Notes on some Ti and Zr chemistry from some "dolerites' from the Groundrush area

Seventeen analyses were supplied, including two repeats and one greywacke, leaving 14 individual igneous analyses. No location data was supplied and the samples were not assumed to be fresh. Major element analysis was by XRF.

Ti/Zr ratios are commonly used to determine lithology in mafic/intermediate rocks. The Table below gives the Ti/Zr ratios and interpreted rock type.

Sample	Ti/Zr	Rock Type
231	59	Intermediate/mafic boundary
257	22	Intermediate
306	94	Mafic
314	187	Mafic
327	44	Intermediate
328	99	Mafic
338	67	Mafic
566	108	Mafic
1155	115	Mafic
1209	104	Mafic
1212	50	Intermediate
1219	89	Mafic
1230	60	Intermediate/mafic boundary
1234	64	Mafic

The Ti and Zr data were plotted on a graph with the data from Groundrush drillholes GHD 8, 60 and 62. Samples can be placed into three groups on this diagram.

Firstly, sample 257, with a Ti/Zr ratio of 22, lies on the diorite trend and plots close to a group of veined and brecciated diorite samples from GHD 62. These samples preserve the Ti/Zr ratios of the igneous rock but have lower abundance of these elements, due to dilution with, in this case, quartz vein material. This sample reports high CO2 and acid-soluble Ca, probably indicating dilution with carbonate veining. It should be followed up.

Secondly, a group of samples shows the same ratios as the dolerites from GHD 8, 60 and 62. A third group of samples has Ti/Zr ratios not seen in the research dataset. Either these represent a distinct mafic association or there has been some modification of the Ti/Zr ratios.

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u57467 25	230304 230																																
GR172	14 904Au(AR)	Au(AB)	Au(AB)	As	Cu	РЬ	Zn	Ni	Bi	Mo	Fe	Ca	Mn	SP	Si	AI	Ca	Fe	К	Ma	Na	Р	8	Ti	Ba	Zr	Υ	Ni	Nb	Cr	C02	-75um	Wt Tota
UNITS	ppb	ppb	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	2	X	ppm	ppm	2	X	2	ž	2	2	2	2	2	2	ppm	ppm	ppm	ppm	ppm	ppm	2	2	Grams
DETECTION	1	1		0.2	0.5	1	1	1	0.02	0.1	0.01	0.01		0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.001	0.001	0.001	20	5	10	5	10	5	0.1	0,1	1
METHOD	AR001	AR001	AR001	AR102	AR101	AR102	AR101	I AR101	AR102	AR102	AR101	AR101	AR101	AR102	XRF204	XRF204	XRF204	XRF204	XRF204	XRF204	XRF204	XRF204	XRF204	XRF204	XRF204	XRF204	XRF204	XRF204	XRF204	XRF204	TC001	PR000	Weight
CO FINISHED																																	
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BLANK 1_u57467	Х	-	X	X	X	X	X	X	X	X	Х	X	X	Х	46.6	X	X	Х	X	0.01	X	0.003	0.011	X	Х	10	Х	Х	20	X	X	-	
231	26	32	27	8.2	321	5	58	4	0.26	0.7	6.22	1.68	679	0.14	25.2	6.2	4.17	12.1	0.64	1.6	2	0.174	0.545	1.147	180	195	120	40	20	55	0.6	-	3010
257	3	-	•	4.8	53.5	7	35	26	0.1	0.3	5.76	3.24	1250	0.14	25.9	6.29	5.5	8.52	0.68	2.1	1.29	0.024	0.017	0.219	520	100	240	40	Х	105	3.7		426
306	6	-		8	136	2	49	24	0.08	0.3	4.35	1	430	0.04	23.9	7.22	5.19	10.3	0.35	3.51	1.94	0.079	0.069	0.893	240	95	370	60	X	95	0.3	-	3270
314	12	12	12	9.2	423	7	48	39	0.44	0.3	5.65	1.05	370	0.12	8.99	8.99	8.99	8.99	8.99	8.99	1.29	0.062	0.411	1.312	80	70	860	70	Х	80	0.2	-	2420
327	6	-	•	2.4	87	8	45	38	0.04	0.3	4.56	0.83	434	0.06	26.8	7.51	3.67	8.33	0.83	2.33	2.31	0.07	0.013	0.633	600	145	270	60	Х	115	X	-	1380
327 Rpt	5	-	-	2.2	84.5	8	47	37	0.04	0.3	4.63	0.83	421	0.06	26.7	7.47	3.66	8.33	0.82	2.32	2.31	0.07	0.017	0.631	620	14 0	270	60	10	115	X	-	
328	4	-		8.2	135	3	42	27	0.06	0.5	3.73	1.43	384	0.08	23.4	7.37	6.1	10.2	0.72	3.52	2.11	0.077	0.049	0.888	140	90	370	80	X	105	0.6	-	1780
338	2	-	•	3.2	156	4	67	33	0.04	0.6	5.46	1.56	677	0.06	24.4	7.13	5.21	9.5	0.97	2.75	1.96	0.085	0.083	0.734	280	110	370	55	10	35	1.1	-	2610
566	1	2	2	1.6	109	11	58	46	0.46	0.4	3.21	1.62	1220	0.04	24.5	8.53	4.92	7.41	1.39	2.71	2	0.056	0.005	0.812	380	75	230	75	X	65	0.8		958
1155	2	-	-	0.8	133	X	31	27	0.08	0.3	2.76	1.67	552	0.04	23.2	7.14	6.63	9.56	0.54	3.93	1.96	0.056	0.005	0.745	160	65	320	85	X	160	1.5	-	1890
1188 (GYWK??)	X	-	•	1.2	92	X	38	59	0.06	0.4	6.62	0.24	3070	0.08	26.8	8.35	0.37	7.7	1.99	2.88	1.34	0.042	0.005	0.412	720	60	200	65	X	55	X	-	1680
1209	1	1	•	0.8	247	2	63	26	0.06	0.6	7.58	1.24	781	0.04	23.3	6.67	4.32	11.8	1.03	3.14	1.92	0.082	0.114	1.091	260	105	780	45	X	55	1	90.2	2480
1212	X	X	•	1.6	44.5	7	121	4	0.02	0.8	7.92	1.46	976	0.06	26.3	6.73	3.66	10.1	1.43	1.28	2.31	0.149	0.095	0.87	320	175	170	15	20	15	1	-	2240
1219	X	-	•	0.8	47	7	76	62	Х	Х	2.29	0.85	413	0.06	23.3	7.7	7.23	6.97	0.68	5.01	1.66	0.028	0.003	0.4	160	45	220	135	X	585	X	-	2630
1230	X	-	•	2	112	4	27	18	0.06	0.2	2.34	1.12	309	0.04	25.5	7.43	6.02	8.41	0.81	2.88	1.71	0.052	0.012	0.508	200	85	280	50	X	30	0.2		3260
1234	1	-	•	0.8	137	1	67	41	0.02	0.3	5.66	0.71	831	0.04	25.1	7.71	4.8	9.13	0.98	2.38	2.24	0.089	0.004	0.707	240	110	340	60	X	30	X	-	2260
1234 Rpt	1	-	•	0.8	140	1	65	41	0.02	0.3	5.59	0.7	822	0.04	25.1	7.69	4.78	9.13	0.97	2.38	2.24	0.03	0.004	0.713	280	110	350	65	X	30	0.1	-	
Gannet ST 257	19	19	19	13.8	44	36	36	28	0.34	3.7	1.07	0.17	67	1	-	-	-	-	-	-	-	-	-	-	-	-	-		-		-	-	-
ST 1.1_u57467	18	19	19	13.2	42.5	35	37	27	0.32	9.7	1.09	0.18	71	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SARM-3	•	-	•		-	-		-	-	•	-	-	•	-	24.5	7.2	2.3	6.93	4.58	0.17	6.21	0.024	0.064	0.28	440	11000	90	30	980	10	-	-	-
<u>ST 1.2_u57467</u>		-	•	•	•	•	•	-	-	•	-	-	•	-	24.3	7.19	2.3	6.94	4.53	0.16	6.21	0.024	0.062	0.287	440	11000	90	30	1010	10	-	•	-
0.5% Carbon for CS	Analyse	-	•		•	•		-	-	•	-	-	•	-	-	-	-	-	-	•	-	-	-	-	-		-		-		1.8		-
<u>ST 1.3_u57467</u>		-	•		-	-		-	-	•	-	-	·	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.8	-	-
Gannet ST33	870	870	870	55	720	100	250	82	1.4	0.8	0.64	0.44	110	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<u>ST 2.1_u57467</u>	876	-	•	53.8	755	105	251	84	1.4	0.9	0.65	0.48	115	1.18	-	-	-	-	-	<u> </u>	-	-	-	-	-	•	-	-	-	•	-	-	-
SARM-2	•	-	•	-	-	-	•	-	-	•	-	-	· ·	-	29.7	9.16	0.49	0.98	12.7	0.28	0.32	0.052	0.004	0.026	2420	20		5		25	-	-	-
ST 2.2_u57467	· ·	-	•	-	-	-	•	-	-	•	-	-	· ·	-	29.7	9.16	0.49	0.97	12.7	0.26	0.37	0.05	0.005	0.024	2420	20		10	20	25	• •	-	-
1.0% Carbon for CS	Analyse	-	•	-	-	-	•	-	-	•	-	-	· ·	-	-	-	-	•	•		•	-	-	•	-	•	-	•	-	•	3.7	-	-
<u>ST 2.3_u57467</u>		-	•	<u> </u>	-	-	<u> </u>	-			-	-	<u> </u>	-	-	-	-	-	-	-	-	-	-	-	-	•		•	-	•	3.5	-	-
Gannet ST270	2520	2520	2520	184	650	200	725	86	8.1		3.98	1.8	1120	6.22	-	-	-	-	-		-	· ·	-	-	-	•	-	•	-	·	-	-	-
<u>ST 3.1_u57467</u>	2500	-	•	190	660	199	755	87	8.04	30	3.9	1.81	1140	5.86	•	•	-	•	-		-	•	<u> </u>	-	-	•	-	· ·	-	•	-	-	-
SARM-5	•	-	•	-	-	-	•	-	-	•	-	-	<u> </u>	-	23.9	2.21	1.9	8.89	0.07	15.3	0.27			0.12		10	250	555	-	24000	-	-	-
<u>ST 3.2_u57467</u>		-	•	-	-	-	•	-	-	•	-	-	· ·	-	23.8	2.23	1.89	8.81	0.07	15.2	0.31	0.007	0.011	0.109	100	10	270	555	<u> </u>	24100	•	-	-
Calcium Carbonate	for CS-2-	-	•	-	-	-	•	-	-	•	-	-	· ·	-	-	-	-	•	•	<u> </u>	•	-	-	-	-	•	-	•	-	•	44.1	-	-
<u>ST 3.3_u57467</u>	-	-	· ·	-	-	-	•	-	-	•	· ·	-	<u> </u>	-	-	-	-	-	-	-	-	· ·	-	-	-	•	-	-	-	-	42.5	-	-