Appendix A:

Samples descriptions and the titanite textural setting

Samples	Sample description	Titanite textural setting
Risby tungsten deposit		
RL-08-40	Green-brown fine-grained (0.1-2mm) Grt-Cpx-Sch skarn (40% Grt, 30% Cpx, 20% Qz, 3% Czo, 5% Cal+Pl, <2% Sch)	200 μm subhedral Ttn with Cpx, Grt, Cal, Qz, Pl
RL-08-43	Red-brown fine- to medium-grained (0.2-5mm) Grt-Sch rich skarn (50% Grt, 30% Cpx, 10% Qz, 5% Cal, 4% Pl, <1% Sch)	100-200 μm subhedral Ttn with Grt, Cpx, Qz, Cal, Pl
RL-08-39	Banded grey Calc-silicate and dark Bi hornfels	100 μm anhedral Ttn in calc-silicate layer with Qz, Pl, Cpx
RL-08-42b	Banded grey Calc-silicate and dark Bi hornfels	100 μm anhedral Ttn in calc-silicate layer with Qz, Pl, Cpx
Ray Gulch tungsten deposit		
RL-08-51	Medium- to coarse grained (2-7mm) Bt-rich granodiorite□40% Pl, 35% Qz, 15% Kfs, 10% Bi□	100-200 μm anhedral to subhedral zoned Ttn in Fsp and Bt and one Ttn with Ilm inclusion
RL-08-61	Fine- to medium-grained (0.2-4mm) Bt-rich granodiorite (45% Qz , 40% Pl, 15% Kfs, 5% Bi)	100-500 μm subhedral zoned Ttn with Fsp, Qz and Bt
RL-08-55b	Dark-green fine- to medium- grained (0.2-2mm) Cpx-Amp-Sch skarn with grey Calc-silicate and dark Bi hornfels (40% Amp, 25% Cpx, 15% Qz, 10% Cal, 10% Grt, <2% Sch)	500 μm euhedral Ttn with Cpx, Amp Cal, Qz, Chl in the skarn
RL-08-56	White and light green fine grained (0.02-1mm) laminated Cpx-Sch skarn white layer (0.02-0.1 mm)(30% Cpx, 70% Qz); green layer(0.1-1mm)(50% Cpx, 30% Qz, 10% Cal, 5% Grt, 5% Pl)	50 μm euhedral Ttn with Cpx, Grt, Cal, Qz,
RL-08-57	Dark-green medium-grained (0.5-5mm) Cpx-Sch skarn (60% Cpx, 10% Amp, 20% Qz, 5% Cal, 2% Sch)	50-200 μm euhedral Ttn with Cpx, Cal, Qz, Amp
RL-08-59	Fine-grained (0.1-1mm) white grey-white calc-silicate hornfels	<100 μm subhedral Ttn with Cpx, Chl, Ms, Qz
RL-08-60	Fine- to coarse-grained (0.2-7mm) brown-green Cpx-Grt-Sch skarn (70% Cpx, 20% Grt, 10% Qz, 1% Sch)	400 μm euhedral Ttn with Cpx, Grt, Cal, Qz
RL-08-62	Grey-green fine-grained (0.1-1mm) Cpx- Sch skarn (60% Cpx, 30% Qz, 10% Grt, 1% Sch)	100-400 μm euhedral Ttn with Cpx, Grt, Qz,
RL-08-63	Banded grey calc-silicate hornfels	<100 μm subhedral Ttn in calc-silicate hornfels with Qz,

		Pl and some Ttn with Rt inclusions
RL-08-66	Finely laminated grey calc-silicate and dark Bi hornfels	200 μm subhedral Ttn with Cpx, Czo, Kfs
Mactung tungsten deposit		
RL-08-67	Fine-grained (0.02-0.5mm) light-grey Cpx-Czo-Grt-Sch skarn (50% Cpx, 40% Qz, 10% Czo) with a Qz, Cpx, sulfide vein	100 μm subhedral Ttn in the contact of coarse-grained Qz, Cpx, sulfide vein and fine-grained Cpx-Czo skarn
RL-08-70	Brown-green fine-grained (0.1-0.5mm) Cpx-Grt-Sch skarn (50% Qz, 30% Cpx, 10% Grt, 5% Cal,< 3% Pl, <2% Sch) with grey-white calc-silicate hornfels	200 μm euhedral Ttn with Cpx, Grt, Cal, Qz, Pl, Chl in skarn
Rl-08-72	Dark-green fine-grained (0.02-0.5mm) Cpx-Grt-Sch skarn (70% Cpx, 15% Qz, 10% Po, 5% Cal, Pl, <1% Sch)	100-200 μm euhedral Ttn with Cpx, Grt, Cal, Qz, Pl
Rl-08-73	Red-brown fine-grained (0.2-2mm) Cpx-Grt-Sch skarn(45% Grt, 40% Cpx, 10% Cal, 5% Qz, <1% Sch)	50 μm subhedral Ttn with Grt, Cpx, Cal, Qz
Rl-08-75	Fine-grained (0.02-0.2mm) brown hornfels(60% Qz, 40% Cpx) with sulfide Qz vein	50 μm subhedral Ttn in the contact of the Vein and the hornfels with Cpx, Cal, Qz, Sul
Boss Mountain molybdenum deposit		
RL-10-05	Medium grained (1-5mm) fresh Hbl-rich granodiorite (40% Pl, 35% Qz, 10% Kfs, 10% Hbl, <4% Bi)	200-700 μm euhedral Ttn with Hbl, Pl, Kfs, Bt, Qz, Mag
RL-10-14	Medium grained (1-5mm) fresh Hbl-rich granodiorite (40% Pl, 35% Qz, 10% Kfs, 10% Hbl, <4% Bi)	300-700 μm euhedral Ttn with Hbl, Pl, Kfs, Qz, Bt, Mag and some Ttn with Ilm inclusions
RL-10-41	Medium grained (1-5mm) fresh Hbl-rich granodiorite (40% Pl, 35% Qz, 10% Kfs, 10% Hbl, <4% Bi)	300-800 μm euhedral Ttn with Hbl, Pl, Bt, Kfs, Qz, Mag
RL-10-06	Qz and green epidote vein cutting the granitic intrusion	150 μm subhedral Ttn in Qz vein and some Ttn with Ilm inclusions
Fox property		
RL-10-15	Brown-green fine- to medium-grained (0.2-4mm) Cpx-Grt skarn (30% Grt, 40% Cpx, 5%Pl, 25% Qz)	300-800 μm subhedral to euhedral Ttn with Cpx, Grt, Pl, Py, Qz and some Ttn with Rt inclusion
RL-10-16	Dark-green fine-grained (0.1-1.5mm) Cpx-Sch skarn (70% Cpx, 10% Grt, 10% Qz, 5% Pl, 3% Ttn, 2% Sch)	50-400 μm subhedral to euhedral zoned Ttn with Cpx, Pl, Qz, Ms, Ap, Po, Py, Ccp
RL-10-17	Brown-green fine-grained (0.1-1mm) Cpx-Grt-Mol skarn (55% Cpx, 20% Grt, 10% Fsp, 10% Qz, 5% Mol)	50-300 μm subhedral zoned Ttn with Cpx, Fsp, Qz
Jersey Emerald tungsten deposit		

RL-10-27A	Brown-green fine- to medium-grained (0.1-5mm) Cpx-Grt-Sch skarn (50% Grt, 35% Cpx, 10% Qz, 5% Cal, <1% Sch) and grey-white calc-silicate hornfels	<100 µm subhedral to euhedral zoned Ttn with Cpx, Czo, Qz in the hornfels or the contact zone.
RL-10-27B	Grey-white calc-silicate hornfels	200 µm subhedral Ttn with Cpx, Czo and some Ttn with Rt inclusions within hornfels
RL-10-27G	Brown-green fine- to coarse-grained (0.1-10mm) Cpx-Grt skarn (40% Grt, 40% Cpx, 10% Qz, 5% Cal, 5% Czo)	50-150 µm anhedral to euhedral zoned Ttn with Cpx, Czo, Cal, Qz and some Ttn with Rt inclusions
RL-10-27E	Brown-green fine- to medium-grained (0.1-5mm) Cpx-Grt-Sch skarn (50% Grt, 30% Cpx, 10% Qz, 5%Czo, 5% Cal)	100-300 µm euhedral zoned Ttn with Cpx, Czo, Grt, Chl, Qz
RL-10-31C	Brown-green fine- to coarse-grained (0.1-10mm) Cpx-Grt-Sch skarn (45% Grt , 40% Cpx, %10 Cal, %3 Czo, 2% Sch) with grey-white calc-silicate hornfels	100 µm euhedral zoned Ttn in the calc-silicate hornfels with Cpx, Czo, Qz and some Ttn with Ilm inclusions
RL-10-31E	Brown-green medium- to coarse- grained (1-10mm) Cpx-Grt-Sch skarn (40% Grt, 35% Cpx, 10% Qz, 8% Cal, 2% Sch) with a Qz Sch vein	100-500 µm subhedral zoned Ttn with Cpx, Grt, Cal, Qz, some grains in the contact of the vein and the skarn
Max molybdenum deposit		
RL-10-34	Brown-green fine- to medium-grained (0.1-3mm) Grt-Cpx-Czo-Sch skarn (45% Cpx, 30% Grt, 10% Czo,10%Qz, 3% Po, <1% Sch)	100-300 µm subhedral to euhedral Ttn with Cpx, Czo Grt, Qz, Ms, Po
RL-10-35	Brown-green fine- to medium-grained (0.1-3mm) Grt-Cpx-Sch skarn(45% Cpx, 35% Grt, 10% Cal,5%Qz, 3% Po <1% Sch)	150-300 µm anhedral to euhedral zoned Ttn with Cpx, Czo, Grt, Cal, Qz
RL-10-38A	Light grey altered medium-grained (0.5-2mm) Bi granodiorite (40% Pl, 45% Qz, 10% Kfs, 5% mica)	<100 µm anhedral Ttn with Chl, Ms, Cal, Ilm, Py, Zrn and Ap in altered Bi
Northern Dancer tungsten and molybdenum deposit		
X10	Fine-grained Bi-Qz hornfels with Qz Cpx Mol Py vein	100 µm euhedral Ttn in Qz, Cpx Mol Py vein
X12	Fine-grained calc-silicate hornfels with Qz, Cpx and scheelite vein	150 µm euhedral Ttn in Qz, Cpx Sch vein

Abbreviations Ttn: titanite, Pl: plagioclase, Fsp: feldspar, Kfs: K-feldspar, Hbl: hornblende, Ms: muscovite, Qz: quartz, Bt: biotite, Grt: garnet, Czo: Clinozoisite, Cpx: clinopyroxene, Cal: calcite,

Chl: chlorite, Sch: scheelite, Po: pyrrhotite, Py: pyrite, Di: diopside, Rt: rutile, Ilm: ilmenite, Mag: magnetite, Ap: apatite, Ccp: chalcopyrite, Mol: molybdenite

Appendix B:

Chemical compositions of titanite

Appendix B-1 Line Numbers	MoO_3	WO_3	Nb_2O_5	Ta_2O_5	SiO_2	TiO_2	ZrO_2	SnO_2	Al_2O_3	Fe_2O_3	Y_2O_3	Ce_2O_3	Yb_2O_3	CaO	MnO	F	F=O	Totals
Magmatic titanite																		
Cores of magmatic titanite from Boss Mountain																		
RL-10-05-1.1.1	0.00	0.00	0.18	0.04	30.74	35.27	0.59	0.00	0.98	1.74	0.14	0.22	0.04	27.04	0.20	0.29	-0.12	97.35
RL-10-05-1.2.1	0.01	0.00	0.13	0.05	30.82	35.07	0.63	0.00	1.13	1.67	0.13	0.23	0.00	26.89	0.21	0.36	-0.15	97.16
RL-10-05-4.1	0.00	0.00	0.14	0.04	30.50	35.22	0.54	0.01	0.97	1.85	0.17	0.24	0.02	26.73	0.19	0.13	-0.06	96.69
RL-10-14-2.1	0.00	0.00	0.24	0.02	30.87	35.16	0.72	0.00	1.02	1.85	0.15	0.26	0.05	27.13	0.18	0.14	-0.06	97.73
RL-10-14-3.1	0.00	0.01	0.18	0.10	30.48	35.06	0.22	0.01	1.09	1.88	0.24	0.30	0.01	26.81	0.18	0.33	-0.14	96.76
RL-10-14-9.3.1	0.00	0.07	0.22	0.07	30.81	35.51	0.57	0.00	1.01	1.86	0.15	0.23	0.04	27.06	0.18	0.48	-0.20	98.05
RL-10-41-1.1	0.01	0.03	0.11	0.00	31.10	34.83	0.57	0.00	0.92	1.52	0.09	0.17	0.03	26.93	0.18	0.22	-0.09	96.62
RL-10-41-2.1	0.00	0.06	0.00	0.04	31.16	35.02	0.42	0.00	0.85	1.52	0.09	0.16	0.00	27.24	0.18	0.30	-0.13	96.91
RL-10-14-6.1	0.00	0.01	0.15	0.02	30.65	35.01	0.03	0.00	0.97	1.83	0.17	0.25	0.04	26.90	0.19	0.37	-0.16	96.43
RL-10-05-1.3.1	0.00	0.00	0.14	0.00	30.84	35.19	0.64	0.00	0.93	1.86	0.20	0.18	0.05	26.76	0.20	0.44	-0.19	97.24
RL-10-05-6.1 (core, *a*)	0.00	0.00	0.18	0.03	30.63	35.02	0.79	0.00	0.93	1.71	0.14	0.22	0.05	26.78	0.17	0.43	-0.18	96.93
RL-10-14-9.2.1	0.02	0.00	0.14	0.07	30.54	35.13	0.30	0.00	1.04	1.66	0.17	0.27	0.03	26.65	0.19	0.09	-0.04	96.28
Rims of magmatic titanite from Boss Mountain																		
RL-10-05-1.3.2	0.00	0.00	0.05	0.03	31.21	34.32	0.51	0.00	1.32	2.39	0.12	0.17	0.04	27.15	0.21	0.37	-0.15	97.73
RL-10-05-6.2 (core, *b*)	0.00	0.00	0.02	0.01	30.96	34.92	0.27	0.00	1.16	2.24	0.06	0.11	0.00	27.30	0.21	0.72	-0.30	97.67
RL-10-14-9.2.2	0.00	0.00	0.14	0.08	30.73	34.33	0.45	0.00	1.25	2.26	0.16	0.21	0.04	26.79	0.17	0.43	-0.18	96.87
RL-10-05-1.1.2	0.00	0.00	0.02	0.01	31.15	34.99	0.37	0.00	1.14	2.03	0.09	0.07	0.02	27.58	0.19	0.29	-0.12	97.84
RL-10-05-1.2.2	0.00	0.00	0.06	0.01	31.08	34.61	0.46	0.00	1.27	2.30	0.08	0.15	0.04	27.28	0.20	0.47	-0.20	97.80
RL-10-05-4.2	0.00	0.02	0.10	0.02	30.89	34.53	0.60	0.00	1.26	2.32	0.18	0.14	0.02	27.17	0.19	0.36	-0.15	97.64
RL-10-14-2.2	0.00	0.00	0.10	0.03	30.99	35.21	0.33	0.00	1.19	2.00	0.10	0.17	0.04	27.55	0.18	0.51	-0.21	98.19
RL-10-14-6.2	0.00	0.01	0.06	0.03	30.91	35.01	0.54	0.00	1.09	1.96	0.13	0.15	0.01	27.37	0.19	0.32	-0.13	97.64
Appendix B-2 Line Numbers	MoO_3	WO_3	Nb_2O_5	Ta_2O_5	SiO_2	TiO_2	ZrO_2	SnO_2	Al_2O_3	Fe_2O_3	Y_2O_3	Ce_2O_3	Yb_2O_3	CaO	MnO	F	F=O	Totals
RL-10-14-9.3.2	0.00	0.02	0.09	0.01	31.03	34.71	0.29	0.00	1.32	2.27	0.09	0.15	0.06	27.42	0.19	0.33	-0.14	97.84
RL-10-14-3.3	0.00	0.00	0.00	0.00	31.19	34.76	0.01	0.00	1.39	2.05	0.01	0.04	0.01	27.97	0.17	0.49	-0.21	97.91
RL-10-41-1.2	0.00	0.03	0.03	0.05	31.40	34.18	0.29	0.00	1.16	2.26	0.05	0.06	0.00	27.44	0.20	0.36	-0.15	97.37

RL-10-41-2.2	0.00	0.00	0.05	0.01	31.42	35.03	0.60	0.00	1.08	2.01	0.09	0.11	0.01	27.42	0.19	0.40	-0.17	98.25
RL-10-41-4.1	0.00	0.02	0.11	0.03	31.11	34.27	0.61	0.00	1.16	2.04	0.12	0.16	0.04	27.15	0.21	0.35	-0.15	97.23
RL-10-41-4.2	0.00	0.01	0.03	0.01	31.50	34.10	0.22	0.00	1.22	2.19	0.06	0.11	0.03	27.56	0.19	0.28	-0.12	97.39
Cores of magmatic titanite from Ray Gulch																		
RL-08-61-1.1	0.00	0.15	0.50	0.00	30.82	34.96	0.14	0.05	1.96	0.80	0.00	0.00	0.00	28.50	0.03	0.40	-0.17	98.15
RL-08-61-2.1	0.00	0.01	0.53	0.04	30.69	34.37	0.11	0.03	2.08	0.53	0.00	0.00	0.00	28.37	0.00	0.47	-0.20	97.04
RL-08-61-3.1	0.00	0.14	0.42	0.07	30.39	34.67	0.10	0.03	2.02	0.77	0.00	0.00	0.00	28.51	0.09	0.34	-0.14	97.38
RL-08-61-4.1	0.00	0.03	0.25	0.00	30.70	35.74	0.12	0.04	2.09	0.65	0.00	0.00	0.00	28.67	0.00	0.44	-0.18	98.54
RL-08-51-1.1	0.00	0.10	0.73	0.07	31.40	34.45	0.09	0.06	2.29	0.73	0.00	0.00	0.00	28.85	0.06	0.54	-0.23	99.13
RL-08-51-2.1	0.00	0.01	0.35	0.11	31.31	35.43	0.03	0.06	2.02	0.55	0.00	0.00	0.00	28.88	0.10	0.39	-0.16	99.07
RL-08-51-3.1	0.00	0.02	0.73	0.12	30.79	34.36	0.07	0.05	2.31	0.60	0.00	0.00	0.00	28.22	0.08	0.36	-0.15	97.54
RL-08-51-4.1	0.00	0.17	0.73	0.19	31.30	34.91	0.09	0.04	2.42	0.80	0.00	0.00	0.00	28.35	0.04	0.30	-0.12	99.20
RL-08-51-5.1	0.00	0.00	0.38	0.00	31.29	35.05	0.09	0.04	2.18	0.51	0.00	0.00	0.00	29.24	0.14	0.55	-0.23	99.23
Rims of magmatic titanite from Ray Gulch																		
RL-08-61-1.2	0.00	0.14	0.05	0.08	31.42	35.04	0.01	0.01	2.32	0.77	0.00	0.00	0.00	29.18	0.07	0.33	-0.14	99.27
RL-08-61-2.2	0.00	0.00	0.10	0.11	31.14	34.59	0.05	0.02	2.55	0.65	0.00	0.00	0.00	28.87	0.03	0.67	-0.28	98.49
RL-08-61-3.2	0.00	0.00	0.02	0.06	31.00	34.40	0.06	0.01	2.46	0.61	0.00	0.00	0.00	28.87	0.06	0.50	-0.21	97.84
RL-08-61-4.2	0.00	0.00	0.10	0.00	31.32	35.47	0.05	0.01	2.27	0.63	0.00	0.00	0.00	29.06	0.08	0.45	-0.19	99.25
RL-08-51-1.2	0.00	0.07	0.14	0.09	31.35	34.97	0.02	0.04	2.32	0.81	0.00	0.00	0.00	28.98	0.12	0.58	-0.24	99.23
RL-08-51-2.2	0.00	0.00	0.09	0.03	31.47	35.26	0.02	0.03	2.37	0.70	0.00	0.00	0.00	29.49	0.01	0.65	-0.27	99.84
RL-08-51-3.2	0.00	0.04	0.08	0.00	31.61	35.13	0.03	0.03	2.16	0.76	0.00	0.00	0.00	29.31	0.03	0.67	-0.28	99.56
RL-08-51-4.2	0.00	0.04	0.10	0.05	31.36	34.88	0.00	0.05	2.08	0.53	0.00	0.00	0.00	29.02	0.06	0.61	-0.26	98.53
Appendix B-3 Line Numbers	MoO_3	WO_3	Nb_2O_5	Ta_2O_5	SiO_2	TiO_2	ZrO_2	SnO_2	Al_2O_3	Fe_2O_3	Y_2O_3	Ce_2O_3	Yb_2O_3	CaO	MnO	F	F=O	Totals
RL-08-51-5.2	0.00	0.00	0.19	0.00	31.23	35.92	0.04	0.06	2.22	0.70	0.00	0.00	0.00	28.81	0.00	0.59	-0.25	99.51
minimum values of magmatic titanite	0.00	0.00	0.00	0.00	30.39	34.10	0.00	0.00	0.85	0.51	0.00	0.00	0.00	26.65	0.00	0.09	-0.30	96.28
maximum values of magmatic titanite	0.02	0.17	0.73	0.19	31.61	35.92	0.79	0.06	2.55	2.39	0.24	0.30	0.06	29.49	0.21	0.72	-0.04	99.84
Hydrothermal titanite																		
Hydrothermal titanite in the Vein from Boss Mountain																		
RL-10-06-3	0.00	0.08	0.01	0.00	31.90	31.29	0.11	0.00	4.04	0.80	0.00	0.01	0.00	28.19	0.01	1.26	-0.53	97.15
RL-10-06-1	0.00	0.16	0.01	0.02	31.94	31.41	0.00	0.00	3.69	1.57	0.00	0.02	0.03	28.29	0.03	1.01	-0.42	97.75
Hydrothermal titanite from the granodiorite from Max																		

RL-10-38A-1	0.00	0.01	0.21	0.04	32.12	31.05	0.00	0.00	4.76	0.40	0.05	0.01	0.01	28.22	0.12	1.35	-0.57	97.80
RL-10-38A-2.1	0.00	0.00	0.23	0.04	32.24	30.29	0.04	0.00	5.20	0.44	0.00	0.01	0.00	28.70	0.03	1.25	-0.53	97.95
RL-10-38A-2.2	0.00	0.00	0.18	0.03	32.45	27.35	0.08	0.00	7.44	0.39	0.01	0.00	0.01	28.57	0.20	1.74	-0.73	97.71
RL-10-38A-2.3	0.00	0.00	0.15	0.05	32.99	24.24	0.05	0.00	9.82	0.74	0.00	0.01	0.00	28.53	0.04	3.08	-1.30	98.40
RL-10-38A-3.1 (*c*)	0.00	0.03	0.12	0.06	32.36	31.01	0.07	0.00	4.64	0.66	0.00	0.01	0.00	28.63	0.05	1.60	-0.67	98.56
RL-10-38A-4.1	0.00	0.01	0.16	0.00	32.57	27.56	0.11	0.00	7.23	0.80	0.00	0.00	0.00	28.22	0.05	2.46	-1.04	98.15
Hydrothemal titanite from the vein in the hornfels																		
from Northern Dancer																		
in the scheelite quartz vein																		
X12-1.1 (light, *d*)	0.00	0.03	2.19	0.11	31.92	26.27	0.44	0.00	5.92	1.96	0.17	0.05	0.00	27.73	0.11	2.11	-0.89	98.13
X12-1.2 (dark, *e*)	0.00	0.04	0.75	0.05	32.02	26.34	0.83	0.06	6.94	1.79	0.16	0.05	0.00	27.83	0.12	2.66	-1.12	98.51
X12-1.3	0.01	0.05	0.29	0.00	32.04	26.60	0.67	0.00	7.27	1.12	0.20	0.04	0.01	27.78	0.08	2.49	-1.05	97.60
in the molybdenite quartz vein																		
X10-1.1 (core)	0.00	0.00	0.12	0.03	31.70	31.61	0.12	0.05	2.20	3.61	0.03	0.09	0.00	27.63	0.17	1.19	-0.50	98.05
X10-1.2 (rim)	0.00	0.00	0.13	0.02	32.02	29.72	0.00	0.10	4.30	2.55	0.04	0.08	0.02	27.79	0.08	2.11	-0.89	98.07

Appendix B-4 Line Numbers	MoO_3	WO_3	Nb_2O_5	Ta_2O_5	SiO_2	TiO_2	ZrO_2	SnO_2	Al_2O_3	Fe_2O_3	Y_2O_3	Ce_2O_3	Yb_2O_3	CaO	MnO	F	F=O	Totals
X10-1.3	0.00	0.00	0.14	0.00	31.56	31.41	0.51	0.12	2.06	4.05	0.02	0.14	0.02	27.62	0.23	1.35	-0.57	98.65
X10-3.2	0.00	0.02	0.12	0.05	31.71	31.16	0.28	0.04	2.59	3.75	0.06	0.09	0.01	27.47	0.14	1.35	-0.57	98.25
X10-4	0.00	0.00	0.05	0.01	31.80	33.55	0.22	0.03	1.89	1.93	0.04	0.08	0.00	28.08	0.12	0.89	-0.38	98.30
maximum	0.01	0.16	2.19	0.11	32.99	35.84	0.83	0.12	9.82	4.05	0.20	0.14	0.03	28.70	0.23	3.08	-0.09	98.92
minimum	0.00	0.00	0.00	0.00	30.36	24.24	0.00	0.00	1.19	0.39	0.00	0.00	0.00	27.47	0.01	0.21	-1.30	95.50
Titanite in Skarn samples																		
Risby																		
RL-08-40-C3-1	0.00	0.00	0.00	0.01	31.94	28.93	0.00	0.00	6.19	1.01	0.01	0.02	0.00	27.94	0.11	2.24	-0.94	97.45
RL-08-40-C3-2	0.00	0.00	0.00	0.00	31.90	30.77	0.05	0.00	4.77	0.43	0.00	0.03	0.00	27.87	0.01	1.85	-0.78	96.91
RL-08-40-C4	0.00	0.03	0.00	0.01	32.33	28.31	0.00	0.00	6.69	1.04	0.05	0.02	0.00	28.09	0.14	3.17	-1.34	98.53
RL-08-40-C5	0.00	0.00	0.00	0.01	32.33	26.77	0.00	0.00	7.86	0.80	0.02	0.03	0.01	28.22	0.06	2.75	-1.16	97.69
RL-08-43-C2-1	0.00	0.00	0.00	0.02	32.62	25.57	0.00	0.50	8.39	0.86	0.00	0.02	0.00	28.24	0.09	2.47	-1.04	97.75
RL-08-43-C2-2	0.00	0.00	0.00	0.01	32.40	27.70	0.00	0.43	6.80	0.85	0.00	0.02	0.02	28.32	0.11	2.47	-1.04	98.09
RL-08-43-C3	0.00	0.00	0.00	0.04	32.24	28.00	0.00	0.00	6.51	0.65	0.14	0.03	0.01	27.99	0.04	2.59	-1.09	97.14
RL-08-43-C4	0.00	0.00	0.00	0.03	32.16	30.77	0.01	0.03	5.21	0.65	0.05	0.02	0.02	28.22	0.02	1.91	-0.80	98.28

	RL-08-43-C5	0.00	0.02	0.00	0.00	32.39	26.29	0.04	0.10	8.17	0.80	0.02	0.01	0.00	28.36	0.07	2.05	-0.86	97.47
	RL-08-43-C2-2-2	0.00	0.01	0.12	0.02	32.50	27.93	0.03	1.00	7.11	0.84	0.00	0.03	0.00	28.93	0.10	2.29	-0.96	99.93
	RL-08-43-C4-2	0.00	0.01	0.00	0.04	32.52	28.27	0.00	0.00	7.10	0.52	0.02	0.01	0.00	29.04	0.03	2.27	-0.95	98.88
	RL-08-43-C5-2	0.00	0.01	0.00	0.02	32.39	27.09	0.00	0.09	7.81	0.48	0.01	0.02	0.00	29.05	0.04	2.82	-1.19	98.65
	Ray Gulch																		
	RL-08-55b-c1-1	0.00	0.01	0.00	0.00	31.66	30.08	0.87	0.00	3.99	1.10	0.01	0.12	0.00	27.79	0.00	1.22	-0.52	96.33
	RL-08-55b-c2	0.00	0.02	0.00	0.04	31.70	32.16	0.00	0.06	2.65	1.55	0.15	0.08	0.00	27.69	0.03	1.11	-0.47	96.76
	RL-08-55b-c3	0.00	0.02	0.00	0.05	31.61	30.69	0.19	0.10	3.96	0.66	0.03	0.06	0.01	27.93	0.01	1.55	-0.65	96.21
	RL-08-55b-c3	0.00	0.02	0.00	0.03	31.58	32.28	0.00	0.08	2.64	1.47	0.18	0.05	0.00	27.67	0.03	1.12	-0.47	96.68
	RL-08-55b-c4	0.00	0.04	0.00	0.02	31.55	32.58	0.00	0.10	2.64	1.49	0.16	0.06	0.00	27.73	0.03	1.12	-0.47	97.05
Appendix B-5	Line Numbers	MoO_3	WO_3	Nb_2O_5	Ta_2O_5	SiO_2	TiO_2	ZrO_2	SnO_2	Al_2O_3	Fe_2O_3	Y_2O_3	Ce_2O_3	Yb_2O_3	CaO	MnO	F	F=O	Totals
	RL-08-55b-c5	0.00	0.04	0.00	0.04	31.78	30.55	0.34	0.00	3.92	0.67	0.01	0.14	0.01	27.80	0.00	1.35	-0.57	96.09
	RL-08-60-C3	0.00	0.00	0.00	0.02	31.49	31.24	0.49	0.00	4.67	0.66	0.00	0.06	0.00	28.02	0.00	1.30	-0.55	97.39
	RL-08-60-C5-1	0.00	0.06	0.00	0.02	31.32	31.83	0.22	0.05	4.03	1.11	0.19	0.03	0.00	27.54	0.01	1.30	-0.55	97.17
	RL-08-60-C5-2	0.00	0.04	0.00	0.04	31.69	31.64	0.28	0.00	4.66	0.93	0.01	0.08	0.00	28.39	0.01	1.44	-0.60	98.59
	RL-08-60-C6-1	0.00	0.00	0.00	0.02	31.65	30.71	0.10	0.00	4.99	1.37	0.22	0.02	0.00	27.97	0.03	1.38	-0.58	97.88
	RL-08-60-C6-2	0.00	0.03	0.00	0.02	31.75	34.94	0.00	0.00	2.34	0.86	0.07	0.02	0.00	28.27	0.03	1.00	-0.42	98.90
	RL-08-62-C2-1	0.00	0.04	0.10	0.01	31.74	32.53	0.00	0.00	2.79	1.23	0.07	0.09	0.03	27.97	0.07	1.12	-0.47	97.31
	RL-08-62-C2-2	0.00	0.02	0.00	0.04	32.34	28.40	0.27	0.05	5.91	1.29	0.02	0.04	0.03	28.33	0.02	2.01	-0.85	97.93
	RL-08-62-C8	0.00	0.04	0.00	0.04	31.84	30.34	0.15	0.00	4.47	1.01	0.07	0.07	0.02	27.99	0.03	1.66	-0.70	97.03
	RL-08-62-C3	0.00	0.02	0.00	0.07	31.81	30.95	0.18	0.12	3.93	0.89	0.07	0.10	0.01	27.78	0.01	1.82	-0.76	97.00
	RL-08-62-C4	0.00	0.01	0.00	0.00	31.95	30.29	0.09	0.05	4.86	1.17	0.03	0.06	0.02	28.02	0.03	1.73	-0.73	97.58
	RL-08-57-C1-1	0.00	0.00	0.03	0.05	31.71	34.84	0.01	0.06	1.91	1.19	0.13	0.11	0.03	27.46	0.05	0.80	-0.34	98.05
	RL-08-57-C1-2	0.00	0.00	0.06	0.05	31.73	34.73	0.02	0.01	1.90	1.27	0.15	0.08	0.05	27.41	0.06	0.67	-0.28	97.90
	RL-08-57-C4	0.00	0.00	0.00	0.08	31.73	34.96	0.01	0.02	1.97	1.22	0.13	0.11	0.02	27.72	0.05	0.69	-0.29	98.44
	RL-08-57-C1-3	0.00	0.06	0.00	0.00	31.69	32.21	0.13	0.07	3.62	0.98	0.05	0.11	0.00	27.79	0.03	0.91	-0.38	97.24
	Rl-08-56-c1	0.00	0.01	0.00	0.04	32.47	33.99	0.00	0.00	3.27	0.47	0.03	0.06	0.01	26.71	0.01	0.71	-0.30	97.48
	Rl-08-56-c2-p	0.00	0.00	0.00	0.01	31.19	35.60	0.00	0.00	1.50	0.74	0.03	0.10	0.02	27.23	0.03	0.72	-0.30	96.87
	Rl-08-56-c3	0.00	0.04	0.00	0.04	29.85	32.28	0.00	0.00	5.81	0.57	0.05	0.10	0.00	26.73	0.00	1.23	-0.52	96.17
	Rl-08-56-c4-p	0.00	0.03	0.00	0.00	31.66	33.12	0.01	0.00	3.62	0.80	0.03	0.09	0.03	27.77	0.02	1.52	-0.64	98.05
	Rl-08-56-c4-2-p	0.00	0.02	0.00	0.00	31.39	33.03	0.03	0.00	3.44	0.81	0.02	0.22	0.00	27.57	0.02	1.34	-0.56	97.33

	Rl-08-56-c5	0.00	0.03	0.00	0.02	31.72	35.38	0.00	0.00	2.31	0.69	0.06	0.02	0.00	27.74	0.02	0.74	-0.31	98.41
	Mactung																		
	Rl-08-72-C1-1	0.00	0.00	0.99	0.55	31.21	32.09	0.03	0.14	2.95	1.40	0.03	0.04	0.00	27.31	0.13	0.98	-0.41	97.44
	Rl-08-72-C1-2	0.00	0.00	0.72	0.13	31.34	31.71	0.00	0.18	3.31	1.39	0.03	0.02	0.02	27.69	0.10	1.46	-0.61	97.48
	Rl-08-72-C2-1	0.00	0.05	0.54	0.07	31.49	32.94	0.02	0.14	2.82	1.21	0.07	0.05	0.00	27.51	0.10	0.79	-0.33	97.46

Appendix B-6	Line Numbers	MoO_3	WO_3	Nb_2O_5	Ta_2O_5	SiO_2	TiO_2	ZrO_2	SnO_2	Al_2O_3	Fe_2O_3	Y_2O_3	Ce_2O_3	Yb_2O_3	CaO	MnO	F	F=O	Totals
	Rl-08-72-C3	0.00	0.03	1.22	0.37	31.43	31.23	0.04	0.13	3.43	1.61	0.03	0.02	0.00	27.28	0.14	1.10	-0.46	97.60
	Rl-08-72-C6	0.00	0.00	0.84	0.17	31.37	30.87	0.00	0.39	3.97	1.24	0.06	0.07	0.02	27.26	0.10	1.71	-0.72	97.36
	Rl-08-73-C1-1	0.00	0.01	0.00	0.03	31.87	29.69	0.01	0.14	5.65	0.66	0.04	0.06	0.00	27.89	0.03	2.27	-0.95	97.40
	Rl-08-73-C1-2	0.00	0.00	0.00	0.01	31.69	28.56	0.00	0.24	6.49	1.10	0.02	0.04	0.01	28.01	0.04	2.58	-1.09	97.72
	Rl-08-73-C3	0.00	0.00	0.00	0.03	31.79	30.54	0.01	0.05	5.25	0.82	0.01	0.00	0.01	27.95	0.04	2.32	-0.98	97.84
	Rl-08-73-C4-1	0.00	0.00	0.00	0.05	31.84	29.39	0.01	0.26	5.87	1.12	0.09	0.05	0.01	27.88	0.06	2.44	-1.03	98.04
	Rl-08-73-C4-2	0.00	0.00	0.00	0.04	32.01	29.22	0.02	0.48	5.85	1.04	0.00	0.02	0.01	27.62	0.04	2.36	-0.99	97.72
	Rl-08-73-C5	0.00	0.00	0.01	0.06	31.64	29.26	0.04	0.56	5.78	0.80	0.02	0.03	0.00	27.74	0.02	2.45	-1.03	97.39
	Rl-08-73-C6	0.00	0.02	0.09	0.04	31.76	29.78	0.01	0.40	5.32	1.00	0.01	0.02	0.00	27.90	0.03	2.23	-0.94	97.69
	RL-08-70-C6	0.00	0.00	0.00	0.09	31.78	29.88	0.02	0.19	5.03	1.22	0.24	0.03	0.01	27.55	0.08	1.89	-0.79	97.21
	RL-08-70-C6-2	0.00	0.00	0.00	0.03	32.05	31.57	0.01	0.24	4.16	1.32	0.20	0.03	0.03	27.77	0.06	1.84	-0.78	98.54
	RL-08-70-C5-1	0.00	0.00	0.07	0.04	32.06	30.85	0.02	0.10	4.50	1.30	0.17	0.03	0.02	27.78	0.10	1.87	-0.79	98.12
	RL-08-70-C5-2	0.00	0.03	0.00	0.01	31.78	30.51	0.00	0.24	4.73	1.38	0.23	0.00	0.03	27.49	0.08	1.58	-0.67	97.42
	RL-08-70-C3	0.00	0.00	0.04	0.00	31.77	31.59	0.00	0.21	3.80	1.24	0.20	0.04	0.03	27.40	0.09	1.41	-0.60	97.23
	Rl-08-75-C1	0.00	0.06	0.28	0.08	31.52	31.11	0.07	0.21	4.21	1.06	0.07	0.04	0.00	27.63	0.12	1.49	-0.63	97.30
	Rl-08-75-C2	0.00	0.04	0.00	0.03	32.06	30.66	0.00	0.14	5.03	0.49	0.08	0.04	0.00	27.60	0.06	2.11	-0.89	97.44
	Rl-08-75-C4	0.00	0.00	0.00	0.00	30.01	31.96	0.12	0.10	4.01	1.03	0.08	0.04	0.00	27.38	0.12	1.09	-0.46	95.49
	Fox																		
	RL-10-16-1	0.00	0.00	0.07	0.04	31.06	37.14	0.08	0.00	0.75	0.26	0.02	0.03	0.00	27.95	0.01	0.32	-0.13	97.60
	RL-10-16-4.1 (core)	0.00	0.02	0.09	0.03	31.06	36.90	0.00	0.00	0.85	0.30	0.05	0.05	0.00	28.00	0.03	0.30	-0.13	97.54
	RL-10-16-4.2 (rim)	0.00	0.00	0.08	0.00	31.69	30.38	0.00	0.01	5.40	0.43	0.02	0.03	0.00	28.23	0.05	2.06	-0.87	97.53
	RL-10-16-6.1 (core, *f*)	0.00	0.03	0.12	0.05	31.16	36.28	0.00	0.00	1.31	0.20	0.03	0.04	0.00	28.22	0.02	0.49	-0.21	97.75
	RL-10-16-6.2 (rim, *g*)	0.00	0.02	0.52	0.05	31.83	24.38	0.10	0.34	9.03	0.50	0.03	0.00	0.00	28.47	0.06	3.72	-1.57	97.49
	RL-10-17-2.1	0.00	0.00	1.39	0.13	31.75	31.79	0.24	0.13	3.28	0.95	0.03	0.03	0.00	27.92	0.05	0.00	0.00	97.69
	RL-10-17-1.1	0.00	0.00	0.69	0.09	31.89	31.50	0.37	0.11	3.68	0.79	0.03	0.03	0.00	28.15	0.02	1.46	-0.61	98.19

Appendix B-7 Line Numbers	MoO_3	WO_3	Nb_2O_5	Ta_2O_5	SiO_2	TiO_2	ZrO_2	SnO_2	Al_2O_3	Fe_2O_3	Y_2O_3	Ce_2O_3	Yb_2O_3	CaO	MnO	F	F=O	Totals
RL-10-17-1.2	0.00	0.00	0.18	0.00	32.02	31.99	0.03	0.02	3.78	0.91	0.02	0.01	0.00	28.09	0.02	1.73	-0.73	98.06
RL-10-17-2.2	0.00	0.00	0.06	0.02	31.92	32.19	0.26	0.04	3.49	0.89	0.04	0.01	0.00	28.28	0.01	1.40	-0.59	98.02
RL-10-17-3.1	0.00	0.03	4.34	0.03	32.01	22.66	1.00	0.31	7.96	1.37	0.01	0.02	0.02	28.12	0.01	1.60	-0.68	98.82
RL-10-17-3.2	0.00	0.05	0.12	0.06	32.38	27.34	0.14	0.05	7.20	0.57	0.00	0.01	0.00	28.62	0.00	1.90	-0.80	97.65
Jersey Emerald																		
RL-10-27E-1.1	0.00	0.00	0.02	0.03	32.12	27.36	1.51	0.20	6.45	1.96	0.03	0.02	0.01	28.28	0.08	2.39	-1.01	99.45
RL-10-27E-2.2	0.00	0.02	0.12	0.03	31.90	30.63	0.74	0.05	4.59	0.70	0.02	0.04	0.00	28.00	0.01	1.65	-0.70	97.81
RL-10-27E-2.1	0.00	0.02	0.11	0.02	31.85	30.88	1.01	0.05	4.44	0.79	0.01	0.04	0.00	27.90	0.00	1.50	-0.63	98.00
RL-10-27E-3.2	0.00	0.00	0.05	0.05	32.11	31.48	0.07	0.00	4.20	0.74	0.05	0.02	0.00	28.17	0.03	1.09	-0.46	97.60
RL-10-27E-3.1	0.00	0.00	0.08	0.00	31.79	34.10	0.15	0.00	2.49	0.52	0.05	0.03	0.00	28.07	0.02	0.85	-0.36	97.80
RL-10-31E-1.1 (core)	0.00	0.03	7.33	0.13	31.21	24.64	1.12	0.21	3.53	4.02	0.01	0.04	0.00	27.02	0.36	0.74	-0.31	100.07
RL-10-31E-1.2 (rim)	0.00	0.00	2.98	0.03	31.55	27.28	0.35	0.09	3.98	3.86	0.02	0.02	0.00	27.40	0.37	1.33	-0.56	98.70
RL-10-31E-2.1 (core)	0.00	0.03	4.38	0.06	31.40	27.41	0.56	0.14	3.34	3.76	0.03	0.03	0.00	27.18	0.35	0.97	-0.41	99.23
RL-10-31E-2.2 (rim)	0.00	0.00	1.60	0.02	31.71	31.20	0.07	0.14	2.79	2.41	0.00	0.06	0.00	27.40	0.28	1.11	-0.47	98.32
RL-10-31E-4.1	0.00	0.00	2.02	0.05	31.62	29.87	0.62	0.17	3.35	2.54	0.00	0.04	0.00	27.42	0.28	1.24	-0.52	98.69
RL-10-31E-4.2	0.00	0.00	0.43	0.04	31.81	30.76	0.20	0.06	3.56	2.61	0.00	0.00	0.02	27.75	0.24	1.15	-0.48	98.15
Max																		
RL-10-34-1.2	0.00	0.03	0.02	0.00	31.01	33.42	0.39	0.00	2.28	0.62	0.07	0.02	0.00	27.70	0.06	0.98	-0.41	96.18
RL-10-34-1.1	0.00	0.06	0.04	0.02	31.49	32.19	0.10	0.00	3.76	2.25	0.01	0.02	0.00	27.28	0.11	1.02	-0.43	97.92
RL-10-34-2.1	0.00	0.01	0.06	0.02	31.03	33.23	0.22	0.03	2.65	0.45	0.08	0.03	0.00	27.83	0.05	0.88	-0.37	96.20
RL-10-34-2.2	0.00	0.02	0.00	0.05	31.26	33.67	0.11	0.00	2.90	0.31	0.02	0.02	0.01	28.15	0.05	0.70	-0.30	96.98
RL-10-34-3	0.00	0.00	0.06	0.05	31.42	33.78	0.00	0.00	3.13	0.29	0.00	0.01	0.00	27.94	0.05	0.71	-0.30	97.15
RL-10-35-3.1 (light, *h*)	0.00	0.01	0.08	0.05	32.15	29.53	1.08	0.08	5.23	1.26	0.02	0.00	0.00	28.30	0.13	1.56	-0.66	98.82
RL-10-35-3.2 (dark, *i*)	0.00	0.01	0.09	0.03	32.51	25.50	0.64	0.19	8.53	1.14	0.00	0.00	0.00	28.71	0.07	3.00	-1.26	99.16
RL-10-35-1	0.00	0.03	0.05	0.07	32.03	31.20	0.00	0.00	4.48	0.40	0.00	0.02	0.00	28.51	0.03	1.11	-0.47	97.47

Appendix B-8 Line Numbers	MoO_3	WO_3	Nb_2O_5	Ta_2O_5	SiO_2	TiO_2	ZrO_2	SnO_2	Al_2O_3	Fe_2O_3	Y_2O_3	Ce_2O_3	Yb_2O_3	CaO	MnO	F	F=O	Totals
RL-10-35-2.1	0.00	0.00	0.05	0.05	32.00	29.26	0.24	0.08	5.47	1.34	0.00	0.00	0.01	28.26	0.05	1.52	-0.64	97.72
RL-10-35-2.2	0.00	0.02	0.03	0.02	32.02	26.13	0.38	0.11	7.90	1.23	0.00	0.00	0.00	28.57	0.04	2.31	-0.97	97.80
minimum of all titanite from skarn	0.00	0.00	0.00	0.00	29.85	22.66	0.00	0.00	0.75	0.20	0.00	0.00	0.00	26.71	0.00	0.00	-1.57	95.49
maximumof all titanite from skarn	0.00	0.06	7.33	0.55	32.62	37.14	1.51	1.00	9.03	4.02	0.24	0.22	0.05	29.05	0.37	3.72	0.00	100.07

Titanite from hornfels

Risby																		
RL-08-39-C3-1	0.00	0.00	0.00	0.04	31.98	31.61	0.00	0.06	4.45	0.77	0.08	0.03	0.03	28.15	0.06	1.36	-0.57	98.05
RL-08-39-C3-2	0.00	0.00	0.00	0.03	31.94	31.45	0.00	0.13	4.35	0.70	0.12	0.05	0.05	27.89	0.06	1.68	-0.71	97.74
RL-08-39-C4	0.00	0.02	0.00	0.02	31.81	33.84	0.19	0.00	2.76	0.64	0.06	0.01	0.01	28.01	0.02	0.43	-0.18	97.64
RL-08-39-C2-1	0.00	0.04	0.00	0.00	32.06	32.00	0.00	0.10	4.41	0.69	0.06	0.03	0.00	27.76	0.05	1.82	-0.76	98.25
RL-08-39-C2-2	0.00	0.00	0.00	0.00	32.20	33.50	0.00	0.00	3.07	0.81	0.00	0.04	0.00	28.18	0.03	1.45	-0.61	98.68
RL-08-42b-c5	0.00	0.00	0.00	0.05	32.02	34.38	0.00	0.00	3.12	0.40	0.11	0.02	0.01	28.66	0.02	1.22	-0.51	99.48
RL-08-42b-c4-1	0.00	0.02	0.00	0.01	32.45	32.22	0.00	0.34	4.61	0.66	0.04	0.02	0.03	28.56	0.06	1.30	-0.55	99.78
RL-08-42b-c4-2	0.00	0.00	0.00	0.01	31.90	33.40	0.00	0.12	3.27	0.68	0.11	0.06	0.03	28.19	0.05	1.54	-0.65	98.71
RL-08-42b-c2-1	0.00	0.00	0.00	0.05	32.22	32.18	0.00	0.00	4.60	0.49	0.06	0.02	0.00	28.73	0.03	1.90	-0.80	99.49
RL-08-42b-c2-2	0.00	0.00	0.00	0.02	31.93	29.52	0.00	0.14	5.98	0.64	0.05	0.02	0.05	28.67	0.08	1.88	-0.79	98.20
RL-08-42b-c1-1	0.00	0.02	0.00	0.03	31.92	32.73	0.00	0.02	4.21	0.44	0.10	0.04	0.04	28.51	0.03	1.45	-0.61	98.92
Ray Gulch										0.00								
RL-08-59-c3	0.00	0.00	0.00	0.00	31.58	35.45	0.01	0.00	2.04	0.27	0.00	0.02	0.04	28.16	0.01	0.66	-0.28	97.94
RL-08-59-c2	0.00	0.00	0.00	0.00	31.50	34.14	0.12	0.00	2.98	0.33	0.02	0.10	0.01	28.15	0.00	1.04	-0.44	97.95
RL-08-59-c3-2	0.00	0.02	0.00	0.01	31.62	34.10	0.04	0.00	3.18	0.29	0.00	0.01	0.00	28.33	0.00	0.88	-0.37	98.12
RL-08-59-c4	0.00	0.03	0.00	0.07	31.38	36.63	0.02	0.00	1.60	0.28	0.01	0.11	0.00	28.23	0.01	0.53	-0.22	98.67
RL-08-59-c5	0.00	0.00	0.00	0.00	32.11	31.82	0.00	0.00	5.05	0.21	0.01	0.03	0.03	28.45	0.00	1.66	-0.70	98.66
Rl-08-63-C1	0.00	0.02	0.00	0.04	31.21	36.03	0.00	0.00	1.50	0.39	0.14	0.13	0.02	27.26	0.03	0.68	-0.29	97.15
Rl-08-63-C2	0.00	0.06	0.00	0.07	30.65	33.68	0.07	0.00	2.58	0.59	1.06	0.26	0.18	25.50	0.04	0.26	-0.11	94.88

Appendix B-9 Line Numbers	MoO_3	WO_3	Nb_2O_5	Ta_2O_5	SiO_2	TiO_2	ZrO_2	SnO_2	Al_2O_3	Fe_2O_3	Y_2O_3	Ce_2O_3	Yb_2O_3	CaO	MnO	F	F=O	Totals
Rl-08-63-C3-1	0.00	0.03	0.00	0.01	30.33	34.70	0.00	0.00	2.16	0.67	0.34	0.27	0.04	26.14	0.05	0.53	-0.22	95.04
Rl-08-63-C3-2	0.00	0.01	0.00	0.01	30.83	34.60	0.00	0.00	1.63	0.90	0.66	0.23	0.09	26.12	0.02	0.66	-0.28	95.48
Rl-08-63-C3-3	0.00	0.00	0.00	0.02	30.62	36.05	0.14	0.00	1.23	0.47	0.05	0.59	0.02	26.53	0.12	0.40	-0.17	96.07
Rl-08-63-C4	0.00	0.00	0.00	0.00	31.71	34.70	0.00	0.00	2.38	0.82	0.05	0.07	0.01	27.66	0.02	1.03	-0.43	98.03
Rl-08-63-C5-2	0.00	0.00	0.00	0.02	31.67	35.01	0.00	0.00	2.68	0.46	0.03	0.17	0.00	27.96	0.03	0.66	-0.28	98.40
Rl-08-63-C6-3	0.00	0.15	0.00	0.06	30.37	37.18	0.00	0.00	1.14	0.40	0.01	0.01	0.00	27.22	0.06	0.52	-0.22	96.91
Rl-08-63-C7-2	0.00	0.02	0.00	0.04	31.87	35.87	0.00	0.00	2.17	0.43	0.00	0.02	0.00	27.51	0.07	0.51	-0.22	98.29
Rl-08-63-C8-2	0.00	0.00	0.00	0.02	31.95	36.51	0.00	0.00	1.63	0.41	0.01	0.03	0.02	27.57	0.09	0.48	-0.20	98.52
RL-08-66-C2	0.00	0.00	0.00	0.01	32.00	32.32	0.00	0.00	3.45	0.54	0.09	0.01	0.03	27.97	0.02	1.24	-0.52	97.16

RL-08-66-C3	0.00	0.00	0.00	0.05	31.64	33.43	0.00	0.00	2.38	0.57	0.06	0.08	0.01	28.10	0.01	0.79	-0.33	96.78
RL-08-66-C4-1	0.00	0.07	0.00	0.03	31.72	33.72	0.00	0.00	2.23	0.67	0.15	0.07	0.03	27.84	0.01	0.48	-0.20	96.81
RL-08-66-C4-2	0.00	0.01	0.00	0.05	31.90	31.96	0.08	0.00	3.36	0.85	0.06	0.22	0.03	27.93	0.01	1.09	-0.46	97.08
RL-08-66-C3-2	0.00	0.00	0.00	0.00	31.90	32.68	0.01	0.00	2.97	0.51	0.07	0.07	0.04	28.11	0.00	1.01	-0.42	96.94
Jersey Emerald										0.00								
RL-10-31C-1.3	0.00	0.02	0.03	0.00	31.42	35.98	2.32	0.00	0.58	1.31	0.00	0.20	0.00	27.53	0.01	0.38	-0.16	99.62
RL-10-31C-1.4	0.00	0.00	0.17	0.00	31.15	36.47	0.72	0.00	0.52	1.06	0.02	0.47	0.00	26.99	0.01	0.24	-0.10	97.72
RL-10-31C-3.1	0.00	0.00	0.12	0.03	31.30	36.09	0.77	0.00	0.43	0.90	0.01	0.22	0.00	27.52	0.01	0.21	-0.09	97.52
RL-10-31C-2.1 (core, *j*)	0.00	0.03	0.08	0.04	31.19	36.21	3.43	0.00	0.31	0.95	0.01	0.44	0.01	27.02	0.02	0.32	-0.13	99.92
RL-10-31C-2.2 (rim, *k*)	0.00	0.00	0.14	0.05	32.15	28.93	0.73	0.01	5.97	0.68	0.00	0.03	0.00	28.34	0.01	2.17	-0.92	98.30
RL-10-31C-1.1	0.00	0.00	0.11	0.09	31.10	35.95	1.98	0.00	0.49	1.05	0.02	0.40	0.02	27.40	0.01	0.29	-0.12	98.79
RL-10-31C-3.2	0.00	0.05	0.24	0.01	32.09	29.48	0.61	0.03	5.42	0.83	0.03	0.06	0.00	28.51	0.00	1.91	-0.81	98.47
RL-10-27A-1.3	0.00	0.01	0.12	0.06	31.99	31.44	0.90	0.01	4.03	0.79	0.02	0.04	0.01	28.05	0.01	1.60	-0.67	98.38
RL-10-27A-6	0.00	0.05	0.02	0.04	31.91	31.12	1.13	0.07	3.69	1.47	0.00	0.02	0.00	28.10	0.13	1.31	-0.55	98.52
RL-10-27A-1.1	0.00	0.00	0.05	0.00	31.80	35.10	0.72	0.00	1.24	1.26	0.00	0.09	0.00	27.84	0.02	0.29	-0.12	98.29
RL-10-27A-1.2	0.00	0.04	0.03	0.01	31.71	35.21	0.71	0.00	1.21	1.21	0.00	0.09	0.00	27.72	0.01	0.58	-0.25	98.29

Appendix B-10 Line Numbers	MoO_3	WO_3	Nb_2O_5	Ta_2O_5	SiO_2	TiO_2	ZrO_2	SnO_2	Al_2O_3	Fe_2O_3	Y_2O_3	Ce_2O_3	Yb_2O_3	CaO	MnO	F	F=O	Totals
RL-10-27B-1.1	0.00	0.00	0.06	0.03	32.03	33.87	0.13	0.00	2.94	0.26	0.00	0.01	0.00	28.33	0.05	1.06	-0.44	98.32
RL-10-27B-2.2	0.00	0.00	0.01	0.00	32.02	33.72	0.20	0.00	2.70	0.74	0.01	0.02	0.03	28.41	0.04	0.95	-0.40	98.45
RL-10-27B-4.1	0.00	0.00	0.03	0.01	32.07	32.54	0.27	0.01	3.42	0.77	0.02	0.05	0.00	28.41	0.01	1.05	-0.44	98.22
RL-10-27B-4.2	0.00	0.02	0.01	0.01	31.90	35.60	0.00	0.00	1.76	0.36	0.00	0.02	0.00	28.53	0.01	0.57	-0.24	98.56
RL-10-27G-3.1	0.00	0.00	0.07	0.04	32.03	31.32	0.07	0.00	4.14	0.75	0.09	0.03	0.01	28.30	0.02	1.18	-0.50	97.57
RL-10-27G-4.1	0.00	0.06	0.53	0.04	31.64	33.07	0.18	0.03	2.86	0.79	0.17	0.02	0.03	27.85	0.06	0.88	-0.37	97.84
RL-10-27G-3.2	0.00	0.01	0.04	0.03	32.11	30.34	0.15	0.02	4.84	0.91	0.05	0.02	0.02	28.28	0.03	0.78	-0.33	97.29
RL-10-27G-4.2	0.00	0.00	0.13	0.03	31.91	31.99	0.88	0.02	3.92	0.55	0.03	0.04	0.01	28.06	0.02	1.01	-0.43	98.18
RL-10-27G-6.3	0.00	0.00	0.02	0.00	31.92	36.05	0.07	0.00	1.54	0.42	0.01	0.03	0.01	28.16	0.02	0.70	-0.30	98.66
RL-10-27G-1.2	0.00	0.00	0.03	0.00	31.72	35.19	0.23	0.00	1.59	0.36	0.00	0.02	0.02	28.14	0.01	0.66	-0.28	97.68
minimum of all titanite from hornfels	0.00	0.00	0.00	0.00	30.33	28.93	0.00	0.00	0.31	0.00	0.00	0.01	0.00	25.50	0.00	0.21	-0.92	94.88
maximumof all titanite from hornfels	0.00	0.15	0.53	0.09	32.45	37.18	3.43	0.34	5.98	1.47	1.06	0.59	0.18	28.73	0.13	2.17	-0.09	99.92
minimum of all titanites	0.00	0.00	0.00	0.00	29.85	22.66	0.00	0.00	0.31	0.00	0.00	0.00	0.00	25.50	0.00	0.00	-1.57	94.88
maximumof all titanites	0.02	0.17	7.33	0.55	32.99	37.18	3.43	1.00	9.82	4.05	1.06	0.59	0.18	29.49	0.37	3.72	0.00	100.07

All the values of 0.00 mean lower than detect limits. Electron microprobe data.

Appendix C:

The trace elements and rare earth elements compositions of titanite

Appendix C-1 samples	Na	B	Sr	V	P	Cu	As	Sb	Pb	Sn	Y	Th	U	W	Mo	Nb	Ta	Zr	Hf	Th/U
Magmatic																				
The core of magmatic titanite from Boss Mountian																				
RL-10-5-1.3B	780.8	14.1	33.4	612.9	326.5	10.7	6.9	0.3	6.3	65.0	2853.3	383.0	95.9	2.7	85.4	1298.5	202.6	1093.8	99.2	3.99
RL-10-5-6B(*a*)	0.0	0.0	37.4	641.7	379.3	23.9	6.5	0.2	11.3	58.1	2952.2	456.6	103.9	4.3	119.9	1063.4	100.4	789.4	75.5	4.40
RL-10-14-9.2B	258.0	0.0	24.6	581.1	0.0	18.1	8.7	0.2	13.9	84.3	2709.7	643.7	168.4	7.9	160.6	2054.2	464.5	1050.9	103.5	3.82
RL-10-5-1.2B	1254.9	16.5	38.2	636.2	306.6	11.1	9.4	0.9	7.8	44.3	3884.8	344.6	87.6	3.5	82.7	892.7	110.6	792.9	63.8	3.93
RL-10-5-4B	919.0	17.6	34.9	574.2	392.1	22.1	7.3	0.1	9.1	57.4	2826.8	488.3	109.7	4.0	92.7	1267.4	206.2	854.2	69.5	4.45
RL-10-14-2B	943.3	10.0	27.6	557.7	0.0	16.3	11.8	0.5	19.4	79.3	2900.4	883.0	236.8	9.2	173.7	1716.4	249.2	1055.3	107.1	3.73
The rims of magmatic titanite from Boss Mountian																				
RL-10-5-1.3D	564.1	21.0	31.3	652.3	256.7	10.9	6.2	0.0	6.7	36.9	1876.8	223.9	69.5	1.9	54.4	482.2	66.8	673.8	49.2	3.22
RL-10-5-6D(*b*)	0.0	0.0	20.2	646.0	93.5	17.3	0.0	4.4	8.8	49.8	1612.3	271.9	132.6	4.7	38.2	335.5	18.7	211.3	31.0	2.05
RL-10-14-9.2D	164.5	13.5	26.9	647.4	0.0	26.5	0.0	0.2	13.6	41.6	1900.5	271.8	146.7	4.1	105.1	498.3	47.4	523.2	41.7	1.85
RL-10-5-1.2D	1046.9	23.3	31.2	671.7	235.6	11.9	5.9	0.2	6.8	30.8	2114.8	229.4	72.4	2.9	68.7	524.1	52.1	720.4	55.0	3.17
RL-10-14-9.1D	586.7	16.5	21.6	587.0	0.0	18.4	7.0	0.5	10.6	48.2	1810.7	334.2	123.4	5.2	91.0	412.7	42.1	509.7	42.2	2.71
RL-10-14-6D	268.2	0.0	20.7	553.6	0.0	10.3	5.6	0.4	10.1	48.0	2494.0	274.0	110.6	3.5	84.4	407.2	55.5	504.4	37.8	2.48
RL-10-14-2D	849.8	10.2	21.0	567.0	0.0	17.9	10.2	1.1	12.9	50.9	1896.5	422.5	180.0	8.1	113.5	629.3	54.9	526.4	49.7	2.35
RL-10-14-2D2	373.8	9.8	22.4	472.4	0.0	13.3	7.0	0.5	15.0	51.2	2391.2	477.3	171.7	6.1	140.2	777.9	79.5	489.1	46.3	2.78
minimum	0.0	0.0	20.2	472.4	0.0	10.3	0.0	0.0	6.3	30.8	1612.3	223.9	69.5	1.9	38.2	335.5	18.7	211.3	31.0	1.9
Maximum	1254.9	23.3	38.2	671.7	392.1	26.5	11.8	4.4	19.4	84.3	3884.8	883.0	236.8	9.2	173.7	2054.2	464.5	1093.8	107.1	4.5

The cores of magmatic titanite from Ray Gulch																				
RL-08-61-5upB	0.0	20.0	30.4	499.5	366.2	13.5	9.1	0.6	30.6	271.5	477.2	623.4	577.8	231.3	22.5	2604.0	97.1	1201.3	38.5	1.08
RL-08-61-5dB	147.1	27.1	25.2	400.2	252.6	0.0	10.3	0.6	26.3	227.3	1639.1	366.1	534.9	109.4	53.7	5908.2	230.9	1043.1	51.8	0.68
RL-08-61-6B	0.0	27.2	30.5	428.6	185.2	16.5	14.8	0.8	25.5	293.3	3139.4	357.2	646.8	102.6	90.2	7917.8	428.8	943.9	47.4	0.55

Appendix C-2 samples	Na	B	Sr	V	P	Cu	As	Sb	Pb	Sn	Y	Th	U	W	Mo	Nb	Ta	Zr	Hf	Th/U
RL-08-51-11-1B	0.0	15.1	27.2	327.3	103.2	12.5	2.9	0.2	23.4	337.9	6135.7	300.5	299.1	77.6	10.1	4987.8	153.0	741.3	58.4	1.00
RL-08-51-11-2B	97.0	14.3	27.6	337.7	259.8	13.0	3.6	0.5	20.7	262.3	3879.0	273.6	338.7	119.8	7.6	3612.8	96.8	1154.2	60.8	0.81
RL-08-51-1-1B	186.4	27.1	29.3	341.1	75.3	9.3	1.2	0.5	11.8	253.4	7721.6	139.9	152.7	40.7	6.4	2654.1	72.6	236.0	14.3	0.92
The rims of magmatic titanite from Ray Gulch																				
RL-08-61-5upD	0.0	20.5	27.0	550.9	84.3	15.2	4.9	0.5	16.5	124.6	436.4	159.1	168.2	28.6	11.1	593.9	41.4	895.5	42.1	0.95
RL-08-61-5dD	0.0	23.4	20.3	453.2	110.1	0.0	5.6	0.4	15.2	130.3	450.6	125.6	168.4	26.5	14.2	1087.8	77.1	697.4	46.5	0.75
RL-08-61-6D	0.0	33.5	24.1	463.2	50.1	10.8	8.8	0.7	15.7	172.1	1309.3	148.5	286.8	36.3	73.3	1829.0	145.1	350.6	22.2	0.52
RL-08-51-11-1D	0.0	25.9	25.2	368.8	71.2	10.9	0.0	0.3	14.8	195.7	911.1	78.1	109.3	25.0	5.9	1236.2	49.9	289.3	17.8	0.71
RL-08-51-11-2D	476.2	27.4	25.3	302.2	70.0	13.3	2.2	0.3	12.5	193.6	884.4	111.0	176.7	42.3	6.3	1531.1	57.1	224.0	17.1	0.63
RL-08-51-1-1D	93.7	25.4	23.9	388.0	70.9	11.9	1.5	0.4	8.7	180.9	1171.4	90.8	126.4	24.5	5.9	1221.5	41.8	254.0	17.9	0.72
minimum	0.0	14.3	20.3	302.2	50.1	0.0	0.0	0.2	8.7	124.6	436.4	78.1	109.3	24.5	5.9	593.9	41.4	224.0	14.3	0.52
Maximum	476.2	33.5	30.5	550.9	366.2	16.5	14.8	0.8	30.6	337.9	7721.6	623.4	646.8	231.3	90.2	7917.8	428.8	1201.3	60.8	1.08
Hydrothermal																				
Hydrothermal titanite from a quartz vein at Boss Mountian																				
RL-10-6-1N	781.0	12.8	19.8	607.0	103.9	891.0	15.4	3.9	7.8	1.3	9.3	0.29	1.4	243.3	21.8	88.3	3.8	10.5	0.8	0.21
RL-10-6-3N	0.0	15.2	13.4	748.6	190.7	2380.1	16.1	2.2	3.3	2.7	3.7	0.7	2.2	62.1	15.2	161.2	3.2	143.1	5.2	0.31
Hydrothermal titanite in granodiorite from Max																				
RL-10-38A-2-1B	0.0	0.0	16.8	620.7	0.0	15.1	0.0	0.2	7.0	91.1	111.0	1.7	6.4	5.2	0.0	2143.9	242.5	82.4	2.5	0.27
RL-10-38A-3(*c*)	497.4	11.1	25.5	504.3	0.0	21.7	0.0	0.4	3.4	60.7	27.9	0.25	5.6	19.4	0.0	1069.3	37.4	24.6	1.1	0.05
RL-10-38A-4	605.9	9.5	21.6	486.3	0.0	12.6	4.0	1.0	5.4	100.5	25.7	1.7	6.8	40.6	0.0	1999.0	82.3	34.6	1.4	0.26
RL-10-38A-2-2D	229.5	12.0	16.9	580.4	0.0	22.5	0.0	0.1	8.2	53.5	68.1	3.2	30.0	58.0	0.0	1312.8	70.8	68.9	1.7	0.11
Hydrothermal titanite in molybdenite quartz from Northern Dancer																				
X10-1	699.9	10.7	44.1	1793.9	110.3	28.5	5.5	0.3	8.7	668.3	1087.9	106.8	146.2	25.0	50.3	1422.8	15.8	697.6	37.6	0.73
X10-3	878.8	0.0	38.8	1698.1	0.0	25.1	0.0	0.3	8.3	739.2	965.1	111.6	117.4	21.9	31.0	1268.9	13.1	459.4	28.8	0.95

X10-2	866.9	0.0	42.0	1522.5	0.0	24.0	4.2	0.2	6.1	484.2	731.9	63.2	94.3	18.1	39.7	844.8	8.0	459.0	17.7	0.67

Appendix C-3 samples	Na	B	Sr	V	P	Cu	As	Sb	Pb	Sn	Y	Th	U	W	Mo	Nb	Ta	Zr	Hf	Th/U
Hydrothemal titanite in a scheelite-quartz vein from Northern Dancer																				
X12-2	333.9	0.0	41.5	725.2	0.0	7.9	9.1	0.7	11.5	646.5	2115.0	32.3	188.1	75.7	57.9	5455.5	11.2	951.3	23.5	0.17
X12-1(*d*)	501.4	0.0	33.4	705.4	0.0	8.2	2.5	0.5	5.2	415.5	1841.6	28.2	97.6	49.5	37.5	5967.7	54.8	416.0	19.6	0.29
Minimum	0.0	0.0	13.4	486.3	0.0	7.9	0.0	0.1	3.3	1.3	3.7	0.25	1.4	5.2	0.0	88.3	3.2	10.5	0.82	0.05
Maximum	878.8	15.2	44.1	1793.9	190.7	2380.1	16.1	3.9	11.5	739.2	2115.0	111.6	188.1	243.3	57.9	5967.7	242.5	951.3	37.6	0.95
Skarn																				
Risby																				
RL-08-40-1-1	0.0	18.9	31.2	694.8	0.0	0.0	0.0	1.1	12.5	79.4	284.9	25.2	128.6	25.4	6.3	434.4	44.0	138.8	6.9	0.20
RL-08-40-1-2	0.0	0.0	121.6	1518.6	0.0	0.0	0.0	0.6	28.6	462.3	361.3	81.9	209.1	85.6	11.4	576.3	45.8	614.4	24.1	0.39
RL-08-40-7-1	1876.0	0.0	147.4	617.6	0.0	24.1	34.3	0.5	15.0	636.5	112.7	4.4	89.2	42.6	0.0	2107.2	14.1	136.0	10.0	0.05
RL-08-40-7-2	3835.9	0.0	24.9	1150.0	0.0	29.7	80.2	0.0	16.7	887.7	162.5	29.2	124.9	73.1	9.2	1219.1	41.3	310.2	14.5	0.23
RL-08-40-7-3	1474.1	0.0	13.1	211.6	0.0	0.0	28.1	0.0	9.9	1002.9	60.5	2.7	144.0	83.0	10.3	2696.4	124.2	340.9	17.8	0.02
RL-08-43-1-1	307.4	22.5	5.0	290.3	0.0	10.7	0.0	0.2	3.9	856.8	568.2	3.7	92.4	65.0	4.8	1736.2	13.5	156.7	11.1	0.04
RL-08-43-1-2	254.3	12.4	4.0	121.4	0.0	5.9	0.0	0.2	4.2	759.1	153.1	3.8	89.8	66.8	2.6	1186.4	10.2	214.6	19.6	0.04
RL-08-43-5	425.9	18.7	14.1	760.4	0.0	7.3	2.5	0.0	6.1	633.5	737.5	6.5	93.1	33.5	6.6	486.1	29.7	437.7	15.2	0.07
RL-08-43-4-2	0.0	11.9	13.4	222.1	125.5	7.5	0.0	0.2	4.3	108.4	845.0	3.9	43.6	54.8	2.2	304.6	12.0	132.3	4.1	0.09
RL-08-43-7	264.8	43.7	4.9	212.0	0.0	7.4	3.1	0.0	7.6	960.9	541.1	3.3	134.9	69.9	6.2	544.5	10.3	200.0	12.6	0.02
RL-08-43-8-2	98.0	50.1	6.2	167.5	0.0	6.7	0.0	0.1	5.6	934.9	445.7	5.1	108.4	85.5	5.5	1432.8	10.5	203.9	17.8	0.05
RL-08-43-8-1	628.2	31.0	19.2	178.7	0.0	3.7	0.0	0.0	7.6	830.6	788.5	3.7	75.2	53.3	4.0	1738.3	14.8	142.2	13.3	0.05
Ray Gulch																				
RL-08-60-6-1	58.5	6.6	24.8	347.4	0.0	9.9	4.8	3.7	19.4	1647.5	782.4	210.5	603.9	336.8	53.3	396.8	15.1	1569.9	53.4	0.35
RL-08-60-6-2	62.8	7.3	58.0	213.1	0.0	10.5	4.8	3.0	12.3	1394.3	3234.2	81.2	310.6	173.3	39.1	921.4	58.9	915.3	37.3	0.26
RL-08-60-8-1	64.4	24.3	22.6	180.9	41.2	9.4	3.8	2.9	9.2	730.9	3012.2	16.7	203.2	164.5	37.2	626.8	44.6	1213.5	41.5	0.08
RL-08-60-8-2	254.2	17.8	31.3	351.8	0.0	11.9	4.0	3.1	9.5	904.2	3048.5	62.5	235.6	201.5	40.2	1170.0	126.2	2759.5	101.7	0.27
RL-08-62-2	814.8	11.3	20.0	111.5	0.0	14.4	5.7	2.2	30.0	1446.1	1343.4	95.2	561.2	473.4	147.6	1533.2	63.9	1984.9	66.0	0.17

Appendix C-4 samples	Na	B	Sr	V	P	Cu	As	Sb	Pb	Sn	Y	Th	U	W	Mo	Nb	Ta	Zr	Hf	Th/U
RL-08-62-8-1	733.7	0.0	20.5	116.8	0.0	15.5	4.8	2.0	17.8	1038.8	971.4	71.1	396.9	344.6	106.9	1371.6	74.3	1979.6	71.1	0.18
RL-08-62-8-2	0.0	18.1	17.9	133.5	0.0	8.1	0.0	1.6	17.6	1869.3	1088.7	54.9	386.5	498.9	128.6	1437.2	57.1	2251.5	66.8	0.14
Mactung																				

RL-08-70-1	0.0	38.0	4.0	553.0	989.1	0.0	0.0	0.5	13.8	1504.5	3776.6	8.6	158.4	111.3	16.5	3659.1	20.8	764.5	28.6	0.05
RL-08-70-2-1	0.0	0.0	5.7	327.4	0.0	0.0	0.0	0.3	16.0	1466.0	4363.0	8.0	175.7	137.1	13.9	1491.5	18.4	752.0	18.1	0.05
RL-08-70-2-2	0.0	0.0	3.7	336.1	0.0	0.0	0.0	0.0	13.2	1263.6	2695.4	5.7	116.6	82.6	9.0	2045.5	21.1	328.3	13.7	0.05
RL-08-70-4	0.0	19.1	4.8	154.6	0.0	13.3	9.8	0.3	16.3	1904.4	3899.7	2.9	153.5	136.8	17.1	1539.7	16.1	547.3	17.6	0.02
RL-08-72-7	0.0	22.3	4.2	617.9	90.6	6.6	0.0	0.0	18.4	1875.6	1359.2	35.0	237.5	147.6	15.9	10869.7	260.5	936.9	40.7	0.15
RL-08-72-8	0.0	19.6	7.5	608.6	0.0	9.0	0.0	0.2	13.0	1865.0	857.2	56.5	207.0	132.7	17.5	11049.6	539.2	695.2	32.8	0.27
RL-08-72-1	0.0	23.2	7.6	719.0	83.3	35.6	0.0	0.0	16.3	1864.5	1275.3	36.0	237.5	171.6	16.5	13174.4	1861.2	673.2	30.2	0.15
The cores from titanite from Fox																				
RL-10-16-6B(*f*)	968.8	11.3	126.5	238.6	63.8	15.8	5.7	0.6	5.3	18.6	434.6	4.5	13.4	16.3	0.6	1136.4	73.0	84.2	11.3	0.33
RL-10-16-4B	902.2	0.0	218.7	137.4	487.7	18.0	4.2	1.8	5.2	17.4	494.8	7.2	34.6	14.8	1.3	1039.4	53.6	80.5	5.2	0.21
The rims in the titanite from Fox																				
RL-10-16-6D(*g*)	1078.0	0.0	113.1	236.4	113.3	28.8	0.0	0.3	4.7	59.6	295.1	2.0	10.0	3.5	0.0	538.6	25.9	31.5	3.1	0.20
RL-10-16-4D	884.1	11.5	111.9	277.6	88.7	12.0	4.1	0.5	2.7	164.3	150.6	3.5	20.2	20.6	2.8	414.4	9.6	183.2	7.0	0.17
The cores from titanite from Max																				
RL-10-35-3B	341.8	0.0	18.5	260.4	0.0	12.5	0.0	0.1	0.9	532.2	51.4	0.4	11.3	67.0	1.7	654.9	51.6	1062.9	63.5	0.03
RL-10-35-2B	231.4	11.7	15.8	122.9	0.0	10.7	2.9	0.3	1.2	587.2	20.1	1.1	19.7	570.1	5.8	810.8	41.3	1146.5	105.4	0.06
The rims from titanite from Max																				
RL-10-35-3D	282.1	8.0	6.3	316.6	0.0	5.7	2.3	0.2	0.8	553.2	12.6	0.4	8.8	43.1	1.6	518.8	27.7	665.7	41.8	0.04
The cores from titanite from Jersey Emerald																				
RL-10-31E-1-1B	513.0	0.0	3.9	592.0	0.0	11.2	2.9	0.8	13.2	852.0	1639.4	24.8	221.5	42.0	54.4	23286.5	328.7	516.6	33.7	0.11
RL-10-31E-1-2B	616.1	0.0	3.2	605.9	0.0	11.1	2.6	0.6	12.1	810.4	411.3	28.6	273.3	54.2	42.6	19491.7	188.5	723.3	45.1	0.10
The rims from titanite from Jersey Emerald																				

Appendix C-5 samples	Na	B	Sr	V	P	Cu	As	Sb	Pb	Sn	Y	Th	U	W	Mo	Nb	Ta	Zr	Hf	Th/U
RL-10-31E-1-2D	212.5	16.2	6.3	551.5	0.0	20.3	1.8	0.6	7.1	1148.6	69.7	20.4	146.1	24.4	32.0	14194.8	330.8	385.2	32.4	0.14
RL-10-31E-4D	574.2	0.0	6.3	875.3	0.0	12.0	0.0	0.5	6.8	588.4	40.8	24.5	124.4	32.0	12.7	2592.9	23.1	324.7	28.4	0.20
Minimum	0.0	0.0	3.2	111.5	0.0	0.0	0.0	0.0	0.8	17.4	12.6	0.4	8.8	3.5	0.0	304.6	9.6	31.5	3.1	0.02
Maximum	3835.9	50.1	218.7	1518.6	989.1	35.6	80.2	3.7	30.0	1904.4	4363.0	210.5	603.9	570.1	147.6	23286.5	1861.2	2759.5	105.4	0.39
Hornfels																				
The cores from titanite from Jersey Emerald																				
RL-10-31C-2B(*j*)	1806.6	0.0	543.6	230.0	169.7	20.3	6.1	0.1	7.0	62.0	132.5	60.1	20.8	5.9	0.5	454.9	52.2	3772.8	104.6	2.89
RL-10-31C-1B	1159.7	31.4	223.3	371.7	0.0	14.0	13.0	0.1	5.2	71.2	121.0	53.1	10.9	3.3	0.3	600.7	56.1	4109.2	136.5	4.87

The rims from titanite from Jersey Emerald

RL-10-31C-2D	1235.5	4.2	1259.5	515.4	107.2	23.6	0.9	0.1	2.9	215.4	137.3	45.9	27.3	78.8	0.6	1640.3	78.6	433.4	11.3	1.68
RL-10-31C-1D(*k*)	879.1	9.3	158.6	388.2	0.0	19.4	3.2	0.0	3.4	61.2	139.3	30.1	7.5	4.2	1.6	306.2	11.5	2235.6	57.2	4.00
Minimum	0.0	0.0	3.2	111.5	0.0	0.0	0.0	0.0	0.83	1.3	3.7	0.25	1.4	1.9	0.0	88.3	3.2	10.5	0.82	0.0
Maximum	3835.9	50.1	1259.5	1793.9	989.1	2380.1	80.2	4.4	30.6	1904.4	7721.6	883.0	646.8	570.1	173.7	23286.5	1861.2	4109.2	136.5	4.9

All the values of 0.00 mean lower than detect limits. LA-ICP-MS data.