951,000	611,000	3.41	1.0
L9905	A2006-126	1.95	0.22	2.17	1,121,000	364,000	1.95	0.9
L9906	A2006-126	1.92	0.12	2.04	4,836,000	1,082,000	8.99	4.4
L9907	A2006-126	1.51	0.33	1.84	1,566,000	475,000	2.76	1.5
L9908	A2006-127	2.27	0.21	2.48	1,017,000	455,000	1.61	0.7
L9907 & L9908[5]	-	3.78	0.54	4.32	2,582,000	930,000	4.37	1.0
M9321	A2006-127	2.18	0.16	2.34	3,328,000	960,000	5.92	2.5
M9521	A2006-127	0.00	16.57	16.57	22,458,000	9,474,000	36.34	2.2
M9522	A2006-127	8.03	0.29	8.32	2,200,000	939,000	3.55	0.4
M9701	A2006-128	1.15	0.26	1.41	-	-	-	-
M9702	A2006-128	2.25	0.26	2.51	-	-	-	-
M9701 & M9702[6]	-	3.40	0.52	3.92	4,591,000	1,318,000	8.18	2.1
M9703	A2006-128	7.86	0.19	8.05	2,288,000	971,000	3.70	0.5
M9704	A2006-129	0.72	0.15	0.87	1,301,000	569,000	2.08	2.4
M9709	A2006-129	13.27	0.60	13.87	10,329,000	4,697,000	16.30	1.2
M0675	A2006-130	4.51	4.06	8.57	19,594,000	10,561,000	28.92	3.4
M0676	A2006-130	0.01	5.63	5.64	7,321,000	5,054,000	9.46	1.7
M0678	A2006-130	6.48	0.20	6.68	1,491,000	535,000	2.53	0.4
MC7913/M911	A2006-130	73.91	2.85	76.76	41,929,000	27,088,000	56.43	0.7
L9108	A2006-125	14.18	1.00	15.18	9,159,000	5,279,000	13.10	0.9
M9708	A2006-129	1.85	0.86	2.71	7,034,000	3,133,000	11.18	4.1
L9210/M9213	A2005-72	28.20	1.69	29.89	10,008,000	6,388,000	13.56	0.5
L9327	A2005-72	1.42	1.40	2.82	18,610,000	9,710,000	27.86	9.9
L9903	A2005-72	1.63	0.15	1.78	1,313,000	447,000	2.25	1.3
M9313	A2005-72	19.00	1.15	20.15	9,924,000	6,187,000	13.63	0.7
M9606	A2005-72	7.20	1.38	8.58	12,639,000	4,718,000	21.20	2.5
M9608	A2005-72	16.65	1.52	18.17	-	-	-	-
B8530[7]	A2003-63	22.34	0.00	22.34	-	-	-	-
M9608 & B8530[8]	-	38.99	1.52	40.51	64,714,000	28,516,000	103.24	2.5

Notes:
* Blue highlighted lakes are those identified in Amendment #2 of Fish Habitat Permits (FH05-III-) 0330, 0329, 0323, and 0338.
1. Permit withdrawal volumes are those presented in the report entitled *2007 Colville River Delta Lakes Recharge Monitoring and Analysis*.
2. Ice aggregate removal volumes were approved for the 2006/2007 winter season only.
3. Values based on projected terrain specific delta wide snow water equivalents: 1.47-inches (lake) and 5.10-inches (tundra).
4. A coefficient of 0.67 was used to calculate lake water recharge volume resulting from snowmelt runoff.
5. L9907 and L9908 hydraulically connected. A combined catchment is used in recharge calculations.
6. M9701 and M9702 hydraulically connected. A combined catchment is used in recharge calculations.
7. B8530 is not included in the thirty permitted study lakes.
8. B8530 and M9608 hydraulically connected. A combined catchment is used in recharge calculations.

Table 4-3 End of Season Potential Recharge and Permitted Withdrawal Volumes

Lake Name	Permit Number	Current Permit Volume[1] (million gal.)			Total Basin Area (ft^2)	Lake Surface Area (ft^2)	Lake Recharge Volume Based on SWE (million gal.)[3,4]	Recharge: Permit Volume Ratio
		Water Withdrawal	Ice Aggregate Removal[2]	Total Permitted Withdrawal				
B8533/L9315	A2006-125	32.22	1.83	34.05	16,333,000	5,895,000	26.86	0.8
M9603	A2006-128	8.72	14.53	23.25	45,213,000	20,327,000	72.98	3.1
L9281	A2006-125	10.60	0.55	11.15	5,276,000	2,224,000	8.57	0.8
L9335	A2006-125	3.43	1.14	4.57	17,086,000	9,053,000	27.12	5.9
L9401	A2006-126	3.04	2.85	5.89	10,711,000	4,858,000	17.28	2.9
L9904	A2006-126	3.29	0.06	3.35	1,951,000	611,000	3.24	1.0
L9905	A2006-126	1.95	0.22	2.17	1,121,000	364,000	1.86	0.9
L9906	A2006-126	1.92	0.12	2.04	4,836,000	1,082,000	8.18	4.0
L9907	A2006-126	1.51	0.33	1.84	1,566,000	475,000	2.61	1.4
L9908	A2006-127	2.27	0.21	2.48	1,017,000	455,000	1.64	0.7
L9907 & L9908[5]	-	3.78	0.54	4.32	2,582,000	930,000	4.25	1.0
M9321	A2006-127	2.18	0.16	2.34	3,328,000	960,000	5.55	2.4
M9521	A2006-127	0.00	16.57	16.57	22,458,000	9,474,000	36.46	2.2
M9522	A2006-127	8.03	0.29	8.32	2,200,000	939,000	3.57	0.4
M9701	A2006-128	1.15	0.26	1.41	-	-	-	-
M9702	A2006-128	2.25	0.26	2.51	-	-	-	-
M9701 & M9702[6]	-	3.40	0.52	3.92	4,591,000	1,318,000	7.66	2.0
M9703	A2006-128	7.86	0.19	8.05	2,288,000	971,000	3.71	0.5
M9704	A2006-129	0.72	0.15	0.87	1,301,000	569,000	2.11	2.4
M9709	A2006-129	13.27	0.60	13.87	10,329,000	4,697,000	16.66	1.2
M0675	A2006-130	4.51	4.06	8.57	19,594,000	10,561,000	31.03	3.6
M0676	A2006-130	0.01	5.63	5.64	7,321,000	5,054,000	11.22	2.0
M0678	A2006-130	6.48	0.20	6.68	1,491,000	535,000	2.45	0.4
MC7913/M911	A2006-130	73.91	2.85	76.76	41,929,000	27,088,000	64.89	0.8
L9108	A2006-125	14.18	1.00	15.18	9,159,000	5,279,000	14.39	0.9
M9708	A2006-129	1.85	0.86	2.71	7,034,000	3,133,000	11.36	4.2
L9210/M9213	A2005-72	28.20	1.69	29.89	10,008,000	6,388,000	15.51	0.5
L9327	A2005-72	1.42	1.40	2.82	18,610,000	9,710,000	29.59	10.5
L9903	A2005-72	1.63	0.15	1.78	1,313,000	447,000	2.17	1.2
M9313	A2005-72	19.00	1.15	20.15	9,924,000	6,187,000	15.43	0.8
M9606	A2005-72	7.20	1.38	8.58	12,639,000	4,718,000	20.73	2.4
M9608	A2005-72	16.65	1.52	18.17	-	-	-	-
B8530[7]	A2003-63	22.34	0.00	22.34	-	-	-	-
M9608 & B8530[8]	-	38.99	1.52	40.51	64,714,000	28,516,000	104.66	2.6

Notes:
* Blue highlighted lakes are those identified in Amendment #2 of Fish Habitat Permits (FH05-III-) 0330, 0329, 0323, and 0338.
1. Permit withdrawal volumes are those presented in the report entitled *2007 Colville River Delta Lakes Recharge Monitoring and Analysis*.
2. Ice aggregate removal volumes were approved for the 2006/2007 winter season only.
3. Values based on an estimated terrain specific delta wide snow water equivalents: 2.29-inches (lake) and 4.23-inches (tundra).
4. A coefficient of 0.67 was used to calculate lake water recharge volume resulting from snowmelt runoff.
5. L9907 and L9908 are hydraulically connected. A combined catchment is used in recharge calculations.
6. M9701 and M9702 are hydraulically connected. A combined catchment is used in recharge calculations.
7. B8530 is not included in the thirty permitted study lakes.
8. B8530 and M9608 are hydraulically connected. A combined catchment is used in recharge calculations.

5.0 References

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Appendix A Snow Survey Sheets

Snow Survey Data Sheet									
Date: 12/28/2007			**Start Time:** 12:00		**End Time:** 14:30		**Observers:** MDM, OOO		
Catchement Basin: L9312			**Driving Wrench Used:** Yes				**Tube Section Used:** 1		
Snow Sample No.	**Sample Type**	**Terrain Type**	**Snow Depth (in)**		**Core Length (in)**	**Tube & Core Weight (lb)**	**Empty Tube Weight (lb)**	**Water Equivalent (in)**	**Density (lb/in^3)**
			w/ Dirt Plug	**w/o Dirt Plug**					
SS47*	Core	Tundra	—	6.2	—	0.68	0.32	1.60	0.009
SS48*	Core	Lake	—	2.4	—	0.54	0.32	0.59	0.009
SS49*	Core	Tundra	—	11.2	—	0.68	0.32	1.60	0.005
SS50*	Core	Lake	—	2.0	—	0.54	0.32	0.59	0.011
SS51*	Core	Lake	—	5.0	—	0.62	0.32	1.34	0.010
SS52*	Core	Tundra	—	12.3	—	0.72	0.34	2.54	0.007
SS53*	Core	Tundra	—	8.0	—	0.68	0.32	1.60	0.007
SS54*	Core	Lake	—	3.0	—	0.54	0.32	0.98	0.012
SS55*	Core	Lake	—	2.0	—	0.56	0.32	0.46	0.008
SS56*	Core	Lake	—	2.0	—	0.56	0.32	0.64	0.012
SS57	Core	Tundra	17.0	17.0	—	3.14	2.66	6.41	0.014
SS58*	Core	Tundra	—	7.5	—	0.54	0.32	1.47	0.007
SS59*	Core	Tundra	—	4.9	—	0.56	0.32	0.64	0.005
SS60*	Core	Tundra	—	8.5	—	0.58	0.32	1.74	0.007
SS61	Depth	Lake	—	2.0					
SS62	Depth	Lake	—	2.0					
SS63	Depth	Tundra	—	7.0					
SS64	Depth	Tundra	—	9.0					
SS65	Depth	Lake	—	5.0					
SS66	Depth	Lake	—	2.0					
SS67	Depth	Lake	—	2.5					
SS68	Depth	Lake	—	3.0					
SS69	Depth	Lake	—	4.0					
SS70	Depth	Lake	—	2.0					
SS71	Depth	Lake	—	2.5					
SS72	Depth	Lake	—	3.0					
SS73	Depth	Lake	—	3.5					
SS74	Depth	Lake	—	3.5					
SS75	Depth	Lake	—	2.0					
SS76	Depth	Lake	—	2.0					
SS77	Depth	Tundra	—	5.0					
SS78	Depth	Tundra	—	6.5					
SS79	Depth	Tundra	—	11.0					
SS80	Depth	Tundra	—	7.0					
SS81	Depth	Tundra	—	7.0					
SS82	Depth	Tundra	—	20.5					
SS83	Depth	Lake	—	4.5					
SS84	Depth	Lake	—	4.0					
SS85	Depth	Lake	—	6.0					
SS86	Depth	Tundra	—	5.0					
SS87	Depth	Tundra	—	10.0					
SS88	Depth	Lake	—	3.5					
SS89	Depth	Lake	—	4.5					
SS90	Depth	Tundra	—	10.5					
SS91	Depth	Tundra	—	12.0					
SS92	Depth	Lake	—	2.0					
SS93	Depth	Lake	—	3.5					
SS94	Depth	Lake	—	3.5					
SS95	Depth	Lake	—	2.0					
SS96	Depth	Lake	—	6.0					
SS97	Depth	Lake	—	3.5					
SS98	Depth	Tundra	—	9.0					
SS99	Depth	Tundra	—	13.5					
SS100	Depth	Tundra	—	8.0					
SS101	Depth	Tundra	—	9.5					
SS102	Depth	Tundra	—	10.5					
SS103	Depth	Tundra	—	10.0					
SS104	Depth	Tundra	—	8.0					

Snow Survey Calculations

Average Area: Tundra = 4943536 ft^2; Lake = 4860982 ft^2

Average SWE: Tundra = 2.02 in; Lake = 0.89 in

Average Snow Depth: Tundra = 9.4 in; Lake = 3.2 in

Average Density: Tundra = 0.008 lb/in^3; Lake = 0.010 lb/in^3

Catchement Basin Weighted SWE = 1.46 in

NOTES:

* Pooled sample measurement conducted, snow depth without dirt plug, SWE, and density represents the average of pooled samples.

Pooled Snow Survey Data Sheet									
Date: 12/28/2007			**Start Time:** 12:00		**End Time:** 14:30		**Observers:** MDM, OOO		
Catchement Basin: L9312			**Driving Wrench Used:** Yes				**Tube Section Used:** 1		
Snow Sample No.	**Pooled Sample #**	**Terrain Type**	**Snow Depth (in)**		**Core Length (in)**	**Bucket & Core Weight (lb)**	**Empty Bucket Weight (lb)**	**Water Equivalent (in)**	**Density (lb/in^3)**
			w/ Dirt Plug	**w/o Dirt Plug**					
SS47	1	Tundra	7.5	6.5	—	—	0.32	—	—
	2	Tundra	6.5	5.5	—	—	—	—	—
	3	Tundra	8.0	6.5	—	—	—	—	—
			Sum =	**18.5**		0.68	**0.36**	4.81	—
			Average =	**6.2**			**0.12**	1.60	0.009
SS48	1	Lake	—	2.0	—	—	0.32	—	—
	2	Lake	—	2.5	—	—	—	—	—
	3	Lake	—	2.5	—	—	—	—	—
	4	Lake	—	2.5	—	—	—	—	—
	5	Lake	—	2.5	—	—	—	—	—
			Sum =	**12.0**		0.54	**0.22**	2.94	—
			Average =	**2.4**			**0.04**	0.59	0.009
SS49	1	Tundra	15.0	11.0	—	—	0.32	—	—
	2	Tundra	15.5	11.5	—	—	—	—	—
	3	Tundra	14.0	11.0	—	—	—	—	—
			Sum =	**33.5**		0.68	**0.36**	—	—
			Average =	**11.2**			**0.12**	1.60	0.005
SS50	1	Lake	—	2.0	—	—	0.32	—	—
	2	Lake	—	2.0	—	—	—	—	—
	3	Lake	—	2.0	—	—	—	—	—
	4	Lake	—	2.0	—	—	—	—	—
	5	Lake	—	2.0	—	—	—	—	—
			Sum =	**10.0**		0.54	**0.22**	2.94	—
			Average =	**2.0**			**0.04**	0.59	0.011
SS51	1	Lake	—	5.0	—	—	0.32	—	—
	2	Lake	—	5.0	—	—	—	—	—
	3	Lake	—	5.0	—	—	—	—	—
			Sum =	**15.0**		0.62	**0.3**	—	—
			Average =	**5.0**			**0.10**	1.34	0.010
SS52	1	Tundra	13.0	12.0	—	—	0.34	—	—
	2	Tundra	14.0	12.5	—	—	—	—	—
			Sum =	**24.5**		0.72	**0.38**	—	—
			Average =	**12.3**			**0.19**	2.54	0.007
SS53	1	Tundra	11.0	8.0	—	—	0.32	—	—
	2	Tundra	9.5	7.5	—	—	—	—	—
	3	Tundra	10.0	8.5	—	—	—	—	—
			Sum =	**24.0**		0.68	**0.36**	—	—
			Average =	**8.0**			**0.12**	1.60	0.007
SS54	1	Lake	—	3.0	—	—	0.32	—	—
	2	Lake	—	3.0	—	—	—	—	—
	3	Lake	—	3.0	—	—	—	—	—
			Sum =	**9.0**		0.54	**0.22**	—	—
			Average =	**3.0**			**0.07**	0.98	0.012
SS55	1	Lake	—	2.0	—	—	0.32	—	—
	2	Lake	—	2.0	—	—	—	—	—
	3	Lake	—	2.0	—	—	—	—	—
	4	Lake	—	2.0	—	—	—	—	—
	5	Lake	—	2.0	—	—	—	—	—
	6	Lake	—	2.0	—	—	—	—	—
	7	Lake	—	2.0	—	—	—	—	—
			Sum =	**14.0**		0.56	**0.24**	—	—
			Average =	**2.0**			**0.03**	0.46	0.008
SS56	1	Lake	—	2.0	—	—	0.32	—	—
	2	Lake	—	2.0	—	—	—	—	—
	3	Lake	—	2.0	—	—	—	—	—
	4	Lake	—	2.0	—	—	—	—	—
	5	Lake	—	2.0	—	—	—	—	—
			Sum =	**10.0**		0.54	**0.22**	—	—
			Average =	**2.0**			**0.04**	0.59	0.011
SS58	1	Tundra	9.0	8.0	—	—	0.32	—	—
	2	Tundra	9.0	7.0	—	—	—	—	—
			Sum =	**15.0**		0.54	**0.22**	—	—
			Average =	**7.5**			**0.11**	1.47	0.007
SS59	1	Tundra	5.5	5.0	—	—	0.32	—	—
	2	Tundra	6.0	4.5	—	—	—	—	—
	3	Tundra	5.5	5.0	—	—	—	—	—
	4	Tundra	5.5	5.0	—	—	—	—	—
	5	Tundra	5.5	5.0	—	—	—	—	—
			Sum =	**24.5**		0.56	**0.24**	—	—
			Average =	**4.9**			**0.05**	0.64	0.005
SS60	1	Tundra	9.5	9.0	—	—	0.32	—	—
	2	Tundra	8.5	8.0	—	—	—	—	—
			Sum =	**17.0**		0.58	**0.26**	—	—
			Average =	**8.5**			**0.13**	1.74	0.007

Snow Sample #	Catchement Basin	Sample Type	Lat. (NAD 83)	Long. (NAD 83)
SS47	L9312	Core	N 70° 20' 03.02"	W 150° 56' 11.68"
SS48	L9312	Core	N 70° 19' 58.24"	W 150° 56' 37.19"
SS49	L9312	Core	N 70° 19' 50.13"	W 150° 56' 31.39"
SS50	L9312	Core	N 70° 19' 52.70"	W 150° 56' 47.14"
SS51	L9312	Core	N 70° 19' 58.38"	W 150° 56' 57.60"
SS52	L9312	Core	N 70° 20' 04.26"	W 150° 56' 57.58"
SS53	L9312	Core	N 70° 19' 40.66"	W 150° 56' 58.51"
SS54	L9312	Core	N 70° 19' 48.53"	W 150° 56' 58.01"
SS55	L9312	Core	N 70° 19' 56.04"	W 150° 57' 08.28"
SS56	L9312	Core	N 70° 19' 50.96"	W 150° 57' 18.57"
SS57	L9312	Core	N 70° 19' 46.64"	W 150° 57' 44.79"
SS58	L9312	Core	N 70° 19' 58.45"	W 150° 57' 24.34"
SS59	L9312	Core	N 70° 19' 41.28"	W 150° 57' 59.42"
SS60	L9312	Core	N 70° 19' 46.98"	W 150° 58' 03.93"
SS61	L9312	Depth	N 70° 19' 51.0"	W 150° 56' 36.57"
SS62	L9312	Depth	N 70° 19' 51.87"	W 150° 56' 41.85"
SS63	L9312	Depth	N 70° 19' 36.72"	W 150° 56' 58.81"
SS64	L9312	Depth	N 70° 19' 38.69"	W 150° 56' 58.71"
SS65	L9312	Depth	N 70° 19' 42.63"	W 150° 56' 58.41"
SS66	L9312	Depth	N 70° 19' 44.59"	W 150° 56' 58.31"
SS67	L9312	Depth	N 70° 19' 46.56"	W 150° 56' 58.11"
SS68	L9312	Depth	N 70° 19' 50.50"	W 150° 56' 57.91"
SS69	L9312	Depth	N 70° 19' 52.47"	W 150° 56' 57.71"
SS70	L9312	Depth	N 70° 19' 54.44"	W 150° 56' 57.61"
SS71	L9312	Depth	N 70° 19' 53.57"	W 150° 56' 52.33"
SS72	L9312	Depth	N 70° 19' 55.38"	W 150° 56' 52.53"
SS73	L9312	Depth	N 70° 19' 56.32"	W 150° 56' 47.45"
SS74	L9312	Depth	N 70° 19' 57.30"	W 150° 56' 42.27"
SS75	L9312	Depth	N 70° 19' 59.19"	W 150° 56' 32.11"
SS76	L9312	Depth	N 70° 20' 00.16"	W 150° 56' 26.93"
SS77	L9312	Depth	N 70° 20' 01.10"	W 150° 56' 21.84"
SS78	L9312	Depth	N 70° 20' 02.05"	W 150° 56' 16.76"
SS79	L9312	Depth	N 70° 20' 03.96"	W 150° 56' 06.50"
SS80	L9312	Depth	N 70° 20' 04.91"	W 150° 56' 01.42"
SS81	L9312	Depth	N 70° 20' 05.88"	W 150° 55' 56.33"
SS82	L9312	Depth	N 70° 20' 06.82"	W 150° 55' 51.25"
SS83	L9312	Depth	N 70° 19' 56.41"	W 150° 56' 57.60"
SS84	L9312	Depth	N 70° 20' 00.35"	W 150° 56' 57.59"
SS85	L9312	Depth	N 70° 20' 02.29"	W 150° 56' 57.59"
SS86	L9312	Depth	N 70° 20' 06.23"	W 150° 56' 57.58"
SS87	L9312	Depth	N 70° 20' 08.13"	W 150° 56' 57.58"
SS88	L9312	Depth	N 70° 19' 55.24"	W 150° 57' 02.99"
SS89	L9312	Depth	N 70° 19' 56.85"	W 150° 57' 13.67"
SS90	L9312	Depth	N 70° 19' 57.62"	W 150° 57' 18.96"
SS91	L9312	Depth	N 70° 19' 59.22"	W 150° 57' 29.64"
SS92	L9312	Depth	N 70° 19' 53.56"	W 150° 57' 02.87"
SS93	L9312	Depth	N 70° 19' 52.72"	W 150° 57' 08.14"
SS94	L9312	Depth	N 70° 19' 51.84"	W 150° 57' 13.31"
SS95	L9312	Depth	N 70° 19' 50.12"	W 150° 57' 23.83"
SS96	L9312	Depth	N 70° 19' 49.24"	W 150° 57' 29.10"
SS97	L9312	Depth	N 70° 19' 48.36"	W 150° 57' 34.36"
SS98	L9312	Depth	N 70° 19' 47.52"	W 150° 57' 39.53"
SS99	L9312	Depth	N 70° 19' 45.76"	W 150° 57' 50.06"
SS100	L9312	Depth	N 70° 19' 44.92"	W 150° 57' 55.32"
SS101	L9312	Depth	N 70° 19' 43.17"	W 150° 58' 00.86"
SS102	L9312	Depth	N 70° 19' 39.36"	W 150° 57' 57.88"
SS103	L9312	Depth	N 70° 19' 45.06"	W 150° 58' 02.40"
SS104	L9312	Depth	N 70° 19' 48.87"	W 150° 58' 05.47"

Snow Survey Data Sheet									
Date:	12/28/2007		**Start Time:**	8:30	**End Time:**	11:30	**Observers:**	OOO, MDM	
Catchement Basin:	L9327		**Driving Wrench Used:**		Yes		**Tube Section Used:**		1

Snow Sample No.	Sample Type	Terrain Type	Snow Depth (in)		Core Length (in)	Tube & Core Weight (lb)	Empty Tube Weight (lb)	Water Equivalent (in)	Density (lb/in^3)
			w/ Dirt Plug	w/o Dirt Plug					
SS204*	Core	Tundra	—	10.0	—	—	—	1.74	0.006
SS205*	Core	Lake	—	6.0	—	—	—	1.47	0.009
SS206*	Core	Tundra	—	5.3	—	—	—	0.87	0.006
SS207*	Core	Lake	—	2.5	—	—	—	0.67	0.010
SS208*	Core	Lake	—	4.3	—	—	—	0.87	0.007
SS209*	Core	Tundra	—	7.8	—	—	—	0.75	0.003
SS210*	Core	Lake	—	4.0	—	—	—	1.25	0.011
SS211*	Core	Lake	—	4.0	—	—	—	0.75	0.007
SS212*	Core	Lake	—	3.0	—	—	—	0.64	0.008
SS213*	Core	Tundra	—	4.8	—	—	—	0.45	0.003
SS214*	Core	Tundra	—	8.5	—	—	—	0.87	0.004
SS215*	Core	Tundra	—	8.0	—	—	—	2.00	0.009
SS216*	Core	Lake	—	3.5	—	—	—	0.80	0.008
SS217	Core	Tundra	18.0	16.0	—	0.64	0.32	4.27	0.010
SS218	Depth	Lake	—	4.0					
SS219	Depth	Lake	—	3.0					
SS220	Depth	Lake	—	6.0					
SS221	Depth	Lake	—	4.0					
SS222	Depth	Lake	—	2.0					
SS223	Depth	Lake	—	2.0					
SS224	Depth	Lake	—	6.0					
SS225	Depth	Lake	—	3.5					
SS226	Depth	Lake	—	3.0					
SS227	Depth	Lake	—	2.5					
SS228	Depth	Tundra	—	7.5					
SS229	Depth	Tundra	—	6.0					
SS230	Depth	Tundra	—	8.0					
SS231	Depth	Tundra	—	5.5					
SS232	Depth	Tundra	—	11.5					
SS233	Depth	Tundra	—	14.5					
SS234	Depth	Lake	—	2.5					
SS235	Depth	Lake	—	3.0					
SS236	Depth	Lake	—	3.0					
SS237	Depth	Lake	—	3.0					
SS238	Depth	Lake	—	3.0					
SS239	Depth	Lake	—	3.5					
SS240	Depth	Lake	—	2.5					
SS241	Depth	Lake	—	2.5					
SS242	Depth	Lake	—	3.0					
SS243	Depth	Lake	—	2.5					
SS244	Depth	Lake	—	4.0					
SS245	Depth	Lake	—	2.5					
SS246	Depth	Tundra	—	8.5					
SS247	Depth	Tundra	—	8.0					
SS248	Depth	Tundra	—	6.0					
SS249	Depth	Tundra	—	11.0					
SS250	Depth	Tundra	—	14.0					
SS251	Depth	Tundra	—	11.5					
SS252	Depth	Tundra	—	6.0					
SS253	Depth	Tundra	—	11.5					
SS254	Depth	Tundra	—	10.0					
SS255	Depth	Tundra	—	8.5					
SS256	Depth	Tundra	—	10.0					
SS257	Depth	Tundra	—	6.0					
SS258	Depth	Tundra	—	9.0					
SS259	Depth	Lake	—	7.0					
SS260	Depth	Lake	—	3.0					
SS261	Depth	Lake	—	5.0					
SS262	Depth	Lake	—	3.0					
SS263	Depth	Lake	—	2.5					
SS264	Depth	Lake	—	3.0					
SS265	Depth	Lake	—	3.5					
SS266	Depth	Lake	—	4.0					
SS267	Depth	Lake	—	4.5					
SS268	Depth	Lake	—	3.0					
SS269	Depth	Lake	—	4.5					
SS270	Depth	Lake	—	2.5					
SS271	Depth	Tundra	—	16.0					
SS272	Depth	Tundra	—	11.5					
SS273	Depth	Lake	—	3.0					
SS274	Depth	Lake	—	5.5					
SS275	Depth	Lake	—	3.5					
SS276	Depth	Lake	—	4.0					
SS277	Depth	Lake	—	4.0					
SS278	Depth	Lake	—	3.5					
SS279	Depth	Lake	—	2.5					
SS280	Depth	Lake	—	3.0					
SS281	Depth	Lake	—	3.0					
SS282	Depth	Lake	—	2.5					

Snow Survey Calculations

Average Area:	Tundra =	8900253	ft^2
	Lake =	9710027	ft^2
Average SWE:	Tundra =	1.53	in
	Lake =	0.83	in
Average Snow Depth:	Tundra =	9.3	in
	Lake =	3.5	in
Average Density:	Tundra =	0.006	lb/in^3
	Lake =	0.009	lb/in^3
Catchement Basin Weighted SWE =		1.16	in

NOTES:

* Pooled sample measurement conducted, snow depth without dirt plug, SWE, and density represents the average of pooled samples.

Pooled Snow Survey Data Sheet									
Date: 12/28/2007			**Start Time:** 8:30		**End Time:** 11:30		**Observers:** OOO, MDM		
Catchement Basin: L9327			**Driving Wrench Used:** Yes				**Tube Section Used:** 1		
Snow Sample No.	**Pooled Sample #**	**Terrain Type**	**Snow Depth (in)**		**Core Length (in)**	**Bucket & Core Weight (lb)**	**Empty Bucket Weight (lb)**	**Water Equivalent (in)**	**Density (lb/in^3)**
			w/ Dirt Plug	**w/o Dirt Plug**					
SS204	1	Tundra	11.0	10.0	—	—	0.34	—	—
	2	Tundra	10.0	10.0	—	—	—	—	—
			Sum =	**20.0**		0.6	**0.26**	3.47	—
			Average =	**10.0**			**0.13**	1.74	0.006
SS205	1	Lake	—	6.0	—	—	0.34	—	—
	2	Lake	—	6.0	—	—	—	—	—
			Sum =	**12.0**		0.56	**0.22**	2.94	—
			Average =	**6.0**			**0.11**	1.47	0.009
SS206	1	Tundra	8.0	6.0	—	—	0.32	—	—
	2	Tundra	4.0	3.0	—	—	—	—	—
	3	Tundra	7.0	6.0	—	—	—	—	—
	4	Tundra	8.0	6.0	—	—	—	—	—
			Sum =	**21.0**		0.58	**0.26**	3.47	—
			Average =	**5.3**			**0.07**	0.87	0.006
SS207	1	Lake	—	2.5	—	—	0.32	—	—
	2	Lake	—	2.5	—	—	—	—	—
	3	Lake	—	2.5	—	—	—	—	—
	4	Lake	—	2.5	—	—	—	—	—
			Sum =	**10.0**		0.52	**0.2**	2.67	—
			Average =	**2.5**			**0.05**	0.67	0.010
SS208	1	Lake	—	4.5	—	—	0.32	—	—
	2	Lake	—	4.0	—	—	—	—	—
	3	Lake	—	4.0	—	—	—	—	—
	4	Lake	—	4.5	—	—	—	—	—
			Sum =	**17.0**		0.58	**0.26**	3.47	—
			Average =	**4.3**			**0.07**	0.87	0.007
SS209	1	Tundra	10.0	9.0	—	—	0.32	—	—
	2	Tundra	10.0	8.0	—	—	—	—	—
	3	Tundra	10.0	7.0	—	—	—	—	—
	4	Tundra	9.0	8.0	—	—	—	—	—
	5	Tundra	9.0	7.0	—	—	—	—	—
			Sum =	**39.0**		0.6	**0.28**	3.74	—
			Average =	**7.8**			**0.06**	0.75	0.003
SS210	1	Lake	—	4.0	—	—	0.34	—	—
	2	Lake	—	4.0	—	—	—	—	—
	3	Lake	—	4.0	—	—	—	—	—
			Sum =	**12.0**		0.62	**0.28**	3.74	—
			Average =	**4.0**			**0.09**	1.25	0.011
SS211	1	Lake	—	4.0	—	—	0.34	—	—
	2	Lake	—	4.0	—	—	—	—	—
	3	Lake	—	4.0	—	—	—	—	—
	4	Lake	—	4.0	—	—	—	—	—
	5	Lake	—	4.0	—	—	—	—	—
			Sum =	**20.0**		0.62	**0.28**	3.74	—
			Average =	**4.0**			**0.06**	0.75	0.007
SS212	1	Lake	—	3.0	—	—	0.34	—	—
	2	Lake	—	3.0	—	—	—	—	—
	3	Lake	—	3.0	—	—	—	—	—
	4	Lake	—	3.0	—	—	—	—	—
	5	Lake	—	3.0	—	—	—	—	—
			Sum =	**15.0**		0.58	**0.24**	3.20	—
			Average =	**3.0**			**0.05**	0.64	0.008
SS213	1	Tundra	6.0	5.0	—	—	0.34	—	—
	2	Tundra	8.0	6.0	—	—	—	—	—
	3	Tundra	5.0	4.0	—	—	—	—	—
	4	Tundra	6.0	4.0	—	—	—	—	—
	5	Tundra	5.0	4.0	—	—	—	—	—
	6	Tundra	7.0	6.0	—	—	—	—	—
			Sum =	**29.0**		0.54	**0.2**	2.67	—
			Average =	**4.8**			**0.03**	0.45	0.003
SS214	1	Tundra	10.0	8.0	—	—	0.32	—	—
	2	Tundra	10.0	8.0	—	—	—	—	—
	3	Tundra	11.0	9.0	—	—	—	—	—
	4	Tundra	11.0	9.0	—	—	—	—	—
			Sum =	**34.0**		0.58	**0.26**	3.47	—
			Average =	**8.5**			**0.07**	0.87	0.004
SS215	1	Tundra	9.0	8.0	—	—	0.32	—	—
	2	Tundra	9.0	8.0	—	—	—	—	—
		Tundra	**Sum =**	**16.0**		0.62	**0.3**	4.01	—
			Average =	**8.0**			**0.15**	2.00	0.009
SS216	1	Lake	—	3.5	—	—	0.32	—	—
	2	Lake	—	3.5	—	—	—	—	—
	3	Lake	—	3.5	—	—	—	—	—
	4	Lake	—	3.5	—	—	—	—	—
			Sum =	**14.0**		0.56	**0.24**	3.20	—
			Average =	**3.5**			**0.06**	0.80	0.008

Snow Sample #	Catchement Basin	Sample Type	Lat. (NAD 83)	Long. (NAD 83)
SS204	L9327	Core	N 70° 15' 45.07"	W 150° 56' 48.65"
SS205	L9327	Core	N 70° 15' 47.68"	W 150° 56' 14.56"
SS206	L9327	Core	N 70° 16' 04.11"	W 150° 55' 59.53"
SS207	L9327	Core	N 70° 15' 57.44"	W 150° 55' 47.20"
SS208	L9327	Core	N 70° 15' 53.22"	W 150° 55' 25.74"
SS209	L9327	Core	N 70° 16' 01.87"	W 150° 54' 53.99"
SS210	L9327	Core	N 70° 15' 47.99"	W 150° 54' 07.90"
SS211	L9327	Core	N 70° 15' 49.31"	W 150° 54' 48.48"
SS212	L9327	Core	N 70° 15' 45.16"	W 150° 55' 18.43"
SS213	L9327	Core	N 70° 15' 38.21"	W 150° 54' 57.92"
SS214	L9327	Core	N 70° 15' 34.98"	W 150° 54' 19.36"
SS215	L9327	Core	N 70° 15' 38.14"	W 150° 54' 04.61"
SS216	L9327	Core	N 70° 15' 42.19"	W 150° 55' 49.22"
SS217	L9327	Core	N 70° 15' 33.64"	W 150° 56' 03.55"
SS218	L9327	Depth	N 70° 15' 50.75"	W 150° 55' 34.88"
SS219	L9327	Depth	N 70° 15' 52.43"	W 150° 55' 37.96"
SS220	L9327	Depth	N 70° 15' 54.11"	W 150° 55' 41.04"
SS221	L9327	Depth	N 70° 15' 55.76"	W 150° 55' 44.12"
SS222	L9327	Depth	N 70° 15' 59.09"	W 150° 55' 50.29"
SS223	L9327	Depth	N 70° 16' 00.78"	W 150° 55' 53.37"
SS224	L9327	Depth	N 70° 16' 02.43"	W 150° 55' 56.45"
SS225	L9327	Depth	N 70° 15' 51.99"	W 150° 55' 30.36"
SS226	L9327	Depth	N 70° 15' 54.46"	W 150° 55' 21.22"
SS227	L9327	Depth	N 70° 15' 55.70"	W 150° 55' 16.70"
SS228	L9327	Depth	N 70° 15' 56.94"	W 150° 55' 12.08"
SS229	L9327	Depth	N 70° 15' 58.15"	W 150° 55' 07.66"
SS230	L9327	Depth	N 70° 15' 59.39"	W 150° 55' 03.13"
SS231	L9327	Depth	N 70° 16' 00.63"	W 150° 54' 58.52"
SS232	L9327	Depth	N 70° 16' 03.08"	W 150° 54' 49.48"
SS233	L9327	Depth	N 70° 16' 04.32"	W 150° 54' 44.95"
SS234	L9327	Depth	N 70° 15' 50.58"	W 150° 55' 29.07"
SS235	L9327	Depth	N 70° 15' 50.39"	W 150° 55' 23.26"
SS236	L9327	Depth	N 70° 15' 50.22"	W 150° 55' 17.44"
SS237	L9327	Depth	N 70° 15' 50.03"	W 150° 55' 11.63"
SS238	L9327	Depth	N 70° 15' 49.83"	W 150° 55' 05.92"
SS239	L9327	Depth	N 70° 15' 49.67"	W 150° 55' 00.11"
SS240	L9327	Depth	N 70° 15' 49.47"	W 150° 54' 54.30"
SS241	L9327	Depth	N 70° 15' 49.11"	W 150° 54' 42.67"
SS242	L9327	Depth	N 70° 15' 48.91"	W 150° 54' 36.86"
SS243	L9327	Depth	N 70° 15' 48.75"	W 150° 54' 31.15"
SS244	L9327	Depth	N 70° 15' 48.55"	W 150° 54' 25.34"
SS245	L9327	Depth	N 70° 15' 48.36"	W 150° 54' 19.53"
SS246	L9327	Depth	N 70° 15' 48.19"	W 150° 54' 13.71"
SS247	L9327	Depth	N 70° 15' 47.83"	W 150° 54' 02.09"
SS248	L9327	Depth	N 70° 15' 40.22"	W 150° 53' 54.75"
SS249	L9327	Depth	N 70° 15' 39.18"	W 150° 53' 59.73"
SS250	L9327	Depth	N 70° 15' 37.06"	W 150° 54' 09.50"
SS251	L9327	Depth	N 70° 15' 36.02"	W 150° 54' 14.48"
SS252	L9327	Depth	N 70° 15' 33.91"	W 150° 54' 24.25"
SS253	L9327	Depth	N 70° 15' 32.87"	W 150° 54' 29.23"
SS254	L9327	Depth	N 70° 15' 35.40"	W 150° 54' 49.80"
SS255	L9327	Depth	N 70° 15' 36.80"	W 150° 54' 53.86"
SS256	L9327	Depth	N 70° 15' 39.58"	W 150° 55' 02.08"
SS257	L9327	Depth	N 70° 15' 40.98"	W 150° 55' 06.15"
SS258	L9327	Depth	N 70° 15' 42.39"	W 150° 55' 10.21"
SS259	L9327	Depth	N 70° 15' 43.79"	W 150° 55' 14.37"
SS260	L9327	Depth	N 70° 15' 46.57"	W 150° 55' 22.59"
SS261	L9327	Depth	N 70° 15' 47.97"	W 150° 55' 26.65"
SS262	L9327	Depth	N 70° 15' 49.37"	W 150° 55' 30.72"
SS263	L9327	Depth	N 70° 15' 49.04"	W 150° 55' 37.73"
SS264	L9327	Depth	N 70° 15' 47.32"	W 150° 55' 40.58"
SS265	L9327	Depth	N 70° 15' 45.61"	W 150° 55' 43.42"
SS266	L9327	Depth	N 70° 15' 43.90"	W 150° 55' 46.37"
SS267	L9327	Depth	N 70° 15' 40.48"	W 150° 55' 52.06"
SS268	L9327	Depth	N 70° 15' 38.77"	W 150° 55' 54.91"
SS269	L9327	Depth	N 70° 15' 37.06"	W 150° 55' 57.76"
SS270	L9327	Depth	N 70° 15' 35.35"	W 150° 56' 00.70"
SS271	L9327	Depth	N 70° 15' 44.65"	W 150° 56' 54.33"
SS272	L9327	Depth	N 70° 15' 45.52"	W 150° 56' 42.97"
SS273	L9327	Depth	N 70° 15' 45.94"	W 150° 56' 37.29"
SS274	L9327	Depth	N 70° 15' 46.39"	W 150° 56' 31.61"
SS275	L9327	Depth	N 70° 15' 46.81"	W 150° 56' 25.93"
SS276	L9327	Depth	N 70° 15' 47.26"	W 150° 56' 20.24"
SS277	L9327	Depth	N 70° 15' 48.13"	W 150° 56' 08.88"
SS278	L9327	Depth	N 70° 15' 48.58"	W 150° 56' 03.19"
SS279	L9327	Depth	N 70° 15' 49.01"	W 150° 55' 57.61"
SS280	L9327	Depth	N 70° 15' 49.46"	W 150° 55' 51.93"
SS281	L9327	Depth	N 70° 15' 49.88"	W 150° 55' 46.24"
SS282	L9327	Depth	N 70° 15' 50.33"	W 150° 55' 40.56"

Snow Survey Data Sheet									
Date: 1/21/2008			**Start Time:** 12:00		**End Time:** 14:00		**Observers:** MDM, EJK		
Catchement Basin: L9312			**Driving Wrench Used:** Yes				**Tube Section Used:** 1		
Snow Sample No.	**Sample Type**	**Terrain Type**	**Snow Depth (in)**		**Core Length (in)**	**Tube & Core Weight (lb)**	**Empty Tube Weight (lb)**	**Water Equivalent (in)**	**Density (lb/in^3)**
			w/ Dirt Plug	**w/o Dirt Plug**					
SS47*	Core	Tundra	—	9.5	—	—	—	2.94	0.011
SS48*	Core	Lake	—	2.0	—	—	—	0.49	0.009
SS49*	Core	Tundra	—	3.6	—	—	—	0.69	0.007
SS50*	Core	Lake	—	2.0	—	—	—	0.42	0.008
SS51*	Core	Lake	—	1.8	—	—	—	0.37	0.008
SS52*	Core	Tundra	—	4.8	—	—	—	0.98	0.007
SS53*	Core	Tundra	—	8.8	—	—	—	2.00	0.008
SS54*	Core	Lake	—	2.3	—	—	—	0.53	0.008
SS55*	Core	Lake	—	2.0	—	—	—	0.59	0.011
SS56*	Core	Lake	—	1.5	—	—	—	0.45	0.011
SS57*	Core	Tundra	—	11.8	—	—	—	2.94	0.009
SS58*	Core	Tundra	—	5.5	—	—	—	0.98	0.006
SS59*	Core	Tundra	—	10.0	—	—	—	2.80	0.010
SS60*	Core	Tundra	—	9.8	—	—	—	2.40	0.009
SS61	Depth	Lake	—	3.5					
SS62	Depth	Lake	—	1.0					
SS63	Depth	Tundra	—	16.0					
SS64	Depth	Tundra	—	14.0					
SS65	Depth	Lake	—	8.0					
SS66	Depth	Lake	—	5.0					
SS67	Depth	Lake	—	6.5					
SS68	Depth	Lake	—	1.0					
SS69	Depth	Lake	—	3.0					
SS70	Depth	Lake	—	2.5					
SS71	Depth	Lake	—	1.5					
SS72	Depth	Lake	—	1.5					
SS73	Depth	Lake	—	3.5					
SS74	Depth	Lake	—	3.0					
SS75	Depth	Lake	—	3.0					
SS76	Depth	Lake	—	1.5					
SS77	Depth	Tundra	—	2.0					
SS78	Depth	Tundra	—	5.5					
SS79	Depth	Tundra	—	6.0					
SS80	Depth	Tundra	—	7.0					
SS81	Depth	Tundra	—	7.0					
SS82	Depth	Tundra	—	20.0					
SS83	Depth	Lake	—	7.0					
SS84	Depth	Lake	—	13.5					
SS85	Depth	Lake	—	5.5					
SS86	Depth	Tundra	—	10.5					
SS87	Depth	Tundra	—	10.5					
SS88	Depth	Lake	—	4.5					
SS89	Depth	Lake	—	3.0					
SS90	Depth	Tundra	—	16.5					
SS91	Depth	Tundra	—	9.5					
SS92	Depth	Lake	—	4.0					
SS93	Depth	Lake	—	2.5					
SS94	Depth	Lake	—	3.0					
SS95	Depth	Lake	—	4.0					
SS96	Depth	Lake	—	8.0					
SS97	Depth	Lake	—	5.0					
SS98	Depth	Tundra	—	9.0					
SS99	Depth	Tundra	—	11.0					
SS100	Depth	Tundra	—	11.5					
SS101	Depth	Tundra	—	8.5					
SS102	Depth	Tundra	—	14.0					
SS103	Depth	Tundra	—	10.0					
SS104	Depth	Tundra	—	12.5					

Snow Survey Calculations

Average Area:	Tundra =	4943536	ft^2
	Lake =	4860982	ft^2
Average SWE:	Tundra =	2.31	in
	Lake =	0.93	in
Average Snow Depth:	Tundra =	9.8	in
	Lake =	3.7	in
Average Density:	Tundra =	0.009	lb/in^3
	Lake =	0.009	lb/in^3
Catchement Basin Weighted SWE =		1.63	in

NOTES:

* Pooled sample measurement conducted, snow depth without dirt plug, SWE, and density represents the average of pooled samples.

Pooled Snow Survey Data Sheet									
Date: 1/21/2008			**Start Time:** 12:00		**End Time:** 14:00		**Observers:** MDM, EJK		
Catchement Basin: L9312			**Driving Wrench Used:** Yes				**Tube Section Used:** 1		
Snow Sample No.	**Pooled Sample #**	**Terrain Type**	**Snow Depth (in)**		**Core Length (in)**	**Bucket & Core Weight (lb)**	**Empty Bucket Weight (lb)**	**Water Equivalent (in)**	**Density (lb/in^3)**
			w/ Dirt Plug	**w/o Dirt Plug**					
SS47	1	Tundra	—	9.5	—	—	0.34	—	—
	2	Tundra	—	9.5	—	—	—	—	—
			Sum =	**19.0**		0.78	**0.44**	5.87	—
			Average =	**9.5**			**0.22**	2.94	0.011
SS48	1	Lake	—	2.0	—	—	0.34	—	—
	2	Lake	—	2.0	—	—	—	—	—
	3	Lake	—	2.0	—	—	—	—	—
	4	Lake	—	2.0	—	—	—	—	—
	5	Lake	—	2.0	—	—	—	—	—
	6	Lake	—	2.0	—	—	—	—	—
			Sum =	**12.0**		0.56	**0.22**	2.94	—
			Average =	**2.0**			**0.04**	0.49	0.009
SS49	1	Tundra	—	4.0	—	—	0.34	—	—
	2	Tundra	—	3.0	—	—	—	—	—
	3	Tundra	—	3.5	—	—	—	—	—
	4	Tundra	—	4.0	—	—	—	—	—
	5	Tundra	—	3.5	—	—	—	—	—
			Sum =	**18.0**		0.6	**0.26**	—	—
			Average =	**3.6**			**0.05**	0.69	0.007
SS50	1	Lake	—	2.0	—	—	0.34	—	—
	2	Lake	—	2.0	—	—	—	—	—
	3	Lake	—	2.0	—	—	—	—	—
	4	Lake	—	2.0	—	—	—	—	—
	5	Lake	—	2.0	—	—	—	—	—
	6	Lake	—	2.0	—	—	—	—	—
	7	Lake	—	2.0	—	—	—	—	—
			Sum =	**14.0**		0.56	**0.22**	2.94	—
			Average =	**2.0**			**0.03**	0.42	0.008
SS51	1	Lake	—	2.0	—	—	0.34	—	—
	2	Lake	—	2.0	—	—	—	—	—
	3	Lake	—	2.0	—	—	—	—	—
	4	Lake	—	2.0	—	—	—	—	—
	5	Lake	—	1.5	—	—	—	—	—
	6	Lake	—	1.5	—	—	—	—	—
	7	Lake	—	1.5	—	—	—	—	—
	8	Lake	—	1.5	—	—	—	—	—
			Sum =	**14.0**		0.56	**0.22**	—	—
			Average =	**1.8**			**0.03**	0.37	0.008
SS52	1	Tundra	—	5.0	—	—	0.34	—	—
	2	Tundra	—	4.5	—	—	—	—	—
	3	Tundra	—	5.0	—	—	—	—	—
			Sum =	**14.5**		0.56	**0.22**	—	—
			Average =	**4.8**			**0.07**	0.98	0.007
SS53	1	Tundra	—	9.0	—	—	0.34	—	—
	2	Tundra	—	8.5	—	—	—	—	—
			Sum =	**17.5**		0.64	**0.3**	—	—
			Average =	**8.8**			**0.15**	2.00	0.008
SS54	1	Lake	—	2.0	—	—	0.34	—	—
	2	Lake	—	2.5	—	—	—	—	—
	3	Lake	—	2.5	—	—	—	—	—
	4	Lake	—	2.5	—	—	—	—	—
	5	Lake	—	2.5	—	—	—	—	—
	6	Lake	—	2.0	—	—	—	—	—
			Sum =	**14.0**		0.58	**0.24**	—	—
			Average =	**2.3**			**0.04**	0.53	0.008
SS55	1	Lake	—	2.0	—	—	0.34	—	—
	2	Lake	—	2.0	—	—	—	—	—
	3	Lake	—	2.0	—	—	—	—	—
	4	Lake	—	2.0	—	—	—	—	—
	5	Lake	—	2.0	—	—	—	—	—
			Sum =	**10.0**		0.56	**0.22**	—	—
			Average =	**2.0**			**0.04**	0.59	0.011
SS56	1	Lake	—	1.5	—	—	0.34	—	—
	2	Lake	—	1.5	—	—	—	—	—
	3	Lake	—	1.5	—	—	—	—	—
	4	Lake	—	1.5	—	—	—	—	—
	5	Lake	—	1.5	—	—	—	—	—
	6	Lake	—	1.5	—	—	—	—	—
			Sum =	**9.0**		0.54	**0.2**	—	—
			Average =	**1.5**			**0.03**	0.45	0.011
SS57	1	Tundra	—	11.5	—	—	0.34	—	—
	2	Tundra	—	12.0	—	—	—	—	—
			Sum =	**23.5**		0.78	**0.44**	—	—
			Average =	**11.8**			**0.22**	2.94	0.009

Pooled Snow Survey Data Sheet									
Date:	1/21/2008		**Start Time:**	12:00	**End Time:**	14:00	**Observers:**	MDM, EJK	
Catchement Basin:	L9312		**Driving Wrench Used:**		Yes		**Tube Section Used:**		1
Snow Sample No.	**Pooled Sample #**	**Terrain Type**	**Snow Depth (in)**		**Core Length (in)**	**Bucket & Core Weight (lb)**	**Empty Bucket Weight (lb)**	**Water Equivalent (in)**	**Density (lb/in^3)**
			w/ Dirt Plug	**w/o Dirt Plug**					
SS58	1	Tundra	—	5.5	—	—	0.34	—	—
	2	Tundra	—	5.5	—	—	—	—	—
	3	Tundra	—	5.5	—	—	—	—	—
			Sum =	**16.5**		0.56	**0.22**	—	—
			Average =	**5.5**			**0.07**	0.98	0.006
SS59	1	Tundra	—	10.0	—	—	0.34	—	—
	2	Tundra	—	10.0	—	—	—	—	—
			Sum =	**20.0**		0.76	**0.42**	—	—
			Average =	**10.0**			**0.21**	2.80	0.010
SS60	1	Tundra	—	10.0	—	—	0.34	—	—
	2	Tundra	—	9.5	—	—	—	—	—
			Sum =	**19.5**		0.7	**0.36**	—	—
			Average =	**9.8**			**0.18**	2.40	0.009

Snow Survey Data Sheet

Date:	1/21/2008	**Start Time:**	8:00	**End Time:**	11:00	**Observers:** MDM, EJK
Catchement Basin:	L9327	**Driving Wrench Used:**		Yes		**Tube Section Used:** 1

Snow Sample No.	Sample Type	Terrain Type	Snow Depth (in)		Core Length (in)	Tube & Core Weight (lb)	Empty Tube Weight (lb)	Water Equivalent (in)	Density (lb/in^3)
			w/ Dirt Plug	w/o Dirt Plug					
SS204*	Core	Tundra	—	6.3	—	—	—	1.34	0.008
SS205*	Core	Lake	—	5.3	—	—	—	1.42	0.010
SS206*	Core	Tundra	—	5	—	—	—	1.25	0.009
SS207*	Core	Lake	—	4.0	—	—	—	0.87	0.008
SS208*	Core	Lake	—	2.5	—	—	—	0.53	0.008
SS209*	Core	Tundra	—	11.3	—	—	—	2.94	0.009
SS210*	Core	Lake	—	3.3	—	—	—	0.73	0.008
SS211*	Core	Lake	—	3.0	—	—	—	0.67	0.008
SS212*	Core	Lake	—	6.5	—	—	—	1.47	0.008
SS213*	Core	Tundra	—	5.5	—	—	—	1.13	0.007
SS214*	Core	Tundra	—	12.0	—	—	—	2.94	0.009
SS215*	Core	Tundra	—	9.5	—	—	—	2.94	0.011
SS216*	Core	Lake	—	2.5	—	—	—	0.69	0.010
SS217	Core	Tundra	20.0	17.5	—	3.08	2.82	3.47	0.007
SS218	Depth	Lake	—	3.0					
SS219	Depth	Lake	—	8.0					
SS220	Depth	Lake	—	3.0					
SS221	Depth	Lake	—	3.5					
SS222	Depth	Lake	—	3.0					
SS223	Depth	Lake	—	3.0					
SS224	Depth	Lake	—	14.5					
SS225	Depth	Lake	—	4.0					
SS226	Depth	Lake	—	3.0					
SS227	Depth	Lake	—	3.0					
SS228	Depth	Tundra	—	5.5					
SS229	Depth	Tundra	—	6.5					
SS230	Depth	Tundra	—	7.0					
SS231	Depth	Tundra	—	7.5					
SS232	Depth	Tundra	—	12.0					
SS233	Depth	Tundra	—	6.0					
SS234	Depth	Lake	—	2.5					
SS235	Depth	Lake	—	3.0					
SS236	Depth	Lake	—	2.0					
SS237	Depth	Lake	—	2.5					
SS238	Depth	Lake	—	3.0					
SS239	Depth	Lake	—	3.0					
SS240	Depth	Lake	—	3.0					
SS241	Depth	Lake	—	2.0					
SS242	Depth	Lake	—	2.5					
SS243	Depth	Lake	—	3.0					
SS244	Depth	Lake	—	2.5					
SS245	Depth	Lake	—	3.0					
SS246	Depth	Tundra	—	10.5					
SS247	Depth	Tundra	—	9.5					
SS248	Depth	Tundra	—	7.0					
SS249	Depth	Tundra	—	9.5					
SS250	Depth	Tundra	—	9.5					
SS251	Depth	Tundra	—	13.0					
SS252	Depth	Tundra	—	5.0					
SS253	Depth	Tundra	—	16.5					
SS254	Depth	Tundra	—	12.5					
SS255	Depth	Tundra	—	10.0					
SS256	Depth	Tundra	—	13.0					
SS257	Depth	Tundra	—	6.5					
SS258	Depth	Tundra	—	7.0					
SS259	Depth	Lake	—	6.0					
SS260	Depth	Lake	—	6.0					
SS261	Depth	Lake	—	4.0					
SS262	Depth	Lake	—	7.5					
SS263	Depth	Lake	—	5.0					
SS264	Depth	Lake	—	4.0					
SS265	Depth	Lake	—	2.0					
SS266	Depth	Lake	—	4.5					
SS267	Depth	Lake	—	5.5					
SS268	Depth	Lake	—	6.0					
SS269	Depth	Lake	—	4.5					
SS270	Depth	Lake	—	4.0					
SS271	Depth	Tundra	—	18.0					
SS272	Depth	Tundra	—	16.5					
SS273	Depth	Lake	—	6.0					
SS274	Depth	Lake	—	8.0					
SS275	Depth	Lake	—	3.0					
SS276	Depth	Lake	—	3.0					
SS277	Depth	Lake	—	10.5					
SS278	Depth	Lake	—	4.0					
SS279	Depth	Lake	—	7.5					
SS280	Depth	Lake	—	3.0					
SS281	Depth	Lake	—	2.0					
SS282	Depth	Lake	—	2.0					

Snow Survey Calculations

Average Area:	Tundra =	8900253	ft^2
	Lake =	9710027	ft^2
Average SWE:	Tundra =	2.36	in
	Lake =	0.99	in
Average Snow Depth:	Tundra =	9.8	in
	Lake =	4.2	in
Average Density:	Tundra =	0.009	lb/in^3
	Lake =	0.009	lb/in^3
Catchement Basin Weighted SWE =		1.65	in

NOTES:

* Pooled sample measurement conducted, snow depth without dirt plug, SWE, and density represents the average of pooled samples.

Pooled Snow Survey Data Sheet									
Date: 1/21/2008			**Start Time:** 8:00		**End Time:** 11:00		**Observers:** MDM, EJK		
Catchement Basin: L9327			**Driving Wrench Used:** Yes				**Tube Section Used:** 1		
Snow Sample No.	**Pooled Sample #**	**Terrain Type**	**Snow Depth (in)**		**Core Length (in)**	**Bucket & Core Weight (lb)**	**Empty Bucket Weight (lb)**	**Water Equivalent (in)**	**Density (lb/in^3)**
			w/ Dirt Plug	**w/o Dirt Plug**					
SS204	1	Tundra	—	6.5	—	—	0.34	—	—
	2	Tundra	—	6.5	—	—	—	—	—
	3	Tundra	—	6.0	—	—	—	—	—
			Sum =	**19.0**		0.64	**0.3**	4.01	—
			Average =	**6.3**			**0.10**	1.34	0.008
SS205	1	Lake	—	5.0	—	—	0.34	—	—
	2	Lake	—	5.5	—	—	—	—	—
	3	Lake	—	5.5	—	—	—	—	—
			Sum =	**16.0**		0.66	**0.32**	4.27	—
			Average =	**5.3**			**0.11**	1.42	0.010
SS206	1	Tundra	—	5.0	—	—	0.34	—	—
	2	Tundra	—	5.5	—	—	—	—	—
	3	Tundra	—	4.5	—	—	—	—	—
			Sum =	**15.0**		0.62	**0.28**	3.74	—
			Average =	**5.0**			**0.09**	1.25	0.009
SS207	1	Lake	—	4.0	—	—	0.34	—	—
	2	Lake	—	4.0	—	—	—	—	—
	3	Lake	—	4.0	—	—	—	—	—
	4	Lake	—	4.0	—	—	—	—	—
			Sum =	**16.0**		0.6	**0.26**	3.47	—
			Average =	**4.0**			**0.07**	0.87	0.008
SS208	1	Lake	—	2.5	—	—	0.34	—	—
	2	Lake	—	2.5	—	—	—	—	—
	3	Lake	—	2.5	—	—	—	—	—
	4	Lake	—	2.5	—	—	—	—	—
	5	Lake	—	2.5	—	—	—	—	—
			Sum =	**12.5**		0.54	**0.2**	2.67	—
			Average =	**2.5**			**0.04**	0.53	0.008
SS209	1	Tundra	—	11.0	—	—	0.34	—	—
	2	Tundra	—	11.5	—	—	—	—	—
			Sum =	**22.5**		0.78	**0.44**	5.87	—
			Average =	**11.3**			**0.22**	2.94	0.009
SS210	1	Lake	—	3.5	—	—	0.34	—	—
	2	Lake	—	3.0	—	—	—	—	—
	3	Lake	—	3.0	—	—	—	—	—
	4	Lake	—	3.5	—	—	—	—	—
			Sum =	**13.0**		0.56	**0.22**	2.94	—
			Average =	**3.3**			**0.06**	0.73	0.008
SS211	1	Lake	—	3.0	—	—	0.34	—	—
	2	Lake	—	3.0	—	—	—	—	—
	3	Lake	—	3.0	—	—	—	—	—
	4	Lake	—	3.0	—	—	—	—	—
			Sum =	**12.0**		0.54	**0.2**	2.67	—
			Average =	**3.0**			**0.05**	0.67	0.008
SS212	1	Lake	—	6.5	—	—	0.32	—	—
	2	Lake	—	6.5	—	—	—	—	—
	3	Lake	—	6.5	—	—	—	—	—
	4	Lake	—	6.5	—	—	—	—	—
			Sum =	**26.0**		0.76	**0.44**	5.87	—
			Average =	**6.5**			**0.11**	1.47	0.008
SS213	1	Tundra	—	5.5	—	—	0.32	—	—
	2	Tundra	—	5.5	—	—	—	—	—
	3	Tundra	—	5.5	—	—	—	—	—
	4	Tundra	—	5.5	—	—	—	—	—
			Sum =	**22.0**		0.66	**0.34**	4.54	—
			Average =	**5.5**			**0.09**	1.13	0.007
SS214	1	Tundra	—	12.0	—	—	0.34	—	—
	2	Tundra	—	12.0	—	—	—	—	—
			Sum =	**24.0**		0.78	**0.44**	5.87	—
			Average =	**12.0**			**0.22**	2.94	0.009
SS215	1	Tundra	—	9.5	—	—	0.34	—	—
	2	Tundra	—	9.5	—	—	—	—	—
			Sum =	**19.0**		0.78	**0.44**	5.87	—
			Average =	**9.5**			**0.22**	2.94	0.011
SS216	1	Lake	—	2.5	—	—	0.32	—	—
	2	Lake	—	2.5	—	—	—	—	—
	3	Lake	—	2.5	—	—	—	—	—
	4	Lake	—	2.5	—	—	—	—	—
	5	Lake	—	2.5	—	—	—	—	—
			Sum =	**12.5**		0.58	**0.26**	3.47	—
			Average =	**2.5**			**0.05**	0.69	0.010

Snow Survey Data Sheet									
Date:	2/13/2008		**Start Time:**	10:30	**End Time:**	12:30	**Observers:**	MDM, OOO	
Catchement Basin:	L9312		**Driving Wrench Used:**		Yes		**Tube Section Used:**		1

Snow Sample No.	Sample Type	Terrain Type	Snow Depth (in)		Core Length (in)	Tube & Core Weight (lb)	Empty Tube Weight (lb)	Water Equivalent (in)	Density (lb/in^3)
			w/ Dirt Plug	w/o Dirt Plug					
SS47	Core	Tundra	15.0	14.5	—	0.64	0.32	4.27	0.011
SS48*	Core	Lake	—	2.7	—	—	—	0.59	0.008
SS49	Core	Tundra	13.0	11.0	—	0.58	0.32	3.47	0.011
SS50*	Core	Lake	—	3.5	—	—	—	0.89	0.009
SS51*	Core	Lake	—	3.8	—	—	—	1.10	0.011
SS52	Core	Tundra	11.5	9.5	—	0.52	0.32	2.67	0.010
SS53*	Core	Tundra	—	8.8	—	—	—	1.94	0.008
SS54*	Core	Lake	—	2.7	—	—	—	0.59	0.008
SS55*	Core	Lake	—	3.1	—	—	—	0.69	0.008
SS56*	Core	Lake	—	2.5	—	—	—	0.59	0.008
SS57*	Core	Tundra	—	11.8	—	—	—	2.27	0.007
SS58*	Core	Tundra	—	8.8	—	—	—	2.00	0.008
SS59	Core	Tundra	11.0	10.0	—	0.54	0.34	2.67	0.010
SS60	Core	Tundra	16.0	14.5	—	0.58	0.32	3.47	0.009
SS61	Depth	Lake	—	3.5					
SS62	Depth	Lake	—	2.0					
SS63	Depth	Tundra	—	11.0					
SS64	Depth	Tundra	—	9.0					
SS65	Depth	Lake	—	7.5					
SS66	Depth	Lake	—	3.0					
SS67	Depth	Lake	—	5.0					
SS68	Depth	Lake	—	2.0					
SS69	Depth	Lake	—	3.0					
SS70	Depth	Lake	—	2.0					
SS71	Depth	Lake	—	3.0					
SS72	Depth	Lake	—	3.0					
SS73	Depth	Lake	—	2.5					
SS74	Depth	Lake	—	2.0					
SS75	Depth	Lake	—	3.5					
SS76	Depth	Lake	—	2.0					
SS77	Depth	Tundra	—	5.0					
SS78	Depth	Tundra	—	8.5					
SS79	Depth	Tundra	—	19.0					
SS80	Depth	Tundra	—	9.0					
SS81	Depth	Tundra	—	9.0					
SS82	Depth	Tundra	—	10.5					
SS83	Depth	Lake	—	6.0					
SS84	Depth	Lake	—	7.5					
SS85	Depth	Lake	—	6.0					
SS86	Depth	Tundra	—	6.5					
SS87	Depth	Tundra	—	10.0					
SS88	Depth	Lake	—	5.0					
SS89	Depth	Lake	—	4.0					
SS90	Depth	Tundra	—	11.0					
SS91	Depth	Tundra	—	15.0					
SS92	Depth	Lake	—	4.0					
SS93	Depth	Lake	—	5.0					
SS94	Depth	Lake	—	2.0					
SS95	Depth	Lake	—	4.0					
SS96	Depth	Lake	—	6.0					
SS97	Depth	Lake	—	5.0					
SS98	Depth	Tundra	—	10.0					
SS99	Depth	Tundra	—	12.5					
SS100	Depth	Tundra	—	13.0					
SS101	Depth	Tundra	—	13.0					
SS102	Depth	Tundra	—	11.0					
SS103	Depth	Tundra	—	6.0					
SS104	Depth	Tundra	—	16.0					

Snow Survey Calculations

Average Area:	Tundra =	4943536	ft^2
	Lake =	4860982	ft^2
Average SWE:	Tundra =	2.78	in
	Lake =	0.91	in
Average Snow Depth:	Tundra =	10.9	in
	Lake =	3.8	in
Average Density:	Tundra =	0.009	lb/in^3
	Lake =	0.009	lb/in^3
Catchement Basin Weighted SWE =		1.85	in

NOTES:

* Pooled sample measurement conducted, snow depth without dirt plug, SWE, and density represents the average of pooled samples.

Pooled Snow Survey Data Sheet									
Date:	2/13/2008		**Start Time:**	10:30	**End Time:**	12:30	**Observers:**	MDM, OOO	
Catchement Basin:	L9312		**Driving Wrench Used:**		Yes		**Tube Section Used:**		1

Snow Sample No.	Pooled Sample #	Terrain Type	Snow Depth (in)		Core Length (in)	Bucket & Core Weight (lb)	Empty Bucket Weight (lb)	Water Equivalent (in)	Density (lb/in^3)
			w/ Dirt Plug	w/o Dirt Plug					
SS48	1	Lake	—	2.5	—	—	0.32	—	—
	2	Lake	—	2.5	—	—	—	—	—
	3	Lake	—	3.0	—	—	—	—	—
	4	Lake	—	3.0	—	—	—	—	—
	5	Lake	—	2.5	—	—	—	—	—
			Sum =	**13.5**		0.54	**0.22**	—	—
			Average =	**2.7**			**0.04**	0.59	0.008
SS50	1	Lake	—	3.5	—	—	0.32	—	—
	2	Lake	—	3.5	—	—	—	—	—
	3	Lake	—	3.5	—	—	—	—	—
			Sum =	**10.5**		0.52	**0.2**	—	—
			Average =	**3.5**			**0.07**	0.89	0.009
SS51	1	Lake	—	3.5	—	—	0.32	—	—
	2	Lake	—	4.0	—	—	—	—	—
	3	Lake	—	4.0	—	—	—	—	—
	4	Lake	—	3.5	—	—	—	—	—
			Sum =	**15.0**		0.65	**0.33**	—	—
			Average =	**3.8**			**0.08**	1.10	0.011
SS53	1	Tundra	11.0	8.5	—	—	0.34	—	—
	2	Tundra	11.0	9.0	—	—	—	—	—
			Sum =	**17.5**		0.63	**0.29**	—	—
			Average =	**8.8**			**0.15**	1.94	0.008
SS54	1	Lake	—	2.5	—	—	0.32	—	—
	2	Lake	—	2.5	—	—	—	—	—
	3	Lake	—	3.0	—	—	—	—	—
	4	Lake	—	3.0	—	—	—	—	—
	5	Lake	—	2.5	—	—	—	—	—
			Sum =	**13.5**		0.54	**0.22**	—	—
			Average =	**2.7**			**0.04**	0.59	0.008
SS55	1	Lake	—	3.0	—	—	0.34	—	—
	2	Lake	—	3.5	—	—	—	—	—
	3	Lake	—	3.0	—	—	—	—	—
	4	Lake	—	3.0	—	—	—	—	—
	5	Lake	—	3.0	—	—	—	—	—
			Sum =	**15.5**		0.6	**0.26**	—	—
			Average =	**3.1**			**0.05**	0.69	0.008
SS56	1	Lake	—	2.5	—	—	0.32	—	—
	2	Lake	—	2.5	—	—	—	—	—
	3	Lake	—	2.5	—	—	—	—	—
	4	Lake	—	2.5	—	—	—	—	—
	5	Lake	—	2.5	—	—	—	—	—
			Sum =	**12.5**		0.54	**0.22**	—	—
			Average =	**2.5**			**0.04**	0.59	0.008
SS57	1	Tundra	14	11.5	—	—	0.34	—	—
	2	Tundra	14.5	12.0	—	—	—	—	—
			Sum =	**23.5**		0.68	**0.34**	—	—
			Average =	**11.8**			**0.17**	2.27	0.007
SS58	1	Tundra	10.5	9.0	—	—	0.34	—	—
	2	Tundra	10.5	8.5	—	—	—	—	—
			Sum =	**17.5**		0.64	**0.3**	—	—
			Average =	**8.8**			**0.15**	2.00	0.008

Snow Survey Data Sheet									
Date:	2/13/2008		**Start Time:**	7:30	**End Time:**	10:00	**Observers:**	OOO, MDM	
Catchement Basin:	L9327		**Driving Wrench Used:**		Yes		**Tube Section Used:**		1
Snow Sample No.	**Sample Type**	**Terrain Type**	**Snow Depth (in)**		**Core Length (in)**	**Tube & Core Weight (lb)**	**Empty Tube Weight (lb)**	**Water Equivalent (in)**	**Density (lb/in^3)**
			w/ Dirt Plug	**w/o Dirt Plug**					
SS204	Core	Tundra	18	16	—	0.74	0.34	5.34	0.012
SS205*	Core	Lake	—	5.3	—	—	—	1.20	0.008
SS206*	Core	Tundra	—	6.4	—	—	—	0.93	0.005
SS207*	Core	Lake	—	4.5	—	—	—	0.87	0.007
SS208*	Core	Lake	—	3.0	—	—	—	0.64	0.008
SS209*	Core	Tundra	—	9.5	—	—	—	1.87	0.007
SS210*	Core	Lake	—	8.8	—	—	—	1.78	0.007
SS211*	Core	Lake	—	5.5	—	—	—	0.98	0.006
SS212*	Core	Lake	—	4.4	—	—	—	1.12	0.009
SS213*	Core	Tundra	—	5.2	—	—	—	0.98	0.007
SS214	Core	Tundra	16	15.0	—	0.62	0.34	3.74	0.009
SS215	Core	Tundra	15.5	14.5	—	0.68	0.32	4.81	0.012
SS216*	Core	Lake	—	3.1	—	—	—	0.91	0.011
SS217	Core	Tundra	18.5	16.5	—	0.66	0.32	4.54	0.010
SS218	Depth	Lake	—	3.5					
SS219	Depth	Lake	—	3.0					
SS220	Depth	Lake	—	9.0					
SS221	Depth	Lake	—	3.0					
SS222	Depth	Lake	—	4.0					
SS223	Depth	Lake	—	4.0					
SS224	Depth	Lake	—	14.0					
SS225	Depth	Lake	—	7.0					
SS226	Depth	Lake	—	3.5					
SS227	Depth	Lake	—	5.0					
SS228	Depth	Tundra	—	14.5					
SS229	Depth	Tundra	—	7.0					
SS230	Depth	Tundra	—	9.0					
SS231	Depth	Tundra	—	5.5					
SS232	Depth	Tundra	—	10.5					
SS233	Depth	Tundra	—	17.5					
SS234	Depth	Lake	—	3.0					
SS235	Depth	Lake	—	4.0					
SS236	Depth	Lake	—	3.0					
SS237	Depth	Lake	—	4.0					
SS238	Depth	Lake	—	3.0					
SS239	Depth	Lake	—	5.0					
SS240	Depth	Lake	—	4.5					
SS241	Depth	Lake	—	7.0					
SS242	Depth	Lake	—	7.0					
SS243	Depth	Lake	—	4.5					
SS244	Depth	Lake	—	4.0					
SS245	Depth	Lake	—	8.0					
SS246	Depth	Tundra	—	9.5					
SS247	Depth	Tundra	—	16.5					
SS248	Depth	Tundra	—	11.0					
SS249	Depth	Tundra	—	6.0					
SS250	Depth	Tundra	—	11.0					
SS251	Depth	Tundra	—	10.5					
SS252	Depth	Tundra	—	8.0					
SS253	Depth	Tundra	—	8.5					
SS254	Depth	Tundra	—	15.0					
SS255	Depth	Tundra	—	12.0					
SS256	Depth	Tundra	—	19.5					
SS257	Depth	Tundra	—	9.5					
SS258	Depth	Tundra	—	12.5					
SS259	Depth	Lake	—	6.5					
SS260	Depth	Lake	—	3.0					
SS261	Depth	Lake	—	3.5					
SS262	Depth	Lake	—	7.0					
SS263	Depth	Lake	—	2.0					
SS264	Depth	Lake	—	3.0					
SS265	Depth	Lake	—	6.0					
SS266	Depth	Lake	—	3.5					
SS267	Depth	Lake	—	9.5					
SS268	Depth	Lake	—	5.0					
SS269	Depth	Lake	—	4.0					
SS270	Depth	Lake	—	4.5					
SS271	Depth	Tundra	—	17.0					
SS272	Depth	Tundra	—	12.0					
SS273	Depth	Lake	—	4.0					
SS274	Depth	Lake	—	5.0					
SS275	Depth	Lake	—	6.0					
SS276	Depth	Lake	—	5.5					
SS277	Depth	Lake	—	8.0					
SS278	Depth	Lake	—	6.0					
SS279	Depth	Lake	—	6.0					
SS280	Depth	Lake	—	5.0					
SS281	Depth	Lake	—	3.0					
SS282	Depth	Lake	—	4.0					

Snow Survey Calculations

Average Area:	Tundra =	8900253	ft^2
	Lake =	9710027	ft^2
Average SWE:	Tundra =	2.86	in
	Lake =	1.13	in
Average Snow Depth:	Tundra =	11.6	in
	Lake =	5.1	in
Average Density:	Tundra =	0.009	lb/in^3
	Lake =	0.008	lb/in^3
Catchement Basin Weighted SWE =		1.96	in

NOTES:

* Pooled sample measurement conducted, snow depth without dirt plug, SWE, and density represents the average of pooled samples.

Pooled Snow Survey Data Sheet									
Date: 2/13/2008			**Start Time:** 7:30		**End Time:** 10:00		**Observers:** OOO, MDM		
Catchement Basin: L9327			**Driving Wrench Used:** Yes				**Tube Section Used:** 1		
Snow Sample No.	**Pooled Sample #**	**Terrain Type**	**Snow Depth (in)**		**Core Length (in)**	**Bucket & Core Weight (lb)**	**Empty Bucket Weight (lb)**	**Water Equivalent (in)**	**Density (lb/in^3)**
			w/ Dirt Plug	**w/o Dirt Plug**					
SS205	1	Lake	—	5.0	—	—	0.34	—	—
	2	Lake	—	5.0	—	—	—	—	—
	3	Lake	—	5.5	—	—	—	—	—
	4	Lake	—	5.5	—	—	—	—	—
			Sum =	**21.0**		0.7	**0.36**	—	—
			Average =	**5.3**			**0.09**	1.20	0.008
SS206	1	Tundra	8.5	6.5	—	—	0.32	—	—
	2	Tundra	7.5	6.5	—	—	—	—	—
	3	Tundra	7	5.0	—	—	—	—	—
	4	Tundra	8.5	7.5	—	—	—	—	—
			Sum =	**25.5**		0.6	**0.28**	—	—
			Average =	**6.4**			**0.07**	0.93	0.005
SS207	1	Lake	—	4.5	—	—	0.34	—	—
	2	Lake	—	4.5	—	—	—	—	—
	3	Lake	—	4.5	—	—	—	—	—
	4	Lake	—	4.5	—	—	—	—	—
			Sum =	**18.0**		0.6	**0.26**	—	—
			Average =	**4.5**			**0.07**	0.87	0.007
SS208	1	Lake	—	3	—	—	0.34	—	—
	2	Lake	—	3	—	—	—	—	—
	3	Lake	—	3	—	—	—	—	—
	4	Lake	—	3	—	—	—	—	—
	5	Lake	—	3	—	—	—	—	—
			Sum =	**15.0**		0.58	**0.24**	—	—
			Average =	**3.0**			**0.05**	0.64	0.008
SS209	1	Tundra	12	9.0	—	—	0.34	—	—
	2	Tundra	11.5	10.0	—	—	—	—	—
			Sum =	**19.0**		0.62	**0.28**	—	—
			Average =	**9.5**			**0.14**	1.87	0.007
SS210	1	Lake	9.5	9.0	—	—	0.32	—	—
	2	Lake	9.5	9.0	—	—	—	—	—
	3	Lake	9	8.5	—	—	—	—	—
			Sum =	**26.5**		0.72	**0.4**	—	—
			Average =	**8.8**			**0.13**	1.78	0.007
SS211	1	Lake	—	5.5	—	—	0.34	—	—
	2	Lake	—	5.5	—	—	—	—	—
	3	Lake	—	5.5	—	—	—	—	—
			Sum =	**16.5**		0.56	**0.22**	—	—
			Average =	**5.5**			**0.07**	0.98	0.006
SS212	1	Lake	—	4.0	—	—	0.32	—	—
	2	Lake	—	4.5	—	—	—	—	—
	3	Lake	—	4.5	—	—	—	—	—
	4	Lake	—	4.0	—	—	—	—	—
	5	Lake	—	5.0	—	—	—	—	—
			Sum =	**22.0**		0.74	**0.42**	—	—
			Average =	**4.4**			**0.08**	1.12	0.009
SS213	1	Tundra	9	5.0	—	—	0.32	—	—
	2	Tundra	9	5.0	—	—	—	—	—
	4	Tundra	9	5.5	—	—	—	—	—
			Sum =	**15.5**		0.54	**0.22**	—	—
			Average =	**5.2**			**0.07**	0.98	0.007
SS215	1	Tundra	—	9.5	—	—	0.34	—	—
	2	Tundra	—	9.5	—	—	—	—	—
			Sum =	**19.0**		0.78	**0.44**	—	—
			Average =	**9.5**			**0.22**	2.94	0.011
SS216	1	Lake	—	3	—	—	0.32	—	—
	2	Lake	—	3	—	—	—	—	—
	3	Lake	—	3.5	—	—	—	—	—
	4	Lake	—	3	—	—	—	—	—
	5	Lake	—	3	—	—	—	—	—
			Sum =	**15.5**		0.66	**0.34**	—	—
			Average =	**3.1**			**0.07**	0.91	0.011

Snow Survey Data Sheet									
Date: 5/16/2008			**Start Time:** 10:30		**End Time:** 12:30		**Observers:** MDM, OOO, JPM		
Catchement Basin: L9312			**Driving Wrench Used:** Yes				**Tube Section Used:** 1		
Snow Sample No.	**Sample Type**	**Terrain Type**	**Snow Depth (in)**		**Core Length (in)**	**Tube & Core Weight (lb)**	**Empty Tube Weight (lb)**	**Water Equivalent (in)**	**Density (lb/in^3)**
			w/ Dirt Plug	**w/o Dirt Plug**					
SS47	Core	Tundra	26.0	25.0	—	2.06	1.52	7.21	0.010
SS48*	Core	Lake	—	4.0	—	—	—	0.89	0.008
SS49*	Core	Tundra	—	7.3	—	—	—	1.47	0.007
SS50*	Core	Lake	—	6.5	—	—	—	1.87	0.010
SS51	Core	Lake	8.0	8.0	—	0.5	0.3	2.67	0.012
SS52	Core	Tundra	16.0	14.0	—	1.74	1.48	3.47	0.009
SS53	Core	Tundra	23.0	22.0	—	1.98	1.42	7.48	0.012
SS54*	Core	Lake	—	4.5	—	—	—	1.34	0.011
SS55	Core	Lake	10.0	10.0	—	1.78	1.50	3.74	0.014
SS56*	Core	Lake	—	3.0	—	—	—	0.98	0.012
SS57	Core	Tundra	26.5	25.5	—	2.06	1.52	7.21	0.010
SS58*	Core	Tundra	—	8.0	—	—	—	2.14	0.010
SS59	Core	Tundra	20.5	19.0	—	1.90	1.52	5.07	0.010
SS60	Core	Tundra	13.0	11.0	—	1.76	1.50	3.47	0.011
SS61	Depth	Lake	—	5.0					
SS62	Depth	Lake	—	3.0					
SS63	Depth	Tundra	—	9.5					
SS64	Depth	Tundra	—	13.5					
SS65	Depth	Lake	—	17.0					
SS66	Depth	Lake	—	5.5					
SS67	Depth	Lake	—	4.0					
SS68	Depth	Lake	—	4.0					
SS69	Depth	Lake	—	3.0					
SS70	Depth	Lake	—	7.0					
SS71	Depth	Lake	—	5.0					
SS72	Depth	Lake	—	3.5					
SS73	Depth	Lake	—	5.0					
SS74	Depth	Lake	—	2.0					
SS75	Depth	Lake	—	2.0					
SS76	Depth	Lake	—	10.0					
SS77	Depth	Tundra	—	2.0					
SS78	Depth	Tundra	—	8.5					
SS79	Depth	Tundra	—	1.0					
SS80	Depth	Tundra	—	7.0					
SS81	Depth	Tundra	—	15.0					
SS82	Depth	Tundra	—	23.0					
SS83	Depth	Lake	—	9.5					
SS84	Depth	Lake	—	11.5					
SS85	Depth	Lake	—	6.5					
SS86	Depth	Tundra	—	1.0					
SS87	Depth	Tundra	—	3.0					
SS88	Depth	Lake	—	4.0					
SS89	Depth	Lake	—	6.0					
SS90	Depth	Tundra	—	4.0					
SS91	Depth	Tundra	—	10.0					
SS92	Depth	Lake	—	7.0					
SS93	Depth	Lake	—	7.0					
SS94	Depth	Lake	—	8.0					
SS95	Depth	Lake	—	6.5					
SS96	Depth	Lake	—	4.0					
SS97	Depth	Lake	—	6.5					
SS98	Depth	Tundra	—	13.5					
SS99	Depth	Tundra	—	12.0					
SS100	Depth	Tundra	—	15.0					
SS101	Depth	Tundra	—	11.0					
SS102	Depth	Tundra	—	16.0					
SS103	Depth	Tundra	—	6.0					
SS104	Depth	Tundra	—	9.5					

Snow Survey Calculations

Average Area:	Tundra =	4943536	ft^2
	Lake =	4860982	ft^2
Average SWE:	Tundra =	3.20	in
	Lake =	1.87	in
Average Snow Depth:	Tundra =	11.6	in
	Lake =	6.1	in
Average Density:	Tundra =	0.010	lb/in^3
	Lake =	0.011	lb/in^3
Catchement Basin Weighted SWE =		2.54	in

NOTES:

* Pooled sample measurement conducted, snow depth without dirt plug, SWE, and density represents the average of pooled samples.

Pooled Snow Survey Data Sheet									
Date:	5/16/2008		**Start Time:**	10:30	**End Time:**	12:30	**Observers:**	MDM, OOO, JPM	
Catchement Basin:	L9312		**Driving Wrench Used:**		Yes		**Tube Section Used:**		1
Snow Sample No.	**Pooled Sample #**	**Terrain Type**	**Snow Depth (in)**		**Core Length (in)**	**Bucket & Core Weight (lb)**	**Empty Bucket Weight (lb)**	**Water Equivalent (in)**	**Density (lb/in^3)**
			w/ Dirt Plug	**w/o Dirt Plug**					
SS48	1	Lake	4.5	4.0	—	—	0.34	—	—
	2	Lake	4.5	4.0	—	—	—	—	—
	3	Lake	4.5	4.0	—	—	—	—	—
			Sum =	**12.0**		0.54	**0.2**	—	—
			Average =	**4.0**			**0.07**	0.89	0.008
SS49	1	Tundra	10	7.0	—	—	0.34	—	—
	2	Tundra	10	7.5	—	—	—	—	—
			Sum =	**14.5**		0.56	**0.22**	—	—
			Average =	**7.3**			**0.11**	1.47	0.007
SS50	1	Lake	7	6.5	—	—	0.34	—	—
	2	Lake	7	6.5	—	—	—	—	—
			Sum =	**13.0**		0.62	**0.28**	—	—
			Average =	**6.5**			**0.14**	1.87	0.010
SS54	1	Lake	5	4.5	—	—	0.36	—	—
	2	Lake	5	4.5	—	—	—	—	—
			Sum =	**9.0**		0.56	**0.2**	—	—
			Average =	**4.5**			**0.10**	1.34	0.011
SS56	1	Lake	3.5	3.0	—	—	0.34	—	—
	2	Lake	3.5	3.0	—	—	—	—	—
	3	Lake	3.5	3.0	—	—	—	—	—
			Sum =	**9.0**		0.56	**0.22**	—	—
			Average =	**3.0**			**0.07**	0.98	0.012
SS58	1	Tundra	10.5	8.0	—	—	0.36	—	—
	2	Tundra	10	8.0	—	—	—	—	—
			Sum =	**16.0**		0.68	**0.32**	—	—
			Average =	**8.0**			**0.16**	2.14	0.010

Snow Survey Data Sheet									
Date: 5/16/2008			**Start Time:** 7:30		**End Time:** 10:00		**Observers:** JPM,OOO, MDM		
Catchement Basin: L9327			**Driving Wrench Used:** Yes				**Tube Section Used:** 1		
Snow Sample No.	**Sample Type**	**Terrain Type**	**Snow Depth (in)**		**Core Length (in)**	**Tube & Core Weight (lb)**	**Empty Tube Weight (lb)**	**Water Equivalent (in)**	**Density (lb/in^3)**
			w/ Dirt Plug	**w/o Dirt Plug**					
SS204	Core	Tundra	26	24.5	—	2.14	1.5	8.54	0.013
SS205*	Core	Lake	—	6.0	—	—	—	2.14	0.013
SS206	Core	Tundra	12.5	11.5	—	1.74	1.5	3.20	0.010
SS207	Core	Lake	7.5	7.0	—	0.52	0.32	2.67	0.014
SS208	Core	Lake	7.5	7.5	—	0.56	0.32	3.20	0.015
SS209	Core	Tundra	15.5	14.0	—	1.84	1.5	4.54	0.012
SS210*	Core	Lake	—	7.0	—	—	—	2.14	0.011
SS211*	Core	Lake	—	4.5	—	—	—	1.34	0.011
SS212*	Core	Lake	—	5.5	—	—	—	1.74	0.011
SS213	Core	Tundra	12.5	11.5	—	1.86	1.54	4.27	0.013
SS214	Core	Tundra	14.0	11.5	—	0.56	0.34	2.94	0.009
SS215	Core	Tundra	27	27.0	—	2.2	1.48	9.61	0.013
SS216*	Core	Lake	—	5.2	—	—	—	1.51	0.011
SS217	Core	Tundra	21.0	19.0	—	0.8	0.34	6.14	0.012
SS218	Depth	Lake	—	8.0					
SS219	Depth	Lake	—	8.0					
SS220	Depth	Lake	—	3.5					
SS221	Depth	Lake	—	3.0					
SS222	Depth	Lake	—	2.5					
SS223	Depth	Lake	—	10.0					
SS224	Depth	Lake	—	13.5					
SS225	Depth	Lake	—	4.0					
SS226	Depth	Lake	—	2.0					
SS227	Depth	Lake	—	4.0					
SS228	Depth	Tundra	—	9.0					
SS229	Depth	Tundra	—	11.0					
SS230	Depth	Tundra	—	10.5					
SS231	Depth	Tundra	—	11.0					
SS232	Depth	Tundra	—	30.0					
SS233	Depth	Tundra	—	10.0					
SS234	Depth	Lake	—	5.5					
SS235	Depth	Lake	—	5.0					
SS236	Depth	Lake	—	6.0					
SS237	Depth	Lake	—	6.0					
SS238	Depth	Lake	—	2.0					
SS239	Depth	Lake	—	12.5					
SS240	Depth	Lake	—	3.5					
SS241	Depth	Lake	—	6.5					
SS242	Depth	Lake	—	9.5					
SS243	Depth	Lake	—	4.5					
SS244	Depth	Lake	—	5.0					
SS245	Depth	Lake	—	7.0					
SS246	Depth	Tundra	—	10.0					
SS247	Depth	Tundra	—	20.0					
SS248	Depth	Tundra	—	13.5					
SS249	Depth	Tundra	—	13.0					
SS250	Depth	Tundra	—	19.0					
SS251	Depth	Tundra	—	22.0					
SS252	Depth	Tundra	—	24.0					
SS253	Depth	Tundra	—	10.0					
SS254	Depth	Tundra	—	19.0					
SS255	Depth	Tundra	—	12.0					
SS256	Depth	Tundra	—	23.0					
SS257	Depth	Tundra	—	4.0					
SS258	Depth	Tundra	—	7.0					
SS259	Depth	Lake	—	8.0					
SS260	Depth	Lake	—	8.5					
SS261	Depth	Lake	—	8.5					
SS262	Depth	Lake	—	7.5					
SS263	Depth	Lake	—	9.5					
SS264	Depth	Lake	—	6.0					
SS265	Depth	Lake	—	3.5					
SS266	Depth	Lake	—	6.0					
SS267	Depth	Lake	—	9.0					
SS268	Depth	Lake	—	10.5					
SS269	Depth	Lake	—	11.0					
SS270	Depth	Lake	—	6.0					
SS271	Depth	Tundra	—	7.0					
SS272	Depth	Tundra	—	12.5					
SS273	Depth	Lake	—	8.0					
SS274	Depth	Lake	—	14.0					
SS275	Depth	Lake	—	6.5					
SS276	Depth	Lake	—	16.5					
SS277	Depth	Lake	—	7.0					
SS278	Depth	Lake	—	12.0					
SS279	Depth	Lake	—	13.0					
SS280	Depth	Lake	—	9.5					
SS281	Depth	Lake	—	13.0					
SS282	Depth	Lake	—	8.5					

Snow Survey Calculations

Average Area:	Tundra =	8900253	ft^2
	Lake =	9710027	ft^2
Average SWE:	Tundra =	4.80	in
	Lake =	2.50	in
Average Snow Depth:	Tundra =	14.9	in
	Lake =	7.4	in
Average Density:	Tundra =	0.012	lb/in^3
	Lake =	0.012	lb/in^3
Catchement Basin Weighted SWE =		3.60	in

NOTES:

* Pooled sample measurement conducted, snow depth without dirt plug, SWE, and density represents the average of pooled samples.

Pooled Snow Survey Data Sheet									
Date:	2/13/2008		**Start Time:**	7:30	**End Time:**	10:00	**Observers:**	JPM,OOO, MDM	
Catchement Basin:	L9327		**Driving Wrench Used:**		Yes		**Tube Section Used:**		1
Snow Sample No.	**Pooled Sample #**	**Terrain Type**	**Snow Depth (in)**		**Core Length (in)**	**Bucket & Core Weight (lb)**	**Empty Bucket Weight (lb)**	**Water Equivalent (in)**	**Density (lb/in^3)**
			w/ Dirt Plug	**w/o Dirt Plug**					
SS205	1	Lake	6.5	6.0	—	—	0.32	—	—
	2	Lake	6.5	6.0	—	—	—	—	—
			Sum =	**12.0**		0.64	**0.32**	—	—
			Average =	**6.0**			**0.16**	2.14	0.013
SS210	1	Lake	8	7.0	—	—	0.34	—	—
	2	Lake	8	7.0	—	—	—	—	—
			Sum =	**14.0**		0.66	**0.32**	—	—
			Average =	**7.0**			**0.16**	2.14	0.011
SS211	1	Lake	5	4.5	—	—	0.34	—	—
	2	Lake	5	4.5	—	—	—	—	—
			Sum =	**9.0**		0.54	**0.2**	—	—
			Average =	**4.5**			**0.10**	1.34	0.011
SS212	1	Lake	5.5	5.5	—	—	0.34	—	—
	2	Lake	5.5	5.5	—	—	—	—	—
			Sum =	**11.0**		0.6	**0.26**	—	—
			Average =	**5.5**			**0.13**	1.74	0.011
SS216	1	Lake	5.5	5	—	—	0.34	—	—
	2	Lake	5.5	5	—	—	—	—	—
	3	Lake	6.0	5.5	—	—	—	—	—
			Sum =	**15.5**		0.68	**0.34**	—	—
			Average =	**5.2**			**0.11**	1.51	0.011