

Provenance of the Ordovician–lower Silurian Tumblagooda Sandstone, Western Australia

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SUPPLEMENTARY PAPERS

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Table 1 Grain counts for the Tumblagooda Sandstone: Qt (total quartzose grains) = Qm (monocrystalline quartz >62.5 µm + polycrystalline quartz such as quartzite >62.5 µm) + Qp (polycrystalline quartz such as chert >62.5 µm); F (total feldspar grains); L (unstable rock fragments = Lithics).

Table 2 Chemical composition (wt%) for tourmalines of Tumblagooda Sandstone (samples GSWA 118300: grains 1 to 34 and GSWA 1813266: grains 35 to 68).

Table 3 Tourmaline analyses from Tumblagooda Sandstone, the Capricorn Orogen, Yilgarn Craton and the Pilbara Craton.

Table 1 Grain counts for the Tumblagooda Sandstone; Quartzose grains: Qt (total quartzose grains) = Qm (monocrystalline quartz >62.5 µm + polycrystalline quartz such as quartzite >62.5 µm) + Qp (polycrystalline quartz such as chert >62.5 µm); feldspar grains: F (total feldspar grains); L (unstable rock fragments = Lithics).

Studied Section	Sample Number	Depth or Height (m)	Qt			F		L	Minerals							Cement				Total Counts
			Qm	Qp					Muscovite	Biotite	Chlorite	Opaque	Tourmaline	Zircon	Rutile	Clay	Calcite	Iron oxide	Quartz	
			Quartz	Quartzite	Chert	K-Feldspar	Plagioclase	Slate												
Red Bluff Coastal range	181284	23.50	449	24	1	74	1	0	4	0	0	0	0	0	0	24	0	0	24	600
	181283	23.00	258	2	0	53	1	0	3	1	0	5	1	1	0	4	0	270	0	600
	181282	21.00	308	6	0	57	0	0	8	2	0	24	2	0	0	0	0	193	0	600
	181281	20.00	346	4	1	92	2	0	2	0	0	0	5	17	2	129	0	0	0	600
	181280	19.80	362	16	0	58	0	0	1	0	0	0	0	0	0	6	0	0	158	600
	181279	18.50	393	102	4	49	0	0	0	0	0	0	0	0	1	6	0	0	45	600
	181278	17.80	469	64	2	58	0	0	0	0	0	0	0	0	0	7	0	0	0	600
	181262	17.75	287	4	0	38	0	0	1	0	0	11	0	0	0	19	0	240	0	600
	181277	17.40	324	6	0	53	1	0	4	4	0	0	0	1	0	0	0	206	0	600
	181276	16.75	289	13	1	53	0	0	1	1	0	18	1	1	0	78	0	143	0	600
	181275	16.00	261	6	0	19	1	0	1	0	0	0	1	2	0	15	0	294	0	600
	181274	13.70	497	10	3	28	0	0	5	0	0	0	3	1	1	52	0	0	0	600
	181273	13.50	344	19	1	43	0	0	0	0	0	1	0	0	0	4	0	188	0	600
	181272	12.20	339	98	2	52	0	0	1	0	0	0	0	0	0	40	0	0	67	600
	181271	11.50	289	9	1	45	0	0	2	1	0	38	1	0	0	14	0	199	0	600
	181300	11.01	355	8	2	44	0	0	1	0	0	23	2	2	1	18	0	144	0	600
	181270	11.00	460	32	0	38	1	0	0	0	0	0	0	0	0	39	0	0	30	600
	181269	10.25	407	57	0	26	1	0	0	0	0	0	0	0	0	38	0	0	71	600
	181267	9.50	446	61	1	36	0	0	0	0	0	0	0	0	0	24	0	0	32	600
	181268	9.00	493	20	0	24	0	0	0	0	0	0	0	0	0	34	0	0	29	600
	181288	8.50	502	14	2	62	0	0	3	2	0	0	0	0	0	14	0	0	0	600
181265	6.25	390	40	0	49	0	0	3	0	0	0	0	0	0	20	0	0	98	600	
181266	6.25	324	115	0	22	1	0	0	0	0	0	0	0	0	26	0	110	2	600	
181264	5.25	386	46	1	35	0	0	0	0	0	0	0	0	0	18	0	69	45	600	
181287	3.80	432	8	1	72	2	0	13	6	0	0	0	0	0	65	0	0	0	600	
181286	1.50	352	66	1	36	2	0	0	0	0	1	0	1	0	9	0	69	62	600	
Eagle Gorge	GW100	x	423	37	3	3	0	0	0	3	0	0	0	0	0	93	0	0	37	600
	GW101	x	368	25	0	6	6	0	0	0	0	0	3	3	0	97	0	25	66	600
	GW102	x	581	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	600
	GW103	x	344	3	0	12	0	0	0	3	0	0	0	0	0	164	0	3	70	600
	GW104	x	431	7	0	0	0	0	0	0	0	0	0	0	0	50	0	50	63	600
	GW105	x	324	0	0	12	0	0	0	0	0	0	0	0	0	0	0	264	0	600
Wendy-1 well	193112	317.90	502	9	0	15	0	0	12	3	0	3	0	0	0	55	0	0	0	600
	193113	319.60	372	12	0	69	27	6	9	0	3	0	3	0	0	99	0	0	0	600
	193114	378.40	360	0	0	66	39	0	24	0	3	0	0	0	0	108	0	0	0	600
	193115	381.40	285	0	0	30	21	0	57	0	0	0	0	0	0	108	54	45	0	600
	193117	470.90	324	0	0	27	42	0	0	0	0	0	0	0	0	165	33	9	0	600
	193118	481.50	354	0	0	45	36	0	9	0	0	0	3	0	0	114	36	3	0	600
	193119	557.20	339	0	0	33	42	0	12	0	0	0	0	0	0	12	0	162	0	600
	193120	607.10	553	3	0	9	3	0	0	0	0	6	3	3	0	16	3	0	0	600
	193121	612.10	303	3	0	21	9	0	0	0	0	9	3	3	0	152	67	30	0	600
	193123	649.50	537	6	0	0	0	0	3	0	0	0	0	0	0	30	0	24	0	600
	193124	741.50	507	6	0	75	12	0	0	0	0	0	0	0	0	0	0	0	0	600
	193126	825.50	447	6	0	51	30	0	0	9	0	0	0	3	0	15	0	3	36	600
	193127	827.90	255	0	3	33	3	0	0	0	0	3	0	3	0	0	0	294	6	600
	193128	832.30	384	3	0	60	24	0	9	39	0	0	0	0	0	12	0	39	30	600
	193129	851.70	411	3	0	45	27	0	6	0	0	12	3	3	0	0	0	81	9	600
	193131	895.50	333	9	0	126	9	0	3	3	0	0	0	0	0	9	0	18	90	600
	193132	906.60	378	3	0	84	0	0	0	0	0	3	0	0	0	0	0	132	0	600
	193133	915.70	453	0	0	45	18	0	0	0	0	0	0	9	0	0	0	75	0	600
	193134	926.60	369	9	0	48	6	0	0	0	0	0	0	0	0	138	0	30	0	600
	193135	951.50	288	0	0	45	6	0	0	0	0	0	0	0	0	9	0	252	0	600
	193136	966.60	363	12	0	0	0	0	0	0	0	0	0	0	0	42	12	147	24	600
	193137	976.90	348	12	0	30	0	0	3	0	0	0	0	0	0	72	0	105	30	600
	193138	1014.60	387	9	3	21	15	0	0	0	0	0	0	0	0	24	0	126	15	600
	193139	1054.30	314	9	3	0	0	0	0	0	0	3	3	3	0	44	0	201	19	600
	193140	1085.70	407	13	3	3	0	0	0	0	0	3	0	3	0	33	0	107	27	600
	193141	1092.50	309	16	3	0	0	0	0	0	0	0	0	0	0	51	0	155	66	600
	193142	1132.90	442	6	0	3	0	0	0	0	0	0	0	0	0	64	0	55	30	600
	193143	1151.20	430	10	3	40	7	0	0	0	0	3	3	3	0	17	0	33	50	600
	193144	1194.60	466	13	10	41	0	0	0	0	0	0	0	0	0	57	0	3	10	600
	193145	1206.10	392	16	0	16	6	0	0	0	0	0	0	0	0	16	0	114	41	600
	193146	1216.20	298	0	0	36	18	0	3	87	0	15	0	0	0	139	0	3	0	600

Table 2 Chemical composition (wt%) for tourmalines of Tumblagooda Sandstone (samples GSWA 118300: grains 1 to 34 and GSWA 1813266: grains 35 to 68).

Grain No.	Weight %											Atom per formula units based on 29 oxygens											Tourmaline	
	B ₂ O ₃	SiO ₂	TiO ₂	Al ₂ O ₃	FeO	MnO	MgO	CaO	Na ₂ O	K ₂ O	Total%	B	Si	Ti	Al	Fe	Mn	Mg	Ca	Na	K	Total	Type	
1	10.71	37.00	0.56	32.96	3.41	0.02	8.28	0.56	2.11	0.03	95.65	3.00	6.00	0.07	6.30	0.46	0.00	2.00	0.10	0.66	0.01	18.61	Dravite	
2	10.49	35.53	0.38	34.75	10.56	0.06	2.57	0.30	1.77	0.06	96.46	3.00	5.89	0.05	6.79	1.46	0.01	0.64	0.05	0.57	0.01	18.46	Schorl	
3	10.64	35.35	1.16	33.89	6.44	0.01	6.04	1.55	1.53	0.08	96.68	3.00	5.78	0.14	6.53	0.88	0.00	1.47	0.27	0.49	0.02	18.57	Dravite	
4	10.74	37.09	0.39	32.86	4.86	0.01	7.86	1.25	1.41	0.04	96.49	3.00	6.00	0.05	6.27	0.66	0.00	1.90	0.22	0.44	0.01	18.54	Dravite	
5	10.42	35.62	1.28	31.31	10.41	0.06	4.55	0.98	1.82	0.05	96.48	3.00	5.94	0.16	6.15	1.45	0.01	1.13	0.18	0.59	0.01	18.62	Schorl	
6	10.71	36.58	0.65	33.89	5.67	0.04	6.54	0.77	1.57	0.02	96.45	3.00	5.94	0.08	6.48	0.77	0.01	1.58	0.13	0.50	0.00	18.49	Dravite	
7	10.56	36.64	0.51	30.69	6.48	0.03	7.92	1.30	1.99	0.03	96.14	3.00	6.03	0.06	5.95	0.89	0.00	1.94	0.23	0.63	0.01	18.75	Dravite	
8	10.58	36.16	0.74	33.18	7.49	0.02	5.49	0.60	1.92	0.04	96.24	3.00	5.94	0.09	6.43	1.03	0.00	1.34	0.11	0.61	0.01	18.56	Dravite	
9	10.55	35.33	1.25	34.16	8.55	0.02	4.15	0.95	1.36	0.04	96.36	3.00	5.82	0.16	6.64	1.18	0.00	1.02	0.17	0.44	0.01	18.43	Schorl	
10	10.30	35.18	0.18	33.98	13.67	0.16	0.74	0.08	1.80	0.05	96.15	3.00	5.93	0.02	6.76	1.93	0.02	0.19	0.01	0.59	0.01	18.46	Schorl	
11	10.65	36.24	0.71	33.57	8.24	0.02	5.21	0.63	1.92	0.03	97.22	3.00	5.91	0.09	6.46	1.12	0.00	1.27	0.11	0.61	0.01	18.58	Dravite	
12	10.37	35.04	0.95	30.11	10.65	0.07	6.05	1.61	1.78	0.08	96.69	3.00	5.87	0.12	5.95	1.49	0.01	1.51	0.29	0.58	0.02	18.83	Dravite	
13	10.34	35.31	0.72	32.87	10.91	0.10	2.79	0.56	1.94	0.07	95.60	3.00	5.94	0.09	6.51	1.53	0.01	0.70	0.10	0.63	0.01	18.54	Schorl	
14	10.53	36.35	0.33	30.99	7.33	0.04	7.47	1.11	2.06	0.03	96.25	3.00	6.00	0.04	6.03	1.01	0.01	1.84	0.20	0.66	0.01	18.78	Dravite	
15	10.46	36.29	0.66	30.13	7.70	0.03	7.19	1.52	1.87	0.02	95.86	3.00	6.03	0.08	5.90	1.07	0.00	1.78	0.27	0.60	0.00	18.74	Dravite	
16	10.27	35.27	1.06	27.54	9.96	0.04	7.48	3.06	1.13	0.09	95.89	3.00	5.97	0.14	5.49	1.41	0.01	1.89	0.55	0.37	0.02	18.84	Uvite	
17	10.60	36.11	0.47	34.26	9.09	0.07	4.03	0.11	2.14	0.06	96.94	3.00	5.92	0.06	6.62	1.25	0.01	0.99	0.02	0.68	0.01	18.56	Schorl	
18	10.18	34.75	0.67	31.11	14.78	0.14	1.75	0.80	2.05	0.08	96.30	3.00	5.93	0.09	6.26	2.11	0.02	0.45	0.15	0.68	0.02	18.70	Schorl	
19	10.54	35.83	0.27	34.26	8.35	0.05	4.47	0.67	1.48	0.04	95.95	3.00	5.91	0.03	6.66	1.15	0.01	1.10	0.12	0.47	0.01	18.46	Schorl	
20	10.38	35.08	0.21	33.64	11.06	0.05	3.51	0.18	1.67	0.06	95.83	3.00	5.87	0.03	6.64	1.55	0.01	0.88	0.03	0.54	0.01	18.56	Schorl	
21	10.42	35.27	1.18	32.91	9.94	0.04	3.69	0.77	1.76	0.07	96.05	3.00	5.88	0.15	6.47	1.39	0.01	0.92	0.14	0.57	0.01	18.53	Schorl	
22	10.38	35.64	0.61	32.41	9.76	0.06	4.17	0.52	1.82	0.04	95.40	3.00	5.97	0.08	6.40	1.37	0.01	1.04	0.09	0.59	0.01	18.55	Schorl	
23	10.42	34.76	1.07	33.61	10.82	0.05	3.12	0.70	1.87	0.04	96.45	3.00	5.80	0.13	6.61	1.51	0.01	0.78	0.13	0.60	0.01	18.57	Schorl	
24	10.10	35.32	0.50	26.11	13.02	0.15	6.67	1.83	1.85	0.06	95.61	3.00	6.08	0.06	5.30	1.87	0.02	1.71	0.34	0.62	0.01	19.02	Schorl	
25	10.39	35.07	0.24	31.24	7.74	0.06	7.13	1.97	1.43	0.10	95.36	3.00	5.87	0.03	6.16	1.08	0.01	1.78	0.35	0.46	0.02	18.76	Dravite	
26	10.51	36.37	0.13	34.93	10.18	0.08	2.26	0.08	1.39	0.04	95.95	3.00	6.02	0.02	6.81	1.41	0.01	0.56	0.01	0.44	0.01	18.29	Schorl	
27	10.58	36.58	0.41	31.04	2.35	0.03	9.98	1.56	1.99	0.04	94.56	3.00	6.01	0.05	6.01	0.32	0.00	2.45	0.27	0.63	0.01	18.76	Dravite	
28	10.51	36.63	0.25	30.49	6.24	0.02	8.35	0.63	2.35	0.02	95.49	3.00	6.06	0.03	5.94	0.86	0.00	2.06	0.11	0.75	0.00	18.82	Dravite	
29	10.43	35.96	1.32	31.50	9.09	0.04	5.04	0.37	1.99	0.02	95.76	3.00	5.99	0.17	6.18	1.27	0.01	1.25	0.07	0.64	0.00	18.57	Schorl	
30	10.37	34.51	1.07	32.95	10.64	0.09	3.67	0.89	1.88	0.05	96.10	3.00	5.79	0.13	6.51	1.49	0.01	0.92	0.16	0.61	0.01	18.63	Schorl	
31	10.41	35.82	0.93	31.00	9.53	0.09	5.27	1.02	2.00	0.04	96.11	3.00	5.98	0.12	6.10	1.33	0.01	1.31	0.18	0.65	0.01	18.68	Schorl	
32	10.13	34.06	0.41	32.67	14.98	0.15	0.67	0.45	2.18	0.06	95.74	3.00	5.84	0.05	6.61	2.15	0.02	0.17	0.08	0.72	0.01	18.67	Schorl	
33	10.44	35.36	0.58	33.85	10.62	0.11	3.04	0.29	1.94	0.04	96.26	3.00	5.89	0.07	6.64	1.48	0.02	0.75	0.05	0.63	0.01	18.54	Schorl	
34	10.32	36.32	0.49	28.86	4.58	0.03	8.89	2.48	1.40	0.06	93.41	3.00	6.11	0.06	5.73	0.64	0.00	2.23	0.45	0.46	0.01	18.70	Dravite	
35	10.15	34.86	0.66	28.04	9.56	0.04	6.87	3.26	0.95	0.12	94.50	3.00	5.97	0.09	5.66	1.37	0.01	1.75	0.60	0.32	0.03	18.78	Uvite	
36	10.09	35.08	0.19	31.43	12.10	0.06	2.55	0.42	1.82	0.06	93.81	3.00	6.04	0.02	6.38	1.74	0.01	0.65	0.08	0.61	0.01	18.55	Schorl	
37	10.24	35.30	0.48	31.50	8.33	0.07	5.11	0.86	1.82	0.03	93.74	3.00	5.99	0.06	6.30	1.18	0.01	1.29	0.16	0.60	0.01	18.60	Dravite	
38	10.09	34.60	1.11	26.73	9.15	0.01	7.96	3.25	1.05	0.07	94.03	3.00	5.96	0.14	5.43	1.32	0.00	2.04	0.60	0.35	0.02	18.86	Uvite	
39	10.22	35.48	0.67	31.35	8.11	0.02	5.04	0.30	2.11	0.06	93.35	3.00	6.03	0.09	6.28	1.15	0.00	1.28	0.05	0.69	0.01	18.59	Dravite	

Grain No.	Weight %											Atom per formula units based on 29 oxygens											Tourmaline	
	B ₂ O ₃	SiO ₂	TiO ₂	Al ₂ O ₃	FeO	MnO	MgO	CaO	Na ₂ O	K ₂ O	Total%	B	Si	Ti	Al	Fe	Mn	Mg	Ca	Na	K	Total	Type	
40	10.10	35.11	0.17	30.09	12.99	0.12	3.34	0.79	1.91	0.07	94.70	3.00	6.04	0.02	6.10	1.87	0.02	0.86	0.15	0.64	0.02	18.71	Schorl	
41	10.46	36.40	0.85	32.41	7.25	0.04	5.18	0.44	1.89	0.03	94.93	3.00	6.05	0.11	6.34	1.01	0.01	1.28	0.08	0.61	0.01	18.48	Dravite	
42	10.32	35.57	0.63	32.59	8.27	0.01	4.47	0.21	2.00	0.04	94.12	3.00	5.99	0.08	6.47	1.17	0.00	1.12	0.04	0.65	0.01	18.53	Schorl	
43	10.15	35.63	0.05	25.68	8.34	0.00	10.06	2.54	1.58	0.08	94.11	3.00	6.10	0.01	5.18	1.19	0.00	2.57	0.47	0.52	0.02	19.07	Dravite	
44	10.03	34.57	0.74	28.13	10.28	0.06	6.07	1.79	1.74	0.07	93.49	3.00	5.99	0.10	5.75	1.49	0.01	1.57	0.33	0.59	0.02	18.84	Dravite	
45	10.04	34.97	0.38	29.54	10.86	0.02	4.51	0.71	2.16	0.05	93.25	3.00	6.06	0.05	6.03	1.57	0.00	1.17	0.13	0.73	0.01	18.75	Schorl	
46	10.36	35.49	0.02	31.04	6.83	0.02	7.52	1.61	1.52	0.07	94.48	3.00	5.95	0.00	6.14	0.96	0.00	1.88	0.29	0.49	0.01	18.73	Dravite	
47	10.34	36.00	0.18	30.59	7.54	0.02	6.87	0.85	1.92	0.04	94.34	3.00	6.05	0.02	6.06	1.06	0.00	1.72	0.15	0.63	0.01	18.71	Dravite	
48	10.07	34.11	0.29	32.33	10.27	0.06	3.50	0.43	1.90	0.04	92.99	3.00	5.89	0.04	6.57	1.48	0.01	0.90	0.08	0.64	0.01	18.61	Schorl	
49	10.53	35.87	0.58	33.49	5.85	0.00	6.20	0.39	2.09	0.06	95.05	3.00	5.92	0.07	6.52	0.81	0.00	1.53	0.07	0.67	0.01	18.59	Dravite	
50	10.40	35.77	0.35	31.37	8.38	0.00	5.90	1.50	1.75	0.04	95.46	3.00	5.98	0.04	6.18	1.17	0.00	1.47	0.27	0.57	0.01	18.68	Dravite	
51	10.40	35.80	0.39	29.54	7.16	0.01	8.39	1.74	1.87	0.01	95.31	3.00	5.98	0.05	5.82	1.00	0.00	2.09	0.31	0.60	0.00	18.86	Dravite	
52	10.32	34.97	0.99	32.25	5.43	0.05	6.52	1.06	1.64	0.04	93.27	3.00	5.89	0.12	6.40	0.76	0.01	1.64	0.19	0.54	0.01	18.56	Dravite	
53	10.30	35.65	1.12	30.60	8.08	0.04	5.74	0.87	1.86	0.03	94.30	3.00	6.02	0.14	6.09	1.14	0.01	1.45	0.16	0.61	0.01	18.61	Dravite	
54	9.95	34.10	1.04	28.70	12.70	0.13	4.07	0.66	2.21	0.07	93.61	3.00	5.96	0.14	5.91	1.86	0.02	1.06	0.12	0.75	0.02	18.83	Dravite	
55	10.35	34.30	1.06	33.14	8.62	0.05	4.59	1.42	1.57	0.06	95.15	3.00	5.76	0.13	6.56	1.21	0.01	1.15	0.26	0.51	0.01	18.59	Schorl	
56	10.45	35.87	0.40	32.32	8.20	0.04	5.61	0.46	2.10	0.04	95.50	3.00	5.97	0.05	6.34	1.14	0.01	1.39	0.08	0.68	0.01	18.66	Dravite	
57	10.62	36.12	0.60	33.91	7.03	0.04	5.41	0.80	1.78	0.03	96.34	3.00	5.91	0.07	6.54	0.96	0.01	1.32	0.14	0.57	0.01	18.53	Dravite	
58	10.43	36.16	0.71	29.57	3.34	0.00	9.93	1.98	1.72	0.01	93.84	3.00	6.02	0.09	5.81	0.46	0.00	2.47	0.35	0.56	0.00	18.76	Dravite	
59	10.11	34.56	0.29	32.82	12.46	0.07	1.58	0.25	1.87	0.05	94.04	3.00	5.94	0.04	6.65	1.79	0.01	0.40	0.05	0.62	0.01	18.51	Dravite	
60	10.75	36.68	0.69	33.62	6.41	0.00	6.57	0.43	2.10	0.02	97.26	3.00	5.93	0.08	6.41	0.87	0.00	1.58	0.08	0.66	0.00	18.61	Dravite	
61	10.58	36.38	0.74	32.30	7.70	0.01	6.10	0.63	2.01	0.01	96.46	3.00	5.98	0.09	6.25	1.06	0.00	1.49	0.11	0.64	0.00	18.63	Dravite	
62	10.35	35.55	0.44	32.61	9.13	0.08	4.24	0.48	1.92	0.06	94.86	3.00	5.97	0.06	6.46	1.28	0.01	1.06	0.09	0.63	0.01	18.56	Schorl	
63	10.31	35.84	0.82	28.13	10.45	0.06	6.88	1.68	1.86	0.02	96.04	3.00	6.04	0.10	5.59	1.47	0.01	1.73	0.30	0.61	0.00	18.86	Dravite	
64	10.54	35.84	0.99	30.80	5.01	0.00	8.75	1.78	1.84	0.08	95.63	3.00	5.91	0.12	5.99	0.69	0.00	2.15	0.31	0.59	0.02	18.78	Dravite	
65	10.35	35.41	0.83	32.24	7.31	0.01	5.51	0.37	2.11	0.03	94.17	3.00	5.95	0.11	6.38	1.03	0.00	1.38	0.07	0.69	0.01	18.60	Dravite	
66	10.40	35.01	1.42	31.38	7.64	0.01	6.14	1.76	1.58	0.08	95.40	3.00	5.85	0.18	6.18	1.07	0.00	1.53	0.31	0.51	0.02	18.65	Dravite	
67	10.27	35.55	0.80	31.17	9.67	0.07	4.55	0.14	2.26	0.05	94.52	3.00	6.02	0.10	6.22	1.37	0.01	1.15	0.03	0.74	0.01	18.65	Schorl	
68	10.17	34.21	0.70	31.95	13.56	0.06	2.16	0.99	1.78	0.07	95.65	3.00	5.85	0.09	6.43	1.94	0.01	0.55	0.18	0.59	0.02	18.65	Schorl	
Min	9.95	34.06	0.02	25.68	2.35	0.00	0.67	0.08	0.95	0.01	92.99	3.00	5.76	0.00	5.18	0.32	0.00	0.17	0.01	0.32	0.00	18.29	Schorl	
Max	10.75	37.09	1.42	34.93	14.98	0.16	10.06	3.26	2.35	0.12	97.26	3.00	6.11	0.18	6.81	2.15	0.02	2.57	0.60	0.75	0.03	19.07	Dravite	
Av	10.37	35.53	0.65	31.47	8.86	0.05	5.44	1.05	1.81	0.05	95.29	3.00	5.95	0.08	6.21	1.25	0.01	1.36	0.19	0.59	0.01	18.65	Dravite	

Table 3 Tourmaline analyses from Tumbagoooda Sandstone, the Capricorn Orogen, Yilgarn Craton and the Pilbara Craton.

Province/ Region	Area	Craton/ Orogen	Oxide weight %					atom per formula unit (apfu)					apfu ratio		Tourmaline Type	Rock Type	Reference
			Al ₂ O ₃	FeO _i	MgO	CaO	Na ₂ O	Al	Fe	Mg	Ca	Na	Fe/ (Fe+Mg)	Ca/ (Ca+Na)			
Perth – Carnarvon Basins (Tumbagoooda Sandstone)	Red Bluff	Pinjarra	32.96	3.41	8.28	0.56	2.11	6.30	0.46	2.00	0.10	0.66	0.19	0.13	Dravite	Sandstone	This study
			34.75	10.56	2.57	0.30	1.77	6.79	1.46	0.64	0.05	0.57	0.70	0.08	Schorl		
			33.89	6.44	6.04	1.55	1.53	6.53	0.88	1.47	0.27	0.49	0.37	0.36	Dravite		
			32.86	4.86	7.86	1.25	1.41	6.27	0.66	1.90	0.22	0.44	0.26	0.33	Dravite		
			31.31	10.41	4.55	0.98	1.82	6.15	1.45	1.13	0.18	0.59	0.56	0.23	Schorl		
			33.89	5.67	6.54	0.77	1.57	6.48	0.77	1.58	0.13	0.50	0.33	0.21	Dravite		
			30.69	6.48	7.92	1.30	1.99	5.95	0.89	1.94	0.23	0.63	0.31	0.27	Dravite		
			33.18	7.49	5.49	0.60	1.92	6.43	1.03	1.34	0.11	0.61	0.43	0.15	Dravite		
			34.16	8.55	4.15	0.95	1.36	6.64	1.18	1.02	0.17	0.44	0.54	0.28	Schorl		
			33.98	13.67	0.74	0.08	1.80	6.76	1.93	0.19	0.01	0.59	0.91	0.02	Schorl		
			33.57	8.24	5.21	0.63	1.92	6.46	1.12	1.27	0.11	0.61	0.47	0.15	Dravite		
			30.11	10.65	6.05	1.61	1.78	5.95	1.49	1.51	0.29	0.58	0.50	0.33	Dravite		
			32.87	10.91	2.79	0.56	1.94	6.51	1.53	0.70	0.10	0.63	0.69	0.14	Schorl		
			30.99	7.33	7.47	1.11	2.06	6.03	1.01	1.84	0.20	0.66	0.35	0.23	Dravite		
			30.13	7.70	7.19	1.52	1.87	5.90	1.07	1.78	0.27	0.60	0.38	0.31	Dravite		
			27.54	9.96	7.48	3.06	1.13	5.49	1.41	1.89	0.55	0.37	0.43	0.60	Uvite		
			34.26	9.09	4.03	0.11	2.14	6.62	1.25	0.99	0.02	0.68	0.56	0.03	Schorl		
			31.11	14.78	1.75	0.80	2.05	6.26	2.11	0.45	0.15	0.68	0.82	0.18	Schorl		
			34.26	8.35	4.47	0.67	1.48	6.66	1.15	1.10	0.12	0.47	0.51	0.20	Schorl		
			33.64	11.06	3.51	0.18	1.67	6.64	1.55	0.88	0.03	0.54	0.64	0.05	Schorl		
			32.91	9.94	3.69	0.77	1.76	6.47	1.39	0.92	0.14	0.57	0.60	0.20	Schorl		
			32.41	9.76	4.17	0.52	1.82	6.40	1.37	1.04	0.09	0.59	0.57	0.13	Schorl		
			33.61	10.82	3.12	0.70	1.87	6.61	1.51	0.78	0.13	0.60	0.66	0.18	Schorl		
			26.11	13.02	6.67	1.83	1.85	5.30	1.87	1.71	0.34	0.62	0.52	0.35	Schorl		
			31.24	7.74	7.13	1.97	1.43	6.16	1.08	1.78	0.35	0.46	0.38	0.43	Dravite		
			34.93	10.18	2.26	0.08	1.39	6.81	1.41	0.56	0.01	0.44	0.72	0.02	Schorl		
			31.04	2.35	9.98	1.56	1.99	6.01	0.32	2.45	0.27	0.63	0.12	0.30	Dravite		
			30.49	6.24	8.35	0.63	2.35	5.94	0.86	2.06	0.11	0.75	0.29	0.13	Dravite		
			31.50	9.09	5.04	0.37	1.99	6.18	1.27	1.25	0.07	0.64	0.50	0.10	Schorl		
			32.95	10.64	3.67	0.89	1.88	6.51	1.49	0.92	0.16	0.61	0.62	0.21	Schorl		
			31.00	9.53	5.27	1.02	2.00	6.10	1.33	1.31	0.18	0.65	0.50	0.22	Schorl		
			32.67	14.98	0.67	0.45	2.18	6.61	2.15	0.17	0.08	0.72	0.93	0.10	Schorl		
			33.85	10.62	3.04	0.29	1.94	6.64	1.48	0.75	0.05	0.63	0.66	0.07	Schorl		
			28.86	4.58	8.89	2.48	1.40	5.73	0.64	2.23	0.45	0.46	0.22	0.49	Dravite		
			28.04	9.56	6.87	3.26	0.95	5.66	1.37	1.75	0.60	0.32	0.44	0.65	Uvite		
			31.43	12.10	2.55	0.42	1.82	6.38	1.74	0.65	0.08	0.61	0.73	0.12	Schorl		
			31.50	8.33	5.11	0.86	1.82	6.30	1.18	1.29	0.16	0.60	0.48	0.21	Dravite		
			26.73	9.15	7.96	3.25	1.05	5.43	1.32	2.04	0.60	0.35	0.39	0.63	Uvite		
			31.35	8.11	5.04	0.30	2.11	6.28	1.15	1.28	0.05	0.69	0.47	0.07	Dravite		
			30.09	12.99	3.34	0.79	1.91	6.10	1.87	0.86	0.15	0.64	0.68	0.19	Schorl		
			32.41	7.25	5.18	0.44	1.89	6.34	1.01	1.28	0.08	0.61	0.44	0.12	Dravite		
			32.59	8.27	4.47	0.21	2.00	6.47	1.17	1.12	0.04	0.65	0.51	0.06	Schorl		
			25.68	8.34	10.06	2.54	1.58	5.18	1.19	2.57	0.47	0.52	0.32	0.47	Dravite		
			28.13	10.28	6.07	1.79	1.74	5.75	1.49	1.57	0.33	0.59	0.49	0.36	Dravite		
			29.54	10.86	4.51	0.71	2.16	6.03	1.57	1.17	0.13	0.73	0.57	0.15	Schorl		
			31.04	6.83	7.52	1.61	1.52	6.14	0.96	1.88	0.29	0.49	0.34	0.37	Dravite		
			30.59	7.54	6.87	0.85	1.92	6.06	1.06	1.72	0.15	0.63	0.38	0.19	Dravite		
			32.33	10.27	3.50	0.43	1.90	6.57	1.48	0.90	0.08	0.64	0.62	0.11	Schorl		
			33.49	5.85	6.20	0.39	2.09	6.52	0.81	1.53	0.07	0.67	0.35	0.09	Dravite		
			31.37	8.38	5.90	1.50	1.75	6.18	1.17	1.47	0.27	0.57	0.44	0.32	Dravite		
			29.54	7.16	8.39	1.74	1.87	5.82	1.00	2.09	0.31	0.60	0.32	0.34	Dravite		
			32.25	5.43	6.52	1.06	1.64	6.40	0.76	1.64	0.19	0.54	0.32	0.26	Dravite		
			30.60	8.08	5.74	0.87	1.86	6.09	1.14	1.45	0.16	0.61	0.44	0.21	Dravite		
			28.70	12.70	4.07	0.66	2.21	5.91	1.86	1.06	0.12	0.75	0.64	0.14	Dravite		
			33.14	8.62	4.59	1.42	1.57	6.56	1.21	1.15	0.26	0.51	0.51	0.34	Schorl		
			32.32	8.20	5.61	0.46	2.10	6.34	1.14	1.39	0.08	0.68	0.45	0.11	Dravite		
			33.91	7.03	5.41	0.80	1.78	6.54	0.96	1.32	0.14	0.57	0.42	0.20	Dravite		
			29.57	3.34	9.93	1.98	1.72	5.81	0.46	2.47	0.35	0.56	0.16	0.38	Dravite		
			32.82	12.46	1.58	0.25	1.87	6.65	1.79	0.40	0.05	0.62	0.82	0.07	Dravite		
			33.62	6.41	6.57	0.43	2.10	6.41	0.87	1.58	0.08	0.66	0.36	0.11	Dravite		
			32.30	7.70	6.10	0.63	2.01	6.25	1.06	1.49	0.11	0.64	0.42	0.15	Dravite		
			32.61	9.13	4.24	0.48	1.92	6.46	1.28	1.06	0.09	0.63	0.55	0.13	Schorl		
			28.13	10.45	6.88	1.68	1.86	5.59	1.47	1.73	0.30	0.61	0.46	0.33	Dravite		
			30.80	5.01	8.75	1.78	1.84	5.99	0.69	2.15	0.31	0.59	0.24	0.34	Dravite		
			32.24	7.31	5.51	0.37	2.11	6.38	1.03	1.38	0.07	0.69	0.43	0.09	Dravite		
			31.38	7.64	6.14	1.76	1.58	6.18	1.07	1.53	0.31	0.51	0.41	0.38	Dravite		
			31.17	9.67	4.55	0.14	2.26	6.22	1.37	1.15	0.03	0.74	0.54	0.04	Schorl		
			31.95	13.56	2.16	0.99	1.78	6.43	1.94	0.55	0.18	0.59	0.78	0.23	Schorl		
Gascoyne		Capricorn	31.63	13.07	3.59	0.44	2.08	5.57	1.63	0.80	0.07	0.60	0.67	0.10	Schorl	Scrubber granite	Shewfelt 2005
			31.25	13.09	3.70	0.48	2.15	5.59	1.66	0.84	0.08	0.63	0.66	0.11	Schorl		
			31.14	13.47	3.26	0.40	2.12	5.59	1.72	0.74	0.07	0.63	0.70	0.10	Schorl		
			31.49	12.52	2.78	0.45	2.05	5.70	1.61	0.64	0.07	0.61	0.72	0.10	Schorl		