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APPENDIX 1

Electron microprobe analysis of the minerals used in section A of the thesis

IS90-cordierite core

	is90-crdc-1	is90-crdc-2	is90-crdc-3	is90-crdc-4	is90-crdc-5
SiO₂	48.83	48.84	48.68	48.54	48.86
TiO₂	0.05	0.01	0.00	0.00	0.00
Al₂O₃	31.38	31.85	31.40	31.08	31.57
FeO	6.87	6.71	6.39	6.66	6.76
MnO	0.49	0.45	0.49	0.42	0.50
MgO	8.35	8.38	8.39	8.12	8.26
CaO	0.02	0.00	0.02	0.02	0.02
Na₂O	0.72	0.82	0.88	0.93	0.85
K₂O	0.01	0.00	0.00	0.01	0.01
Total	96.73	97.07	96.25	95.78	96.83

IS90-cordierite reaction rim

	is90-crdr-1	is90-crdr-2	is90-crdr-3	is90-crdr-4	is90-crdr-5
SiO₂	48.91	48.67	48.68	48.98	48.75
TiO₂	0.00	0.00	0.00	0.00	0.00
Al₂O₃	31.86	32.04	32.09	32.08	32.09
FeO	6.65	6.45	6.42	6.47	6.35
MnO	0.50	0.54	0.51	0.47	0.46
MgO	8.46	8.23	8.36	8.28	8.30
CaO	0.02	0.01	0.00	0.02	0.03
Na₂O	0.81	0.71	0.75	0.76	0.80
K₂O	0.01	0.00	0.00	0.00	0.00
Total	97.21	96.65	96.81	97.07	96.78

IS90-biotite cordierite core					
	is90-bic-1	is90-bic-2	is90-bic-3	is90-bic-4	is90-bic-5
SiO₂	36.72	36.60	36.72	36.53	36.53
TiO₂	1.26	1.25	1.22	1.17	1.33
Al₂O₃	19.78	19.58	19.77	19.63	19.34
FeO	16.41	15.78	16.15	16.23	16.68
MnO	0.15	0.14	0.13	0.13	0.15
MgO	11.66	11.47	11.58	11.93	11.72
CaO	0.00	0.01	0.00	0.00	0.00
Na₂O	0.35	0.31	0.31	0.28	0.28
K₂O	7.93	8.36	8.17	7.87	8.14
Total	94.26	93.50	94.06	93.77	94.17

IS90-biotite reaction rim					
	is90-bir-1	is90-bir-2	is90-bir-3	is90-bir-4	is90-bir-5
SiO₂	36.68	36.66	36.81	37.03	36.61
TiO₂	1.33	1.27	1.35	1.18	1.31
Al₂O₃	19.60	19.57	19.60	19.61	19.34
FeO	16.61	16.13	16.34	16.79	16.84
MnO	0.14	0.14	0.14	0.12	0.15
MgO	11.80	11.84	12.01	11.90	11.60
CaO	0.01	0.00	0.00	0.00	0.00
Na₂O	0.34	0.33	0.35	0.30	0.33
K₂O	8.34	8.10	8.15	8.18	7.81
Total	94.86	94.04	94.75	95.12	93.98

IS90-biotite matrix					
	is90-bim-1	is90-bim-2	is90-bim-3	is90-bim-4	is90-bim-5
SiO₂	36.28	36.43	36.23	36.11	36.35
TiO₂	1.49	1.49	1.52	1.43	1.40
Al₂O₃	19.02	19.27	19.21	19.16	19.30
FeO	16.71	16.96	16.56	16.70	16.89
MnO	0.19	0.17	0.15	0.13	0.18
MgO	11.21	11.24	11.37	11.73	12.06
CaO	0.03	0.02	0.00	0.00	0.00
Na₂O	0.35	0.31	0.34	0.33	0.29
K₂O	8.10	7.83	7.91	8.17	7.83
Total	93.37	93.73	93.29	93.75	94.29

IS90-muscovite cordierite core					
	is90-msc-1	is90-msc-2	is90-msc-3	is90-msc-4	is90-msc-5
SiO₂	47.69	46.91	47.20	47.05	47.59
TiO₂	0.24	0.33	0.22	0.37	0.04
Al₂O₃	37.02	36.45	36.78	36.73	37.29
FeO	0.58	0.59	0.56	0.68	0.61
MnO	0.03	0.02	0.02	0.00	0.00
MgO	0.49	0.45	0.37	0.48	0.46
CaO	0.00	0.00	0.00	0.00	0.00
Na₂O	1.08	1.14	1.04	1.04	1.31
K₂O	6.95	7.53	7.17	7.09	7.50
Total	94.09	93.43	93.36	93.43	94.81

IS90-muscovite reaction rim					
	is90-msr-1	is90-msr-2	is90-msr-3	is90-msr-4	is90-msr-5
SiO₂	46.90	47.15	47.08	47.02	46.75
TiO₂	0.33	0.36	0.43	0.59	0.55
Al₂O₃	36.29	36.34	37.06	36.31	35.81
FeO	0.56	0.66	0.58	0.49	0.57
MnO	0.01	0.00	0.02	0.01	0.00
MgO	0.47	0.54	0.42	0.45	0.56
CaO	0.00	0.01	0.01	0.01	0.00
Na₂O	1.19	1.18	1.21	1.28	1.11
K₂O	7.56	7.42	7.65	7.79	7.84
Total	93.31	93.65	94.45	93.96	93.20

IS90-muscovite matrix					
	is90-msm-1	is90-msm-2	is90-msm-3	is90-msm-4	is90-msm-5
SiO₂	46.70	46.48	46.13	46.31	46.67
TiO₂	0.45	0.26	0.35	0.43	0.38
Al₂O₃	36.08	36.07	36.03	36.15	36.33
FeO	0.47	0.61	0.54	0.60	0.44
MnO	0.02	0.05	0.00	0.01	0.01
MgO	0.45	0.49	0.48	0.45	0.46
CaO	0.00	0.01	0.02	0.02	0.00
Na₂O	1.13	1.38	1.34	1.47	1.12
K₂O	7.88	7.91	8.23	8.08	8.08
Total	93.18	93.26	93.11	93.53	93.49

IS90-staurolite matrix

	is90-st-1	is90-st-2	is90-st-3	is90-st-4	is90-st-5
SiO₂	27.39	27.43	27.59	28.08	27.85
TiO₂	0.48	0.59	0.60	0.58	0.57
Al₂O₃	53.00	53.11	52.71	52.55	53.14
FeO	12.93	12.69	13.00	12.99	12.80
MnO	0.53	0.53	0.52	0.50	0.52
MgO	1.90	1.84	1.67	1.90	1.85
CaO	0.00	0.00	0.02	0.01	0.00
Na₂O	0.00	0.02	0.00	0.00	0.00
K₂O	0.00	0.00	0.00	0.00	0.00
Total	96.23	96.21	96.11	96.61	96.73

IS90-garnet reaction rim

	is90-grtr-1	is90-grtr-2	is90-grtr-3	is90-grtr-4	is90-grtr-5
SiO₂	37.54	37.96	37.91	37.85	37.96
TiO₂	0.00	0.01	0.01	0.00	0.04
Al₂O₃	20.67	21.01	21.11	20.90	21.12
FeO	29.02	29.36	29.74	29.15	29.10
MnO	9.46	8.89	8.74	7.89	7.76
MgO	2.25	2.52	2.62	3.06	3.14
CaO	1.25	1.06	1.14	1.33	1.28
Na₂O	0.01	0.01	0.00	0.08	0.03
K₂O	0.02	0.01	0.01	0.03	0.02
Total	100.22	100.83	101.29	100.29	100.45

IS90-garnet matrix

	is90-grtm-1	is90-grtm-2	is90-grtm-3	is90-grtm-4	is90-grtm-5
SiO₂	37.98	37.75	37.76	37.99	37.77
TiO₂	0.05	0.04	0.00	0.03	0.03
Al₂O₃	21.14	21.09	20.92	21.12	21.03
FeO	29.43	29.13	29.58	29.15	29.56
MnO	8.21	7.82	8.16	7.51	7.77
MgO	2.82	2.90	2.88	3.18	3.12
CaO	0.90	1.27	0.88	1.06	1.12
Na₂O	0.03	0.01	0.00	0.03	0.01
K₂O	0.00	0.00	0.00	0.00	0.00
Total	100.57	100.03	100.18	100.07	100.41

IS90-plagioclase cord core

	core		rim	
	is90-plc-1	is90-plc-2	is90-plc-3	is90-plc-4
	SiO₂	63.43	62.87	62.68
TiO₂	0.04	0.04	0.01	0.00
Al₂O₃	22.57	22.77	22.93	22.89
FeO	0.11	0.09	0.16	0.09
MnO	0.01	0.02	0.00	0.02
MgO	0.01	0.00	0.00	0.01
CaO	4.00	4.26	4.79	4.67
Na₂O	9.15	8.33	8.33	8.26
K₂O	0.03	0.04	0.03	0.04
Total	99.35	98.41	98.93	98.66

IS90-plag reaction rim

	core		rim	
	is90-plr-1	is90-plr-2	is90-plr-3	is90-plr-4
	SiO₂	63.45	63.56	63.60
TiO₂	0.00	0.01	0.00	0.00
Al₂O₃	22.35	22.79	22.31	22.44
FeO	0.07	0.05	0.10	0.11
MnO	0.02	0.00	0.00	0.01
MgO	0.00	0.01	0.00	0.00
CaO	4.05	4.15	4.02	4.01
Na₂O	8.02	7.98	8.29	8.10
K₂O	0.06	0.06	0.03	0.07
Total	98.01	98.61	98.35	98.38

IS90-plag matrix

	core		rim	
	is90-plm-1	is90-plm-2	is90-plm-3	is90-plm-4
	SiO₂	63.36	63.79	63.52
TiO₂	0.00	0.00	0.03	0.00
Al₂O₃	22.84	22.32	21.96	21.94
FeO	0.03	0.01	0.00	0.04
MnO	0.00	0.00	0.01	0.02
MgO	0.00	0.00	0.01	0.00
CaO	4.16	3.81	3.71	3.57
Na₂O	7.66	7.79	8.18	8.33
K₂O	0.04	0.04	0.04	0.04
Total	98.09	97.76	97.45	98.12

RQ30-biotite pseudomorph							
	rq30-btp-1	rq30-btp-2	rq30-btp-3	rq30-btp-4	rq30-btp-5	rq30-btp-6	rq30-btp-4
SiO₂	37.13	36.62	37.22	37.81	38.16	37.18	37.85
TiO₂	0.85	0.66	0.75	0.99	1.07	0.93	1.00
Al₂O₃	19.04	18.81	19.00	18.80	19.44	18.75	18.44
FeO	17.14	17.13	16.51	16.64	16.69	15.10	15.61
MnO	0.15	0.17	0.16	0.17	0.15	0.15	0.16
MgO	11.21	12.26	11.29	10.75	10.59	10.99	11.23
CaO	0.17	0.19	0.11	0.07	0.11	0.30	0.11
Na₂O	0.18	0.10	0.16	0.15	0.14	0.25	0.14
K₂O	7.81	6.54	8.42	8.19	8.32	7.99	8.76
Cl	0.02	0.03	0.02	0.02	0.01	0.00	0.00
Total	93.68	92.50	93.65	93.59	94.68	91.64	93.30

RQ30-biotite matrix							
	rq30-btm-1	rq30-btm-2	rq30-btm-3	rq30-btm-4	rq30-btm-5	rq30-btm-6	rq30-btm-7
SiO₂	36.14	37.61	37.39	38.11	37.06	37.61	37.88
TiO₂	0.89	1.15	1.04	1.06	0.99	0.95	1.00
Al₂O₃	17.55	18.27	18.38	18.89	18.47	18.41	18.99
FeO	20.22	16.83	16.59	15.86	17.28	16.43	16.15
MnO	0.16	0.16	0.14	0.15	0.16	0.17	0.16
MgO	9.85	11.27	11.31	10.49	10.21	11.26	10.84
CaO	0.13	0.08	0.08	0.08	0.14	0.13	0.09
Na₂O	0.08	0.07	0.11	0.17	0.16	0.12	0.15
K₂O	7.51	8.45	7.77	6.70	8.61	7.82	6.57
Cl	0.04	0.02	0.02	0.02	0.00	0.03	0.01
Total	92.56	93.90	92.82	91.52	93.06	92.92	91.83

RQ30-muscovite pseudomorph								
	rq30-msp-1	rq30-msp-2	rq30-msp-3	rq30-msp-4	rq30-msp-5	rq30-msp-6	rq30-msp-7	rq30-msp-8
SiO₂	48.35	48.79	47.01	46.63	46.79	46.45	46.44	45.34
TiO₂	0.26	0.16	0.22	0.23	0.20	0.32	0.31	0.38
Al₂O₃	36.74	37.77	35.17	34.93	35.65	35.24	34.29	34.30
FeO	1.07	0.76	0.97	1.20	0.88	0.93	1.72	0.83
MnO	0.00	0.01	0.00	0.00	0.02	0.01	0.03	0.01
MgO	0.74	0.48	0.55	0.92	0.54	0.54	0.53	0.53
CaO	0.06	0.02	0.10	0.11	0.06	0.06	0.13	0.05
Na₂O	1.01	1.11	1.12	1.02	1.19	1.06	0.84	1.18
K₂O	5.97	6.07	8.51	8.57	8.84	8.88	6.94	8.82
Cl	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Total	94.19	95.18	93.66	93.62	94.16	93.49	91.23	91.44

RQ30-muscovite matrix									
	rq30-msm-1	rq30-msm-2	rq30-msm-3	rq30-msm-4	rq30-msm-6	rq30-msm-7	rq30-msm-8	rq30-msm-9	rq30-msm-10
SiO₂	48.13	48.76	48.33	48.54	49.32	47.18	47.95	47.39	47.42
TiO₂	0.28	0.31	0.24	0.30	0.19	0.24	0.17	0.26	0.20
Al₂O₃	37.25	37.53	36.06	37.26	36.70	35.54	37.11	36.31	36.18
FeO	0.93	0.97	1.24	1.06	1.00	1.39	0.87	1.02	1.25
MnO	0.01	0.00	0.02	0.02	0.01	0.01	0.02	0.01	0.00
MgO	0.53	0.58	0.65	0.63	0.73	0.60	0.53	0.60	0.59
CaO	0.04	0.08	0.06	0.03	0.08	0.05	0.06	0.05	0.06
Na₂O	1.11	1.04	0.96	1.06	0.86	1.05	1.12	0.96	1.06
K₂O	6.22	5.49	6.90	5.75	5.61	6.83	6.21	5.70	6.63
Cl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	94.50	94.76	94.45	94.64	94.51	92.89	94.04	92.30	93.39

RQ30-chlorite pseudomorph										
	rq30- chlp-1	rq30- chlp-2	rq30- chlp-3	rq30- chlp-4	rq30- chlp-5	rq30- chlp-6	rq30- chlp-7	rq30- chlp-8	rq30- chlp-9	rq30- chlp-10
SiO₂	25.25	30.32	29.66	33.84	27.22	30.40	30.23	28.93	34.78	31.12
TiO₂	0.09	0.06	0.07	0.08	0.10	0.08	0.06	0.14	0.11	0.32
Al₂O₃	15.52	20.81	21.25	23.52	16.40	22.21	22.19	22.16	20.07	21.01
FeO	33.49	19.26	19.56	20.04	31.77	20.75	21.00	20.49	18.91	19.32
MnO	0.11	0.21	0.24	0.07	0.10	0.23	0.25	0.26	0.19	0.26
MgO	9.55	14.04	13.80	5.73	9.38	14.26	14.31	14.14	12.10	13.96
CaO	0.55	0.37	0.38	0.42	0.55	0.25	0.37	0.37	0.49	0.38
Na₂O	0.09	0.40	0.34	0.21	0.05	0.02	0.03	0.01	0.03	0.00
K₂O	1.02	1.27	1.56	2.70	1.13	1.17	0.91	0.45	0.92	1.27
Cl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	85.68	86.74	86.86	86.61	86.70	89.36	89.34	86.95	87.61	87.64

RQ30-chlorite matrix							
	rq30-chlm-1	rq30-chlm-2	rq30-chlm-3	rq30-chlm-4	rq30-chlm-5	rq30-chlm-6	rq30-chlm-7
SiO₂	31.48	31.40	25.02	26.21	31.82	27.32	25.76
TiO₂	0.06	0.03	0.10	0.07	0.10	0.08	0.12
Al₂O₃	21.71	21.72	23.39	23.04	19.67	19.97	21.37
FeO	19.36	19.94	23.93	22.93	19.24	27.37	26.67
MnO	0.24	0.24	0.28	0.26	0.20	0.20	0.25
MgO	14.01	13.44	15.56	15.21	12.74	12.48	13.76
CaO	0.57	0.50	0.03	0.14	0.44	0.28	0.19
Na₂O	0.01	0.03	0.00	0.00	0.04	0.04	0.02
K₂O	1.01	0.97	0.00	0.25	2.16	0.84	0.43
Cl	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	88.46	88.26	88.31	88.11	86.40	88.57	88.57

RQ30-plagioclase pseudo

	core plagioclase		rim plagioclase	
	rq30-plp-1	rq30-plp-2	rq30-plp-3	rq30-plp-4
	SiO₂	61.33	61.59	61.73
TiO₂	0.02	0.00	0.00	0.00
Al₂O₃	24.14	24.23	23.72	24.26
FeO	0.15	0.16	0.15	0.19
MnO	0.00	0.00	0.00	0.00
MgO	0.00	0.00	0.01	0.00
CaO	6.24	6.13	5.91	5.79
Na₂O	8.23	7.91	8.33	8.20
K₂O	0.06	0.06	0.08	0.08
Total	100.17	100.08	99.93	100.87

RQ30-plagioclase pseudo/matrix

	core plagioclase		rim plagioclase	
	rq30-plpm-1	rq30-plpm-2	rq30-plpm-3	rq30-plpm-4
	SiO₂	62.00	62.23	60.90
TiO₂	0.04	0.04	0.08	0.00
Al₂O₃	23.41	23.80	24.02	23.65
FeO	0.13	0.12	0.14	0.15
MnO	0.00	0.00	0.02	0.00
MgO	0.00	0.00	0.01	0.00
CaO	5.56	5.57	6.13	6.39
Na₂O	8.87	8.74	8.51	8.82
K₂O	0.07	0.06	0.05	0.04
Total	100.08	100.55	99.87	100.26

RQ30-plagioclase matrix

	core plagioclase		rim plagioclase
	rq30-plm-1	rq30-plm-2	rq30-plm-3
	SiO₂	62.27	62.12
TiO₂	0.01	0.00	0.06
Al₂O₃	24.05	23.96	24.09
FeO	0.18	0.17	0.18
MnO	0.01	0.02	0.02
MgO	0.00	0.01	0.01
CaO	5.64	5.66	5.98
Na₂O	8.59	8.39	8.39
K₂O	0.08	0.08	0.07
Total	100.83	100.40	100.97

RQ83-biotite matrix							
	rq83-btm- 1	rq83-btm- 2	rq83-btm- 3	rq83-btm- 4	rq83-btm- 5	rq83-btm- 6	rq83-btm- 7
SiO₂	35.94	37.57	37.08	37.93	36.20	35.50	37.17
TiO₂	1.02	1.01	1.22	1.06	1.39	1.31	1.45
Al₂O₃	16.53	18.07	17.99	18.48	16.74	16.21	17.36
FeO	24.07	16.68	17.52	16.54	23.08	25.80	17.00
MnO	0.04	0.09	0.12	0.14	0.05	0.07	0.08
MgO	4.59	8.93	9.13	10.29	5.77	3.27	9.38
CaO	0.24	0.39	0.21	0.22	0.25	0.20	0.15
Na₂O	0.23	0.12	0.16	0.14	0.16	0.18	0.24
K₂O	8.14	8.18	8.87	8.33	8.02	8.51	8.02
Cl	0.01	0.03	0.02	0.02	0.00	0.00	0.00
Total	90.81	91.08	92.31	93.15	91.65	91.05	90.85

RQ83-muscovite pseudomorph										
	rq83- msp-1	rq83- msp-2	rq83- msp-3	rq83- msp-4	rq83- msp-5	rq83- msp-6	rq83- msp-7	rq83- msp-8	rq83- msp-9	rq83- msp-10
SiO₂	48.77	59.55	51.01	47.68	47.43	47.03	48.43	49.65	46.85	46.64
TiO₂	0.00	0.06	0.05	0.10	0.07	0.15	0.02	0.08	0.04	0.22
Al₂O₃	37.81	28.68	36.09	36.33	36.27	36.74	37.35	37.11	36.24	35.36
FeO	1.16	0.93	1.27	1.06	1.59	1.75	1.20	1.19	1.82	1.71
MnO	0.02	0.01	0.01	0.00	0.01	0.01	0.02	0.00	0.02	0.03
MgO	0.49	0.37	0.67	0.46	0.42	0.39	0.61	0.50	0.42	0.56
CaO	0.04	0.05	0.05	0.06	0.01	0.02	0.04	0.06	0.03	0.03
Na₂O	0.89	0.78	1.16	1.18	1.02	1.73	1.12	0.92	1.41	1.16
K₂O	6.17	5.14	5.97	8.28	8.14	6.14	6.97	6.28	7.11	8.15
Cl	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00
Total	95.35	95.57	96.29	95.15	94.96	93.98	95.76	95.79	93.94	93.87

RQ83- muscovite matrix					
	rq83-msm-1	rq83-msm-2	rq83-msm-3	rq83-msm-4	rq83-msm-5
SiO₂	47.45	46.29	46.14	46.40	46.99
TiO₂	0.05	0.25	0.14	0.09	0.16
Al₂O₃	37.19	35.89	35.87	36.16	36.60
FeO	1.69	1.30	1.42	1.06	1.13
MnO	0.00	0.02	0.02	0.00	0.01
MgO	0.44	0.39	0.31	0.37	0.37
CaO	0.06	0.04	0.05	0.03	0.02
Na₂O	1.51	1.08	1.16	1.26	1.25
K₂O	6.59	7.98	7.38	8.25	7.89
Cl	0.00	0.00	0.00	0.00	0.00
Total	94.98	93.23	92.49	93.62	94.42

RQ83-chlorite pseudomorph										
	rq83- chlp-1	rq83- chlp-2	rq83- chlp-3	rq83- chlp-4	rq83- chlp-5	rq83- chlp-6	rq83- chlp-7	rq83- chlp-8	rq83- chlp-9	rq83- chlp-10
SiO₂	24.88	24.30	27.47	31.12	25.30	25.04	26.81	24.43	25.32	25.56
TiO₂	0.07	0.08	0.12	0.16	0.08	0.06	0.07	0.05	0.06	0.06
Al₂O₃	22.75	22.71	22.89	23.89	22.99	23.45	22.74	23.39	23.52	23.07
FeO	21.63	21.62	21.92	18.32	22.36	23.39	23.07	23.56	23.41	22.68
MnO	0.34	0.30	0.31	0.25	0.31	0.37	0.33	0.33	0.33	0.32
MgO	16.18	15.78	14.81	12.57	15.80	16.17	15.30	15.61	15.78	16.41
CaO	0.00	0.03	0.08	0.14	0.07	0.05	0.16	0.04	0.06	0.09
Na₂O	0.01	0.23	0.01	0.09	0.01	0.02	0.01	0.01	0.00	0.01
K₂O	0.01	0.08	0.21	1.27	0.08	0.00	0.08	0.01	0.00	0.03
Cl	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.00	0.00
Total	85.88	85.13	87.83	87.81	87.00	88.55	88.57	87.41	88.49	88.25

RQ83-chlorite matrix					
	rq83-chlm-1	rq83-chlm-2	rq83-chlm-3	rq83-chlm-4	rq83-chlm-5
SiO₂	25.13	25.04	24.22	25.03	24.92
TiO₂	0.13	0.05	0.03	0.08	0.11
Al₂O₃	23.34	23.49	23.00	23.11	23.30
FeO	24.07	23.41	23.44	24.14	23.09
MnO	0.34	0.34	0.34	0.38	0.36
MgO	15.24	16.23	14.51	14.17	13.61
CaO	0.05	0.06	0.02	0.02	0.05
Na₂O	0.01	0.02	0.01	0.04	0.26
K₂O	0.01	0.01	0.01	0.01	0.07
Cl	0.01	0.00	0.00	0.00	0.00
Total	88.34	88.66	85.59	86.99	85.77

APPENDIX 2

**Complete electron microprobe analysis of monazite grains used in section B and D of
the thesis**

Charters Towers metamorphics: FIA2

No.	P ₂ O ₅	PbO	La ₂ O ₃	UO ₂	ThO ₂	Y ₂ O ₃	Ce ₂ O ₃	CaO	SiO ₂	Pr ₂ O ₃	SO ₃	Nd ₂ O ₃	Sm ₂ O ₃	Gd ₂ O ₃	Dy ₂ O ₃	Total	Age (Ma)	Error (2σ)	Comment
1	30.920	0.169	14.440	0.270	5.710	2.600	28.010	1.208	0.352	2.960	0.002	10.900	1.720	1.440	0.495	101.197	514	41	rq91-m1-s1
2	31.280	0.200	13.140	0.633	6.060	3.210	26.950	1.400	0.286	2.940	0.028	11.110	1.990	1.840	0.848	101.916	496	35	rq91-m2-s1
3	31.220	0.193	13.450	0.680	6.020	2.830	26.970	1.400	0.266	2.930	0.006	11.090	1.950	1.750	0.695	101.449	474	34	rq91-m3-s1
4	30.330	0.121	14.970	0.303	4.170	1.400	29.240	0.886	0.398	3.240	0.006	11.890	2.000	1.620	0.217	100.790	476	51	rq91-m4-s1
5	29.930	0.134	15.150	0.406	4.580	1.540	28.920	1.001	0.239	3.220	0.000	11.580	1.810	1.570	0.227	100.307	463	45	rq91-m4-s2
6	30.700	0.171	14.480	0.502	5.910	1.670	28.040	1.245	0.248	3.120	0.002	11.280	1.850	1.590	0.573	101.380	468	37	rq91-m4-s3
7	29.690	0.147	14.550	0.483	4.910	1.830	28.480	1.071	0.749	3.050	0.000	11.330	1.850	1.600	0.605	100.344	462	40	rq91-m5-s1
8	30.070	0.136	14.770	0.271	4.810	1.370	29.110	1.004	0.355	3.130	0.015	12.200	2.030	1.710	0.513	101.493	491	48	rq91-m6-s1
9	29.740	0.232	12.890	0.300	9.360	1.380	26.320	1.520	0.938	2.940	0.030	11.170	1.970	1.640	0.562	100.992	471	28	rq91-m7-s1
10	30.400	0.214	12.460	0.443	7.460	3.180	26.090	1.490	0.319	2.990	0.017	11.540	1.910	1.790	0.789	101.091	477	31	rq91-m8-s1
11	29.900	0.206	13.080	0.534	7.160	2.290	26.450	1.540	0.295	2.910	0.000	11.270	1.850	1.800	0.781	100.066	473	31	rq91-m8-s2
12	30.370	0.180	13.780	0.326	7.140	1.390	27.210	1.470	0.360	2.960	0.016	11.540	2.030	1.690	0.540	101.002	457	34	rq91-m9-s1
13	30.490	0.190	13.660	0.317	7.250	1.370	27.120	1.460	0.366	3.000	0.014	11.630	2.020	1.710	0.545	101.142	479	34	rq91-m9-s2
14	30.230	0.132	14.250	0.282	4.970	1.730	28.460	1.069	0.275	3.160	0.000	11.920	2.000	1.820	0.732	101.028	447	44	rq91-m10-s1
15	29.990	0.226	12.910	0.348	8.670	2.360	25.620	1.640	0.479	2.860	0.013	11.630	1.990	1.810	0.676	101.221	470	29	rq91-m10-s2
16	30.680	0.118	14.860	0.358	3.540	1.790	28.780	0.783	0.203	3.190	0.026	11.750	2.000	1.750	0.786	100.614	503	56	rq91-m11-s1
17	30.780	0.152	13.300	0.596	4.500	2.620	27.960	0.973	0.206	3.070	0.000	11.780	2.250	2.130	1.100	101.417	464	40	rq91-m12-s1
18	29.910	0.181	14.110	0.818	4.980	2.340	27.580	1.204	0.334	3.050	0.004	11.230	1.900	1.690	0.708	100.038	483	36	rq91-m13-s1
19	29.890	0.173	14.140	0.396	6.460	1.410	27.650	1.325	0.291	2.990	0.022	11.420	2.000	1.710	0.447	100.323	463	36	rq91-m14-s1
20	27.660	0.180	12.730	0.779	5.290	1.480	24.850	1.341	9.010	2.780	0.007	10.490	1.770	1.430	0.557	100.354	485	35	rq91-m15-s1
21	30.720	0.220	13.280	0.444	7.880	2.540	26.320	1.660	0.312	2.830	0.000	10.990	1.770	1.750	0.676	101.392	479	30	rq91-m15-s2

No.	P ₂ O ₅	PbO	La ₂ O ₃	UO ₂	ThO ₂	Y ₂ O ₃	Ce ₂ O ₃	CaO	SiO ₂	Pr ₂ O ₃	SO ₃	Nd ₂ O ₃	Sm ₂ O ₃	Gd ₂ O ₃	Dy ₂ O ₃	Total	Age (Ma)	Error (2σ)	Comment
22	29.380	0.141	13.590	0.295	4.990	2.350	26.820	1.028	2.420	2.880	0.011	11.210	1.910	1.730	0.644	99.399	462	43	rq91-m15-s3
23	30.190	0.156	14.700	0.441	5.380	1.620	28.550	1.174	0.255	3.050	0.006	11.780	1.940	1.600	0.588	101.431	471	40	rq91-m16-s1
24	30.000	0.169	14.420	0.452	6.020	1.620	28.380	1.142	0.344	3.030	0.015	11.530	1.890	1.590	0.567	101.168	464	37	rq91-m16-s2
25	30.150	0.193	13.850	0.895	4.940	2.680	27.610	1.231	0.344	3.040	0.000	11.340	1.940	1.680	0.771	100.662	498	35	rq91-m17-s1
26	30.870	0.108	14.740	0.248	3.270	3.600	28.580	0.723	0.158	3.030	0.013	11.470	1.770	1.840	0.920	101.340	454	55	rq91-m17-s2

Seventy Mile Range Group (Thalanga) FIA1:

No.	P ₂ O ₅	PbO	La ₂ O ₃	UO ₂	ThO ₂	Y ₂ O ₃	Ce ₂ O ₃	CaO	SiO ₂	Pr ₂ O ₃	SO ₃	Nd ₂ O ₃	Sm ₂ O ₃	Gd ₂ O ₃	Dy ₂ O ₃	Total	Age (Ma)	Error (2σ)	Comment
27	30.150	0.089	15.590	0.359	3.070	1.264	30.450	0.598	1.243	3.230	0.008	11.060	1.770	1.500	0.373	100.752	420	62	rq13a-m1-s1
28	30.380	0.079	15.560	0.341	2.760	1.139	30.550	0.567	0.263	3.220	0.008	11.030	1.840	1.550	0.626	99.913	409	69	rq13a-m1-s2
29	30.310	0.057	15.730	0.288	1.790	1.320	31.270	0.427	0.157	3.310	0.013	11.350	1.800	1.540	0.678	100.039	395	91	rq13a-m2-s1
30	29.820	0.140	15.080	0.286	5.680	1.105	29.600	0.932	0.508	3.030	0.010	10.400	1.590	1.320	0.500	100.000	440	43	rq13a-m2-s2
31	30.180	0.076	15.780	0.295	2.910	1.246	30.860	0.611	0.245	3.210	0.006	10.980	1.670	1.430	0.612	100.112	388	67	rq13a-m2-s3
32	30.110	0.059	15.750	0.205	1.940	1.350	31.380	0.409	0.146	3.210	0.006	11.160	1.780	1.480	0.712	99.697	427	97	rq13a-m2-s4
33	30.930	0.073	15.470	0.378	2.210	1.460	30.920	0.636	0.887	3.090	0.009	11.240	1.800	1.590	0.710	101.402	410	76	rq13a-m3-s1
34	30.360	0.097	15.170	0.244	3.510	1.139	30.150	0.698	1.374	3.040	0.000	11.450	1.700	1.470	0.595	100.997	462	65	rq13a-m4-s1
35	30.240	0.111	14.100	0.338	4.850	1.237	28.210	0.988	0.570	2.960	0.012	11.680	2.040	1.720	0.673	99.729	378	47	rq13a-m5-s1
36	30.780	0.110	14.450	0.416	4.250	1.410	28.680	0.836	0.321	3.010	0.000	11.560	2.050	1.830	0.738	100.442	395	50	rq13a-m6-s1
37	31.080	0.054	16.270	0.346	0.955	1.290	31.440	0.309	0.145	3.270	0.000	11.690	1.750	1.470	0.673	100.742	496	125	rq13a-m7-s1
38	29.950	0.107	14.940	0.464	4.180	1.550	29.050	0.816	0.287	3.030	0.005	11.110	1.800	1.650	0.771	99.710	375	47	rq13a-m8-s1
39	30.040	0.088	14.840	0.375	2.770	1.460	29.790	0.658	0.443	3.100	0.002	11.170	1.800	1.630	0.741	98.907	438	67	rq13a-m9-s1
40	30.170	0.089	15.210	0.270	3.520	1.236	29.740	0.749	0.540	3.040	0.037	11.130	1.720	1.470	0.619	99.540	402	60	rq13a-m10-s1
41	31.460	0.091	15.080	0.291	3.210	1.550	29.580	0.693	0.559	3.080	0.006	11.060	1.770	1.560	0.663	100.651	428	64	rq13a-m11-s1
42	29.200	0.097	15.260	0.326	3.360	1.450	29.890	0.758	0.348	3.150	0.009	11.140	1.780	1.510	0.707	98.984	437	62	rq13a-m12-s1
43	30.110	0.153	14.100	0.233	7.210	1.226	28.150	1.181	0.553	2.980	0.018	10.630	1.680	1.420	0.571	100.214	395	36	rq13a-m13-s1
44	30.480	0.055	15.700	0.182	1.910	1.360	31.780	0.384	0.149	3.360	0.013	11.270	1.770	1.360	0.586	100.358	412	92	rq13a-m14-s1
45	7.300	0.047	4.300	0.299	1.370	0.147	7.950	0.451	74.290	0.791	0.001	2.530	0.388	0.253	0.069	100.186	449	85	rq13a-m15-s1
46	32.420	0.108	14.380	0.513	3.250	1.860	29.170	0.859	0.406	3.090	0.000	11.170	1.900	1.740	0.715	101.580	438	52	rq13a-m16-s1
47	30.350	0.059	15.600	0.413	1.610	1.650	30.470	0.383	0.324	3.140	0.021	11.220	1.800	1.470	0.559	99.068	369	78	rq13a-m17-s1

No.	P ₂ O ₅	PbO	La ₂ O ₃	UO ₂	ThO ₂	Y ₂ O ₃	Ce ₂ O ₃	CaO	SiO ₂	Pr ₂ O ₃	SO ₃	Nd ₂ O ₃	Sm ₂ O ₃	Gd ₂ O ₃	Dy ₂ O ₃	Total	Age (Ma)	Error (2σ)	Comment
48	29.140	0.042	16.120	0.293	1.220	1.350	31.190	0.309	0.626	3.290	0.014	11.400	1.780	1.470	0.586	98.831	345	99	rq13a-m17-s2
49	28.800	0.092	15.030	0.485	2.850	1.650	29.520	0.630	0.302	3.100	0.000	11.340	1.910	1.660	0.634	98.003	415	56	rq13a-m17-s3
50	29.790	0.124	15.400	0.304	5.140	1.290	28.710	0.869	0.546	2.850	0.014	11.210	1.840	1.590	0.582	100.259	417	43	rq13a-m18-s1

Seventy Mile Range Group (Thalanga) FIA2:

No.	P ₂ O ₅	PbO	La ₂ O ₃	UO ₂	ThO ₂	Y ₂ O ₃	Ce ₂ O ₃	CaO	SiO ₂	Pr ₂ O ₃	SO ₃	Nd ₂ O ₃	Sm ₂ O ₃	Gd ₂ O ₃	Dy ₂ O ₃	Total	Age (Ma)	Error (2σ)	Comment
51	30.390	0.120	13.130	0.327	4.620	1.390	28.370	0.902	0.511	3.170	0.018	12.290	2.280	1.920	0.727	100.165	430	49	RQ8-m1-s1
52	30.190	0.085	13.420	0.303	2.940	1.390	28.770	0.604	0.377	3.240	0.000	12.670	2.530	2.070	0.652	99.240	426	68	RQ8-m2-s1
53	30.350	0.114	13.160	0.356	4.460	1.400	28.760	0.888	0.361	3.190	0.000	12.180	2.190	1.780	0.697	99.885	409	49	RQ8-m2-s2
54	30.060	0.124	13.250	0.345	5.120	1.320	27.990	0.928	0.435	3.100	0.001	12.010	2.240	1.890	0.628	99.440	403	44	RQ8-m3-s1
55	29.910	0.094	13.500	0.388	3.470	1.440	28.260	0.878	0.447	3.160	0.007	12.050	2.130	1.710	0.668	98.112	395	56	RQ8-m4-s1
56	30.060	0.135	12.840	0.335	5.430	1.227	26.680	0.954	0.426	3.120	0.018	12.990	2.550	1.950	0.602	99.318	428	44	RQ8-m5-s1
57	30.060	0.146	13.280	0.304	6.660	1.079	27.560	1.165	0.522	3.150	0.014	11.950	1.900	1.520	0.574	99.884	394	38	RQ8-m5-s2
58	29.970	0.032	14.940	0.469	0.216	1.220	30.720	0.197	0.408	3.390	0.008	12.810	1.880	1.380	0.492	98.132	332	129	RQ8-m6-s1
59	30.450	0.107	14.050	0.488	3.680	1.240	29.230	0.856	0.150	3.280	0.005	12.330	1.940	1.500	0.566	99.871	415	52	RQ8-m6-s2
60	30.610	0.052	14.650	0.467	0.896	1.300	31.220	0.300	0.108	3.460	0.002	12.920	1.950	1.450	0.614	100.000	415	104	RQ8-m6-s3
61	29.510	0.171	12.790	0.337	7.400	1.203	26.710	1.230	0.682	3.020	0.003	11.560	2.190	1.830	0.578	99.212	418	35	RQ8-m7-s1
62	28.750	0.153	12.600	0.302	7.130	1.149	26.360	1.349	4.220	3.000	0.013	11.440	1.990	1.600	0.565	100.622	389	35	RQ8-m8-s1
63	29.540	0.182	12.580	0.380	8.200	1.179	25.930	1.580	2.140	2.890	0.000	11.140	1.870	1.540	0.530	99.681	402	31	RQ8-m9-s1
64	29.870	0.146	13.700	0.334	6.550	1.280	27.180	1.138	0.780	2.970	0.009	11.300	1.920	1.590	0.524	99.291	393	37	RQ8-m10-s1
65	29.260	0.177	12.890	0.311	8.330	1.290	26.600	1.276	0.822	2.920	0.016	11.230	1.980	1.710	0.577	99.389	390	31	RQ8-m10-s2
66	30.520	0.085	13.860	0.279	2.980	1.700	29.590	0.806	0.306	3.310	0.006	12.880	2.200	1.840	0.666	101.027	424	61	RQ8-m11-s1
67	30.160	0.110	13.720	0.259	4.610	1.500	27.880	1.258	0.488	3.300	0.035	12.270	2.110	1.780	0.589	100.068	405	46	RQ8-m11-s2
68	28.830	0.102	13.050	0.376	4.010	1.680	28.530	0.783	0.690	3.190	0.001	12.050	2.240	1.910	0.701	98.143	387	44	RQ8-m11-s3
69	28.180	0.152	13.050	0.334	6.690	1.198	27.540	1.293	1.346	3.210	0.003	12.270	2.140	1.660	0.546	99.612	408	35	RQ8-m12-s1
70	30.120	0.192	12.370	0.486	8.940	1.300	26.900	1.590	0.769	3.040	0.013	11.970	2.120	1.620	0.525	101.955	384	26	RQ8-m13-s1
71	30.370	0.112	13.340	0.399	4.490	1.460	28.600	0.943	0.857	3.220	0.004	12.000	2.110	1.800	0.639	100.343	392	43	RQ8-m14-s1

Seventy Mile Range Group (Thalanga) FIA3:

No.	P ₂ O ₅	PbO	La ₂ O ₃	UO ₂	ThO ₂	Y ₂ O ₃	Ce ₂ O ₃	CaO	SiO ₂	Pr ₂ O ₃	SO ₃	Nd ₂ O ₃	Sm ₂ O ₃	Gd ₂ O ₃	Dy ₂ O ₃	Total	Age (Ma)	Error (2σ)	Comment
72	30.740	0.039	16.120	0.227	1.074	1.029	31.420	0.382	0.258	3.180	0.007	12.140	1.830	1.380	0.500	100.327	394	127	RQ30-m1-s1
73	30.820	0.057	15.450	0.300	2.020	1.253	30.330	0.491	0.221	3.170	0.002	12.060	1.940	1.540	0.549	100.204	362	80	RQ30-m1-s2
74	30.170	0.063	15.680	0.549	1.430	1.300	30.650	0.444	0.560	3.180	0.002	11.770	1.770	1.440	0.542	99.551	381	76	RQ30-m1-s3
75	29.980	0.074	15.870	0.366	2.690	1.360	28.640	0.786	0.297	3.290	0.026	12.140	1.970	1.620	0.621	99.729	370	63	RQ30-m1-s4
76	30.580	0.093	14.640	0.227	4.010	1.108	29.920	0.749	0.827	3.140	0.000	11.980	1.950	1.470	0.597	101.291	392	55	RQ30-m2-s1
77	30.320	0.080	15.280	0.202	3.110	1.038	29.930	0.645	0.259	3.220	0.011	12.450	2.020	1.580	0.559	100.704	429	70	RQ30-m2-s2
78	29.900	0.066	15.870	0.189	2.490	1.111	28.810	0.732	0.296	3.480	0.002	12.570	2.030	1.560	0.489	99.595	414	81	RQ30-m2-s3
79	29.980	0.092	14.780	0.289	4.100	1.255	29.510	0.772	0.305	3.190	0.000	11.790	1.940	1.630	0.603	100.235	362	50	RQ30-m2-s4
80	29.960	0.099	14.860	0.258	4.550	1.094	29.870	0.875	0.378	3.190	0.008	11.930	1.880	1.460	0.562	100.974	369	49	RQ30-m2-s5
81	30.390	0.108	14.670	0.285	4.550	1.163	28.760	0.826	0.350	3.080	0.000	11.660	2.000	1.630	0.542	100.015	403	48	RQ30-m3-s1
82	29.500	0.123	14.260	0.371	5.120	1.330	28.230	1.013	0.320	3.050	0.009	11.480	2.070	1.690	0.630	99.195	396	43	RQ30-m3-s2
83	29.660	0.132	14.330	0.337	5.970	1.097	28.080	1.150	0.984	3.030	0.002	11.180	1.940	1.540	0.481	99.914	385	38	RQ30-m3-s3
84	29.470	0.080	14.790	0.297	3.290	1.266	29.280	0.665	0.206	3.190	0.009	12.240	2.220	1.830	0.614	99.445	367	59	RQ30-m3-s4
85	28.770	0.112	14.080	0.310	4.960	1.074	28.480	0.949	0.789	3.080	0.011	11.490	1.870	1.510	0.523	98.009	384	45	RQ30-m3-s5
86	28.580	0.111	14.460	0.342	4.420	1.290	28.730	0.915	0.390	3.120	0.007	11.670	2.140	1.570	0.528	98.273	406	48	RQ30-m3-s6
87	30.240	0.143	13.440	0.388	6.500	1.280	27.640	1.690	0.608	3.040	0.001	11.220	1.790	1.430	0.585	99.994	377	35	RQ30-m4-s1
88	28.740	0.167	13.190	0.321	8.190	1.192	27.200	1.480	1.659	2.950	0.034	11.090	1.830	1.330	0.474	99.846	371	30	RQ30-m4-s2
89	29.890	0.177	13.010	0.354	8.870	1.156	26.760	1.540	0.792	2.970	0.004	10.850	1.730	1.400	0.503	100.006	364	28	RQ30-m5-s1
90	29.410	0.202	12.900	0.347	9.430	1.080	26.590	1.430	1.196	2.890	0.000	10.870	1.780	1.340	0.481	99.946	400	27	RQ30-m5-s2
91	30.630	0.096	14.830	0.355	3.960	1.320	28.770	0.791	0.626	3.000	0.000	11.920	2.090	1.690	0.566	100.644	372	51	RQ30-m6-s1
92	29.730	0.098	14.590	0.297	4.700	1.130	27.480	1.015	1.260	2.900	0.010	11.860	2.140	1.620	0.456	99.285	344	46	RQ30-m6-s2

No.	P ₂ O ₅	PbO	La ₂ O ₃	UO ₂	ThO ₂	Y ₂ O ₃	Ce ₂ O ₃	CaO	SiO ₂	Pr ₂ O ₃	SO ₃	Nd ₂ O ₃	Sm ₂ O ₃	Gd ₂ O ₃	Dy ₂ O ₃	Total	Age (Ma)	Error (2σ)	Comment
93	30.400	0.075	15.210	0.285	2.790	1.121	30.370	0.592	0.353	3.080	0.000	12.060	2.030	1.570	0.476	100.412	404	69	RQ30-m6-s3
94	30.390	0.055	15.720	0.316	1.780	1.181	30.770	0.486	0.275	3.250	0.019	11.620	1.830	1.420	0.518	99.630	371	86	RQ30-m7-s1
95	30.380	0.120	14.540	0.245	5.660	1.113	28.260	0.972	0.472	3.080	0.006	11.560	1.930	1.490	0.553	100.381	378	42	RQ30-m8-s1
96	30.040	0.151	13.820	0.383	6.900	1.280	26.500	1.307	0.687	2.900	0.011	11.120	1.990	1.630	0.596	99.316	380	34	RQ30-m8-s2
97	28.880	0.170	13.730	0.324	8.050	1.023	26.970	1.316	0.942	2.910	0.010	10.760	1.730	1.340	0.536	98.691	389	31	RQ30-m8-s3
98	29.180	0.086	15.250	0.260	3.850	1.145	30.340	0.740	0.517	3.260	0.030	11.690	1.810	1.390	0.401	99.947	367	54	RQ30-m9-s1
99	30.820	0.047	16.320	0.374	0.985	1.260	31.910	0.309	0.134	3.350	0.000	12.490	1.930	1.430	0.459	101.818	405	107	RQ30-m10-s1
101	30.310	0.045	16.420	0.387	0.687	1.242	32.170	0.240	0.065	3.340	0.013	12.320	1.940	1.420	0.380	100.979	443	122	RQ30-m10-s3
102	30.310	0.042	16.840	0.344	0.668	1.088	32.890	0.221	0.054	3.430	0.010	12.010	1.770	1.220	0.346	101.241	444	135	RQ30-m10-s4
103	30.270	0.044	16.510	0.350	0.684	1.117	32.240	0.235	0.073	3.360	0.010	11.820	1.720	1.250	0.321	100.003	460	131	RQ30-m10-s5
104	30.350	0.055	15.760	0.331	1.860	1.280	31.350	0.399	0.095	3.330	0.000	12.260	1.970	1.350	0.815	101.204	357	80	RQ30-m10-s6
105	30.600	0.036	16.810	0.296	1.240	1.192	32.430	0.399	0.107	3.370	0.012	11.910	1.730	1.200	0.401	101.733	287	97	RQ30-m10-s7
106	30.580	0.045	16.240	0.273	1.330	1.111	32.080	0.336	0.222	3.430	0.000	12.200	1.910	1.330	0.502	101.588	382	104	RQ30-m10-s8
107	30.530	0.044	16.340	0.355	0.926	1.177	32.450	0.271	0.141	3.450	0.007	12.320	1.920	1.420	0.564	101.915	397	111	RQ30-m10-s9
108	29.490	0.130	13.750	0.345	5.830	1.320	28.190	1.153	0.471	3.080	0.010	11.670	1.920	1.610	0.585	99.553	383	38	RQ30-m11-s1

Seventy Mile Range Group (Thalanga) FIA4:

No.	P ₂ O ₅	PbO	La ₂ O ₃	UO ₂	ThO ₂	Y ₂ O ₃	Ce ₂ O ₃	CaO	SiO ₂	Pr ₂ O ₃	SO ₃	Nd ₂ O ₃	Sm ₂ O ₃	Gd ₂ O ₃	Dy ₂ O ₃	Total	Age (Ma)	Error (2σ)	Comment
109	30.620	0.058	14.420	0.421	1.350	1.320	32.270	0.400	0.178	3.380	0.005	11.790	1.780	1.380	0.577	99.948	412	91	RQ83-m1-s1
110	29.890	0.064	13.970	0.289	2.360	1.071	31.290	0.580	0.495	3.340	0.022	11.870	1.750	1.250	0.447	98.688	380	76	RQ83-m1-s2
111	30.730	0.047	14.400	0.313	1.460	1.004	32.510	0.330	0.278	3.520	0.001	12.030	1.740	1.230	0.473	100.066	360	99	RQ83-m1-s3
112	30.210	0.068	13.530	0.420	1.960	1.300	31.030	0.526	0.993	3.360	0.005	11.480	1.750	1.300	0.556	98.487	399	76	RQ83-m1-s4
113	30.380	0.051	14.550	0.435	1.064	1.340	32.560	0.370	0.325	3.380	0.008	11.860	1.790	1.350	0.532	99.994	384	96	RQ83-m2-s1
114	29.420	0.076	13.670	0.384	2.470	1.208	30.250	1.820	1.063	3.180	0.002	11.280	1.690	1.300	0.463	98.275	406	69	RQ83-m2-s2
115	29.870	0.141	12.720	0.370	6.670	1.330	29.480	1.131	0.731	3.170	0.008	11.590	1.630	1.300	0.408	100.549	368	33	RQ83-m3-s1
116	29.690	0.203	11.810	0.422	9.980	1.300	27.130	1.600	2.049	2.980	0.005	10.610	1.840	1.420	0.551	101.590	375	25	RQ83-m4-s1
117	27.960	0.195	11.910	0.493	9.940	1.142	26.910	1.940	1.654	2.900	0.019	11.070	1.820	1.420	0.495	99.868	354	24	RQ83-m5-s1
118	30.930	0.067	14.350	0.340	2.420	1.400	30.670	0.545	0.193	3.230	0.016	12.100	2.370	2.000	0.743	101.374	369	68	RQ83-m6-s1
119	31.090	0.076	13.850	0.323	2.750	1.490	29.740	0.621	0.235	3.220	0.003	12.430	2.740	2.320	0.762	101.651	391	64	RQ83-m6-s2
120	31.230	0.043	14.920	0.321	1.116	1.460	31.480	0.344	0.211	3.360	0.015	12.350	2.270	1.930	0.772	101.821	356	101	RQ83-m6-s3
121	30.790	0.047	14.610	0.168	1.670	1.149	31.730	0.353	0.210	3.320	0.000	12.260	2.080	1.550	0.550	100.487	397	104	RQ83-m6-s4
122	31.280	0.074	14.660	0.368	2.250	1.400	31.720	0.529	0.378	3.350	0.013	12.020	1.850	1.380	0.594	101.866	425	72	RQ83-m6-s5
123	31.630	0.050	15.090	0.416	1.025	1.330	32.190	0.216	0.316	3.370	0.000	12.240	1.770	1.310	0.515	101.467	402	98	RQ83-m7-s1
124	29.530	0.061	14.430	0.395	2.110	1.237	30.880	0.340	1.530	3.200	0.000	11.900	1.750	1.330	0.487	99.179	346	68	RQ83-m7-s2
125	31.050	0.072	14.380	0.508	1.880	1.590	31.930	0.525	0.251	3.160	0.015	11.850	1.820	1.410	0.605	101.045	395	68	RQ83-m7-s3
126	30.430	0.075	14.860	0.563	1.500	1.560	31.840	0.509	0.391	3.360	0.015	11.950	1.720	1.460	0.530	100.763	446	74	RQ83-m7-s4
127	31.150	0.064	15.910	0.595	1.230	1.580	31.440	0.400	0.318	3.130	0.008	11.420	1.710	1.440	0.594	100.989	391	75	RQ84-m1-s1
128	31.470	0.069	16.040	0.365	2.520	1.180	30.620	0.522	0.641	3.290	0.006	11.720	1.680	1.240	0.533	101.896	367	68	RQ84-m2-s1
129	30.950	0.067	16.210	0.285	2.650	1.186	30.680	0.519	0.382	3.220	0.004	11.660	1.790	1.420	0.560	101.582	370	69	RQ84-m2-s2

No.	P ₂ O ₅	PbO	La ₂ O ₃	UO ₂	ThO ₂	Y ₂ O ₃	Ce ₂ O ₃	CaO	SiO ₂	Pr ₂ O ₃	SO ₃	Nd ₂ O ₃	Sm ₂ O ₃	Gd ₂ O ₃	Dy ₂ O ₃	Total	Age (Ma)	Error (2σ)	Comment
130	31.130	0.061	16.490	0.273	1.980	1.242	30.920	0.455	0.220	3.270	0.003	11.710	1.860	1.430	0.516	101.560	410	85	RQ84-m2-s3
131	30.890	0.051	15.920	0.578	0.959	1.370	30.440	0.303	2.123	3.240	0.014	11.900	1.730	1.350	0.503	101.372	344	81	RQ84-m3-s1
132	31.670	0.059	16.060	0.303	2.110	1.340	30.930	0.496	0.332	3.220	0.015	11.770	1.700	1.310	0.498	101.814	362	78	RQ84-m4-s1
133	29.230	0.078	15.090	0.332	3.300	1.166	30.270	0.719	1.038	3.210	0.008	11.390	1.670	1.280	0.412	99.194	350	54	RQ84-m5-s1
134	29.560	0.102	15.090	0.327	3.990	1.259	30.360	0.656	0.243	3.180	0.000	11.000	1.670	1.240	0.408	99.083	403	49	RQ84-m5-s2
135	30.630	0.071	15.610	0.281	2.410	1.208	30.600	0.507	0.174	3.260	0.000	11.990	2.280	1.830	0.573	101.423	417	73	RQ84-m6-s1
136	30.890	0.080	15.650	0.332	2.980	1.226	30.280	0.577	0.224	3.270	0.000	11.710	2.110	1.670	0.593	101.592	387	60	RQ84-m6-s2
137	30.530	0.065	15.700	0.273	2.360	1.141	31.070	0.489	0.180	3.310	0.012	11.930	1.870	1.400	0.516	100.845	387	73	RQ84-m6-s3
138	30.630	0.067	15.830	0.291	2.790	1.173	30.870	0.546	0.287	3.240	0.000	11.600	1.880	1.460	0.529	101.193	343	63	RQ84-m6-s4
139	30.580	0.077	15.690	0.294	3.040	1.201	30.480	0.595	0.275	3.190	0.000	11.680	1.900	1.460	0.493	100.954	375	60	RQ84-m6-s5
140	30.210	0.104	15.400	0.307	4.360	1.115	30.170	0.782	0.431	3.110	0.011	11.440	1.740	1.360	0.494	101.033	394	47	RQ84-m6-s6
141	30.620	0.060	15.870	0.255	2.260	1.144	31.080	0.465	0.138	3.260	0.010	12.100	2.030	1.640	0.529	101.460	375	75	RQ84-m6-s7
142	30.470	0.063	15.300	0.252	2.390	1.160	30.120	0.477	0.178	3.220	0.021	12.340	2.480	1.980	0.546	100.997	378	73	RQ84-m6-s8
143	30.790	0.077	15.230	0.422	2.490	1.420	29.710	0.537	0.225	3.310	0.014	11.950	2.170	1.780	0.371	100.496	387	62	RQ84-m7-s1
144	30.740	0.067	15.500	0.401	1.870	1.330	30.170	0.475	0.631	3.240	0.000	11.760	2.090	1.790	0.342	100.406	405	75	RQ84-m7-s2
145	28.910	0.099	14.170	0.296	4.250	1.193	28.130	0.846	0.523	3.130	0.023	12.270	2.620	2.050	0.376	98.886	380	47	RQ84-m7-s3
146	30.690	0.094	15.040	0.450	3.540	1.226	29.960	0.798	0.831	3.130	0.006	11.060	1.610	1.270	0.298	100.002	379	49	RQ84-m8-s1
147	29.740	0.078	15.430	0.665	1.470	1.600	30.970	0.505	0.662	3.230	0.018	11.560	1.700	1.480	0.395	99.502	419	65	RQ84-m8-s2

APPENDIX 3

JCU sample collection

Sample No.	Eastings	Northings	Strike of thin sections prepared	Number
RQ002	367584	7754272	0, 30, 60, 90, 100, 110, 120, 130, 140, 150	10
RQ004	367819	7753850	0, 30, 60, 90, 100, 110, 120, 130, 140, 150	10
RQ005	366766	7754687	0, 30, 60, 90, 100, 110, 120, 150, 160, 170	10
RQ006	366780	7754645	0, 30, 60, 90, 100, 110, 120, 130, 140, 150	10
RQ007	366770	7754635	0, 30, 60, 70, 80, 90, 120, 150	8
RQ008	366753	7754620	0, 30, 60, 90, 120, 130, 140, 150	8
RQ009	366754	7754617	0, 30, 40, 50, 60, 90, 100, 110, 120, 150	10
RQ010	366733	7754565	0, 30, 60, 70, 80, 90, 120, 130, 140, 150	10
RQ012b	366462	7754783	0, 30, 60, 90, 120, 130, 140, 150	8
RQ012c	366462	7754783	0, 30, 60, 90, 120, 130, 140, 150	8
RQ013a	366521	7754723	0, 30, 60, 70, 80, 90, 120, 150	8
RQ013b	366521	7754723	0, 30, 60, 90, 100, 110, 120, 130, 140, 150	10
RQ014	366502	7754809	0, 30, 60, 70, 80, 90, 120, 150	8
RQ015	366513	7754830	0, 30, 60, 70, 80, 90, 120, 130, 140, 150	10
RQ021	365800	7755172	0, 30, 60, 90, 100, 110, 120, 150	8
RQ025	365801	7755048	0, 30, 60, 90, 120, 130, 140, 150	8
RQ026	365801	7755044	0, 30, 40, 50, 60, 90, 120, 150	8
RQ027	365805	7754990	0, 30, 60, 70, 80, 90, 100, 110, 120, 150	10
RQ029	364116	7755538	0, 30, 60, 90, 120, 130, 140, 150	8
RQ030	364116	7755538	0, 30, 60, 70, 80, 90, 100, 110, 120, 150	10
RQ031	364734	7755604	0, 30, 60, 90, 110, 120, 130, 150	8
RQ057	349695	7742559	0, 30, 60, 90, 120, 130, 140, 150	8
RQ062	354739	7748011	0, 30, 60, 90, 120, 130, 140, 150	8
RQ063	354740	7748007	0, 30, 60, 80, 90, 100, 120, 150	8
RQ074	348595	7742905	0, 30, 60, 90, 120, 130, 140, 150	8
RQ077	363628	7755928	0, 20, 30, 40, 50, 60, 90, 120, 150	9
RQ078	363628	7755928	0, 20, 30, 40, 50, 60, 90, 120, 150	9
RQ079	363606	7755905	0, 30, 60, 70, 80, 90, 120, 150	8
RQ080	363606	7755905	0, 30, 60, 80, 90, 100, 120, 150	8
RQ081	363647	7755770	0, 30, 40, 50, 60, 90, 120, 150	8
RQ083	363575	7755743	0, 20, 30, 40, 50, 60, 70, 90, 120, 150	10
RQ084	363575	7755743	0, 20, 30, 40, 50, 60, 70, 90, 120, 150	10
RQ085	363575	7755743	0, 20, 30, 40, 50, 60, 70, 90, 120, 150	10
RQ086	364226	7755615	0, 30, 60, 70, 80, 90, 120, 150	8
RQ087	364226	7755615	0, 30, 60, 90, 120, 130, 140, 150	8
RQ088	364236	7755619	0, 30, 60, 90, 120, 130, 140, 150	8
RQ089	364149	7755536	0, 30, 60, 90, 120, 130, 140, 150	8

Sample No.	Eastings	Northings	Strike of thin sections prepared	Number
RQ047	421140	7781747	0, 30, 60, 70, 80, 90, 120, 130, 140, 150	10
RQ049	421132	7781752	0, 30, 50, 60, 70, 90, 120, 150	8
RQ050	421122	7781760	0, 30, 60, 90, 120, 130, 140, 150	8
RQ051	421110	7781767	0, 30, 60, 90, 100, 110, 120, 130, 140, 150	10
RQ091	421171	7782772	0, 30, 60, 80, 90, 100, 120, 150	8
RQ092	421105	7782798	0, 30, 40, 50, 60, 90, 120, 150	8
RQ093	421538	7781021	0, 30, 60, 90, 100, 110, 120, 150	8
RQ094	421538	7781016	0, 30, 60, 90, 120, 130, 140, 150	8
RQ096	421512	7781059	0, 30, 40, 50, 60, 90, 120, 130, 140, 150	10
RQ097	421508	7781062	0, 30, 60, 70, 80, 90, 120, 140, 150, 160	10
RQ099	421508	7781067	0, 30, 60, 90, 120, 130, 140, 150	8
RQ100	421520	7781222	0, 30, 60, 90, 100, 110, 120, 150	8
RQ101	421189	7781711	0, 30, 50, 60, 70, 90, 120, 140, 150, 160	10
