Division of Geological & Geophysical Surveys

PUBLIC-DATA FILE 93-7

LAND SELECTION UNIT 7 (TYONEK & KENAI QUADRANGLES): REFERENCES, DGGS SAMPLE LOCATIONS, GEOCHEMICAL AND MAJOR OXIDE DATA

by

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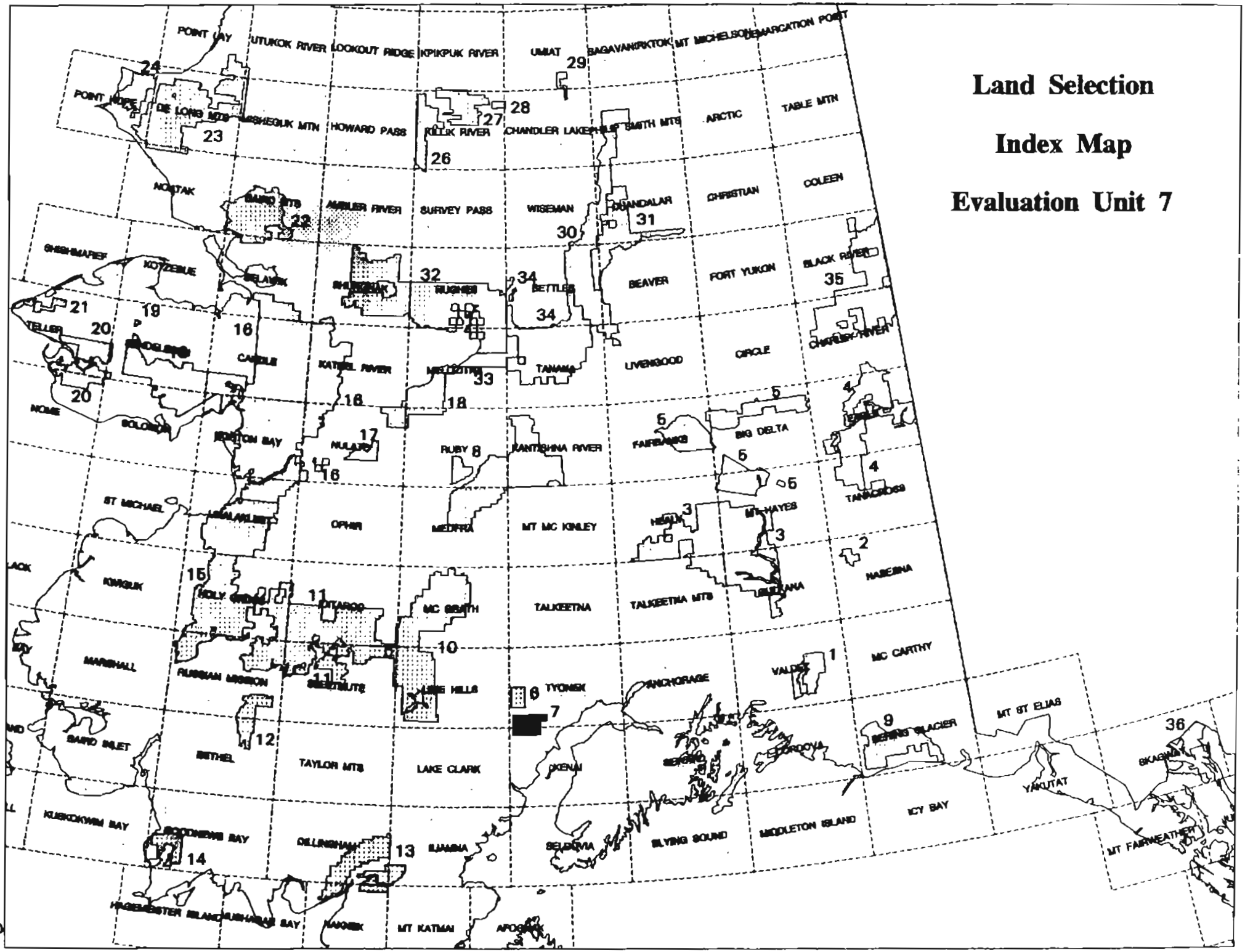
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ICY BAY
MIDDLETON ISLAND
YAKUTAT
MT FAIRWEATHER
HAGEMEISTER ISLAND
NAKNEK
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LAND SELECTION UNIT 7 (TYONEK AND KENAI QUADRANGLES): REFERENCES, DGGS SAMPLE LOCATIONS, GEOCHEMICAL AND MAJOR OXIDE DATA

The Neacola Mountains Evaluation Unit 7 encompasses 298,000 acres in the Tyonek and Kenai quadrangles. The area is underlain by Mesozoic and Tertiary plutonic rocks, with a small area of Tertiary Tyonek Formation sedimentary rocks in the northeastern part of the Unit. The plutonic rocks are generally intermediate in composition, but include more felsic and mafic variants as well. The northeast-trending Lake Clark fault transects the Unit.

There is no known history of mining activity in Unit 7, and available geologic mapping is of a reconnaissance nature. DGGS collected rock samples anomalous in Au, Sn, Cu, Bi and Ba in zones of potassic alteration in igneous rocks. In addition to mineral resource potential, this area holds a low to moderate potential for a building stone resource, and a low to moderate potential for coal deposits in the Tertiary sedimentary rocks.

In this Public-data File, we present results of limited DGGS field work done in June 1992 in Unit 7. The work was done in support of DGGS mineral resource evaluation of lands available for selection as State land. References used in the evaluation of Unit 7 are listed on a following page. Samples collected by DGGS are briefly described in the first table. In the geochemical tables, the asterisks in the left-hand column indicate the analytical procedure that we consider to be more reliable for those elements that were analyzed by more than one method. Major oxide compositions are plotted in the second figure according to the method of Streckeisen and LeMaitre (1979). CIPW norms were calculated using the UAF/PETCAL program, with oxide values normalized on an anhydrous basis.

The discriminant scores (Au discrim.) shown at the bottom of the major oxide table are a reflection of how similar the Unit 7 rocks are to other systems which formed gold deposits around the world. The score is based on the discriminant functions developed by Newberry and Burns (1989) and discussed in detail by Burns and others (1991). The discriminant functions statistically determine the extent to which the composition of an unaltered Unit 7 plutonic rock resembles major-oxide compositions of unaltered plutonic rocks associated with gold deposits worldwide. The discriminant score is a number between 0 and 100; a score of 100 indicates that the composition of the sample is indistinguishable from those of gold-associated plutons; a score of 0 indicates the opposite. The score is <u>not</u> directly proportional to the amount of gold present and does <u>not</u> indicate that there is gold at the sample site, but it is a good estimate of whether the sample belongs to a plutonic <u>system</u> that had the capability of depositing some gold. Some important limitations which must be considered in the interpretation of the scores are:
1) Only analyses from relatively unaltered rocks can be used.
2) Rocks from porphyry Cu-Mo deposits (because of alteration) and aplites will both typically have a low discriminant score, even though they may be from systems that are related to gold.

3) Discriminant scores are not given for alkalic (nepheline-normative) rocks, but these rocks may be related to gold.
4) A small percentage of plutonic rocks may appear to be related to gold systems when they are not.

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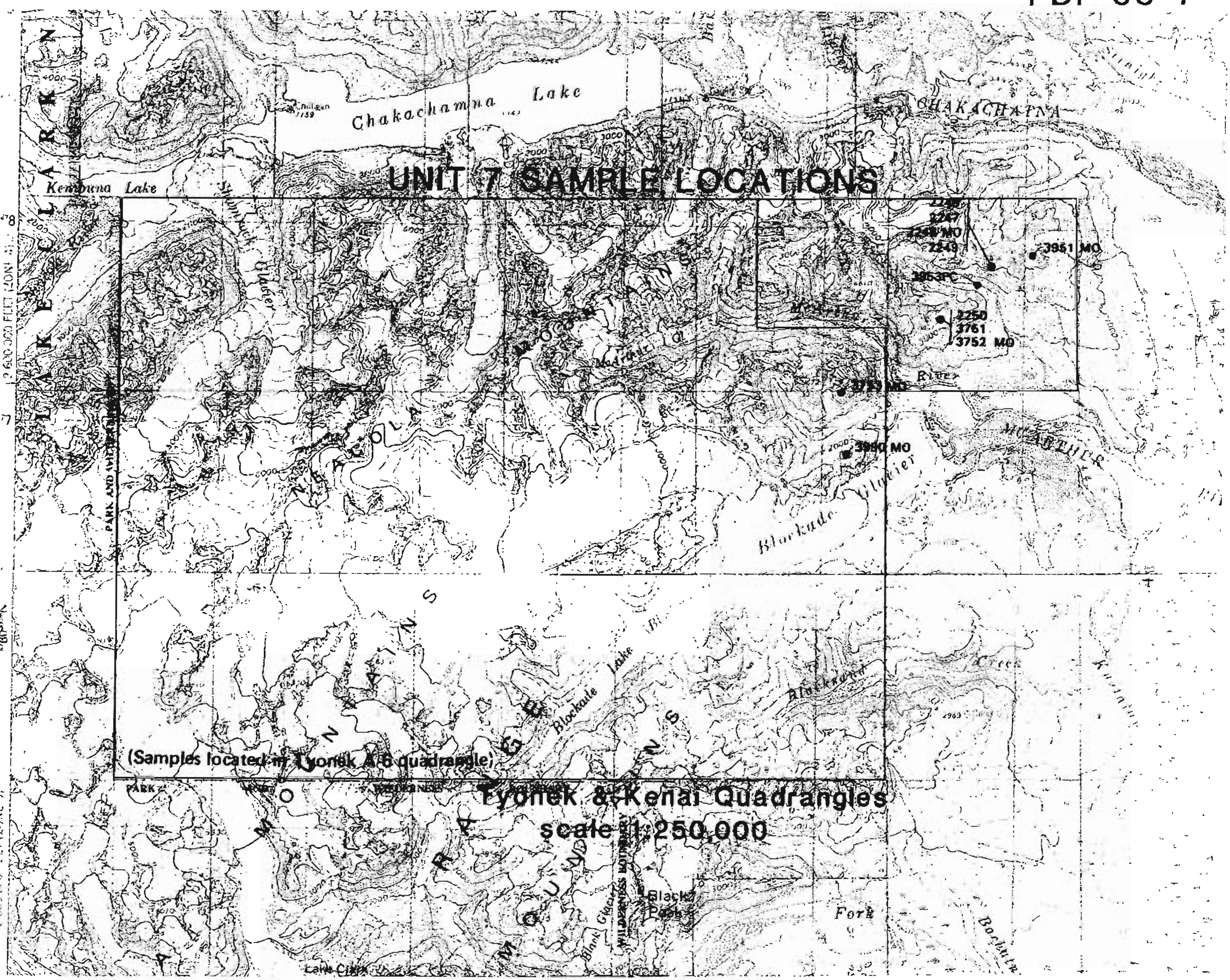

UNIT 7 SAMPLE LOCATIONS
LAKE CLARK
Kenibuna Lake
Chakachamna Lake
CHAKACHATNA
Blockade Glacier
Blockade Lake
2247
2248 MO
2249
3951 MO
3953PC
2250
3761
3752 MO
(Samples located in Tyonek A-6 quadrangle)
Tyonek & Kenai Quadrangles
scale 1:250,000
Black Peak
Fork
Lake Clark

LAND SELECTION UNIT 7 SAMPLES

QUAD	STATION	GEOCHEM	PAN CON	M. OXIDE	ROCK DESCRIPTION	LATITUDE	LONGITUDE
Ty A–6	92CN03			3951	Med–gr. hb–bt qtz monzonite	61.08	–152.238
Ty A–6	92CN04		3953		Bouldery, vegetated mid–stream bar	61.129	–152.11
Ty A–6	92DNS56	2249			Bt granitic w/ tourmaline, white mica, spec. hem.	61.137	–152.097
Ty A–6	92DNS56	2246			Granitic w/ alteration zones; chl, musc, py	61.136	–152.097
Ty A–6	92DNS56			2248	Bt granodiorite (w/ gt?)	61.137	–152.097
Ty A–6	92DNS56	2247			Med–gr. bt granodiorite, chl, red specks	61.136	–152.097
Ty A–6	92DNS57			3752	Med–gr. bt granodiorite/granite	61.113	–152.145
Ty A–6	92DNS57	3751			Alteration vein in bt granitic; musc, py, kspar	61.113	–152.145
Ty A–6	92DNS57	2250			Malachite in 10cm wide zone in bt granite	61.113	–152.145
Ty A–6	92DNS58			3753	Fine–gr. bt granodiorite/granite	61.08	–152.238
Ty A–6	92WM207			3990	Foliated bt sph qtz diorite/schist	61.08	–152.238

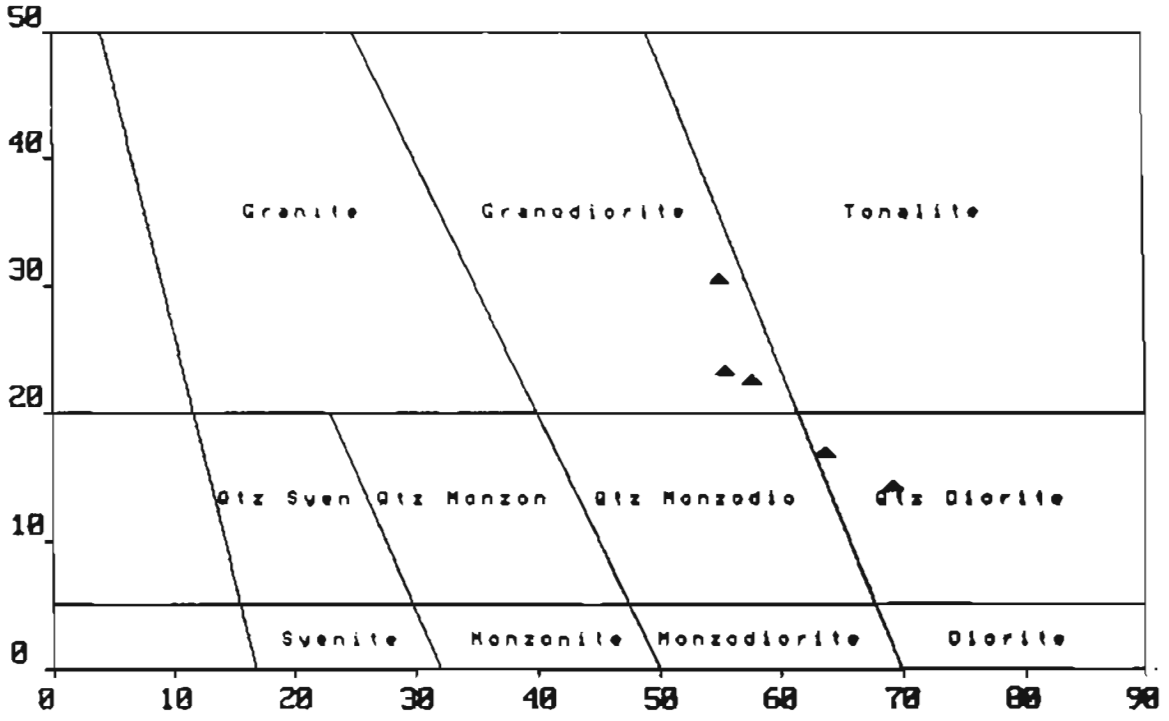
LAND SELECTION UNIT 7 (Analyses by Bondar – Clegg)

	METHOD	UNIT	L.LIMIT	U.LIMIT	2246	2247	2249	2250	3751	3953(pc)
Ag*	ICP	PPM	0.5	50	-0.5	-0.5	-0.5	0.7	-0.5	-0.5
Ag	INAA	PPM	5	300	-5	-5	-5	-5	-5	-5
Al	ICP	PCT	0.01	10	2.04	1.16	1.71	1.77	2.42	1.64
As	ICP	PPM	5	2000	40	26	8	18	13	-5
As*	INAA	PPM	1	10000	4	4	3	1	2	3
Au	INAA	PPB	5	10000	12	-5	-5	52	40	11
Ba	ICP	PPM	5	2000	339	598	1323	492	339	140
Ba*	INAA	PPM	100	20000	980	1100	2200	930	710	110
Bi	AA	PPM	1	2000	15	-1	-1	-1	-1	-1
Bi*	ICP	PPM	5	2000	15	12	-5	12	-5	-5
Br	INAA	PPM	1	30000	-1	-1	-1	-1	-1	-1
Ca	ICP	PCT	0.01	10	0.51	1.09	0.69	2.29	0.77	1.73
Cd*	ICP	PPM	2	2000	-2	-2	-2	-2	-2	-2
Cd	INAA	PPM	10	2000	-10	-10	-10	-10	-10	-10
Ce	INAA	PPM	10	30000	28	46	48	41	48	330
Co*	ICP	PPM	1	20000	2	3	1	6	6	24
Co	INAA	PPM	10	20000	-10	-10	-10	-10	-10	41
Cr*	ICP	PPM	2	20000	10	9	17	21	19	124
Cr**	INAA	PPM	50	30000	-50	-50	-50	-50	-50	100
Cs	INAA	PPM	1	10000	2	5	3	1	4	-1
Cu	ICP	PPM	1	20000	39	14	6	2118	96	44
Eu	INAA	PPM	2	30000	-2	-2	-2	-2	3	4
Fe	ICP	PCT	0.01	10	0.69	1.05	0.66	1.55	1.86	10
Fe*	INAA	PCT	0.5	10	1.1	1.7	0.9	2.4	2.8	10
Ga	ICP	PPM	10	2000	24	23	16	23	24	47
Hf	INAA	PPM	2	30000	2	3	-2	3	4	36
Ir	INAA	PPB	100	1000	-100	-100	-100	-100	-100	-100
K	ICP	PCT	0.01	10	1.22	1.01	1.35	0.91	1.23	0.31
La	ICP	PPM	5	2000	-5	-5	-5	-5	-5	98
La*	INAA	PPM	5	30000	12	19	20	16	21	150
Li	ICP	PPM	2	2000	14	35	24	17	13	4
Lu	INAA	PPM	0.5	2000	-0.5	-0.5	-0.5	-0.5	-0.5	1.5
Mg	ICP	PCT	0.01	10	0.07	0.12	0.09	0.32	0.33	0.73
Mn	ICP	PPM	5	20000	167	432	252	394	318	2189
Mo*	ICP	PPM	1	20000	5	1	1	2	2	4
Mo	INAA	PPM	2	30000	-2	-2	-2	-2	-2	-2
Na*	ICP	PCT	0.01	10	3.34	3.26	2.69	3.16	2.99	1.06
Na*	INAA	PCT	0.05	10	3.4	3.8	3	3.6	3.4	0.94
Nb	ICP	PPM	5	2000	9	9	6	10	9	38
Ni*	ICP	PPM	1	20000	4	3	3	7	8	27
Ni	INAA	PPM	20	30000	-20	-20	-20	-20	-20	-20
Pb*	AA	PPM	2	10000	13	4	3	3	9	7
Pb	ICP	PPM	2	10000	25	15	20	9	11	6
Rb	INAA	PPM	10	10000	68	82	78	46	74	-10
Sb	ICP	PPM	5	2000	10	10	-5	-5	-5	-5
Sb*	INAA	PPM	0.2	9999	1.1	1.3	0.5	-0.2	1.5	0.6
Sc	INAA	PPM	0.5	2000	2.5	4.1	2.7	6.9	8.1	13
Se	INAA	PPM	10	30000	-10	-10	-10	-10	-10	-10
Sm	INAA	PPM	0.2	2000	2.4	3.2	3.2	4.1	4.9	26.5
Sn*	ICP	PPM	20	2000	-20	-20	-20	-20	-20	40
Sn	INAA	PPM	200	30000	-200	-200	-200	-200	-200	-200
Sn**	XRF	PPM	1	10000	13	-8	8	-9	13	21
Sr	ICP	PPM	1	2000	96	221	248	335	184	187
Ta	ICP	PPM	5	2000	-100	-100	-100	-100	-100	-100
Ta*	INAA	PPM	1	2000	-1	-1	-1	1	1	5
Tb	INAA	PPM	1	30000	-1	-1	-1	-1	-1	2
Te	AA	PPM	0.2	100	-0.2	-0.2	-0.2	-0.2	-0.2	-0
Te	ICP	PPM	25	2000	-25	-25	-25	-25	-25	-25
Te	INAA	PPM	20	2000	-20	-20	-20	-20	-20	-20
Th	INAA	PPM	0.5	3000	3.9	5.3	6.3	4.2	5.1	25
Ti	ICP	PCT	0.01	10	0.09	0.12	0.08	0.19	0.23	0.63
U	INAA	PPM	0.5	2000	1.8	1.7	0.7	2.8	1.8	5.7
V	ICP	PPM	2	2000	26	29	18	60	72	672
W	ICP	PPM	20	2000	-20	-20	-20	-20	-20	-20
W*	INAA	PPM	2	30000	4	-2	-2	-2	8	6
Y	ICP	PPM	5	2000	-5	-5	-5	-5	-5	37
Yb	INAA	PPM	5	2000	-5	-5	-5	-5	-5	8
Zn*	ICP	PPM	2	20000	39	56	34	52	68	229
Zn	INAA	PPM	200	30000	-200	-200	-200	-200	-200	390
Zr	ICP	PPM	5	2000	19	-5	-5	-5	-5	-5
Zr*	INAA	PPM	500	10000	-500	-500	-500	-500	-500	1400

LAND SELECTION UNIT 7

SAMPLE	3990	2248	3752	3753	3951
SIO2	60.1	71.1	62.8	67.8	68.8
AL2O3	17.0	14.9	17.4	16.6	16.9
FE2O3TOT	6.31	1.72	3.85	2.8	0.74
FE2O3	2.54	0.83	1.52	1.25	0.30
FEO	3.4	0.8	2.1	1.4	0.4
MGO	3.16	0.74	1.95	1.07	0.44
MNO	0.13	0.07	0.1	0.07	0.04
CAO	5.99	2.95	4.9	3.56	3.24
NA2O	4.37	4.79	4.66	5.12	5.31
2O	1.84	1.87	1.98	2.01	2.1
TIO2	0.776	0.256	0.494	0.353	0.117
P2O5	0.24	0.1	0.19	0.12	0.08
SUM	99.7	98.4	97.9	99.3	97.5
BA	511	697	750	676	700
NB	26	14	27	28	21
Y	17	73	<1	<1	11
SR	689	726	966	849	967
RB	62	58	54	60	63
ZR	159	73	73	124	52
CR	<1	<1	<1	<1	<1
CIPW NORMS					
QUARTZ	11.55	29.26	14.98	21.20	22.70
CORUNDUM	0.00	0.00	0.00	0.00	0.20
ORTHOCLASE	9.75	11.23	11.95	11.96	12.72
ALBITE	37.22	41.18	40.28	43.60	46.07
ANORTHITE	22.07	13.85	21.16	16.48	15.95
DIOPSIDE	5.04	0.28	1.94	0.41	0.00
HYPERSTHENE	8.62	2.23	6.05	3.58	1.50
MAGNETITE	3.71	1.22	2.25	1.82	0.45
ILMENITE	1.49	0.50	0.95	0.67	0.23
APATITE	0.58	0.24	0.45	0.28	0.19
SUM	100.00	100.00	100.00	100.00	100.00
AU DISCR.	55	0	10	0	1

(Analyses by XRAL)


50
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Granite
Granodiorite
Tonalite
Qtz Syen
Qtz Monzon
Qtz Monzodio
Qtz Diorite
Syenite
Monzonite
Monzodiorite
Diorite
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70
80
90

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