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AN UPDATE ON SKARN DEPOSITS OF ALASKA

by

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In 1985--with the considerable assistance of Gar Pessel and Janice Hagen--I released "a compendium of data for skarn deposits of Alaska". This work was primarily a literature review and compilation, with some skarn mineral compositions determined by XRD techniques. The compilation showed, among other facts, that there were some serious holes in our knowledge about Alaskan skarns. Since that time the ADGGS has supported Alaskan skarn studies with field assistance, analyses, and microprobe time. I present in this PDF data from these studies over the period 1985-1995. Additional data are given in UAF student theses listed in the references at the end of this document. All the data are also on "quattro" files available with this PDF.

Since 1985 a new category of skarn deposit has been recognized, the Gold skarn. This deposit type contains high gold concentrations with relatively low concentrations of Cu and W and is commonly highly anomalous in Te, Bi, As, and Sb (Meinert, 1989). Many Alaskan lode deposits have been mined exclusively for their contained gold, even when other ore elements are present at high concentrations, and skarns are no exception to this tendency. Hence, production statistics alone are not a good guide to the metal contents--and thus skarn classification--of Alaskan skarns. I have revised the classification of Alaskan skarns from Newberry (1985) by separating out Au and Mo skarns, employing bulk ore analyses (where available) and otherwise analyses of (representative?) skarn hand specimens and listed these in Table 1. Scores of additional skarn occurrences have been discovered and/or revealed in the last decade, due to extensive government and industry mapping in Alaska, and these are also listed in Table 1. In this and the following Tables, the skarn types are listed by the following abbreviations: a=Au, c=Cu, f=Fe-(Cu,Au), g=magnesian Fe, m=Mo, s=Sn, w=W, and Z=Zn-Pb. Replacement bodies spatially associated with minor skarn and plutonic rocks (e.g., Liberty Bell, S-Central Alaska) are included in this compilation, but sulfides in marble with no obvious plutonic association (e.g., Reef Ridge, Medfra quadrangle) are not.

Table 2 contains a listing of geochemical analyses of skarn samples performed between 1985 and 1995 and not published elsewhere. These were performed by a variety of techniques at several different analytical laboratories, including AA at the ADGGS analytical facility (now defunct), XRF at the University of Alaska, and ICP, AA, INAA, and graphite furnace AA at several commercial laboratories. Data generated by methods of known unreliability (e.g., Sn and W by ICP) are not included in Table 2. Duplicate analyses of several dozen samples by several different reliable techniques (e.g., W by INAA and XRF, Zn by INAA, ICP, AA, and XRF) indicate that the data are generally accurate to better than +/- 30%. The samples are derived from a variety of sources: ADGGS pulps previously analyzed for a few elements, samples I collected, and samples donated by ADGGS, USGS, USBM, UAF, and industry geologists.

Tables 3 through 22 are microprobe analyses of skarn minerals performed between 1985 and 1995 and not published elsewhere. These are given in terms of weight percent oxides or elements (F,Cl). Minerals analyzed include garnet, pyroxene, idocrase, epidote, chlorite, plagioclase, k-feldspar, biotite-phlogopite, amphibole, talc, serpentine, ilvaite, rhodenite, and clinohumite. Most of the analyses were performed using the Chemica SX-50 electron microprobe at the University of Alaska, employing natural mineral standards, a 15 kV, 10 nA, 1 micron beam, and counting times of 10 seconds. Dr. Ken Severin helped setup the probe and create analytical routines. About 10% of the analyses were performed using the Chemica electron microprobe at Washington State University, Pullman, Washington, using the same analytical conditions. Replicate mineral analyses indicate no systematic differences between analyses performed at the two locations. Some analyses have very low totals, due to presence of non-analyzed elements (e.g., H₂O), or to analytical problems such as poor polish, or uneven carbon coating. I have made no attempt to select out "good" or "bad" analyses. Some of the analyzed samples were from my personal collections, others were donated by Dave Adams, Tom Bundtzen, Roger Burleigh, Karen Clautice, John Dillon, Jeff Foley, Bruce Gamble, Gary Lowell, and Ken Maas.

Tables 23 and 24 present major and trace element data for skarn-related plutonic rocks not published elsewhere. The trace elements were determined by XRF at the University of Alaska on pulps previously analyzed for major elements and on rocks crushed at MRL's rock-crushing facility. Major element analyses are presented as CIPW norms. All were determined by XRF techniques, some by the ADGGS, some by the USGS, and some by commercial labs.

Tables 25 and 26 present Pb and S isotopic data (respectively) for skarn and replacement body samples not published elsewhere. Pb isotope analyses were performed by ChemPet labs and at the USGS, Denver Federal Center. S isotope analyses were performed by Krueger Enterprises, Cambridge Mass.

Table 27 presents Rare Earth Element analyses (not published elsewhere) performed on skarn samples employing INAA techniques. The samples were analyzed by XRAL Analytical Labs, Ontario, Canada.

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TABLE 1: GENERAL INFORMATION FOR 274 ALASKAN SKARN DEPOSITS

Name	type	lat	long	quad	terrane	Host	plut age
Paint R.	Fe	59	7 154	40 Iliamna	Penin	Tr	100
Turtle Reef	Fe	59	36 153	34 Iliamna	Penin	Tr	155
Ursus Cove	Fe	59	31 153	46 Iliamna	Penin	prm	170
Barron	Fe	58	18 134	50 Juneau	YTT		
Redoubt	Fe	60	13 152	46 Kenai	Penin	Tr	170
Tuxedni Bay	Fe	60	15 152	51 Kenai	Penin	Tr	170
Kasna Crk	Fe	60	9 154	3 Lake Clark	Penin	J	75
Takona Crk	Fe	60	8 154	8 Lake Clark	Penin	J	75
Bernard Glacier	Fe	61	7 141	48 McCarthy	Wrang	Pn	295
Chitistone Glacier	Fe	61	27 142	11 McCarthy	Wrang	Prm	275
Copper Queen	Fe	61	35 143	45 McCarthy	Wrang	Tr	140
Kuskulana Pass	Fe	61	35 143	37 McCarthy	Wrang	Tr	140
Midas	Fe	61	33 143	46 McCarthy	Wrang	Tr	140
War Eagle	Fe	61	33 143	46 McCarthy	Wrang	Tr	140
Abyss Lake	Fe	58	20 136	37 Mt Fairweather	Wrang	Pz	115
Alaska Chief	Fe	58	27 136	7 Mt Fairweather	Alex-Cr	Sil	115
Dundas Bay NE	Fe	58	28 136	34 Mt Fairweather	Alex-Cr	Sil/Dev	115
E Dundas Bay	Fe	58	23 136	11 Mt Fairweather	Alex-Cr	Sil/Dev	115
Francis Isl	Fe	58	38 136	11 Mt Fairweather	Alex-Cr	Sil/Dev	115
John Hopkins Inlet	Fe	58	45 137	0 Mt Fairweather	Alex-Cr	Sil/Dev	115
Mt Merriam	Fe	58	54 136	26 Mt Fairweather	Alex-Cr	Sil/Dev	115
Queen Inlet	Fe	58	54 136	31 Mt Fairweather	Alex-Cr	Sil/Dev	115
Reid Glacier	Fe	58	47 136	46 Mt Fairweather	Alex-Cr	Sil/Dev	115
Sandy Cove	Fe	58	44 135	59 Mt Fairweather	Alex-Cr	Sil/Dev	115
Tidal Inlet	Fe	58	38 136	21 Mt Fairweather	Alex-Cr	Sil/Dev	115
W Rendu Inlet	Fe	58	55 136	39 Mt Fairweather	Alex-Cr	Sil/Dev	115
Willoughby Isl	Fe	58	36 136	8 Mt Fairweather	Alex-Cr	Sil/Dev	115
E Fk Broxon Gulch	Fe	63	20 146	0.5 Mt Hayes	Wrang	Pn/Prm	145
E Fk Broxon Gulch	Fe	63	19 146	1 Mt Hayes	Wrang	Pn/Prm	145
MacLaren Glac E	Fe	63	19 146	24 Mt Hayes	Wrang	Tr	145
Magnetite Crk	Fe	63	12 145	6 Mt Hayes	Wrang	Perm	
Rainey Crk	Fe	63	19 145	59 Mt Hayes	Wrang	Penn	
Slate Crk	Fe	63	9.3 144	51 Mt Hayes	Wrang	Pn/Prm	
W Fk Glac	Fe	63	11 144	49 Mt Hayes	Wrang	Pn/Prm	
W Fk Rainey Crk	SFe	63	18 145	57 Mt Hayes	Wrang	Mz	
W Fk Ridge	Fe	63	18 146	0 Mt Hayes	Wrang	Pn/Prm	150
Nelson & Tift	Fe	54	48 131	58 Prince Rupert	Alex-Cr	pO	480
Baldy Lode	Fe	57	48 135	20 Sitka	Alex-Cr	Miss	130
Indian Isl	Fe	58	15 136	21 Sitka	Wrang	Tr	115
Claire Bear	Fe	59	21 136	19 Skagway	Alex-Cr	Sil/Dev	112
Hayes	Fe	59	3 135	25 Skagway	Alex-Cr	Sil/Dev	
Leblondeau	Fe	59	14 136	14 Skagway	Alex-Cr	Sil/Dev	112
Porcupine pendant	Fe	59	20 136	17 Skagway	Alex-Cr	Sil/Dev	112
Saksaia Glacier	Fe	59	24 136	20 Skagway	Alex-Cr	Sil/Dev	110
Shannon	Fe	59	22 136	21 Skagway	Alex-Cr	Sil/Dev	112
Skagway Rd	Fe	59	20 135	12 Skagway	Tracy Arm		64
Adams-Pessel	Fe	62	28 148	32 Talkeetna Mnt	Wrang	Penn/Pr	180
Billiken	Do-Fe	65	43 162	Bendeleben	Seward	Pz	100
Medfra Fe	Do-Fe	63	40 154	4 Medfra	Nixon Fork	Ord	69
Sleekemute Fe	Do-Fe	61	10 156	10 Sleekemute	Nixon Fork	Ord	42

TABLE 1: GENERAL INFORMATION FOR 274 ALASKAN SKARN DEPOSITS

Name	type	lat	long	quad	terrane	Host	plut	age
Terry's	Fe	61	42	148	29 Anchorage	Penin	uPz	170
Craig	Fe	56	28	131	16 Bradfield	CanTracy Arm		90
N. Bradfield R.	Fe	56	23	131	23 Bradfield	CanTracy Arm	uPz	70
Alarm	Fe	55	35	132	28 Craig	Alex-Cr	Ord/Sil	430
Baker Pt	Fe	55	31	132	25 Craig	Alex-Cr	Ord/Sil	105
Big Five	Fe	55	39	132	25 Craig	Alex-Cr	Ord/Sil	430
Brown & Metzdorf	Fe	55	25	132	29 Craig	Alex-Cr	Ord/Sil	
Campbell	Fe	55	16	132	39 Craig	Alex-Cr	pO	430
Charles	Fe	55	36	132	29 Craig	Alex-Cr	Ord/Sil	430
Copper Center	Fe	55	37	132	30 Craig	Alex-Cr	Ord/Sil	430
Copper King-Morni	Fe	55	34	132	26 Craig	Alex-Cr	Ord/Sil	430
Copper Mntn	Fe	55	14	132	37 Craig	Alex-Cr	pO	105
Copper Queen	Fe	55	32	132	23 Craig	Alex-Cr	Ord/Sil	430
Gould	Fe	55	13	132	36 Craig	Alex-Cr	pO	105
Green Monster	Fe	55	15	132	32 Craig	Alex-Cr	pO	105
Haida	Fe	55	36	132	30 Craig	Alex-Cr	Ord/Sil	430
Hetta Mntn	Fe	55	12	132	32 Craig	Alex-Cr	pO	105
Hole-in-the-wall	Fe	55	32	132	18 Craig	Alex-Cr	Ord/Sil	430
Houghton	Fe	55	16	132	38 Craig	Alex-Cr	pO	105
Iron Cap	Fe	55	39	132	24 Craig	Alex-Cr	Ord/Sil	430
Iron King	Fe	55	33	132	25 Craig	Alex-Cr	Ord/Sil	430
It	Fe	55	35	132	28 Craig	Alex-Cr	Ord/Sil	430
Jumbo	Fe	55	15	132	37 Craig	Alex-Cr	pO	105
Lake Marge	Fe	55	12	132	31 Craig	Alex-Cr	pO	105
Magnetite Cliff	Fe	55	15	132	37 Craig	Alex-Cr	pO	105
Mamie	Fe	55	31	132	17 Craig	Alex-Cr	Ord/Sil	430
Mt Andrew	Fe	55	31	132	18 Craig	Alex-Cr	Ord/Sil	430
Mt Jumbo	Fe	55	16	132	39 Craig	Alex-Cr	pO	105
Peacock-Tacoma	Fe	55	31	132	30 Craig	Alex-Cr	Ord/Sil	430
Poorman	Fe	55	34	132	26 Craig	Alex-Cr	Ord/Sil	430
Rich Hill	Fe	55	32	132	21 Craig	Alex-Cr	Ord/Sil	430
Rush & Brown	Fe	55	37	132	35 Craig	Alex-Cr	Ord/Sil	430
Russian Bear	Fe	55	13	132	34 Craig	Alex-Cr	pO	105
Stevenstown	Fe	55	31	132	17 Craig	Alex-Cr	Ord/Sil	430
Sultana	Fe	55	17	132	35 Craig	Alex-Cr	pO	105
Summit Lake	Fe	55	13	132	33 Craig	Alex-Cr	pO	105
Thorne Bay	Fe	55	43	132	33 Craig	Alex-Cr	Ord/Sil	105
Tolstoi	Fe	55	38	132	22 Craig	Alex-Cr	Ord/Sil	430
Uncle Sam	Fe	55	32	132	23 Craig	Alex-Cr	Ord/Sil	430
Upper Magnetite	Fe	55	15	132	37 Craig	Alex-Cr	pO	105
Butte Crk	Fe	63	2	147	37 Healy	Wr	Tr	140
Windy E.	Fe	63	28	149	7 Healy	Dillinger	Dev	70
Windy W.	Fe	63	28	149	9.3 Healy	Dillinger	Dev	70
Copper King	Fe	59	41	153	9 Iliamna	Penin	Prm	160
Diamond Pt.	Fe	59	39	153	38 Iliamna	Penin	Tr	160
Dutton	Fe	59	41	153	58 Iliamna	Penin	Tr	160
Folly	Fe	59	15	154	27 Iliamna	Penin	Prm	180
Iniskin R.	Fe	59	48	153	27 Iliamna	Penin	Prm	150
Marsh Crk	Fe	59	49	153	22 Iliamna	Penin	Tr	160
Millett	Fe	59	47	154	31 Iliamna	Penin	Tr	170

TABLE 1: GENERAL INFORMATION FOR 274 ALASKAN SKARN DEPOSITS

Name	type	lat	long	quad	terrane	Host	plut age
Deimos	Cu	67	44	149 13	Chandalar	AA-Ham	Dev 400
Eva	Cu	67	39	149 23	Chandalar	AA-Ham	Dev 400
Evelyn Lee	Cu	67	34	149 14	Chandalar	AA-Ham	Dev 400
Ginger	Cu	67	43	149 15	Chandalar	AA-Ham	Dev 400
Hurricane-Diane	Cu	67	45	149 10	Chandalar	AA-Ham	Dev 400
Luna	Cu	67	46	149 10	Chandalar	AA-Ham	Dev 400
Mike-Vicky	Cu	67	46	149 12	Chandalar	AA-Ham	Dev 400
Pilgrim	Cu	67	45	149 1	Chandalar	AA-Ham	Dev 400
Venus	Cu	67	37	149 19	Chandalar	AA-Ham	Dev 400
Victor	Cu	67	38	149 22	Chandalar	AA-Ham	Dev 400
Cape Addington	Cu	55	27	133 49	Craig	Alex-Cr	Sil
Pelegroso	Cu	55	32	133 5.7	Craig	Alex-Cr	
San Juan Bautista	Cu	55	24	133 18	Craig	Alex-Cr	
Shellhouse	Cu	55	2.8	133 4	Craig	Alex-Cr	
Gold Harbor	Cu-Mo	54	55	133 1.4	Dixon Entranc	Alex-Cr	
Iron Crk	Cu	64	4.1	143 134	Eagle	YTT	Pz 93
Copeland Crk	Cu	63	10	149 48	Healy	Chulitna	Tr 65
Bruin Bay	Cu	59	21	154 1	Iliamna	Penin	Tr 174
KL	Cu	58	49	154 53	Katmai	Penin	K 36
Commonwealth	Cu	55	46	130 12	Ketchikan	Tracy Arm	Pz 50
Marble Cu	Cu	55	43	130 52	Ketchikan	Tracy Arm	Pz 80
Tangus Mntn	Cu	55	3	131 21	Ketchikan	Alex-Cr	
Glacier Fork	Cu	60	51	153 12	Lake Clark	Penin	Tr
Little Tazimia	Cu	60	4	153 59	Lake Clark	Penin	Tr 44
S. Current Crk	Cu	60	13	153 44	Lake Clark	Penin	Tr 39
Upper Tazimia	Cu	60	7	153 56	Lake Clark	Penin	Tr 44
North Fork	Cu	61	57	154 21	Lime Hills	Dillinger	65
Colorado	Cu	61	57	141 3	McCarthy	Wrang	Tr 110
Midway	Cu	62	26	153 39	McGrath	Dillinger	Ord/Sil 33
3850 Nunatak	Cu	58	57	136 59	Mt Fairweathe	Alex-Cr	Sil/Dev 70
Adams Inlet	Cu	58	51	136 30	Mt Fairweathe	Alex-Cr	Dev
Dundas Bay W.	Cu	58	28	136 34	Mt Fairweathe	Alex-Cr	Dev
Geikie Inlet	Cu	58	35	136 32	Mt Fairweathe	Alex-Cr	Dev
Lemeisur Isl.	Cu	58	16	136 4.5	Mt Fairweathe	Alex-Cr	Dev
Powell Gulch	Cu	63	9	144 49	Mt Hayes	Wrang	Pn/Prm 170
W Fk Rainey Crk	Cu	63	18	145 59	Mt Hayes	Wrang	Pn/Prm 145
Cooper Pass	Cu	62	16	142 28	Nabesna	Wrang	Prm 110
Nugget	Cu	62	22	143 10	Nabesna	Wrang	Tr
Orange Hill	Cu	62	11	142 50	Nabesna	Wrang	Prm 105
Roundtop	Cu	64	5	158	Nulato	Ruby	78
Devilfish Bay	Cu	56	5	133 23	Petersburg	Alex-Cr	Sil 100
Dry Pass	Cu	56	8	133 25	Petersburg	Alex-Cr	Sil 100
Stag Bay	Cu	57	55	136 20	Sitka	Wrang	Tr 110
Rendu Glacier	Cu	59	2	136 48	Skagway	Alex-Cr	Dev 112
Kwiniuk	Cu	64	34	162 28	Solomon	Seward	Pz
Dall Glacier	Cu	62	33	152 13	Talkeetna	Mystic	Dev 65
Champion I	Cu-Au	64	33	141 41	Eagle	YTT	Pz 90
Deer Ck	Cu-Au	64	51	142 7.3	Eagle	YTT	Pz 92
Mitchell	Cu-Au	64	5.4	143 2	Eagle	YTT	Pz 93
Oscar-B	Cu-Au	64	15	143 7.9	Eagle	YTT	Pz 93

TABLE 1: GENERAL INFORMATION FOR 274 ALASKAN SKARN DEPOSITS

Name	type	lat	long	quad	terrane	Host	plut	age
Copper King	Cu-Au	63	15	149	39 Healy	Chulitna	Pn/Pm	68
Zackly	Cu-Au	63	13	146	42 Mt Hayes	Wrang	Tr	130
Nabesna	Cu-Au	62	21	142	55 Nabesna	Wrang	Tr	110
79SK762	Mo	56	7	131	10 Bradfield Can	Tracy Arm		
Mo Glacier	Mo	61	1	153	36 Lime Hills	Peninsular		38
Lemeisur Isl SW	Mo	58	16	136	5.8 Mt Fairweathe	Alex-Cr		
Nunatak Mo	Mo	58	59	136	7 Mt Fairweathe	Alex-Cr	Dev	30
Lillie	Mo	56	9	133	26 Petersburg	Alex-Cr	Sil	100
Liberty Bell	Au	64	2	148	51 Fairbanks	YTT	pz	92
Partin Crk	Au	63	4	149	57 Healy	Chulitna	Tr	?
Silver King	Au	63	12	149	36 Healy	Chulitna	Tr	68
Nixon Fork	Au	63	14	154	46 Medfra	Nixon Fork	Ord	69
Rambler	Au	62	23	143	0 Nabesna	Wrang	Tr	110
Beef Ridge	W	66	48	149	57 Beaver	Ruby	Dev-Sil	91
Valley Ridge	W	66	38	149	50 Beaver	Ruby	Dev-Sil	91
Kiwalik	W	65	32	162	16 Bendeleben	Seward	Pz	400
Bonanza	W	66	38	150	2.7 Bettles	Ruby	Dev-Sil	91
MR45	W	64	60	144	57 Big Delta	YTT	Pz	90
MR52	W	64	50	144	57 Big Delta	YTT	Pz	90
N Fk Salcha	W	64	55	144	51 Big Delta	YTT	Pz	90
Twin Mntn	W	65	6	143	28 Charley R.	YTT	Pz	70
Big Windy	W	65	5.3	144	38 Circle	YTT	Pz	74
FUR	W	65	6.5	144	40 Circle	YTT	Pz	64
Middle Fk Salcha	W	65	5.4	145	4 Circle	YTT	Pz	77
PGD	W	65	7	144	30 Circle	YTT	Pz	70
PZL	W	65	11	144	30 Circle	YTT	Pz	61
Qtz Crk	W	65	33	146	26 Circle	Wickersham	Pz	65
Crescent Crk	W	64	48	143	39 Eagle	YTT	Pz	93
Lucky 13	W	64	14	143	54 Eagle	YTT	Pz	60
Wolverine	W	64	51	143	18 Eagle	YTT	Pz	93
N. Kachauik	W	64	50	162	58 Solomon	Seward	Pz	
Table Mntn	W-Au	65	27	146	Circle	YTT	Pz	80
Cleary	W-Au	65	3	147	24 Fairbanks	YTT	Pz	92
Gil	W-Au	64	60	147	15 Fairbanks	YTT	Pz	92
Schubert	W-Au	64	59	147	23 Fairbanks	YTT	Pz	92
Spruce Hen	W-Au	64	58	147	31 Fairbanks	YTT	Pz	92
Stepovich	W-Au	64	59	147	21 Fairbanks	YTT	Pz	92
Yellow Pup	W-Au	64	59	147	20 Fairbanks	YTT	Pz	92
Pedro	W-Au	65	2	147	31 Livengood	YTT	Pz	92
Serpentine H.S.	Sn	65	51	164	39 Bendeleben	Seward	Pz	71
Lime Peak N	Sn	66		147	Circle	Wickersham		57
Lime Pk S	Sn	66		147	Circle	Wickersham		57
Prindle	Sn	65		146	Circle	YTT		60
White Mntn Crk	Sn	67	29	141	11 Coleen	Porcupine	Pz	370
Lyman Fork	Sn	61	57	154	0.1 Lime Hills	Dillinger		tert
u. Babel R.	Sn	61	48	154	16 Lime Hills	Dillinger	Sil/Dev	tert
Contact	Sn	69	15	143	38 Mt Michaelson	AA-No Slope	Pz	380
Esotuk Glac	Sn	69	18	144	22 Mt Michaelson	AA-No Slope	Pz	380
Jago	Sn	69	17	143	36 Mt Michaelson	AA-No Slope	Pz	380
Groundhog Basin	Sn	56	31	132	4 Petersburg	YTT	Dev	17

TABLE 1: GENERAL INFORMATION FOR 274 ALASKAN SKARN DEPOSITS

Name	type	lat	long	quad	SKARN	DEPOSITS	Host	plut	age
Akabluak Pass	Sn	67	29 154	42	Survey Pass	AA-Ham	1Pz		370
Angayu Crk N	Sn	67	30 155	9	Survey Pass	AA-Ham	Dev		370
Arrigetch Center	Sn	67	26 154	2	Survey Pass	AA-Ham	Dev		370
Arrigetch Center	Sn	67	27 153	57	Survey Pass	AA-Ham	Dev		370
Arrigetch Crk E	Sn	67	26 154	6	Survey Pass	AA-Ham	Dev		370
Arrigetch Crk W	Sn	67	27 154	11	Survey Pass	AA-Ham	Dev		370
Kobuk NW	Sn	67	19 154	24	Survey Pass	AA-Ham	1Pz		370
Lower Kobuk N	Sn	67	19 154	2	Survey Pass	AA-Ham	Dev/Sil		370
Lower Kobuk S	Sn	67	19 154	2	Survey Pass	AA-Ham	Dev		370
Middle Kobuk	Sn	67	20 153	59	Survey Pass	AA-Ham	Dev		370
N Reed R	Sn	67	19 154	58	Survey Pass	AA-Ham	1Pz		370
Noatak NE	Sn	67	33 154	59	Survey Pass	AA-Ham	Dev		370
Noatak NW	Sn	67	36 155	5	Survey Pass	AA-Ham	Dev		370
Noatak S	Sn	67	31 155	7	Survey Pass	AA-Ham	Dev		370
Oz	Sn	67	26 154	6	Survey Pass	AA-Ham	Dev		370
Pendant Peak	Sn	67	26 153	58	Survey Pass	AA-Ham	Dev		370
Saddle Crk	Sn	67	26 153	55	Survey Pass	AA-Ham	Dev		370
Upper Kobuk	Sn	67	21 154	2	Survey Pass	AA-Ham	Dev		370
Boulder Crk	Sn	62	54 152	9.2	Talkeetna	YTT	Pz		56
Bessie-Maple	Sn	65	27 167	12	Teller	York	Ord		80
Black Mntn	Sn	65	29 166	45	Teller	Seward	pC		79
Brooks Mntn	Sn	65	31 167	9	Teller	York	Ord		77
Camp Crk	Sn	65	28 167	9	Teller	York	Ord		80
Cape Mntn	Sn	65	35 168	1	Teller	AA-Delong	Miss		79
Ear Mntn	Sn	65	56 166	12	Teller	York	Ord		77
Lost R	Sn	65	28 167	10	Teller	York	Ord		80
Rapid R	Sn	65	27 167	19	Teller	York	Ord		80
Tin Crk	Sn	65	28 167	7	Teller	York	Ord		80
Dillon Cr	Zn-Pb	65	13 163	46	Bendeleben	Seward	Pz		
Gold Crk	Zn-Pb	64	53 145	37	Big Delta	YTT	Pz	?	
Stoneboy Crk	Zn-Pb	64	41 144	24	Big Delta	YTT	Pz		52
Nelson Galcier	Zn-Pb	56	29 131	60	Bradfield Can	YTT	Pz		15
Bob	Zn-Pb	67	52 148	41	Chandalar	AA-Ham	Dev		400
Gayle	Zn-Pb	67	52 148	43	Chandalar	AA-Ham	Dev		400
Io	Zn-Pb	67	47 149	6	Chandalar	AA-Ham	Dev		400
Jim Montana	Zn-Pb	67	49 148	54	Chandalar	AA-Ham	Dev		400
Mowgli	Zn-Pb	67	49 148	49	Chandalar	AA-Ham	Dev		400
Gould Island	Zn-Pb	55	17 132	32	Craig	Alex-Cr	pO		105
Yellowstone	Zn-Pb	55	6 133	7	Craig	Alex-Cr			
Champion E	Zn-Pb	64	34 141	33	Eagle	YTT	Pz		90
Champion II	Zn-Pb	64	33 141	43	Eagle	YTT	Pz		91
Eva (My) Crk	Zn-Pb	64	6.4 143	12	Eagle	YTT	Pz		
Oscar -H	Zn-Pb	64	14 143	5.5	Eagle	YTT	Pz		89
VABM Happy	Pb-Zn	64	33 142	18	Eagle	YTT	Pz		49
Chechacko	Zn-Pb	65	4 147	25	Fairbanks	YTT	Pz		70
Ahtell	Zn-Pb	62	46 144	1	Gulkana	Wr	Pn/Pm		
Duryea	Zn-Pb	59	41 153	56	Iliamna	Penin	Tr		
Bund	Zn-Pb	58	58 135	10	Juneau	Tracy Arm	Pz		
Big R.	Zn-Pb	61	52 154	40	Lime Hills	Dillinger	Ord/Sil		55
O'Hara	Zn-Pb	61	20 143	50	McCarthy	Wrang	Pn/Prm		

TABLE 1: GENERAL INFORMATION FOR 274 ALASKAN SKARN DEPOSITS

Name	type	lat	long	quad	terrane	Host	plut	age
Bowser Crk N	Zn-Pb	62	11	153	40 McGrath	Dillinger	Ord/Sil	33
Bowser Crk S	Zn-Pb	62	10	153	41 McGrath	Dillinger	Ord/Sil	33
Rat Fork	Zn-Pb	62	18	153	54 McGrath	Dillinger	Ord/Sil	34
Smith Lake	Zn-Pb	62	?	153	? McGrath	Dillinger	Ord/Sil	30
Tin Crk	Zn-Pb	62	25	153	39 McGrath	Dillinger	Ord/Sil	31
Red Mtn	Zn-Pb	58	58	136	3 Mt Fairweather	Alex-Cr		
Mendenhall	Zn-Pb	63	12	145	14 Mt Hayes	Wrang	Pn/Prm	
Little Caribou	Zn-Pb	63	46	150	30 Mt McKinley	YTT	Pz	
Mt Eielson	Zn-Pb	63	24	150	20 Mt McKinley	McKinly	Dev	38
Slippery Crk	Zn-Pb	63	12	151	7 Mt McKinley	Ping	Tr	
Thoroughfare	Zn-Pb	63	23	150	14 Mt McKinley	McKinly	Dev	40
Lemmon	Zn-Pb	62	11	142	49 Nabesna	Wrang	Prm	105
Glacier Basin	Zn-Pb	56	29	132	1 Petersburg	YTT	Dev	17
No. Cu Co.	Zn-Pb	56	53	133	22 Petersburg	Alex-Ad	J-K	50
Taylor Crk	Zn-Pb	56	48	133	22 Petersburg	Alex-Ad		
Children	Zn-Pb	56	56	134	8 Port Alexandre	Alex-Cr	Prm	
Inspiration	Zn-Pb	59	21	135	10 Skagway	Tracy Arm		48
Mt Seltat	Zn-Pb	59	36	136	20 Skagway	Alex-Cr	Sil/Dev	
Nataga Skyline	Zn-Pb	59	37	136	17 Skagway	Alex-Cr	Sil/Dev	
Ammerman Mtn	Zn-Pb	68	22	141	3 Table Mtn	AA-No Slope	Pz	370
Coal Crk	Zn-Pb	63		149	51 Talkeetna	Kahiltna		54
Hogback	Zn-Pb	62	53	152	14 Talkeetna	YTT	Pz	55
Earnie Lake	Zn-Pb	67	24	152	51 Wiseman	AA-Ham	Prot	900
Frog	Zn-Pb	67	19	152	56 Wiseman	AA-Ham	Prot	900
Wild Lake	Zn-Pb	67	31	151	35 Wiseman	AA-Ham	Dev	370

TABLE 2: GEOCHEMISTRY OF 292 HAND SPECIMENS FROM ALASKAN SKARNS

Location	type	Snpl#	Au	Pt	Pd	Te	Ag	Cu	Pb	Zn	Mo	Ni	Co	Bi	As	Sb	Hg	Sn	W	F
			ppb----->			ppm----->														
Ag King	a	RN241	25000	5	3	24	72	67210	89	390	100	275	34	80	7060	20		1	26	
Ag King	a	RN254	10320	3	1	98	3	2367	270	234	25	158	5	2405	33	3		1	7	
Ag King	a	RN255	1500			0.76		6930	23	58	6	184		1		1		8	1	
Liberty Bell	a	1854	26000			2.7	20000	1656	497	1062	43	3800	1200	288	74000	1770		4060	4045	
Liberty Bell	a		9500				13	100	690	20	1	2	5	35	64700	110	0.28			
Liberty Bell	a	RN120	2850	8	1	2.3	28	268	125	96	43	59	14	0	674	84		156	6	
Liberty Bell	a		2750				2.4	480	290	340	1	260	35	180	5550	16	0.09			
Lucretia	a	rn247a	18000			86	12	8650						35	10500	35			110	
Lucretia	a	rn247	3250			0.85	33	185	24	80	3	220	13	1	139	25		13	1	
Lucretia	a	Rn248c	2505			54	3	3540		120	1		15	95	9920	13			53	
Nixon Fork	a	1867 N	28640	13	1	93		7800	232	1648	127	37		5705		99		180	2345	
Nixon Fork	a	1868 N	13610	28	3	8.1		31380	15	507	118	26		125		17		72	13	
Partin Crk	a	RN218A	15000			24	190	1370	1	1300	69	653	65	2622	45800	94		22	1	
Partin Crk	a	rn218c	1400			2.28	35	2500	1	350	15	150	55	150	3560	35		10	5	
Partin Crk	a	rn240	1150			1.72	14	2800	1	240	12	115	48	95	4550	25		10	5	
Rambler	a	1864	9700	10	1	1.9	63	3487	475	1700	2	10	98	556	23	8.3		13	1	
Alaska Chief	c	5S225A	2500				30	7000	50	600	5	70	70	10			0.22			
Alaska Chief	c	5S225A	500				3	1200	20	140	3	20	10				0.08			
Alaska Chief	c	5S228	300				50	13000	40	570	3	60	140	15			0.06			
Alaska Chief	c	5S226B	200				0.5	80	20	75	5	5	5				0.1			
Alaska Chief	c	5S225B	40				0.2	600	35	150	5	30	10				0.1			
Alaska Chief	c	5S226A	10				0.4	40.0	15	40	3	5	7				0.08			
Alaska Chief	c	5S227	10				0.3	55	10	50	3	7	10				0.06			
Chandalar	c	CH-6	62	2	2	10.9		60000						34						
Cu King	c	rn242b	480			1.33		48560												
Cu King	c	rn242a	350			1.6		55650												
Cu King	c	rn243b	345			0.11		32570												
Cu King	c	rn246b	69	8	1	0.85		13460												
Devilfish Bay	c	g30	10				327	53000	187000	3700	1	4	3		2	6				
Evelyn Lee	c	84LN7	220				4	14803	9	48	10	33	20	2	56	1	0.19		19	
Evelyn Lee	c	84LN124	55				5	18898	10	171	79	40	10	2	14	2	0.075		10	
Evelyn Lee	c	84LN205	10				1	486	5	9	2	14	8	5	6	1	0.016		10	
Evelyn Lee	c	84LNSA	5				1	26	5	2	1	10	4	6	5	2	0.01		10	
Evelyn Lee	c	84LN51A	5				1	184	5	1	1	17	1	2	5	2	0.01		10	
Evelyn Lee	c	84LN205	5				1	131	5	1	1	3	4	11	5	1	0.015		10	
Evelyn Lee	c	84LN78	5				1	864	5	11	1	12	7	10	5	3	0.015		10	
Massive Cp	c	6S048	5500				260	38000	10	1200	20	15	100	15			0.14	200	450	
Massive Cp	c	6S049	4500				220	45000	10	2600	30	15	100	7			0.3	150	650	
Massive Cp	c	6S050	3500				210	58000	10	220	20	15	100	15			0.08	250	500	
Massive Cp	c	7S072	500				1.5	1500	15	35	5	50	100							
Massive Cp	c	7S073	50				1	950	45	35	5	30	30							
Massive Cp	c	7S074	10				0.5	70	15	95	5	30	20							
Massive Cp	c	7S075	5				0.3	30	5	25	5	5	10							
Willett	c	DH-3	100			0.3	49	8649	44	310	20	92	100	0	370	10		0	6	
Willett	c	Dh-4	26			2.6	3	2820	45	302	24	32	53	4	160	12		1	17	
Mitchell	c	1857	230	8	7	1.2	150	33654	625	3100	21	39	27	2830	48	5.9		34	10	
Nabesna	c	NBI-22B	9920				81.0	19600	26	620	1	19	90	5	1500	4.0	0.40	3	1	
Nabesna	c	NBII-10	2940					215000	2	850	23	13	27		20	0.1				
Nabesna	c	NBI-26	1090				116.0	25400	53	360	45	7	100		515	0.1		2	1	
Nabesna	c	NBII-11	740					39200	4	470	1	18	17		49	0.1				

TABLE 2: GEOCHEMISTRY OF 292 HAND SPECIMENS FROM ALASKAN SKARNS

Location	type	Smpl#	Au	Pt	Pd	Te	Ag	Cu	Pb	Zn	Mo	Ni	Co	Bi	As	Sb	Hg	Sn	W	F
			ppb----->				ppm----->													
Nabesna	c	NBI-38	550				0.5	16	28	82	4	27	11		20	0.1				
Nabesna	c	NBI-22A	350				2.0	333	4	28	2	8	44		302	0.1		1	45	
Nabesna	c	NBII-2	280				2.1	1049	3	46	2	23	33			0.1				
Nabesna	c	NBII-6	140				1.7	916	1	31	3	13	14			0.1				
Nabesna	c	NBI-29	85				0.7	555	680	870	1	5	10		66	0.1				
Nabesna	c	NBI-35	55				0.2	24	200	34	<1	3	23		41	385	0.06			
Nabesna	c	NBI-1B	55				1.0	969	3	4000	4	4	28		24	3.7	0.40	6	1	
Nabesna	c	NBI-1A	35				0.3	45		50	1	3	15		71	0.1		4	1	
Nabesna	c	NBI-28	35				41.0	18400	48	48	2	9	6			0.1				
Nabesna	c	NBI-4	10					25		63	1	1	14			0.1		2	1	
Nabesna	c	NBI-17	10					6	2	32	<1	9	20		45	0.1		2	12	
Nabesna	c	NBIII-1	10				0.5	240	130	61	1	13	12		160	220				
Nabesna	c	NBI-18	10					39	2	38	1	2	22		46	0.1		3	85	
Nabesna	c	NBI-27	10				1.1	132	22	170	3	2	1		10	0.1			1	
North Fork	c	93ha25d	3200				400	25000	27	3000	1	55	54	4	134	6		96	4	
North Fork	c	93ha25a	2400				110	30000	14	1600	25	77	120	4	3590	8.3		55	1	
North Fork	c	93ha25b	110				13	3957	23	320	2	52	19	1	141	5.7		9	1	
North Fork	c	93ha27	60				2	1337	10	220	1	41	46	1	174	4		28	1	
Orange Hill	c	1863	41			4.8	4	15850	1232	14000	24	19	46	3	40	1.4		31	170	
OrangeHill	c	OHI-4d	38				35	50000	1	750		2	16							
OrangeHill	c	OHI-4	24				135	50000	1	1800		6	53							
OrangeHill	c	OHI-7	3				2.5	2930	26	500		12	13							
OrangeHill	c	OHI-8	2				6.4	75	49	510		18	5							
OrangeHill	c	OHI-6b	2				0.5	69	9	31		3	1		3	0.2	0.05			
RaineyHollow	c	RE 2	0												1	0.9	0.03			
RaineyHollow	c	RH 20	0												280	0.6	0.1			
Rendu Glac	c	77so48	5500				500	38000		1200			100						4200	
Rendu Glac	c	77so49	4500				500	62000		2600			100						6185	
Rendu Glac	c	77so50	3500				500	58000		220			100						5000	
Rendu Glac	c	77so72	500				1.5	1500		35			100							
Rendu Glac	c	77so53	50				1	840		15			15						238	
StagBay	c	sb-1	10				194	35000	80	69	1	6	21		2	1				
StagBay	c	sb-2	10				0.05	79	4	23	1	2	7		2	2				
Zackley	c	zm21	2800				24	56000	10	14	82	20	4		66	1				
Zackley	c	zm23	50				1.2	910	3	48	4	65	13		2	1				
Zackley	c	z-11	10				0.1	470	6	89	3	113	60		19	1				
Zackly	c	z-20b	50656				140	95000		250	313	62	21		137	31.1	0.2		22	
Zackly	c	z-f-3	43008				100	124000		<200	59	20	3		93	1.7	5		69	
Zackly	c	6091	16900	40	5		67	87500	7	<200	5	88	5		74	0.9	0.445		11	
Zackly	c	10-7-ox	10000	25	61		75	70000		80			29	200						
Zackly	c	6092	7830	30	10		69	52340	6	<200	1	30	5		88	0.7	3.8		6	
Zackly	c	z-56	7744				45	47600		<200	4	250	51		4250	7	1.25		5	
Zackly	c	6820	6770	30	30		15	65420		<200	12	120	28		238	2.9			35	
Zackly	c	z-2-574	4470				110	34560		<200	21	250	70		44	1	0.7		354	
Zackly	c	6823	3780	20	10		4	32640		<200	2	88	38		65	2.6			18	
Zackly	c	6090	3670	50	10		88	27500	12	<200	8	89	5		77	1.8	1.15		10	
Zackly	c	z-66	3648				5	2800		<200	3	30	5	7	55	2.5	0.045		1	
Zackly	c	z-2-569	3370				39	57500		<200	15	430	130		15	0.6	0.27		92	
Zackly	c	z-7	3330				72	31500		<200	5	130	12		49	5.6	1.7		8	
Zackly	c	z-19	2880				12	94300		<200	299	140	69		107	10	0.27		1	

TABLE 2: GEOCHEMISTRY OF 292 HAND SPECIMENS FROM ALASKAN SKARNS

Location	type	Smpl#	Au	Pt	Pd	Te	Ag	Cu	Pb	Zn	Mo	Ni	Co	Bi	As	Sb	Hg	Sn	W	F
			ppb----->			ppm----->														
Zackly	c	z-17	1952				250	157000		<200	7	160	49		16	16	0.09		3	
Zackly	c	z-32	1810				45	28500		<200	140	51	14		28	2.4	0.03		37	
Zackly	c	6807	1360	20	10		2	24500		<200	4	52	32		46	4.2			10	
Zackly	c	6094	110				3.5	2300	4	<200	65	71	5		83	0.6	0.14		90	
Zackly	c	6093	85				2.7	1440	4	<200	39	20	5		46	0.3	0.09		69	
Zackly	c	z-25	59				1	1070		<200	6450	67	22		8	1	0.015		3	
Zackly	c	6095	38				3.5	2500	3	<200	120	66	5		126	0.5	0.19		120	
Zackly	c	z-36	18				2	1420		<200	17	25	23		10	1.2	0.003		6	
Zackly	c	6096	17				2	860	4	<200	57	86	5		71	0.7	0.11		68	
Adams	f	83ad244	10				0.05	470	1	87	32	26	6		5	1				
Campbell	f	2j51r	10				0.6	1520	3	6	5	24	300		5	<1		1	3	70
Haida	f	q-180	5650				93	92600	13	109	1	5	37		1300	0.1	0.1	2	1	40
Hetta Mnt	f	72c233	5500				200	195000	300	1450	520	22	48		3	<1				
Hetta Mnt	f	72c235-	800				190	100000	2	7000	98	940	64		120	<1				
Houghton	f	72j325r	1000				9.3	52000	1	61	3	3	191		62	1				
Houghton	f	H-1	500				144	400000	6	6600	1	222	10		1	<1				
Jumbo	f	TB-12	830					45800										1	1	70
Jumbo	f	TB-6	680					68100										2	1	40
Jumbo	f	TB-5	670					54200										2	1	90
Jumbo	f	TB-2	570					34200							1	0.1	0.15	1	1	
Jumbo	f	TB-1	360					10300							1	0.1	0.1	2	1	25
Jumbo	f	tkb50	100				0.8	1620	22	15	51	12	43		2	<1				
Jumbo	f	TB-7	70					7430							10	1.5	0.51	2	2	420
Jumbo	f	tb28	50				1.5	2400	10	590	1	3	39		1	<1				
Jumbo	f	TB-3	10					8200										2	6	260
Jumbo	f	TB-4	10					7850										21	2	150
Jumbo	f	TB-13	10															5	1	
Lake Marge	f	71j339R	20				0.2	1310	34	30	190	48	20		1	<1				
Maine	f	m1622	50				85	87000	2650	36000	2	76	100		3	<1		1	1	580
McClarenGl	f	mq-6	10				1.8	3000	27	88	3	7000	311		440	30				
Paint R	f	pr-1	1100				180	88000	1	670	1	160	560		320	1				
Sultana	f	S-1	3200				168	92	40	247	1	48	12		220	<1				
Summit Lk	f	SL-1	30				3.2	7400	65	38	1	5	4		2	1				
Summit lk	f	SL3	10				10.5	38000	20	64	1	30	27		2	1				
TuxedniBay	f	t-1	200				170	118000	42000	410000	18	6	282		1740	50				
jumbo	f	72c224	5400				55	148000	30	560	4	18	1370		2	<1				
jumbo	f	2j55r	1500				5	22000	6	2	2	18	16		3	<1		2	1	120
jumbo	f	j5	700				7	16100	5	2	2	24	31		5	<1		2	4	260
pow	f	q-141	2700				55	47400	11	88	16	8	160		750	0.9	0.4	1	1	50
pow	f	72c231a	10				0.2	1550	7	16	3	20	28		1	<1		1	21	70
pow	f	bm-1	10				0.1	35	8	1	2290	13	5		1	<1		1	8	130
Billiken	g	1852	120	9	1	0.1	2	2973	21	130	11	46	130	2	17	3.4		11	1	
MedfraFe	g	2810	3160			3.6	5.1	940	90	290	8	5	10	2000	4350	170	0.87	19	17	
MedfraFe	g	2775	380			2.4	4.9	613	4	71	22	7	35	27	2980	236	0.42	30	7	
MedfraFe	g	2808	16			0.05	1.6	80	5	2300	160	26	10	1	105	1.2	0.038	3	310	
MedfraFe	g	2777	9			0.05	1.1	395	6	220	4	6	21	1	14	2	0.015	18	1	
MedfraFe	g	2807	7			0.1	0.8	374	5	39	298	8	32	1	13	0.5	1	12	170	
MedfraFe	g	2809	3			0.05	2.3	66	358	200	1	14	8	1	114	75.7	0.031	3	57	
MedfraFe	g	2779	2			0.05	0.9	7	1	150	5	23	29	1	3	0.2	0.051	29	8	
MedfraFe	g	2778	2			0.05	0.8	30	3	107	1	16	17	1	2	0.5	0.001	13	1	

TABLE 2: GEOCHEMISTRY OF 292 HAND SPECIMENS FROM ALASKAN SKARNS

Location	type	Supl#	Au	Pt	Pd	Te	Ag	Cu	Pb	Zn	Mo	Ni	Co	Bi	As	Sb	Hg	Sn	W	P
			ppb----->			ppm----->														
Sleekemute	g	2939	200				0.1	574	1	76	14	7	14		37	12	0.09			
Sleekemute	g	2941	200				0.1	147	12	2	7	5	12		467	11	0.1			
Sleekemute	g	2940	100				0.1	563	6	19	8	4	21		189	10	0.08			
DryPass	m	dp-1	400				165	209000	5	165	43000	25	570		390	2				
Ho Glacier	m	HG-1	6			0.05	1	27	8	30	4057	10	3	1	13	3		1	2	
Ho Glacier	m	HG-2	3			0.05	1	4	12	270	8500	14	24	0	3	1.2		1	3	
Nunatak	m	Nun-1	3			0.05	0.5	2360	18	190	29	55	41	0	3	0.5		1	186	
Nunatak	m	Nun-2	2			0.05	0.5	294	5	110	944	36	17	0	3	0.8		1	142	
Arrigetch	s	1851	10				4	1530		2300	12		13		100	16			3	
Arrigetch	s	79AD16	8					5	169	1160	13	50		8				13	1	
Arrigetch	s	79AD12	7					5	24	503	6	25		26		10		220	1	
Arrigetch	s	79AD19	6					192	4518	1278	18	342		1045				174	1	
Arrigetch	s	79AD10	5					196	74	727	5	19		12				997	1	
Arrigetch	s	79AD78	4					23	58	160	9	32		116				2011	23	
Arrigetch	s	79AD16	4					5	13	249	7	21		34				154	3	
Arrigetch	s	79AD16	3					5	133	9686	21	27		238				5155	1888	
Arrigetch	s	79AD34	2					432	693	9812	7	4		12				2669	1	
Arrigetch	s	79AD18	2					759	228	502	8	8		10				7804	1	
Arrigetch	s	79AD78	1					12	103	219	9	12		11				3278	74	
Brooks Mtn	s	BH2-86	1				50.0	513	8530	10830	2			72				500	2	20000
Brooks Mtn	s	BH3074					3.6	284	347	20000	3			32				385	401	20000
Brooks Mtn	s	BH2974					0.9	11	66	900	3			9				286	26	4200
Brooks Mtn	s	BWA					7.4	555	489	1520	3			19				598	23	6300
Cape Mtn	s	CMT8-8	1				0.3	1	7	70	3			54				35	360	5000
Cape Mtn	s	CM59	1				1.5	1	16	90	2			840				76	1400	10000
Cape Mtn	s	CMT8A	1				0.3	1	9	61	1			110				30	200	5000
Cape Mtn	s	CH11					0.3	110	130	52	1			2				1400	71	9800
Ear Mtn	s	C-38	4				0.6	83	32	135	5			49	180	165		285	3	
Ear Mtn	s	C-25	3				6.6	800	76	80	3			264		337		617	375	
Ear Mtn	s	C-37	2				0.9	108	33	279	7			38	350	78	0.095	425	7	
Ear Mtn	s	C-23	2				1.6	158	22	290	5			47	348	71	0.09	1135	38	
Ear Mtn	s	C-24	2				0.4	124	24	235	6			92	330	123		883	13	
Ear Mtn	s	C-27	2				0.2	70	22	440	9			91	200			980	15	
Ear Mtn	s	C-26	1				0.8	116	23	96	4			30				83	6	
Groundhog Basins		63B	300			0.1	400	630	89000	96000	2	17	45	15	34000	15		39500	12	
Groundhog Basins		J14	250				250	670	81000	92000		700	600	40	140000			140000	13	
Groundhog Basins		156A	200			0.25	4	560	770	99000	4	7	87	43	20	21		785	15	
Groundhog Basins		63A	150			0.1	300	1200	53000	85000	2	46	130	10	100000	8		23500	10	
Groundhog Basins		160A	100			0.3	3	380	38	120000	1	19	87	320	10	1		4500	10	
Groundhog Basins		HOM	20				55	1800	37000	80000								12200	20	
Groundhog Basins		158B	20			0.02	54	3300	1400	69000	5	21	26	120	10	24		2450	15	
Groundhog Basins		5P24	20				15	700	92000	110000		70	60	40	80			14900	15	
Groundhog Basins		158A	10			0.02	74	1200	1800	160000	4	12	43	140	8	27		13600	18	
Groundhog Basins		162B	10			0.1	1	190	99	1700	1	180	58	5	5	1		880	10	
Groundhog Basins		160B	5			0.1	3	370	45	35000	1	10	30	87	29	4		620	19	
Groundhog Basins		159A	<50			0.02	9	1700	64	41000	3	8	51	10	150	2		18600	14	
Lost River	s	LR2	5				50.0	128	10000	174	2			225				41	2000	4000
Lost River	s	LR3	5				1.7	43	138	160	4			105				20000	2000	20000
Lost River	s	LR1					0.8	123	370	300	19			10				490	2000	8500
LymanPK	s	93kc89	7				1.6	109	59	142	14	18	24	4	296	9		98	21	

TABLE 2: GEOCHEMISTRY OF 292 HAND SPECIMENS FROM ALASKAN SKARNS

Location	type	Smpl#	Au	Pt	Pd	Te	Ag	Cu	Pb	Zn	Mo	Ni	Co	Bi	As	Sb	Hg	Sn	W	F
			ppb----->				ppm----->													
Earnie Lake	z	79DN262	1220				37.7	330	38266	18317	1	5	70		130000	315				
Eieleson	z	E-216	10				28	72	4550	50000		9	103		3	0.4	0.05			
Glacier Basin	z	67B	50			2.2	82	2900	130000	88000	2	6	19	10	10	45		450	15	
Glacier Basin	z	64A	10			0.1	5	410	240	56000	1	5	60	<10	110	23		550	15	
Glacier Basin	z	154C	<50			0.03	4	29	10000	3700	1	720	59	<10	5	47		360	10	
Glacier Basin	z	67A	<50			0.2	22	290	1300	24000	2	26	80	<10	10	31		140	10	
McKinley PK	z	mp-4	10				333	128	33000	100000	1	4	77		4	3				
McKinley PK	z	mp-5	10				153	1450	220000	77000	1	1	44		3	35				
Nelson Glac	z	167A	<50			2.4	180	7800	65000	64000	3	2	14	5	10	69		60	5	
Nelson Glac	z	167B	<50			3.3	73	6100	73000	75000	8	1	8	2	36	39		80	5	
Nelson Glac	z	152A	<50			1.2	290	14000	94000	45000	5	4	8	8	54	53		85		
Nelson Glac	z	167C	<50			1.15	78	670	111000	51000	3	12	18	3	60	51		75		
Sheep Crk	z		<10				26.4	5000	1100	130000	3	10	100	20			0.16		2	
SlippCrk	z	SC-2	10				9.9	1610	58000	76000	2	2	37		3	2				
Tin Crk	z	tc82-d01					48	100	1000	1000										
Tin Crk	z	tc82-d01					80.96	100	100	4300										
Tin Crk	z	tc82-d01					348.8	400	59700	148300										
Tin Crk	z	tc-82-w04					33.28	4400	1300	93000										
Tin Crk	z	tc82-d02					16	900	14900	190000										
Tin Crk	z	tc82-d01					176	100	8200	56500										
Tin Crk	z	tc82-d02					11.2	100	16500	22100										
Tin Crk	z	tc82-d01					32	200	900	28000										
Tin Crk	z	tc82-d02					2.56	200	300	61000										
Tin Crk	z	tc82-d01					6.4	100	600	13200										
Tin Crk	z	tc82-d02					44.16	1100	41000	101900										
Tin Crk	z	tc82-d02					3.2	100	600	118000										
Tin Crk	z	tc-82-w03					22.4	1200	5700	27500										
Tin Crk	z	tc-82-w02					11.2	100	1000	24500										
Tin Crk	z	tc-82-w01					19.84	9200	600	12300										
Tin Crk	z	tc-82-w01					82.56	24200	3700	40500										
Tin Crk	z	tc-82-w02					121.6	12900	13000	38000										
Tin Crk	z	tc-82-w03					134.4	15600	113500	151000										
Tin Crk	z	tc-82-w03					19.52	700	18000	30500										
Tin Crk	z						170	15000	3000	70000										
Tin Crk	z	tc-82-w04					41.28	100	12500	53000										
Tin Crk	z	tc-82-w03					4.8	700	200	43500										
Tin Crk	z	tc-82-w01					59.52	7700	3700	32500										
Tin Crk	z	tc-82-w05					34.88	6500	7600	117100										
Tin Crk	z	tc-82-w05					6.08	1600	200	41300										
Tin Crk	z		10				155	2401	1770	111000	1	7	10	98	<10	0.03	0.03	1	1	
Tin Crk	z		10				13.4	3500	1700	9400	16	20	50	20			0.1		3	
Tin Crk	z		<10				7.2	2417	258	24000	1	5	14	8	<10	<1	0.07	1	1	
Wild Lake	z	79DN199	520				31	9700	2400	1000	10	50	10	20	500	10000				

TABLE 3: MICROPROBE COMPOSITIONS OF PYROXENES FROM ALASKAN FE SKARNS

DEPOSIT NAME	Na2O	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	Fe2O3	Total
Calcic Fe-(Au,Cu) skarns--Alaska Peninsula										
Paint River	0.06	13.82	0.29	50.38	23.95	0.00	0.39	4.26	2.93	96.08
Paint River	0.05	13.43	0.36	50.18	24.05	0.07	0.51	4.56	2.41	95.62
Paint River	0.08	14.02	0.49	51.93	22.96	0.03	0.34	0.00	6.31	96.15
Paint River	0.06	13.92	0.35	52.84	22.99	0.01	0.32	0.00	7.01	97.49
Paint River	0.06	13.09	0.32	50.51	23.02	0.07	0.53	0.00	7.64	95.23
Tuxedni Bay	0.08	16.21	0.57	52.30	23.81	0.03	0.27	1.47	0.00	94.75
Tuxedni Bay	0.03	16.61	0.21	52.34	24.43	0.05	0.47	1.10	1.12	96.36
Tuxedni Bay	0.00	16.92	0.10	52.69	24.48	0.00	0.43	1.04	0.17	95.84
Tuxedni Bay	0.07	16.60	0.53	52.31	24.64	0.05	0.10	0.99	0.71	96.00
Kasna Crk	0.16	2.09	0.34	48.50	22.68	0.00	0.89	23.61	0.19	98.45
Kasna Crk	0.23	1.84	0.22	48.58	22.21	0.02	0.94	24.38	1.39	99.80
Kasna Crk		3.15	0.00	49.45	22.05		2.11	22.92		99.68
Kasna Crk		3.36	0.00	48.28	22.69		2.22	21.36		97.91
Kasna Crk		0.08	0.00	0.82	0.39	0.00	0.03	0.32	2.47	2.43
Kasna Crk		0.08	0.00	0.80	0.40	0.00	0.03	0.30	2.42	2.48
Calcic Fe-(Cu,Au) skarns, Jumbo Basin area, SE Alaska										
2J55R POW	0.21	10.31	0.35	45.15	19.36	0.01	0.43	8.16	0.00	83.98
2J55R POW	0.15	11.56	0.73	48.60	21.79	0.01	0.50	7.90	0.00	91.23
2J55R POW	0.18	10.59	0.64	47.30	21.45	0.03	0.33	7.58	0.00	88.09
2J55R POW	0.14	11.07	0.60	47.57	20.58	0.00	0.50	7.51	0.00	87.98
2J55R POW	0.16	9.54	0.35	45.58	19.48	0.00	0.57	9.08	0.00	84.77
CU Mtn	0.11	9.50	0.08	49.76	21.57	0.02	2.73	0.00	10.60	94.37
CU Mtn	0.03	9.91	0.13	51.65	22.64	0.03	0.71	0.00	11.79	96.90
Hetta Mtn	0.05	11.66	5.56	46.00	21.00	0.02	0.89	5.23	0.00	90.41
Hetta Mtn	0.26	11.49	0.68	49.33	22.86	0.00	0.84	7.18	1.27	93.91
Hetta Mtn	0.10	11.81	0.36	50.94	22.17	0.00	0.96	0.00	7.81	94.14
Hetta Mtn	0.20	12.47	0.74	47.95	22.01	0.00	0.74	5.27	0.66	90.03
Hetta Mtn	0.11	12.30	0.29	50.24	22.83	0.03	1.39	6.29	0.00	93.48
Hetta Mtn	0.15	12.23	0.27	51.13	22.38	0.00	0.66	0.00	7.46	94.27
J-5_JUMBO	0.37	9.48	0.22	45.92	19.52	0.01	0.77	10.50	0.00	86.80
J-5_JUMBO	0.39	9.35	0.29	45.90	19.56	0.05	0.79	10.01	0.00	86.34
J-5_JUMBO	0.48	9.70	0.34	46.36	19.46	0.03	0.57	9.57	0.00	86.51
J-5_JUMBO	0.42	10.08	0.44	46.42	19.78	0.04	0.46	9.24	0.00	86.87
J-5_JUMBO	0.42	11.33	0.31	46.45	19.43	0.05	0.55	8.00	0.62	87.16
SUMMIT_LAKE	0.06	10.19	0.08	48.74	22.33	0.03	0.97	8.30	0.00	90.70
SUMMIT_LAKE	0.09	10.74	0.07	48.18	21.51	0.00	0.94	7.87	0.00	89.39
SUMMIT_LAKE	0.13	10.33	0.06	50.13	21.14	0.01	1.17	0.00	8.74	91.71
SUMMIT_LAKE	0.03	10.67	0.16	48.19	21.80	0.00	0.79	7.95	0.00	89.58
SUMMIT_LAKE	0.14	10.05	0.15	50.58	21.30	0.00	1.14	0.00	9.72	93.08
SUMMIT_LAKE	0.09	11.13	0.10	48.70	21.97	0.03	1.02	8.31	0.00	91.36

TABLE 3: MICROPROBE COMPOSITIONS OF PYROXENES FROM ALASKAN FE SKARNS

DEPOSIT NAME	Na2O	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	Fe2O3	Total
Magnesian Fe skarns										
BILLIKEN	0.07	17.73	0.10	54.45	25.28	0.03	0.24	0.58	0.89	99.38
BILLIKEN	0.00	17.37	0.02	54.09	25.18	0.00	0.27	1.18	0.54	98.65
BILLIKEN	0.08	16.27	0.35	52.69	24.18	0.00	0.17	2.51	0.88	97.12
BILLIKEN	0.00	17.73	0.13	53.93	24.92	0.01	0.04	0.92	0.68	98.35
BILLIKEN	0.01	18.28	0.04	54.33	25.11	0.07	0.11	0.13	0.78	98.85
BILLIKEN	0.03	18.20	0.04	54.15	25.06	0.00	0.04	0.06	0.96	98.53
BILLIKEN	0.13	15.59	0.83	52.36	24.70	0.06	0.31	2.32	2.54	98.82
BILLIKEN	0.13	16.70	0.36	52.85	24.57	0.00	0.01	1.34	1.62	97.58
MEDFRA_FE	0.05	14.73	0.05	48.03	18.28	0.00	0.10	0.00	1.51	82.75
MEDFRA_FE	0.03	14.40	0.58	41.26	15.32	0.06	0.02	1.51	0.00	73.18
MEDFRA_FE	0.08	14.54	0.43	46.09	19.45	0.00	0.07	1.98	0.00	82.64
MEDFRA_FE	0.14	3.11	0.46	40.23	18.40	0.04	0.59	14.91	0.00	77.87
MEDFRA_FE	0.20	3.72	0.22	45.43	20.21	0.00	0.61	16.82	0.00	87.20
MEDFRA_FE	0.04	16.18	0.16	49.01	21.74	0.00	0.14	1.58	0.38	89.22
MEDFRA_FE	0.16	4.17	0.22	46.47	18.64	0.02	0.59	0.00	18.80	89.07
MEDFRA_FE	0.14	2.72	0.31	43.90	18.58	0.06	0.52	0.00	19.43	85.66
MEDFRA_FE	0.00	16.25	0.23	51.00	23.58	0.00	0.05	1.75	0.73	93.59
MEDFRA_FE	0.13	3.51	0.30	46.45	21.74	0.02	0.66	20.19	0.39	93.39
MEDFRA_FE	0.09	4.57	0.24	47.18	21.46	0.02	0.87	19.50	0.32	94.25
SLEEKEMUTE	FE0.01	11.99	3.92	49.03	24.47	0.28	0.22	5.88	3.52	99.33
SLEEKEMUTE	FE0.13	10.93	4.50	49.14	24.32	0.42	0.09	7.82	3.09	100.42
SLEEKEMUTE	FE0.06	10.88	3.01	49.17	24.23	0.29	0.26	8.12	3.63	99.63
SLEEKEMUTE	FE0.11	10.90	2.27	50.29	24.01	0.13	0.20	9.34	2.31	99.57
SLEEKEMUTE	FE0.07	11.59	2.22	50.01	24.37	0.20	0.20	7.56	3.02	99.24
SLEEKEMUTE	FE0.66	8.24	8.58	41.39	16.39	0.53	0.19	11.02	6.35	93.36
SLEEKEMUTE	FE0.16	9.23	4.25	48.13	24.46	0.23	0.30	8.94	4.82	100.50
SLEEKEMUTE	FE0.06	14.47	2.99	50.98	25.20	0.14	0.31	2.43	3.69	100.26
SLEEKEMUTE	FE0.04	15.15	3.41	50.43	25.30	0.17	0.19	0.68	4.56	99.93
SLEEKEMUTE	FE0.01	15.96	2.32	52.25	25.67	0.10	0.38	0.82	3.58	101.09
SLEEKEMUTE	FE0.11	10.69	1.60	50.63	24.27	0.13	0.30	9.67	2.63	100.03
SLEEKEMUTE	FE0.03	11.77	3.31	49.17	24.37	0.25	0.25	6.44	2.79	98.37
SLEEKEMUTE	FE0.10	12.18	1.25	50.85	24.17	0.09	0.31	7.45	2.97	99.37
SLEEKEMUTE	FE0.01	11.26	3.43	51.16	23.72	0.11	0.34	0.00	10.67	100.70
SLEEKEMUTE	FE0.11	9.11	5.88	49.15	22.48	0.20	0.21	0.00	14.08	101.20

TABLE 4: COMPOSITIONS OF GARNETS FROM ALASKAN FE SKARNS

Deposit	Na2O	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	Fe2O3	TOTAL
	Jumbo Basin Fe (Cu,Au) skarns									
CU_MNTN	0.02	0.06	2.12	33.66	30.67	0.00	0.33	0.25	26.42	93.53
CU_MNTN	0.00	0.02	5.60	34.94	31.26	0.02	0.21	0.36	21.76	94.17
CU_MNTN	0.04	0.02	3.54	34.43	30.30	0.01	0.37	0.60	24.49	93.81
CU_MNTN	0.01	0.01	0.61	33.90	30.32	0.01	0.21	0.00	28.48	93.54
CU_MNTN	0.02	0.00	0.07	34.73	30.86	0.00	0.40	0.00	29.88	95.96
CU_MNTN	0.00	0.01	0.13	34.38	30.32	0.05	0.58	0.00	28.58	94.05
CU_MNTN	0.00	0.00	0.13	34.12	30.14	0.03	0.48	0.11	29.41	94.41
CU_MNTN	0.00	0.04	6.33	34.69	31.45	0.17	0.38	0.82	20.67	94.56
CU_MNTN	0.10	0.00	3.34	34.75	30.60	0.35	0.89	0.20	24.83	95.04
CU_MNTN	0.06	0.00	4.07	34.05	30.47	0.09	0.48	1.28	23.77	94.28
CU_MNTN	0.00	0.02	5.77	33.68	32.38	0.01	0.34	0.00	23.72	95.92
HOUGHTON	0.08	0.02	2.91	35.02	27.97	0.15	1.01	0.92	24.89	92.97
HOUGHTON	0.09	0.18	4.21	35.75	30.28	0.29	0.52	0.19	23.78	95.29
HOUGHTON	0.06	0.10	4.45	35.60	30.43	0.28	0.58	0.70	23.57	95.77
HOUGHTON	0.04	0.13	4.58	36.35	30.88	0.36	0.49	0.57	23.74	97.15
HOUGHTON	0.00	0.08	4.50	35.94	29.46	0.27	0.86	1.69	23.60	96.38
HOUGHTON	0.01	0.10	4.04	36.25	30.38	0.24	0.80	0.77	24.56	97.16
HOUGHTON	0.01	0.16	5.13	36.09	30.40	0.34	0.57	1.24	22.83	96.78
HOUGHTON	0.09	0.04	3.02	35.68	29.04	0.19	0.96	2.13	25.91	97.07
HOUGHTON	0.03	0.13	5.07	36.07	30.63	0.08	0.52	0.64	23.04	96.20
HOUGHTON	0.07	0.03	4.15	35.92	29.55	0.24	0.80	1.48	24.13	96.37
HOUGHTON	0.03	0.06	3.29	35.92	29.37	0.15	1.17	1.20	25.50	96.68
Jumbo	0.00	0.08	9.18	34.03	27.57	0.08	0.36	0.00	13.15	84.46
Jumbo	0.00	0.03	8.73	34.42	27.44	0.06	0.26	0.06	14.68	85.68
Jumbo	0.02	0.01	9.33	35.14	28.17	0.04	0.27	0.00	13.96	86.94
Jumbo	0.01	0.06	8.51	35.44	27.89	0.00	0.38	0.00	15.07	87.36
Jumbo	0.20	0.02	9.27	34.76	26.64	0.03	0.42	0.00	13.59	84.93
Jumbo	0.05	0.06	8.27	35.92	28.77	0.08	0.50	0.00	16.39	90.02
Jumbo	0.02	0.06	7.90	36.41	28.53	0.04	0.44	0.00	17.46	90.86
Jumbo	0.05	0.07	8.41	35.70	28.11	0.09	0.39	0.00	16.00	88.81
Jumbo	0.03	0.03	1.54	32.97	26.27	0.02	0.59	0.00	23.61	85.07
Jumbo	0.05	0.01	7.38	34.38	27.19	0.13	1.14	0.60	17.13	88.00
Jumbo	0.00	0.01	6.17	34.53	27.80	0.21	0.77	0.80	19.21	89.49
Jumbo	0.04	0.00	6.75	34.85	28.05	0.09	0.76	0.76	18.69	89.98
Jumbo	0.02	0.00	6.57	34.45	26.90	0.08	0.85	0.00	17.84	86.72
Jumbo	0.07	0.06	7.71	34.94	27.77	0.09	0.81	0.34	17.03	88.81
Jumbo	0.00	0.03	8.08	36.27	29.27	0.14	0.77	0.31	17.59	92.46
SUMMIT LAKE	0.03	0.02	1.80	33.37	27.22	0.02	0.59	0.06	25.14	88.24
SUMMIT LAKE	0.00	0.01	1.14	33.56	28.20	0.00	0.42	0.00	26.11	89.43
SUMMIT LAKE	0.04	0.00	5.70	34.49	28.13	0.00	0.97	0.43	20.26	90.03
SUMMIT LAKE	0.00	0.00	5.81	34.31	28.10	0.02	0.76	0.84	20.00	89.85
SUMMIT LAKE	0.01	0.07	0.14	33.91	27.72	0.00	0.63	0.00	28.14	90.62
SUMMIT LAKE	0.00	0.01	4.90	35.61	29.60	0.03	0.73	0.11	22.43	93.43
SUMMIT LAKE	0.01	0.06	0.37	31.70	28.84	0.04	0.57	0.27	26.21	88.06

TABLE 4: COMPOSITIONS OF GARNETS FROM ALASKAN FE SKARNS

Deposit	Na2O	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	Fe2O3	TOTAL
Fe-Cu-Au skarns										
PAINT River	0.01	0.03	15.60	37.00	32.41	0.04	0.72	1.00	7.96	94.76
PAINT River	0.03	0.00	15.69	37.95	33.02	0.07	0.73	0.54	8.34	96.37
PAINT River	0.04	0.04	15.39	37.40	32.44	0.03	0.50	1.25	8.54	95.64
PAINT River	0.05	0.00	15.35	37.20	32.59	0.08	0.74	0.93	8.49	95.44
PAINT River	0.00	0.10	6.89	36.76	32.43	0.12	0.21	0.00	21.42	97.94
PAINT River	0.00	0.06	5.94	36.77	31.70	0.02	0.12	1.33	23.14	99.07
MILLETT	0.01	0.03	0.59	35.27	32.24	0.08	0.88	0.32	30.40	99.83
MILLETT	0.00	0.00	0.29	35.19	31.48	0.00	0.84	0.00	30.07	97.86
MILLETT	0.00	0.00	0.23	35.42	31.87	0.03	1.02	0.18	30.87	99.62
MILLETT	0.00	0.02	0.32	35.00	32.13	0.00	0.94	0.00	30.52	98.93
MILLETT	0.00	0.00	0.31	35.18	32.14	0.06	0.77	0.00	30.37	98.83
MILLETT	0.02	0.02	0.19	35.39	32.31	0.04	0.98	0.00	30.27	99.21
MILLETT	0.01	0.26	0.37	34.95	31.04	0.04	0.81	0.00	29.76	97.23
MILLETT	0.00	0.01	0.21	35.03	31.88	0.06	1.06	0.00	30.17	98.42
MILLETT	0.05	0.01	0.14	35.60	32.18	0.04	0.80	0.00	31.12	99.94
MILLETT	0.00	0.04	0.88	35.12	32.36	0.03	0.79	0.34	29.96	99.52
MILLETT	0.01	0.04	0.25	35.41	31.62	0.00	0.82	0.00	30.29	98.44
ADAMS skarn	0.00	0.10	16.21	37.70	32.45	0.23	0.57	1.33	7.25	95.85
ADAMS skarn	0.00	0.08	16.40	37.33	32.35	0.27	0.37	1.25	6.59	94.63
ADAMS skarn	0.00	0.11	16.09	37.88	32.37	0.19	0.94	1.05	7.58	96.20
ADAMS skarn	0.01	0.14	16.58	36.35	33.41	0.10	0.78	0.00	8.83	96.20
Kasna Crk		0.29	1.47	34.86	32.13	0.00	0.63		30.00	99.38
Kasna Crk		0.39	0.00	35.71	31.02	0.00	1.79		30.60	99.51
Kasna Crk		0.00	6.20	35.22	33.36	0.15	0.59		22.72	98.24
Magnesian Fe skarns										
SLEEKEMUTE Fe	0.00	0.18	13.46	39.17	31.37	0.27	0.64	2.44	12.14	99.67
SLEEKEMUTE Fe	0.01	0.28	13.63	39.00	31.03	0.23	0.69	2.30	11.73	98.90
SLEEKEMUTE Fe	0.03	0.36	16.76	39.41	33.55	0.33	0.12	1.37	7.62	99.55
SLEEKEMUTE Fe	0.00	0.18	13.54	38.73	31.45	0.20	0.55	2.71	12.01	99.37
SLEEKEMUTE Fe	0.00	0.36	13.40	39.15	31.55	0.16	0.78	2.54	12.65	100.58
SLEEKEMUTE Fe	0.02	0.12	11.27	32.81	24.57	1.24	0.71	7.84	0.91	79.49
SLEEKEMUTE Fe	0.04	0.13	12.45	34.47	29.81	1.63	0.61	3.46	9.03	91.62
SLEEKEMUTE Fe	0.00	0.05	10.92	33.34	23.22	1.07	0.56	0.89	8.19	78.24
MEDFRA Fe	0.00	0.19	13.82	38.59	31.01	0.24	0.87	2.70	11.39	98.81
MEDFRA Fe	0.01	0.14	12.95	38.75	31.56	0.17	0.52	3.23	13.18	100.51
MEDFRA Fe	0.00	0.24	14.00	39.47	31.03	0.19	0.67	3.53	11.82	100.94
MEDFRA Fe	0.06	0.17	14.36	38.63	30.82	0.22	0.97	3.19	10.74	99.15
MEDFRA Fe	0.04	0.14	14.45	39.25	31.14	0.27	0.58	3.79	11.01	100.66
MEDFRA Fe	0.05	0.17	14.13	38.87	31.22	0.27	0.72	3.78	11.46	100.67
MEDFRA Fe	0.02	0.24	14.23	38.72	30.31	0.26	0.98	3.91	10.99	99.67

TABLE 5: MICROPROBE COMPOSITIONS OF PYROXENES FROM ALASKAN CU SKARNS

DEPOSIT NAME	Na2O	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	Fe2O3	Total
Gold-rich Cu skarns										
Deer Crk	0.06	2.21	0.35	48.65	21.48	0.07	1.02	23.72		97.56
Deer Crk	0.06	2.83	0.16	49.31	21.57	0.00	2.57	22.41		98.91
Deer Crk	0.10	2.99	0.13	48.98	21.49	0.00	1.76	22.21		97.66
Deer Crk	0.03	3.83	0.27	49.28	21.64	0.00	1.01	22.96		99.03
Deer Crk	0.02	1.81	0.17	48.64	20.99	0.00	1.60	25.27		98.49
Deer Crk	0.03	2.60	0.18	48.43	20.95	0.00	1.69	24.22		98.10
Deer Crk	0.17	6.16	0.33	53.75	23.64	0.00	1.03	20.60		105.67
Deer Crk	0.10	5.27	0.12	61.73	26.41	0.19	1.33	26.54		121.69
Deer Crk	0.07	8.17	0.24	51.42	22.79	0.00	0.90	15.50		99.10
Deer Crk	0.10	4.70	0.27	50.35	21.85	0.07	1.07	20.81		99.23
Deer Crk	0.00	6.99	0.16	51.09	22.21	0.00	1.06	17.98		99.48
Deer Crk	0.06	3.83	0.13	49.91	21.66	0.00	0.91	22.29		98.79
Deer Crk	0.04	8.09	0.31	51.74	22.33	0.10	0.84	15.36		98.82
Deer Crk	0.15	5.62	0.23	50.14	21.87	0.07	1.03	19.08		98.19
Champion I	0.20	1.30	0.46	50.77	22.55	0.02	0.37	28.64		104.32
Champion I	0.01	1.41	0.68	56.10	24.87	0.06	0.68	31.82		115.62
Champion I	0.05	0.51	0.81	48.18	21.31	0.05	0.67	29.06		100.64
Champion I	0.03	0.36	0.40	47.89	20.69	0.20	0.98	28.25		98.80
Champion I	0.10	2.22	0.34	49.44	21.98	0.02	0.75	26.28		101.13
Champion I	0.01	1.74	0.11	53.21	23.72	0.02	0.84	29.38		109.03
Champion I	0.11	1.41	0.25	49.24	21.57	0.05	0.55	27.59		100.76
North Fork	0.13	7.50	0.17	50.18	23.37	0.02	0.42	15.72	1.37	98.89
North Fork	0.42	7.03	1.11	49.81	22.84	0.13	0.36	15.59	1.68	98.97
North Fork	0.14	4.84	0.13	48.69	23.10	0.00	0.66	18.70	1.83	98.09
North Fork	0.12	6.86	0.24	49.87	23.23	0.00	0.35	16.76	0.26	97.67
North Fork	0.21	7.03	0.57	49.09	22.55	0.03	0.30	16.04	0.67	96.48
North Fork	0.51	6.85	1.22	49.88	22.78	0.24	0.28	15.81	1.02	98.59
North Fork	0.38	6.86	1.10	49.55	22.73	0.19	0.34	15.99	0.91	98.04
North Fork	0.14	7.83	0.31	50.18	23.08	0.02	0.40	15.45	1.50	98.89
North Fork	0.21	7.24	0.74	49.20	22.70	0.11	0.21	15.75	0.45	96.61
North Fork	0.37	7.36	0.79	50.25	22.45	0.13	0.24	16.36	0.04	97.99
MITCHELL	0.02	3.15	0.11	49.21	21.61	0.00	2.07	22.66		98.82
MITCHELL	0.07	7.83	0.47	51.97	22.42	0.00	0.65	16.58		99.98
MITCHELL		6.90	0.10	50.50	24.12		1.51	16.74		99.87
MITCHELL	0.10	12.41	2.03	50.63	23.94	0.00	0.46	6.73	0.00	96.31
MITCHELL	0.02	14.43	0.22	52.02	23.79	0.01	0.58	4.11	0.00	95.17

TABLE 5: MICROPROBE COMPOSITIONS OF PYROXENES FROM ALASKAN CU SKARNS

DEPOSIT NAME	Na2O	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	Fe2O3	Total
Gold-poor Cu skarns										
Copper King	0.02	9.73	0.13	52.53	24.81	0.01	0.68	13.29		101.21
Copper King	0.09	10.96	0.12	52.48	24.68	0.01	0.52	11.15		100.02
Copper King	0.05	10.81	0.06	52.57	24.81	0.01	0.58	11.44		100.34
Orange Hill	0.12	15.33	2.58	51.92	21.25	0.18	1.13	5.97		98.48
Orange Hill	0.16	13.78	0.62	54.91	24.67	0.00	0.35	6.27		100.76
Orange Hill	0.20	13.73	0.46	55.15	24.72	0.01	0.26	7.00		101.53
Orange Hill	0.20	13.80	0.61	54.24	24.55	0.20	0.35	6.39		100.34
Orange Hill	0.35	13.85	3.33	50.92	22.35	0.37	0.24	6.50		97.91
Orange Hill	0.22	14.12	1.51	53.88	24.83	0.42	0.23	5.62		100.83
Stag Bay	0.03	17.83	0.57	53.87	24.74	0.02	0.02	0.79	0.97	98.84
Stag Bay	0.04	16.17	0.49	52.56	24.19	0.04	0.22	2.65	0.71	97.09
Stag Bay	0.04	16.33	1.04	52.20	24.24	0.02	0.09	1.99	1.23	97.18
Stag Bay	0.01	16.78	0.76	52.62	24.83	0.07	0.28	0.95	0.97	97.26
Stag Bay	0.04	16.46	0.82	52.05	23.89	0.00	0.24	1.88	0.85	96.24
Stag Bay	0.03	16.50	1.10	53.27	25.07	0.00	0.16	1.88	1.04	99.05
Stag Bay	0.04	15.79	1.37	52.30	25.00	0.06	0.02	2.19	2.17	98.94
Stag Bay	0.07	17.39	0.70	52.63	24.60	0.03	0.08	0.06	1.95	97.50
Stag Bay	0.07	17.65	0.52	54.00	25.23	0.12	0.17	0.39	1.55	99.71
Stag Bay	0.05	16.17	1.08	52.22	24.47	0.10	0.11	2.01	1.74	97.96
Stag Bay	0.04	16.66	0.85	52.80	24.96	0.01	0.02	1.27	1.68	98.30
Stag Bay	0.06	16.48	0.35	53.46	24.27	0.03	0.02	3.12	0.00	97.78
Shellhouse	0.12	8.48	0.10	51.42	23.25	0.05	1.31	14.68	0.00	99.39
Shellhouse	0.21	0.25	0.06	45.11	21.40	0.01	0.31	22.51	0.00	89.85
Shellhouse	0.20	0.20	0.12	46.37	22.29	0.00	0.28	21.88	0.00	91.34
Shellhouse	0.01	10.33	0.02	51.47	24.02	0.04	1.02	11.32	1.55	99.78
Shellhouse	0.12	10.40	0.24	51.57	23.77	0.00	0.97	11.16	1.44	99.65
Shellhouse	0.15	9.77	0.01	51.70	24.15	0.00	0.94	11.81	1.62	100.16
Shellhouse	0.07	9.93	0.00	51.78	24.15	0.00	0.94	12.03	0.48	99.37
Shellhouse	0.08	9.01	0.11	51.20	23.28	0.00	1.06	13.91	0.23	98.87
Shellhouse	0.20	10.65	0.14	52.37	24.28	0.00	1.06	10.52	0.84	100.06
Rendu Glacier	0.00	15.94	0.19	53.99	23.77	0.00	0.63	3.93		98.45
Rendu Glacier	0.04	19.07	0.07	60.21	26.07	0.00	0.32	1.49		107.26
Rendu Glacier	0.02	17.71	0.17	55.49	24.27	0.00	0.51	1.20		99.37
Rendu Glacier	0.00	17.30	0.26	54.60	23.86	0.09	0.40	1.93		98.46
Rendu Glacier	0.02	17.44	0.22	56.38	24.20	0.02	0.64	2.04		100.95
Rendu Glacier	0.08	17.38	0.10	55.20	24.12	0.04	0.50	1.64		99.04
Rendu Glacier	0.00	16.44	0.12	55.03	24.12	0.05	0.85	2.74		99.35
Rendu Glacier	0.03	17.26	0.18	58.44	25.59	0.04	0.48	3.70		105.71
Glacier Fork		15.59	0.00	54.27	26.11		0.73	3.00		99.70
Glacier Fork		12.05	0.12	53.12	24.45		1.32	9.05		100.11
Glacier Fork		16.45	0.00	53.71	25.70		0.87	2.68		99.41
Glacier Fork		15.19	0.00	53.73	25.84		0.76	4.14		99.66

TABLE 6: COMPOSITIONS OF GARNETS FROM ALASKAN CU SKARNS

Deposit	Na2O	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	Fe2O3	TOTAL
Au-rich Cu skarns										
Champion I	0.00	0.00	8.99	37.40	31.77	0.00	0.34	0.54	18.91	97.95
Champion I	0.03	0.05	7.24	37.30	32.23	0.07	0.27	0.10	21.57	98.86
Champion I	0.03	0.15	7.04	36.95	32.31	0.56	0.11	0.45	21.57	99.16
Champion I	0.00	0.08	5.79	36.68	31.76	0.12	0.20	0.41	23.30	98.34
Champion I	0.00	0.34	6.41	36.45	32.65	0.84	0.21	0.00	21.51	98.41
Champion I	0.00	0.10	6.30	39.15	33.91	0.00	0.16	0.33	24.66	104.62
DEER CK	0.04	0.00	11.21	37.87	32.05	0.75	0.56	0.26	15.85	98.57
DEER CK	0.00	0.00	9.05	36.95	31.72	0.19	0.57	1.04	18.41	97.93
DEER CK	0.05	0.01	9.13	36.65	31.93	0.04	0.36	1.39	18.04	97.59
DEER CK	0.01	0.00	17.17	39.57	33.44	0.31	0.77	1.25	8.02	100.53
DEER CK	0.04	0.05	19.14	42.41	35.93	0.54	0.49	0.00	7.27	105.87
DEER CK	0.03	0.07	17.60	38.79	33.13	0.39	0.59	0.31	6.66	97.56
DEER CK	0.00	0.00	11.71	37.70	32.30	0.32	0.57	0.13	14.92	97.65
Champion I	0.00	0.00	9.94	36.74	31.42	0.42	0.37	1.41	16.84	97.15
Champion I	0.00	0.03	7.68	39.11	33.19	1.43	0.32	0.98	22.47	105.21
Champion I	0.01	0.00	10.22	39.06	34.05	0.99	0.21	0.93	18.46	103.92
Copper King	0.00	0.01	9.44	36.69	31.39	1.09	0.25	0.96	17.58	97.40
Copper King	0.03	0.00	7.20	36.09	31.37	0.32	0.28	1.43	20.56	97.26
Copper King	0.05	0.00	6.05	35.68	30.34	1.13	0.32	2.11	22.01	97.68
MITCHELL CU		0.00	12.95	36.12	33.98	1.41	1.35		14.00	99.81
MITCHELL CU		0.00	15.04	38.24	34.39	0.00	1.52		10.78	99.97
MITCHELL Cu	0.04	0.04	6.33	36.64	31.18	0.00	1.59	0.72	22.04	98.57
MITCHELL Cu	0.00	0.00	7.57	36.85	32.28	0.01	1.20	0.28	20.34	98.52
MITCHELL Cu	0.00	0.03	10.16	37.09	28.36	0.08	4.75	1.66	16.31	98.43
MITCHELL Cu	0.05	0.04	11.40	37.50	30.94	0.00	2.88	0.78	14.88	98.46
MITCHELL Cu	0.00	0.01	11.75	37.21	30.63	0.00	3.26	1.39	14.37	98.62
MITCHELL Cu	0.05	0.08	1.97	33.59	31.31	0.05	0.09	0.00	25.62	92.76
MITCHELL Cu	0.01	0.03	2.57	34.95	30.08	0.03	0.16	0.88	26.13	94.84
MITCHELL Cu	0.04	0.04	2.08	35.08	30.72	0.06	0.19	0.00	26.39	94.61
MITCHELL Cu	0.00	0.03	2.36	34.89	30.44	0.10	0.28	0.00	25.15	93.26
MITCHELL Cu	0.05	0.06	1.78	33.52	31.39	0.05	0.31	0.00	26.78	93.93
MITCHELL Cu	0.04	0.07	5.56	31.30	29.67	0.03	0.16	0.00	23.71	90.54
MITCHELL Cu	0.00	0.03	1.93	32.23	30.13	0.06	0.18	0.00	25.78	90.34
Au-poor Cu skarns										
ORANGE HILL	0.02	0.17	2.41	34.52	30.62	0.29	0.12	0.00	24.81	92.95
ORANGE HILL	0.01	0.00	1.37	35.26	28.96	0.00	1.70	0.00	27.35	94.64
ORANGE HILL	0.00	0.01	0.25	34.93	29.24	0.00	1.47	0.02	29.52	95.45
ORANGE HILL	0.02	0.00	0.57	35.31	29.24	0.02	1.32	0.00	28.11	94.60
ORANGE HILL	0.00	0.00	1.51	35.36	28.50	0.00	1.27	0.04	27.31	94.00
ORANGE HILL	0.00	0.00	0.23	34.33	29.10	0.00	1.24	0.11	29.17	94.18
ORANGE HILL	0.01	0.06	0.37	35.01	29.69	0.00	0.85	0.00	29.05	95.04
ORANGE HILL	0.00	0.10	0.49	35.06	29.85	0.00	1.11	0.00	28.78	95.38
ORANGE HILL	0.00	0.04	0.22	34.80	29.66	0.14	1.11	0.00	29.07	95.02
ORANGE HILL	0.00	0.03	0.36	33.73	29.13	0.12	1.02	0.00	27.99	92.37
ORANGE HILL	0.06	0.00	5.02	38.67	27.57	0.07	1.80	0.00	20.94	94.13
ORANGE HILL	0.10	0.00	6.38	35.09	29.93	0.10	1.32	0.32	20.35	93.60
SHELLHOUSE	0.00	0.01	0.13	35.16	31.90	0.02	0.40	0.35	30.78	98.74
SHELLHOUSE	0.05	0.00	0.08	35.33	31.95	0.05	0.31	0.46	30.96	99.17

TABLE 6: COMPOSITIONS OF GARNETS FROM ALASKAN CU SKARNS

Deposit	Na2O	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	Fe2O3	TOTAL
SHELLHOUSE	0.01	0.01	0.14	35.34	32.34	0.00	0.31	0.00	30.72	98.89
SHELLHOUSE	0.01	0.00	0.13	35.38	31.41	0.07	0.34	0.59	30.67	98.60
SHELLHOUSE	0.08	0.00	0.11	35.20	31.63	0.00	0.25	0.05	30.61	97.93
SHELLHOUSE	0.01	0.00	0.08	35.49	31.65	0.00	0.34	0.61	30.98	99.15
RAINEY HOLLOW	0.01	0.30	2.98	34.03	29.63	0.29	0.06	0.00	22.45	89.76
RAINEY HOLLOW	0.07	0.55	2.57	34.21	29.78	0.35	0.06	0.00	23.44	91.03
RAINEY HOLLOW	0.01	0.09	1.30	32.73	29.50	0.11	0.27	0.00	24.96	88.97
RAINEY HOLLOW	0.00	0.09	0.04	33.63	29.47	0.03	0.24	0.00	26.80	90.29
RAINEY HOLLOW	0.00	0.12	0.50	34.09	29.60	0.00	0.06	0.00	27.18	91.55
RAINEY HOLLOW	0.03	0.13	1.60	33.34	29.03	0.00	0.12	0.00	24.94	89.18
RAINEY HOLLOW	0.06	0.09	0.81	32.35	30.10	0.05	0.07	0.00	26.89	90.40
DRY PASS	0.00	0.02	3.41	35.42	31.58	0.00	1.01	0.00	24.71	96.14
DRY PASS	0.04	0.00	4.51	35.28	31.23	0.01	1.15	0.00	23.10	95.33
DRY PASS	0.01	0.00	1.86	34.95	30.87	0.04	0.96	0.00	26.14	94.83
DRY PASS	0.04	0.02	0.94	34.23	30.68	0.00	0.77	0.00	28.51	95.18
DRY PASS	0.09	0.01	1.25	34.86	31.29	0.02	0.95	0.08	28.79	97.33
DRY PASS	0.00	0.01	2.37	34.79	30.91	0.00	1.27	0.00	26.79	96.13
DRY PASS	0.00	0.02	7.03	36.51	31.91	0.00	1.72	0.02	20.97	98.18
DRY PASS	0.02	0.00	2.55	35.54	31.49	0.01	0.95	0.00	26.55	97.11
DRY PASS	0.01	0.03	11.00	37.06	31.37	0.10	2.25	0.79	15.13	97.72
DRY PASS	0.00	0.01	8.54	36.81	32.48	0.03	1.05	0.00	18.23	97.15
DRY PASS	0.00	0.03	5.11	35.66	31.74	0.01	1.18	0.24	23.41	97.37
DRY PASS	0.05	0.00	4.29	35.94	32.59	0.01	0.87	0.00	23.99	97.75
DRY PASS	0.02	0.00	1.08	35.03	31.45	0.00	0.52	0.00	28.90	97.00
DRY PASS	0.00	0.00	4.49	35.91	31.96	0.07	0.82	0.00	24.07	97.32
DRY PASS	0.00	0.04	0.53	35.52	31.10	0.00	0.94	0.00	29.35	97.49
DRY PASS	0.05	0.03	4.58	35.95	31.88	0.00	1.25	0.00	23.26	96.98
DRY PASS	0.00	0.00	7.07	35.71	31.88	0.00	1.41	0.21	20.48	96.75
DRY PASS	0.00	0.03	8.86	36.38	32.28	0.08	1.15	0.52	18.12	97.40
Glacier Fork	0.00	0.14	1.88	33.45	29.49	0.16	0.00	0.00	24.63	89.75
Glacier Fork	0.00	0.11	0.70	33.59	28.57	0.10	0.19	0.00	26.40	89.65
Glacier Fork		0.00	7.26	35.41	33.92	0.11	0.94		21.58	99.22
Glacier Fork		0.00	0.11	35.28	32.49	0.00	0.62		31.09	99.59
Glacier Fork		0.28	6.43	36.83	33.57	0.15	0.43		22.27	99.96
Glacier Fork		0.00	0.00	35.00	32.43	0.00	0.73		31.37	99.53
Glacier Fork		0.00	3.13	35.76	33.47	0.00	0.46		26.90	99.72
Glacier Fork		0.00	7.19	36.99	33.71	0.44	0.10		18.86	97.29
GOLD HARBOR	0.00	0.00	2.61	36.08	31.50	0.02	0.81	0.41	27.29	98.71
GOLD HARBOR	0.00	0.00	2.94	35.21	30.93	0.10	1.39	0.37	26.23	97.17
GOLD HARBOR	0.00	0.03	3.45	35.58	30.69	0.12	1.75	0.22	25.57	97.40
GOLD HARBOR	0.05	0.02	3.73	35.98	29.35	0.23	1.70	2.23	25.32	98.62
GOLD HARBOR	0.00	0.03	3.93	35.49	30.20	0.29	2.24	1.54	25.04	98.76
GOLD HARBOR	0.06	0.02	5.14	36.69	32.15	0.04	0.81	0.24	23.88	99.03
GOLD HARBOR	0.00	0.00	4.91	36.49	32.28	0.01	1.16	0.00	23.94	98.78
GOLD HARBOR	0.00	0.02	5.47	36.22	30.20	0.05	1.90	1.23	22.94	98.02
GOLD HARBOR	0.03	0.07	1.75	32.78	30.56	0.04	0.21	0.00	24.23	89.67
GOLD HARBOR	0.00	0.08	1.94	33.56	31.53	0.04	0.25	0.00	28.01	95.42
GOLD HARBOR	0.01	0.02	1.90	34.02	31.28	0.00	0.10	0.42	25.82	93.58
GOLD HARBOR	0.03	0.05	5.34	35.97	30.66	0.43	1.59	1.39	22.87	98.33
GOLD HARBOR	0.00	0.00	6.20	36.46	32.44	0.09	1.03	0.06	22.16	98.44

TABLE 7: COMPOSITIONS OF PYROXENES FROM ALASKAN MO SKARNS

Deposit	Na2O	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	Fe2O3	TOTAL
MO GLACIER	0.03	18.02	0.11	53.50	24.94	0.00	0.07	0.00	0.81	97.47
MO GLACIER	0.04	16.29	0.43	53.33	24.61	0.06	0.13	2.48	0.00	97.37
MO GLACIER	0.00	17.38	0.21	53.33	24.47	0.04	0.04	1.24	0.00	96.70
MO GLACIER	0.03	17.84	0.04	53.10	24.58	0.09	0.02	0.14	0.94	96.78
MO GLACIER	0.09	15.40	0.28	53.00	24.18	0.10	0.16	0.00	2.94	96.16
MO GLACIER	0.07	15.78	1.48	51.44	24.28	0.27	0.20	2.00	0.54	96.05
MO GLACIER	0.00	17.80	0.03	53.12	23.81	0.00	0.03	1.25	0.37	96.41
MO GLACIER	0.00	17.33	0.15	53.41	24.83	0.06	0.14	1.06	0.11	97.10
MO GLACIER	0.04	16.82	0.17	51.89	23.95	0.07	0.14	1.14	0.97	95.18
MO GLACIER	0.06	17.76	0.05	52.93	24.59	0.04	0.16	0.00	1.58	97.16
MO GLACIER	0.00	17.75	0.08	52.51	24.27	0.02	0.21	0.00	1.41	96.24
MO GLACIER	0.03	17.77	0.15	53.55	24.36	0.00	0.11	0.91	0.15	97.03
MO GLACIER	0.02	17.73	0.12	53.48	24.95	0.00	0.17	0.13	0.99	97.58
MO GLACIER	0.12	16.74	0.72	53.11	20.48	0.05	0.63	4.82	0.00	96.67
MO GLACIER	0.04	17.51	0.11	53.20	24.31	0.05	0.08	1.05	0.60	96.94
MO GLACIER	0.09	16.89	0.54	52.69	24.30	0.00	0.10	1.25	0.03	95.89
MO GLACIER	0.23	14.04	0.80	51.08	20.37	0.02	0.94	7.18	0.00	94.65
MO GLACIER	0.24	13.00	1.21	50.74	23.31	0.01	0.57	5.99	1.37	96.42
MO GLACIER	0.13	15.04	0.38	54.35	22.94	0.07	0.35	4.01		97.27
MO GLACIER	0.22	11.83	0.64	52.69	22.51	0.00	0.61	8.97		97.46
MO GLACIER	0.14	13.09	0.49	53.64	23.02	0.08	0.59	6.23		97.27
MO GLACIER	0.06	15.77	1.09	53.48	23.59	0.07	0.20	2.28		96.54
MO GLACIER	0.15	13.55	3.03	50.90	23.15	0.28	0.18	4.44		95.67
MO GLACIER	0.01	17.23	0.15	55.20	23.42	0.18	0.08	1.11		97.38
MO GLACIER	0.00	16.98	1.14	52.77	23.40	0.03	0.02	0.25		94.60
NUNATAK	0.09	6.00	0.18	49.93	23.01	0.02	1.75	16.98	0.00	97.96
NUNATAK	0.05	5.34	0.21	49.27	22.79	0.02	0.74	19.26	0.01	97.69
NUNATAK	0.05	6.80	0.26	50.23	23.05	0.03	0.83	16.69	0.00	97.93
NUNATAK	0.05	6.51	0.14	49.85	22.72	0.05	1.65	16.38	0.00	97.35
NUNATAK	0.10	10.70	0.46	50.61	23.47	0.00	0.63	10.28	0.06	96.30
NUNATAK	0.09	6.89	0.32	49.97	22.76	0.00	1.00	16.92	0.01	97.95
NUNATAK	0.04	10.29	0.31	51.45	23.76	0.00	0.69	0.00	11.51	98.05
NUNATAK	0.13	7.07	0.28	49.90	22.52	0.00	1.48	15.76	0.00	97.14
NUNATAK	0.19	9.05	0.43	50.84	23.06	0.02	0.19	14.00	0.00	97.78
NUNATAK	0.08	6.44	0.28	49.74	22.95	0.00	1.04	17.20	0.16	97.87
NUNATAK	0.09	8.06	0.25	49.70	23.36	0.01	0.43	14.30	0.08	96.28
NUNATAK	0.12	9.30	0.39	50.84	22.87	0.00	0.68	13.68	0.58	98.46
NUNATAK	0.06	9.66	0.17	50.95	23.45	0.01	1.01	12.39	0.17	97.85
NUNATAK	0.09	11.93	0.35	51.20	23.74	0.08	0.51	8.70	0.14	96.72

TABLE 8: COMPOSITIONS OF GARNET FROM ALASKAN MO SKARNS

Deposit	Na2O	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	Fe2O3	TOTAL
MO GLACIER	0.01	0.06	8.69	35.55	31.95	0.86	0.86	1.35	16.54	95.85
MO GLACIER	0.01	0.19	15.58	36.48	33.17	0.21	0.68	0.26	8.52	95.09
MO GLACIER	0.01	0.19	15.80	39.73	34.71	0.21	0.62	0.43	9.65	101.36
MO GLACIER	0.02	0.04	6.40	35.59	31.72	0.76	0.66	0.39	20.47	96.05
MO GLACIER	0.00	0.06	8.08	35.75	31.45	0.91	0.78	0.66	17.79	95.47
MO GLACIER	0.02	0.03	8.49	36.02	31.60	0.71	0.95	0.90	17.67	96.38
MO GLACIER	0.04	0.01	8.18	36.36	32.19	0.79	0.70	0.14	18.13	96.53
MO GLACIER	0.00	0.06	14.69	36.70	32.09	0.13	0.70	1.08	9.05	94.50
MO GLACIER	0.00	0.02	8.78	38.52	33.86	0.86	0.78	1.17	19.26	103.27

TABLE 9: COMPOSITIONS OF PYROXENE FROM ALASKAN AU SKARNS

Deposit Name	Na2O	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	Fe2O3	Total
Ag King	0.07	2.97	0.78	49.33	23.15	0.09	0.95	23.62		100.96
Ag King	0.14	3.06	0.40	49.57	23.16	0.09	0.63	23.15		100.20
Ag King	0.03	3.37	0.46	48.91	23.25	0.07	0.80	22.19		99.11
Ag King	0.07	3.72	0.14	50.57	23.47	0.04	1.76	21.73		101.50
Ag King	0.11	4.95	0.22	50.54	23.64	0.03	0.92	20.36		100.77
Ag King	0.01	6.05	0.18	50.98	23.81	0.00	1.17	18.18		100.38
Ag King	0.07	4.73	0.10	50.90	23.67	0.03	1.56	20.44		101.50
Ag King	0.08	4.55	0.23	50.70	23.52	0.00	0.79	21.51		101.38
Ag King	0.06	3.91	0.18	50.06	23.58	0.00	1.23	21.36		100.38
Ag King	0.08	4.36	0.13	50.64	23.30	0.02	1.01	21.38		100.93
Ag King	0.15	2.35	0.32	49.66	23.02	0.06	1.53	23.40		100.52
Ag King	0.07	4.91	0.23	50.21	23.28	0.01	0.95	20.57		100.22
PARTIN CRK	0.06	2.21	0.35	48.65	21.48	0.07	1.02	23.72		97.56
PARTIN CRK	0.06	2.83	0.16	49.31	21.57	0.00	2.57	22.41		98.91
PARTIN CRK	0.02	1.81	0.17	48.64	20.99	0.00	1.60	25.27		98.49
PARTIN CRK	0.03	2.60	0.18	48.43	20.95	0.00	1.69	24.22		98.10
RAMBLER	0.42	7.40	0.98	49.18	23.01	0.13	0.44	13.87	2.71	98.12
RAMBLER	0.20	7.55	0.19	50.62	23.42	0.03	0.26	15.93	0.55	98.73
RAMBLER	0.12	13.07	0.94	49.27	22.89	0.01	0.30	5.44	4.93	96.96
RAMBLER	0.08	13.41	0.38	53.57	25.05	0.03	0.41	7.30	0.85	101.07
RAMBLER	0.08	11.40	0.28	49.00	22.27	0.00	0.28	8.06	0.00	91.37
RAMBLER	0.03	14.75	0.70	53.43	25.18	0.00	0.08	5.10	1.47	100.75
RAMBLER	0.14	14.96	0.69	52.78	24.62	0.03	0.12	4.17	0.99	98.48
RAMBLER	0.37	13.91	0.94	51.85	24.75	0.00	0.40	3.40	2.85	98.47
RAMBLER	0.08	15.43	0.98	53.39	24.28	0.04	0.24	4.66	0.87	99.98
RAMBLER	0.08	10.69	0.27	52.02	24.39	0.01	0.41	11.12	1.20	100.19
RAMBLER	0.02	12.12	0.23	51.64	24.48	0.02	0.43	8.27	3.17	100.39
RAMBLER	0.10	14.71	1.07	53.54	25.23	0.05	0.21	4.84	0.96	100.72
RAMBLER	0.13	15.33	1.13	53.35	25.18	0.11	0.10	3.63	1.41	100.36
Nixon Fork	0.09	14.15	0.64	53.06	25.40	0.00	0.17	6.71		100.24
Nixon Fork	0.06	10.97	0.56	52.23	24.56	0.05	0.44	11.21		100.09
Nixon Fork	0.20	10.00	0.53	52.42	24.44	0.04	0.37	12.45		100.46
Nixon Fork	0.06	10.46	0.55	52.07	24.54	0.00	0.51	12.05		100.23
Nixon Fork	0.04	9.18	0.25	52.06	24.61	0.01	0.67	13.96		100.78
Nixon Fork	0.12	8.38	0.27	51.64	24.30	0.02	0.64	15.31		100.67
Nixon Fork	0.12	9.56	0.33	51.79	24.75	0.02	0.78	13.01		100.37
Nixon Fork	0.04	17.86	0.42	54.61	25.84	0.05	0.18	0.03	0.98	99.02
Nixon Fork	0.01	18.24	0.18	54.79	25.84	0.02	0.20	0.00	0.96	99.28
Nixon Fork	0.01	17.43	0.07	54.64	25.89	0.00	0.00	1.05	0.11	99.10
Nixon Fork	0.02	18.03	0.08	55.16	25.59	0.03	0.54	0.41	0.33	99.87
Nixon Fork	0.07	17.82	0.06	54.93	25.45	0.00	0.21	0.42	0.00	98.97
Nixon Fork	0.14	7.17	0.10	50.57	23.86	0.04	0.75	15.76	0.60	98.38
Nixon Fork	0.02	18.46	0.61	54.33	25.84	0.00	0.18	0.00	2.18	99.44
Nixon Fork	0.13	8.64	0.29	50.84	23.73	0.00	0.66	13.74	0.54	98.03
Nixon Fork	0.10	8.36	0.17	51.33	23.68	0.03	0.67	14.55	0.00	98.88
Nixon Fork	0.00	18.32	0.38	55.07	25.77	0.01	0.32	0.00	1.07	99.88
Nixon Fork	0.09	7.67	0.26	50.69	23.66	0.02	0.72	15.29	0.00	98.40
Nixon Fork	0.11	8.41	0.01	51.22	23.86	0.00	0.91	14.26	0.51	98.78
Nixon Fork	0.09	8.40	0.06	51.41	24.11	0.00	0.78	14.39	0.29	99.24
Nixon Fork	0.07	8.88	0.20	51.33	23.92	0.02	0.75	13.83	0.02	99.00

TABLE 9: COMPOSITIONS OF PYROXENE FROM ALASKAN AU SKARNS

Deposit Name	Na2O	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	Fe2O3	Total
Nixon Fork	0.03	17.72	0.21	54.68	25.73	0.00	0.29	0.42	1.13	99.07
Nixon Fork	0.16	5.28	0.21	49.70	22.90	0.03	0.76	19.22	1.46	98.25
Nixon Fork	0.20	5.81	0.28	50.06	23.43	0.00	0.68	17.86	1.89	98.33
Nixon Fork	0.12	4.23	0.14	49.48	23.09	0.00	0.94	20.54	0.24	98.54
Nixon Fork	0.12	4.66	0.11	49.94	22.99	0.02	0.31	20.97	0.00	99.11
Nixon Fork	0.17	5.55	0.14	49.82	22.91	0.02	0.75	18.79	1.35	98.15
Nixon Fork	0.18	6.00	0.37	50.02	23.45	0.00	0.91	17.33	1.54	98.25
Nixon Fork	0.14	6.19	0.11	50.51	23.17	0.00	0.63	18.40	0.67	99.14
Nixon Fork	0.17	7.73	0.54	50.83	23.70	0.08	0.80	15.12	0.93	98.96
Nixon Fork	0.08	10.69	0.40	52.14	24.81	0.00	0.37	10.79	0.73	99.28
Nixon Fork	0.10	7.51	0.64	50.50	24.02	0.00	0.80	14.97	2.33	98.55
Nixon Fork	0.04	16.38	1.97	52.92	25.07	0.30	0.10	1.97	0.99	98.75
Nixon Fork	0.04	16.24	1.67	52.95	26.10	0.28	0.00	1.01	1.64	98.29
Nixon Fork	0.16	6.00	0.37	49.96	23.51	0.01	0.71	17.46	0.48	98.18
Nixon Fork	0.21	5.75	0.19	50.07	23.27	0.02	0.55	18.27	0.47	98.33
Nixon Fork	0.13	5.00	0.25	49.72	23.60	0.02	0.64	19.07	0.73	98.43
Nixon Fork	0.09	18.13	0.13	54.89	26.37	0.01	0.00	0.00	1.44	99.61
Nixon Fork	0.01	18.12	0.07	55.21	26.27	0.01	0.00	0.06	0.61	99.74
Nixon Fork	0.03	17.70	1.53	54.15	25.89	0.00	0.28	0.00	1.11	99.57
Nixon Fork	0.15	10.18	0.53	51.90	24.34	0.06	0.66	11.44	1.25	99.25
Nixon Fork	0.09	10.42	0.44	51.75	24.35	0.00	0.65	11.03	0.52	98.73
Nixon Fork	0.06	10.13	0.43	51.46	24.39	0.08	0.38	11.66	0.61	98.60
Nixon Fork	0.10	10.36	0.38	52.17	24.19	0.00	0.98	11.49	0.87	99.66
Nixon Fork	0.15	9.79	0.36	51.64	24.21	0.00	0.74	11.85	1.06	98.73
Nixon Fork	0.02	18.43	0.18	55.35	26.21	0.02	0.24	0.00	1.36	100.46
Nixon Fork	0.02	18.27	0.14	54.88	26.15	0.00	0.43	0.00	1.90	99.89
Nixon Fork	0.01	18.28	0.22	54.59	26.48	0.03	0.43	0.00	2.81	100.04
Nixon Fork	0.00	17.75	0.15	55.02	26.51	0.00	0.75	0.00	1.84	100.18
Nixon Fork	0.00	18.52	0.04	54.97	26.08	0.02	0.33	0.00	1.91	99.95
Nixon Fork	0.03	18.44	0.10	54.98	26.19	0.00	0.33	0.00	1.99	100.08
Nixon Fork	0.00	18.44	0.05	55.15	26.42	0.00	0.48	0.00	1.95	100.53
Nixon Fork	0.00	18.47	0.08	54.75	26.47	0.00	0.32	0.00	2.38	100.10
Nixon Fork	0.01	18.86	0.08	55.10	26.62	0.00	0.32	0.00	2.95	100.98
Nixon Fork	0.02	18.71	0.09	55.27	26.52	0.00	0.32	0.00	2.35	100.94
Nixon Fork	0.01	18.77	0.06	55.07	26.61	0.00	0.28	0.00	2.77	100.81
Nixon Fork	0.00	18.47	0.03	55.01	26.14	0.04	0.17	0.00	1.37	99.85
Nixon Fork	0.02	18.51	0.09	55.08	26.85	0.00	0.20	0.00	2.58	100.76
Nixon Fork	0.01	18.91	0.04	54.79	26.53	0.00	0.24	0.00	3.23	100.52
Nixon Fork	0.00	18.87	0.09	54.83	26.26	0.00	0.21	0.00	2.74	100.25
Nixon Fork	0.05	18.62	0.11	54.91	26.03	0.00	0.02	0.00	1.52	99.74
Nixon Fork	0.05	18.80	1.05	54.03	26.11	0.00	0.00	0.00	3.10	100.03
Nixon Fork	0.08	8.88	0.30	51.10	24.42	0.01	0.65	12.98	1.73	98.41
Nixon Fork	0.09	10.42	0.36	51.72	24.70	0.03	0.57	10.65	1.74	98.54
Nixon Fork	0.01	18.02	0.45	54.15	26.29	0.03	0.18	0.00	3.17	99.12
Nixon Fork	0.06	8.63	0.24	50.77	24.00	0.04	0.74	13.58	1.41	98.06
Nixon Fork	0.11	10.68	0.31	51.87	24.60	0.02	0.64	10.36	1.90	98.58
Nixon Fork	0.02	16.12	1.65	52.65	25.34	0.31	0.05	1.92	0.85	98.06
Nixon Fork	0.00	16.97	2.43	52.58	25.54	0.65	0.06	0.42	1.25	98.65
Nixon Fork	0.01	16.52	0.97	53.61	25.40	0.24	0.03	2.25	0.55	99.03
Nixon Fork	0.03	17.76	0.92	53.81	25.93	0.25	0.00	0.00	2.09	98.70

TABLE 10: MICROPROBE COMPOSITIONS OF GARNET FROM ALASKAN AU SKARNS

Deposit Name	Na2O	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	Fe2O3	TOTAL
Liberty Bell	0.04	0.00	11.21	37.87	32.05	0.75	0.56	0.26	15.85	98.57
Liberty Bell	0.00	0.00	11.71	37.70	32.30	0.32	0.57	0.13	14.92	97.65
Liberty Bell	0.00	0.00	8.99	37.40	31.77	0.00	0.34	0.54	18.91	97.95
Liberty Bell	0.03	0.07	17.60	38.79	33.13	0.39	0.59	0.31	6.66	97.56
Liberty Bell	0.00	0.00	9.94	36.74	31.42	0.42	0.37	1.41	16.84	97.15
Liberty Bell	0.01	0.00	17.17	39.57	33.44	0.31	0.77	1.25	8.02	100.53
Silver King	0.02	0.08	15.4	38.79	34.98	0.11	0.59	10		100
Silver King	0.03	0.2	15.34	38.45	34.93	0.22	0.63	10		99.82
Silver King	0.02	0.08	14.87	38.66	34.82	0.08	0.47	10.5		99.55
Silver King	0.06	0.11	15.55	38.03	35.06	0.16	0.59	9.93		99.48
Silver King	0.04	0.04	13.64	38.6	35.12	0.14	0.57	12.2		100.37
Silver King	0.03	0.05	13.04	38.48	34.78	0	0.48	13		99.88
Silver King	0	0.07	13.74	38.5	34.97	0.06	0.39	12.7		100.47
Silver King	0.03	0.05	12.6	38.09	34.68	0	0.39	13.7		99.52
Silver King	0.02	0.13	14.93	37.79	34.96	0.79	0.54	10.2		99.37
Silver King	0	0.14	15.2	38.29	34.91	0.59	0.63	9.87		99.65
Silver King	0	0.08	18.85	38.94	36.03	1.34	0.29	4.58		100.12
Silver King	0	0.08	18.51	38.96	36.19	1.18	0.3	4.8		100.04
Silver King	0.01	0.1	18.6	38.98	36.15	1.04	0.21	5.12		100.27
Silver King	0.01	0.16	19.05	39.69	36.06	0.33	0.22	4.49		100.02
Silver King	0.02	0.02	17.57	38.95	35.47	0.24	0.62	7.28		100.17
Silver King	0.02	0.07	19.93	39.96	36.31	0.15	0.17	4.09		100.7
Silver King	0.04	0.18	19.38	39.61	36.25	0.49	0.21	4.18		100.35
Nixon Fork	0.06	0.04	13.5	38.15	35.39	0.41	0.42		11.84	99.83
Nixon Fork	0.03	0.09	13.23	38.47	35.18	0.32	0.62		12.25	100.2
Nixon Fork	0.02	0.04	12.86	38.11	35.1	0.4	0.37		12.59	99.49
Nixon Fork	0	0.06	11.86	37.89	34.71	0.61	0.36		13.38	98.87
Nixon Fork	0.03	0.07	13.94	38.1	34.91	0.82	0.45		11.28	99.59
Nixon Fork	0.01	0.03	13.15	38.41	34.75	0.12	0.44		12.52	99.42
Nixon Fork	0.03	0.55	17.12	39.3	35.64	0.23	0.07		7.53	100.47
Nixon Fork	0.01	0.57	18.23	39.15	36.05	0.05	0.16		5.93	100.16
Nixon Fork	0.03	0.02	9.11	38.07	34.03	0.19	0.43	0.05	18.78	100.71
Nixon Fork	0.00	0.00	9.56	38.04	33.50	0.36	0.39	0.83	17.87	100.54
Nixon Fork	0.03	0.00	10.36	37.97	33.89	0.22	0.18	0.80	16.86	100.32
Nixon Fork	0.00	0.04	9.32	37.73	34.04	0.30	0.24	0.00	17.87	99.53
Nixon Fork	0.03	0.00	12.06	38.34	34.24	0.24	0.17	0.79	14.49	100.35
Nixon Fork	0.01	0.04	9.47	38.06	33.60	0.16	0.27	0.62	18.17	100.42
Nixon Fork	0.04	0.04	9.41	37.81	33.74	0.30	0.28	0.02	17.89	99.51
Nixon Fork	0.00	0.04	13.42	38.57	34.30	0.36	0.43	0.68	12.43	100.22
Nixon Fork	0.02	0.02	12.28	38.52	34.18	0.42	0.11	0.80	13.99	100.33
Nixon Fork	0.03	0.00	9.07	37.93	33.63	0.28	0.23	0.25	18.49	99.90
Nixon Fork	0.04	0.63	9.99	39.24	32.00	0.23	0.29	0.06	17.27	99.74
Nixon Fork	0.02	0.00	9.43	37.96	33.87	0.24	0.25	0.00	17.97	99.74
Nixon Fork	0.02	0.00	9.20	37.95	33.69	0.41	0.43	0.14	18.21	100.05
Nixon Fork	0.02	0.00	9.07	38.20	33.96	0.37	0.33	0.24	18.70	100.89
Nixon Fork	0.00	0.00	9.91	37.88	33.30	0.10	0.18	0.78	17.32	99.47
Nixon Fork	0.01	0.00	8.24	37.92	33.45	0.67	0.12	0.71	19.42	100.54
Nixon Fork	0.04	0.00	9.28	37.84	33.74	0.48	0.32	0.46	18.08	100.23
Nixon Fork	0.03	0.04	9.18	38.14	33.38	0.39	0.50	0.14	18.27	100.06
Nixon Fork	0.03	0.00	9.68	37.85	33.41	0.35	0.21	0.56	17.42	99.50
Nixon Fork	0.00	0.30	17.76	39.54	34.83	0.46	0.00	0.78	6.25	99.92

TABLE 10: MICROPROBE COMPOSITIONS OF GARNET FROM ALASKAN AU SKARNS

Deposit Name	Na2O	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	Fe2O3	TOTAL
Nixon Fork	0.00	0.40	17.72	39.83	34.83	0.18	0.08	0.67	6.78	100.49
Nixon Fork	0.00	0.29	17.52	39.19	35.30	0.44	0.19	0.39	6.65	99.96
Nixon Fork	0.02	0.43	16.87	39.73	34.80	0.11	0.00	0.58	8.10	100.63
Nixon Fork	0.03	0.51	17.93	39.89	35.40	0.00	0.12	0.09	6.83	100.79
Nixon Fork	0.01	0.37	17.22	39.28	35.39	0.73	0.00	0.47	6.93	100.40
Nixon Fork	0.01	0.50	18.50	39.63	35.83	0.15	0.10	0.14	5.85	100.71
Nixon Fork	0.00	0.44	15.35	38.70	34.98	1.20	0.00	0.46	8.97	100.09
Nixon Fork	0.02	0.06	11.56	38.15	34.01	0.70	0.44	0.88	14.78	100.60
Nixon Fork	0.00	0.41	15.66	38.99	34.30	1.20	0.12	1.05	8.53	100.25
Nixon Fork	0.00	0.07	13.31	38.82	34.21	0.86	0.32	0.70	12.14	100.43
Nixon Fork	0.01	0.03	13.37	38.85	34.12	0.67	0.48	0.69	12.25	100.46
Nixon Fork	0.00	0.00	11.79	37.10	34.22	0.07	0.33	1.00	14.63	99.14
Nixon Fork	0.00	0.00	13.08	37.38	33.77	0.26	0.39	1.65	12.59	99.11
Nixon Fork	0.00	0.00	14.19	37.25	33.91	0.35	0.50	1.95	10.92	99.07
Nixon Fork	0.00	0.00	14.49	37.68	34.07	0.34	0.48	1.65	10.62	99.32
Nixon Fork	0.00	0.00	13.00	37.11	34.14	0.34	0.46	1.50	12.67	99.23
Nixon Fork	0.00	0.06	12.93	38.71	33.69	1.14	0.44	0.98	12.31	100.26
Nixon Fork	0.00	0.03	14.57	38.79	34.04	0.47	0.23	0.94	10.50	99.58
Nixon Fork	0.02	0.00	14.22	38.72	34.27	0.31	0.42	0.86	11.33	100.15
Nixon Fork	0.01	0.46	16.23	39.22	35.26	0.43	0.15	0.00	8.60	100.35
Nixon Fork	0.00	0.53	16.66	39.42	35.37	0.60	0.08	0.00	7.61	100.27
Nixon Fork	0.03	0.50	16.84	39.26	35.03	0.53	0.00	0.49	7.64	100.31
Nixon Fork	0.06	0.45	15.93	38.86	35.06	1.12	0.07	0.51	8.35	100.42
Nixon Fork	0.00	0.51	16.39	38.73	34.90	0.88	0.12	0.24	7.64	99.40
Nixon Fork	0.02	0.50	16.18	39.13	35.16	0.99	0.01	0.44	8.20	100.62
Nixon Fork	0.02	0.48	16.78	39.04	35.35	0.87	0.10	0.30	7.41	100.34
Nixon Fork	0.07	0.51	16.88	39.28	34.98	0.57	0.10	0.78	7.72	100.90
Nixon Fork	0.00	0.52	16.86	39.10	35.32	0.84	0.22	0.00	6.64	99.52
Nixon Fork	0.00	0.53	17.22	39.17	35.59	1.01	0.06	0.22	6.73	100.52
Nixon Fork	0.05	0.50	16.78	39.07	35.24	1.06	0.18	0.00	6.74	99.61
Nixon Fork	0.00	0.57	17.10	39.02	35.09	0.97	0.11	0.23	6.69	99.78
Nixon Fork	0.00	0.53	17.06	39.00	35.46	1.08	0.07	0.22	6.77	100.18
Nixon Fork	0.02	0.69	16.88	39.25	35.21	1.06	0.00	0.01	7.08	100.20
Nixon Fork	0.05	0.53	16.71	38.84	35.75	1.01	0.11	0.00	7.34	100.33
Nixon Fork	0.01	0.61	16.56	38.94	35.52	0.97	0.02	0.00	7.62	100.24
Nixon Fork	0.00	0.58	16.54	39.02	35.51	1.05	0.10	0.00	7.47	100.27
Nixon Fork	0.02	0.63	16.14	38.94	35.47	1.40	0.07	0.28	7.98	100.93
Nixon Fork	0.03	0.64	15.74	39.00	34.96	1.42	0.18	0.23	8.39	100.58
Nixon Fork	0.23	10.86	10.86	45.23	25.03	1.25	0.00	0.00	7.48	100.93
Nixon Fork	0.04	0.55	15.71	38.89	34.99	1.13	0.12	0.00	8.55	99.98
Nixon Fork	0.02	0.49	17.11	39.65	34.80	0.60	0.02	0.47	7.21	100.37
Nixon Fork	0.00	0.55	14.89	39.01	35.12	1.10	0.13	0.01	9.95	100.75
Nixon Fork	0.02	0.05	12.50	38.38	34.52	0.43	0.40	0.69	13.84	100.82
Nixon Fork	0.00	0.05	12.90	38.34	34.41	0.75	0.31	1.11	12.92	100.80
Nixon Fork	0.00	0.04	11.44	38.52	34.24	0.16	0.30	0.65	15.62	100.97
Nixon Fork	0.04	0.07	10.90	38.10	34.22	0.57	0.22	0.62	15.87	100.61
Nixon Fork	0.00	0.06	10.89	38.38	34.31	0.42	0.28	0.45	16.12	100.91
Nixon Fork	0.03	0.06	10.87	37.81	34.32	0.34	0.11	0.61	16.01	100.16
Nixon Fork	0.01	0.00	11.32	38.23	34.34	0.47	0.42	0.41	15.35	100.55
Nixon Fork	0.00	0.06	12.38	38.46	34.46	0.44	0.33	0.83	14.02	100.97
Nixon Fork	0.00	0.54	15.48	38.49	35.22	1.40	0.03	0.41	8.64	100.22

TABLE 11: MICROPROBE COMPOSITIONS OF PYROXENES FROM ALASKAN W SKARNS

Deposit	Na2O	MgO	Al2O3	SiO2	dCaO	TiO2	MnO	FeO	Fe2O3	TOTAL
high-Au W skarns										
Table Mtn	0.10	3.44	0.21	49.25	23.22	0.00	1.20	21.40		98.85
Table Mtn	0.07	8.98	0.27	51.39	24.62	0.00	0.50	14.20		100.04
Table Mtn	0.11	6.16	0.26	51.89	24.57	0.07	1.18	18.90		103.13
Table Mtn	0.08	9.31	0.42	53.12	24.96	0.07	0.31	13.77		102.03
Table Mtn	0.04	2.26	0.37	49.84	23.47	0.01	1.28	25.17		102.44
Table Mtn	0.10	8.94	0.29	52.56	25.11	0.08	0.33	14.61		102.03
Table Mtn	0.06	4.38	0.16	50.52	23.81	0.02	1.37	20.60		100.91
Table Mtn	0.09	3.37	0.19	50.14	23.70	0.00	1.56	21.28		100.33
Table Mtn	0.03	2.99	0.19	49.67	23.69	0.01	1.11	22.27		99.99
Table Mtn	0.05	2.95	0.16	50.16	23.60	0.00	1.55	22.64		101.12
Table Mtn	0.12	3.35	0.25	50.04	23.31	0.00	1.67	22.22		100.99
Cleary	0.43	5.58	0.36	50.90	22.82	0.00	0.53	20.03		100.66
Cleary	0.91	4.89	0.62	50.29	21.84	0.00	0.37	20.93		99.85
Cleary	0.71	5.34	0.59	51.05	22.42	0.00	0.39	20.58		101.09
Cleary	1.02	4.80	0.57	51.02	21.81	0.00	0.46	21.59		101.26
Cleary	0.74	5.57	0.48	50.89	22.48	0.02	0.42	19.59		100.20
Cleary	1.42	4.80	0.78	50.45	21.09	0.04	0.38	20.93		99.90
Cleary	2.04	4.80	1.27	50.80	20.26	0.02	0.79	20.97		100.96
Cleary	1.38	4.61	0.79	50.88	21.47	0.00	0.39	21.58		101.10
Cleary	0.83	5.00	0.96	50.80	21.91	0.00	0.42	20.74		100.68
STEPOVITCH	0.18	0.50	0.88	45.72	20.13	0.03	1.27	25.90	0.18	94.79
STEPOVITCH	0.21	0.71	2.50	45.28	20.18	0.03	1.54	24.44	0.00	94.88
STEPOVITCH	0.23	0.51	0.42	46.32	20.39	0.02	1.78	25.52	0.70	95.89
Gilmore Dome	0.19	2.14	0.85	50.25	22.33	0.15	1.12	24.83		101.87
Gilmore Dome	0.14	2.69	0.48	50.54	23.10	0.05	0.89	23.96		101.85
Gilmore Dome	0.11	2.89	0.62	50.26	23.10	0.10	0.95	23.66		101.69
Gilmore Dome	0.12	2.81	1.77	49.54	22.27	0.17	0.95	24.52		102.16
Gilmore Dome	0.13	2.44	0.56	50.24	22.88	0.00	1.08	24.74		102.06
low-Au W skarns										
LUCKY13	0.03	7.70	0.19	51.55	21.25	0.15	1.76	16.50		99.13
LUCKY13	0.06	7.35	0.34	53.44	22.78	0.13	1.74	17.97		103.81
LUCKY13	0.21	7.50	1.66	50.92	21.63	0.07	1.70	14.86		98.54
LUCKY13	0.16	7.96	0.83	50.44	20.67	0.10	0.39	17.20		97.76
LUCKY13	0.22	8.36	0.39	51.07	22.03	0.05	1.60	15.94		99.66
LUCKY13	0.28	7.72	0.89	50.89	21.48	0.00	1.32	16.55		99.12
Puzzle Gulch	0.11	11.20	0.29	52.29	24.80	0.03	0.26	10.99		99.97
Puzzle Gulch	0.39	10.16	0.55	52.03	23.73	0.03	0.21	10.99		98.10
Puzzle Gulch	0.18	10.57	0.36	53.42	24.68	0.00	0.14	12.01		101.37
Fur	0.28	11.84	0.39	53.59	24.33	0.13	0.28	10.08		100.92
Puzzle Gulch	0.07	10.98	0.42	53.34	24.63	0.12	0.26	10.15		99.98
Qtz Creek	0.04	10.53	0.17	51.09	24.02	0.07	0.09	11.36	0.25	97.61
Qtz Creek	0.24	12.63	0.33	51.53	23.39	0.01	0.20	7.85	0.89	97.06
Qtz Creek	0.28	12.91	0.43	51.47	23.99	0.03	0.14	6.37	1.72	97.33
Qtz Creek	0.10	16.66	0.24	53.05	23.75	0.03	0.18	2.69	0.99	97.69
Fur	0.16	11.73	0.26	53.74	24.37	0.03	0.23	10.56		101.08
Fur	0.09	9.64	1.15	51.12	25.26	2.71	0.16	10.72		100.84
Fur	0.14	12.25	0.37	54.29	24.23	0.00	0.17	10.18		101.62
Fur	0.14	11.29	0.29	53.65	25.02	0.00	0.06	10.91		101.35
Fur	0.09	10.72	0.17	52.84	24.55	0.06	0.35	11.92		100.69

TABLE 11: MICROPROBE COMPOSITIONS OF PYROXENES FROM ALASKAN W SKARNS

Deposit	Na2O	MgO	Al2O3	SiO2	dCaO	TiO2	MnO	FeO	Fe2O3	TOTAL
Fur	0.23	10.99	0.68	52.60	24.38	0.05	0.15	11.44		100.51
Fur	0.17	11.80	0.38	52.78	24.13	0.00	0.08	10.74		100.09
Fur	0.14	10.03	0.42	53.35	24.29	0.00	0.16	12.43		100.81
Fur	0.21	10.42	0.43	53.14	24.03	0.00	0.06	12.38		100.66
Fur	0.31	10.50	0.67	52.81	23.62	0.01	0.15	11.96		100.02
Fur	0.08	9.67	0.37	52.79	24.36	0.00	0.24	13.59		101.11
Fur	0.11	10.20	0.27	54.20	24.82	0.00	0.17	11.58		101.33
Fur	0.11	10.39	0.34	53.26	24.33	0.00	0.23	13.23		101.89
Fur	0.15	10.40	0.32	53.41	24.22	0.05	0.30	12.24		101.08
Fur	0.16	9.93	0.58	53.39	24.13	0.10	0.26	12.67		101.22
Fur	0.12	12.07	0.47	54.17	24.20	0.00	0.25	9.27		100.56
Fur	0.11	7.47	0.33	49.72	23.33	0.01	1.46	17.00		99.43
Fur	0.11	5.54	0.26	51.70	23.54	0.08	1.04	17.89		100.16
Fur	0.10	5.94	0.32	51.94	23.69	0.02	0.97	18.29		101.25
Fur	0.08	7.42	0.53	52.42	23.73	0.05	1.01	15.79		101.02
Fur	0.07	7.65	0.40	51.81	23.35	0.00	0.69	15.45		99.41
Fur	0.12	5.43	0.42	50.84	23.64	0.00	0.23	19.65		100.32
Fur	0.10	10.35	0.32	53.48	24.83	0.04	0.56	10.91		100.59
Fur	0.13	10.29	0.58	52.33	24.26	0.00	0.73	11.20		99.52
Fur	0.10	10.53	0.38	53.05	24.49	0.09	0.56	10.99		100.20
Fur	0.12	6.81	0.43	51.48	23.64	0.00	0.53	17.25		100.25
Fur	0.12	3.91	0.47	50.40	22.95	0.00	0.76	22.24		100.86
Fur	0.10	7.68	0.31	51.98	23.63	0.11	0.66	16.26		100.72
Fur	0.08	4.02	0.48	51.07	23.03	0.00	1.04	22.15		101.87
Fur	0.12	10.79	0.67	53.22	23.98	0.12	0.45	10.43		99.78
Puzzle Gulch	0.19	10.48	0.44	53.70	24.51	0.00	0.14	11.39		100.85
Puzzle Gulch	0.18	9.89	0.41	53.59	24.37	0.02	0.25	12.11		100.81
Puzzle Gulch	0.09	9.59	0.45	53.39	24.36	0.07	0.15	12.74		100.84
Puzzle Gulch	0.21	10.43	0.61	52.76	23.79	0.06	0.19	11.90		99.94
Puzzle Gulch	0.16	11.54	0.35	54.22	24.19	0.02	0.30	10.74		101.52
Puzzle Gulch	0.08	9.76	0.40	54.76	23.94	0.08	0.06	9.81		98.90
Puzzle Gulch	0.14	11.18	0.54	52.51	24.13	0.00	0.24	11.53		100.27
Puzzle Gulch	0.13	11.19	0.46	52.50	24.02	0.04	0.16	11.07		99.56
Puzzle Gulch	0.14	10.14	0.38	53.49	24.39	0.08	0.32	11.32		100.25
Puzzle Gulch	0.13	10.77	0.37	52.70	23.91	0.00	0.19	11.58		99.65
Puzzle Gulch	0.13	9.80	0.59	51.58	23.19	0.00	0.28	12.71		98.29
Puzzle Gulch	0.14	11.31	0.46	53.18	23.48	0.09	0.16	11.28		100.09
Puzzle Gulch	0.14	11.94	0.45	54.39	23.49	0.04	0.07	9.65		100.14
Puzzle	0.40	9.26	2.45	52.08	23.43	0.42	0.23	12.52		100.79
MR45	0.05	7.01	0.20	49.59	23.54	0.04	0.52	15.90	1.47	98.32
MR45	0.10	6.85	0.24	51.11	22.23	0.06	0.06	19.49	0.00	100.12
MR45	0.00	6.62	0.13	49.87	23.39	0.02	0.12	17.63	0.00	97.77
MR45	0.08	6.72	0.20	50.07	23.92	0.00	0.17	16.70	1.19	99.05
MR52	0.12	10.87	0.55	50.96	23.65	0.01	0.35	10.36	1.51	98.38
MR52	0.10	9.88	0.40	51.17	23.93	0.06	0.43	12.08	1.37	99.42
MR52	0.10	11.14	0.55	51.52	24.76	0.00	0.26	9.29	1.26	98.88
MR52	0.18	11.09	0.83	50.90	23.78	0.05	0.19	9.64	1.80	98.46
MR52	0.06	10.26	0.53	51.18	23.78	0.00	0.11	12.05	0.19	98.15
MR52	0.05	10.45	0.41	51.09	24.36	0.02	0.23	10.80	2.02	99.43
MR52	0.10	10.82	0.46	51.24	23.58	0.00	0.25	11.05	1.04	98.54
MR52	0.07	10.51	0.49	51.38	23.94	0.07	0.31	11.45	0.75	98.96

TABLE 11: MICROPROBE COMPOSITIONS OF PYROXENES FROM ALASKAN W SKARNS

Deposit	Na2O	MgO	Al2O3	SiO2	dCaO	TiO2	MnO	FeO	Fe2O3	TOTAL
Big Windy	0.11	9.99	0.36	51.43	23.73	0.07	0.26	12.58	1.16	99.69
Big Windy	0.11	9.50	0.74	52.35	22.78	0.03	0.18	14.46	0.00	100.15
Big Windy	0.10	9.15	0.30	51.24	23.54	0.00	0.30	14.03	0.11	98.75
Big Windy	0.12	9.11	0.42	50.47	23.74	0.07	0.31	12.88	0.84	97.96
Big Windy	0.23	9.53	0.50	51.56	23.24	0.00	0.23	13.58	0.55	99.43
Big Windy	0.08	8.75	0.43	50.62	23.52	0.02	0.36	14.07	1.56	99.42
Big Windy	0.11	9.70	0.50	51.17	23.92	0.00	0.24	12.48	1.13	99.25
Big Windy	0.10	9.76	0.32	51.36	24.37	0.01	0.45	11.88	1.93	100.18
Big Windy	0.07	8.57	0.33	50.62	23.79	0.01	0.30	14.14	1.78	99.60
Big Windy	0.05	12.51	0.51	53.50	23.87	0.04	0.28	0.00	9.28	100.03
Big Windy	0.11	13.13	0.27	52.22	24.84	0.01	0.31	6.42	2.50	99.80
Big Windy	0.11	10.82	0.46	51.42	24.12	0.04	0.40	10.40	0.87	98.65
Big Windy	0.11	11.98	0.27	51.18	24.00	0.00	0.35	8.24	3.39	99.52
N Fk Salcha	0.67	8.18	1.04	44.41	19.99	0.06	0.00	9.86	1.96	86.17
N Fk Salcha	0.73	8.42	1.10	46.72	20.82	0.01	0.29	10.54	2.09	90.70
N Fk Salcha	0.64	7.68	0.96	46.58	19.88	0.00	0.19	14.43		90.36
N Fk Salcha	0.72	8.11	0.89	47.74	19.73	0.08	0.17	13.09		90.52
Puzzle	0.09	10.12	0.60	53.09	24.69	0.00	0.15	11.75		100.48
Puzzle	0.08	10.58	0.39	53.65	24.74	0.02	0.20	11.12		100.79
Puzzle	0.18	10.13	0.34	53.13	24.19	0.05	0.27	11.29		99.57
Puzzle	0.10	10.87	0.38	53.34	24.46	0.00	0.23	11.04		100.42
Puzzle	0.08	10.52	0.31	53.19	24.34	0.13	0.09	11.25		99.90
Puzzle	0.08	10.94	0.44	53.33	24.24	0.12	0.21	10.97		100.33
Puzzle	0.34	9.30	0.44	51.99	24.02	0.07	0.35	12.95		99.45
Puzzle	0.18	9.38	0.37	53.53	24.18	0.07	0.19	12.92		100.81
Puzzle	0.17	9.24	0.47	51.90	23.26	0.00	0.32	13.00		98.35
Puzzle	0.40	9.26	2.45	52.08	23.43	0.42	0.23	12.52		100.79
BONANZA	0.21	13.42	0.36	54.17	24.62	0.00	0.33	6.91		100.03
BONANZA	0.21	13.21	0.54	54.80	24.88	0.00	0.16	7.25		101.05
BONANZA	0.29	13.37	0.48	52.64	23.80	0.04	0.24	7.10	0.68	98.63
BONANZA	0.05	12.74	0.15	51.40	23.99	0.00	0.34	7.46	1.49	97.60
BONANZA	0.09	13.34	0.22	52.20	24.79	0.00	0.11	6.34	0.94	98.04
BONANZA	0.07	13.76	0.26	51.21	23.24	0.00	1.89	4.69	0.45	95.56
BONANZA	0.03	14.09	0.21	51.32	23.53	0.00	0.49	5.49	0.61	95.76
BONANZA	0.06	15.74	0.15	53.19	24.54	0.00	0.31	3.52	0.93	98.44
BONANZA	0.06	13.22	0.44	51.51	23.66	0.00	0.19	7.24	0.28	96.60
BONANZA	0.08	13.99	0.83	52.91	22.46	0.00	0.24	0.00	4.98	95.49
BONANZA	0.07	13.97	0.30	51.94	23.10	0.00	1.53	4.47	0.00	95.39
BONANZA	0.21	14.78	0.73	51.43	23.58	0.05	0.11	3.93	0.54	95.34
BONANZA	0.12	12.68	0.30	51.63	24.56	0.00	0.14	6.98	1.88	98.28
BONANZA	0.20	13.31	0.39	52.46	24.31	0.02	0.15	6.81	1.11	98.74

TABLE 12: COMPOSITIONS OF GARNET FROM ALASKAN W SKARNS

Deposit	Na2O	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	Fe2O3	TOTAL
Big Windy	0.04	0.13	17.96	34.77	27.05	0.18	0.24	5.64	2.22	88.22
Big Windy	0.02	0.12	18.43	35.75	27.08	0.16	0.75	6.04	2.28	90.61
Big Windy	0.03	0.19	18.41	35.41	25.68	0.14	0.90	6.53	1.80	89.08
Big Windy	0.02	0.17	18.56	33.76	23.46	0.16	1.11	8.95	2.24	88.42
Table Mtn	0.00	0.01	18.29	38.81	34.01	0.37	1.55	7.43		100.49
Table Mtn	0.02	0.10	18.68	39.34	35.67	0.53	0.43	5.68		100.45
Table Mtn	0.00	0.05	20.28	38.55	21.86	0.29	5.78	13.91		100.73
Table Mtn	0.01	0.11	20.47	38.55	18.44	0.33	9.10	14.39		101.42
Table Mtn	0.04	0.03	20.55	38.98	20.94	0.32	6.44	14.12		101.42
MR52	0.01	0.08	18.60	39.07	33.76	0.23	0.16	1.74	4.73	98.37
MR52	0.02	0.06	18.08	38.73	33.25	0.44	0.15	2.68	5.28	98.69
MR52	0.00	0.04	18.56	39.26	33.33	0.29	0.31	1.90	4.70	98.39
MR52	0.02	0.06	15.18	38.16	33.51	0.15	0.06	1.26	9.44	97.84
MR52	0.04	0.08	17.92	38.36	33.39	0.42	0.27	2.16	5.35	97.98
MR52	0.06	0.07	17.67	38.25	32.80	0.27	0.30	2.00	5.52	96.92
MR52	0.01	0.17	18.90	38.63	34.18	0.03	0.02	1.94	4.55	98.43
MR52	0.01	0.10	18.33	39.30	33.88	0.23	0.16	1.33	5.18	98.52
MR52	0.00	0.02	16.30	38.49	32.83	0.28	0.41	1.95	7.71	97.99
Quartz Crk	0.03	0.00	17.10	38.22	34.04	0.21	0.83	8.32		98.77
Quartz Crk	0.06	0.10	19.31	38.73	35.95	0.17	0.63	4.81		99.76
Quartz Crk	0.00	0.00	15.63	38.31	34.12	0.10	0.74	10.35		99.26
MR45	0.02	0.00	19.69	38.98	34.06	0.85	0.04	1.99	2.51	98.14
MR45	0.00	0.00	19.69	39.36	34.36	0.77	0.07	2.04	2.92	99.21
MR45	0.01	0.01	19.24	39.33	34.21	0.78	0.07	1.61	3.39	98.64
MR45	0.02	0.02	19.28	39.14	34.39	0.62	0.01	1.30	3.35	98.12
MR45	0.05	0.00	19.83	39.71	33.74	0.86	0.10	2.12	2.55	98.97

TABLE 13: COMPOSITIONS OF PYROXENE FROM ALASKAN SN SKARNS

Deposit	Na2O	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	Fe2O3	TOTAL
MT PRINDLE	0.00	4.76	0.23	49.96	23.58	0.05	1.49	19.03		99.09
MT PRINDLE	0.00	4.96	0.22	49.79	23.55	0.03	1.39	19.12		99.05
MT PRINDLE	0.08	0.00	0.50	48.32	23.03	0.00	3.57	24.53		100.06
MT PRINDLE	0.11	0.13	0.07	49.27	22.69	0.00	1.10	27.79		101.17
MT PRINDLE	0.01	4.97	0.23	51.99	24.07	0.05	1.37	20.18		102.87
MT PRINDLE	0.01	3.35	0.37	49.94	23.97	0.03	0.86	22.52		101.05
MT PRINDLE	0.08	3.08	0.95	49.40	23.92	0.29	0.79	22.72		101.24
MT PRINDLE	0.08	10.54	0.42	51.92	24.54	0.00	0.85	11.60		99.94
MT PRINDLE	0.07	0.99	0.17	48.69	23.18	0.03	1.00	26.05		100.16
MT PRINDLE	0.07	1.03	0.25	49.37	23.09	0.03	1.14	25.31		100.29
MT PRINDLE	0.01	0.57	0.28	49.06	23.11	0.11	1.47	26.63		101.25
ARRIGETCH	0.06	9.96	0.23	59.06	20.84	0.00	0.05	8.71	0.00	98.91
ARRIGETCH	0.28	12.88	0.34	51.97	23.74	0.00	0.16	7.33	1.02	97.71
ARRIGETCH	0.09	13.18	1.56	51.68	24.44	0.11	0.04	6.62	0.01	97.72
ARRIGETCH	0.32	13.59	0.40	53.07	22.53	0.00	0.13	0.00	8.04	98.07
ARRIGETCH	0.05	16.69	0.12	53.68	25.10	0.04	0.21	1.89	1.01	98.77
ARRIGETCH	0.04	17.82	0.08	53.99	25.13	0.03	0.09	0.37	1.12	98.66
LYMAN FORK	0.03	10.57	0.59	50.67	24.29	0.04	1.05	9.48	1.53	98.24
LYMAN FORK	0.00	12.10	0.29	52.28	24.65	0.00	1.46	7.88	1.62	100.29
LYMAN FORK	0.03	12.51	0.51	51.94	24.72	0.01	0.94	7.09	1.91	99.64
LYMAN FORK	0.03	11.75	0.37	51.70	24.48	0.04	1.37	8.06	1.13	98.93
LYMAN FORK	0.06	11.01	1.13	51.13	24.56	0.04	1.02	8.78	2.46	100.20
LYMAN FORK	0.04	11.31	0.47	50.75	24.37	0.00	1.53	7.59	1.54	97.60
LYMAN FORK	0.06	11.01	0.59	51.61	24.26	0.04	1.07	9.66	1.12	99.42
LYMAN FORK	0.02	12.95	0.51	52.11	24.84	0.02	1.07	6.24	1.33	99.08
LYMAN FORK	0.04	12.86	0.80	52.19	24.71	0.01	1.02	6.62	1.50	99.75
Groundhog basin	0.09	8.85	0.16	51.69	23.97	0.04	1.19	14.28		100.27
Groundhog basin	0.02	15.46	0.94	53.29	25.48	0.14	0.23	4.55		100.11
Groundhog basin	0.19	11.67	0.82	52.17	24.22	0.07	0.30	9.82		99.26
Groundhog basin	0.11	10.08	0.15	51.87	24.22	0.03	0.53	12.58		99.57
Groundhog basin	0.08	9.69	0.33	51.87	23.78	0.00	0.92	13.05		99.72
Groundhog basin	0.23	9.18	0.20	51.48	23.63	0.00	0.80	13.63		99.15
Groundhog basin	0.17	12.61	0.48	54.73	23.96	0.00	0.81	9.09		101.85
Groundhog basin	0.27	13.03	0.23	54.59	23.49	0.08	0.52	8.56		100.76
Groundhog basin	0.03	13.04	0.46	52.76	24.67	0.01	0.49	8.17		99.63
Groundhog basin	0.07	11.93	0.53	52.41	24.53	0.00	0.52	10.11		100.10
Groundhog basin	0.05	13.65	0.52	53.03	24.89	0.00	0.45	7.08		99.67
Groundhog basin	0.04	7.81	0.24	50.96	23.19	0.00	0.53	16.03		98.80
Groundhog basin	0.08	6.67	0.67	50.42	23.55	0.00	1.12	16.60		99.11
Groundhog basin	0.08	8.14	0.91	52.28	24.24	0.07	1.00	14.25		100.97
Groundhog basin	0.07	7.67	0.22	50.97	23.46	0.02	0.77	16.22		99.40
Groundhog basin	0.12	7.41	0.22	50.95	23.55	0.00	0.71	16.99		99.95
Groundhog basin	0.03	4.06	0.11	50.22	23.98	0.03	2.72	19.24		100.39
Groundhog basin	0.10	4.14	0.08	49.72	23.45	0.01	0.97	20.58		99.06
Groundhog basin	0.06	5.11	0.30	50.90	23.98	0.00	2.05	18.71		101.10
Groundhog basin	0.06	4.24	0.13	49.82	23.80	0.00	2.49	18.72		99.26
Groundhog basin	0.08	5.48	0.37	51.50	23.94	0.00	0.65	19.96		101.97
Groundhog basin	0.10	6.11	0.30	51.66	23.93	0.03	1.00	17.96		101.09
Groundhog basin	0.07	4.90	0.47	50.93	23.85	0.05	0.42	20.23		100.92
Groundhog basin	0.03	4.02	0.33	51.05	23.64	0.03	1.11	20.94		101.14
Groundhog basin	0.03	5.29	0.34	51.14	23.61	0.04	1.23	19.63		101.30

TABLE 13: COMPOSITIONS OF PYROXENE FROM ALASKAN SN SKARNS

Deposit	Na2O	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	Fe2O3	TOTAL
Groundhog basin	0.05	5.59	0.48	51.54	23.91	0.03	1.08	19.11		101.78
OKPILAK	0.07	10.67	0.35	49.99	21.69	0.00	0.34	0.00	10.49	93.59
OKPILAK	0.08	3.57	0.17	46.01	19.52	0.05	1.93	0.00	19.34	90.67
OKPILAK	0.08	3.55	0.14	46.49	20.96	0.00	1.93	19.96	0.00	93.11
OKPILAK	0.00	4.66	0.11	49.87	22.48	0.00	4.69	0.00	17.91	99.72
CAPE Mtn	0.01	15.51	0.08	54.89	25.50	0.00	0.31	3.80		100.10
CAPE Mtn	0.04	18.27	0.04	55.22	26.05	0.04	0.12	0.61		100.40
CAPE Mtn	0.09	14.66	0.13	53.92	25.61	0.07	0.23	5.45		100.16
CAPE Mtn	0.06	14.07	0.15	52.93	25.02	0.00	0.26	6.40		98.89
CAPE Mtn	0.04	18.53	0.02	55.39	26.08	0.02	0.05	0.20		100.33
CAPE Mtn	0.04	18.54	0.12	55.49	25.83	0.00	0.01	0.44		100.47
CAPE Mtn	0.00	15.07	0.34	53.59	24.67	0.01	0.32	5.86		99.86
Ear Mtn	0.15	12.41	0.52	52.32	24.54	0.00	0.32	8.58		98.84
Ear Mtn	0.07	13.81	1.71	51.76	24.27	0.15	0.33	6.64		98.74
Ear Mtn	0.08	15.89	0.73	54.17	25.90	0.01	0.37	3.36		100.51
Ear Mtn	0.10	16.58	0.69	53.97	25.69	0.01	0.20	2.32		99.56
Ear Mtn	0.07	16.09	0.93	53.52	25.93	0.13	0.12	2.55		99.34
Ear Mtn	0.10	16.66	0.73	54.95	25.71	0.00	0.18	2.45		100.78
Ear Mtn	0.22	16.07	1.04	53.92	25.69	0.00	0.19	2.98		100.11
Ear Mtn	0.06	14.50	0.62	52.49	24.88	0.06	0.07	5.57		98.25
Ear Mtn	0.06	14.29	0.53	53.32	25.12	0.05	0.12	5.89		99.38
Ear Mtn	0.06	14.30	0.61	52.95	25.18	0.02	0.24	6.51		99.87
Ear Mtn	0.01	14.04	0.16	53.27	25.66	0.00	0.10	6.73		99.97
Ear Mtn	0.10	14.00	0.81	52.84	25.58	0.02	0.11	6.42		99.88
Ear Mtn	0.13	14.39	0.45	53.71	25.50	0.06	0.15	5.97		100.36
Ear Mtn	0.14	14.82	0.53	53.77	25.25	0.02	0.43	4.95		99.91
Brooks Mtn	0.01	16.82	0.91	53.54	25.93	0.03	0.41	2.29		99.94
Brooks Mtn	0.13	16.04	0.24	54.09	25.83	0.00	1.03	3.37		100.73
Brooks Mtn	0.00	16.66	1.38	52.74	25.71	0.01	0.56	2.39		99.45
Brooks Mtn	0.18	0.42	0.77	48.25	22.63	0.02	1.89	25.84		100.00
Brooks Mtn	0.13	2.19	0.39	48.95	22.89	0.01	1.98	23.41		99.95
Brooks Mtn	0.03	2.57	0.21	49.30	23.10	0.00	2.46	22.44		100.11
Brooks Mtn	0.10	1.23	0.21	48.75	22.58	0.00	2.82	24.20		99.89
Brooks Mtn	0.10	3.04	0.39	49.20	19.57	0.02	2.02	24.74		99.08
Brooks Mtn	0.11	2.88	0.46	48.94	17.94	0.00	2.28	25.55		98.16
Brooks Mtn	0.06	3.35	0.53	49.38	23.09	0.04	1.99	21.95		100.39
Brooks Mtn	0.02	3.47	0.46	48.79	22.80	0.04	2.09	21.42		99.09
Brooks Mtn	0.07	3.34	0.47	49.04	22.96	0.02	1.85	21.56		99.31
Brooks Mtn	0.00	1.21	0.03	48.91	23.08	0.00	4.94	22.11		100.28
Brooks Mtn	0.14	3.75	0.61	49.56	22.92	0.06	1.84	20.98		99.86
Brooks Mtn	0.10	15.77	0.76	54.24	25.41	0.06	0.10	3.73		100.17
Brooks Mtn	0.02	15.71	0.27	54.57	25.57	0.02	0.24	3.85		100.25
Brooks Mtn	0.02	15.71	0.27	54.57	25.57	0.02	0.24	3.85		100.25
Cape Mtn	0.08	5.67	0.48	50.53	23.50	0.07	1.34	18.41		100.08
Cape Mtn	0.16	5.06	0.39	50.08	23.60	0.00	1.63	19.45		100.37
Cape Mtn	0.10	5.00	1.39	48.71	23.51	0.15	1.85	19.09		99.80
Cape Mtn	0.14	8.30	0.32	52.09	23.99	0.02	1.67	13.95		100.48
Cape Mtn	0.19	8.36	0.41	52.04	23.94	0.01	1.35	13.78		100.08
Cape Mtn	0.18	7.37	0.35	51.84	23.87	0.01	1.64	15.19		100.45
Cape Mtn	0.13	15.17	0.13	54.13	25.74	0.05	0.65	4.51		100.51
Cape Mtn	0.08	13.57	0.35	53.72	25.18	0.29	0.43	6.92		100.54

TABLE 13: COMPOSITIONS OF PYROXENE FROM ALASKAN SN SKARNS

Deposit	Na ₂ O	MgO	Al ₂ O ₃	SiO ₂	CaO	TiO ₂	MnO	FeO	Fe ₂ O ₃	TOTAL
Cape Mtn	0.12	13.06	0.42	53.04	24.31	0.03	0.69	8.51		100.18
Cape Mtn	0.09	12.49	0.32	52.93	24.73	0.01	0.64	8.82		100.03
Cape Mtn	0.10	12.03	0.45	53.06	24.60	0.08	0.61	9.67		100.60
Cape Mtn	0.10	11.88	0.39	52.42	24.73	0.04	0.57	10.11		100.24
Ear Mtn	0.04	15.18	0.30	53.29	25.23	0.00	0.44	4.38		98.86
Ear Mtn	0.01	15.76	0.11	53.54	25.39	0.04	0.59	3.57		99.01
Ear Mtn	0.00	16.59	0.39	53.37	25.66	0.02	0.32	3.02		99.37
Ear Mtn	0.10	11.57	0.33	52.49	24.69	0.03	0.37	10.53		100.11
Ear Mtn	0.04	15.41	0.18	53.51	25.82	0.00	0.37	4.26		99.59
Tin Creek	0.00	15.05	1.08	52.65	25.81	0.00	0.27	4.87		99.73
Tin Creek	0.00	14.97	0.90	53.69	25.63	0.03	0.70	5.19		101.11
Tin Creek	0.00	12.95	0.47	52.66	25.23	0.00	0.49	8.10		99.90
Tin Creek	0.00	14.70	0.91	52.63	25.69	0.00	0.43	5.38		99.74
Tin Creek	0.00	12.19	0.96	52.13	25.15	0.00	0.42	9.37		100.22
Tin Creek	0.00	13.13	1.45	51.88	25.43	0.02	0.38	7.97		100.26
Tin Creek	0.10	4.11	0.28	49.50	23.72	0.00	0.78	21.17		99.66
Tin Creek	0.05	4.64	0.20	50.20	23.59	0.00	0.67	20.62		99.97

TABLE 14: COMPOSITIONS OF GARNET FROM ALASKAN SN SKARNS

Deposit	Na2O	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	Fe2O3	TOTAL
ARRIGETCH	0.00	0.13	9.24	36.81	30.51	0.06	0.80	1.41	17.16	96.10
ARRIGETCH	0.00	0.17	9.61	37.02	31.00	0.00	0.64	0.96	16.76	96.16
ARRIGETCH	0.00	0.01	8.05	36.76	30.00	0.04	1.19	0.90	18.66	95.62
ARRIGETCH	0.00	0.12	9.46	36.60	31.03	0.03	0.83	0.71	16.74	95.52
ARRIGETCH	0.00	0.01	6.39	36.77	30.05	0.00	1.36	0.16	21.12	95.86
ARRIGETCH	0.00	0.25	18.09	38.77	34.32	0.56	0.09	0.51	4.95	97.55
ARRIGETCH	0.00	0.00	19.07	37.75	33.74	0.21	0.12	1.92	3.42	96.23
ARRIGETCH	0.09	0.36	20.20	36.08	7.04	0.00	0.00	32.54	0.05	96.36
ARRIGETCH	0.04	0.21	20.27	36.70	7.59	0.00	0.93	31.21	0.20	97.15
ARRIGETCH	0.07	0.20	20.21	36.91	8.03	0.00	1.18	30.17	0.32	97.08
ARRIGETCH	0.00	0.14	20.12	36.57	8.78	0.02	1.92	29.72	0.66	97.93
ARRIGETCH	0.04	0.21	20.09	36.71	8.84	0.00	2.13	29.20	0.79	98.00
ARRIGETCH	0.04	0.24	20.14	36.23	7.72	0.00	0.73	31.81	0.42	97.32
ARRIGETCH	0.02	0.35	18.21	38.66	34.12	1.02	0.02	0.28	4.13	96.81
ARRIGETCH	0.00	0.29	18.66	37.89	34.84	0.68	0.11	0.18	3.72	96.36
ARRIGETCH	0.05	0.31	18.63	38.81	34.78	0.69	0.12	0.26	4.23	97.88
LYMAN FORK	0.00	0.09	7.68	35.74	32.59	0.12	0.85	0.06	20.81	97.93
LYMAN FORK	0.03	0.16	9.28	35.72	31.40	0.14	1.16	1.02	17.90	96.81
LYMAN FORK	0.00	0.02	12.65	36.85	31.81	0.33	1.28	2.28	12.94	98.15
LYMAN FORK	0.04	0.04	13.44	37.17	32.67	0.30	1.42	1.19	12.44	98.70
Lime Peak	0.02	0.09	16.58	38.35	32.54	0.59	0.89	10.71		99.77
Lime Peak	0.07	0.09	15.94	38.13	33.06	0.67	0.89	11.06		99.92
Lime Peak	0.00	0.13	14.27	37.56	32.53	0.36	1.34	11.86		98.07
Lime Peak	0.01	0.03	8.15	36.83	34.12	0.00	0.44	16.75		96.33
Lime Peak	0.00	0.07	12.62	37.28	31.94	0.25	1.23	13.65		97.06
Lime Peak	0.06	0.05	4.89	35.95	30.79	0.04	2.86	21.29		96.01
Groundhog Basin	0.03	0.00	13.57	39.25	32.19	0.45	1.62	1.97	12.32	101.40
Groundhog Basin	0.00	0.00	14.34	38.65	31.92	0.02	2.09	2.19	11.40	100.61
Groundhog Basin	0.01	0.00	13.15	38.84	32.15	0.77	1.60	2.09	12.48	101.09
Groundhog Basin	0.00	0.04	14.96	38.89	32.11	0.27	2.23	1.70	10.27	100.46
Groundhog Basin	0.00	0.08	14.76	38.99	32.35	0.16	2.08	1.68	10.79	100.89
Groundhog Basin	0.06	0.15	19.31	39.16	34.78	0.41	0.41	1.78	4.36	100.42
Groundhog Basin	0.04	0.19	19.15	39.26	35.32	0.44	0.33	1.28	4.72	100.73
Groundhog Basin	0.04	0.13	14.00	38.12	34.23	1.63	0.65	0.00	11.38	100.18
Groundhog Basin	0.05	0.03	15.19	38.39	34.34	0.00	0.54	2.78	9.27	100.59
Groundhog Basin	0.03	0.19	16.89	38.44	35.27	0.08	0.30	0.67	7.96	99.83
Groundhog Basin	0.00	0.16	15.89	37.68	34.47	0.19	0.42	0.78	8.85	98.44
Groundhog Basin	0.00	0.02	17.27	38.31	33.98	0.02	0.99	1.06	6.86	98.51
Groundhog Basin	0.03	0.09	17.92	38.40	34.58	0.08	0.77	0.85	6.05	98.77
Groundhog Basin	0.00	0.05	18.06	38.12	33.91	0.93	1.17	1.01	5.44	98.69
OKPILAK	0.00	0.06	19.53	36.59	20.39	0.19	5.97	8.68	0.61	92.01
OKPILAK	0.02	0.02	18.49	34.18	18.07	0.23	8.91	7.83	0.81	88.57
OKPILAK	0.00	0.02	14.63	32.45	20.08	7.71	6.29	6.23	0.00	87.41
OKPILAK	0.01	0.02	18.25	34.57	17.76	0.13	8.67	7.56	1.10	88.05
OKPILAK	0.02	0.04	18.42	34.59	18.48	0.18	9.29	6.63	1.05	88.69
OKPILAK	0.04	0.06	18.35	33.68	20.90	0.18	9.32	3.95	1.54	88.01

TABLE 15: COMPOSITIONS OF PYROXENE FROM ALASKAN ZN-PB SKARNS

Deposit	Na2O	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	Fe2O3	TOTAL
VABM HAPPY	0.09	2.43	0.89	48.15	21.38	0.05	3.43	22.29		98.69
VABM HAPPY	0.03	0.32	0.00	49.63	21.54	0.00	8.44	21.20		101.18
VABM HAPPY	0.21	1.68	0.12	50.68	22.42	0.13	3.89	25.00		104.13
VABM HAPPY	0.00	0.56	0.03	49.22	21.23	0.09	4.12	26.06		101.30
VABM HAPPY	0.01	0.00	0.05	47.80	20.49	0.00	4.48	25.75		98.57
VABM HAPPY	0.04	1.11	0.26	48.88	20.71	0.00	4.30	24.55		99.84
VABM HAPPY	0.01	0.07	0.04	47.78	20.55	0.05	1.23	28.96		98.68
VABM HAPPY	0.04	0.93	0.14	51.67	21.29	0.00	1.69	29.81		105.59
VABM HAPPY	0.04	1.84	0.24	48.88	21.42	0.12	1.79	24.58		98.90
CHAMPION II	0.13	2.24	0.19	49.25	21.51	0.07	4.57	21.73		99.68
CHAMPION II	0.10	5.14	0.73	50.84	21.85	0.00	3.58	17.29		99.53
CHAMPION II	0.16	4.87	0.91	47.18	23.68	0.29	5.40	17.18		99.66
CHAMPION II	0.09	3.24	0.08	52.07	22.64	0.02	4.73	20.39		103.25
CHAMPION II	0.15	6.74	1.11	50.59	22.43	0.05	2.47	15.64		99.18
CHAMPION II	0.23	6.88	1.19	51.37	22.46	0.07	2.87	14.91		99.97
CHAMPION II	0.18	6.99	1.05	52.01	22.97	0.02	2.51	15.51		101.23
Coal Ck	0.11	3.32	0.12	49.69	23.11	0.03	1.62	22.68		100.69
Coal Ck	0.04	3.61	0.07	49.84	23.41	0.01	2.05	21.59		100.61
Coal Ck	0.04	3.02	0.11	49.43	23.30	0.00	1.66	22.72		100.32
IRON CK	0.14	5.21	0.68	52.50	22.99	0.18	1.08	23.09		105.88
IRON CK	0.00	9.29	0.30	51.43	23.23	0.03	1.05	14.20		99.52
IRON CK	0.01	9.01	0.30	51.28	22.77	0.12	1.06	14.29		98.83
IRON CK	0.03	8.51	0.40	51.31	22.85	0.15	1.13	15.27		99.66
IRON CK	0.04	8.89	0.44	54.93	24.52	0.06	0.89	17.42		107.19
IRON CK	0.11	6.85	0.35	50.68	22.35	0.00	1.43	17.48		99.25
IRON CK	0.12	9.76	0.45	51.21	23.07	0.00	0.99	13.31		98.89
IRON CK	0.25	16.26	0.61	56.94	22.72	0.00	0.38	1.51		98.68
IRON CK	0.17	18.97	0.18	58.60	25.89	0.00	0.00	0.35		104.14
IRON CK	0.38	18.17	0.99	55.11	24.05	0.05	0.06	0.28		99.08
IRON CK	0.20	17.95	0.36	56.04	24.29	0.00	0.06	0.50		99.38
IRON CK	0.01	16.96	0.26	54.64	24.00	0.00	1.02	1.64		98.53
OSCAR	0.06	3.31	0.07	48.94	21.56	0.00	2.81	21.33		98.07
OSCAR	0.08	7.35	0.28	53.32	23.50	0.00	1.26	17.16		102.95
OSCAR	0.02	3.10	0.09	49.41	21.28	0.00	2.79	21.14		97.81
OSCAR	0.01	3.01	0.03	49.41	21.47	0.00	2.73	21.47		98.12
OSCAR	0.00	2.57	0.10	49.01	21.45	0.03	2.44	23.08		98.68
OSCAR	0.04	2.40	0.04	48.74	21.31	0.00	3.24	23.05		98.82
OSCAR	0.03	1.81	0.06	48.42	21.48	0.00	2.64	24.32		98.77
OSCAR	0.00	1.76	0.05	48.37	21.26	0.07	2.23	23.81		97.53
OSCAR	0.08	2.39	0.44	49.10	21.19	0.07	1.12	24.38		98.77
OSCAR	0.12	8.15	0.37	53.08	22.63	0.00	1.13	16.49		101.97
OSCAR	0.19	2.66	0.33	48.47	21.26	0.00	1.36	23.82		98.08
OSCAR	0.07	8.81	0.22	51.18	22.76	0.10	1.39	14.94		99.47
OSCAR	0.08	11.12	0.67	55.19	24.29	0.04	1.03	12.33		104.73
OSCAR	0.04	3.94	0.44	50.15	21.77	0.00	1.60	21.46		99.40
OSCAR	0.23	6.33	0.21	50.32	21.97	0.00	1.13	18.16		98.35
OSCAR	0.42	10.11	0.59	47.56	24.12	0.00	1.32	10.92		95.04
Glacier Basin	0.04	3.44	0.20	49.21	23.25	0.00	2.65	20.04		98.83
Glacier Basin	0.03	3.86	0.24	49.19	23.00	0.03	0.89	21.41		98.65
Glacier Basin	0.09	3.59	0.25	49.57	22.89	0.05	1.65	21.18		99.27
Glacier Basin	0.15	5.20	0.79	49.45	22.66	0.16	0.97	19.32		98.70

TABLE 15: COMPOSITIONS OF PYROXENE FROM ALASKAN ZN-PB SKARNS

Deposit	Na ₂ O	MgO	Al ₂ O ₃	SiO ₂	CaO	TiO ₂	MnO	FeO	Fe ₂ O ₃	TOTAL
BOSWER CRK	0.08	5.33	0.28	46.18	21.57	0.00	1.89	15.81	2.04	93.18
BOSWER CRK	0.03	6.52	0.12	47.46	21.58	0.06	2.21	15.13	0.64	93.77
BOSWER CRK	0.03	5.47	0.10	47.27	22.44	0.00	2.05	15.79	0.48	93.63
BOSWER CRK	0.02	7.38	0.09	46.88	22.28	0.00	2.29	11.93	2.63	93.51
BOSWER CRK	0.02	5.43	0.06	47.53	22.02	0.00	2.36	16.47	0.82	94.71
BOSWER CRK	0.07	4.05	0.21	45.65	22.07	0.00	1.86	16.87	2.56	93.34
BOSWER CRK	0.00	5.97	0.09	48.19	22.70	0.01	2.41	15.48	0.99	95.83
EIELESON	0.03	4.54	0.04	47.13	22.31	0.05	4.93	14.60	0.54	94.18
EIELESON	0.03	4.32	0.12	47.82	21.76	0.05	3.85	16.07	0.00	94.01
EIELESON	0.00	4.52	0.09	48.40	21.73	0.02	3.89	15.52	0.00	94.17
EIELESON	0.02	5.10	0.03	48.07	21.89	0.02	4.17	15.63	0.00	94.92
EIELESON	0.02	4.62	0.02	47.66	22.37	0.09	3.70	16.00	0.00	94.48
EIELESON	0.00	4.71	0.11	47.94	22.64	0.02	4.24	15.56	0.00	95.21
EIELESON	0.07	4.76	0.07	48.31	22.36	0.00	3.62	16.01	0.00	95.19
McKinley Park	0.31	5.75	0.83	50.02	23.18	0.02	1.73	16.69	1.31	99.84
McKinley Park	0.32	8.27	1.07	50.96	23.20	0.09	1.31	13.73	0.11	99.06
McKinley Park	0.40	8.37	1.56	51.32	23.88	0.03	1.36	12.66	0.33	99.92
McKinley Park	0.47	5.25	1.30	49.85	23.16	0.02	2.38	16.02	0.64	99.10
McKinley Park	0.20	5.17	0.71	49.85	22.73	0.00	1.68	17.98	0.00	98.32
McKinley Park	0.36	4.36	1.29	49.26	22.55	0.00	2.41	17.54	0.00	97.77
McKinley Park	0.47	11.82	1.84	51.79	22.42	0.00	0.82	9.13	0.86	99.15
RAT FORK	0.15	3.58	0.45	44.21	20.64	0.05	1.58	17.42	0.00	88.07
RAT FORK	0.08	3.94	0.56	45.06	20.98	0.03	1.74	16.69	0.00	89.08
SLIPPERY CRK	0.00	3.10	0.24	46.60	21.43	0.02	4.65	17.81	0.00	93.85
SLIPPERY CRK	0.09	2.41	0.06	47.14	21.41	0.02	3.82	18.54	0.00	93.48
SLIPPERY CRK	0.02	3.66	0.08	47.93	21.53	0.00	4.45	15.82	0.00	93.48
SLIPPERY CRK	0.09	3.28	0.09	47.68	22.07	0.02	4.39	17.22	0.00	94.84
SLIPPERY CRK	0.16	2.96	0.06	46.74	21.27	0.01	4.40	17.48	0.00	93.07
SLIPPERY CRK	0.07	2.06	0.32	46.21	20.75	0.00	4.75	18.65	0.00	92.80
SMITH LAKE	0.03	10.18	0.13	50.13	23.03	0.00	0.56	10.64	0.00	94.69
SMITH LAKE	0.05	9.53	0.39	49.31	22.15	0.00	1.23	12.11	0.36	95.12
SMITH LAKE	0.05	10.51	0.25	50.25	23.06	0.00	0.88	9.85	0.00	94.85
SMITH LAKE	0.01	10.48	0.11	49.37	23.29	0.01	0.81	9.68	0.49	94.25
SMITH LAKE	0.09	9.10	0.21	49.40	23.25	0.00	0.99	11.66	0.75	95.45
SMITH LAKE	0.03	7.39	0.28	48.65	22.90	0.00	0.87	14.64	0.25	95.00
SMITH LAKE	0.13	7.53	0.29	48.41	22.88	0.00	0.88	13.67	0.70	94.48
SMITH LAKE	0.03	8.37	0.13	48.82	22.91	0.01	1.13	12.86	0.19	94.45
SMITH LAKE	0.22	7.14	0.73	50.37	23.71	0.08	1.80	14.35	0.60	98.99
STONEBOY CRK	0.21	6.03	0.30	50.63	17.66	0.06	1.41	11.64	0.00	87.95
STONEBOY CRK	0.13	5.74	0.32	45.17	18.95	0.04	1.98	12.12	0.00	84.43
STONEBOY CRK	0.14	7.00	0.31	45.90	21.30	0.81	1.04	13.77	0.00	90.26
STONEBOY CRK	0.20	4.59	0.33	56.50	17.49	0.00	3.35	13.00		95.47
STONEBOY CRK	0.17	4.54	0.17	31.28	29.72	0.00	2.05	23.76		91.69
STONEBOY CRK	0.07	7.49	0.18	47.64	21.70	0.03	1.26	13.38	0.00	91.76
STONEBOY CRK	0.02	7.41	0.16	46.85	21.57	0.02	1.09	14.01	0.13	91.25
STONEBOY CRK	0.11	5.51	0.20	45.59	20.82	0.01	3.35	13.38	0.00	88.96
VABM HAPPY	0.09	1.11	0.08	49.90	22.13	0.02	1.30	27.95		102.56
VABM HAPPY	0.07	1.99	0.06	49.96	21.74	0.15	1.48	25.29		100.74
VABM HAPPY	0.00	1.34	0.13	47.36	19.03	0.00	2.08	27.50		97.45
VABM HAPPY	0.08	1.34	0.10	51.96	22.17	0.00	4.64	25.11		105.41
VABM HAPPY	0.00	1.35	0.03	48.33	21.23	0.07	3.76	24.10		98.86

TABLE 15: COMPOSITIONS OF PYROXENE FROM ALASKAN ZN-PB SKARNS

Deposit	Na ₂ O	MgO	Al ₂ O ₃	SiO ₂	CaO	TiO ₂	MnO	FeO	Fe ₂ O ₃	TOTAL
Glacier Basin	0.10	4.83	0.45	49.98	22.72	0.00	1.17	19.88		99.13
Glacier Basin	0.13	5.80	1.15	51.27	23.64	0.00	1.48	20.49		103.95
Glacier Basin	0.39	4.26	0.95	50.90	24.66	0.21	1.20	19.98		102.55
Glacier Basin	0.09	3.11	0.28	49.75	23.22	0.02	2.30	21.46		100.24
Glacier Basin	0.08	3.32	0.23	49.83	23.60	0.03	1.83	21.22		100.15
Glacier Basin	0.05	1.33	0.28	49.03	23.32	0.01	1.99	24.16		100.17
Glacier Basin	0.05	2.50	0.12	49.15	23.21	0.02	3.10	21.21		99.35
Glacier Basin	0.05	3.78	0.15	48.84	23.03	0.02	2.02	19.91		97.80
Glacier Basin	0.07	3.20	0.20	49.71	23.13	0.01	2.28	21.48		100.09
Glacier Basin	0.08	1.80	0.12	48.99	23.01	0.00	2.15	23.35		99.50
Glacier Basin	0.32	0.06	0.09	48.76	22.95	0.00	2.23	25.97		100.38
Glacier Basin	1.25	1.43	0.77	49.08	21.33	0.10	1.65	24.75		100.36
Glacier Basin	1.03	2.07	0.96	49.83	21.88	0.16	2.23	22.06		100.22
Glacier Basin	0.26	0.33	0.05	48.82	22.80	0.00	3.63	24.43		100.32
Glacier Basin	0.32	0.12	0.08	48.62	22.57	0.00	2.30	26.38		100.39

TABLE 16: COMPOSITIONS OF GARNET FROM ALASKAN ZN-PB SKARNS

Deposit	Na2O	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	Fe2O3	TOTAL
STONEBOY CRK	0.00	0.24	12.94	33.59	31.64	0.13	0.85	0.00	12.07	91.47
STONEBOY CRK	0.17	4.54	0.17	31.28	29.72	0.00	2.05	0.00	23.76	91.69
FE CRK	0.00	0.02	13.47	38.19	32.97	0.12	1.12	0.67	12.60	99.16
FE CRK	0.00	0.18	15.92	37.65	33.65	1.16	1.04	0.00	7.62	97.22
FE CRK	0.04	0.08	15.05	38.58	33.32	0.00	0.78	0.00	10.13	97.99
FE CRK	0.02	0.04	17.41	37.51	33.77	0.00	0.69	0.86	5.82	96.11
FE CRK	0.00	0.12	19.05	40.21	34.94	0.31	1.00	0.00	4.92	100.54
FE CRK	0.00	0.09	10.53	37.42	33.08	0.44	0.20	0.03	16.52	98.31
FE CRK	0.05	0.06	0.00	35.15	31.12	0.07	0.16	0.76	31.00	98.38
FE CRK	0.03	0.00	0.00	35.16	30.90	0.00	0.06	0.54	31.01	97.69
FE CRK	0.06	0.08	0.07	35.41	30.82	0.07	0.01	0.00	30.17	96.67
FE CRK	0.10	0.00	0.20	35.25	30.96	0.07	0.02	0.62	30.78	97.99
FE CRK	0.06	0.01	0.00	34.41	31.14	0.10	0.14	0.82	30.35	97.03
CHAMPION E	0.04	0.10	13.39	37.98	31.64	0.53	0.99	0.00	12.38	97.05
CHAMPION E	0.00	0.11	12.05	37.06	32.03	1.90	0.74	0.00	13.70	97.60
CHAMPION E	0.03	0.02	0.17	35.03	31.22	0.00	0.27	0.86	30.63	98.24
CHAMPION E	0.00	0.07	7.05	38.95	33.91	0.14	0.44	0.35	23.32	104.23
CHAMPION E	0.03	0.02	5.99	39.39	34.13	0.09	0.26	0.57	25.37	105.84
CHAMPION E	0.07	0.09	9.17	37.28	32.08	0.44	0.37	0.37	18.52	98.39
CHAMPION E	0.00	0.15	8.49	40.20	34.67	1.21	0.64	0.00	21.19	106.54
CHAMPION E	0.05	0.08	13.19	37.79	32.45	0.84	0.86	0.12	12.69	98.05
CHAMPION E	0.09	0.03	7.09	36.69	28.88	0.17	4.39	0.99	21.26	99.58
CHAMPION E	0.00	0.10	13.14	40.48	35.11	1.61	1.01	0.00	14.80	106.25
CHAMPION E	0.00	0.06	0.92	35.41	31.01	0.07	0.53	1.44	29.79	99.22
CHAMPION E	0.04	0.02	2.16	35.87	31.61	0.02	0.22	1.07	28.25	99.26
CHAMPION E	0.00	0.02	0.50	36.01	31.02	0.12	0.31	0.71	30.98	99.67
OSCAR	0.00	0.05	16.27	38.55	33.19	1.67	0.38	0.00	5.77	95.88
OSCAR	0.01	0.00	17.82	38.61	31.85	0.16	1.33	1.76	6.15	97.68
OSCAR	0.00	0.03	17.03	39.00	33.43	0.00	0.17	0.00	7.39	97.06
OSCAR	0.04	0.00	18.10	41.48	34.93	0.00	0.36	0.17	8.25	103.32
OSCAR	0.02	0.00	3.18	35.95	31.28	0.00	0.45	0.67	26.73	98.27
OSCAR	0.07	0.00	7.67	36.72	30.80	0.27	0.79	0.71	20.36	97.40
OSCAR	0.00	0.02	5.77	36.22	31.63	0.03	0.72	0.97	22.90	98.27
OSCAR	0.00	0.06	18.40	38.86	33.55	0.87	0.18	0.00	5.34	97.26
OSCAR	0.03	0.00	14.25	38.37	33.70	0.26	0.43	0.00	10.86	97.89
OSCAR	0.03	0.08	7.64	36.67	30.69	0.44	0.97	1.04	20.39	97.95
OSCAR	0.01	0.03	11.16	36.77	31.93	0.14	0.97	0.64	14.96	96.60
OSCAR	0.00	0.00	6.74	36.60	31.06	0.40	0.85	0.00	21.59	97.23
OSCAR	0.03	0.00	6.80	36.01	31.66	0.12	0.71	0.53	21.12	96.97
OSCAR	0.00	0.04	6.71	36.94	31.40	0.17	0.80	1.01	22.07	99.14
OSCAR	0.00	0.05	20.03	39.84	33.95	0.10	0.14	0.10	3.78	97.99

TABLE 17: MICROPROBE COMPOSITIONS OF IDOCRASE FROM ALASKAN SKARNS

Deposit	F	Cl	Na2O	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	total
W SKARN IDOCRASE											
MR52	1.31	0.01	0.17	1.66	15.24	37.93	35.39	2.41	0.00	4.55	97.35
MR52	1.24	0.04	0.16	1.50	15.49	37.17	35.53	2.33	0.11	4.02	96.31
MR52	1.24	0.02	0.11	1.90	14.56	36.79	34.79	2.20	0.00	4.80	95.13
MR52	0.49	0.34	0.08	1.46	13.21	34.99	32.23	1.73	0.04	4.53	88.27
MR52			0.08	1.59	15.95	36.68	33.24	1.30	0.06	5.78	94.67
MR52			0.18	1.50	16.32	37.32	33.43	0.44	0.04	6.22	95.44
MR45			0.14	3.19	14.29	39.08	22.53	0.09	0.21	10.52	90.05
Gilmore Dome	2.32	0.05	0.12	1.14	16.80	36.54	35.56	1.83	0.00	3.47	95.46
Gilmore Dome	2.17	0.23	0.04	0.74	16.36	36.44	34.98	0.32	0.23	5.66	94.78
Gilmore Dome	2.15	0.22	0.18	0.86	15.88	30.54	30.57	0.75	0.20	5.68	84.66
Gilmore Dome	2.14	0.20	0.01	0.62	15.84	36.17	34.40	1.06	0.20	6.18	94.47
Gilmore Dome	2.09	0.22	0.08	0.52	18.14	41.98	39.57	0.83	0.32	7.35	108.78
Gilmore Dome	2.05	0.10	0.06	1.22	16.32	36.94	35.12	1.03	0.11	4.52	95.31
Gilmore Dome	1.89	0.13	0.12	1.20	17.20	37.84	35.43	1.44	0.04	3.48	96.76
Gilmore Dome	1.89	0.08	0.08	0.93	16.19	36.27	34.67	0.35	0.22	5.35	94.05
Gilmore Dome	1.87	0.12	0.09	1.31	18.03	40.48	38.78	0.84	0.10	5.12	104.74
Gilmore Dome	1.81	0.06	0.08	0.46	16.64	37.34	35.43	0.02	0.38	7.33	97.68
Gilmore Dome	1.74	0.09	0.07	1.22	18.45	41.71	39.84	1.40	0.23	5.43	108.34
Gilmore Dome	1.74	0.09	0.05	1.32	18.56	41.92	40.60	1.37	0.11	5.09	109.02
Gilmore Dome	1.68	0.06	0.04	1.32	17.48	40.39	38.01	1.45	0.07	5.35	104.13
Gilmore Dome	1.64	0.11	0.09	1.17	16.74	35.20	34.43	0.48	0.17	4.69	92.97
Gilmore Dome	1.59	0.21	0.03	0.70	16.46	36.39	34.94	0.47	0.27	5.75	95.02
Gilmore Dome	1.20	0.02	0.13	1.24	16.59	36.58	34.23	1.62	0.23	4.85	95.48
Gilmore Dome	0.97	0.05	0.07	1.39	19.33	43.90	41.53	1.08	0.03	5.83	113.15
Big Windy			0.14	1.30	17.10	37.31	33.81	1.12	0.02	4.91	95.71
Big Windy			0.06	1.47	18.25	37.28	34.25	0.57	0.00	3.28	95.17
Big Windy			0.05	1.67	18.11	37.41	34.02	0.50	0.06	3.33	95.14
Big Windy			0.06	1.38	17.08	37.17	33.71	1.39	0.15	4.58	95.50
Big Windy			0.06	1.72	16.77	37.59	33.66	1.21	0.18	4.77	95.96
Big Windy			0.35	7.48	17.11	40.71	19.16	0.05	0.35	9.28	94.48
BONANZA	1.05	0.04	0.21	1.67	15.55	37.11	34.90	3.07	0.00	3.23	95.73
BONANZA	0.81	0.07	0.15	1.54	16.34	37.56	35.29	2.72	0.01	2.70	96.30
BONANZA	0.80	0.01	0.22	1.83	15.27	36.99	34.95	2.97	0.04	3.27	95.55
BONANZA	0.69	0.00	0.25	1.77	15.15	37.37	34.92	3.35	0.00	3.28	96.08
BONANZA	0.66	0.02	0.22	1.76	14.58	37.04	34.63	4.15	0.09	3.22	95.69
BONANZA	0.58	0.01	0.26	1.71	14.29	37.02	35.06	3.97	0.09	3.30	95.70
BONANZA	0.54	0.00	0.23	1.75	15.20	37.02	34.81	3.33	0.03	2.78	95.14
BONANZA		0.03	0.28	1.71	14.70	37.24	34.87	3.78	0.08	3.33	95.99
BONANZA	0.43	0.04	0.19	1.83	14.92	36.63	34.58	2.84	0.03	3.37	94.39
BONANZA			0.14	1.63	15.71	36.53	32.96	3.19	0.05	3.24	93.44
BONANZA			0.13	1.68	15.90	36.49	33.43	3.49	0.00	2.96	94.08
BONANZA			0.31	1.69	15.47	36.48	33.12	3.75	0.12	2.97	93.91
BONANZA			0.16	1.68	16.66	36.29	31.58	2.24	0.01	2.85	91.46
BONANZA			0.35	1.85	15.24	35.59	32.69	3.22	0.02	3.98	92.93
SN SKARN IDOCRASE											
TIN CRK	2.31	0.16	0.10	1.06	14.80	35.37	32.72	0.00	0.09	6.63	90.78
TIN CRK	2.26	0.40	0.13	1.07	15.22	36.25	32.98	0.12	0.25	7.20	93.21
TIN CRK	2.17	0.15	0.15	0.11	16.95	36.71	32.66	0.02	0.20	6.40	93.20
TIN CRK	2.11	0.28	0.00	1.80	13.81	36.20	33.27	0.15	0.27	6.82	92.30
TIN CRK	2.08	0.10	0.18	0.14	16.98	36.50	33.09	0.02	0.09	6.24	93.25

TABLE 17: MICROPROBE COMPOSITIONS OF IDOCRASE FROM ALASKAN SKARNS

Deposit	F	Cl	Na2O	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	total
TIN CRK	1.95	0.27	0.08	0.00	15.98	36.15	33.41	0.11	0.20	7.69	93.63
TIN CRK	1.89	0.25	0.07	1.97	14.27	36.11	33.21	0.08	0.26	6.81	92.78
TIN CRK	1.77	0.24	0.01	0.04	15.37	35.90	32.74	0.07	0.27	8.24	92.63
TIN CRK	1.65	0.13	0.14	0.15	16.58	36.26	33.06	0.00	0.19	6.40	92.79
TIN CRK	1.51	0.22	0.05	0.02	15.80	35.70	32.80	0.07	0.31	7.47	92.21
TIN CRK	1.40	0.16	0.12	0.04	16.43	36.03	33.17	0.00	0.22	6.61	92.62
TIN CRK	1.26	0.22	0.12	0.41	15.40	36.22	33.05	0.00	0.17	7.36	92.72
Puzzle Gulch	2.54	0.00	0.11	1.56	17.99	36.09	34.71	1.32	0.06	3.28	95.12
Puzzle Gulch	2.51	0.00	0.09	1.62	18.35	37.61	35.57	1.12	0.07	3.19	97.62
Puzzle Gulch	2.48	0.00	0.06	1.60	18.27	37.43	34.78	0.91	0.07	3.42	96.54
Puzzle Gulch	2.13	0.00	0.09	1.55	18.17	37.29	35.14	1.01	0.14	3.30	96.68
Puzzle Gulch	2.10	0.03	0.11	1.51	18.21	37.57	35.25	1.07	0.16	3.38	97.24
Puzzle Gulch	1.89	0.00	0.08	1.54	18.41	37.26	35.68	1.04	0.06	3.15	97.23
Puzzle Gulch	1.66	0.00	0.10	1.58	17.97	36.55	35.25	0.95	0.09	3.64	96.12
Mt Prindle			0.03	1.51	16.57	36.51	35.72	0.93	0.22	5.21	96.70
Mt Prindle			0.08	1.05	15.73	36.07	34.77	2.35	0.30	4.54	94.89
MT PRINDLE	2.81	0.11	0.05	1.15	15.92	37.55	36.32	1.09	0.30	5.34	97.74
MT PRINDLE	2.54	0.28	0.02	1.07	15.95	37.61	35.98	1.36	0.35	5.29	97.62
MT PRINDLE	2.34	0.27	0.05	1.36	15.51	37.26	36.32	1.84	0.28	4.84	97.45
MT PRINDLE	2.25	0.23	0.02	1.41	15.93	37.25	36.03	1.26	0.24	4.87	97.01
MT PRINDLE	2.24	0.75	0.03	0.86	15.71	37.44	36.55	1.35	0.21	6.25	98.39
MT PRINDLE	2.06	0.19	0.19	1.25	15.81	37.32	36.53	1.11	0.25	5.38	97.84
MT PRINDLE	1.49	0.30	0.04	1.54	15.59	37.56	35.96	1.54	0.31	5.09	97.63
Lost River	2.40		0.05	2.10	20.08	37.26	35.38	0.00	0.57	0.89	96.33
Lost River	2.39		0.02	3.16	15.33	36.50	33.70	0.03	0.82	5.32	94.88
Lost River	2.36		0.05	2.00	17.64	36.87	34.13	0.07	1.11	4.99	96.86
Lost River	2.33		0.10	1.10	19.28	36.48	33.33	0.00	0.51	3.80	94.60
Lost River	2.27		0.06	1.59	18.43	36.55	34.00	0.02	0.90	4.16	95.71
Lost River	2.24		0.04	2.41	16.16	36.20	33.62	0.58	0.91	5.16	95.08
Lost River	2.15		0.04	2.49	16.16	35.63	33.93	0.27	0.69	5.69	94.90
Lost River	2.07		0.12	2.49	17.81	37.32	34.25	0.02	0.66	4.11	96.78
Lost River	2.00		0.00	3.00	16.32	35.99	34.91	0.06	0.80	4.46	95.54
Lost River	1.96		0.03	2.87	14.26	36.16	34.61	0.27	0.84	6.44	95.48
Lost River	1.84		0.05	2.24	13.56	36.52	33.66	0.01	1.30	8.84	96.18
Lost River	1.83		0.03	2.17	15.28	35.78	34.21	0.00	1.00	6.17	94.64
Lost River	1.72		0.04	2.09	18.56	36.44	34.55	0.55	1.21	2.67	96.11
Lost River	1.71		0.03	2.20	17.36	35.72	34.67	0.00	0.80	3.49	94.27
Lost River	1.65		0.01	3.54	13.26	35.24	34.32	0.12	0.80	6.05	93.34
Lost River	1.57		0.26	1.46	17.58	36.83	33.38	0.07	1.62	4.94	96.14
Lost River	1.56		0.23	1.16	18.10	35.88	34.25	0.10	0.69	4.45	94.86
LYMAN FORK	1.86	0.59	0.04	2.01	13.91	36.58	34.43	0.67	0.80	7.17	95.61
LYMAN FORK	1.80	0.40	0.03	2.16	13.65	35.17	33.58	0.77	0.56	6.85	92.76
LYMAN FORK	1.49	0.41	0.04	2.25	13.79	37.99	36.65	0.67	0.53	8.14	100.05
LYMAN FORK	1.46	0.32	0.01	2.10	12.81	34.70	32.40	0.54	0.73	8.02	91.30
LYMAN FORK	1.21	0.27	0.06	2.18	12.64	35.36	33.24	0.83	0.62	7.35	92.28
LYMAN FORK	1.07	0.23	0.02	2.35	13.72	37.31	35.86	1.17	0.34	6.44	97.20
LYMAN FORK	1.06	0.53	0.07	2.40	12.22	35.43	33.42	1.16	0.58	7.58	92.85
LYMAN FORK	0.99	0.41	0.00	2.19	12.98	35.32	33.36	1.06	0.47	7.44	92.82
LYMAN FORK			0.02	2.23	13.90	34.87	34.24	1.89	0.44	12.26	99.84
LYMAN FORK			0.02	3.15	12.22	34.86	33.55	0.15	0.55	17.12	101.61
LYMAN FORK			0.06	2.35	13.09	34.98	33.99	0.35	0.45	16.12	101.40

TABLE 17: MICROPROBE COMPOSITIONS OF IDOCRASE FROM ALASKAN SKARNS

Deposit	F	Cl	Na2O	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	total
LYMAN FORK			0.06	2.46	13.78	35.08	34.62	0.91	0.40	15.26	102.58
LYMAN FORK			0.00	0.08	12.83	36.97	33.12	0.31	1.35	15.12	99.78
Groundhog Basin	2.07	0.03	0.12	1.18	17.33	36.90	38.37	0.43	0.27	4.96	99.56
Groundhog Basin	1.88	0.06	0.04	0.74	17.18	36.74	37.81	0.12	0.66	5.90	99.18
Groundhog Basin	1.85	0.04	0.02	1.59	17.00	36.21	38.00	0.28	0.17	5.37	98.64
Groundhog Basin	1.83	0.02	0.16	1.32	17.35	37.08	38.27	0.41	0.40	5.20	100.19
Groundhog Basin	1.65	0.06	0.09	0.49	17.23	36.72	37.73	0.72	0.55	5.72	99.24
Groundhog Basin	1.15	0.09	0.09	0.30	17.76	36.19	37.96	0.41	0.45	6.85	100.01
EAR MTN	2.82	0.98	0.02	2.07	16.20	35.23	33.70	0.51	0.21	3.07	91.01
EAR MTN	2.28	0.28	0.00	2.64	14.36	35.88	33.93	0.03	0.36	5.30	92.50
EAR MTN	2.25	0.09	0.05	2.84	13.67	35.89	31.81	0.02	0.18	5.27	89.73
EAR MTN	1.94	0.58	0.03	2.11	16.59	36.35	32.31	0.00	0.20	3.52	91.09
EAR MTN	1.94	0.39	0.02	2.95	13.54	35.06	33.71	0.75	0.24	5.26	91.54
EAR MTN	1.83	0.13	0.02	2.35	14.47	35.95	32.04	0.00	0.38	5.09	90.30
EAR MTN	1.62	0.06	0.09	3.34	13.50	35.46	34.20	0.13	0.12	5.01	91.84
EAR MTN	1.59	0.12	0.00	2.85	13.64	35.22	33.87	0.08	0.22	5.16	91.04
EAR MTN	1.54	0.15	0.02	2.94	14.02	35.18	33.69	0.27	0.19	5.60	91.92
EAR MTN	1.41	0.13	0.02	2.83	15.62	35.79	34.16	0.06	0.19	3.45	92.12
EAR MTN	1.37	0.15	0.04	2.84	14.37	35.64	34.02	1.15	0.17	4.25	92.48
EAR MTN	1.33	0.16	0.05	2.74	14.46	35.32	34.08	0.06	0.21	4.69	91.60
EAR MTN	1.32	0.19	0.00	3.07	13.67	35.79	34.33	0.22	0.21	5.18	92.46
EAR MTN	1.19	0.26	0.05	2.67	15.37	35.83	34.44	0.62	0.22	4.00	93.20
EAR MTN	1.18	0.07	0.03	2.63	15.27	36.31	32.21	0.07	0.17	4.02	90.71
EAR MTN	1.08	0.10	0.04	3.08	15.18	35.96	33.94	0.11	0.19	3.67	92.18
EAR MTN	1.07	0.23	0.00	2.58	15.15	35.90	32.08	0.00	0.16	3.72	89.60
EAR MTN	0.98	0.15	0.05	3.01	15.66	37.10	33.43	0.25	0.18	3.49	93.17
EAR MTN	0.92	0.11	0.02	4.14	12.75	35.83	32.31	0.38	0.25	5.29	90.96
EAR MTN	0.85	0.08	0.03	2.78	15.21	35.96	32.33	0.12	0.02	3.43	89.87
EAR MTN	0.70	0.08	0.04	2.72	14.40	35.93	32.19	0.48	0.18	4.65	90.58
EAR MTN	0.63	0.08	0.03	2.90	13.92	35.68	32.10	0.24	0.17	4.62	89.67
EAR MTN	0.56	0.38	0.06	2.28	13.63	34.90	31.75	1.51	0.25	4.30	88.67
EAR MTN	0.50	0.02	0.00	4.37	12.75	36.23	33.51	0.36	0.04	4.95	92.20
MO SKARN IDOCRASE											
MO GLACIER			0.00	3.69	18.31	37.68	37.42	0.02	0.08	12.80	110.00
MO GLACIER			0.02	3.59	17.31	35.48	35.06	0.01	0.13	12.38	103.98
MO GLACIER			0.01	3.40	17.23	35.31	34.84	0.00	0.09	11.81	102.70

TABLE 18: MICROPROBE COMPOSITIONS OF FELDSPAR FROM ALASKAN SKARN DEPOSIT

DEPOSIT	type	Na2O	Al2O3	SiO2	K2O	CaO	MnO	FeO	TOTAL
Fur	w	2.25	33.82	49.22	0.03	16.11	0.04	0.06	101.52
Fur	w	1.19	36.43	46.73	0.00	18.39	0.07	0.02	102.83
Fur	w	1.37	35.95	46.14	0.03	18.07	0.04	0.11	101.71
Fur	w	0.89	36.74	45.64	0.06	18.75	0.11	0.00	102.18
Fur	w	4.60	29.80	56.61	0.16	13.24	0.00	0.16	104.56
Fur	w	1.89	34.54	47.63	0.04	16.75	0.04	0.13	101.01
Fur	w	2.14	34.80	47.31	0.06	17.22	0.00	0.05	101.57
Fur	w	1.79	32.96	47.45	0.09	17.68	0.00	0.05	100.01
Fur	w	2.10	32.43	48.57	0.02	16.71	0.00	0.02	99.85
Fur	w	1.25	33.86	46.56	0.04	18.53	0.05	0.03	100.32
Fur	w	4.66	28.81	54.44	0.18	11.25	0.03	0.07	99.45
LUCKY 13	w	0.94	33.94	44.97		17.19	0.00	0.11	97.15
LUCKY 13	w	0.75	34.51	44.66		17.81	0.00	0.14	97.86
LUCKY 13	w	0.92	37.85	50.53		19.54	0.00	0.12	108.97
LUCKY 13	w	1.09	33.89	45.33		16.86	0.00	0.10	97.26
LUCKY 13	w	1.29	35.99	48.96		18.15	0.00	0.17	104.56
LUCKY 13	w	5.60	27.04	54.74		9.28	0.11	0.46	97.24
Puzzle	w	2.51	34.43	49.56	0.02	15.76	0.06	0.11	102.45
Puzzle	w	1.75	35.19	47.96	0.02	17.07	0.05	0.05	102.09
Puzzle	w	2.05	34.85	48.98	0.04	16.93	0.02	0.05	102.93
Puzzle	w	2.25	34.64	48.24	0.01	16.00	0.00	0.13	101.27
Puzzle	w	2.21	34.73	48.66	0.03	16.33	0.00	0.23	102.18
Puzzle	w	1.76	35.50	47.79	0.00	17.00	0.16	0.00	102.21
Puzzle	w	6.08	28.23	57.37	0.19	9.47	0.00	0.00	101.33
Puzzle	w	2.28	34.44	48.51	0.01	15.86	0.00	0.07	101.17
Puzzle	w	1.67	35.44	47.98	0.03	17.00	0.04	0.10	102.25
Puzzle	w	2.72	34.22	49.68	0.04	15.68	0.09	0.03	102.45
Puzzle	w	2.44	34.20	48.63	0.02	16.44	0.00	0.00	101.72
Puzzle	w	6.08	28.11	57.93	0.21	9.23	0.08	0.10	101.74
Puzzle Gulch	w	4.48	34.19	50.28	0.11	12.17	0.00	0.29	101.53
Puzzle Gulch	w	4.13	31.60	53.06	0.07	11.98	0.07	0.14	101.04
Puzzle Gulch	w	4.88	29.85	55.28	0.08	11.34	0.00	0.00	101.43
Puzzle Gulch	w	5.38	28.08	55.24	0.10	9.97	0.00	0.07	98.84
Puzzle Gulch	w	2.07	34.72	48.02	0.05	16.50	0.07	0.04	101.47
Puzzle Gulch	w	1.69	33.41	45.01	0.01	17.50	0.00	0.06	97.69
Puzzle Gulch	w	3.09	33.22	51.86	0.04	14.48	0.00	0.02	102.70
Puzzle Gulch	w	4.40	30.94	56.65	0.16	11.80	0.02	0.00	103.96
Puzzle Gulch	w	3.68	35.60	51.39	0.09	13.16	0.04	1.19	105.15
Puzzle Gulch	w	3.37	32.50	51.90	0.10	14.64	0.00	0.02	102.54
Puzzle Gulch	w	3.02	31.13	49.47	0.07	15.20	0.02	0.00	98.92
Puzzle Gulch	w	4.04	29.03	51.91	0.12	13.29	0.00	0.13	98.51
Puzzle Gulch	w	4.54	29.32	53.10	0.14	12.73	0.00	0.07	99.89
Puzzle Gulch	w	4.40	29.28	53.99	0.13	12.59	0.03	0.12	100.53
Puzzle Gulch	w	2.47	32.12	49.05	0.09	16.09	0.02	0.23	100.08
Puzzle Gulch	w	2.44	31.04	48.57	0.03	16.39	0.00	0.00	98.47
Groundhog	s	10.68	21.06	66.01	0.19	1.73	0.02	0.31	100.00
Groundhog	s	10.26	21.00	65.87	0.12	2.07	0.00	0.39	99.71
Groundhog	s	10.89	21.06	66.48	0.21	1.65	0.00	0.09	100.38
Groundhog	s	9.99	21.54	64.95	0.30	2.51	0.00	0.23	99.52
LOST River	s	1.00	39.47	45.48	0.18	17.87	0.00	0.40	104.40

TABLE 18: MICROPROBE COMPOSITIONS OF FELDSPAR FROM ALASKAN SKARN
DEPOSIT type Na2O Al2O3 SiO2 K2O CaO MnO FeO TOTAL

No. FORK	c	7.80	25.22	58.91		6.74	0.04	0.29	99.00
No. FORK	c	8.14	24.71	59.99		6.21	0.00	0.31	99.36
No. FORK	c	11.37	20.76	66.24		1.23	0.00	0.19	99.78
Nixon Fork	a	9.50	21.09	65.12	0.78	2.69	0.00	0.10	99.28
Nixon Fork	a	8.35	24.39	61.60	0.31	5.72	0.00	0.04	100.41
Nixon Fork	a	7.29	26.07	59.02	0.21	7.68	0.03	0.02	100.32
Nixon Fork	a	11.73	19.48	68.37	0.08	0.09	0.00	0.00	99.75
Nixon Fork	a	9.69	21.31	64.87	0.52	2.60	0.00	0.14	99.13
Nixon Fork	a	9.38	22.12	63.25	0.41	3.52	0.00	0.20	98.88
Nixon Fork	a	6.88	27.18	58.48	0.22	8.65	0.02	0.14	101.57
RAMBLER	a	3.38	32.46	52.15	0.11	14.31	0.03	0.21	102.64
RAMBLER	a	3.38	32.93	51.37	0.06	14.55	0.02	0.29	102.60
RAMBLER	a	3.60	30.28	50.06	0.23	13.98	0.00	0.22	98.37
BONANZA	w	7.91	23.86	55.83		5.88	0.00	0.06	93.55
BONANZA	w	10.82	19.06	69.40	0.08	0.20	0.03	0.00	99.60
BONANZA	w	8.61	22.82	57.69		4.58	0.00	0.00	93.70
BONANZA	w	8.26	22.30	54.04		4.37	0.09	0.03	89.09
BONANZA	w	8.64	22.87	60.72		4.54	0.00	0.00	96.76
BONANZA	w	5.93	18.96	64.11	0.34	4.89	0.00	0.06	94.28
Big Windy	w	2.06	33.41	48.22		16.00	0.00	0.00	99.69
Big Windy	w	2.14	33.61	48.37		16.04	0.00	0.14	100.29
Big Windy	w	1.21	34.88	46.26		17.20	0.00	0.06	99.60
Big Windy	w	1.18	31.77	46.07		19.81	0.07	0.91	99.81
FOLEY W	w	0.62	36.69	45.33	0.01	19.05	0.00	0.06	101.77
FOLEY W	w	0.44	36.51	44.48	0.00	19.60	0.03	0.10	101.16
FOLEY W	w	0.62	36.12	45.20	0.04	19.19	0.00	0.11	101.28
FOLEY W	w	0.94	36.09	44.36	0.00	18.68	0.00	0.13	100.19
FOLEY W	w	0.43	36.62	44.53	0.00	19.58	0.02	0.17	101.35
FOLEY W	w	0.66	36.42	45.11	0.00	19.06	0.01	0.10	101.36
FOLEY W	w	0.83	33.66	44.92	0.03	18.97	0.00	0.32	98.73
FOLEY W	w	0.50	34.27	44.35	0.00	19.11	0.00	0.05	98.29
FOLEY W	w	0.65	36.45	45.54	0.04	19.14	0.00	0.10	101.92
Fur	w	4.61	30.28	55.27	0.11	12.32	0.00	0.13	102.71
Fur	w	0.50	36.41	43.71	0.07	18.89	0.00	0.19	99.76
Fur	w	1.46	35.34	46.61	0.06	17.53	0.02	0.00	101.01
Fur	w	2.28	34.15	47.94	0.00	15.67	0.00	0.15	100.19
Fur	w	2.35	33.67	47.91	0.05	15.86	0.02	0.09	99.95
Fur	w	2.57	33.48	49.52	0.04	15.61	0.00	0.06	101.28
Fur	w	4.97	28.26	55.17	0.14	11.57	0.04	0.00	100.14
Fur	w	5.04	30.29	55.67	0.15	11.35	0.02	0.12	102.64
Fur	w	1.78	35.01	48.34	0.03	17.04	0.00	0.10	102.30
Fur	w	2.26	27.28	44.43	0.12	14.29	0.00	0.78	89.15
Fur	w	5.24	27.52	55.06	0.16	11.01	0.02	0.04	99.04
Fur	w	0.54	36.77	44.77	0.00	18.95	0.00	0.01	101.04
Fur	w	4.54	30.82	54.56	0.12	12.69	0.00	0.00	102.73
Fur	w	3.98	29.96	52.40	0.05	13.93	0.00	0.04	100.36
Fur	w	2.70	32.58	49.78	0.04	15.27	0.00	0.04	100.42
Fur	w	0.48	37.33	44.94	0.03	19.10	0.00	0.16	102.04
Fur	w	0.55	36.64	44.23	0.03	19.60	0.03	0.08	101.17
Fur	w	3.76	30.08	52.40	0.12	13.97	0.05	0.02	100.40

TABLE 18: MICROPROBE COMPOSITIONS OF FELDSPAR FROM ALASKAN SKARN
DEPOSIT type Na2O Al2O3 SiO2 K2O CaO MnO FeO TOTAL

LOST River	s	10.02	23.84	66.42	0.29	2.18	0.00	0.04	102.79
LOST River	s	8.50	26.60	61.81	0.18	5.85	0.00	0.04	102.98
PRINDLE	s	0.82	34.72	44.24	0.07	20.42	0.00	0.19	100.46
PRINDLE	s	11.62	19.31	68.57	0.07	0.12	0.00	0.00	99.69
PRINDLE	s	11.30	20.38	68.43	0.15	0.80	0.00	0.09	101.16
PRINDLE	s	11.66	19.96	70.37	0.18	0.02	0.04	0.09	102.33
PRINDLE	s	12.03	19.95	71.31	0.09	0.07	0.01	0.00	103.46
PRINDLE	s	0.68	35.08	45.56	0.02	19.43	0.03	0.07	100.85
PRINDLE	s	11.15	20.26	70.87	0.13	0.40	0.01	0.00	102.82
PRINDLE	s	1.60	25.09	48.29	0.00	10.96	0.05	0.01	86.00
TIN CRK	s	6.03	27.36	55.61	0.25	7.73	0.01	0.33	97.32
TIN CRK	s	5.61	27.08	56.01	0.13	9.86	0.00	0.00	98.68
TIN CRK	s	3.29	30.98	50.14	0.15	13.37	0.04	0.13	98.10
MO GLACIER	m	10.19	20.82	64.67		1.93	0.01	0.16	97.77
MO GLACIER	m	9.99	20.82	65.87	0.11	1.96	0.00	0.00	98.75
MO GLACIER	m	9.55	22.00	62.42		3.09	0.00	0.01	97.07
MO GLACIER	m	9.16	21.44	64.07	0.14	2.78	0.00	0.01	97.59
MO GLACIER	m	2.71	31.56	48.70	0.03	14.58	0.03	0.10	97.71
MO GLACIER	m	0.04	35.36	41.97	0.00	18.28	0.11	0.15	95.91
MO GLACIER	m	10.41	20.68	64.51		1.22	0.00	0.03	96.85
NUNATAK	m	4.56	29.64	52.08		12.25	0.06	0.09	98.68
NUNATAK	m	7.71	24.78	59.48		6.46	0.01	0.30	98.74
NUNATAK	m	9.92	22.04	63.99		3.24	0.00	0.39	99.58
NUNATAK	m	5.57	27.48	56.64	0.22	9.25	0.04	0.13	99.33
NUNATAK	m	7.99	24.48	59.96		5.96	0.00	0.43	98.82
MO GLACIER ksm		0.22	18.48	62.47	15.46	0.18	0.00	0.22	97.02
NUNATAK ksp	m	0.61	18.18	65.62	15.04	0.03	0.04	0.07	99.60
TIN CRK KSP	s	0.18	17.74	65.96	15.37	0.10	0.08	0.16	99.59
FUR KSP	w	0.81	18.75	60.10	14.02	0.09	0.03	0.13	93.93
FUR KSP	w	0.71	18.34	63.07	15.33	0.06	0.03	0.01	97.54
PUZZLE GULCH	w	0.63	19.15	65.52	15.40	0.02	0.00	0.01	100.73
PUZZLE GULCH	w	0.49	19.10	64.86	15.40	0.00	0.00	0.04	99.88
PUZZLE GULCH	w	0.53	19.29	65.62	15.15	0.00	0.07	0.00	100.66
PUZZLE ksp	w	0.59	18.91	66.05	16.32	0.00	0.01	0.00	101.87
PUZZLE ksp	w	0.57	18.72	65.19	15.62	0.04	0.00	0.00	100.15
NIXON FORK ksa		1.52	18.32	64.78	15.10	0.06	0.14	0.23	100.15
RAMBLER ksp	a	0.27	18.92	65.57	16.75	0.02	0.01	0.21	101.75
RAMBLER ksp	a	0.70	19.30	65.59	15.50	0.24	0.00	0.15	101.49
RAMBLER ksp	a	0.70	18.95	64.82	15.61	0.08	0.00	0.21	100.37

TABLE 19: MICROPROBE COMPOSITIONS OF CHLORITE FROM ALASKAN SKARNS

DEPOSIT	type	Cl	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	total
Rambler	a		8.53	20.86	25.08			0.85	31.68	87.00
RAMBLER	a	0.09	5.22	11.27	30.58	0.94	0.00	0.04	27.82	75.96
RAMBLER	a	0.05	5.05	11.26	29.16	0.39	0.05	0.11	29.97	76.05
Nixon Fork	a		8.29	19.31	24.90	0.04	0.02	0.60	36.45	89.61
Nixon Fork	a		8.81	19.37	24.73	0.03	0.00	0.65	37.27	90.85
Nixon Fork	a		8.31	19.12	24.70	0.14	0.02	0.55	36.30	89.14
Nixon Fork	a		8.20	18.91	24.50	0.08	0.06	0.69	35.98	88.43
Nixon Fork	a	0.04	1.73	16.61	24.86	0.28	0.09	0.28	44.44	88.32
Nixon Fork	a	0.00	2.09	21.21	28.63	0.14	0.09	0.66	50.30	103.11
Nixon Fork	a	0.01	8.55	19.10	24.56	0.08	0.00	0.53	36.07	88.90
Nixon Fork	a	0.04	7.72	18.32	25.22	0.17	0.00	0.61	36.50	88.57
Nixon Fork	a		8.18	19.92	24.68	0.11	0.00	0.52	35.79	89.20
Nixon Fork	a		8.18	18.91	24.07	0.15	0.00	0.51	35.34	87.15
NIXON FORK	a		0.30	20.34	20.83	0.00	0.02	0.11	40.57	82.16
NIXON FORK	a		0.39	19.28	21.00	0.00	0.01	0.02	39.91	80.61
NIXON FORK	a		0.31	19.71	20.36	0.00	0.04	0.00	38.81	79.23
NIXON FORK	a		0.39	19.89	20.64	0.00	0.00	0.03	39.73	80.68
SUMMIT LAKE	f		4.63	14.03	24.74	0.09	0.00	0.47	34.78	78.74
SUMMIT LAKE	f		6.27	14.34	22.89	0.29	0.00	0.68	32.31	76.78
Jumbo Basin	f		10.28	20.16	24.61	0.07	0.04	0.19	27.74	83.09
Jumbo Basin	f		11.26	21.69	24.89	0.00	0.04	0.06	30.28	88.22
Jumbo Basin	f		9.91	20.83	25.36	0.07	0.10	0.29	29.77	86.33
JUMBO	f		10.84	15.50	23.45	0.06	0.03	0.74	25.41	76.04
BILLIKEN	g		21.12	16.18	27.85	0.11	0.03	0.57	25.30	91.16
BILLIKEN	g		21.60	15.93	28.02	0.11	0.03	0.68	24.52	90.88
OSCAR	z	0.14	6.17	15.52	24.33	0.63	0.03	1.23	36.11	84.16
OSCAR	z	0.18	7.01	12.74	26.36	0.25	0.19	1.01	37.96	85.70
ORANGE HILL	c	0.05	19.14	20.64	27.21	0.06	0.10	0.22	19.40	86.82
ORANGE HILL	c	0.04	18.92	20.01	27.42	0.09	0.04	0.25	19.83	86.61
ORANGE HILL	c	0.01	19.63	20.92	28.28	0.06	0.00	0.19	18.73	87.82
ORANGE HILL	c	0.01	18.67	21.29	27.64	0.11	0.26	0.32	18.80	87.11
ORANGE HILL	c	0.00	16.98	19.67	27.11	0.00	0.05	0.15	21.98	85.94
ORANGE HILL	c	0.03	17.14	20.21	27.32	0.02	0.01	0.16	22.93	87.82
ORANGE HILL	c	0.01	16.53	19.38	27.97	0.70	0.72	0.16	22.19	87.65
ORANGE HILL	c	0.02	14.73	21.72	26.45	0.06	0.00	0.23	24.01	87.22
Nabesna	c		16.84	20.04	27.35			0.92	23.94	89.09
Nabesna	c		9.87	20.03	25.57			0.75	30.95	87.17
Nabesna	c		17.80	18.19	27.95			1.44	22.30	87.68
Nabesna	c		16.46	18.52	27.35			1.53	23.83	87.69
DEER CK	c	0.04	6.86	18.89	24.15	0.21	0.02	0.51	36.50	87.17
DEER CK	c	0.00	5.21	19.62	26.22	0.08	0.09	0.66	43.54	95.41
DEER CK	c	0.02	5.06	18.25	24.74	0.09	0.00	0.90	41.94	90.99
Table Mntn	w		7.22	19.54	25.53	0.16	0.12	1.55	34.24	88.36
Table Mntn	w		6.92	20.18	25.09	0.03	0.01	0.79	36.01	89.03
Table Mntn	w		5.28	20.29	23.93	0.06	0.00	0.68	37.06	87.30
Table Mntn	w		6.47	20.04	25.43	0.07	0.16	1.30	36.26	89.73
TABLE MTN	w	0.00	7.47	18.05	24.25	0.48	0.06	1.61	35.79	87.70
TABLE MTN	w	0.01	7.61	18.54	24.59	0.29	0.00	1.45	34.94	87.44
TABLE MTN	w	0.00	7.22	17.64	24.95	0.14	0.04	1.52	37.01	88.53
TABLE MTN	w	0.00	7.64	17.68	26.28	0.28	0.16	1.59	36.39	90.02
PUZZLE GULCH	w	0.00	15.77	23.88	30.73	0.26	0.07	0.15	14.81	85.65

TABLE 19: MICROPROBE COMPOSITIONS OF CHLORITE FROM ALASKAN SKARNS

DEPOSIT	type	Cl	MgO	Al ₂ O ₃	SiO ₂	CaO	TiO ₂	MnO	FeO	total
PUZZLE GULCH	w	0.00	19.14	17.68	30.66	0.22	0.20	0.21	16.47	84.56
Prindle	s		5.48	19.80	26.39	0.26	0.01	1.22	35.80	88.96
Lime Pk	s		5.89	15.89	29.05	0.49	0.04	0.33	37.20	88.89
Lime Pk	s		9.32	18.56	26.23	0.00	0.00	1.47	30.44	86.02
Lime Pk	s		6.15	15.66	29.45	0.54	0.03	0.37	37.68	89.88
OSCAR	z	0.07	8.97	14.46	25.77	0.11	0.00	1.71	34.50	85.59
OSCAR	z	0.10	11.55	15.52	27.36	0.14	0.10	1.83	30.12	86.71
CHAMPION II	z	0.01	12.72	16.64	32.56	0.38	0.02	5.63	27.73	95.67
ARRIGETCH	z		4.07	18.13	22.56	0.00	0.01	0.30	42.24	87.32
ARRIGETCH	z		4.98	19.07	22.94	0.01	0.04	0.33	41.91	89.28
ARRIGETCH	z		4.71	19.60	23.10	0.00	0.06	0.17	42.12	89.76
ARRIGETCH	z		4.33	18.33	22.52	0.07	0.01	0.22	40.33	85.82

TABLE 20: MICROPROBE COMPOSITIONS OF EPIDOTE FROM ALASKAN SKARNS

DEPOSIT	type	Cl	MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	total
NIXON FK	a		0.03	25.21	38.56	22.62	0.00	0.67	11.20	98.29
NIXON FK	a		0.01	24.98	38.55	23.72	0.37	0.07	11.11	98.81
NIXON FK	a		0.00	25.30	38.19	22.06	0.11	0.97	11.41	98.05
NIXON FK	a		0.03	23.85	38.57	22.64	0.07	0.79	12.40	98.34
NIXON FK	a		0.00	24.72	37.83	23.60	0.00	0.17	11.27	97.59
MT ANDREW	f		0.07	23.78	38.18	23.44	0.02	0.00	13.17	98.67
MT ANDREW	f		0.07	24.41	38.79	23.47	0.03	0.22	11.29	98.27
MT ANDREW	f		0.00	22.01	37.62	23.43	0.10	0.14	14.56	97.86
MT ANDREW	f		0.04	23.21	38.44	23.34	0.12	0.15	12.83	98.12
MT ANDREW	f		0.07	23.74	38.52	23.76	0.37	0.04	12.30	98.79
MT ANDREW	f		0.05	22.73	37.97	23.80	0.00	0.11	12.72	97.39
MT ANDREW	f		0.02	22.65	38.03	23.62	0.20	0.11	13.83	98.45
MT ANDREW	f		0.02	22.39	37.31	23.33	0.03	0.17	13.92	97.16
MT ANDREW	f		0.00	23.04	37.61	23.84	0.18	0.09	12.45	97.20
MT ANDREW	f		0.01	20.34	37.36	22.68	0.08	0.05	16.06	96.57
MT ANDREW	f		0.03	22.68	37.89	23.50	0.29	0.07	12.63	97.08
MT ANDREW	f		0.00	22.21	37.96	23.23	0.04	0.29	13.85	97.58
MT ANDREW	f		0.00	23.45	38.19	23.76	0.02	0.09	12.62	98.13
MT ANDREW	f		0.05	24.14	38.34	23.42	0.16	0.06	11.54	97.70
Jumbo	f		0.00	21.64	38.32	22.96	0.00	0.16	15.14	98.21
Jumbo	f		0.00	21.69	37.69	23.11	0.13	0.35	13.67	96.65
Jumbo	f		0.02	22.63	38.02	23.09	0.01	0.53	14.46	98.76
Jumbo	f		0.03	22.52	38.51	23.14	0.20	0.24	13.94	98.57
Jumbo	f		0.04	22.59	37.35	22.63	0.10	0.64	13.15	96.49
JUMBO	f		0.00	22.74	38.23	22.81	0.09	0.54	13.69	98.10
ADAMS SKARN	f		0.02	23.99	36.71	21.96	0.14	0.20	9.48	92.49
ORANGE HILL	c		0.00	24.05	38.28	23.56	0.00	0.17	12.03	98.09
ORANGE HILL	c		0.00	23.20	38.30	23.20	0.00	0.10	12.77	97.58
ORANGE HILL	c		0.15	23.52	38.38	23.58	0.02	0.07	12.01	97.72
MITCHELL	c		0.04	25.15	38.63	23.80	0.06	0.10	10.69	98.46
MITCHELL	c		0.03	25.00	38.22	23.93	0.16	0.02	9.93	97.30
MITCHELL	c		0.01	24.17	38.42	23.88	0.02	0.07	11.09	97.66
IRON CK	c		0.00	24.52	42.31	23.98	0.02	0.39	15.69	106.90
IRON CK	c		0.00	21.23	36.98	21.73	0.09	0.27	13.90	94.19
Evelyn Lee	c		0.00	22.05	38.26	23.33	0.00	0.09	14.69	98.41
Evelyn Lee	c		0.00	21.88	38.69	23.20	0.08	0.11	15.11	99.07
Evelyn Lee	c		0.00	21.96	38.42	23.68	0.00	0.19	14.97	99.21
Evelyn Lee	c		0.00	22.18	38.36	23.44	0.00	0.27	14.65	98.89
Evelyn Lee	c		0.07	22.33	38.40	23.41	0.00	0.26	14.21	98.68
Evelyn Lee	c		0.00	22.48	38.38	23.03	0.01	0.21	14.18	98.29
Evelyn Lee	c		0.00	21.43	38.35	23.32	0.12	0.18	15.61	99.01
Evelyn Lee	c		0.01	21.89	38.36	23.44	0.09	0.20	14.82	98.81
Evelyn Lee	c		0.00	21.42	38.39	23.41	0.00	0.27	15.73	99.22
Evelyn Lee	c		0.00	22.72	38.52	23.21	0.00	0.15	13.87	98.46
Evelyn Lee	c		0.05	22.53	38.73	23.25	0.10	0.13	14.08	98.86
Evelyn Lee	c		0.00	21.68	38.62	22.83	0.00	0.17	15.67	98.97
DEER CK	c		0.00	24.45	37.56	21.98	0.12	0.13	10.81	95.07
DEER CK	c		0.00	24.12	37.86	22.15	0.12	0.09	10.82	95.15
DEER CK	c		0.00	23.20	38.28	22.17	0.00	0.11	13.28	97.03
DEER CK	c		0.01	22.84	37.44	21.75	0.14	0.28	12.86	95.32

TABLE 20: MICROPROBE COMPOSITIONS OF EPIDOTE FROM ALASKAN SKARNS

DEPOSIT	type	Cl	MgO	Al ₂ O ₃	SiO ₂	CaO	TiO ₂	MnO	FeO	total
DEER CK	c		0.00	25.67	41.33	23.60	0.14	0.70	12.65	104.10
DEER CK	c		0.04	26.56	38.00	22.58	0.09	0.05	8.60	95.92
Chandalar	c		0.04	24.08	38.22	23.54	0.25	0.21	11.37	97.71
CHAMPION I	c		0.00	24.74	41.46	24.22	0.00	0.19	13.26	103.86
CHAMPION I	c		0.00	23.87	37.70	22.58	0.00	0.18	10.48	94.81
CHAMPION I	c		0.01	23.92	37.93	21.00	0.04	0.34	11.22	94.46
STEPOVITCH	w		0.01	26.01	39.00	24.03	0.01	0.12	9.84	99.02
STEPOVITCH	w		0.03	25.61	38.97	23.83	0.00	0.12	10.36	98.91
STEPOVITCH	w		0.03	26.86	39.32	23.63	0.08	0.00	9.03	98.95
STEPOVITCH	w		0.03	27.15	39.32	24.01	0.05	0.13	9.19	99.86
STEPOVITCH	w		0.01	26.64	39.35	24.07	0.06	0.13	9.04	99.29
STEPOVITCH	w		0.03	26.04	38.83	24.07	0.10	0.10	10.01	99.17
STEPOVITCH	w		0.02	26.83	39.08	24.00	0.06	0.16	8.26	98.39
STEPOVITCH	w		0.00	25.77	39.48	23.75	0.16	0.04	9.82	99.02
STEPOVITCH	w		0.00	27.08	39.53	23.93	0.13	0.11	8.67	99.45
STEPOVITCH	w		0.00	26.15	39.07	23.91	0.03	0.10	10.05	99.32
Puzzle Gulch	w	0.00	0.03	28.77	39.36	24.23	0.25	0.00	6.26	98.89
Puzzle Gulch	w	0.05	0.06	25.66	37.19	23.81	0.07	0.00	6.14	92.96
FOLEY W	w		0.05	25.80	38.14	23.56	0.16	0.15	7.99	95.85
FOLEY W	w		0.49	28.92	39.42	23.50	0.02	0.00	5.16	97.50
FOLEY W	w		0.04	29.23	41.88	25.51	0.10	0.20	6.51	103.47
FOLEY W	w		0.00	27.38	38.45	23.08	0.07	0.38	5.90	95.26
FOLEY W	w		0.04	27.35	38.99	23.67	0.10	0.10	7.51	97.77
FOLEY W	w		0.05	26.14	38.99	26.15	0.19	0.15	7.17	98.85
FOLEY W	w		0.00	25.90	38.87	23.45	0.26	0.09	6.69	95.26
FOLEY W	w		0.00	26.41	38.47	22.98	0.00	0.52	8.09	96.46
Fur	w	0.00	0.00	27.22	39.02	23.65	0.00	0.32	7.50	97.69
Fur	w	0.00	0.00	29.36	39.41	24.63	0.00	0.08	6.31	99.79
Fur	w	0.00	0.03	29.29	39.46	24.38	0.02	0.03	6.23	99.44
Fur	w	0.00	0.01	29.64	40.15	24.04	0.05	0.01	6.63	100.52
Fur	w	0.00	0.03	29.91	39.19	24.57	0.06	0.06	5.35	99.16
Fur	w	0.00	0.07	29.20	39.08	23.72	0.00	0.06	5.93	98.05
Fur	w	0.00	0.01	29.49	39.26	24.09	0.14	0.13	5.95	99.07
Fur	w	0.00	0.02	29.67	39.24	24.04	0.08	0.06	5.75	98.86
Fur	w	0.01	0.04	29.61	39.48	23.95	0.06	0.09	6.14	99.37
Fur	w	0.04	0.03	29.75	39.99	24.24	0.00	0.00	5.68	99.72
Fur	w	0.00	0.06	29.52	39.18	24.23	0.01	0.11	5.73	98.83
Fur	w	0.00	0.03	29.23	39.32	24.17	0.02	0.13	5.66	98.56
Fur	w	0.00	0.04	26.42	38.71	24.12	0.10	0.14	6.04	95.55
Fur	w	0.02	0.08	25.80	38.85	23.96	0.11	0.09	5.82	94.72
Cleary	w		0.02	24.93	38.50	23.36	0.00	0.11	10.44	97.36
BIG WINDY	w		0.01	26.40	33.92	21.29	0.17	0.17	4.96	86.92
JAGO	s		0.03	29.89	38.35	23.81	0.04	0.14	4.41	96.67
JAGO	s		0.04	29.30	37.65	23.76	0.10	0.23	5.13	96.22
JAGO	s		0.02	29.59	38.46	23.83	0.06	0.07	5.25	97.27
Groundhog	Bas		0.00	25.06	39.18	25.97	0.00	0.26	11.33	101.78
Groundhog	Bas		0.12	24.59	38.25	25.57	0.00	0.20	11.29	100.02
Groundhog	Bas		0.02	25.48	38.34	24.20	0.05	0.11	9.53	97.72
Groundhog	Bas		0.17	25.43	38.81	25.72	0.12	0.23	9.98	100.45
Groundhog	Bas		0.02	25.33	39.27	25.80	0.14	0.29	11.15	102.00

TABLE 20: MICROPROBE COMPOSITIONS OF EPIDOTE FROM ALASKAN SKARNS										
DEPOSIT	type	Cl	MgO	Al ₂ O ₃	SiO ₂	CaO	TiO ₂	MnO	FeO	total
Groundhog	Bas		0.03	20.96	37.50	22.74	0.02	0.04	15.30	96.59
Cape Mtn	s		0.03	24.09	38.26	23.12	0.09	0.40	11.15	97.14
Cape Mtn	s		0.05	26.08	38.67	23.84	0.02	0.21	8.65	97.52
Cape Mtn	s		0.07	24.36	37.73	22.86	0.07	0.18	9.15	94.42
NUNATAK	m		0.00	24.46	36.64	22.99	0.00	0.06	10.09	94.24
NUNATAK	m		0.00	18.80	36.57	22.17	0.08	0.04	15.88	93.53
NUNATAK	m		0.00	17.86	35.67	23.19	4.62	0.00	11.99	93.33
NUNATAK	m		0.02	21.44	36.47	22.26	0.02	0.15	12.76	93.12
NUNATAK	m		0.00	20.40	36.38	22.69	3.12	0.02	11.91	94.51
NUNATAK	m		0.01	19.54	36.32	21.48	0.05	0.07	15.79	93.26
STONEBOY	CRKz		0.07	16.04	30.51	14.18	0.04	0.21	8.73	69.77
OSCAR	z		0.03	23.39	38.14	21.73	0.05	0.33	12.64	96.31
OSCAR	z		0.00	22.94	37.04	21.86	0.05	0.16	12.14	94.19
OSCAR	z		0.02	22.25	37.20	21.51	0.08	0.23	14.02	95.30
CHAMPION II	z		0.00	21.39	36.64	21.66	0.00	0.13	13.40	93.23
CHAMPION I	z		0.01	21.98	37.06	21.70	0.13	0.11	12.97	93.94
CHAMPION I	z		0.02	21.78	37.28	21.69	0.00	0.23	12.52	93.51

TABLE 21: MICROPROBE COMPOSITIONS OF AMPHIBOLES FROM ALASKAN SKARNS												
DEPOSIT	F	Cl	Na2O	MgO	Al2O3	SiO2	K2O	CaO	TiO2	MnO	FeO	TOTAL
Liberty Bell	0.11	1.03	1.10	3.96	12.19	40.22	1.68	12.11	0.12	0.68	26.51	99.71
Nixon Fork			1.96	11.63	16.94	39.16	2.33	12.59	0.24	0.36	13	98.21
Nixon Fork	0.27	0.28	1.66	10.22	16.24	36.93	2.42	12.24	0.86	0.01	15.48	96.61
Nixon Fork			1.83	10.19	15.64	39.15	2.17	12.47	0.07	0.2	15.89	97.61
Nixon Fork	0.38	0.11	0.39	8.35	4.24	47.96	0.20	11.72	0.12	0.56	23.73	97.73
Nixon Fork	0.18	0.11	0.50	7.78	5.59	46.57	0.32	11.39	0.27	0.47	23.31	96.49
Nixon Fork	0.35	0.24	1.09	6.50	14.01	36.13	3.42	11.88	2.65	0.23	20.50	96.99
Nixon Fork	0.00	0.29	0.68	5.55	7.87	43.20	0.64	11.43	0.30	0.50	25.81	96.27
Nixon Fork	0.41	0.23	0.94	5.41	8.35	42.61	0.79	11.48	0.34	0.33	26.26	97.12
Nixon Fork	0.25	0.34	1.30	4.43	12.49	39.73	1.24	11.44	0.24	0.12	25.30	96.89
Nixon Fork	0.40	0.80	1.43	3.88	10.94	38.75	1.65	11.26	0.51	0.31	27.29	97.21
Nixon Fork	0.22	0.47	1.06	3.55	9.26	40.12	1.04	11.20	0.18	0.22	29.28	96.59
Nixon Fork	0.28	0.60	1.29	2.54	11.66	37.81	1.63	11.15	0.29	0.24	28.52	96.01
Nixon Fork	0.31	0.79	1.27	2.53	11.27	37.39	1.56	10.91	0.23	0.34	29.37	95.99
Nixon Fork	0.39	0.89	1.28	2.09	11.40	37.26	1.77	10.74	0.46	0.33	29.83	96.43
Nixon Fork	0.30	1.24	1.23	2.03	10.59	37.66	1.80	10.77	0.29	0.33	30.50	96.73
CHAMPION I			0.68	1.67	7.82	42.77	0.46	11.63		0.41	31.3	96.74
CHAMPION I			0.62	1.63	7.61	42.49	1.18	11.36		0.65	32.53	98.07
DEER CK			0.23	3.18	3.21	47.47	0.13	10.95		1.15	30.82	97.14
DEER CK			0.5	2.13	5.71	46.11	0.32	10.82		0.96	31.19	97.74
DEER CK	0.07	0.02	0.32	0.89	4.10	49.64	0.27	11.34	0.00	0.64	32.63	99.92
DEER CK	0.03	0.00	0.17	0.69	3.08	49.53	0.17	11.14	0.11	0.39	34.34	99.63
DEER CK	0.00	0.00	0.25	0.06	2.78	49.67	0.32	11.22	0.02	0.05	35.35	99.71
Evelyn Lee			0.46	13.98	0.92	54.34	0.04	12.24	0	0.34	16.43	98.75
Evelyn Lee			0.52	13.47	1.4	53.47	0.07	11.98	0.06	0.29	16.79	98.05
Evelyn Lee			0.54	13.43	0.96	53.84	0.03	11.9	0.06	0.34	16.54	97.64
Evelyn Lee			0.54	13.36	0.85	53.79	0.07	11.72	0.03	0.35	16.28	96.99
Evelyn Lee			0.34	13.14	0.92	53.77	0.04	11.86	0.03	0.33	17.38	97.81
Evelyn Lee			0.83	12.3	1.28	53.65	0.02	11.36	0.03	0.26	17.92	97.65
Evelyn Lee			1.03	12.12	1.39	53.5	0.06	10.87	0	0.3	18.66	97.93
Evelyn Lee			0.97	10.63	1.37	52.71	0	11.03	0.01	0.35	20.33	97.40
Evelyn Lee			1.14	10.38	1.67	52.75	0.07	10.64	0	0.4	20.49	97.54
Evelyn Lee			1.35	10.32	2.45	52.04	0.13	10.31	0.03	0.33	20.83	97.79
Evelyn Lee			1.02	10.27	1.74	52.27	0.07	10.98	0.01	0.32	20.76	97.44
Glacier Fork			0.13	11.04	0.89	51.98	0	12.54		0.94	19.85	97.37
Glacier Fork			0.4	10.18	3.64	49.04	0.39	11.75		0.82	19.54	95.76
Glacier Fork			0.43	10.18	5.08	48.19	0.61	12		0.69	18.73	95.91
Glacier Fork			0.49	7.63	4.82	47.81	0.28	11.71		1.2	23.37	97.31
Glacier Fork			0.53	7.25	6.14	46.18	0.36	11.82		1.09	24.22	97.59
Glacier Fork			0.25	1.76	1.69	48.89	0.14	10.84		1.49	32.79	97.85
Iron Crk	0.33	0.02	0.08	17.88	0.50	56.37	0.03	12.48	0.00	1.16	10.41	99.25
Iron Crk	0.00	0.04	0.28	16.58	0.85	53.51	0.04	11.55	0.00	1.07	10.44	94.36
Iron Crk	0.29	0.03	0.22	15.97	1.36	54.49	0.06	10.79	0.00	0.99	12.22	96.41
Nabesna			0.77	17.43	3.95	52.88	0.30	12.12	0.73	0.42	10.31	98.91
Nabesna			0.08	16.59	0.27	55.77	0.06	11.62	0.03	0.69	13.23	98.34
Nabesna			0.00	14.11	0.31	55.09	0.00	11.36	0.00	1.08	16.24	98.19
Nabesna			0.05	14.02	1.05	56.72	0.00	11.90	0.04	0.64	12.61	97.03
Nabesna			0.08	12.42	0.36	54.15	0.01	12.46	0.00	0.74	17.63	97.85
Nabesna			0.09	11.73	0.43	53.81	0.01	11.33	0.00	1.15	19.11	97.66
Nabesna			0.06	9.62	0.74	51.86	0.02	10.22	0.00	1.92	22.47	96.91

TABLE 21: MICROPROBE COMPOSITIONS OF AMPHIBOLES FROM ALASKAN SKARNS												
DEPOSIT	F	Cl	Na2O	MgO	Al2O3	SiO2	K2O	CaO	TiO2	MnO	FeO	TOTAL
ORANGE HILL			0.46	17.86	0.50	55.23		11.74	0.00	0.01	9.28	95.08
ORANGE HILL			0.56	17.43	0.70	53.88		11.62	0.00	0.00	10.14	94.33
ORANGE HILL			0.42	16.64	0.73	55.03		11.77	0.05	0.03	11.39	96.06
ORANGE HILL			0.39	16.46	0.62	54.45		11.58	0.03	0.00	11.95	95.49
Venus	0.00	0.02	0.42	12.90	1.17	55.42	0.06	12.35	0.12	0.34	17.20	99.99
Venus	0.27	0.00	0.62	12.68	1.41	54.76	0.03	11.62	0.04	0.29	18.03	99.75
Venus	0.00	0.00	0.49	12.52	1.57	54.39	0.06	12.65	0.03	0.42	17.46	99.58
Venus	0.36	0.01	0.52	12.29	0.89	55.01	0.03	11.97	0.03	0.36	18.50	99.96
Venus	0.03	0.00	0.50	11.97	0.84	55.09	0.03	11.86	0.00	0.29	19.22	99.83
Venus	0.30	0.02	0.71	11.73	1.73	53.96	0.11	11.32	0.00	0.33	17.94	98.15
DRY PASS			0.21	13.90	1.17	52.81		12.05	0.04	1.99	13.67	95.83
DRY PASS			0.25	13.60	1.21	51.03		11.40	0.00	2.42	13.62	93.53
Jumbo	0.24	0.02	0.08	13.72	0.45	55.42	0.07	12.43	0.01	0.80	16.41	99.65
Jumbo	0.00	0.03	0.19	11.85	0.60	52.59	0.17	13.23	0.01	0.92	17.61	97.20
Jumbo	0.21	0.02	0.19	11.35	0.69	54.69	0.17	9.92	0.00	1.12	21.09	99.44
Jumbo	0.00	0.04	0.33	10.97	0.52	53.54	0.61	10.74	0.00	0.99	19.93	97.67
Jumbo	0.00	0.01	0.17	10.59	0.80	54.22	0.11	11.28	0.00	0.91	20.29	98.38
Kasna Crk			0.46	15.54	0.73	53.33	0	11.35		3.44	11.45	96.30
Kasna Crk			0.28	13.5	0.73	53.58	0	11.71		4.34	13.15	97.29
Kasna Crk			0.23	12.92	0.73	53.43	0.09	11.92		2.29	15.52	97.13
Kasna Crk			0.07	11.23	0.52	53.29	0	12		4.71	14.97	96.79
PAINT R			0.71	6.16	6.02	44.39		10.94	0.13	0.47	27.69	96.50
BILLIKEN			0.44	14.80	2.63	51.04		12.22	0.10	0.14	13.79	95.15
BILLIKEN			0.40	14.63	1.85	52.01		12.14	0.08	0.33	13.68	95.11
BILLIKEN			0.21	14.30	1.60	52.21		12.30	0.06	0.34	14.74	95.76
BILLIKEN			0.43	13.46	2.05	51.13		12.14	0.09	0.31	15.07	94.67
BILLIKEN			0.47	13.14	3.47	49.93		12.28	0.02	0.24	15.80	95.34
SLEEKEMUTE			0.66	8.24	8.58	41.39		16.39	0.53	0.19	17.37	93.36
MO GLACIER			0.22	17.19	1.46	52.30		12.96	0.04	0.64	7.72	92.52
MO GLACIER			0.14	16.28	1.64	52.57		16.71	0.00	0.71	6.66	94.69
MO GLACIER			0.12	15.98	0.93	52.64		12.03	0.04	0.92	10.32	92.98
MO GLACIER			0.29	15.23	2.02	51.92		12.00	0.08	1.10	11.22	93.85
MO GLACIER	0.07	0.00	0.19	14.94	1.58	53.64	0.10	11.36	0.00	1.00	10.71	93.59
MO GLACIER			0.37	14.63	2.94	51.08		11.57	0.05	1.20	12.90	94.74
MO GLACIER			0.30	14.56	2.87	50.99		11.72	0.12	1.03	12.10	93.69
MO GLACIER			0.31	13.91	2.50	50.63		11.64	0.14	1.03	13.71	93.86
MO GLACIER	0.00	0.00	0.27	13.75	3.57	52.58	0.13	11.46	0.00	1.11	12.76	95.63
MO GLACIER	0.34	0.00	0.25	13.19	2.12	52.04	0.01	10.78	0.00	1.22	13.54	93.48
MO GLACIER	0.07	0.02	0.40	13.04	3.71	51.42	0.15	11.15	0.01	0.86	14.50	95.33
MO GLACIER	0.10	0.01	0.47	12.47	3.80	51.06	0.12	11.27	0.00	1.05	15.22	95.57
NUNATAK			1.06	7.56	5.68	46.02		11.56	0.60	0.64	22.71	95.82
NUNATAK			1.15	7.15	6.85	44.09		11.33	0.79	0.75	23.39	95.50
NUNATAK			1.09	6.65	6.08	45.51		11.01	0.42	0.79	24.44	95.99
NUNATAK	0.57	0.06	1.07	6.59	7.07	45.32	0.74	10.42	0.53	0.56	23.59	96.52
NUNATAK	0.20	0.04	1.18	6.54	6.76	44.71	0.65	10.51	0.57	0.72	23.51	95.41
NUNATAK			1.24	6.48	8.40	43.28		11.03	0.92	0.63	22.90	94.88
NUNATAK			1.03	6.39	7.63	44.52		11.46	0.81	0.62	24.43	96.89
NUNATAK			1.34	6.13	8.76	41.57		11.25	0.83	0.48	24.60	94.96
NUNATAK			1.41	6.13	8.82	42.78		11.05	0.91	0.63	24.05	95.76
NUNATAK	0.49	0.05	1.28	6.04	7.99	43.62	0.98	10.71	0.67	0.64	24.40	96.86

TABLE 21: MICROPROBE COMPOSITIONS OF AMPHIBOLES FROM ALASKAN SKARNS												
DEPOSIT	F	Cl	Na2O	MgO	Al2O3	SiO2	K2O	CaO	TiO2	MnO	FeO	TOTAL
NUNATAK	0.63	0.10	1.51	5.90	8.94	42.01	1.09	10.73	0.82	0.51	23.98	96.22
ARRIGETCH	0.08	0.02	0.03	21.43	0.15	58.07	0.10	13.19	0.00	0.17	4.48	97.71
ARRIGETCH	0.90	0.02	0.33	19.06	3.07	55.97	0.02	12.76	0.21	0.11	6.76	99.20
ARRIGETCH	0.75	0.02	0.26	18.95	2.96	56.13	0.02	13.44	0.18	0.21	6.86	99.77
ARRIGETCH	0.74	0.04	0.31	18.77	2.93	56.20	0.04	12.84	0.09	0.34	7.40	99.69
ARRIGETCH			0.34	16.77	1.93	52.38		12.25	0.04	0.20	10.64	94.54
ARRIGETCH			1.67	4.34	10.36	38.11		10.20	0.04	1.08	25.76	91.56
Cape Mtn t1			0.87	14.26	4.18	51.17	0.52	12.45	0.12	0.49	13.27	97.33
Cape Mtn t1			0.92	14.18	3.92	51.38	0.56	12.51	0.12	0.58	13.76	97.93
Cape Mtn t1			0.99	14.18	4.98	50.13	0.59	12.23	0.14	0.60	12.94	96.78
Cape Mtn t1			1.17	14.11	4.10	51.54	0.51	12.47	0.09	0.45	13.82	98.26
Cape Mtn t1			1.00	13.99	4.71	50.81	0.50	12.00	0.15	0.53	14.04	97.73
Cape Mtn t1			1.41	13.23	6.34	49.75	0.61	12.52	0.23	0.63	14.48	99.20
Cape Mtn t2			0.96	11.44	6.22	48.72	0.68	12.31	0.11	0.83	16.95	98.22
Cape Mtn t2			0.72	8.46	4.92	48.48	0.36	11.90	0.07	1.19	21.57	97.67
Cape Mtn t2			0.93	5.62	8.71	44.89	0.78	12.07	0.14	1.12	24.68	98.94
Groundhog	0.26	0.09	0.73	13.32	4.6	50.15	0.42	12.78	0.16	0.6	12.3	95.41
Groundhog			1.37	12.84	13.89	45.22		11.86	0.4	0.07	9.939	95.58
Groundhog	0.65	0.15	0.85	12.68	5.237	48.58	0.44	12.94	0.23	0.52	13.05	95.33
Groundhog			1.44	11.96	12.72	45.31		12.03	0.42	0.12	11.04	95.04
Groundhog	0.4	0.01	0.16	9.427	3.496	50.32	0.14	11.45	0.1	0.49	20.42	96.42
Groundhog	0.08	0.03	0.91	9.198	6.84	48.41	0.41	13.22	0.37	0.5	19.18	99.15
Groundhog	0.1	0.94	1.26	4.166	10.73	42.26	1.41	13.07	0.02	0.79	25.23	99.99
Groundhog	0.23	0.88	1.4	4.165	11.36	42.08	1.49	12.97	0.25	0.73	24.25	99.79
Groundhog	0	0.45	0.89	3.498	7.069	45.12	0.8	12.84	0.05	0.85	28.1	99.66
Groundhog	0.08	0.39	0.98	3.398	8.646	43.73	1.04	12.83	0.29	0.95	27.49	99.83
Groundhog	0.1	1	0.85	3.36	6.18	44.62	0.79	13.31	0.11	0.82	27.59	98.73
Groundhog	0.04	0.78	1.1	2.653	8.379	43.69	1.34	15.7	0.23	0.92	24.46	99.29
Groundhog	0.15	1.05	1.26	2.393	11.15	40.51	1.73	12.65	0.2	0.56	28.06	99.72
Groundhog	0.04	1.11	1.2	2.381	10.16	40.77	1.58	12.85	0.11	1.02	28.04	99.26
Groundhog	0.04	0	0.51	0.827	5.835	46.27	0.44	12.28	0.14	1.83	31.81	99.98
Groundhog	0.04	0	1.03	0.67	7.565	43.66	1	12.27	0.14	1.56	32.06	99.99
Groundhog	0.22	0.04	0.78	0.648	7.19	43.57	0.55	11.97	0.29	1.43	32.71	99.41
Groundhog	0.04	0.03	0.84	0.461	7.744	43.41	0.62	12.36	0.05	1.14	33.11	99.80
LOST RIVER	1.09		2.1	9.36	15.85	39.45	0.17	11.93	0.27	0.63	15.15	96.00
LOST RIVER	1.01	0.07	1.96	8.9	18.06	37.67	1.65	12.14	0.08	0.71	14.58	96.83
LOST RIVER	0.8	0.03	2.12	8.74	15.82	37.64	1.9	12.13	0.19	0.68	15.79	95.84
LOST RIVER	1.18		2.29	7.04	15.85	38.04	1.7	11.77	0.14	0.66	18.62	97.29
LOST RIVER	0.97		2	6.42	20.59	34.95	2	11.66	0	0.42	17.32	96.33
LOST RIVER	0.95	0.03	2.51	5.05	12.49	38.59	2.05	11.28	0.05	2.68	21.93	97.61
LOST RIVER	1.39	0.15	1.74	4.41	13.23	37.74	1.87	11.05	0.08	0.71	23.44	95.81
LOST RIVER	0.66	0.1	2.25	3.3	12.33	37.44	1.76	10.82	0.1	1.42	23.1	93.28
Lyman Fork	0.65	0.01	0.18	18.61	2.47	56.05	0.08	13.19	0.13	0.24	7.58	99.18
Lyman Fork	0.77	0.01	0.12	18.41	2.13	56.28	0.09	13.51	0.00	0.21	7.34	98.86
Lyman Fork	0.69	0.04	0.22	16.25	2.93	54.63	0.13	12.81	0.00	0.15	11.34	99.19
Mt Prindle			0.50	0.38	0.25	41.36		9.08	0.02	1.27	38.35	91.20
Mt Prindle			0.00	0.36	9.51	40.83	0.98	11.08	0.29	0.69	31.12	94.86
Mt Prindle			0.21	0.30	1.32	48.67	0.15	11.05	0.16	0.73	35.55	98.14
Mt Prindle			1.03	0.28	9.55	40.67	1.71	10.81	0.21	0.79	32.23	97.28
Mt Prindle			1.26	0.19	9.91	39.17	1.79	11.16	0.00	0.72	33.17	97.37

TABLE 21: MICROPROBE COMPOSITIONS OF AMPHIBOLES FROM ALASKAN SKARNS												
DEPOSIT	F	Cl	Na2O	MgO	Al2O3	SiO2	K2O	CaO	TiO2	MnO	FeO	TOTAL
OKPILAK			0.13	6.69	1.34	47.05		9.96	0.00	1.50	21.57	88.24
BONANZA			0.22	17.84	1.93	53.91		11.38	0.05	1.16	6.42	92.91
BONANZA			0.26	17.35	1.81	53.62		11.28	0.05	1.45	7.03	92.84
Cleary			1.02	5.62	7.53	45.75	0.46	11.40	0.07	0.38	25.79	98.02
Cleary			1.20	5.13	7.93	45.04	0.50	11.40	0.09	0.39	26.39	98.07
Fur	0.42	0.00	0.40	14.61	3.58	53.02	0.25	12.73	0.11	0.20	13.93	99.25
Fur	0.98	0.03	0.51	14.02	7.90	51.33	0.52	12.89	0.10	0.07	11.63	99.97
Fur	0.61	0.01	0.54	13.11	4.56	51.43	0.33	12.62	0.00	0.24	15.36	98.81
Fur	0.49	0.00	0.61	12.95	5.93	50.61	0.62	12.90	0.09	0.17	14.77	99.14
Fur	0.42	0.02	0.48	11.81	3.89	52.33	0.36	12.56	0.13	0.14	15.34	97.47
Fur	0.82	0.01	0.81	10.87	8.01	49.19	0.86	12.65	0.19	0.29	15.82	99.52
Fur	0.19	0.00	0.47	5.81	6.48	47.90	0.29	11.92	0.03	0.50	23.98	97.57
Fur	0.19	0.04	0.00	3.56	12.71	42.13	0.72	12.02	0.14	0.53	25.13	97.17
Fur	0.44	0.04	0.98	3.34	12.59	41.79	0.86	11.76	0.07	0.52	26.67	99.06
Fur	0.39	0.00	1.07	3.33	12.10	42.61	0.61	11.79	0.10	0.59	26.74	99.33
Fur	0.02	0.02	1.05	3.28	12.64	41.19	0.82	11.74	0.11	0.46	26.22	97.55
Fur	0.16	0.07	1.11	3.07	11.24	41.15	0.49	11.62	0.29	0.68	27.43	97.31
Gilmore Dome	0.17	0.01	0.58	3.94	4.71	48.40	0.24	11.52	0.09	0.53	29.27	99.45
Gilmore Dome	0.03	0.00	0.56	3.48	5.07	47.87	0.22	11.68	0.00	0.97	28.89	98.77
Gilmore Dome	0.00	0.02	0.58	3.20	5.39	47.03	0.23	11.39	0.08	0.86	29.43	98.19
Gilmore Dome	0.19	0.02	0.74	2.96	7.04	46.43	0.42	11.61	0.13	0.68	29.01	99.23
Gilmore Dome	0.03	0.05	0.59	2.89	6.86	46.18	0.64	13.33	0.09	0.84	28.44	99.93
Gilmore Dome	0.00	0.05	0.81	2.84	8.31	44.30	0.66	11.62	0.29	0.79	28.99	98.65
Gilmore Dome	0.00	0.00	0.96	2.67	7.65	45.77	0.02	11.73	0.04	0.95	29.10	98.89
Gilmore Dome	0.55	0.05	0.79	2.40	10.70	42.64	1.23	11.88	0.26	0.49	28.92	99.90
Gilmore Dome	0.03	0.08	0.87	2.34	11.34	41.45	1.41	11.83	0.17	0.47	28.89	98.88
Gilmore Dome	0.31	0.06	0.90	2.03	11.92	40.91	1.56	11.89	0.18	0.77	29.01	99.53
Gilmore Dome	0.53	0.10	1.16	1.99	13.62	39.49	1.46	11.56	0.27	0.64	28.39	99.19
Gilmore Dome	0.36	0.09	1.12	1.97	13.38	39.66	1.32	11.47	0.30	0.49	28.42	98.57
Gilmore Dome	0.25	0.06	1.03	1.77	13.16	40.28	1.44	11.89	0.27	0.53	29.01	99.69
Gilmore Dome	0.47	0.08	0.97	1.61	12.35	40.84	1.52	11.56	0.24	0.51	29.84	99.99
LUCKY 13	0.37	0.07	1.62	7.47	10.53	47.98	1.31	12.35	1.45	0.78	16.04	99.97
LUCKY 13	0.18	0.04	1.27	7.07	9.84	44.79	1.11	11.38	1.64	0.82	19.79	97.93
LUCKY 13	0.00	0.07	1.55	6.99	10.40	47.43	1.20	11.67	1.52	0.84	17.32	98.98
LUCKY 13	0.60	0.03	1.28	6.92	9.12	42.82	1.10	10.60	1.58	0.81	22.65	97.48
Puzzle Gulch	0.60	0.00	0.18	15.46	1.35	53.42	0.15	12.00	0.00	0.15	12.04	95.34
STEPOVICH			1.27	0.65	9.69	38.59		10.43	0.65	1.38	29.93	92.59
STEPOVICH			0.38	0.59	0.43	40.83		11.64	0.06	1.08	32.93	87.93
STEPOVICH			0.42	0.56	0.31	40.03		8.55	0.01	1.45	35.09	86.41
STEPOVICH			0.33	0.50	0.27	40.21		9.55	0.03	1.37	35.74	88.00
STEPOVICH			0.42	0.43	0.48	36.67		5.45	0.00	0.95	41.15	85.54
Table Mtn			0.54	3.42	5.48	46.79	0.34	11.91	0.24	0.77	28.64	98.13
Table Mtn			0.94	2.31	10.96	42.45	0.56	11.45	0.17	0.92	27.50	97.26
Table Mtn	0.00	0.03	0.42	3.63	4.58	47.72	0.25	11.92	0.30	1.06	30.02	99.91
Table Mtn	0.00	0.04	0.49	3.40	5.12	47.60	0.33	11.63	0.38	1.19	29.76	99.94
Table Mtn	0.00	0.05	0.67	2.95	5.83	45.75	0.28	11.44	0.39	1.16	30.66	99.17
Table Mtn	0.00	0.04	0.92	2.59	8.99	44.37	0.86	11.44	0.09	0.85	28.88	99.02
Windy			0.69	9.81	7.10	48.12		11.69	0.01	0.20	19.67	97.28

TABLE 21: MICROPROBE COMPOSITIONS OF AMPHIBOLES FROM ALASKAN SKARNS												
DEPOSIT	F	Cl	Na2O	MgO	Al2O3	SiO2	K2O	CaO	TiO2	MnO	FeO	TOTAL
ARRIGETCH			0.08	6.90	0.39	50.17		0.26	0.00	0.52	37.95	96.27
ARRIGETCH			0.18	6.58	0.53	49.84		0.26	0.03	0.46	38.64	96.52
ARRIGETCH			0.12	6.54	0.27	50.27		0.22	0.00	0.50	38.59	96.51
ARRIGETCH			0.15	6.53	0.78	49.00		0.32	0.03	0.18	37.29	94.27
ARRIGETCH			0.19	6.45	0.89	49.82		0.23	0.07	0.70	38.57	96.92
EAR MTN	1.43	0.01	0.45	12.57	25.97	36.15	0.04	4.32	0.23	0.00	4.66	85.84
EAR MTN	0.43	0.00	1.21	9.77	25.30	35.37	0.06	2.82	0.35	0.07	7.46	82.84
EAR MTN	0.03	0.10	1.40	7.77	26.01	34.84	0.02	2.56	0.24	0.02	10.13	83.12
Glacier Basin	0.04	0.00	0.22	15.6	3.048	53.2	0.11	12.84	0.09	0.39	11.19	96.75
Glacier Basin	0.35	0	0.26	15.58	2.934	52.88	0.08	13.16	0	0.25	10.89	96.38
Glacier Basin	0.13	0	0.27	15.46	5.482	50.61	0.22	12.07	0.26	0.36	11.75	96.60
Glacier Basin	0.18	0.04	0.32	15.46	3.621	50.09	0.13	12.37	0.21	0.2	9.836	92.46
Glacier Basin	0.3	0	0.26	15.04	3.496	50.22	0.14	13.57	0.24	0.26	10.1	93.62
Glacier Basin	0.35	0.02	0.35	14.94	5.158	50.71	0.2	12.16	0.16	0.23	11.15	95.42
Glacier Basin	0.52	0.00	0.36	14.84	5.127	50.42	0.3	12.39	0.42	0.14	11.31	95.84
Glacier Basin	0.52	0	0.31	14.8	5.108	50.72	0.29	12.75	0.24	0.21	11.5	96.44
Glacier Basin	0	0.03	0.49	14.7	6.11	50.31	0.33	12.68	0.31	0.33	11.14	96.43
Glacier Basin	0.41	0.02	0.46	14.67	5.958	50.59	0.33	12.87	0.33	0.3	11.22	97.16
Glacier Basin	0.3	0	0.32	13.69	3.304	51.28	0.06	12.6	0.05	0.53	13.52	95.65
Glacier Basin	0.31	0	0.27	13.59	3.568	50.63	0.12	12.3	0.02	0.6	12.54	93.95
Glacier Basin	0.41	0.03	0.41	11.22	3.404	51.79	0.28	12.8	0.21	0.59	18.5	99.63
Glacier Basin			0.44	10.98	3.838	50.76	0.19	11.59	0.19	0.71	18.91	97.60
Glacier Basin	0	0	0.53	10.43	4.726	50.51	0.33	13.14	0.09	0.45	18.97	99.18
Glacier Basin			0.5	10.09	4.299	49.93	0.18	11.89	0	0.52	17.78	95.19
Glacier Basin			0.27	9.68	2.925	51.55	0.22	11.68	0.03	0.57	20.6	97.51
HAPPY	1.13	0.04	0.26	24.63	1.02	57.55	0.13	13.47	0.00	0.14	1.17	99.53
HAPPY	0.00	0.09	0.17	2.18	0.44	51.99	0.08	7.65	0.00	4.74	32.16	99.49
HAPPY	0.07	0.24	0.32	2.12	0.10	48.10	0.10	5.75	0.08	4.27	32.99	94.14
HAPPY	0.16	0.04	0.11	2.02	0.18	48.64	0.05	6.02	0.03	4.25	35.17	96.68
HAPPY	0.20	0.00	0.04	1.87	0.08	48.14	0.01	9.41	0.00	3.75	32.30	95.80
STONEBOY CRK			0.01	0.54	6.61	60.93		5.94	0.00	0.06	3.42	77.51

TABLE 22: MICROPROBE COMPOSITIONS OF OTHER MINERALS FROM ALASKAN SKARNS

Biotite-Phlogopite											
DEPOSIT	F	Cl	MgO	Al2O3	SiO2	K2O	CaO	TiO2	MnO	FeO	TOTAL
LIBERTY BELL	1.49	1.62	14.54	12.41	39.00	9.52	0.06	1.53	0.11	17.44	97.71
LIBERTY BELL	1.76	0.00	15.29	15.26	39.11	9.91	0.12	0.00	0.24	14.65	96.33
MEDFRA			18.39	16.02	32.07	11.53	0.01	0.03	0.07	4.67	82.78
MEDFRA			17.35	11.77	29.18	11.72	0.00	0.00	0.00	4.11	74.13
BILLIKEN			20.68	15.23	38.71	10.89	0.20	0.44	0.18	8.26	94.60
BILLIKEN			27.19	12.04	44.70	10.92	0.04	0.17	0.10	4.05	99.21
BILLIKEN			21.23	15.08	38.09	11.05	0.16	0.50	0.18	8.74	95.04
BILLIKEN			21.67	14.65	38.75	11.13	0.10	0.37	0.19	7.79	94.64
BILLIKEN			28.99	12.48	45.29	8.98	0.05	0.19	0.06	3.54	99.57
BILLIKEN			21.49	14.92	39.12	10.99	0.10	0.41	0.07	7.72	94.82
BILLIKEN			26.20	11.42	41.61	11.06	0.01	0.07	0.02	3.90	94.28
BILLIKEN			23.86	0.41	56.29	10.05	0.12	0.03	0.24	8.68	99.68
DEPOSIT			MgO	Al2O3	SiO2	CaO	TiO2	MnO	FeO	TOTAL	
Clinohumite											
BIKLLIKEN			23.55	0.39	56.13	0.07	0.07	0.02	9.22	89.43	
BIKLLIKEN			22.67	0.41	57.87	0.11	0.07	0.05	9.98	91.15	
Talc											
MILLETT			14.09	3.83	42.45	0.17	0.02	2.09	29.06	91.69	
MILLETT			16.37	1.52	49.89	0.16	0.02	0.79	22.95	91.70	
Nabesna			22.50	0.45	58.56	1.57	0.08	0.19	10.93	94.28	
Serpentine-Greenalite											
MEDFRA			24.36	0.15	40.44	0.47	0.07	0.19	13.07	78.75	
MEDFRA			30.23	0.04	37.12	0.09	0.00	0.12	15.12	82.73	
MEDFRA			25.79	0.04	36.36	0.28	0.02	0.21	10.00	72.69	
MEDFRA			0.49	2.27	21.20	1.47	0.00	0.71	48.42	74.55	
STEPOVITCH			0.39	1.05	24.23	1.58	0.01	0.99	44.87	73.11	
Sleekemute			51.42	0.05	40.65	0.10	0.03	0.04	2.34	94.64	
Minnesotaite											
HAPPY			0.70	1.31	40.39	0.58	0.03	0.70	47.52	91.22	
HAPPY			0.63	1.84	38.10	0.42	0.00	0.75	45.06	86.80	
HAPPY			0.59	2.22	39.27	0.43	0.00	1.02	44.80	88.32	
HAPPY			0.59	0.13	39.07	0.31	0.00	1.03	46.40	87.53	
OSCAR			1.77	0.39	41.02	1.35	0.01	2.66	39.33	86.53	
OSCAR			1.94	0.40	42.46	1.19	0.00	3.03	37.35	86.37	
Ilvaite											
DEER CK			0.05	0.58	30.49	13.24	0.20	0.56	53.31	98.43	
DEER CK			0.05	0.63	29.81	12.83	0.00	0.17	53.61	97.09	
HAPPY			0.13	0.00	29.19	12.37	0.11	0.97	53.13	95.89	
HAPPY			0.00	0.07	28.79	11.33	0.00	1.55	54.79	96.53	
HAPPY			0.15	0.13	30.77	12.45	0.00	5.32	50.53	99.34	
HAPPY			0.09	0.05	29.23	11.70	0.09	4.59	50.45	96.20	
HAPPY			0.03	0.01	28.77	12.77	0.12	0.27	52.56	94.52	
HAPPY			0.08	0.01	28.89	11.97	0.05	4.48	49.72	95.20	
RAT FORK			1.24	3.03	39.41	19.48	0.02	1.43	32.83	97.44	
Rhodenite											
RAT FORK			0.01	0.25	45.65	7.18	0.00	37.71	5.15	95.94	
RAT FORK			0.24	0.44	45.64	7.38	0.06	30.83	11.20	95.79	
RAT FORK			0.76	0.14	44.77	8.40	0.01	31.92	9.58	95.59	

TABLE 23: TRACE ELEMENT DATA FOR PLUTONIC ROCKS ASSOCIATED
WITH ALASKAN SKARN DISTRICTS/DEPOSITS

DISTRICT/DEPOSIT	type	Smp#	Nb	Rb	Sr	Y	Zr
			ppm----->				
Ag King	a	rn248b	8	73		23	56
Ag King	a	rn234c	13	19		15	48
Ag King	a	kc126	13	93		21	102
Ag King	a	pe110	16	75		19	151
Ag King	a	rn248a	18	19		15	147
Ag King	a	rn250b	19	60		17	167
Ag King	a	pe109b	19	72		17	173
Ag King	a	kc124	20	73		29	128
Ag King	a	rn252a	20	91		29	149
Liberty Bell	a	89RB112	8	255	895	8	94
Liberty Bell	a	RN 112	8	255		8	94
Liberty Bell	a	89RN105	17	244	683	20	92
Liberty Bell	a	rn105	17	244		20	92
Lucretia	a	rn247b	12	18		14	75
Lucretia	a	rn246	12	20		25	82
Nixon Fork	a		16	235	257	28	277
Nixon Fork	a		16	174	322	34	326
Nixon Fork	a		22	275	306	25	282
Nixon Fork	a		22	78	75	15	146
Nixon Fork	a		24	172	409	35	264
Nixon Fork	a		28	229	394	31	405
North Fork	a	93kc63	12	148	565	19	178
Partin Crk	a	rn217	22	107		7	159
Partin Crk	a	217b	33	72		10	53
Champion I	c	BL28955	15	158	413	21	126
Champion I	c	BL28957	17	33	499	25	119
Chandalar	c	ln146	7	69	320	5	150
Chandalar	c	ln146	7	69	320	5	150
Chandalar	c		15	94	320	12	130
Chandalar	c		15	94	320	12	130
Chandalar	c	ln82	15	170	300	14	130
Chandalar	c	ln82	15	170	300	14	130
Chandalar	c		17	120	290	17	150
Chandalar	c		17	98		12	140
Chandalar	c		17	98		12	140
Chandalar	c		17	120	290	17	150
Chandalar	c	ln2	17	67	360	5	120
Chandalar	c	ln2	17	67	360	5	120
Chandalar	c	ln75	18	89	490	5	110
Chandalar	c	ln21	18	96	370	11	140
Chandalar	c	ln21	18	96	370	11	140
Chandalar	c	ln75	18	89	490	5	110
Chandalar	c		19	81	330	7	140
Chandalar	c		19	81	330	7	140
Chandalar	c	ln38	20	100	340	5	140
Chandalar	c	ln38	20	100	340	5	140
Chandalar	c	911b1	23	178	93	21	417
Chandalar	c	911b1	23	178	93	21	417
Chandalar	c	91sl58	25	240	649	30	199

TABLE 23: TRACE ELEMENT DATA FOR PLUTONIC ROCKS ASSOCIATED
WITH ALASKAN SKARN DISTRICTS/DEPOSITS

DISTRICT/DEPOSIT	type	Smp#	Nb	Rb	Sr	Y	Zr
			ppm----->				
Chandalar	c	91sl58	25	240	649	30	199
Chandalar	c	91lb2	29	138	399	20	165
Chandalar	c	91lb2	29	138	399	20	165
Cu King	c	rn243a	24	93		16	121
Cu King	c	rn243	36	94		8	137
Deer Creek	c	BL28891	12	194	91	22	153
Deer Crk	c	31611	22	86	366	22	109
Deer Crk	c	31627	25	96	432	16	125
Deer Crk	c	31612	27	91	346	18	147
Deer Crk	c	31613	30	134	399	17	63
Nabesna	c	w720-2	8	59	450	7	74
Nabesna	c	w69-3	8	45	552	8	81
Nabesna	c	b-150	11	62	465	7	104
Nabesna	c	w71-1	17	54	542	21	108
North Fork	c	93kc62	10	244	650	22	188
Orange Hill	c	ORAN HL	5	39	269	9	87
Rainey Hollow	c	R111	7	95	350	12	150
Rainey Hollow	c	R111	7	95	350	12	150
Rainey Hollow	c	R81C	10	110	450	15	160
Rainey Hollow	c	R81C	10	110	450	15	160
Zackly	c	85ank107a	7	20	190	33	250
Zackly	c	85akrm-2	7	45	190	21	120
Zackly	c	z54250	12	52	755	12	110
Zackly	c	z54283	15	46	810	18	95
Zackly	c	za-1	16	62	681	31	106
Zackly	c	z-1	16	66	832	8	74
Zackly	c	zf-1	18	67	691	28	74
Clair Bear	f	84wg113	10	40	730	10	180
E Fk Broxon Gulch	f	85akrm-1	8	10	230	20	110
E Fk Broxon Gulch	f	85aksb-4	10	35	520	15	140
Jumbo	f	72C234-0	7	55	850	9	150
Jumbo	f	C90	9	65	750	11	145
Jumbo	f	71C452	10	60	930	14	200
Jumbo	f	70C109	10	50	820	12	190
LeBlondeau	f	84er85	20	30	630	25	130
McLaren Glacier	f	85aksb-2	8	45	430	12	140
McLaren Glacier	f	79ank96a	10	50	375	18	150
McLaren Glacier	f	79ank99g	12	35	570	14	160
McLaren Glacier	f	79ank99g	15	62	345	16	170
McLaren Glacier	f	79ank95a	15	71	370	16	165
Porcupine	f	84wg137	20	50	570	10	120
Shannon	f	85wg168	5	75	551	10	114
Shannon	f	84wg114	20	60	370	10	30
Skagway Rd	f	86wg271	15	75	750	20	170
Skagway Rd	f	she007	20	90	650	20	160
Billiken	g	83AGe67B	14	142	924	21	200
Billiken	g	82ATi210	16	166	1030	25	204
Billiken	g	84ATi256	18	110	970	26	295
Medfra Fe	g	2774	14	74	650	20	200

TABLE 23: TRACE ELEMENT DATA FOR PLUTONIC ROCKS ASSOCIATED
WITH ALASKAN SKARN DISTRICTS/DEPOSITS

DISTRICT/DEPOSIT	type	Smp#	Nb	Rb	Sr	Y	Zr
			ppm----->				
Medfra Fe	g	76pa50b	24	170	340	25	216
Slekekemute dolo-Fg		83mr232c	12	142	231	21	144
Mo Glacier	m	85AR30	6	49	554	11	105
Mo Glacier	m	85AR7	6	41	452	15	182
Mo Glacier	m	85AR6	9	88	415	10	101
Mo Glacier	m	85AR41	15	132	416	14	96
Nunatak	m	NUN-2-PO	9	59	140	9	71
Nunatak	m	NUM-2-GR	17	84	541	17	140
Arrigetch	s	79AD 86	23	257	70	67	259
Arrigetch	s	79AD178	24	440	17	106	141
Arrigetch	s	79AD 216	24	272	78	68	304
Arrigetch	s	79AD180	26	479	15	84	167
Arrigetch	s	79AD 138	30	476	28	110	186
Arrigetch	s	79AD 199	35	552	18	140	168
Arrigetch	s	79AD 179	49	390	64	168	179
Brooks Mntn	s	BM49	13	539	6	70	89
Brooks Mntn	s	BM139	26	607	51	53	291
Brooks Mntn	s	BM37-72	36	747	12	87	133
Cape Mntn	s	CM-11	24	332.6	48.8	76	60.9
Cape Mntn	s	CM 972	25	788.3	10.5	160	38.5
Cape Mntn	s	CM-60B	28	468	41	82	166
Cape Mntn	s	CM GOOD	29	658	8	106	110
Cape Mntn	s	cm22	29	532	12	87	33
Cape Mntn	s	CMA2	31	513	15.1	88	74.1
Cape Mntn	s	cm41	40	630	16	78	24
Ear Mntn	s	EM174	24	595.2	66.7	95	157
Ear Mntn	s	emhn21	26	495	73	85	198
Ear Mntn	s	EM189	29	596	54.3	87	150
Ear Mntn	s	EM-190	31	728	20	88	110
Ear Mntn	s	emep10	36	758	11	163	91
Ear Mntn	s	EMWP1	38	586	58	82	164
Ear Mntn	s	EM178	39	723	14.3	138	94.7
Ear Mntn	s	emwp7	42	647	13	98	52
Groundhog	s	61B	39	415	8	129	84
Groundhog	s	57A	49	580	5	146	103
Groundhog	s	61A	49	560	6	145	100
Groundhog	s	58A	50	590	6	140	91
Groundhog	s	162E	60	610	10	265	132
Groundhog	s	57D	60	580	13	180	126
Groundhog	s	58B	65	530	15	180	136
Groundhog	s	165B	66	420	10	320	154
Groundhog	s	162F	68	650	10	160	112
Groundhog	s	164C	68	330	38	184	122
Groundhog	s	166D	74	620	5	255	118
Groundhog	s	164A	84	620	12	188	136
Jago	s	AR-S-10 J	12	181	128	20	158
Jago	s	91-17B JA	16	166	424	30	135
Lime Peak	s	TS60b	20	510	40	80	120
Lime Peak	s	DNS93	20	480	5	110	160

TABLE 23: TRACE ELEMENT DATA FOR PLUTONIC ROCKS ASSOCIATED
WITH ALASKAN SKARN DISTRICTS/DEPOSITS

DISTRICT/DEPOSIT	type	Smp#	Nb	Rb	Sr	Y	Zr
			ppm----->				
Lime Peak	s	DA116	20	640	5	160	60
Lime Peak	s	MW15a	20	610	40	50	110
Lime Peak	s	LB25	20	660	5	160	120
Lime Peak	s	TS60a	30	520	10	80	160
Lime Peak	s	TS67	30	620	5	120	140
Lime Peak	s	RR151	30	440	60	80	170
Lime Peak	s	DNS110	30	500	10	110	170
Lime Peak	s	DNS113	30	530	20	80	170
Lime Peak	s	DA19c	40	500	30	260	50
Lime Peak	s	TS52	40	450	50	50	200
Lost River	s	LOST RV	33	884	13	212	76
Lost River	s	LOST RIV-1	71	859	3	182	149
Lyman Fork	s	93bt143	19	196	47	55	151
Lyman Fork	s	93bt145	34	128	129	30	396
Lyman Fork	s	93bt146	76	230	14	100	578
Mt Prindle	s	RN127	5	870	5	40	80
Mt Prindle	s	TS58	10	690	10	60	120
Mt Prindle	s	RN175e	10	820	5	10	20
Mt Prindle	s	DNS121	10	930	5	50	60
Mt Prindle	s	DNS122	10	1000	30	20	20
Mt Prindle	s	MA103	10	630	40	80	30
Mt Prindle	s	RN130	10	730	30	60	100
Mt Prindle	s	DA137	20	990	20	50	20
Mt Prindle	s	MW73	20	810	50	30	20
Mt Prindle	s	RR149	20	630	10	70	100
Mt Prindle	s	DNS106	20	840	30	60	50
Mt Prindle	s	DNS119	20	910	5	30	20
Mt Prindle	s	DNS124	30	630	80	30	100
Mt Prindle	s	MA89	30	570	10	60	90
Mt Prindle	s	DA186	60	1000	50	10	10
Okpilak	s	KH24E GR	11	143	20	15	103
Okpilak	s	WKW70A OK	18	280	100	39	116
Okpilak	s	WKW76A OK	22	305	78	40	119
Okpilak	s	WKW67D W/B	22	371	67	48	111
Serpentine H.S.	s	SERP5	113	873	1	48	103
Serpentine H.S.	s	SERP-8	115	795	2	73	111
Serpentine H.S.	s	SERP-1	123	881	2	164	86
Tin Crk	s	TC-8	43	745	2	116	101
Tin Crk	s	TC-28	57	673	3	138	129
Tin Crk	s	TC-11	58	824	3	114	93
Bonanza	w	81kc235	23	171	972	56	352
Bonanza	w	91lb33	24	163	597	56	255
Bonanza	w	91sl75	26	302	758	32	41
Bonanza	w	91sl74	27	192	596	36	240
Bonanza	w	91sl77	31	222	857	39	246
Bonanza	w	91sl77.5	42	237	769	33	508
Fairbanks	w	JB216	10	111	680	14	187
Fairbanks	w	JB211	12	130	702	21	195
Fairbanks	w	3989	12	100	720	16	170

TABLE 23: TRACE ELEMENT DATA FOR PLUTONIC ROCKS ASSOCIATED

WITH ALASKAN SKARN DISTRICTS/DEPOSITS							
DISTRICT/DEPOSIT	type	Smp#	Nb	Rb	Sr	Y	Zr
ppm----->							
Fairbanks	w	JB173	12	155	300	28	75
Fairbanks	w	rn370	12	109	607	17	168
Fairbanks	w	JB108	13	130	740	22	145
Fairbanks	w	agf	13	133	606	18	198
Fairbanks	w	JB195	14	205	550	33	120
Fairbanks	w	JB161	14	190	310	27	87
Fairbanks	w	JB189	14	205	322	32	79
Fairbanks	w	JB167	14	180	340	25	100
Fairbanks	w	JB133	14	220	600	30	100
Fairbanks	w	JB214	14	165	350	36	120
Fairbanks	w	rn303	14	124	950	22	181
Fairbanks	w	JB116a	14	180	531	22	121
Fairbanks	w	JB132	14	195	635	20	150
Fairbanks	w	JB192	15	200	381	36	85
Fairbanks	w	JB213	15	180	835	20	170
Fairbanks	w	JB127	15	185	765	18	170
Fairbanks	w	JB143	15	210	680	32	142
Fairbanks	w	JB144	15	240	470	40	90
Fairbanks	w	JB175	15	225	330	33	115
Fairbanks	w	JB145	15	228	276	36	75
Fairbanks	w	JB146	16	200	430	38	132
Fairbanks	w	JB135	16	170	270	35	122
Fairbanks	w	JB128	16	194	820	26	160
Fairbanks	w	JB106	16	190	690	20	165
Fairbanks	w	JB152	16	230	196	45	77
Fairbanks	w	JB134	16	190	330	32	119
Fairbanks	w	rn371	17	107	623	8	157
Fairbanks	w	JB142	17	240	485	28	130
Fairbanks	w	rn301	17	119	635	27	170
Fairbanks	w	JB148	17	220	400	36	125
Fairbanks	w	JB147	18	248	248	26	163
Fairbanks	w	JB215	18	185	598	25	170
Fairbanks	w	JB137	20	220	120	35	50
Fairbanks	w	JB149	20	210	220	49	76
Fairbanks	w	JB194	20	190	200	42	60
Kiwalik Mtn	w	81ATi113A	16	220	279	45	291
Kiwalik Mtn	w	81ATi101a	18	74	85	41	208
Kiwalik Mtn	w	81ATi159	22	43	389	47	217
Lucky 13	w	BL06536	15	148	236	28	145
Lucky 13	w	BL06596	65	272	143	33	58
Quartz Creek	w	DNS178	20	440	140	20	90
Quartz Creek	w	DNS178	40	600	130	20	120
Quartz Creek	w	DNS178	40	420	170	20	130
Quartz Creek	w	DNS178	50	360	5	10	10
Quartz Creek	w	DNS178	50	430	190	30	170
Quartz Creek	w	DNS178	50	430	160	40	110
Quartz Creek	w	RR135	70	380	10	30	30
Table Mtn	w	1782	15	268	181	21	127
Table Mtn	w	88rn312	15	210	180	23	140

TABLE 23: TRACE ELEMENT DATA FOR PLUTONIC ROCKS ASSOCIATED
WITH ALASKAN SKARN DISTRICTS/DEPOSITS

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DISTRICT/DEPOSIT	type	Smp#	Nb ppm	Rb	Sr	Y	Zr
Table Mtn	w	88rn316	15	230	145	17	130
Table Mtn	w	88rn313	15	250	150	22	140
Table Mtn	w	88rn310a	16	220	170	23	135
Table Mtn	w	203974	17	240	220	33	110
Table Mtn	w	88rn314	18	210	180	11	135
Table Mtn	w	204113	19	220	200	37	110
Table Mtn	w	DA217c	20	230	190	20	80
Table Mtn	w	RN183-185	20	360	30	40	10
Table Mtn	w	RN196b	50	280	90	20	190
Upper Chena	w	79AWS85	6	403	4	18	45
Upper Chena	w	F-81-2	6	267	48	35	59
Upper Chena	w	79AWS-94A	8	225	384	18	217
Upper Chena	w	PG-81-31	9	224	101	21	32
Upper Chena	w	PG-7-80	10	267	269	20	82
Upper Chena	w	C-81-12	12	302	68	25	42
Upper Chena	w	UPPER CHEN	13	270	227	5	84
Upper Chena	w	84TS48	13	270	227	8	84
Upper Chena	w	F-12-80	13	334	401	10	141
Upper Chena	w	84TS43	16	206	330	33	200
Upper Chena	w	84TS46	18	177	351	21	162
Upper Chena	w	84TS44	19	176	391	30	180
Upper Chena	w	84TS45	26	172	381	28	194
Champion II	z	BL07991	10	110	412	29	157
Coal Crk	z		15	550	3	2	32
Coal Crk	z		19	525	2	23	23
Coal Crk	z		23	555	2	35	18
Coal Crk	z		26	500	2	38	19
Coal Crk	z		27	870	2	48	15
Coal Crk	z		27	500	2	43	18
Coal Crk	z		31	520	2	39	16
Coal Crk	z		34	840	2	54	12
Happy	z	BL28917	14	230	310	28	78
Happy	z	BL28920	15	106	478	32	250
Happy	z	BL28914	15	187	204	21	132
Happy	z	BL28919	17	180	143	9	240
Happy	z	BL28922	19	91	1704	16	132
Oscar	z	BL07980	9	4	546	20	167
Oscar	z	BL07974	22	172	856	23	222
Oscar	z	BL07968	26	158	632	23	267

TABLE 24: NORMS FOR PLUTONIC ROCKS ASSOCIATED WITH ALASKAN SKARNS
DEPOSIT/AREA type samp # qtz an or ab cor a/a+o q/f+q

Rambler	a	w71-1	22.2	19.4	15.5	31.7	0	55.6	25.0
Nixon Fork	a		19.77	12.12	26.83	31.32	1.04	31.1	22.0
Nixon Fork	a		7	20.3	20.3	36.2	0	50.0	8.4
Nixon Fork	a		7.5	17.2	21.1	32.8	0	44.9	9.5
Nixon Fork	a		5	18.26	20.6	35.1	0	47.0	6.3
Nixon Fork	a		15.2	14.4	24.4	31.1	0	37.1	17.9
Nixon Fork	a		4.4	15.5	27.6	33.1	0	36.0	5.5
Nixon Fork	a		13.3	15.7	23.8	33.5	0	39.7	15.4
Nixon Fork	a		6.2	15.4	22.25	35.31	0	40.9	7.8
Nixon Fork	a		12.66	10	27.17	34.46	0	26.9	15.0
Champion I	c	BL28955	26.2	17.1	18.3	26.0	1.55	48.4	29.9
Champion I	c	BL28957	24.7	28.4	16.5	28.4	0.00	63.3	28.1
Chandalar	c	911b1	18	15.2	25.8	38.7	2.8	37.1	18.4
Chandalar	c	911b2	17.5	17.9	20.7	31.7	0	46.4	19.9
Chandalar	c	91sl58	21.64	11.7	26.7	32.1	0	30.5	23.5
Deer Ck	c		23.45	23.16	14.50	25.44	0.00	61.5	27.1
Deer Ck	c		22.05	20.52	17.00	25.91	0.00	54.7	25.8
Deer Ck	c		12.65	23.57	18.69	25.37	1.97	55.8	15.8
Deer Ck	c		23.23	22.82	15.23	25.95	0.20	60.0	26.6
Devilfish Bay	c	7932a	3.2	28.05	10.3	30	0	73.1	4.5
Devilfish Bay	c	79DB17A	11	21.56	16.23	34.05	0	57.1	13.3
Devilfish Bay	c	79RS18A	25.87	20.6	7.9	41.4	0.49	72.3	27.0
Devilfish Bay	c	79db33a	7.4	23.5	11.9	37.9	0	66.4	9.2
Devilfishbay	c	79db97a	21.4	25.2	7.9	37.1	0	76.1	23.4
Dry Pass	c	79db31c	8.6	19.8	18.7	36.6	0	51.4	10.3
Dry Pass	c	79sk22a	25.4	19.6	14.64	34.1	0	57.2	27.1
NABESNA	c	NB-1-3	3.8	34.5	8.3	24.8	0	80.6	5.3
NABESNA	c	NbIII-3	17.4	19.7	16	29.9	0	55.2	21.0
NABESNA	c	b-150	18.3	21.8	14.3	28.6	0	60.4	22.0
NABESNA	c	nbII-5	2.85	24.4	11.9	35.5	0	67.2	3.8
NABESNA	c	w69-3	17.9	21.5	14.6	31.6	0	59.6	20.9
NABESNA	c	w720-2	17	18.4	14.9	32	0	55.3	20.7
Orange Hill	c	G13	16.12	25.97	11.12	29.88	0.00	70.0	19.4
Orange Hill	c	G2	16.88	20.90	13.57	34.60	0.00	60.6	19.6
Rainey Hollow	c	R106	14.63	28.91	3.77	14.88	5.11	88.5	23.5
Rainey Hollow	c	R110	37.63	3.92	21.10	12.43	1.17	15.7	50.1
Rainey Hollow	c	R111	50.00	1.15	13.23	25.17	4.00	8.0	55.8
Rainey Hollow	c	R38	7.63	31.21	0.18	22.77	0.00	99.4	12.3
Rainey Hollow	c	R59	49.04	11.80	12.58	7.49	5.69	48.4	60.6
Rainey Hollow	c	R818	11.12	5.46	20.81	0.00	3.74	20.8	29.7
Rainey Hollow	c	RIB	0.00	30.12	5.48	20.99	0.00	84.6	0.0
Zackly	c	Z-1	1.37	19.57	22.57	34.17	0.00	46.4	1.8
Zackly	c	Z-2	0.97	23.09	16.61	38.42	0.00	58.2	1.2
Zackly	c	Z-4	1.18	23.36	15.41	37.26	0.00	60.3	1.5
Zackly	c	Z8	8.14	22.18	15.65	37.01	0.00	58.6	9.8
Zackly	c	ZA1	10.32	23.02	15.14	34.81	0.00	60.3	12.4
Zackly	c	ZF1	12.55	20.11	18.96	34.04	0.00	51.5	14.7
Cu Mtn	f		0	31	7.2	23.4	0	81.2	0.0
Jumbo	f	70C109	19.97	22.58	8.75	42.32	0.00	72.1	21.3
Jumbo	f	71C101	13.04	12.29	11.15	48.00	0.42	52.4	15.4

TABLE 24: NORMS FOR PLUTONIC ROCKS ASSOCIATED WITH ALASKAN SKARNS
DEPOSIT/AREA type samp # qtz an or ab cor a/a+o q/f+q

Jumbo	f	71C117	7.15	21.05	8.59	34.51	0.00	71.0	10.0
Jumbo	f	71C285	0.00	29.63	7.75	17.85	0.00	79.3	0.0
Jumbo	f	71C336	0.00	23.62	9.65	39.32	0.00	71.0	0.0
Jumbo	f	71C340	14.14	18.38	17.50	37.37	0.00	51.2	16.2
Jumbo	f	71C351	1.31	30.45	5.01	25.44	0.00	85.9	2.1
Jumbo	f	71C422	1.96	24.27	17.65	26.30	0.00	57.9	2.8
Jumbo	f	71C426	0.00	29.26	6.91	26.95	0.00	80.9	0.0
Jumbo	f	71C450	13.09	18.81	19.83	34.73	0.00	48.7	15.1
Jumbo	f	71C452	9.33	18.28	18.57	37.90	0.00	49.6	11.1
Jumbo	f	71C455	0.55	28.49	7.17	36.66	0.00	79.9	0.8
Jumbo	f	72C184	8.15	25.14	10.08	36.60	0.00	71.4	10.2
Jumbo	f	72C209	9.78	21.38	11.75	40.86	0.00	64.5	11.7
Jumbo	f	72C212	14.67	18.86	17.26	35.76	0.00	52.2	16.9
Jumbo	f	72C234-023	0.05	19.54	7.61	40.09	1.34	72.0	25.5
Jumbo	f	72J	12.51	19.00	21.45	11.76	0.00	47.0	27.4
Jumbo	f	C90	8.27	23.25	8.76	51.05	1.67	72.6	9.1
Jumbo	f	R72J31	2.37	31.71	4.71	25.55	0.00	87.1	3.7
Kasaan	f	80JD2136	0.87	28.87	1.90	34.93	1.60	93.8	1.3
Kasaan	f	80JD220C	6.29	23.06	5.57	42.03	0.13	80.5	8.2
LeBlandeau	f	84er85	14.8	25.5	10.3	32.3	0	71.2	17.9
Mt Jumbo	f		10	18	18	37.3	0	50.0	12.0
Porcupine Pendaf		84wg137	25.3	21.7	9.5	32	0.7	69.6	28.6
Shannon	f	85wg168	19.6	21.6	14	33.5	0	60.7	22.1
Skagway Rd	f	86wg271	21	20.3	16.14	31.5	0	55.7	23.6
Skagway Rd	f	she007	26	16.5	14.86	33.4	0.76	52.6	28.6
Skagway Rd	f	she177	25.8	15.8	16.5	31.63	1.08	48.9	28.8
billiken	g	82ati210	12.9	20.14	19.4	31	0	50.9	15.5
billiken	g	83age67b	12.9	20.2	19.6	30.4	0	50.8	15.5
billiken	g	84ati25612	9.8	20.3	19.1	30.6	0	51.5	15.6
medfra Fe	g	2774	7	21.6	12	28.2	0	64.3	10.2
medfra Fe	g	76pa50b	25.2	8	39.6	22.2	0	16.8	26.5
sleekemute	g	83mr232c20	5.2	13	23	35.2	0.09	36.1	22.4
Lillie	m	79db108a	24.8	13.6	16.6	39.9	0	45.0	26.1
Lillie	m	79rs19a	19.9	16	25.3	31.6	0	38.7	21.4
Lillie	m	79sk72a	21.1	15	15.65	41	0	48.9	22.7
Mo Glacier	m	mo gl-1	34.9	5	26.2	30.7	0	16.0	36.1
Mo Glacier	m	mo gl-10	18.8	17.5	16.2	33.45	0.44	51.9	21.9
Mo Glacier	m	mo gl-2	23.5	15.7	16.1	31.7	0	49.4	27.0
Mo Glacier	m	mo gl-3	26.7	16	15.4	32.16	0.14	51.0	29.6
Mo Glacier	m	mo gl-4	28.9	15.1	13.3	34.5	0	53.2	31.5
Mo Glacier	m	mo gl-5	30.9	13.3	14.3	34.2	0.06	48.2	33.3
Mo Glacier	m	mo gl-6	23.7	16.2	12.3	39	0.08	56.8	26.0
Mo Glacier	m	mo gl-7	32.8	14.8	12.7	32.8	0.24	53.8	35.2
Mo Glacier	m	mo gl-8	19.8	21	12.2	33.7	0	63.3	22.8
Mo Glacier	m	mo gl-9	25.7	15	13.3	36.23	0	53.0	28.5
Nunatak	m	nun-1	31.85	2.61	28.9	33.87	0	8.3	32.8
Nunatak	m	nun-2	30.5	10.8	22.5	34.2	0.1	32.4	31.1
ARRIGETCH AREA	s		40.97	2.67	24.82	26.06	0.66	9.7	43.3
Groundhog Basins		162E	30.3	2.2	28.5	36.4	0.5	7.2	31.1
Groundhog Basins		162F	28.1	2.4	31.8	34.7	0.5	7.0	29.0

TABLE 24: NORMS FOR PLUTONIC ROCKS ASSOCIATED WITH ALASKAN SKARNS
 DEPOSIT/AREA type samp # qtz an or ab cor a/a+o q/f+q

Groundhog Basins		164A	30.6	2.4	27.3	37.5	0.3	8.1	31.3
Groundhog Basins		165B	31.8	2	26.1	37.9	0	7.1	32.5
Groundhog Basins		166D	31.7	2.4	27.9	35.2	0.7	7.9	32.6
Groundhog Basins		57A	32.3	3.1	27.1	35	0.5	10.3	33.1
Groundhog Basins		57D	31.2	2.6	25.8	37.6	0.8	9.2	32.1
Groundhog Basins		58A	30.4	3.1	28.1	36	0.6	9.9	31.1
Groundhog Basins		58B	32.8	2.9	27.1	35	0.5	9.7	33.5
Groundhog Basins		61A	28.2	3.2	27.8	38.8	0.1	10.3	28.8
Groundhog Basins		61B	32.7	2.5	25.1	39.4	0	9.1	32.8
Lime Peak	s	LP10	34.24	4.01	34.15	23.16	0.65	10.5	35.8
Lime Peak	s	LP102	46.58	2.96	25.14	18.86	3.21	10.5	39.8
Lime Peak	s	LP104	45.73	3.66	26.58	18.16	2.73	12.1	38.6
Lime Peak	s	LP20730	29.10	2.25	28.81	37.81	0.36	7.2	29.7
Lime Peak	s	LP63	44.79	3.78	27.41	17.92	2.31	12.1	44.7
Lyman Fk	s	93bt143	31.9	1.5	29.9	33.4	0	4.8	33.0
Lyman Fk	s	93bt145	20	4.9	29.3	39.3	0	14.3	21.4
Lyman Fk	s	93bt146	32.3	0.5	29.7	30	0.1	1.7	34.9
Mt Prindle	s	RN130	33.37	2.45	30.17	30.43	0.70	7.5	34.6
Fairbanks	w	88rn301	26.5	11.8	26.5	28.5	0.56	30.8	28.4
Fairbanks	w	89RN105	25.32	7.18	26.36	35.57	0.46	21.4	26.8
Fairbanks	w	89Rn112	29.54	7.05	22.09	35.25	1.03	24.2	31.4
Fairbanks	w	89rn370	19.9	19	25	20.6	0	43.2	23.6
Fairbanks	w	89rn371	25.5	22.1	17.7	22.8	0.45	55.5	28.9
Fairbanks	w	JB162	35.50	3.98	26.93	31.21	1.42	12.9	36.4
Fairbanks	w	fngrc	25.6	10.7	26.5	30.6	0.5	28.8	27.4
Fairbanks	w	fngrf	27.3	11.2	23.7	31.8	0.11	32.1	29.0
Fairbanks	w	fngrm	24.4	12.6	26.7	30.7	0.12	32.1	25.8
Kiwalik Mtn	w	81ati101	34	4.7	13.5	41.85	1.8	25.8	36.2
Kiwalik Mtn	w	81ati113	38.1	10.56	34.9	11.1	0.68	23.2	39.8
Kiwalik Mtn Devw		81ati159	34.9	9.9	4.7	48.4	0	67.8	35.6
Lucky 13	w		35.43	4.50	30.74	26.21	0.02	12.8	36.6
Lucky 13	w		29.24	11.50	23.24	29.12	0.21	33.1	31.4
Table Mtn	w	RN196b	27.48	2.74	26.76	29.02	1.85	9.3	32.0
Upper Chena	w	79aws85	29.6	0.6	19.07	46.22	1.6	3.1	31.0
Upper Chena	w	83ad166	35.6	4.4	28.2	26.8	2.3	13.5	37.5
Upper Chena	w	83ad58	30.9	3.7	26.7	34.9	1.56	12.2	32.1
Upper Chena	w	83ad7	33.3	5.7	29	26.5	2.4	16.4	35.2
Upper Chena	w	2911	28.8	14.06	24.7	23.5	0.53	36.3	31.6
Champion East	z	BL07991	23.18	21.51	15.46	25.94	0.84	58.2	26.9
Champion I	z	BL28955	26.21	17.13	18.26	25.98	1.55	48.4	29.9
Champion I	z	BL28957	24.74	28.42	6.53	28.38	0.00	81.3	28.1
Nataga-Skyline	z	76WG103	26.47	19.30	11.95	34.90	0.18	61.8	28.6
Oscar Skarn	z	BL07980	17.48	14.71	26.24	25.51	0.00	35.9	20.8
Oscar Skarn-A	z	BL07968	23.93	10.50	31.03	21.91	1.94	25.3	27.4
Oscar Skarn-H	z	BL07974	13.14	7.13	36.11	29.50	0.00	16.5	15.3
VABM Happy	z	BL28914	39.15	5.50	31.42	19.33	1.64	14.9	41.0
VABM Happy	z	BL28917	40.70	8.49	32.92	15.34	0.95	20.5	41.8
VABM Happy	z	BL28919	37.19	6.31	31.08	19.96	1.08	16.9	39.3
VABM Happy	z	BL28920	16.79	13.23	22.04	41.02	0.00	37.5	18.0
VABM Happy	z	BL28922	3.68	9.81	27.31	44.77	0.00	26.4	4.3

TABLE 25: LEAD ISOTOPIC RATIOS FOR ALASKAN SKARNS/REPLACEMENT BODIES
DEPOSIT type quadrangle 206/204 207/204 208/204 occurrence

Ag King	a	Healy	19.114	15.582	38.545	skarn
Liberty Bell	a	Fairbanks	19.061	15.637	38.87	replacement
Liberty Bell	a	Fairbanks	19.173	15.649	38.874	replacement
Liberty Bell	a	Fairbanks	19.078	15.629	38.838	replacement
McCaulie Glac	a	Healy	19.008	15.563	38.483	skarn
Gayle	c	Chandalar	18.445	15.566	38.102	skarn
Mitchell	c	Eagle	19.183	15.69	39.16	skarn
Rainy Ck	f	Mt Hayes	18.72	15.57	38.196	skarn
Rainy Ck	f	Mt Hayes	18.744	15.577	38.213	skarn
Billiken	g	Bendeleben	18.904	15.63	38.76	skarn
Billiken	g	Bendeleben	18.894	15.619	38.718	skarn
Arrigetch Cr	s	Survey Pass	18.3	15.58	38.05	skarn
BP Prosp	s	Wiseman	18.338	15.57	38.044	skarn
Beaver Ck	s	Survey Pass	18.497	15.604	38.206	skarn
Brooks Mntn	s	Teller	18.997	15.633	38.828	skarn
Coal Crk	s	Healy	19.03	15.581	38.386	skarn
Grndhog Basin	s	Petersburg	19.246	15.67	38.873	skarn
Grndhog Basin	s	Petersburg	19.218	15.638	38.781	skarn
Grndhog Basin	s	Petersburg	19.227	15.684	38.92	skarn
Grndhog Basin	s	Petersburg	19.257	15.66	38.85821	skarn
Grndhog Basin	s	Petersburg	19.2285	15.637	38.79146	skarn
Grndhog Basin	s	Petersburg	19.257	15.664	38.87389	skarn
Grndhog Basin	s	Petersburg	19.2394	15.69	38.95767	skarn
Grndhog Basin	s	Petersburg	19.214	15.649	38.82	skarn
Grndhog Basin	s	Petersburg	19.148	15.657	38.907	skarn
Grndhog Basin	s	Petersburg	19.235	15.641	38.8	skarn
White Mtn	s	Coleen	18.802	15.641	39.264	skarn
Wild Lake	s	Wiseman	18.292	15.562	38.018	skarn
Spruce Hen	w	Fairbanks	19.06	15.601	38.735	skarn
Bowser Ck	z	McGrath	19.068	15.616	38.63	skarn
Bowser Ck	z	McGrath	19.019	15.636	38.636	skarn
Chatham	z	Fairbanks	19.126	15.683	39.157	replacement
Chechacko	z	Livengood	19.046	15.619	38.961	replacement
Cleary Rd	z	Fairbanks	19.087	15.663	39.044	replacement
Frog	z	Wiseman	17.837	15.553	37.508	skarn
Frog	z	Wiseman	17.829	15.529	37.429	skarn
Mt Eielson	z	Mt McKinley	19.123	15.674	39.132	skarn
Rat Fork	z	McGrath	18.999	15.595	38.517	skarn
Stoneboy Ck	z	Big Delta	19.226	15.597	38.936	skarn
Valeska Lake	z	McGrath	19.006	15.593	38.565	skarn
Wackowitz	z	Livengood	19.027	15.612	38.93	replacement

TABLE 26: SULFUR ISOTOPIC DATA FOR ALASKAN SKARNS/REPLACEMENT BODIES

DEPOSIT	type	del 34S	occurrence
Liberty Bell	a	-2.1	replacement
Liberty Bell	a	-1.8	replacement
Liberty Bell	a	-1.4	replacement
McCaullie	a	-8.5	replacement
Nixon Fork	a	1.5	skarn
Nixon Fork	a	3.6	skarn
Partin Crk	a	-9.2	skarn
Partin Crk	a	-8.1	skarn
Partin Crk	a	-6.4	skarn
Silver King	a	-11.6	skarn
Silver King	a	-10.5	skarn
Cathedral Crk	c	-3.5	skarn
Cu King	c	-7.6	skarn
Cu King	c	-6.3	skarn
Deer Crk	c	3.3	skarn
Evelyn Lee	c	-1.2	skarn
Evelyn Lee	c	-0.8	skarn
Evelyn Lee	c	-0.7	skarn
Mex	c	-4.1	replacement
Mex	c	-3.8	replacement
Mex	c	-3.4	replacement
Mex	c	1.2	replacement
Mitchell	c	-0.5	skarn
Nabesna	c	-1.4	skarn
Orange Hill	c	0.2	skarn
Orange Hill	c	0.3	skarn
Orange Hill	c	0.6	skarn
Orange Hill	c	0.8	skarn
Venus	c	-0.6	skarn
Victor	c	0.3	skarn
Viking	c	-2.1	skarn
Zackly	c	-7.7	skarn
Jumbo	f	-0.7	skarn
Kasaan	f	-2.1	skarn
Kasaan	f	-1.6	skarn
Arrigetch	s	9.9	skarn
Ear Mtn	s	2.6	skarn
Groundhog Basin	s	-0.1	skarn
Groundhog Basin	s	1.2	skarn
Gilmore Dome	w	-3.4	skarn
Gilmore Dome	w	-2.3	skarn
Upper Chena	w	0.3	skarn
Upper Chena	w	1.8	skarn
Upper Chena	w	2.3	skarn
Upper Chena	w	4.1	skarn
Upper Chena	w	6.1	skarn
Bowser Crk	z	-1.9	skarn
Champion II	z	5.9	skarn
Coal Crk	z	-7.7	skarn
Coal Crk	z	-5.4	skarn
Eielson	z	-1.8	skarn
Happy Mtn	z	1.1	skarn
Happy Mtn	z	1.4	skarn
Nelson Glacier	z	0.2	skarn
Nelson Glacier	z	1.2	skarn

TABLE 27: REE ABUNDANCES IN ALASKAN SKARNS

DEPOSIT	type	samp #	La	Ce	Nd	Sm	Eu	Yb	Lu
			ppm----->						
Rambler	a	1864	0.5	2		0.3	0.2	0.2	0.02
Chandalar	c	CH-16	13	28	14	3.4	0.8	2	0.1
Millett DH-3	c	1855	4	8		0.6	0.1	0.3	0.03
Millett DH-4	c	1856	8	10		0.9	0.5	0.6	0.11
Mitchell	c	1857	15	36	20	3.1	1.9	0.4	0.1
North Fork	c	93ha27	57	98		10	3	6	0.7
Orange Hill	c	1863	9	18	10	2.6	1	1.2	0.15
Jumbo	f		5	3	1	1.8	0.6	2	0.1
Mt Andrew	f		3	3	1	0.3	0.3	0.5	0.05
Billiken	g	1852	1	2		0.3	0.4	0.1	0.06
Mo Glac-1	m	1858	1	4		2.7	0.8	1.2	0.22
Mo Glac-2	m	1859	1	6		0.3	0.2	0.1	0.02
Nun-1	m	1860	8	14		1.4	0.5	0.9	0.13
Nun-2	m	1861	10	21	10	2.3	1.3	1.3	0.22
Arrigetch	s	1851	49	108	40	7.9	1.2	3	0.4
Ear Mtn	s	Bond-37	23	45	21	3.9	0.5	2	0.3
Ear Mtn	s	Bond-23	34	61	26	6.4	0.6	3.5	0.5
LymanFK	s	93kc89	82	200		20.7	3	15	2.2
LymanFk	s	93bt144	4	7		0.4			
Okpilak	s	1862	15	28	10	3.2	1.1	1.4	0.26
Stepovitch	w	1865	11	22	10	2.1	0.6	1.3	0.24
Stoneboy Crk	z	91kc19	23	37	10	2	0.3	0.8	0.14
Stoneboy Crk	z	91rn21	21	38	10	2.4	0.5	1.1	0.18
Stoneboy Crk	z	91rn22	25	48	20	2.8	0.7	1.3	0.18
U Babel R	z	89bt130	12	30		3.6	0.5	2	0.3